Salt Lake City Transit Master Plan | 2017

EXECUTIVE SUMMARY

Key Moves

To achieve the Transit Master Plan goals and desired community outcomes, the top priorities of the Plan include:

Implement a frequent transit network (FTN) to provide reliable, efficient, and frequent transit service that takes advantage of the City's strong street network grid. Initial priorities are to enhance evening service on key routes, which will make transit more usable for both work and non-work trips, and to implement frequent service in the 200 S corridor.

Develop pilot programs and partnerships for employer shuttles and on-demand shared ride services that extend the reach of fixed route service for employment areas or neighborhoods that lack sufficient density or demand to support cost-effective frequent transit service. Implementation of these programs will consider the east and west sides of the city equally and incorporate Federal Transit Administration guidance to ensure equal access for people with disabilities.

Develop enhanced bus corridors that help transit run faster and more reliably, and offer high quality stop amenities that make riding transit comfortable and attractive. An initial priority is to implement coordinated capital and service improvements on 200 S, a primary east-west transit corridor for bus (and potentially future bus rapid transit and/or streetcar) service between downtown and the University.

Implement a variety of transit-supportive programs and transit access improvements that overcome barriers to using transit in terms of information, understanding, and access (including pedestrian and bicycle facilities and affordability). Initial plan priorities include developing a highly visible frequent service brand and focusing access improvements, rollout of real-time transit information, and targeted transit marketing programs on corridors that will be prioritized for FTN service enhancements.

Acknowledgments

The Salt Lake City Transit Master Plan was prepared by the Salt Lake City Division of Transportation in coordination with the Utah Transit Authority (UTA) and multiple City departments and other community and regional organizations.

Members of the Transit Master Plan Steering Committee provided valuable expertise and assistance throughout development of the Plan. The Planning Commission, City Council, and the Mayor also provided important guidance.

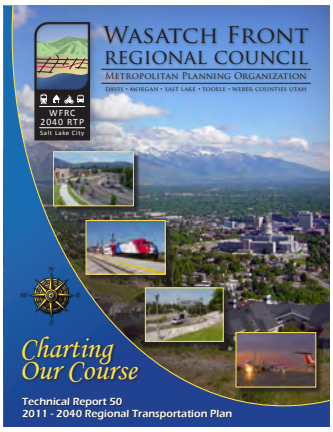
The City would especially like to thank the people of Salt Lake City and the region who provided input through outreach events, online surveys, and other channels during development of the Plan.

Why a Transit Master Plan

The Salt Lake City Transit Master Plan is a blueprint for the future of public transportation in Salt Lake City. It addresses public transit service, facilities, and policies and programs, just as the Pedestrian and Bicycle Master Plan addresses active transportation elements for the city. The Transit Master Plan emphasizes providing choices in travel and reducing dependence on the single occupant automobile. The Plan builds on numerous Salt Lake City and regional plans (see sidebar) that have identified the availability of safe, high quality, and convenient transportation choices as a critical tool to support achievement of broader outcomes (e.g., health, economic competitiveness, and quality of life). The Plan identifies key corridors for high frequency transit; intermodal opportunities to enhance linkages between the pedestrian environment and transit corridors, nodes, and centers; shared mobility options to improve access to transit and serve lower demand neighborhoods; and policies and programs that will leverage investments in transit and support transit ridership.

The Transit Master Plan builds on previous planning efforts including:

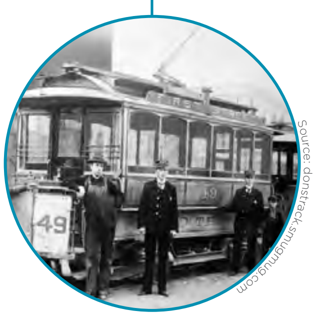
- Plan Salt Lake
- Sustainable Salt Lake
- Pedestrian and Bicycle Master Plan
- Downtown Plan
- Northwest Quadrant Master Plan
- 2040 Regional Transportation Plan
- Utah's Unified Transportation Plan 2011-2040



How far we've come

From its humble beginings as a handful of rival independent streetcar operators, the incorporated Utah Transit Authority (UTA) became the fastest growing transit agency in the country by the 1980s. The following two decades were defined by developing and implementing plans for bringing light rail and commuter rail transit to Salt Lake City and the region. The future brings a renewed focus to improve the quality of both bus and rail transit in Salt Lake City through implementation of UTA's Core Route Network and the Salt Lake City Transit Master Plan recommendations.

1889
Electric streetcar begins operating on the mule-drawn lines that were established by SLC Railroad Co. in the 1870s.



Source: donstrack.smugmug.com

1890s
Several streetcar companies form, including Salt Lake Rapid Transit Company. Rail lines are built along major spurs, creating Sugar House as SLC's first streetcar suburb.

1900s
Fierce competition among rival streetcar lines results in their incorporation into the Consolidated Railway and Power Company.

Source: Utah Historical Society

1908
Trolley Square is constructed and the streetcar system is expanded. For 37 years, the Square is home to over 140 trolley cars.

Source: Utah Historical Society

Source: sugar-house.blogspot.com

1920s – 1930s
The transit system in Salt Lake City continues to expand, and while still primarily served by streetcars, electric coaches and gas buses begin to appear. Streetcar lines are increasingly replaced with bus routes.

1940s
National City Lines buys out and decommissions the trolleys from the Utah Light and Traction Company. Buses fast become the dominant transit mode.

Source: sltrib.com

Sources: Salt Lake City Corporation and Utah Transit Authority, except where otherwise noted

1950s – 1960s
Low gas prices and highway construction causes a precipitous decline in transit ridership over the next 20 years.

1969
The Utah State Legislature passes enabling legislation called the Utah Public Transit District Act.

1970s – 1980s
UTA is incorporated and farebox revenue is halved, causing an increase in ridership. UTA becomes the fastest growing transit agency in the country.

1999
The first TRAX light rail line opens from Downtown SLC to Sandy.

1995
Winning the bid for the 2002 Winter Olympics makes Salt Lake City a high priority for federal transit funding, and sets the stage for building a rail network.

2008
FrontRunner begins operating in 2008 from Salt Lake City to Ogden.

2010s
The recession's impact on sales tax revenues, at the same time that massive rail expansion is underway, results in cuts to bus service.

2013
Streetcars return to the City with the S Line. The Salt Lake City Council commits funding to the creation of the City's first-ever Transit Master Plan.

Our goals

The Transit Master Plan goals support broader community outcomes that are important to Salt Lake City and clearly define all the desired elements to improve the transit system in Salt Lake City. These goals guided the evaluation of investment options and development of the Plan's recommendations.

1 IMPROVE AIR QUALITY

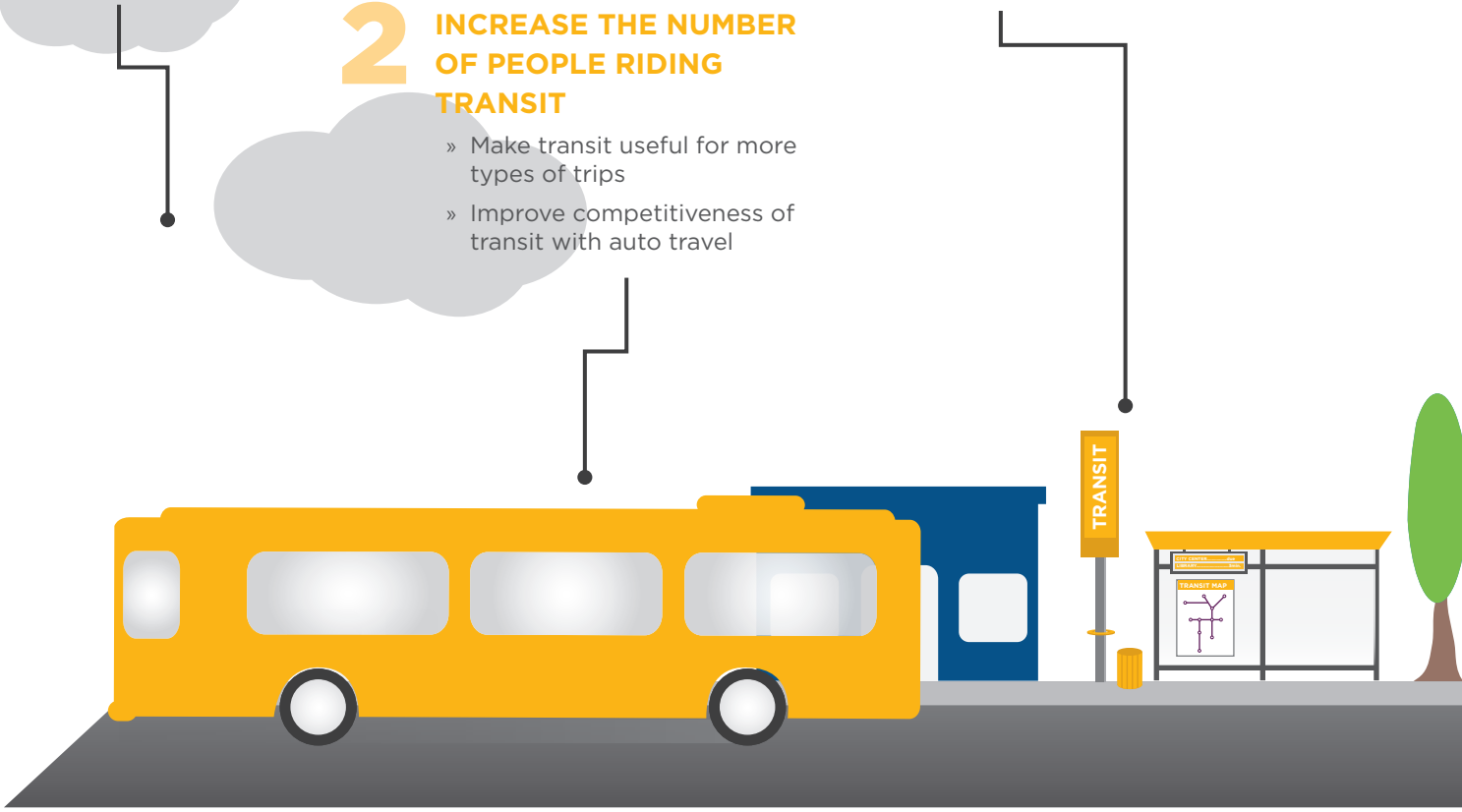
- Reduce vehicle miles traveled per capita

2 INCREASE THE NUMBER OF PEOPLE RIDING TRANSIT

- Make transit useful for more types of trips
- Improve competitiveness of transit with auto travel

3 PROVIDE A SAFE AND COMFORTABLE TRANSIT ACCESS AND WAITING EXPERIENCE

- Improve bicycle and pedestrian access to transit
- Improve the transit waiting experience and universal accessibility of stops and stations



4 PROVIDE A COMPLETE TRANSIT SYSTEM THAT SUPPORTS A TRANSIT LIFESTYLE

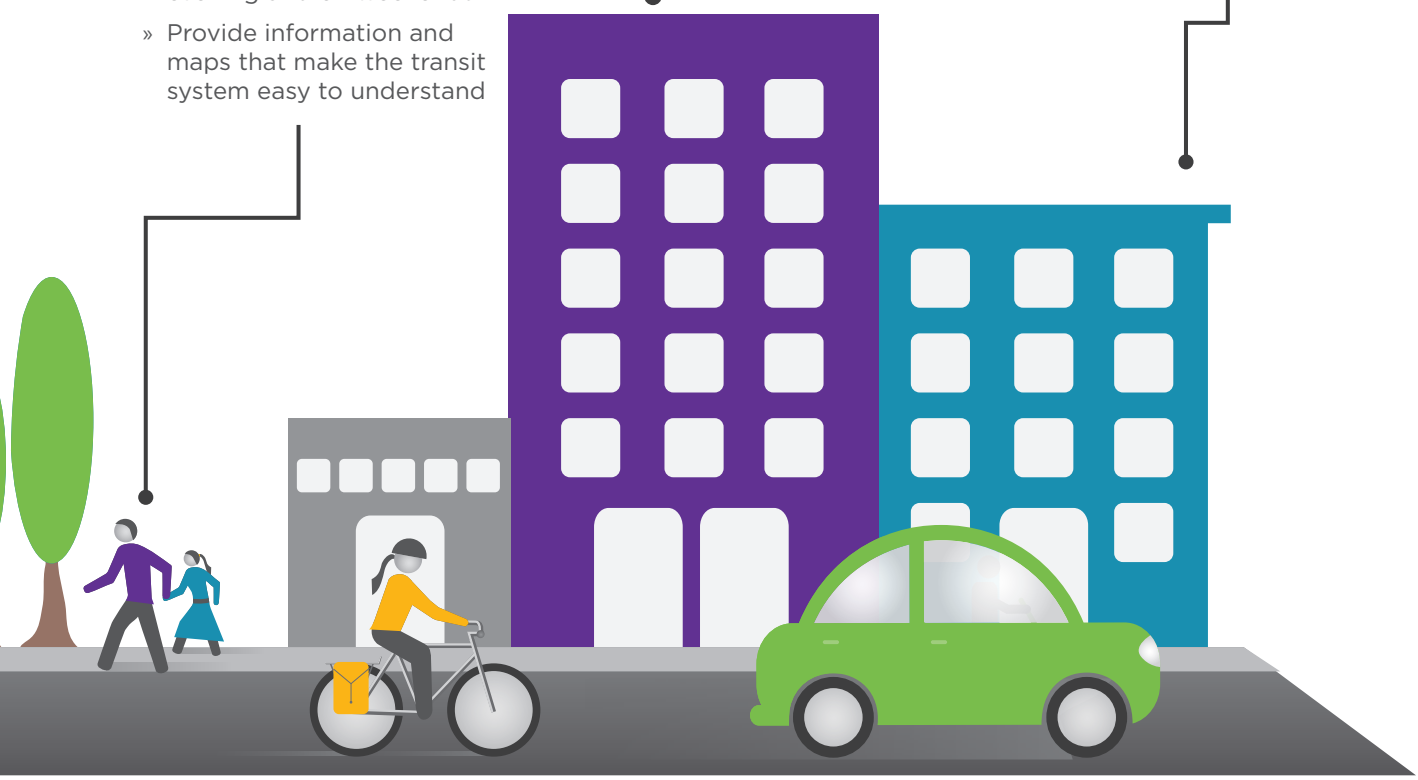
- Provide reliable, efficient, frequent, and affordable transit service
- Maintain stable service on the core transit network
- Provide service on the core transit network during the evening and on weekends
- Provide information and maps that make the transit system easy to understand

5 PROVIDE ACCESS TO OPPORTUNITY FOR LIKELY RIDERS WHO ARE UNDERSERVED

- Design a transit network that supports access to jobs, education, daily needs, and services for people who are more likely to use transit based on ability, age or income
- Provide affordable transit options, particularly for low-income households

6 CREATE ECONOMICALLY VIBRANT, LIVABLE PLACES THAT SUPPORT USE OF TRANSIT

- Align transit investments with transit-supportive land use policies and development
- Catalyze economic development and jobs in Salt Lake City by providing effective transit service that employers, businesses, and the development community can depend upon



Why now

With changes in demographics, socioeconomic conditions, and transportation preferences, there is an increasing need to reassess how transit service can best serve Salt Lake City's residents, employees, and visitors. The Salt Lake City Transit Master Plan sets a vision to improve transit service to best meet changing preferences and future needs.

1 Transit supports our growing population and economy

Expanded transit service is needed—particularly during times of peak travel—to maintain commute times that are competitive with auto travel, retain and attract businesses, and support the efficient movement of freight.

2 Transit carries more people, reducing emissions and improving air quality

On-road transportation accounts for over 15% of total emissions in Salt Lake City. If current trends continue, vehicle miles traveled are expected to increase 1.4% per year.

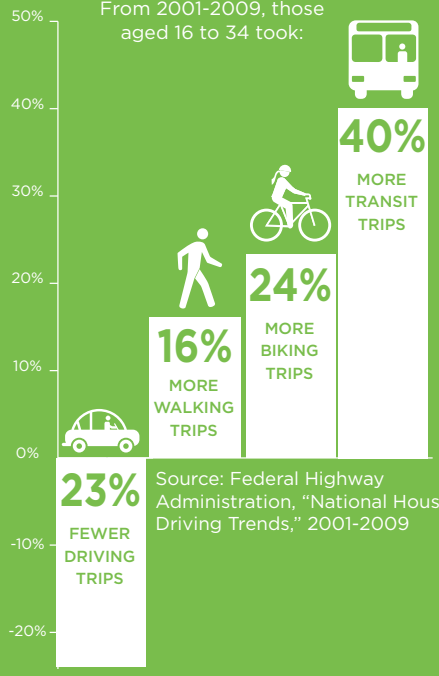
Source: Salt Lake City Community Carbon Footprint (2010).

3 Transit supports changing transportation preferences

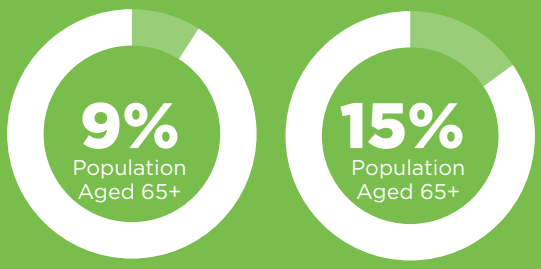
The Millennial generation (approximately those born between 1981 and 1997) is driving less and using transit, biking, and walking more.

THE MILLENNIALS ARE TRAVELING DIFFERENTLY

From 2001-2009, those aged 16 to 34 took:



Source: Federal Highway Administration, "National Household Driving Trends," 2001-2009



Source: 2014 ACS 5-year Estimates and Utah Governor's Office of Planning and Budget

4 Transit supports a more accessible and inclusive city for older adults and people with disabilities.

As the City's Baby Boomers reach retirement, they will require safe and affordable transit options to stay active and engaged in their communities and access daily services and medical appointments. **Transit is also the primary mode of travel for many of the approximately 1 in 10 Salt Lake City residents that have a disability.**

5 Transit provides an affordable transportation option

Salt Lake City residents spend an average of 20% of their household income on transportation; transit provides an affordable option for those who most need it.

Source: Housing and Transportation Affordability Index. Transportation Costs as % of Income. http://htaindex.cnt.org/map/"

6 Transit keeps us healthy

Taking transit can help increase physical activity and improve health. The current obesity rate in Salt Lake County is 27%.

Source: Utah Department of Health. Public Health Indicator Based Information System (IBIS). 2016. Retrieved from https://ibis.health.utah.gov/indicator/complete_profile/Obe.html

Public transit users walk an average of **19 minutes daily** getting to and from transit stops

SOURCE: Besser, Lilah, and Andrew Dannenberg. "Walking to Public Transit: Steps to Help Meet Physical Activity Requirements." American Journal of Preventive Medicine 29:4 (2005): 273-80.

What we heard

The Salt Lake City Transit Master Plan public outreach process engaged broad and diverse segments of the population. Opportunities for public involvement occurred throughout the process, from goal setting, to identifying issues and opportunities, to weighing in on priorities. **This is what we heard.**

1 What are your desired outcomes for transit?

Outreach Method: Stakeholder Interviews

# of Participants: 16 organizations

What did we hear? The community's goals for transit were documented through stakeholder interviews and a questionnaire made available to the general public at the outset of the Transit Master Plan. Common themes are listed below:

- To attract riders, public transit must be competitive with private automobile (in time and convenience)
- Support current and future growth areas
- Be a regional destination for culture/commerce
- Meet local and commuter needs
- Build a "transit culture"

2 What are the opportunities to improve transit?

Outreach Method: Mobile Outreach Events

# of Participants: Hundreds of people at 18 events

What did we hear? Key findings from the comment boards are summarized below:

- 18% want improved east-west connections
- 12% want more frequent transit
- 9% want service to run later in the evenings and on weekends

Outreach Method: Open House

# of Participants: 60

What did we hear? Participants were invited to identify which of the Salt Lake City Transit Master Plan's service design principles was the most important to the success of the project.

- Almost 50% of respondents identified "provide simple citywide connections on a high-frequency network" as the most important service design principle

3 What are your priorities?

Outreach Method: Open City Hall Questionnaire

# of Participants: 535

What did we hear?

- 41% of respondents selected transit system convenience and reliability as the most important outcome
- Pedestrian and bicycle access to stops (28%) was the highest ranking improvement
- A citywide network is the most important big idea for a majority of respondents (51%)

Outreach Method: Design Your Transit System Online Tool

# of Participants: 1,400

What did we hear?

The Design Your Transit System tool asked the community to prioritize different levels of service, where transit should be improved, and what capital and other improvements are needed. Key findings are outlined below:

- Improved convenience: 49% selected "Making transit easier and more convenient to use" as their primary decision factor in designing their transit system
- Faster, and more reliable: 56% of survey respondents don't take transit because it takes too long
- Improved connectivity: 54% of survey respondents can't get where they need to go via transit
- Weekend and later service: 70% of survey respondents said they want evening transit service; 58% want more transit service on Saturdays
- Regional and local priorities: Salt Lake City residents want investments in a bus based system; respondents who live outside of Salt Lake City want investments in a bus and rail system
- Improved bicycle and pedestrian access: 43% of survey respondents want improved bike and pedestrian access to transit

Our challenges

Using key findings from the State of the System report, stakeholder input, and public outreach, a gaps analysis was conducted to identify opportunities to improve the transit system in Salt Lake City. **This is what we found.**

Transit service is limited outside of the standard commute. Frequent service is very limited outside of standard commute times, particularly in the evening and on weekends. Some areas of the city with high propensity to use transit have low transit mode share and are not well-served by the existing transit system. For example, of the 44 bus routes that operate in Salt Lake City, only about half operate outside commute periods and provide midday service.*

Transit is not the preferred option. Approximately 6% of Salt Lake City residents take transit to work; only 2% of all trips are made on transit.

Transit boardings outside of Salt Lake City are outpacing boardings inside Salt Lake City. Total transit ridership on all lines that touch Salt Lake City increased by 28% between 2011 and 2014 whereas boardings in Salt Lake City on these lines only increased by 13%.*

Bus stop amenities are limited. There are limited amenities for passengers at bus stops—83% of bus stops do not have a bench or a shelter for people to wait for the bus to arrive.*

> **"I used transit regularly for daily commute for about 6 months. It more than doubled my commute time, and I was constantly worrying about missing the 'last bus.' The (bus) system worked; it was just slow."**
>
> -Design Your Transit System Survey Respondent

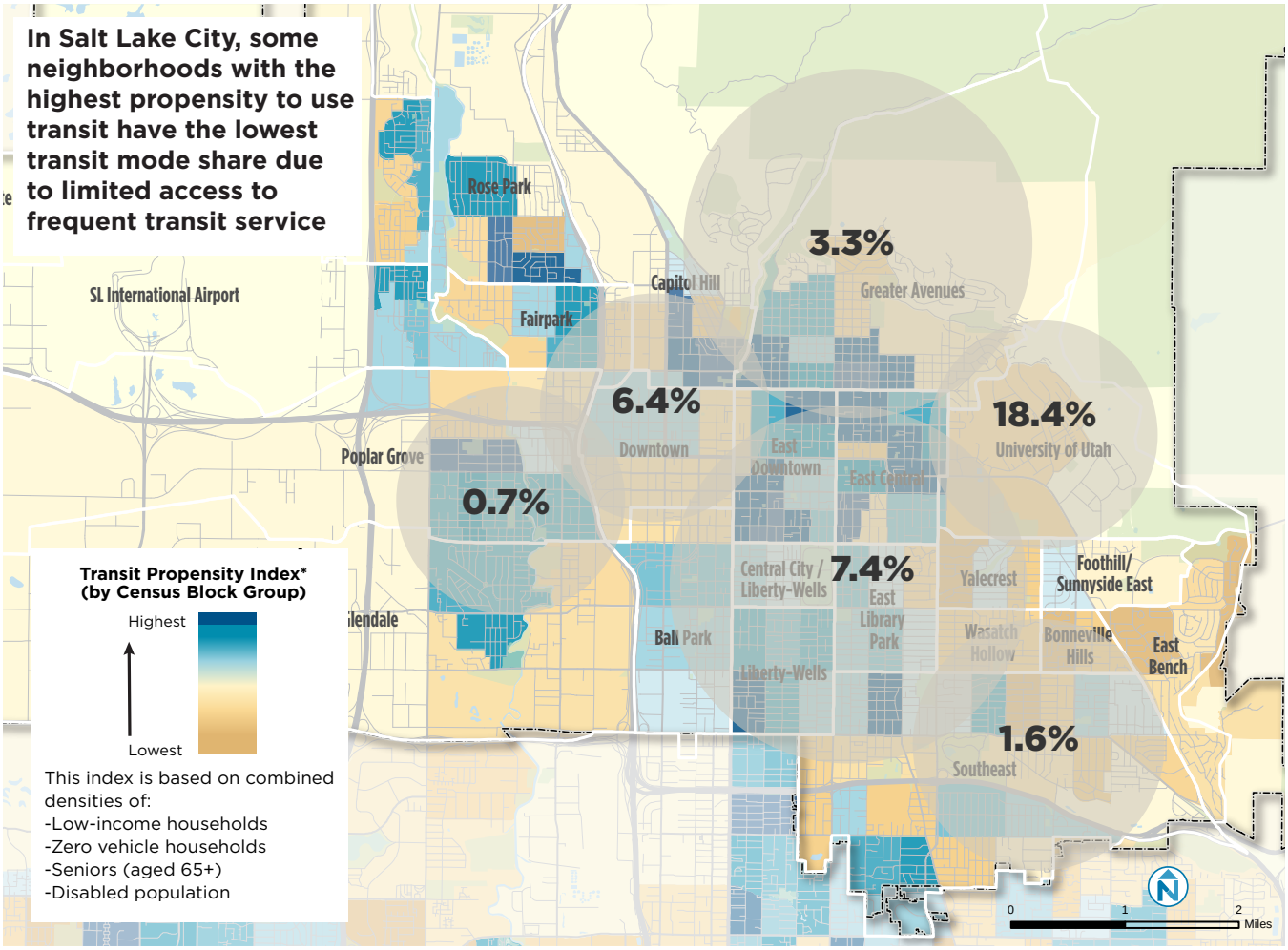
Access to transit is a challenge. Access to transit is challenging in Salt Lake City due to the wide streets and large blocks, and a majority of stops have not had ADA accessibility improvements.

System information is limited. Improved information (e.g., maps, online schedules, and trip planning, etc.) is needed to help residents, employees, and visitors understand how to use the transit system.

Cost of transit is burdensome for some. The cost of transit is particularly burdensome on large families, youth, and transit dependent populations—low-income, older adults, persons with disabilities, and zero car households.

* Note: Based on the State of the System report, which was produced in June 2015 using the best data available at the time.

The Percent of Transit Riders Varies Across Salt Lake City



Bicycle and pedestrian improvements are needed in areas of Salt Lake City, such as Ballpark Station, to connect people safely and comfortably to transit

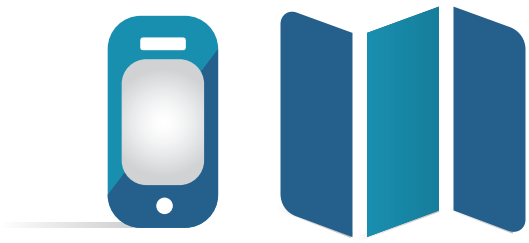
Only 17% of bus stops in Salt Lake City have a bench or shelter for passengers to wait comfortably for the bus to arrive

Building a complete transit system

The Transit Master Plan supports a complete transit system. The policies, programs, and service improvements that support a complete transit system leverage investments in transit service, maximize the benefits of transit, and bring Salt Lake City closer to meeting the goals set forth in the Transit Master Plan. **How does a complete transit system benefit people?**

1. **Expanded frequent transit service** that is fast, reliable, and permanent allows people to ride transit without a schedule and transfer with ease

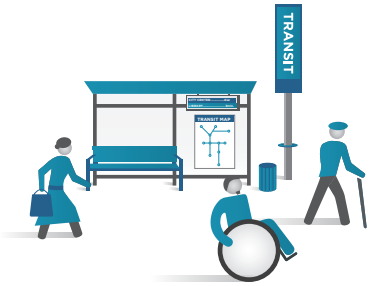
2. **Transit information and legibility** lets riders know when transit will arrive and makes using the system intuitive



3 **Safe and convenient pedestrian and bicycle access** connect people to transit stops and key destinations

4 **On-demand services (e.g., Lyft and Uber) and bike share** serve first and last mile needs and expand service hours

5 **High-quality stops and stations** make transit accessible, comfortable, and convenient



6 **Flexible fare and pass programs** make transit easy to use and affordable for families and low-income people

7 **Coordinated land use, parking, and placemaking policies** help transit connect people to destinations efficiently

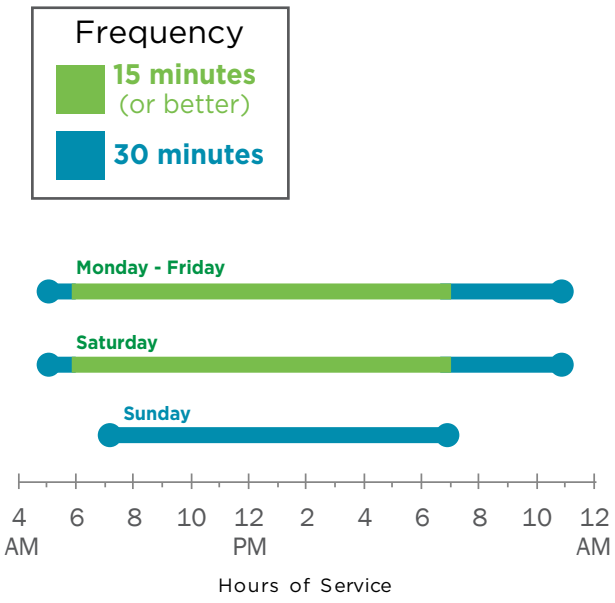
8 **Education and outreach** improve awareness and understanding of how to use the transit system

SALT LAKE CITY'S

Frequent Transit Network

The Transit Master Plan provides a vision for an expanded Frequent Transit Network (FTN); it is a long-term, 20-year vision that identifies the corridors where high-frequency service should be provided in Salt Lake City. Building off the existing grid network, the FTN is a set of designated transit corridors that offers frequent and reliable service connecting major destinations and neighborhood centers seven days a week throughout the day and evening. The lines on the FTN map (following page) do not represent individual routes, but are corridors where frequent service would be provided by a combination of bus or rail technologies. Defining an FTN vision allows Salt Lake City to work closely with Utah Transit Authority (UTA) to set priorities for service provision now and in the future.

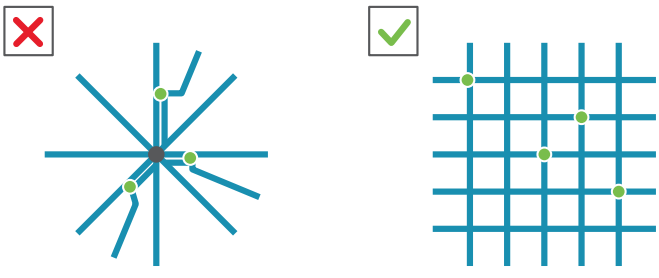
FTN Frequency and Span

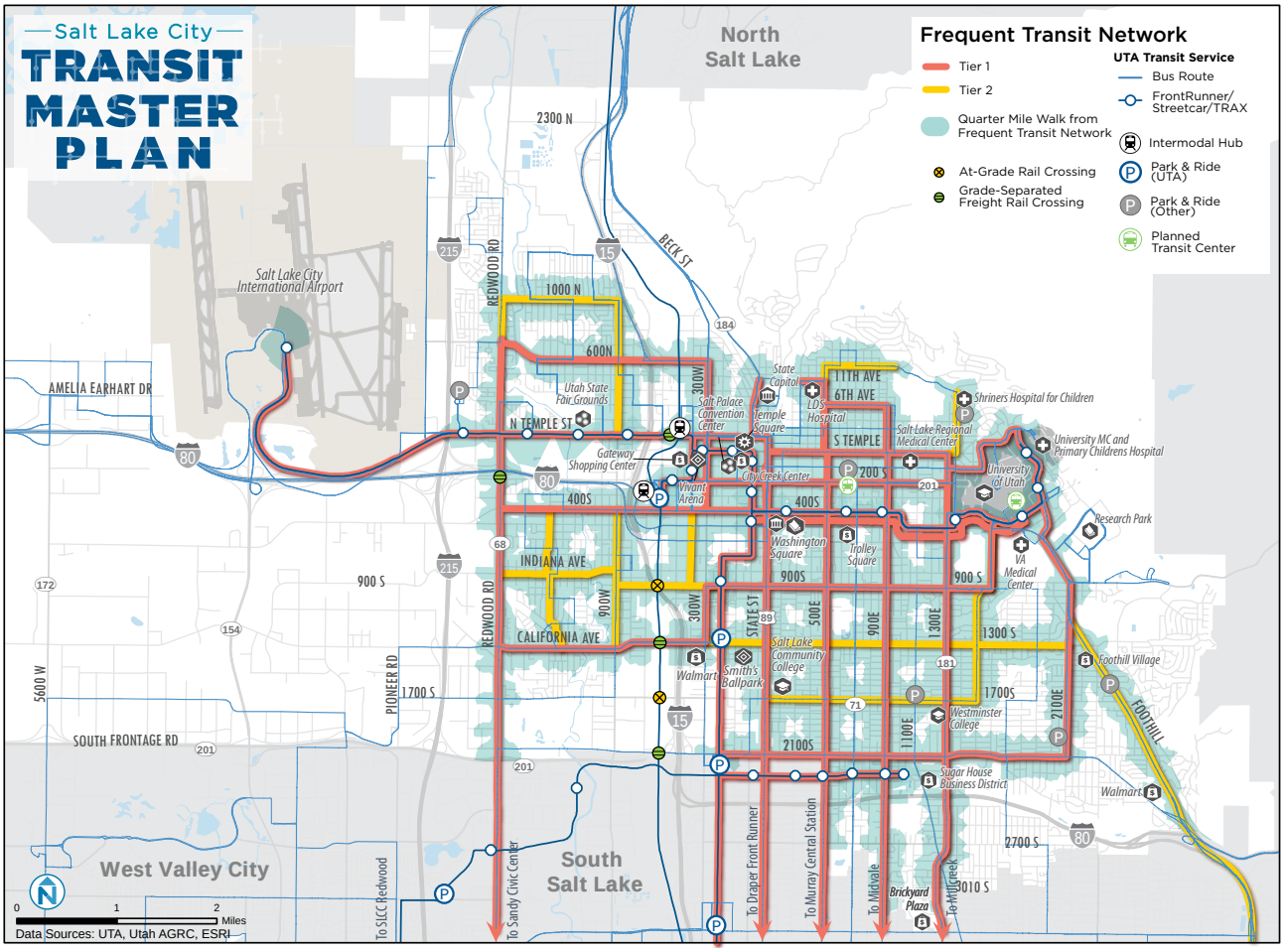


Why a Grid Network?

Salt Lake City's existing, centralized hub model is effective for regional connections but is inefficient for some local trips. Currently, many of UTA's routes terminate at Central Station, which provides good connectivity to commuter rail service, but creates challenges for people who need to travel to other destinations throughout the city, necessitating multiple transfers and/or indirect trips. The FTN builds on Salt Lake City's strong street network grid.

Radial vs. Grid Network





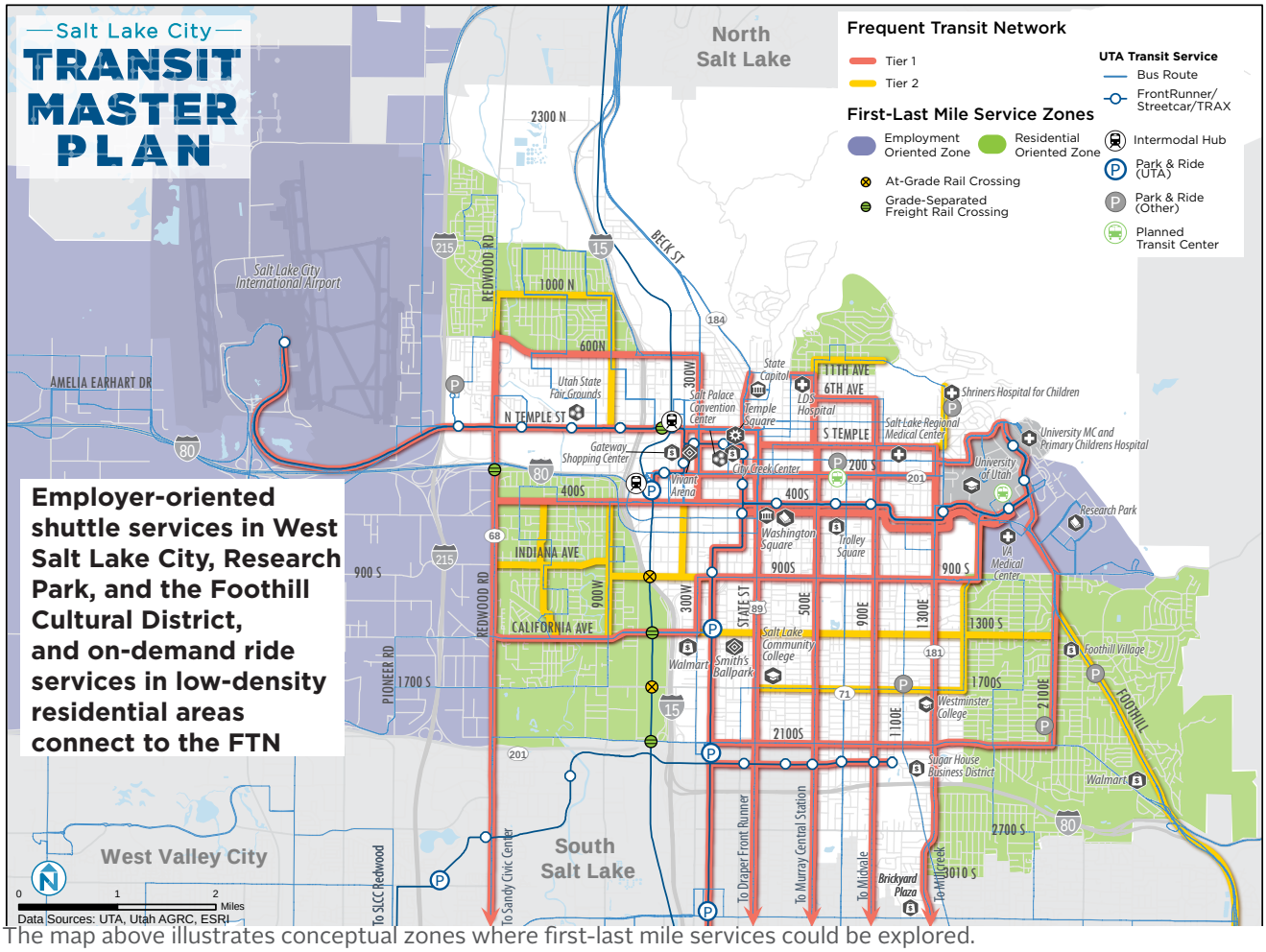
The map above illustrates phased implementation of the corridors that are recommended to create a grid-based Frequent Transit Network in Salt Lake City. The lines on the map do not represent individual routes, but rather provide a sense of the quantity, structure, and geography of coverage that Salt Lake City envisions for the future FTN. The yellow shading represents a quarter mile walking distance from the FTN.

The Frequent Transit Network is:

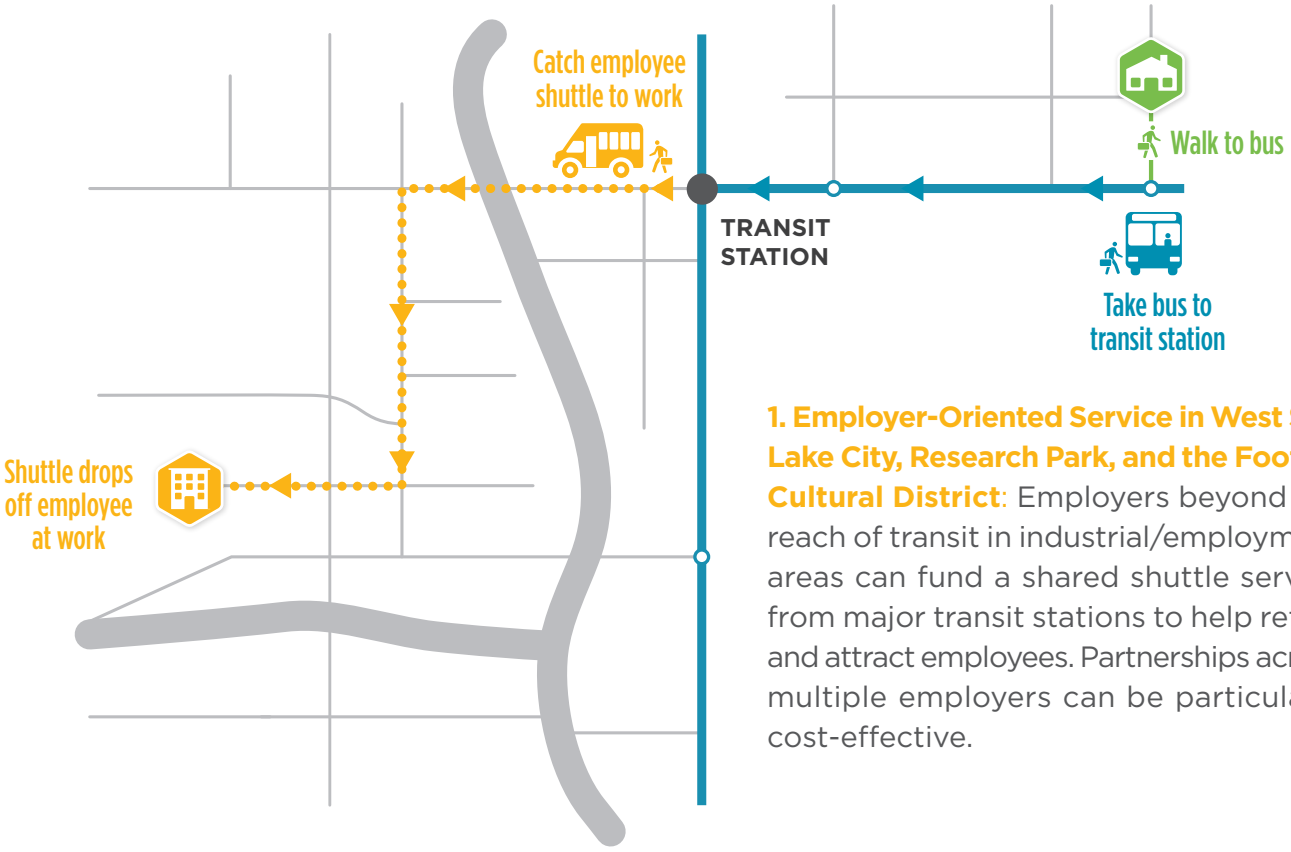
- **Fast and Reliable:** Operate transit on arterial streets/transit priority streets where it will be most rapid and reliable; make improvements that reduce transit travel time and make it more competitive with automobile travel.
- **Frequent:** Connect major destinations and neighborhood centers with all-day service, 15 minutes or better. Service that operates every 15 minutes or less is considered the minimum service level that allows people to use transit without consulting a schedule.
- **All Day:** A service frequence of 15 minutes or better, between at least 6 a.m. - 7 p.m. on weekdays and Saturdays, with 30-minute service in the evening and on Sundays.
- **Every Day:** Service running 7 days per week maintains a basic level of frequent service on weekends.
- **Stable and Permanent:** Once adopted, it is critical that the FTN become a stable, relatively unchanging part of the transit system that offers riders the same level of reliability as the TRAX system.

Connecting neighborhoods and employment to the FTN

Local transit service extends the reach of transit to neighborhoods and employment areas that are not within walking distance of the Frequent Transit Network. While the FTN (including TRAX light rail, BRT, and other frequent bus modes) serves long, direct citywide corridors, local service routes are designed to connect neighborhoods and employment areas to the FTN. The plan will need to adapt to ensure transit is "right-sized" to serve growing areas such as Northwest Quadrant as it develops and a street network is planned. As the FTN is implemented, the local service network should be adjusted to complement the FTN, and maintain a basic level of local service (minimum 60-minute frequency for 12 hours per day) to within a half mile of most residents. **By 2040, 73% of the people projected to live and/or work in Salt Lake City will be within a quarter-mile walking distance of the FTN.** Two additional types of local service are recommended to extend the reach of transit in Salt Lake City.

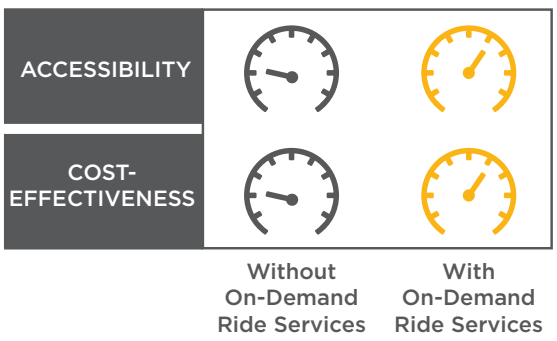


The map above illustrates conceptual zones where first-last mile services could be explored.

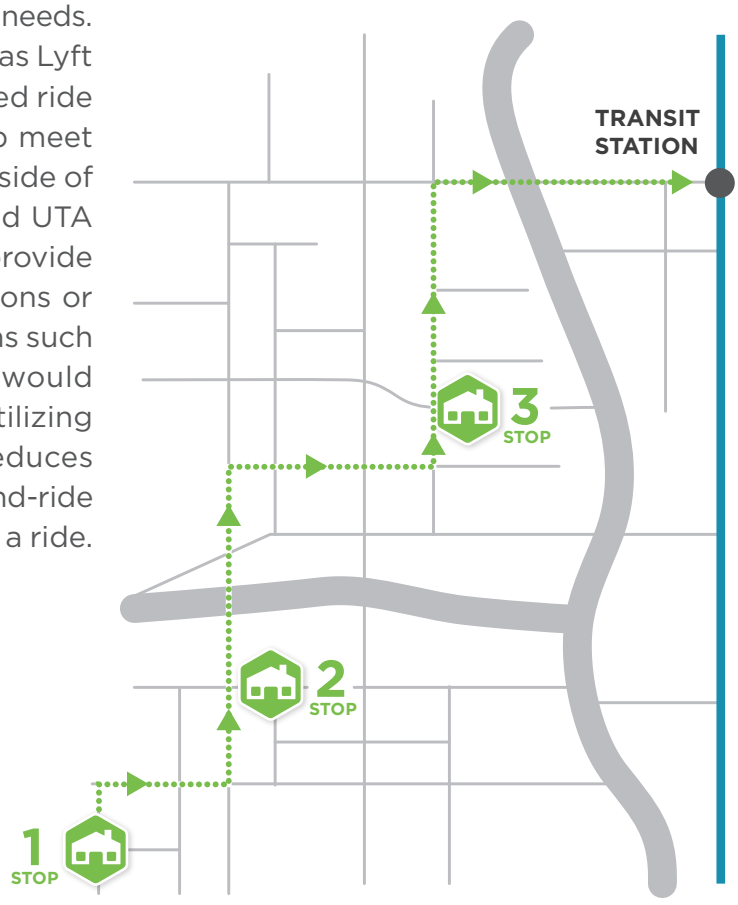


1. Employer-Oriented Service in West Salt Lake City, Research Park, and the Foothill Cultural District: Employers beyond the reach of transit in industrial/employment areas can fund a shared shuttle service from major transit stations to help retain and attract employees. Partnerships across multiple employers can be particularly cost-effective.

2. On-Demand Ride Services in Low-Density Residential Areas: Some neighborhoods in Salt Lake City lack sufficient density or demand to make it cost-effective to provide FTN and/or local service but still have important transit needs. On-demand ride service companies, such as Lyft and Uber, can provide cost-effective shared ride service in these areas. They can also help meet citywide needs to connect to the FTN outside of local transit operating hours. The City and UTA would partner with these companies to provide a discounted fare on trips to transit stations or other identified neighborhood destinations such as a grocery store; these partnerships would be structured to ensure equal access. Utilizing vehicles that are already on the road reduces traffic, cold starts, and the need for park-and-ride lots, especially if several people can share a ride.



The dials illustrate conceptually that on-demand shared ride services can improve transit access and cost-effectiveness.



Making transit fast and reliable

Capital Investment Principles

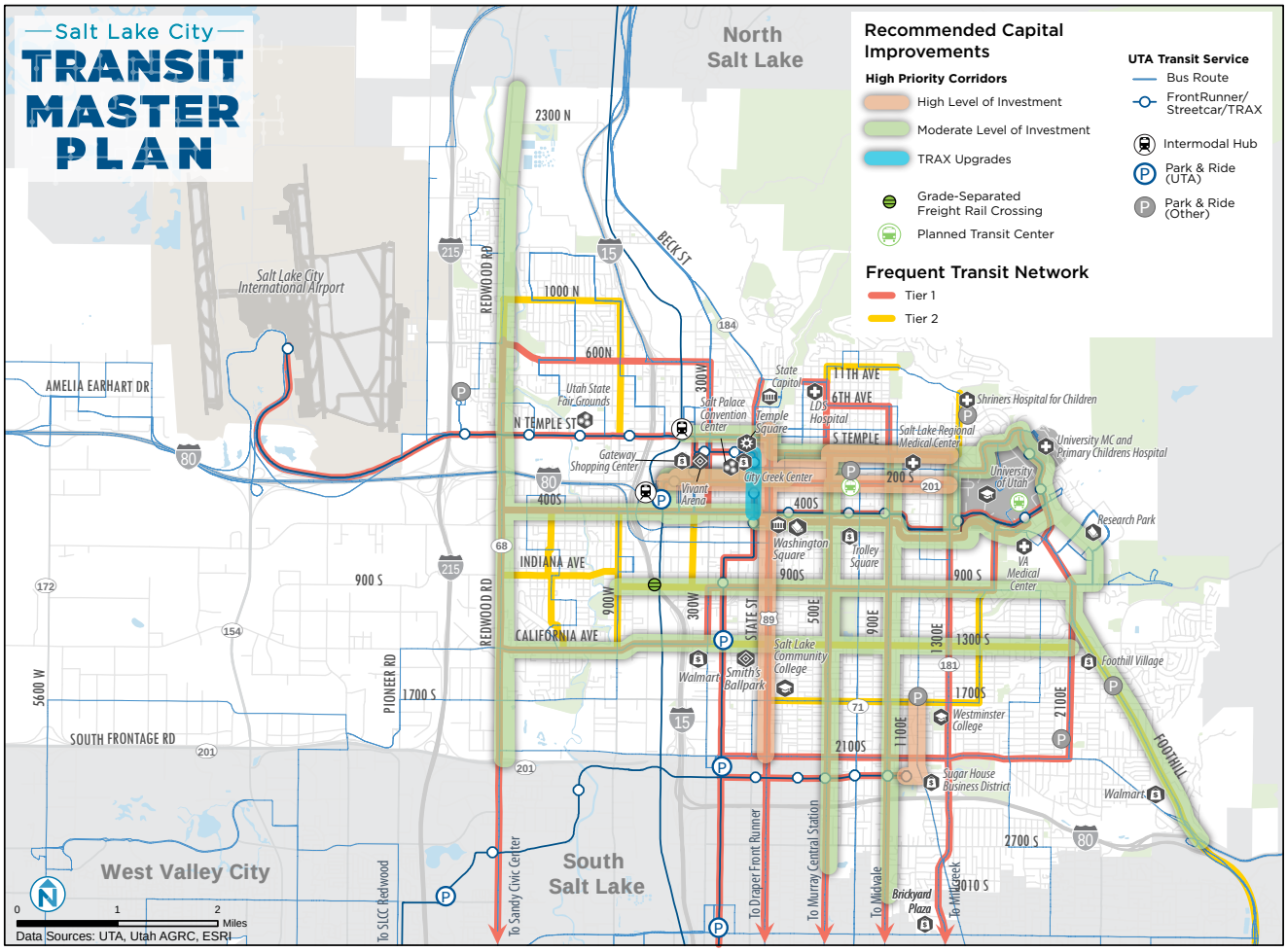
The following principles were used, along with a Transit Master Plan analysis of current and potential transit corridors, to guide where Salt Lake City should prioritize capital improvements to make service faster and more reliable.

- **Ridership potential**—enhance transit experience for existing riders and attract new riders.
- **Cost-effectiveness**—investment per passenger.
- **Land use**—corridor land use/density that supports a particular mode or level of investment.
- **Corridor conditions**—potential (need) for travel time savings, and right-of-way opportunity or constraint.

Priority Corridors

Capital investments in transit corridors support investments in frequent service and long hours of operation, and help address challenges identified through the Transit Master Plan gaps analysis. Recommended corridors for transit capital improvements include:

- **200 S**—key east-west bus (and potentially, future bus rapid transit and/or streetcar) corridor between downtown and the University.
- **State Street/500 E/900 E**—north-south enhanced bus corridors spaced about a half mile apart extending from southern city limits through downtown to major destinations, including the State Capitol and LDS Hospital, and into the Avenues neighborhood.
- **400 S**—continuous east-west bus corridor between Redwood Road and the University.
- **900 S and 1300 S/California**—continuous east-west cross-town bus corridors in the center of the city, including service to the Poplar Grove and Glendale neighborhoods.
- **TRAX light rail improvements**—capital improvements to resolve capacity issues that preclude direct service between the Airport and the University.
- **Regional access corridors**—support regional transit on corridors such as Redwood Road, Foothill Drive, and Beck Street (to South Davis County).
- **S-Line Streetcar Extension**—extend the line to improve its utility, to 1700 S (consistent with the Regional Transportation Plan) with a connection to the 900 E FTN corridor. A future extension along 900 E could connect to TRAX service at 400 S.



Salt Lake City's highest priorities for capital investments include facilities and corridor management strategies that enhance transit speed and reliability and amenities that improve passenger comfort.

Implementing Priority Corridors

The plan identifies a transit priority toolbox of treatments that can be applied to transit corridors to improve speed and reliability, including dedicated lanes, transit signal priority, queue jumps, off-board fare collection, level boarding, and context-appropriate stop spacing. The toolbox is generally consistent with the NACTO Transit Street Design Guide*, which provides additional design options and implementation details.

Implementation of the Transit Master Plan priority corridors should integrate recommendations in the City's other modal plans, including the Pedestrian and Bicycle Master Plan. This approach recognizes the importance of safe walking and biking access to transit and the cost-effectiveness of coordinating improvements.

* http://nacto.org/publication/transit-street-design-guide/

Enhanced Bus Corridors

Two proposed transit modes are enhanced bus and bus rapid transit (BRT). The main difference is that bus rapid transit includes dedicated lanes. Both types of bus service make transit run faster, more reliably, and provide high quality amenities at bus stops and stations. Page 21 highlights key elements of enhanced bus corridors.

A first step in developing capital improvements on these corridors would be to conduct a more detailed study to refine the mode (including potential applicability of a rail mode), specific alignment, and design. Capital investment corridors with connections to the existing rail system can serve as a potential framework for a streetcar network.

Making transit comfortable and convenient

Access and Amenities

Capital investments help improve the transit experience, providing safe and convenient access to the system and comfort on vehicles and at stops and stations. For many potential transit users, a lack of comfort, convenience, and safe access deters them from using transit. Expanding the current program to enhance amenities at transit stops would address a key system gap—83% of bus stops do not have a bench or a shelter where people can more comfortably wait for the bus to arrive.* Transit investments, such as branding, enhanced stations, and bike parking, can help achieve the Transit Master Plan goal of providing a safe and comfortable transit access and waiting experience. The graphic on the following page illustrates investments in enhanced bus corridors and stations.

BEFORE IMPROVEMENTS:

AFTER IMPROVEMENTS:

Preminary data show an increase in ridership related to capital improvements on 200 S

Secondary Transit Centers

Salt Lake Central Station is the city's primary intermodal transportation hub. It connects TRAX, FrontRunner, numerous bus routes, and intercity services. However, it requires out-of-direction travel for some bus routes and its bus layover facilities are at capacity; UTA is working to develop the Depot District Clean Fuels Center on UTA-owned property adjacent to Central Station, which would provide additional layover space that would support the Transit Master Plan. North Temple Station has similar issues in addition to first and last mile challenges.

The Transit Master Plan recommends developing two new transit centers:

- **East Downtown, vicinity of 200 S and 700 E**—would support current high transit demand in east downtown and provide additional layover capacity to support implementation of the FTN.
- **The University of Utah campus**—The University has obtained funding to develop dedicated layover facilities on the campus, needed to expand service to and from the University.

Note: * Based on the State of the System report, which was produced in June 2015 using the best data available at the time.

Mobility Hubs

Located at the intersection of frequent transit corridors, mobility hubs integrate the transit network with multimodal access and connections. They include pedestrian and bicycle improvements and other sustainable modes (e.g., car or bike sharing) designed to connect transit passengers to adjacent neighborhoods and nearby land uses.

ELEMENTS OF HIGH QUALITY BUS CORRIDORS

A **TRANSIT SIGNAL PRIORITY**

Intersection improvements including transit signal priority (TSP) allow buses to bypass congestion. TSP gives buses earlier and/or longer green lights.

B **BRANDING AND VEHICLES**

Unique designs make buses and stations more visible, raising awareness and increasing customer expectations for higher levels of service.

Martijn van Exel, Flickr

C **ENHANCED STATIONS**

Enhanced amenities include raised platforms, tactile treatments, off-board fare payment, real-time arrival information, larger shelters, bike parking, and information in audio, visual, and tactile formats

D **ENHANCED FARE COLLECTION SYSTEMS**

Off-board fare collection using ticket vending machines, card readers, and other tools at stations allow passengers to load without waiting in line to pay their fares.

E **BIKE PARKING**

Bike parking and GREENbike bike share at stations increase the reach of transit.

Wikimedia Commons, Jim Henderson

F **RUNNING WAY IMPROVEMENTS**

Could include bus-only lanes that separate transit from traffic and are clearly marked or queue jumps.

Supporting the complete transit network

Fast, reliable, and connected transit service is only one element of a complete transit network in Salt Lake City. Safe and comfortable bicycle and pedestrian access to stops, legible transit information, education and outreach campaigns, affordable pass programs, and supportive land use policies leverage investments in transit service, ensuring more people ride transit more often. Applying the principle of "designing for disability" makes the transit system work better for all users. Key supportive strategies and recommendations are outlined below.

Bike and Pedestrian Access

A safe and connected network of pedestrian and bicycle facilities is a foundation of a good transit system. Additional mid-block crossings and bike/transit integration can help support a complete transit network. Key recommendations include:

- Create pedestrian and bicycle routes using mid-block crossings and passageways, wide sidewalks, and signage; prioritize mid-block crossings along the FTN
- Treat bike share as an extension of the transit system and prioritize expansion of GREENbike to provide connections to the FTN

- In partnership with the City's Pedestrian and Bicycle Program, designate a network of multiuse paths; neighborhood byways; and bike lanes that provide direct connections between local destinations and the FTN
- Strengthen the City's existing Complete Streets Ordinance (per the Pedestrian and Bicycle Master Plan) by integrating transit

Transit Information

For people to be able to use transit, they must first know what services exist and understand how to use those services. Providing clear and concise information in multiple formats is critical for a high quality transit system. Salt Lake City should support

UTA in providing real-time information at stops and stations and developing a unique FTN brand. Key recommendations include:

- Provide real-time information displays at bus stops along the FTN
- Establish a Frequent Transit Network brand that is in line with UTA's updated branding efforts and is highly visible and distinguishable from other service types; the brand should expand UTA's existing frequent service branding to include: printed and web/app-friendly maps and schedule information, as well as vehicles, stations, and stops

Education and Outreach

A lack of knowledge and understanding is often the greatest barrier to transit use. Building a "transit culture" through education and promotional programs is a powerful way for Salt Lake City to increase the number of people riding transit for more trips. Key recommendations include:

- Expand on UTA's existing public information campaign to educate Salt Lake City residents, employees, and visitors on the benefits of transit
- Continue to develop an individualized marketing/SmartTrips program that targets neighborhoods along the FTN as service improvements are made; a "New Resident" program is also an effective way to reach new residents

Fare and Pass Programs

Fare and pass programs provide a seamless and more affordable way for passengers—particularly large families, youth, and low-income residents—to access the transit system. Salt Lake City can further promote and expand the HIVE Pass program and work with UTA to improve fare affordability. Key recommendations include:

- Improve fare affordability; work with UTA to determine next steps for establishing more affordable fare options for trips within Salt Lake City
- Promote and expand the HIVE Pass Program to get more passes into hands of people who are not currently using transit

Parking and Land Use Policies

Parking management and land use policies are needed to fully leverage the City's transit investments to ensure a symbiotic connection between development and transit service. Key recommendations include:

- Initiate additional parking studies for areas beyond Downtown and Sugar House to support the FTN
- Establish density thresholds that indicate when certain frequency levels are justified
- Establish standards that ensure transit-supportive design and development practices along major transit corridors, including the FTN
- Standardize Transit Area Zones to foster appropriate development along the Frequent Transit Network
- Create community gathering places around transit stops and stations (such as plazas, parklets, squares, or parks)

Implementing the Transit Master Plan

Achieving the enhanced transit services, facilities, and supportive programs set forth in the Transit Master Plan will require:

- **Strengthening the City's partnership with UTA.** Implementing the Transit Master Plan will require the City and UTA to continue to build a close partnership. Regular meetings will provide a forum for the two agencies to define their roles related to implementation of the plan, determine the level of local control, and articulate the outcomes of interagency consensus building.
- **New local transit funding sources.** Funding from a variety of public and private sources will be needed to enhance Salt Lake City's transit system and reflect the vision of the Transit Master Plan. The plan identifies potential funding options including expanding existing sources and developing innovative new sources. Private sector opportunities include sponsoring stops and funding employee shuttle services.
- **Establishing new public-private partnerships.** Contracting arrangements for residential on-demand services will need to specify when and where the service will be available, and resolve fare payment, equity, accessibility, and technology considerations. The City could encourage private sector participation by expanding the Transit Station Area Zoning District to include the FTN corridors, and factoring additional transit and transit-supportive investments into its point system.
- **Coordination between City departments.** The plan's recommendations will require support from a variety of City departments—with responsibilities ranging from streets, sidewalks, bicycle facilities, traffic signals, land use, and urban design. Specific early action items will be to standardize design guidance using the NACTO Transit Street Design Guide and to revise the Complete Streets Ordinance to explicitly include transit.
- **Adapting to changing circumstances.** The plan is a flexible, "living" document and the City can apply its principles to evolving needs. For example, the prison that is planned for the northwest quadrant of the city is a major new land use that will generate transit demand.

For more information, or to get in touch, contact the Salt Lake City Transportation Division at (801) 535-6630 or slcrides@slcgov.com

Salt Lake City
TRANSIT MASTER PLAN

2017

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1 INTRODUCTION

1 INTRODUCTION

The Salt Lake City Transit Master Plan is a blueprint for the future of transit in Salt Lake City. The Transit Master Plan emphasizes providing choices in travel and reducing dependence on the single occupant automobile. Numerous Salt Lake City plans in the last decade have identified the availability of safe, high-quality, convenient transportation choices as a critical tool to support achievement of broader outcomes, e.g., health, economic competitiveness, and quality of life. The plan builds on this work and identifies key corridors for high-frequency transit; important intermodal opportunities to significantly enhance linkages between the pedestrian environment and key transit corridors, nodes, and centers; shared mobility options to improve access to transit and serve lower demand neighborhoods and employment areas; and policies and programs that will leverage investments in transit and support transit ridership. The plan builds on the strong partnership between the City and Utah Transit Authority (UTA) and aligns with short- and long-term service design and operating principles.

PROJECT OVERVIEW

The Transit Master Plan helps Salt Lake City and UTA set priorities for the next 20 years and guides decisions about the timing and location of service and capital investments. The planning process included an in-depth analysis of city-wide travel patterns, the existing transit system and projections for future growth, extensive public outreach, and a multi-phased evaluation process to develop a set of recommendations that will guide future transit investment priorities in Salt Lake City.

The Plan was led by Salt Lake City and sought to identify citywide transit needs and investments (rather than focusing on any one neighborhood). It builds on other local and regional planning efforts and was developed in close coordination with UTA, City departments, and regional agencies. The inclusive public process is described below and in Appendix B.

Why a Transit Master Plan for Salt Lake City?

- Increase safe, reliable, and affordable transportation options for city residents
- Foster business relationships and economic development
- Accommodate urban growth in a sustainable, cost-effective manner
- Provide access to jobs, housing, and recreation
- Enhance partnerships with UTA
- Represent the community's ideal network of buses, trains, and streetcars

REPORT ORGANIZATION

The Transit Master Plan is comprised of an **Executive Summary** (under separate cover) that highlights major themes and recommendations (in the future Salt Lake City also plans to develop an overall transportation master plan summarizing this and other individual transportation modal plans), and a **Technical Report** that is organized into seven chapters (plus appendices) as follows:

Chapter 1: Introduction. Provides an overview of the Transit Master Plan process, including plan goals and objectives. Includes a summary of community input and system gaps identified throughout the planning process.

Chapter 2: Service. Provides recommendations for an expanded frequent transit network (FTN) for Salt Lake City. Components include service design principles, an FTN service level definition, maps, and descriptions of alternative local service models to support the FTN.

Chapter 3: Capital. Analyzes existing and potential transit corridors throughout Salt Lake City to determine their suitability for capital investments and recommends potential transit mode(s) for high-potential corridors identified through the corridor analysis.

Chapter 4: Access to the System. Provides recommendations for improving bicycle and pedestrian access as well as first and last mile connections. Salt Lake City manages the streets that connect people to transit, which makes the City a key partner in improving access to the system.

Chapter 5: Program and Policies. Describes a range of programs and policies that can support the Salt Lake City FTN and enhance the usability and attractiveness of the public transit system. Recommendations address information and legibility, education and outreach, fare and pass programs, and parking management.

Chapter 6: Land Use. Provides guidance for community planning and design in the areas surrounding transit stops and stations to support transit-oriented development and the coordination between land use and transit in Salt Lake City.

Chapter 7: Implementation. Provides guidance and suggested phasing for implementing the FTN, capital improvements, and transit-supportive programs and policies. Potential funding sources and service delivery conditions are also discussed.

Appendix A: State of the System Fact Book. Describes the existing conditions for transit, travel demand, and land use patterns that affect the performance of transit in Salt Lake City.

Appendix B: Community Outreach. Summarizes the community outreach conducted throughout the Transit Master Plan process.

Appendix C: Gaps Analysis. Provides an analysis of the transit system gaps identified through the Fact Book analysis and community outreach.

Appendix D: Corridor Analysis Results. Provides results from the corridor analysis that informed Transit Master Plan recommendations.

The Transit Master Plan was developed in 2015 and 2016 using the best information available at the time. The Transit Master Plan is a flexible, "living" document. The City can apply its principles to address changing circumstances and needs, and adapt the plan to integrate the outcomes of other planning processes.

SALT LAKE CITY TRANSIT MASTER PLAN GOALS

The goals and objectives, shown in Figure 1-1 below, were developed through the refinement of goals established by City officials, incorporation of public input, and initial evaluation of the existing system. They support broader community outcomes that are important to Salt Lake City and clearly define all the desired elements for improving the transit system in Salt Lake City. These goals and objectives guided the evaluation of investment options and development of the Plan's recommendations.

Figure 1-1 Salt Lake City Transit Master Plan Goals and Objectives

Goals		Objectives
1	Improve air quality.	Reduce per capita vehicle miles traveled.
2	Increase the number of people riding transit.	Increase transit ridership.
		Make transit useful for more types of trips.
		Improve the competitiveness of transit with auto travel.
3	Provide a complete transit system that supports a transit lifestyle.	Provide reliable, efficient, frequent, and affordable transit service.
		Provide service on a citywide network that serves a broad range of important community destinations.
		Maintain stable service on the core transit network.
		Provide service on the core transit network during the evening and on weekends to support all types of trips, including work and non-work trips.
		Provide information and maps that make the transit system easy to understand.
4	Provide a safe and comfortable transit access and waiting experience.	Improve bicycle and pedestrian access to transit.
		Improve the transit waiting experience and universal accessibility of stops and stations.
5	Provide access to opportunity for likely riders who are underserved.	Design a transit network that supports access to jobs, education, daily needs, and services for people who are more likely to use transit based on ability, age, or income.
		Provide affordable transit options, particularly for low-income households.
6	Create economically vibrant, livable places that support use of transit.	Align transit investments with transit-supportive land use policies and development.
		Catalyze economic development and jobs in Salt Lake City by providing effective transit service that employers, businesses, and the development community can depend upon.

Benefits of an Enhanced Public Transit System

With changes in demographics, socioeconomic conditions, and transportation preferences, there's an increasing need to reassess how transit service can best serve Salt Lake City's residents, employees, and visitors. The Salt Lake City Transit Master Plan sets a vision to improve transit service to best meet changing preferences and future needs.

1 Transit supports our growing population and economy

Expanded transit service is needed particularly during times of peak travel to maintain competitive commute times, retain and attract businesses, and support the efficient movement of freight.

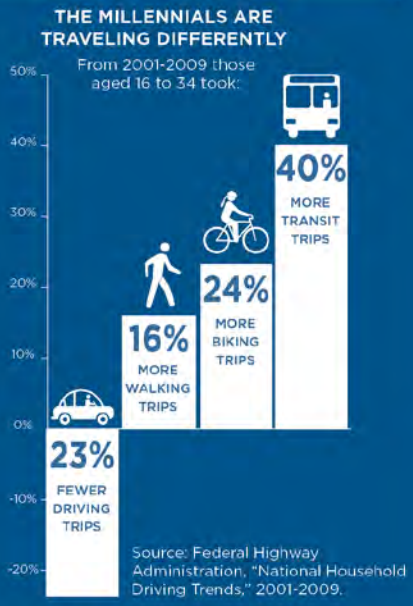
2 Transit carries more people, reducing emissions and improving air quality

On-road transportation accounts for over 15% of total emissions in Salt Lake City. If current trends continue, vehicle miles traveled are expected to increase 1.4% per year.

Source: Salt Lake City Community Carbon Footprint (2010).

3 Transit supports changing transportation preferences

The Millennial generation (approximately those born between 1981 and 1997) is driving less and using transit, biking, and walking more.



4 Transit supports a more accessible and inclusive city for older adults and people with disabilities

As the City's Baby Boomers reach retirement, they will require safe and affordable transit options to stay active and engaged in their communities and access daily services and medical appointments. Transit is also the primary mode of travel for many of the approximately 1 in 10 Salt Lake City residents that have a disability.

Source: 2014 ACS 5-year Estimates and Utah Governor's Office of Planning and Budget

5 Transit provides an affordable transportation option

Salt Lake City residents spend an average of 20% of their household income on transportation; transit provides an affordable option for those that most need it.

20% transportation costs

Source: Housing and Transportation Affordability Index. Transportation Costs as % of Income. http://htaindex.cnt.org/map/"

6 Transit keeps us healthy

Taking transit can help increase physical activity and improve health. The current obesity rate in Salt Lake County is 27%.

Source: Utah Department of Health. Public Health Indicator Based Information System (IBIS). 2016. Retrieved from https://ibis.health.utah.gov/indicator/complete_profile/Obe.html

Source: Besser, Lilah, and Andrew Dannenberg. "Walking to Public Transit: Steps to Help Meet Physical Activity Requirements." American Journal of Preventive Medicine 29:4 (2005): 273-80.

SUMMARY OF COMMUNITY INPUT

The Salt Lake City Transit Master Plan public outreach process engaged a broad and diverse segment of the population. Opportunities for public involvement included: stakeholder interviews, mobile event outreach, public open houses, and online engagement. Public outreach was conducted in all seven Council Districts of Salt Lake City. In addition to the general public, numerous organizations were involved in the planning process, including:

- Breathe Utah
- Crossroads Urban Center
- Envision Utah
- Heal Utah
- Salt Lake County Aging and Adult Services
- Salt Lake City Chamber of Commerce
- Salt Lake City Community Councils
- Salt Lake City Council
- Salt Lake City Downtown Alliance
- Salt Lake City Planning Commission
- Salt Lake City School District
- Salt Lake City Transportation Advisory Board (TAB)
- Salt Lake City's UTA Trustees
- Salt Lake County
- South Salt Lake City
- Sugar House Chamber
- University of Utah
- Utah Department of Transportation (UDOT)
- Utah Transit Authority (UTA)
- Utah Transit Riders Union
- Wasatch Front Regional Council
- Westminster College

An overview of key outreach efforts is provided below; Appendix B provides a detailed summary.

Stakeholder Interviews

The project team met with several key stakeholder groups in the community during spring of 2015 to understand the needs of their organizations and constituencies. Interviews focused specifically on their goals for the Transit Master Plan, issues and opportunities for the current UTA network, level of understanding of the services provided, and any other issues such as accessibility, affordability, etc.

Mobile Outreach Events

To develop a presence in the community, the team conducted 18 mobile outreach events during the summer of 2015. This effort took advantage of existing city-wide and neighborhood events and engaged members of the public that do not traditionally attend open houses.

Over 400 individual comments were collected via comment boards and a mapping exercise that allowed attendees to geographically highlight routes in need of improved service, longer service, or new service. A number of these events used a branded trolley-style bus to allow members of the public to board, interact with members of the project team, and engage in the outreach activities.

Public Open House

On September 23, 2015, a total of 60 people attended a public Open House held at the City Creek Harmons grocery store. The team presented the educational boards from the mobile outreach effort as well as boards that showed key gaps where land use density or demographics indicate a propensity to ride transit, but where there is little transit use.

> "People work on Sunday and late at night, it is difficult to get where we need to go when we cannot rely on the transit system to run at the appropriate times."
>
> - *"Design Your Own Transit System" Survey Respondent*

A total of 64 comments were provided via three "conversation boards"—one for prioritizing goals, one for comments on service design principles, and one for conversation on maps and information, fares, and access and station improvements.

Online Engagement

To engage Salt Lake City residents who were unable to attend one of the in-person public outreach events, the project team developed a project website: SLCRides.org. The website included detailed information about the project, outreach events planned and completed, project reports and documentation, and online community input tools—Open City Hall Questionnaire, Open UTA Questionnaire, and the "Design Your Own Transit System" tool. In addition to the available online community input tools, twenty-two participants wrote direct emails through the SLCRides.org website.

Open City Hall Questionnaire

The Open City Hall online questionnaire asked respondents to identify their top choices regarding key outcomes from the Plan, desired improvements, and "big ideas" related to transit. The questionnaire was available from July 30 to October 1, 2015 through Open City Hall and the project website.

Among the 535 responses, air quality (49%) and transit system convenience and reliability (41%) were identified as the most important outcomes. Pedestrian and bicycle access to stops (28%) was the highest ranking improvement and a citywide network of transit service was the most important big idea.

Open UTA Questionnaire

The Open UTA online questionnaire asked respondents to identify their top choices regarding service improvements, bus improvements, light rail (TRAX) improvements, and FrontRunner improvements. The questionnaire was accessible from UTA's website during the summer of 2015 and closed on October 1, 2015. A total of 461 responses were collected, including 74 from Salt Lake City residents.

> "Buses should run on predictable routes on major streets at closer distance intervals. The city is a grid; the bus system should reflect that. Nowhere in town should be more than one transfer and a short walk away."
>
> - *"Design Your Own Transit System" Survey Respondent*

Bus was identified as the most important mode for improvement (45%), followed by TRAX and Streetcar (35%). Improving service span was the most important bus improvement (50%). Late night service was the most important TRAX improvement (47%) and Sunday service was the top priority for FrontRunner enhancement (59%).

"Design Your Own Transit System" Online Tool

Between November 2015 and April 2016, a "Design Your Transit System" tool was made available to the public on the project website SLCrides.org. Over 1,400 people participated. Input highlighted the key challenges and opportunities to improve the transit system in Salt Lake City. Major findings from this outreach tool are described below.

- **Participants**
  - 1,412 people participated, of which 65% live in Salt Lake City.
  - The online tool reached a wide audience; however, seniors (65 or older), low-income populations (earning less than $35,000 per year), and residents of western Salt Lake City were somewhat under-represented as compared to their share of the general population.
- **Transit Use**
  - 40% of respondents ride transit multiple times per week and 60% ride at least once a month.
  - The top reason cited for riding transit was environmental reasons (25% of respondents).
  - The top reasons for not riding transit more often were related to convenience, with more than 50% of respondents indicating transit takes too long or doesn't go where they need it to go.
- **Service Coverage**
  - The highest-priority destinations to serve were Utah's top job centers (52%) and mixed use and major growth areas (49%). These two destinations were priorities for all groups regardless of frequency of transit use, age, or income.
  - Service to LIMITED neighborhoods[1] was a particular priority for adults 65 or older (2nd most common response) and low income respondents (3rd most common response).
- **Service Periods**
  - Respondents most desired new service in the evening (70%), followed by Saturday service (58%) and finally Sunday service (39%). These priorities were identical, regardless of respondents' frequency of transit use, age, or income.
- **Capital Improvements**
  - The top capital improvement priority was to increase investments in a rail-based system (46%). This was the top priority regardless of frequency of use, age, or income.
  - Responses from Salt Lake City residents were similar to those of all people who responded, though Salt Lake City residents were somewhat more likely to want to increase investment in the bus system.
  - Adults age 45-64, age 65 or older, and low-income respondents were somewhat more likely than other groups to indicate a preference for a bus-based system or incremental improvements to the current system.
- **Other Improvements (to support coverage, service period, and capital investment selections)**
  - Increased investment in access to transit on foot or by bike was the highest priority improvement overall (43%) and for all groups except those age 65 or older.
  - Respondents age 65 and older indicated a preference for investments in benches, shelters, and amenities at transit stops.

[1] Limited neighborhoods are neighborhoods with a high propensity to use transit.

GAPS ANALYSIS

While portions of Salt Lake City are well-served by transit, some portions of the city experience a mismatch in the existing transit supply and current demand, resulting in a "gap." To determine where gaps exist, an analysis was conducted to identify underserved corridors or markets, areas with too much service, and areas ineffectively served by transit.

Key transit service needs and gaps identified in this analysis are highlighted below; the complete Gaps Analysis is provided in Appendix C:

- **Transit service is limited outside of the standard commute.** Frequent service is very limited outside of standard commute times, such as midday, evenings, and weekends. Some areas of the city with high propensity to use transit have a low transit mode share and are not well-served by the existing transit system. For example, of the 44 transit routes that operate in Salt Lake, only about half operate outside commute periods and provide midday service.
- **Transit is not the preferred option.** Six percent of Salt Lake City residents take transit to work; only 2% of all trips are made on transit.
- **Transit boardings outside of Salt Lake City are outpacing boardings inside Salt Lake City.** Total transit ridership on all lines that touch Salt Lake City increased by 28% between 2011 and 2014 whereas boardings in Salt Lake City on these lines only increased by 13%.
- **Bus stop amenities are limited.** There are limited amenities for passengers at bus stops—83% of bus stops do not have a bench or a shelter where people can more comfortably wait for the bus to arrive.
- **Access to transit is a challenge.** Access to transit is challenging in Salt Lake City due to the wide streets and large blocks.
- **System information is limited.** Improved information (maps, online schedules, and trip planning, etc.) is needed to help residents, employees, and visitors understand how to use the transit system.
- **Cost of transit is burdensome for some.** The cost of transit is particularly burdensome on large families, youth, and transit dependent populations—low-income, older adults, persons with disabilities, and zero car households.

COMPLETE TRANSIT SYSTEM

The Salt Lake City Transit Master Plan sets a vision for frequent transit service throughout the city, responding to community and policy direction to improve public transportation for the benefit of all members of the community. However, getting more service to more people is not the only answer. Enhancing transit quality and the transit passenger experience for Salt Lake City residents and workers will take a coordinated, "complete transit system" approach.

What is the "Complete Transit System?"

A Complete Transit System is a unifying concept for complementary transit service quality and land use elements (e.g., service levels and land use policies) and non-service elements (e.g., facilities, pedestrian and bicycle access, etc.) that function together to achieve the desired local outcomes for transit in Salt Lake City.

The Salt Lake City Transit Master Plan provides strategies and recommendations for Salt Lake City to develop a Complete Transit System that:

Prioritizes **expanded frequent transit service** that is fast and reliable, frequent, all day, every day, and permanent.

Improves **transit information and legibility.**

Ensures there is safe and convenient **pedestrian and bicycle access** to transit and from transit to key destinations.

Integrates **on-demand ride services and bikeshare** to serve first-last mile needs and expand service span.

Builds **stops and stations** that are accessible, comfortable, and convenient.

Offers **fare and pass programs** that are flexible and affordable.

Coordinates **land use, parking, and placemaking policies** with transit investments.

Provides **education and outreach** to improve understanding of the transit system.

Implementing the policies, programs, and service improvements that support a Complete Transit System will require a strong partnership between UTA and Salt Lake City. These elements will help the City and UTA fully leverage investments in transit service, maximize the benefits of transit, and bring Salt Lake City closer to meeting the goals set forth in the Transit Master Plan.

2 TRANSIT SERVICE

2 TRANSIT SERVICE

This chapter provides the Salt Lake City Transit Master Plan transit service recommendations. Transit recommendations are grounded in an extensive existing conditions and gaps analysis that informed a detailed evaluation of current and potential transit corridors in Salt Lake City. A multi-faceted public outreach process complemented the technical evaluation and helped validate the recommendations.

A core service element of the Transit Master Plan is an expanded frequent transit network (FTN) for Salt Lake City. The FTN is the City's long-term, 20-year vision for high-frequency transit service corridors in Salt Lake City. The existing TRAX light rail system already provides frequent service; this Plan builds off of this core network by identifying a high-frequency grid comprised of both rail and bus service. Defining an FTN vision allows Salt Lake City to work closely with the Utah Transit Authority (UTA) to set priorities for service provision now and in the future.

This chapter includes the following elements:

- **Service Design Principles.** Principles that can be used to design a network of transit routes that will fulfil the FTN vision.
- **FTN Overview and Service Level Definition**. The definition of the standardized minimum service level that will be provided on all FTN corridors, e.g., frequency, span (hours of operation), and days of service.
- **FTN Vision and Maps.** The vision for where frequent service should be provided throughout the city, including general phasing recommendations.
- **Local Service Network.** Recommendations for the network of local bus routes that provide connections to the FTN.
- **First-Last Mile Service Models**. Examples of alternative service models to improve first- and last-mile connections to the FTN and other transit services.

SERVICE DESIGN PRINCIPLES FOR SALT LAKE CITY

The service design principles below guide the development of the frequent transit network in Salt Lake City. These principles respond to the goals of the Plan, the gaps analysis, and input from stakeholders and the public (described in Chapter 1).

- **Convenient**: Provide frequent, reliable daytime and evening transit service
- **Connected**: Provide simple, citywide connections on a high-frequency network
- **Legible**: Brand the core frequent transit network differently and design for ease of understanding
- **Easy to Use**: Make the transit network easy to access and comfortable
- **Demand Driven**: Invest in transit where overall travel market demand is high
- **Permanent**: Provide stable service that riders and investors can rely on now and in the future

These service design principles inform the frequent transit network recommendations and can inform design of specific transit routes that are developed to fulfil the vision. They also inform the recommendations for capital investments, programs, policies, and other supportive investments which are presented in subsequent chapters.

FREQUENT TRANSIT NETWORK OVERVIEW

What is a Frequent Transit Network?

A frequent transit network (FTN) is a set of designated transit corridors that offer frequent, reliable service connecting major destinations and neighborhood centers seven days a week and in the evenings. The FTN can be comprised of both bus and rail technologies. Regardless of mode, the network should be developed to provide a consistently high standard of capacity, reliability, frequency, and passenger amenities. The FTN should be easy to understand and clearly communicated to riders and non-riders. The FTN is just one element of a complete transit system—other local transit routes would provide well-timed connections to the FTN and additional first and last-mile services would help passengers connect to origins and destinations located beyond a short walking or biking distance of the FTN.

Chapter 4 describes access improvements for people walking and biking to transit. Chapter 5 provides recommendations related to branding the FTN.

Key Performance Characteristics of a Frequent Transit Network

To meet City goals to increase transit mode share and truly support residents' ability to live a car-free lifestyle, a frequent transit network should ideally have the following characteristics:

- **Fast and Reliable**: Operate transit on arterial streets/transit priority streets where it will be most rapid and reliable; make improvements that reduce transit travel time and make it more competitive with automobile travel.
- **Frequent**: Connect major destinations and neighborhood centers with 15 minute or better, all day service. Service that operates every 15 minutes or less is considered the minimum service level that allows people to use transit without consulting a schedule.
- **All Day**: 15 minute or better service frequency between at least 6 a.m. – 7 p.m. on weekdays and Saturdays, with 30-minute service in the evening and on Sundays.
- **Every Day**: 7 day per week service that maintains a basic level of frequent service on weekends.

- **Stable and Permanent**. Once adopted, it is critical that the FTN become a stable, relatively unchanging part of the transit system so that riders can rely on it much as they do the TRAX system.

What Investments are Typically Made on a Frequent Transit Network?

Once the network is defined, coordinated transit service and capital investments, bicycle and pedestrian access improvements, and transit-supportive land use policy changes are needed to fully realize the value of the FTN. A truly effective FTN must be developed as a partnership between the City's multiple departments, the transit agency (UTA), and the private sector. Once the City and its transit partners agree on the definition of the FTN, they can work together to obtain funding and make the improvements necessary to achieve the level of service that is envisioned. FTN investments and supportive policies include:

- **Intersection and Signal Management**: Signal management and right-of-way improvements are a critical component of the FTN. Since these corridors carry the highest volume of transit riders and have the greatest potential to capture more non-auto users, signal management at intersections should favor transit vehicles; moving full, high-capacity buses through congested commercial districts should be balanced with the need for on-street parking to support local businesses; and integrated solutions should be sought to allow transit and bicycles to safely coexist.
- **Transit Lanes**: Providing transit with priority lanes on high-ridership corridors supports investments in frequent service. Where sufficient right-of-way is available in these corridors, dedicating part of the right-of-way to transit is justified based on transit's higher person-carrying capacity. Transit lanes also allow buses to bypass congested areas, making bus travel times shorter and more reliable.
- **Stops/Stations**: The quality of stop and station amenities on FTN corridors is critical. Stops and stations also represent an opportunity to brand the FTN network differently so that the location of high-frequency service is clear to riders.
- **Multimodal Investments**: Coordinated multimodal investments along the FTN provide safe, high-quality walking and bicycling access to stops and stations on the FTN.
- **Land Use**: Zoning and other land use policies must support high frequency service along the FTN. The FTN designates which corridors will have the highest-quality transit service. Land use policies will need to foster transit-supportive land use development along these corridors.

Figure 2-1 summarizes the primary components of an FTN.

See Chapter 3 for further discussion of transit capital investments, and Chapters 5 and 6 for further discussion of stop/station amenities, multimodal investments, and land use policies that support the FTN.

Figure 2-1 Frequent Transit Network (FTN) Summary

Feature	Description
Mode	Any mode that meets the service level definition is considered part of the FTN (e.g., could include TRAX, BRT, Bus Plus/Enhanced Bus[1], Streetcar, etc.).
Span	Operates all day every day (see Figure 2-4 for minimum service level definition).
Frequency	Operates at sufficient frequency for most of the day so that riders don't have to consult a schedule (see Figure 2-4 for minimum service level definition).
Route Spacing	Operates throughout the city on relatively straight, east-west and north-south cross-city corridors spaced approximately every ½ mile so no passenger has to walk more than ~1/4 mile to access the FTN (see Figure 2-6 and Figure 2-7 for FTN maps illustrating recommended phasing).
Branding	The FTN is branded in a clear, easily identifiable, and easily distinguishable way to make it easily recognizable on the street, in print materials, and in online information. This includes stops, stations, vehicles, maps, schedules, wayfinding, and trip planning information. (See FTN branding examples in Chapter 5).
Reliable	Investments are made and service is operated to maximize reliable headways (see capital recommendations in Chapter 3).
Permanent/ Stable	Provides a permanent service option—e.g., residents, businesses, and developers can count on trunk bus lines to remain where they are, just like a TRAX line is permanent.
Stop Spacing	Stop spacing varies depending on mode, but could range from ¼ to ½ mile for bus and ½ to 1 mile for light rail. (See Chapter 3: Capital.)

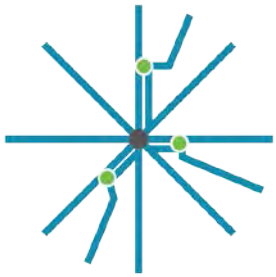
[1] Bus Plus is a proposed network of high-frequency transit service defined in the UTA Network Study (2013). It is referred to as Enhanced Bus in the Regional Transportation Plan (RTP). Bus Plus service would include all of the amenities of Bus Rapid Transit without the exclusive lanes. See Chapter 3 for more details. The State of the System Fact Book (see Appendix A, page 4-33) also summarizes UTA's proposed Bus Plus Network.

FREQUENT TRANSIT NETWORK SERVICE VISION

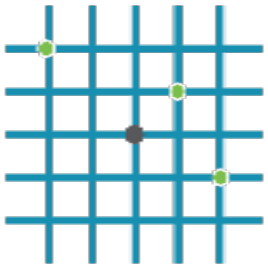
A High-Frequency Grid System for Salt Lake City

There are two primary network designs that most transit systems utilize: radial or grid. Figure 2-2 and Figure 2-3 describe these models and summarize their keys strengths and weaknesses.

Figure 2-2 Basic Transit Network Design Concepts



A Radial (Hub and Spoke) model has a single central transit station that provides access to most, if not all, transit routes. This model provides direct connections to destinations located near the central hub and access to most destinations outside of the hub with a single transfer.



A Grid system provides a more integrated network with multiple options to connect between transit lines. This network requires frequent service to make transfers convenient at major stops or transit centers where lines intersect.

Figure 2-3 Comparison of Transit Service Models

	Radial (Hub and Spoke) Model	Grid Model
Strengths	▪ Easy access to destinations near a central hub in the downtown core ▪ Coordinated schedules where all routes leave the hub at the same time allow access to most other destinations with no more than one well-timed transfer	▪ Can be effective for short trips ▪ Can reduce out-of-direction travel ▪ Can provide good service to a wider range of destinations, including those outside of downtown ▪ Routes can be spaced farther apart; people will generally walk longer distances to frequent service ▪ Concentrating service on direct corridors serving the grid helps provide resources to increase frequency
Weaknesses / Design Considerations	▪ Can increase travel times and out-of-direction travel for trips that don't naturally pass through the hub ▪ Can be inefficient in a city with dispersed major trip generators ▪ As a city grows, maintaining coordinated schedules can result in system inefficiencies	▪ Requires very frequent service to make transfers convenient and avoid long wait times ▪ Routes serving the grid should be designed to ensure that most destinations can be accessed with no more than one transfer

In practice, most transit systems are a hybrid combining elements from both radial and grid network designs. For example, a central transit hub can facilitate well-timed connections to/from regional services while high-frequency cross-town routes support convenient, flexible connections between branches of the

radial network without requiring passengers to travel through the central hub. Developing secondary transit hubs or high-quality major stops where high-frequency lines intersect help facilitate these connections.

Current Salt Lake City Service Model

Salt Lake City's current, centralized hub model is effective for regional connections. However, Salt Lake Central Station is located in an area west of the downtown core that provides good connectivity to commuter rail, but does not have considerable activity or density. Many of UTA's routes currently terminate at Central Station to take advantage of the centralized layover space that is available there. The gaps analysis and public outreach indicated that this creates challenges for people who need to travel to other destinations throughout the city, necessitating multiple transfers and/or indirect trips. Further, requiring routes to go through Central Station despite a lack of demand undermines productivity in some cases.

Recommended Salt Lake City Service Model

Developing a high-frequency network is best suited for Salt Lake City's rapidly growing population and diversifying transit demand needs. Salt Lake City's strong linear street grid is well-suited for a grid-based system. This change could allow for more frequency on heavily used routes and/or offer better service in currently under-served areas where there is demand. However, new layover locations will need to be identified to make this model viable, both to support transfers and for operational reasons (e.g. layover). Potential secondary transit hub locations are discussed in more detail below.

> "Buses should run on predictable routes on major streets at closer distance intervals. The city is a grid; the bus system should reflect that. Nowhere in town should be more than 1 transfer and a short walk away."
>
> - *"Design Your Own Transit System" Survey Respondent*

FTN Corridor Analysis

The Transit Master Plan corridor analysis provided the basis for the FTN recommendations. In addition to the service design principles and FTN performance characteristics described above, factors included:

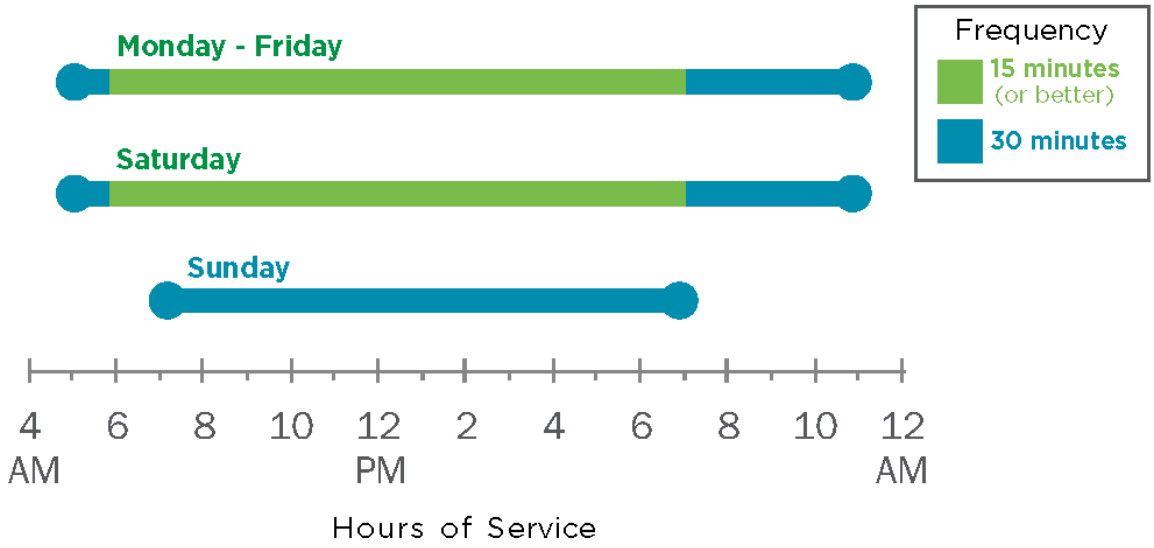
- Population and employment density and industry-standard rules-of-thumb relating transit service frequency to the minimum intensity of land use (e.g., household size, population, and employment) required to support that level of service.
- Service to major activity centers such as the University of Utah, downtown Salt Lake City, or other major anchors or activity centers at one or both ends of a line.
- Spacing between parallel corridors, e.g., approximately a half-mile as described above.
- Access to opportunity for vulnerable and transit-dependent populations

Appendix D provides more detail on the FTN corridor analysis.

Frequent Transit Network Service Level Definition

High-frequency service is critical for a grid-based transit system because riders depend more on transfers to access destinations. Based on the general principles described above, the level of service shown in Figure 2-4 is recommended for the FTN. All designated FTN routes should operate according to these parameters, which were designed to not only be frequent, but also to operate relatively consistently all day, every day. A simple and easy-to-understand service design, along with clear branding, allows riders to use an FTN route without referencing a schedule and provides a level of certainty and reliability on which riders can depend.

Figure 2-4 FTN Minimum Service Level Definition

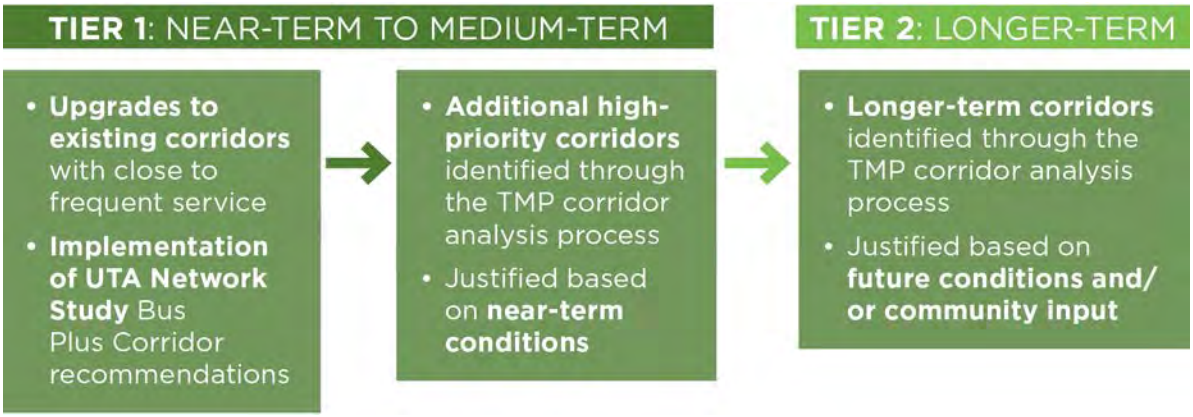


Note: Appendix D provides additional detail on the relationships between land use and frequency.

Frequent Transit Network Recommendation and Phasing

The FTN is a long-range vision that is intended to be phased in over time, as described in Figure 2-5. UTA currently has plans to provide frequent service consistent with the above definition on its Core Service Network, although the specific corridors that will comprise this network are not yet finalized.

Figure 2-5 Phasing Approach for the FTN*



* Note: Some existing corridors have frequent service (at least every 15 minutes) on weekdays during the day (peak periods and midday), but do not meet the FTN service level definition later in the evening or on weekends.

> "Ideally I'd like a transit system that is everywhere, all the time, but until that happens, I'd like people to get used to taking transit, which I think would require very, very frequent service in key areas."
>
> - *"Design Your Own Transit System" Survey Respondent*

FTN Phasing Maps

Figure 2-7 illustrates phased implementation of the corridors that are recommended to create a grid-based FTN in Salt Lake City. The lines on these maps do not represent individual routes, but rather provide a sense of the quantity, structure, and geography of coverage that Salt Lake City envisions for the future FTN.

Tier 1 FTN Corridors – Short-Term Implementation: Figure 2-6

The recommended Tier 1 FTN includes two categories of corridors:

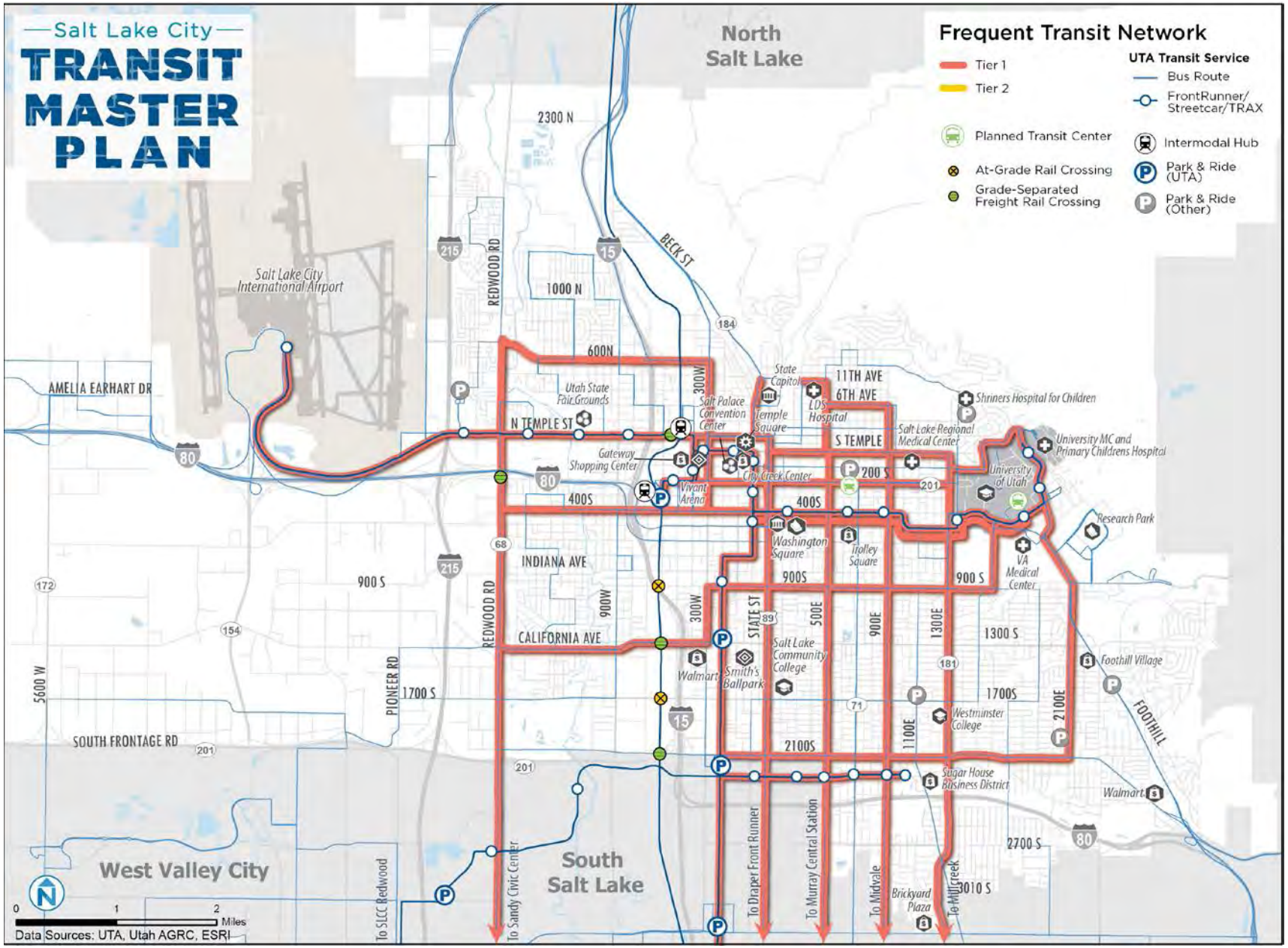
1. **Existing and planned corridors** where UTA already operates or plans to implement frequent service. These include the Bus Plus Corridors recommended in the UTA Network Study (2013) that were incorporated into the Regional Transportation Plan (2015) as Enhanced Bus corridors and are also supported by the Transit Master Plan evaluation and outreach process.[2]
   - **200 S** performed strongly in the Transit Master Plan analysis and is recommended as a primary east-west transit corridor for bus (and potentially future bus rapid transit and/or streetcar) service between downtown and the University.

[2]UTA plans to designate a Core Network of routes that will have frequent service, but this network had not yet been finalized by the time Salt Lake City's Transit Master Plan was completed in fall 2016.

- **State Street, 500 E, 900 E, and 1300 E.** Combined with existing TRAX service in the 200 W corridor, frequent bus service on State Street, 500 E, 900 E, and 1300 E would provide north-south connections with approximately half-mile spacing between southern city limits and downtown, as far east as the University of Utah.
- **North and South Temple Streets** also performed strongly in the Transit Master Plan analysis, and in conjunction with frequent service on 200 S and existing TRAX service in the 400 S corridor, would provide quarter-mile spacing for frequent service through downtown.
- **2100S/2100E**. This east-west and north-south corridor (currently served by Route 21), provides a connection between the Central Pointe TRAX Station and the University along the southern and eastern edges of the frequent grid.
- **Redwood Road**. While it lacks the density of other corridors, Redwood Road is an important, continuous street for transit in west Salt Lake City. It would run along the western edge of the recommended Salt Lake City FTN and would be linked with additional east-west FTN corridors.

2. **Additional high-priority corridors** that go beyond existing plans for frequent service (UTA Network Study, Regional Transportation Plan, etc.). These corridors provide the following enhancements to the existing or planned frequent service network:
   - **Provide additional east-west cross-town connections**
     - **400 S.** This corridor would connect Redwood Road to the University of Utah.
     - **1300 S / 900 S**. This corridor would begin to build out the east-west frequent service grid between the TRAX line along 400 S and southern city limits. Due to an at-grade railroad crossing on 900 S, this corridor transitions to 1300 S between 300 W and Redwood Road. (At-grade freight railroad crossings can cause significant transit delays and bus bunching, especially for high frequency service.) In the long-term, it is assumed that a separated crossing could be implemented on 900 S (see Tier 2 FTN map).
   - **Extend north-south corridors to better serve major activity centers and neighborhoods north of downtown**
     - **State Street**. Extend north-south frequent service to the State Capitol.
     - **500 E and 900 E**. Extend north-south frequent service to the LDS Hospital and into the Avenues neighborhood.
   - **Provide better connectivity in Rose Park and Fairpark neighborhoods**
     - Provide frequent service on 200 W and 600 N that connects these two neighborhoods to downtown Salt Lake City. These neighborhoods show high propensity to use transit, but are not well served currently.

Figure 2-6 Frequent Transit Network Vision: Tier 1



Tier 2 FTN Corridors – Longer-Term Implementation (Figure 2-7)

Proposed Tier 2 corridors recommended for implementation in the longer-term are illustrated in Figure 2-7. These corridors complete the FTN vision of a well-defined transit grid with approximately half-mile spacing in the portions of Salt Lake City where existing or future land use supports this level of service. The following Tier 2 recommendations build upon earlier service enhancements:

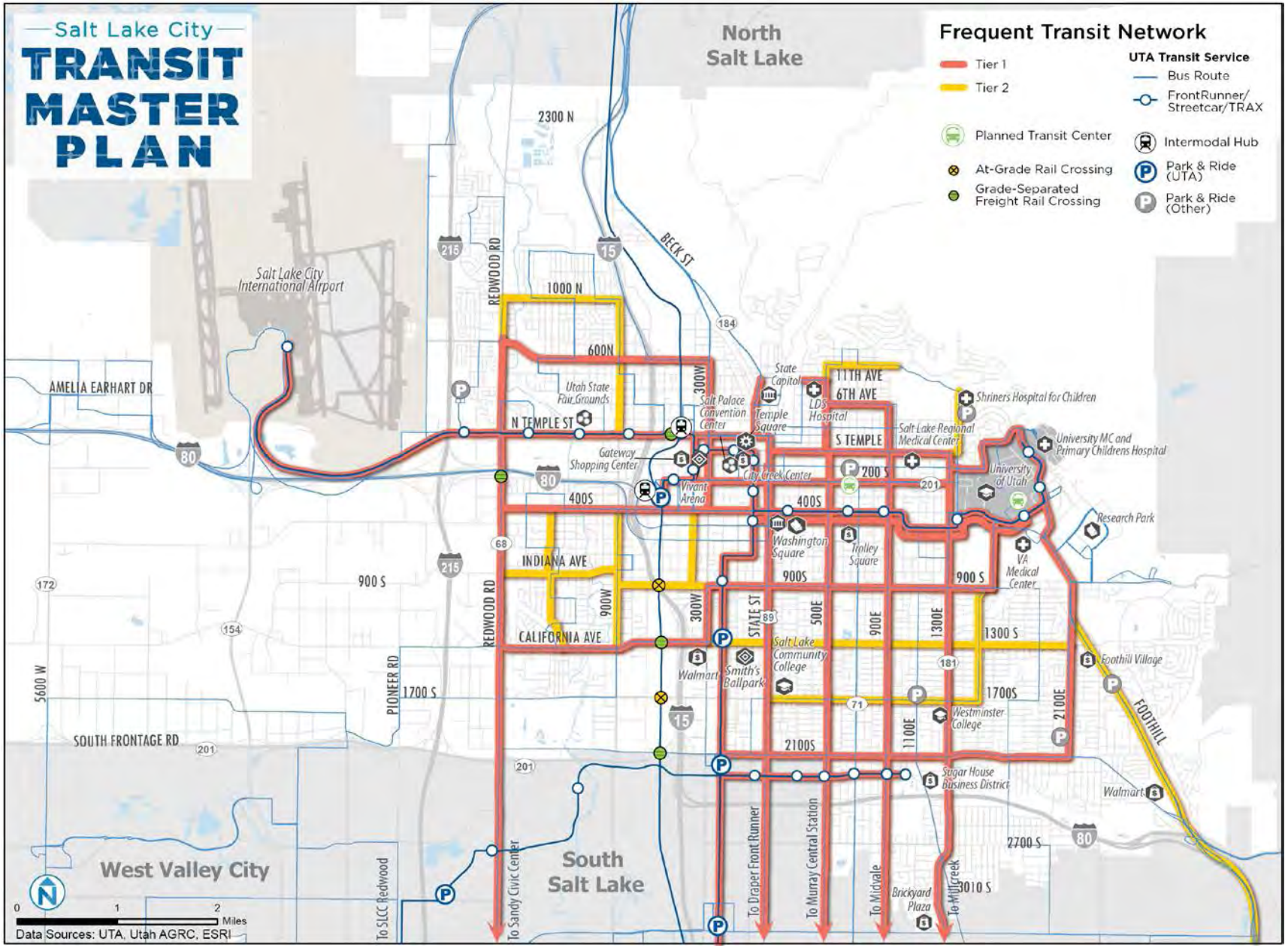
- **Implement additional east-west cross-town corridors to provide approximately half-mile spacing between frequent east-west corridors**
  - **900 S and 1300 S.** Assuming a grade-separated railroad crossing has been developed on 900 S, both corridors would have frequent service between Redwood Road and 1500 E.
  - **1700 S.** Frequent service between State Street and the University (including 1500 E).
- **Extend north-south corridors to better serve major activity centers and neighborhoods north of downtown**
  - **11th Avenue and 1200 E.** Additional frequent service to Shriners Hospital and the Avenues neighborhood.
- **Enhance service to Rose Park and Fairpark neighborhoods**
  - Provide frequent service on additional corridors, assumed to be 900 W and 1000 N.
- **Enhanced service on regional access corridors**
  - **Foothill Drive.** Foothill Drive is an important corridor for regional access to Salt Lake City as well as a local corridor through the city's eastern neighborhoods. The City, UTA, University of Utah, UDOT, and other partners completed an implementation strategy for transportation and other enhancements for the corridor in 2017. As the study has strong stakeholder and community support, it is suggested that project partners consider moving forward with near-term implementation of the study's significant transit, bicycle and pedestrian supportive elements. Salt Lake City will also participate as a key stakeholder in developing updated University of Utah transportation plans and will partner with UTA and the University to seek resources for further study of bus, rail, and shuttle service connecting to and within the University of Utah campus, Research Park, VA Hospital, and Foothill Cultural District in the context of planned land use changes.

Additional Service Span Priorities

In addition to the identified FTN corridors, Salt Lake City prioritizes later hours and/or expanded weekend service on the existing UTA rail system, which provides important local and regional connections, including:

- **TRAX Green Line to Salt Lake International Airport.** Provide extended hours of service to the Airport; employees and travelers need transit access earlier in the morning and later at night.
- **FrontRunner.** Add Sunday service; FrontRunner currently only operates Monday through Saturday.

Figure 2-7 Frequent Transit Network Vision: Tier 1 and Tier 2



FTN Access

Figure 2-8 illustrates a quarter-mile walking (network) distance from the completed frequent transit network vision. A quarter-mile is a rule-of-thumb for the minimum distance people are willing to walk to access transit, although people will typically walk longer distances to high-quality service.

By 2040:

- Approximately **73% of current residents** would be within walking distance of a frequent transit route.
- Approximately **73% of current jobs** would be within walking distance of a frequent transit route.

Figure 2-9 illustrates the recommended FTN in relation to populations with a high-propensity for transit use, including low-income households, households without access to a vehicle, seniors, and persons with disabilities.

As described in the Local Service Network section below, it is important to emphasize that local bus routes would continue to serve parts of Salt Lake City that are not served by the FTN. In addition, the Transit Master Plan recommends that the City implement first-last mile strategies to enhance access to the frequent transit network

FTN Implementation Case Studies

In many cities, frequent transit service is implemented incrementally, while branding these services as a high-quality frequent service *network* is often undertaken later. Chapter 5 highlights the branding aspects of two such cities – Minneapolis and Portland. Chapter 7 describes the process that the City of Seattle used to fund targeted increases in King County Metro service levels to expand frequent service provided in the city. In Houston, as described below, the transit agency undertook a more comprehensive restructuring to expand the frequent service network.

Houston METRO

The Metropolitan Transit Authority (METRO) in Houston, TX recently transformed its bus network from a low performing limited network to a more expansive frequent network. The new network—launched in August 2015—was designed to enable anywhere to anywhere travel with a single fast connection.

Houston has experienced decades of decentralized urban growth; however, most bus lines terminated in one small section of the downtown core, where only 25% of the region's jobs are located. Without increasing operating costs, METRO was able to restructure the Houston bus network to:

- Increase the share of METRO's resources focused on maximizing ridership from 55% to around 80%
- Expand the reach of frequent service
- Expand weekend service, especially Sunday service[1]

To achieve this, METRO removed duplicative and low-demand routes. A small number of existing riders (0.5%) were negatively impacted, as they were no longer located within a quarter-mile of bus service.[2]

Within the first month of the new service, weekend ridership dramatically increased, especially on Sundays. Daytime and evening service levels on weekends are now almost identical to service on weekdays. Ridership in the first month slightly decreased, which is commonly observed with any major service change but by the third month of service, local ridership increased by 8%.[3]

1 Jarrett Walker. Houston: Great Ridership News on the New Network. 28 October 2015 Human Transit Blog. Retrieved from http://humantransit.org/2015/10/houston-good-ridership-news-on-the-new-network.html

2 Jarrett Walker. Houston: Transit Reimagined. 9 May 2014 Human Transit Blog. Retrieved from http://humantransit.org/2014/05/houston-a-transit-network-reimagined.html

3 Laura Bliss. How Houston's Bus Network Got Its Groove Back. 5 April 2016. City Lab. Retrieved from http://www.citylab.com/commute/2016/04/how-houstons-bus-network-got-its-groove-back/476784/

Houston Frequent Network – Before Change

Houston Frequent Network – After Change

Houston transformed its bus network from limited span and frequency (above) to an expansive high frequency network (below).

Source: Human Transit, Jarrett Walker

Figure 2-8 Frequent Transit Network Vision: Tier 1 and Tier 2 Quarter-Mile Walk Access

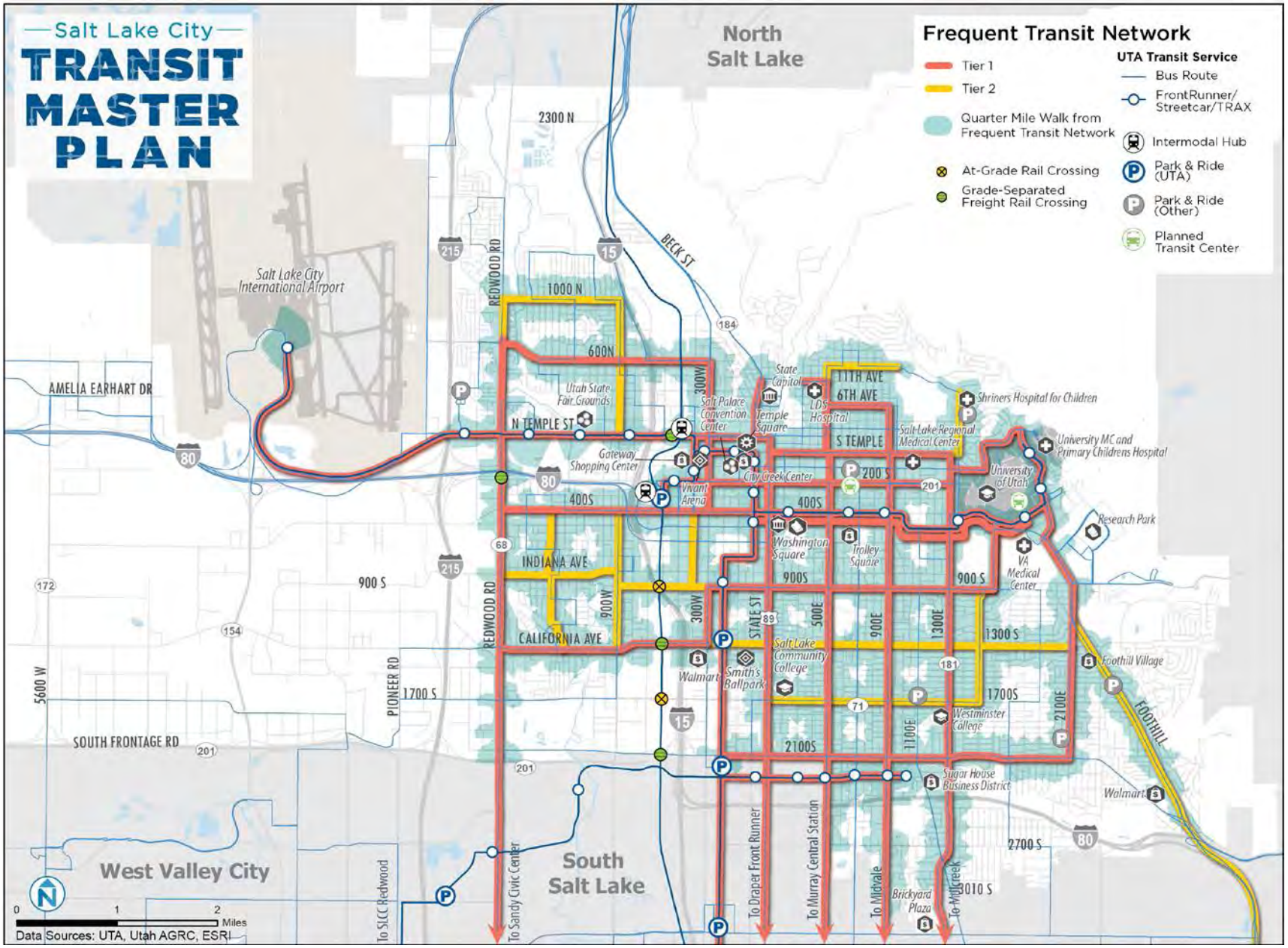
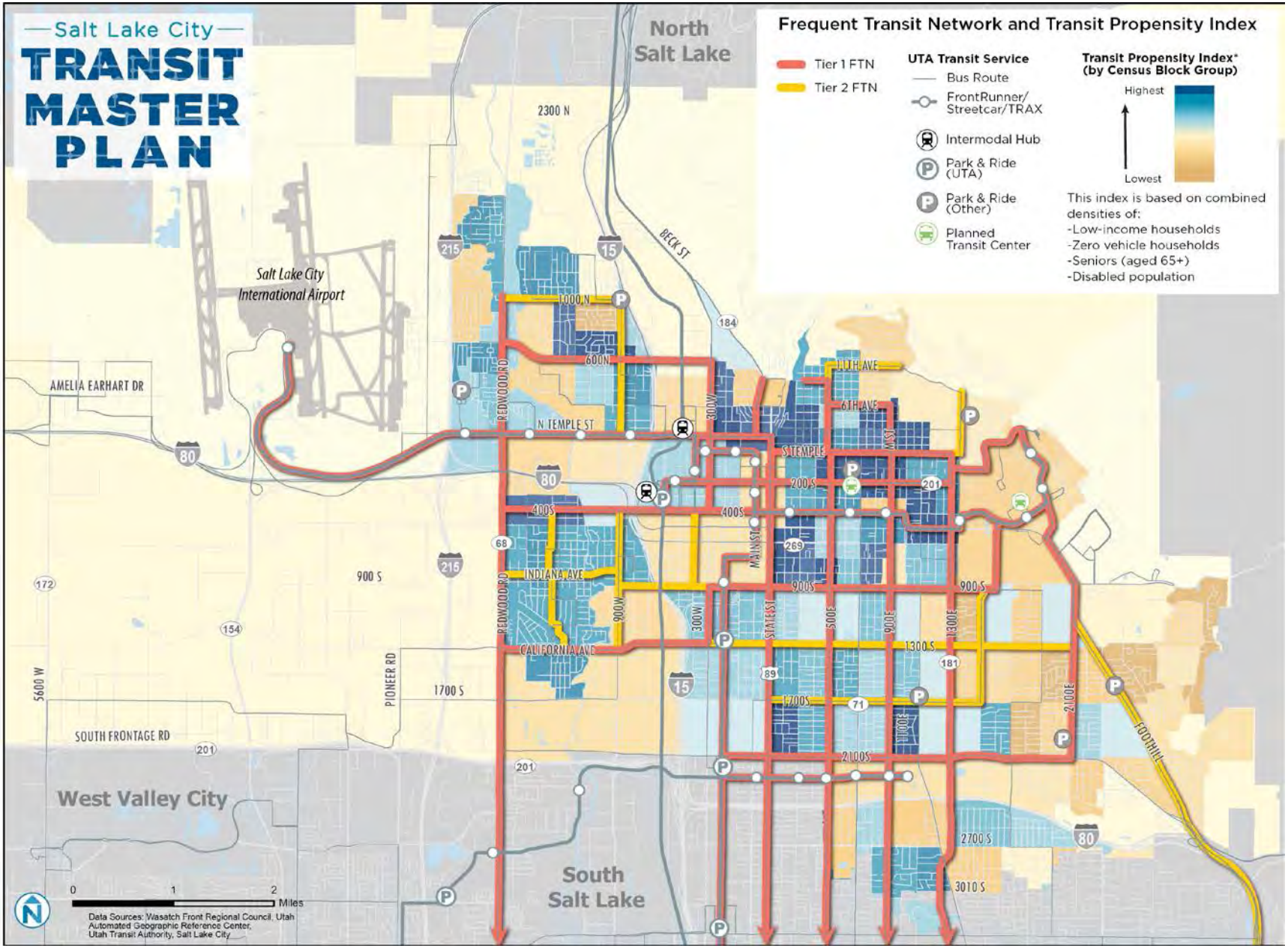


Figure 2-9 Frequent Transit Network Vision: Tier 1 and Tier 2 with Transit Propensity Index



FTN Branding

Based on outreach findings, the current UTA frequent transit network branding is not readily visible to the average rider. UTA's current service types are not defined primarily based on frequency, but on a combination of service qualities including purpose, stop spacing, and frequency, e.g., types include local, shuttle, flex, commuter, express, and fast bus. UTA is rolling out Bus Rapid Transit lines outside of Salt Lake City and "Core Service"—branded high-frequency services with improved reliability, a higher level of stop/station amenities, and protection from service cuts to provide customers with the same guarantee of permanence associated with TRAX. UTA's Core Service would likely be largely consistent with the FTN corridors recommended in the Transit Master Plan.

Branding for the FTN should be coordinated with UTA's roll out of branded Core Service.

> Chapter 5: Supportive Programs and Policies provides a more detailed discussion of service branding, including examples of frequent transit network branding in other cities.

Proposed Secondary Transit Hubs to Support Grid System

Salt Lake Central Station, located on the west side of downtown Salt Lake City on 600 W between 200 S and 400 S, is the city's primary intermodal transportation hub. It connects TRAX, FrontRunner, numerous bus routes, and interstate coach services like Amtrak and Greyhound. UTA is working to develop the Depot District Clean Fuels Center on UTA-owned property adjacent to Central Station (see sidebar on the next page for more detail), which would provide additional layover space that would support the Transit Master Plan.

Source: Flickr Matt' Johnson

However, Salt Lake Central requires out-of-direction travel for some bus routes and is therefore not optimal as a downtown layover location for these routes. In addition, its bus layover facilities are at capacity and cannot accommodate additional bus service at peak times.

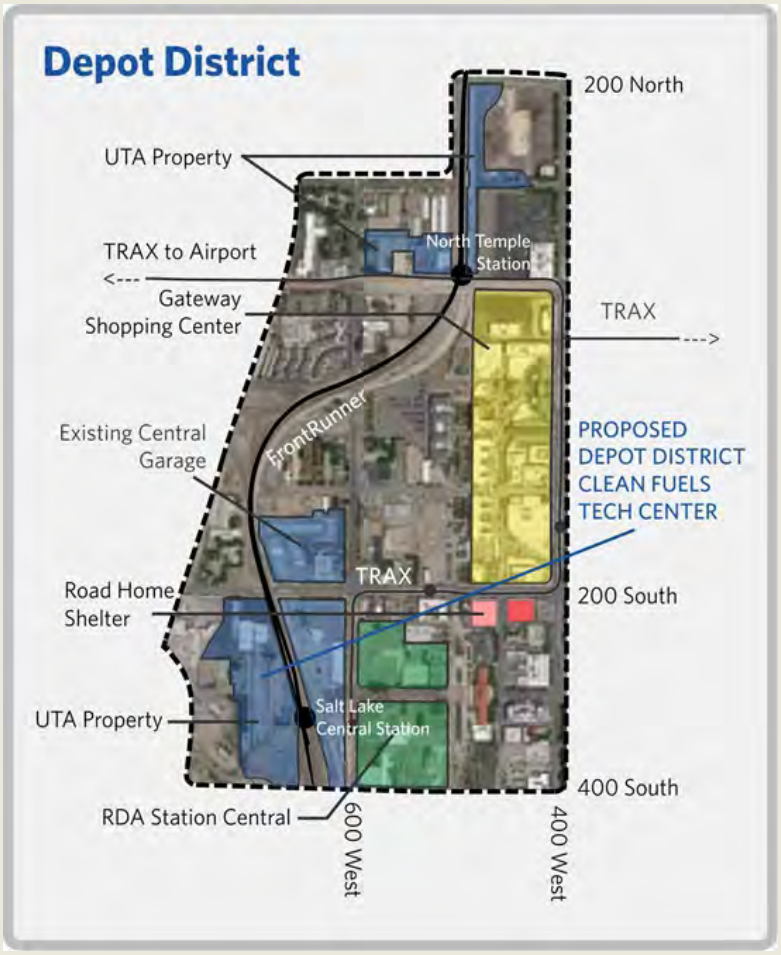
The concept of developing additional transit centers and layover facility locations has been studied in the past, although locations previously studied in downtown are no longer available. Proposed locations identified as part of the Transit Master Plan analysis include:

- **East Downtown, vicinity of 200 S and 700 E.** An additional, centrally-located facility would support current, high transit demand in east downtown and provide additional layover capacity to support implementation of the FTN. A high-frequency bus service grid would in-turn make transfers at a secondary transit center more convenient.
- **The University of Utah campus**. The University of Utah is one of the city's largest trip generators. However, UTA does not currently have dedicated layover facilities on the campus and existing facilities lack capacity to expand service to/from the University.

The areas stretching from downtown to the University of Utah are the most common origins/destinations for trips in Salt Lake City. Corridors serving these proposed transit hub locations (including Route 2 along 200 S) have some of the highest bus ridership in Salt Lake City. In addition, routes operating on 500E and 900E could benefit from close proximity to an east downtown transit hub. With implementation of the FTN, increased ridership on these routes and corridors would be better served with these additional transit hubs. Finally, creating more layover space for UTA buses is a major factor in enabling additional transit service to be provided in Salt Lake City, including implementation of the envisioned FTN network.

Depot District Clean Fuels Tech Center

UTA is in the process of expanding its facilities with the Depot District Clean Fuels Tech Center—a new maintenance facility on 25 acres of UTA property located at approximately 600 South and 200 West in Salt Lake City. The transit-oriented development is located in a transit-rich area—with access to FrontRunner, TRAX, and 15 bus routes—and would also include office space and mixed-use residential buildings. Additional capacity and infrastructure would allow UTA to transform the property into a state-of-the-art maintenance and fueling facility and increase its fleet of clean fuel. UTA is currently searching for the necessary funds to build the Depot District Clean Fuels Tech Center, and the agency has worked to establish project readiness. UTA has completed the necessary environmental studies, finalized design and constructed a small fueling facility for its current CNG bus fleet on the site. UTA has identified local funding to help cover design and construction costs and is actively pursuing federal grants for the remaining capital requirements.



Source: UTA. https://www.rideuta.com/About-UTA/Active-Projects/Depot-District-Clean-Fuels-Tech-Center

LOCAL SERVICE NETWORK

The FTN is designed to serve long, direct citywide corridors. This includes TRAX light rail, Bus Rapid Transit, and other frequent bus modes that are oriented to serve longer-distance trips and have a longer spacing between stops. Local transit service extends the reach of transit to neighborhoods and employment areas that are not within walking distance of the frequent transit network. While the FTN serves long, citywide corridors, other local service is designed to connect neighborhoods and employment areas to the FTN. Traditional fixed-route local bus service and first-last mile services are recommended to extend local transit access in Salt Lake City.

This chapter focuses on local service strategies. Other strategies to provide "first-last mile" access to transit are discussed in Chapter 5: Access. These include car share, park-and-rides, bicycle sharing, and secure bicycle parking.

Local Fixed-Route Transit Service

Local fixed-route bus service that connects to the FTN and provides neighborhood circulation is an equally important element of the complete transit system. Coverage rather than speed is the goal for the local network. Stop spacing as close as 600 feet can be acceptable in some cases. As with the FTN, transit access improvements are critical to maximizing usefulness of the local services and providing equitable access to transit service for all populations.

The local network that feeds the FTN is not a key focus of this plan since the City's limited transit resources will be focused on the development of the FTN. However, the City should support UTA actions to:

- Maintain a basic or "lifeline" level local service to within ½ mile of most residents. This level of service is defined by a minimum of 60-minute frequency for 12 hours per day. If a route cannot support this level of service, then alternative local service models should be considered to provide access to a FTN station. Alternative service models can also be considered to provide access to the FTN during early morning or later evening hours when basic local service does not operate.
- As the FTN is implemented, the local service network should be adjusted to ensure it complements and supports new frequent services.

There are a variety of additional approaches that Salt Lake City could promote to complement the frequent transit network. The remainder of this chapter describes these strategies.

First-Last Mile Services

The "first-last mile" concept was informed by findings in the UTA First/Last Mile Study (2016) and recognizes the need to get people to and from the transit system efficiently in areas that lack sufficient density, demand, or street connectivity to justify providing FTN or even a basic level of traditional local fixed-route service, as defined above. Public outreach efforts for this plan have identified a significant need for improved first and last-mile connections in Salt Lake City.[3]

Where Could First-Last Mile Services be Used?

The gaps analysis conducted as part of the State of the System Fact Book (Appendix C) identified geographic areas and times-of-day where parts of the city lack convenient or any access to transit service. The recommended FTN would help meet these needs; however, first-last mile services could be used to provide cost-effective access to the FTN in parts of the city where geographic or temporal gaps would remain. Figure 2-10 illustrates conceptual zones where first-last mile services could be explored. These include:

- Western Salt Lake City, west of Redwood Road or I-215 (primarily employment-oriented demand), including the Northwest Quadrant as this part of the city develops and in relation to regional bus service in the Mountain View Corridor
- University of Utah Research Park (primarily employment-oriented demand); destinations in the Foothill Cultural District will also be included in discussions about shuttles and circulation in this part of the City
- Southeast Salt Lake City, including the East Bench (primarily residential)
- Glendale/Poplar Grove neighborhoods (primarily residential)
- Rose Park/Fairpark neighborhoods (primarily residential)
- Northern part of Greater Avenues neighborhood (primarily residential)

These conceptual zones were defined based on a quarter-mile walking distance of the recommended FTN, illustrated in Figure 2-11. The defined zones include areas that would be served by Tier 2 FTN corridors, which may only be implemented in the longer-term time frame.

The technologies used to provide first-last mile services are evolving rapidly. Elected officials and stakeholders have expressed concerns services developed to meet the needs identified in the Transit Master Plan are affordable and accessible to all users.

The Federal Transit Administration issued guidance in 2016 to clarify requirements for ensuring that the these types of services provide an equivalent level of service for people with and without disabilities, including the following characteristics:

- Response time
- Fares
- Geographic area of service
- Hours and days of service
- Restrictions or priorities based on trip purpose
- Availability of information and reservations capability
- Any constraints on capacity or service availability

The Transit Master Plan recommends that City staff research and monitor best practices to ensure equal access to rides regardless of ability, and incorporate those practices into partnerships and agreements that implement these services.

Source: https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-faqs-americans-disabilities-act-ada

[3] UTA conducted a First Mile/Last Mile Study in 2016, but this system wide study only covered TRAX stations in Salt Lake City.

Figure 2-10 First-Last Mile Service Zones

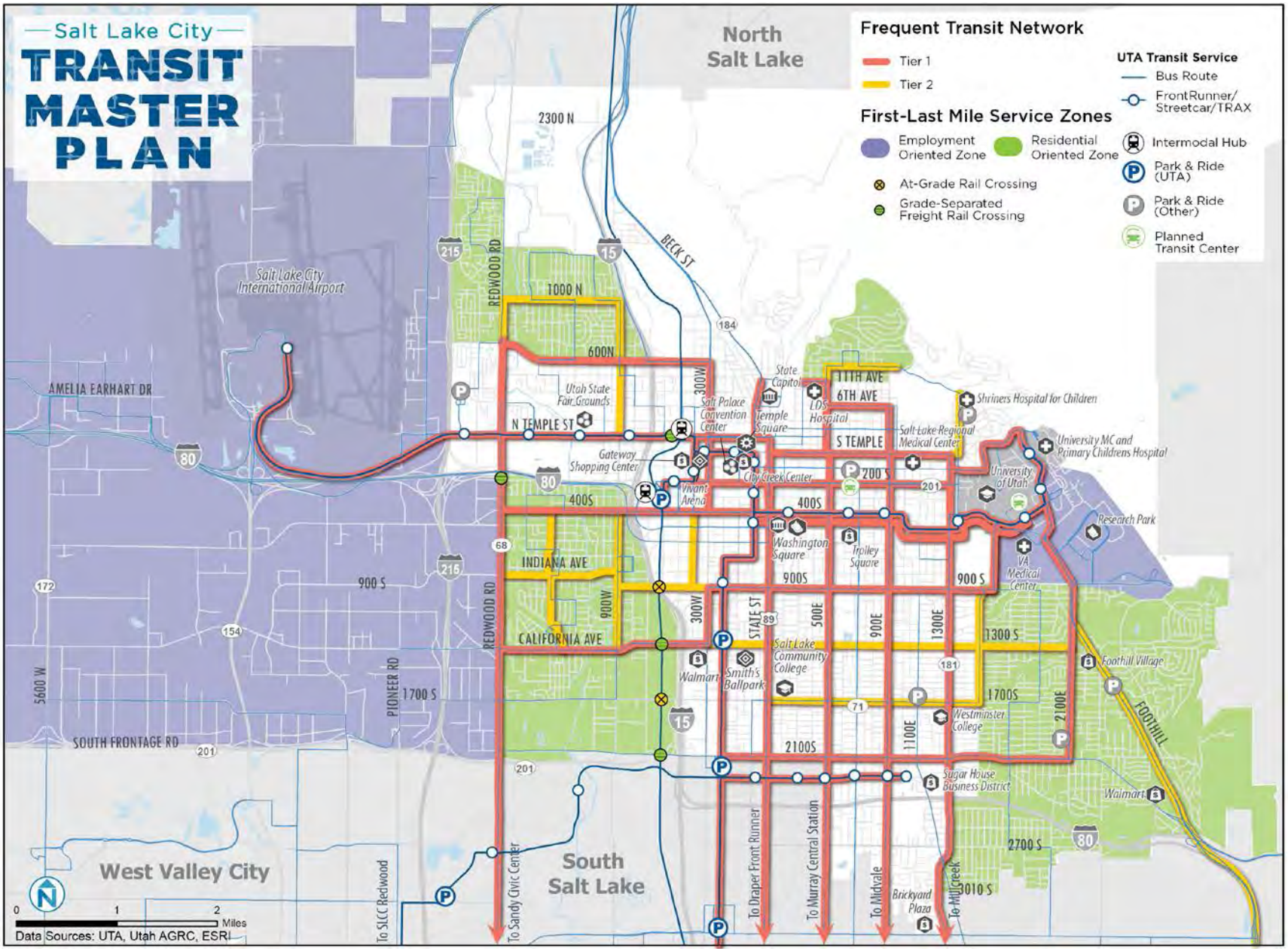
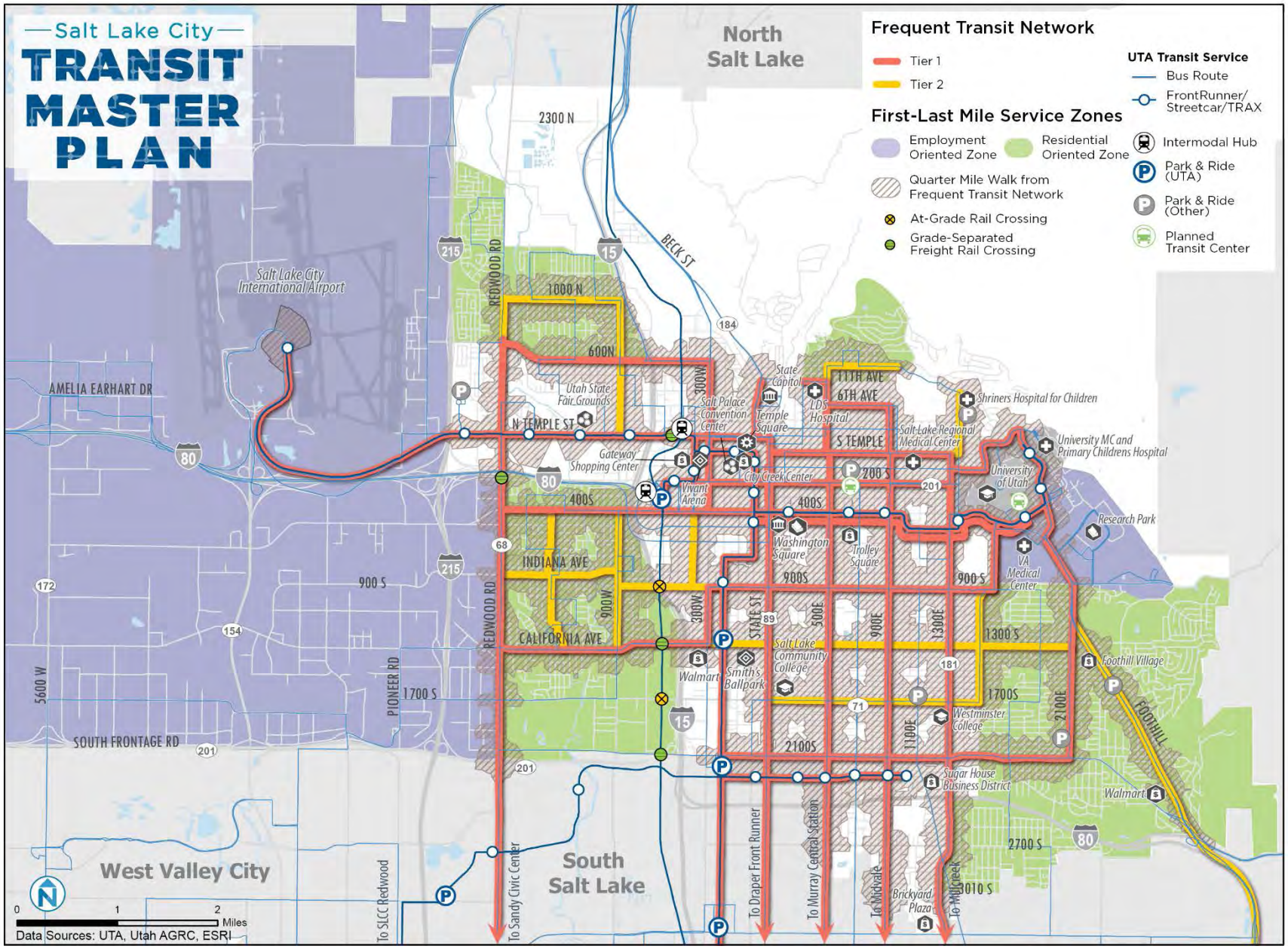


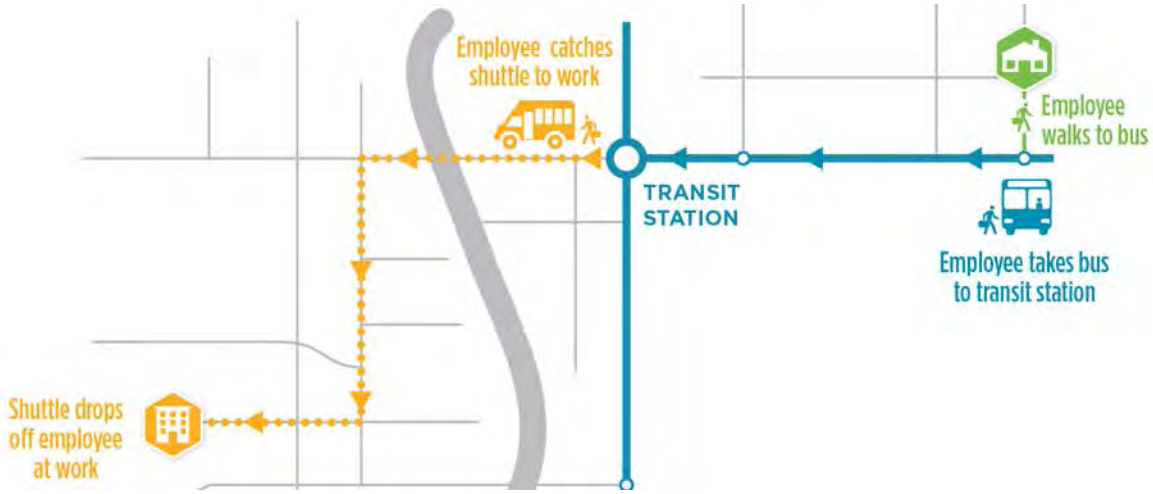
Figure 2-11 First-Last Mile Service Zones with Quarter-Mile Walking Distance from FTN



How Do First-Last Mile Services Work?

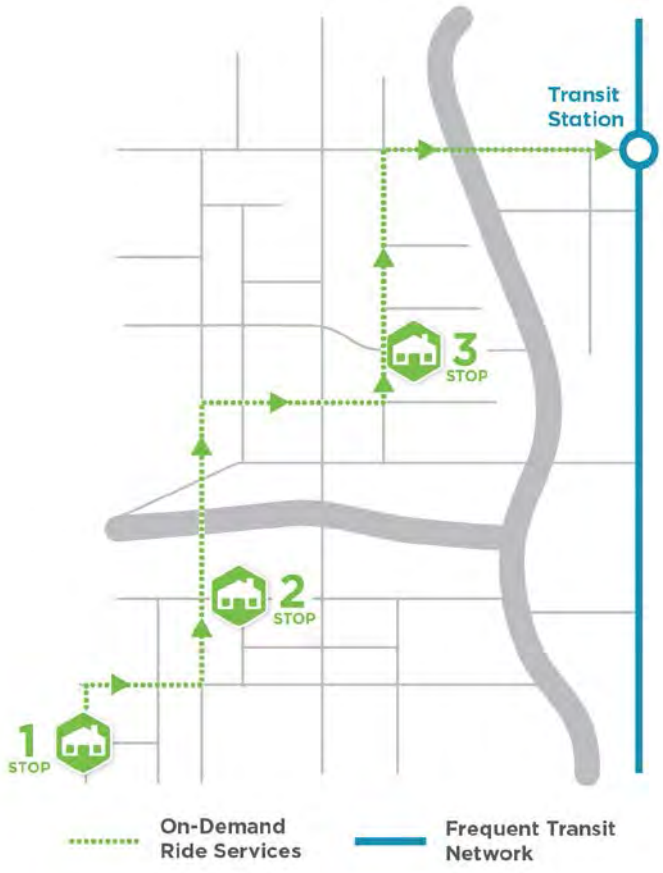
The graphics below illustrate how first/last mile services could be implemented to extend the reach of transit service for both employment areas in west Salt Lake City and residential neighborhoods by enabling seamless connections to the frequent transit network.

1. Employment Areas: Employers beyond the reach of transit in industrial areas in West Salt Lake City can partner to fund a shared shuttle service. Shuttle schedules would be coordinated with employee working hours and serve one or more major transit stations.



2. Lower-Density Residential Areas: Some neighborhoods in Salt Lake City lack sufficient density or demand to make it cost-effective to provide FTN and/or local service but still have important transit needs. On-demand ride service companies, such as Lyft and Uber, can provide cost-effective demand-responsive shared ride service in these areas. They can also help meet citywide needs to connect to the FTN outside of local transit operating hours. The City and UTA would partner with these companies to provide a discounted fare on trips to transit stations or other identified neighborhood destinations such as a grocery store. For example:

- A resident eligible for a discounted trip requests an on-demand ride from their home.
- The on-demand ride service company schedules a shared ride to/from designated transit stations or neighborhood services.
- The resident uses the FTN to travel to/from their destination.



First-Last Mile Strategy Success Factors

Factors that contribute to success for these local service strategies should be considered as these approaches are implemented. Alternative local services should strive to achieve the following:

- **Ensure cost effectiveness.** Target popular origins and destinations that will allow the service to reach critical mass rather than have underutilized capacity.
- **Connect to existing services.** Integrate and coordinate effectively with other transit services to ensure the service will successfully provide a first-last mile connection.
- **Leverage partnerships.** Developing the service as a partnership, between multiple public agencies or between public and private organizations, can distribute management and operation of the service as well as associated costs.
- **Ensure equitable access for all users.** Structure partnerships to ensure that an adequate number of vehicles are available to accommodate people with disabilities and that services are affordable for low-income users.

Examples of First-Last Mile Services

This section provides specific examples of first-last mile services that have been developed around the country to extend the reach of transit service. These types of services fall into two general categories:

- **Community shuttles** to complement fixed-route transit service. These shuttles can serve **fixed-routes** or may provide service **on-demand**. Shuttles can be operated by transit agencies, non-profits, or public-private partnerships. Shuttles may also be sponsored by major employers or a Transportation Management Association (TMA) to connect major employment areas to transit service.
- **On-demand ride services** companies offer on-demand, point-to-point transportation that passengers can use to access the frequent transit network. These companies use an online-enabled application or platform to enable booking a trip on a computer or smartphone. This means that a ride can be summoned easily when and where transit is not available. The difference between on-demand ride services companies and taxis is that passengers are connected to drivers who use their personal vehicles rather than those owned by the taxi company. Uber and Lyft currently operate in Salt Lake City.

Source: Ride Connection

Source: Lyft

Figure 2-12 summarizes characteristics of these types of services. Successful case studies of each type of strategy are detailed in subsequent sections.

Figure 2-12 First-Last Mile Service Strategy Characteristics and Applications

	Distance	Service Type	Schedule	Service Span	Origins and Destinations	Operator
Fixed-route community shuttles	Short	Fixed-route	Scheduled time points	Limited to fixed-route community shuttle schedule	Specified locations	Public with possible support from private
On-demand community shuttles	Medium or Long	Demand response	By request Availability based on-demand	Limited to on-demand community shuttle schedule	Defined by service area	Public with possible support from private
On-demand ride services	Short or long	Demand response	By request Availability based on-demand	24 hours a day/ 7 days a week	Defined by service area	Private with possible support from public

Fixed-Route Community Shuttle Case Studies

Fixed-route community shuttles, sometimes described as neighborhood circulators, are used effectively in some cities to serve short trips within communities, feed major transit routes (e.g., rail, BRT, or frequent bus service), shopping, employment, and other activities. Community shuttles often use smaller-capacity vehicles, such as 20 to 25 passenger mini-buses, to provide local transit service in lower-density residential neighborhoods or areas of challenging topography that are more difficult to serve with conventional fixed-route transit service. Some communities have maximized the cost-effectiveness of this model through special contracted rates for community shuttle operators (e.g., Vancouver BC case study) or services operated by non-profits (e.g., Ride Connection case study).

Shuttle Bug–Chicago, IL

Source: TMA of Lake-Cook

In operation since 1996, the Shuttle Bug program offers convenient door-to-door and fixed-route service from Metra Commuter Rail stations to employer sites on accessible Pace buses. The program is a public-private partnership between the TMA of Lake Cook (covering the Chicago suburbs of Buffalo Grove, Deerfield, Glenview, Northbrook, Des Plaines, Lake Forest, Lincolnshire, Mettawa, and Riverwoods in Cook and Lake County, Illinois), Pace Suburban Bus, Metra Commuter Rail, and local area businesses.

Regular fare is $2.00 per trip, but employees of member businesses ride free with a company-issued Ventra card.[1] Currently, there are 14 routes connecting about 40 companies with eight Metra stations and serving about 1,200 daily trips.[2] While operations are managed entirely by the Lake Cook TMA, operational costs are shared by Pace, Metra, and area businesses. Funding sources include federal grants, local municipal funding, state funding, foundation funding, and private contributions. Companies contribute funds based on ridership as well as company headcount.

By sharing operating costs and leveraging private-public partnerships, the Shuttle Bug program has become nationally-recognized in successfully providing a first-last mile solution as well as numerous benefits to participating employers.

Ride Connection–Portland, OR

Ride Connection is a non-profit, community service organization in the tri-county area of Portland, Oregon that is mostly focused on meeting the transportation needs of older adults and people with disabilities. The organization is made up of a network of over 30 agencies, providing a variety of transportation services such as Community Connector Shuttles for rural communities where regular fixed-route transit service is limited or unavailable.

Source: Ride Connection

Open to the general public, Community Connector Shuttles are currently available in the cities of Tualatin (Tualatin Shuttle), Forest Grove (Grovelink), and Hillsboro (North Hillsboro Link). These shuttles are intended to provide transportation for commuters to and from TriMet stations, including WES Commuter Rail in Tualatin, TriMet (regional transit operator) Line 57 in Forest Grove, and Orenco Station in Hillsboro. Ride Connection operates Community Connector shuttles, providing drivers, vehicles, and scheduling. Planning for a Community Connector shuttle includes close coordination with communities being served as well as collaboration with TriMet.[3]

Ride Connection receives funding from a variety of sources, including federal and state grants from the Oregon Department of Transportation, TriMet, private foundation grants, and corporate and individual donations. Programs are largely supported through volunteer hours—including volunteer drivers—who are typically members of the community recruited by Ride Connection. Success of these shuttles has been possible by targeting specific communities and connecting directly to regional transit service.

TransLink–Vancouver, BC

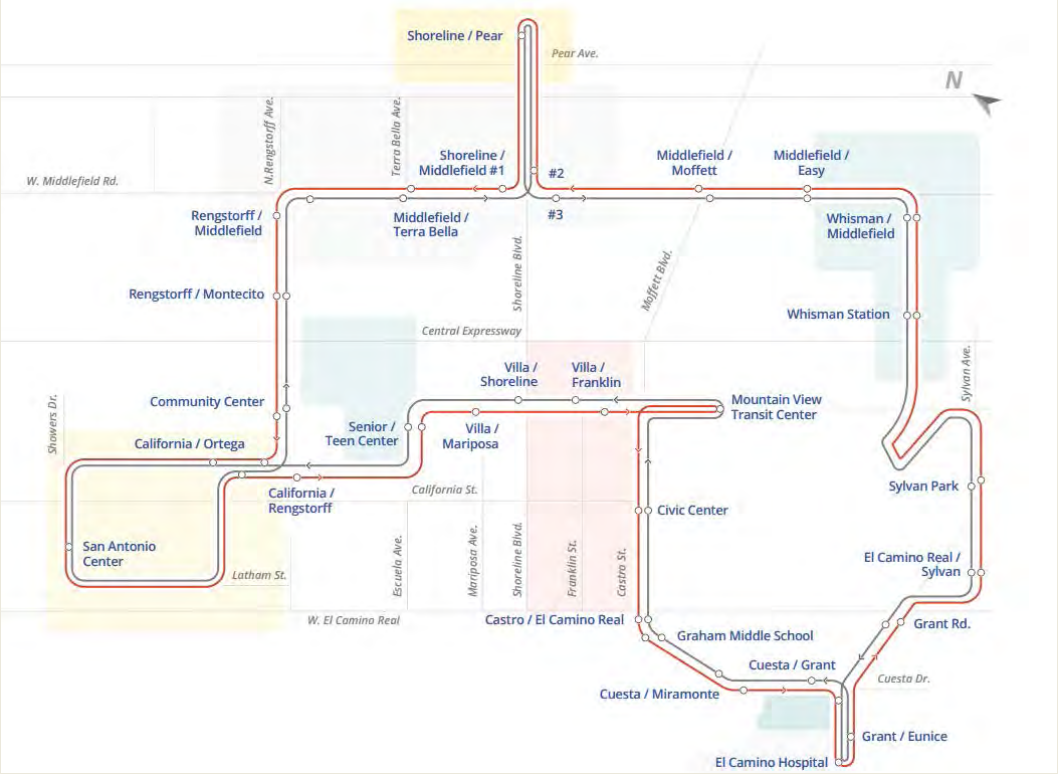
TransLink, the transit provider for the Vancouver BC region, has a community shuttle program that serves a number of neighborhoods in the city of Vancouver and communities in outer suburban areas. Shuttle routes were created to provide more economical transit service to low-ridership areas but have been implemented in a variety of operating environments from quiet suburbs to dense, urban areas. Coast Mountain Bus Company (CMBC)—a wholly-owned subsidiary of TransLink—operates the shuttles. Routes complement downtown transit service, provide feeder service from outer neighborhoods to downtown-bound rail or BRT service, and operate as circulators within the University of British Columbia (UBC) campus.

For the Vancouver region, community shuttles have proven to be a lower-cost option for providing transit services to underserved areas. Operating cost per service hour is about 36% lower for CMBC-operated shuttles than regular bus service, and about 54% lower for contracted shuttle service. This is partially due to lower labor costs, as community shuttle drivers are part of a separate component of the bus union and have a different motor vehicle licensing requirement since no air brakes are used in shuttle vehicles. Additionally, these shuttles tend to travel shorter distances, reducing maintenance costs. Overall, the program has been impactful in providing a link from outer suburban communities to central transit service more cost-effectively than conventional fixed-route service.[4]

Mountain View Community Shuttle–Mountain View, CA

The Mountain View Community Shuttle circulates throughout the City of Mountain View, connecting residences, offices, park and recreational facilities, medical services, shopping centers, and entertainment venues. Currently still a pilot program, the service was developed as public-private partnership between the City of Mountain View and Google.

This fareless service operates Monday through Friday between 10 a.m. to 6 p.m. and between 12 p.m. and 8 p.m. on weekends and holidays. Two routes—one clockwise and one counterclockwise—serve the same loop and operate at a frequency of approximately 30 minutes. Transit connections are available to the regional commuter rail (Caltrain), employer commuter shuttles, Santa Clara Valley Transportation Authority (VTA), and other Mountain View shuttles provided by the local Transportation Management Association, mvgo.[5]



Source: City of Mountain View

Google is funding the pilot program operating costs for two years. The purchase of four new all-electric buses—produced by Motiv Power Systems—was made possible through California Energy Commission (CEC) grants.[6] Ridership for the service has continued to increase since the launch of the service in January 2015. The service captured 3,393 riders in the first month of operation but monthly ridership for all of 2015 was an average of 8,089 with a total of 97,079 riders. Ridership for January through March of 2016 totaled 30,977 riders, a 60% increase from the same months in 2015.[7]

1 Ventra Cards is a fare payment system for Chicago Transit Authority (CTA) and Pace.

2 TMA of Lake-Cook. About the Shuttle Bug Program. 2016. Retrieved from http://tmalakecook.org/shuttle-bug/about-the-shuttle-bug

3 Ride Connection. Retrieved from https://rideconnection.org/ride/services/community-connectors

4 SDOT. Transit Master Plan Appendix D: Community Shuttles. April 2012.

5 Mountain View Community Shuttle. Retrieved from https://mvcommunityshuttle.com/

6 Stephen Hall, 9 to 5 Goggle. Google Launches 100% electric, WiFi-powered Mountain View Community Shuttle Program. January 2015. Retrieved from http://9to5google.com/2015/01/13/google-mountain-view-community-shuttle/

7 Mountain View Community Shuttle. Operational Statistics Summary. March 2016. Retrieved from https://mvcommunityshuttle.com/statistics/

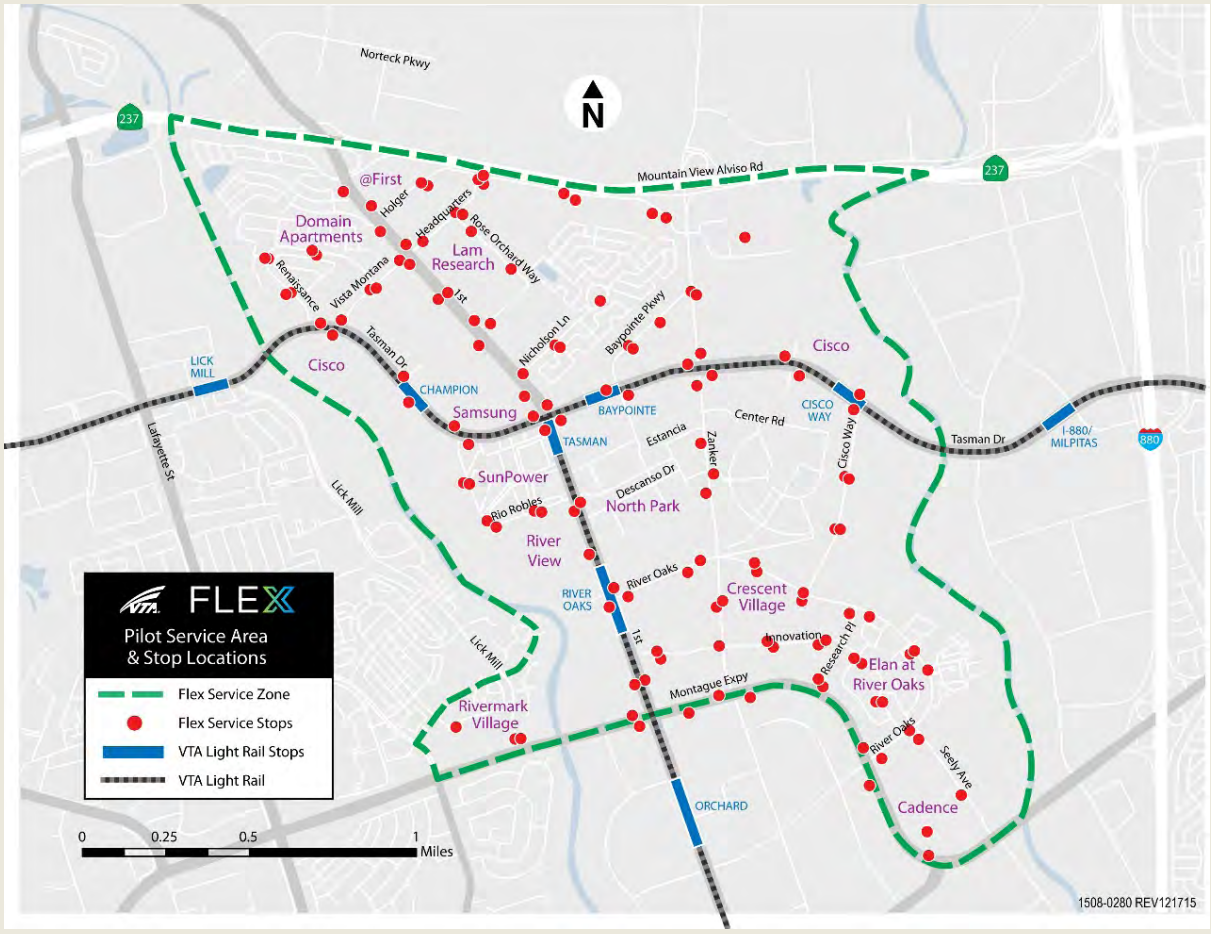
On-Demand Shuttle Case Studies

On-demand shuttles, operated by a public or private entity, provide a flexible end-to-end or first-last mile transit option that is often more cost-effective than fixed-route service. This type of service could be considered to serve employers in Western Salt Lake City.

VTA FLEX–San Jose, CA

In January 2016, Valley Transportation Authority (VTA) began a new pilot program in North San Jose, called FLEX, which offers on-demand transit service between regular transit stops and high-density employment centers and/or retail centers.

FLEX is not a fixed-route service and does not make scheduled stops. It operates in a 3.25 square mile service area that surrounds VTA's Tasman Light Rail Station. Travelers can request a ride using their smart phone or on the VTA website. A driver is then dispatched to pick up the passenger, who is provided with directions to the pick-up location. Other riders with similar travel destinations are picked up and dropped off during the course of the ride. Although the wait time is dependent on the number of trip requests at the given time, the software interface provides an estimated arrival time based on the driver's GPS location and trip load.[1]This service is still in the pilot phase but has received positive feedback from users, who have experienced shorter travel times to and from VTA light rail stations.[2]



Source: Santa Clara Valley Transportation Authority

RTD Call-n-Ride–Denver, CO

The Regional Transportation District (RTD) runs Call-n-Rides for 21 service areas in the Denver region. Passengers can request a ride up to two hours in advance by directly calling the driver's cell phone. Advanced reservations (up to 2 weeks ahead of time) can also be made via the RTD Call-n-Ride website. Some Call-n-Ride service areas also provide scheduled stops, where riders can wait to be picked up and then be dropped off anywhere within the service area. Additionally, some communities have coordinated with RTD to provide deviated fixed-route service to better meet the needs of the community.[3]

Source: City of Golden

Funding for the service is primarily by federal grants and RTD's operating budget but many local partners also help fund the service in their area. Call-n-Ride has been a successful first and last mile connection to other RTD services and final destinations. RTD service standards specify Call-n-Ride areas to be between four and 10 square miles with two to four persons per acre and one to three employees per acre. Productivity of Call-n-Ride services typically ranges from about three (minimum standard) to 10 daily boardings per revenue hour. Productivity in the range of four to six boardings per hour is considered to be successful.

RTD Call-n-Ride for the City of Golden includes a fixed-route deviated service.

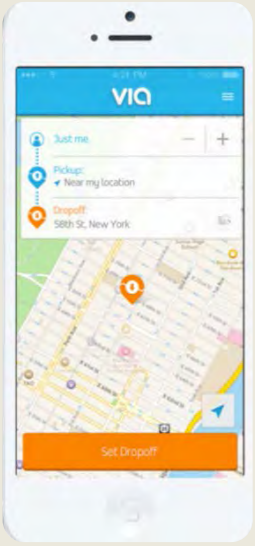
Sources:

1 VTA. FLEX. 2016. Retrieved from http://www.vta.org/getting-around/vta-flex

2 Five Stars for FLEX!. January 2016. Retrieved from http://www.vta.org/News-and-Media/Connect-with-VTA/Five-Stars-for-FLEX#.VwrW3RMrL-Y

3 City of Golden. Community Call-n-Ride Bus. Retrieved from http://www.cityofgolden.net/live/transit-services/community-call-n-ride-bus/

On-Demand Ride Services Case Studies



Source: Via

On-demand ride services refers to on-demand, point-to-point transportation services that are scheduled and paid for using an online-enabled application or platform, such as smart phone apps (e.g., Uber and Lyft). Unlike taxis, passengers are connected to drivers who use their personal vehicles rather than vehicles associated with a company. These companies tend to cater to individuals traveling across town or to the airport but some are specifically designed as a carpool service. Some services are also catering to older adult populations by partnering with third party internet providers. These partnerships allow people without access to a smart phone to request a ride via the internet instead via a smart phone. Transit agencies, employers, and communities are also beginning to use these companies to serve first and last-mile gaps in the transportation system.

Via–Chicago, IL and New York, NY

Via is a privately-operated on-demand ride service company that transports multiple passengers heading in the same direction. The service is available in Chicago and New York City. Users can access the service via a smartphone app where they enter their origin and destination and are then directed to a nearby pick-up location. Passengers are dropped off close to their final destination. Riders who pre-pay for their ride are charged a flat fee of $5. Riders who choose not to pre-pay incur a $2 surcharge. This service operates in dense areas of Chicago and New York, strategically targeting first and last-mile connections for transit users within the service area.[1]

Split–Washington, DC

Split operates an on-demand ride service to multiple passengers traveling in the same direction in central Washington DC, including first- and last-mile connections for transit users. Users must access the service via a smartphone app where they enter their origin and destination and are then directed to a nearby pick-up location. Riders are charged a $2 base fare and $1 per extra mile but are able to split the fare with other riders, making the cost more affordable.[2]

SunRail Uber Partnership–Altamonte Springs, FL

The City of Altamonte Springs is the first city in the country to subsidize Uber rides to and from transit stations. Uber users starting or ending a trip at the Altamonte Springs SunRail station receive a 25% discount on their fare. Additionally, users traveling anywhere within the city limits via Uber have 20% of their fare paid for by the city. The city hopes that this pilot program will encourage SunRail ridership, reduce traffic congestion, and provide a more affordable travel option for all residents and visitors. Users must access Uber using the mobile app and enter a promo code to receive the discount on their ride.[3]

Lyft's Friends with Transit Campaign

Source: Lyft

According to Lyft, 25% of its riders use the service to connect to public transit. Lyft is beginning a campaign to bridge the first and last mile gap, connecting its service with transit. In October 2015, Lyft began its first official partnership with a transit agency, Dallas Area Rapid Transit (DART). The partnership allows users to access Lyft as a transportation option within DART's mobile application. Through the application, users are able to view the location of Lyft vehicles and request a ride, enabling an on-demand ride service. Lyft and DART made an agreement that lets users get $5 off their first ten Lyft rides.

Other Partnership Examples

Source: Livable City

Jurisdictions and agencies across the country are beginning to coordinate with on-demand ride services companies in a variety of ways, ranging from software collaborations to allocation of passenger loading space at transit stops (or other designated zones) to subsidies. In addition to Lyft (above), **DART** also partnered with Uber and Zipcar to connect mobile apps. Users who access the DART GoPass app have direct access to Uber, Lyft, and Zipcar mobile applications. DART riders still have to arrange and pay separately for the ride share service.[4] **A San Francisco non-profit, Livable City,** partnered with Lyft to designate loading zones for rideshare users at the San Francisco regional commuter rail (CalTrain) station to promote the connection between ridesharing and transit.[5,6] **Livermore-Amador Valley Transit Authority (LAVTA)** in California is pursuing a subsidy program with Lyft to promote demand-responsive ridesharing as an alternative to low-performing LAVTA routes that provide access to Bay Area Rapid Transit (BART) stations. **The Denton County Transportation Authority (DCTA)** in Texas is also in the process of providing subsidies for first and last mile trips made with Uber.[7]

1 Via. 2015. Retrieved from http://ridewithvia.com/

2 Split. 2016. Retrieved from http://split.us/

3 Veronica Brezina, Click Orlando. Altamonte Springs Uber discounts begin. March 2016. Retrieved from http://www.clickorlando.com/news/altamonte-springs-becomes-first-us-city-to-partner-with-uber-hopes-to-increase-sunrail-ridership

4 Bill Zeeble, Kera News. DART Works With Lyft, Uber, Zipcar To Ease Your Trip. October 2015. Retrieved from http://keranews.org/post/dart-works-lyft-uber-zipcar-ease-your-trip

5 11th Hour Project. December 2015. Retrieved from http://www.11thhourproject.org/press/the-11th-hour-project-announces-winners-of-the-just-transit-sf-challenge-de

6 Livable City. Curbing the CalTrain Cluster. December 2015. Retrieved from http://livablecity.org/curbthecluster/

7 Bj Lewis, Dallas Morning News. DCTA plan to add options. May 2015. Retrieved from http://www.dallasnews.com/news/community-news/lewisville-flower-mound/headlines/20150531-dcta-plans-to-add-options.ece

Applicability of First-Last Mile Service Types and Case Studies to Salt Lake City

Services similar to those described in the above case studies are recommended to improve local transit connections to the retail/employment centers and residential areas in Salt Lake City as identified above. Each of the case studies targets connections to a retail/employer oriented area, a residential-oriented area, or both. Figure 2-13 summarizes the target markets for each of the case studies.

Figure 2-13 Summary of Target Areas for First-Last Mile Service Types and Case Studies

Service Type	Case Study	Retail/Employer Oriented	Residential Oriented
Fixed-Route Community Shuttle	Pace Shuttle Bug	X	
	Ride Connection Community Connector		X
	TransLink Community Shuttles		X
	Mountain View Community Shuttle	X	X
On-Demand Community Shuttle	VTA FLEX	X	
	RTD Call-n-Ride	X	X
On-Demand Ride Services	Via	X	
	Split	X	
	On-Demand Ride Services Partnership (Various)	X	X

Non-vehicular connections, such as bike share, can also serve as a viable option for improving connections to transit. Bicycle/pedestrian first-last mile strategies are described in Chapter 4.

SUMMARY OF RECOMMENDATIONS – SERVICE IMPROVEMENTS

The following table outlines specific service improvements that are recommended in the Transit Master Plan. High priority strategies are highlighted in blue.

Figure 2-14 Service Improvement Recommendations

Recommendation Category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Frequent Transit Network (FTN)-Tier 1 Existing/Planned	2.1	Develop an FTN in a phased approach. Implement high priority corridors for Salt Lake City that are already identified in the UTA Network Study and supported by the Transit Master Plan analysis and outreach.	Existing corridors in with strong ridership and conditions that will merit FTN status.	Lead: UTA Support: City	Near-Term
Frequent Transit Network (FTN)-Tier 1 Transit Master Plan Recommendations	2.2	Develop an FTN in a phased approach. Implement highest priority corridors for Salt Lake City beyond those already planned by UTA.	Tier 1 corridors have conditions now or in the near-term that will merit FTN status.	Lead: UTA Support: City	Near-Term to Medium-Term
Frequent Transit Network (FTN)-Tier 2 Transit Master Plan Recommendations	2.3	Develop an FTN in a phased approach. Implement longer-term priority corridors for Salt Lake City beyond those already planned by UTA.	Tier 2 corridors are projected to have conditions that merit FTN status in the future. The implementation of the FTN will serve long, direct citywide corridors.	Lead: UTA Support: City	Long-Term
New Transit Hubs	2.4	Construct additional transit centers in the vicinity of 200 S and 700 E and on the University of Utah campus.	To support current transit demand and the development of the high-frequency grid network.	Lead: UTA Support: City, University of Utah	Medium-Term
Local Service Network	2.5	As the FTN is implemented, adapt local routes to support the FTN. Maintain a basic or "lifeline" level local service to within ½ mile of most residents (a minimum of 60 minute frequencies for 12 hours per day) or consider an alternative service model.	A complete transit system requires local coverage-oriented routes (or alternative services) that provide connections to the FTN and neighborhood circulation.	Lead: UTA Support: City	Ongoing

1 Uber for Business and Lyft for Work allow companies to set up a specific business account for their employees to request and pay for rides seamlessly within the organization. These services also include ridesharing functions.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years. Chapter 7: Implementation will provide corridor-level phasing guidance.

High priority strategies

Recommendation Category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
First-Last Mile Service Strategies	2.6	Consider implementing an employer-oriented community shuttle pilot program to serve employment sites in western Salt Lake City.	Employers beyond the reach of transit in industrial areas can fund a shared shuttle service from major transit stations to help retain and attract employees. Partnerships across multiple employers can be particularly cost effective.	Lead: UTA Support: City, local businesses, employers, University of Utah	Near-Term
First-Last Mile Service Strategies	2.7	Develop pilot programs and/or partnerships with private or non-profit transportation providers, including on-demand ride services companies such as Lyft and Uber, to fill in spatial and temporal gaps in transit service. This includes first-last mile connections generally, shift workers, off-peak entertainment, etc.	Some neighborhoods in Salt Lake City lack sufficient density or demand to justify providing FTN or local service but still have transit needs. Citywide, there are transit needs outside of transit operating hours. On-demand ride services companies can provide a cost-effective demand-responsive service to areas beyond the reach of transit.	Lead: City Support: UTA, private or non-profit service providers, on-demand ride services companies	Near-Term
First-Last Mile Service Strategies	2.8	Conduct outreach to employers in need of last mile connections to educate them on the opportunity to fund last mile trips for their employees using tools like Uber for Business and Lyft for Work[1]	Employers may be beyond the reach of the FTN in industrial areas, such as western Salt Lake City; by partnering with on-demand ride services companies, employers can facilitate employees taking transit to work	Lead: City Support: On-demand ride services companies, employers	Near-Term
First-Last Mile Service Strategies	2.9	Foster creation of a Transportation Management Association (TMA) comprising west Salt Lake City employers.	Such an organization can help the City and UTA develop alternative, multi-employer first-last/mile services in west Salt Lake City.	Lead: City Support: UTA, employers and local businesses	Near-Term
First-Last Mile Service Strategies	2.10	Research best practices to ensure equal access for shared rides, regardless of ability.	Partnerships with shared ride service providers should be structured to ensure equitable access.	Lead: City Support: UTA, private or non-profit service providers	Near-Term

1 Uber for Business and Lyft for Work allow companies to set up a specific business account for their employees to request and pay for rides seamlessly within the organization. These services also include ridesharing functions.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years. Chapter 7: Implementation will provide corridor-level phasing guidance.

High priority strategies


UTA
SALT LAKE CENTRAL
250 South
600 West
SALT LAKE CENTRAL

3 CAPITAL

This chapter defines the capital elements of the Salt Lake City Transit Master plan, which include investments in transit corridors and facilities. The capital recommendations will support implementation of the frequent transit network (FTN) by enabling transit to run faster and more reliably and improving facilities to make it more comfortable and convenient to access transit.

CAPITAL INVESTMENT PRINCIPLES/FRAMEWORK

The City's goals (see Chapter 1) prioritize operating and capital investments that increase the number of people riding transit; improve air quality; connect transit-dependent populations with jobs, education, and services; and create economically-vibrant, livable places. Transit capital investments help Salt Lake City accomplish these goals by making transit travel highly efficient and reliable, treating transit as a priority in the street rights of way, and developing safe and comfortable transit access and facilities.

The following principles were used, along with the Transit Master Plan's analysis of current and potential transit corridors, to guide where Salt Lake City should prioritize capital improvements to make service faster and more reliable.

- **Ridership potential**—enhanced transit experience for existing riders and attract new riders
- **Cost-effectiveness**—investment per passenger (accounting for corridor length)
- **Land use**—corridor land use (including density, street connectivity, etc.) that supports a particular mode or level of investment
- **Corridor conditions**—Potential (need) for travel time savings and right-of-way opportunity or constraint

The assessment of capital priorities also documents alignment between existing UTA, Wasatch Front Regional Council and City plans and priorities, Transit Master Plan goals, and public input received through the plan's outreach process.

TRANSIT MODES AND AMENITIES

UTA provides a variety of transit modes in Salt Lake City including bus, streetcar, TRAX light rail, and FrontRunner commuter rail. Figure 3-1 describes characteristics of transit modes already operated by UTA and others recommended in this plan that do not currently operate in Salt Lake City:

- **Enhanced Bus**. Enhanced Bus uses features like transit signal priority (TSP) or queue jumps to help buses avoid delay at traffic signals and bypass congestion. Figure 3-3 illustrates typical features of corridors. The UTA Network Study (2013) recommended a set of these corridors (referred to as Bus Plus), including many of the FTN corridors identified in Chapter 2 and the Transit Master Plan priority corridors discussed in this chapter.

- **Bus Rapid Transit (BRT).** UTA operates one BRT line outside of Salt Lake City and there are several proposed BRT projects in the UTA service area. BRT includes the features of Enhanced Bus, but is distinguished by dedicated lanes to provide fast, reliable travel times. It is often described as light rail with rubber-tire vehicles.
- **Community Shuttle**. Community shuttles are flexible services designed to meet specific transit market needs. The employer shuttles recommended in Chapter 2 are a form of community shuttle service. Other types of community shuttles may be appropriate to meet future potential needs in Salt Lake City. Key success factors for Community Shuttles include large trip generators and well-defined markets.

Figure 3-1 Salt Lake City Existing and Recommended Transit Modes

Mode	Recommended Service Level (Frequency)	Existing and Planned Services	Photo	Access: Station Spacing [1]	Vehicle Features / Capacity	Running Way Features	Station Amenities [2]
Commuter Rail	▪ 30 minutes	▪ Provo– Central Station - N. Temple – Ogden	 Source: Flickr Paul Kimo McGregor	5-10 miles	▪ Locomotive pulls variable number of coach cars with 100-135 seats each ▪ FrontRunner capacity currently at 500	▪ Grade-separated running-way	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information
TRAX Light Rail	▪ Frequent Service (15 min. or better all day – see Chapter 2)	▪ Red Line: South Jordan - Downtown - University of Utah ▪ Blue Line: Draper, Sandy - Downtown ▪ Green Line: West Valley - Downtown - Airport	 Source: Nelson\Nygaard	½ - 1 mile	▪ 400 (assumes 4 cars with up to 100 person capacity) ▪ Branded vehicles	▪ Dedicated running-way ▪ Transit signal priority (TSP) for entire corridor	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information
Streetcar		Existing S-Line Planned S-Line Extension Planned Downtown Streetcar	 Source: Nelson\Nygaard	¼ - 1/3 mile	▪ 100 (assumes 1 car) ▪ Branded vehicles	▪ Mixed-traffic (could use exclusive or semi-exclusive running way in congested corridors)	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information
BRT		None in Salt Lake City One line (outside of Salt Lake City): UTA MAX between Magna, the West Valley Central TRAX Station, and the Millcreek TRAX station in South Salt Lake	 Source: UTA	1/3 – ½ mile	▪ 40-90 (articulated) ▪ Branded vehicles	▪ Dedicated running way in congested corridors ▪ Transit signal priority (TSP) for entire corridor	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information

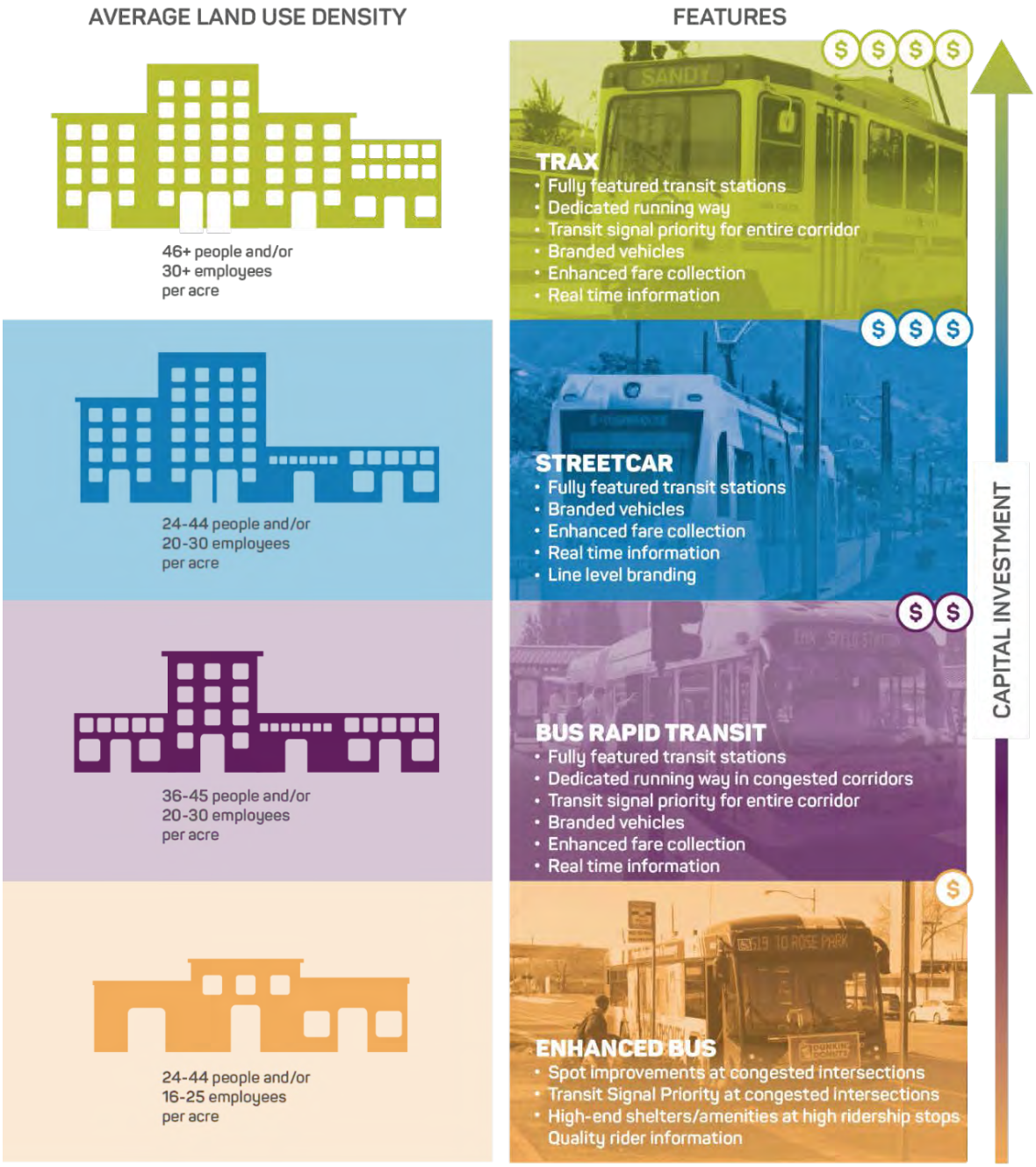
Mode	Recommended Service Level (Frequency)	Existing and Planned Services	Photo	Access: Station Spacing [1]	Vehicle Features / Capacity	Running Way Features	Station Amenities [2]
Enhanced Bus		None in Salt Lake City Planned corridors include Bus Plus Corridors identified in UTA Network Study (see Figure 3-8)	 Enhanced bus stop in Glendale, CA. Source: NACTO	¼ - ½ mile	▪ Typically 40 foot bus ▪ 40-60	▪ Similar to BRT, but without dedicated lanes ▪ Spot improvements and/or TSP) at congested intersections	▪ High-end shelters and amenities at high ridership stops ▪ Quality rider information
Local Bus	30 or 60 minutes	21 local routes within Salt Lake City	 Source: Nelson\Nygaard	⅛ – ¼ mile	▪ 40-60	▪ Typically runs in mixed-traffic	▪ Prioritized based on ridership thresholds (see Chapter 6)
Community Shuttle	30 minutes (may be limited to peak hours)	None in Salt Lake City Employer shuttles are recommended to serve employment areas in west Salt Lake City	 Community Shuttle in Portland, OR. Source: Wikimedia Steve Morgan	Variable fixed-stop spacing based on land use, or on-demand	▪ 15-30 ▪ Minibus or small standard bus	▪ N/A	▪ Branded signage

[1] See Figure 3-4 for additional detail on stop spacing. [2] Additional detail on recommended station amenities is provided in Chapter 6.

Transit Modes, Features, and Supportive Land Use

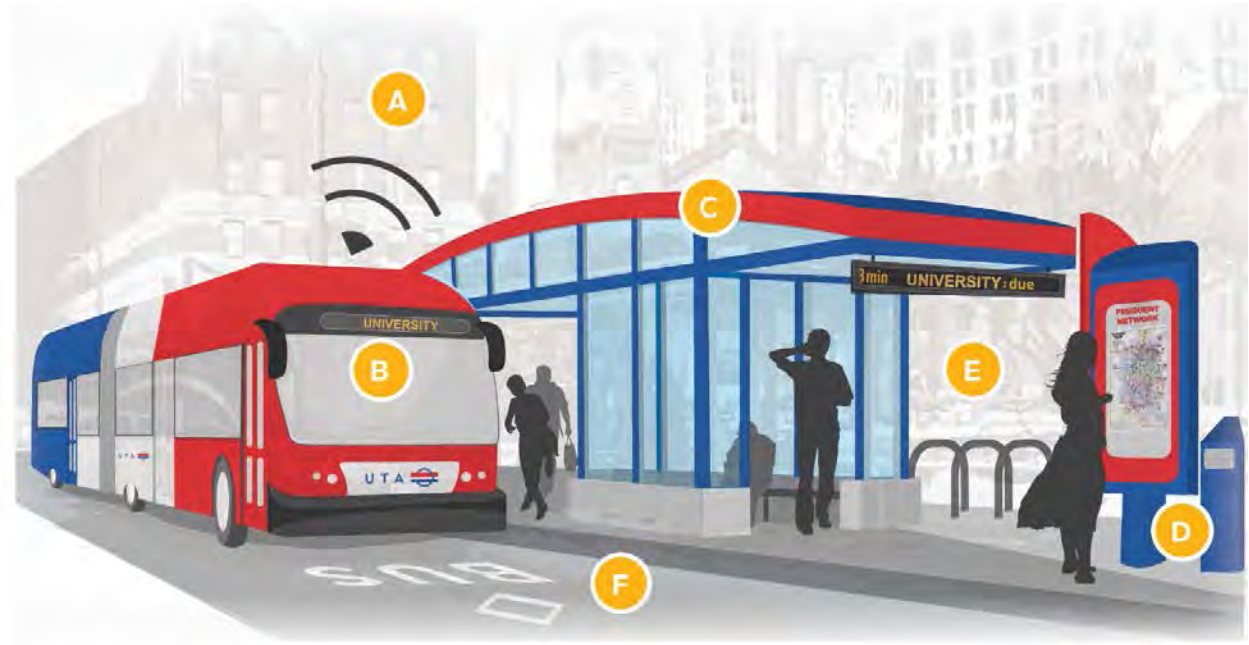
Land use density and transit service should be developed in concert to ensure their mutual benefit and success. High-quality transit modes that provide frequent service and a high-level of amenities require supportive land use to generate enough riders to be cost-effective. As shown in Figure 3-2, light rail and streetcar services require a relatively high density of population and jobs to warrant their higher passenger-carrying capacity and capital cost. BRT and Enhanced Bus service have a lower capital cost, operating cost, and passenger carrying capacity than rail and can be successful with a more moderate level of density. In addition to population and employment density, street connectivity and safe pedestrian and bicycle access are also important to support ridership across all modes.

Figure 3-2 Salt Lake City Transit Modes, Land Use Conditions, and Capital Features



Two proposed transit modes for Salt Lake City are Enhanced Bus and Bus Rapid Transit (BRT). The main difference is that BRT includes dedicated lanes. Both types of bus service make transit run faster and more reliably and provide high-quality amenities at bus stops and stations. Figure 3-3 highlights the key elements of these types of high-quality bus corridors.

Figure 3-3 Elements of High Quality Bus Corridors



A TRANSIT SIGNAL PRIORITY

Intersection improvements including transit signal priority (TSP) allow buses to bypass congestion. TSP gives buses earlier and/or longer green lights.

B BRANDING AND VEHICLES

Unique designs make buses and stations more visible, raising awareness and increasing customer expectations for higher levels of service.

C ENHANCED STATIONS

Enhanced amenities include raised platforms, tactile treatments, off-board fare payment, real-time arrival information, larger shelters, bike parking, and information in audio, visual, and tactile formats

D ENHANCED FARE COLLECTION SYSTEMS

Off-board fare collection using ticket vending machines, card readers, and other tools at stations allow passengers to load without waiting in line to pay their fares.

E BIKE PARKING

Bike parking and GREENbike bike share at stations increase the reach of transit.

F RUNNING WAY IMPROVEMENTS

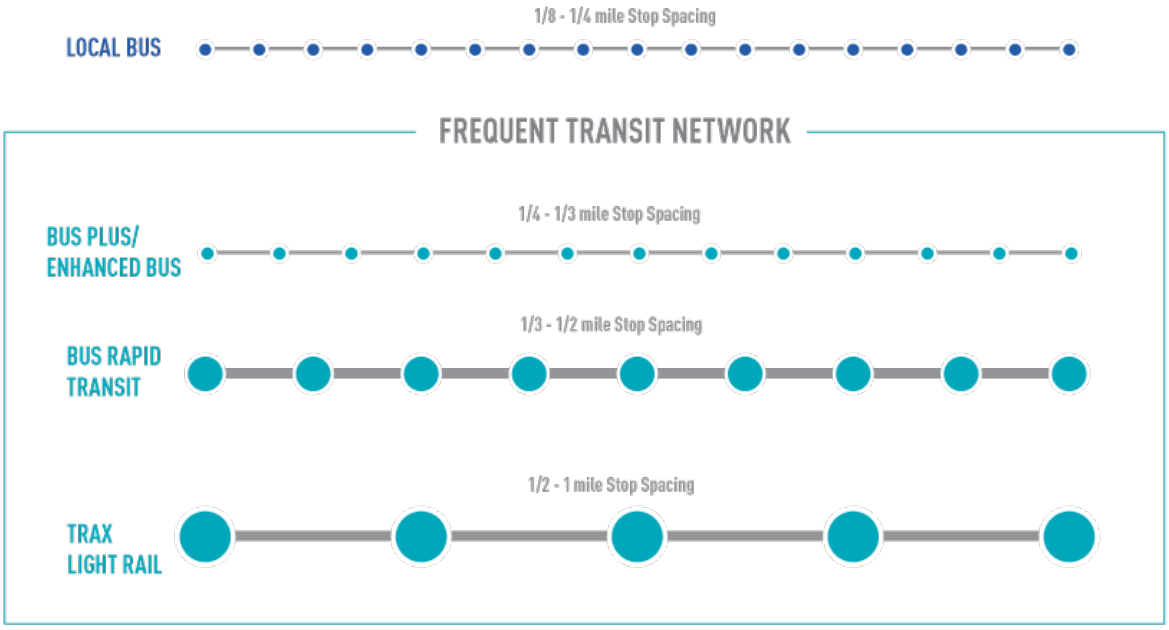
Could include bus-only lanes that separate transit from traffic and are clearly marked or queue jumps.

Stop Spacing

Stop spacing refers to the distance between stops on a transit route or corridor. The number of stops is a tradeoff between access and speed. A shorter distance between stops increases access to a transit line, but reduces speed. This tradeoff often varies by mode, as shown in Figure 3-4. Access is a priority for local service — stops can be spaced as close as ⅛ mile apart. Services along the FTN, however, place a greater emphasis on speed. Bus Rapid Transit and Enhanced Bus corridors that serve relatively straight corridors across the city should have longer stop spacing. Higher-quality stops spaced ¼ to ½ mile apart on average mean that few passengers have to walk more than about ¼ mile to a stop along these corridors. TRAX serves longer-distance regional connections and therefore has longer stop spacing. In areas with dense destinations, such as downtown, FTN stop spacing can be more frequent.

Decreasing stop spacing to significantly less than ¼ mile (e.g., an average walk of less than 1/8 mile, or one typical Salt Lake City block, to reach a stop along a corridor) negatively affects the actual and perceived travel time for all riders. Implementation of changes to stop spacing would consider the surrounding context, and in all contexts would attempt to provide access to stops within a quarter mile (or no more than half-mile spacing). Providing limited stop service on alternating trips is also a potential tool that could be used to balance travel speed and access considerations for certain corridors/routes.

Figure 3-4 Stop Spacing Guidelines by Mode



Stop Spacing Case Studies

Reducing the number of stops on a route can result in significant actual and perceived time savings along a route, particularly where spacing is less than every 1,000 feet. Savings can range from 5 to 20% of the total running time on a route.

- **Seattle, WA:** King County Metro designed RapidRide stops to be about a half-mile apart. Stops are between 500 and 1,000 feet apart in some downtown locations. Metro does not operate parallel local service along RapidRide corridors, although some route segments have other local service.
- **Kansas City, MO.** Kansas City Area Transportation Authority MAX BRT service has quarter-mile average stop spacing. KCATA phased out local underlay service on its Main Street BRT line; most passengers were boarding at BRT stations.

Bus-Rail Integration

Transit agencies use various techniques to integrate bus and rail services to improve the passenger experience. Because UTA operates both rail and bus services, Salt Lake City does not have some of the inter-agency coordination challenges that exist in other cities, such as fare integration. Opportunities to improve bus-rail integration in Salt Lake City include timed connections, signage and wayfinding, shared stops, and transit information.

- **Timed Connections.** Bus and rail schedules can be coordinated to enable efficient connections for key travel patterns served by bus and rail modes.
- **Signage and Wayfinding.** Maps and wayfinding signage can be designed to help passengers easily navigate between bus and rail stops. In Portland, OR, TriMet uses both techniques to facilitate bus and light rail transfers along the 5th/6th Avenue Transit Mall.
- **Transit Information.** Real-time information displays and apps can help passengers decide or make connections between modes. TriMet shows both bus and light rail arrival at Orange Line stations. In Minneapolis, Metro Transit's app directs riders to the closest bus and rail stops based on their GPS location.
- **Shared Platforms.** Shared bus and streetcar stops enable convenient transfers and may allow passengers to take either mode for some trips. Station platforms can be designed to accommodate both bus and rail vehicles. Key design considerations include platform height, which needs to accommodate wheelchair ramps, and providing sufficient platform length to avoid delays. Buses and streetcars share stops in Minneapolis and Portland.

Wayfinding on the Portland Transit Mall.

Source: TriMet

Metro Transit app identifies bus and rail stops.

Source: Metro Transit

Transit Master Plan Transit Corridor Analysis

Figure 3-5 illustrates a set of transit corridors that were evaluated to inform the frequent transit network (Chapter 2) and the capital recommendations provided in this chapter.

- Phase I of the evaluation analyzed current and/or potential arterial roadway segments, created using logical breakpoints (e.g., key intersections).
- Phase II of the evaluation analyzed the corridors, or combinations of segments, shown in Figure 3-5.
- For the purposes of evaluation, all corridors were assumed to use a bus mode and operating characteristics (service span and frequency).
- The metrics analyzed in Phases I and II included:

Phase I and II

- Existing ridership
- Transit Propensity Index (TPI)
- Land use density current (population and employment)
- Land use density future (population and employment)
- Lack of access to a vehicle

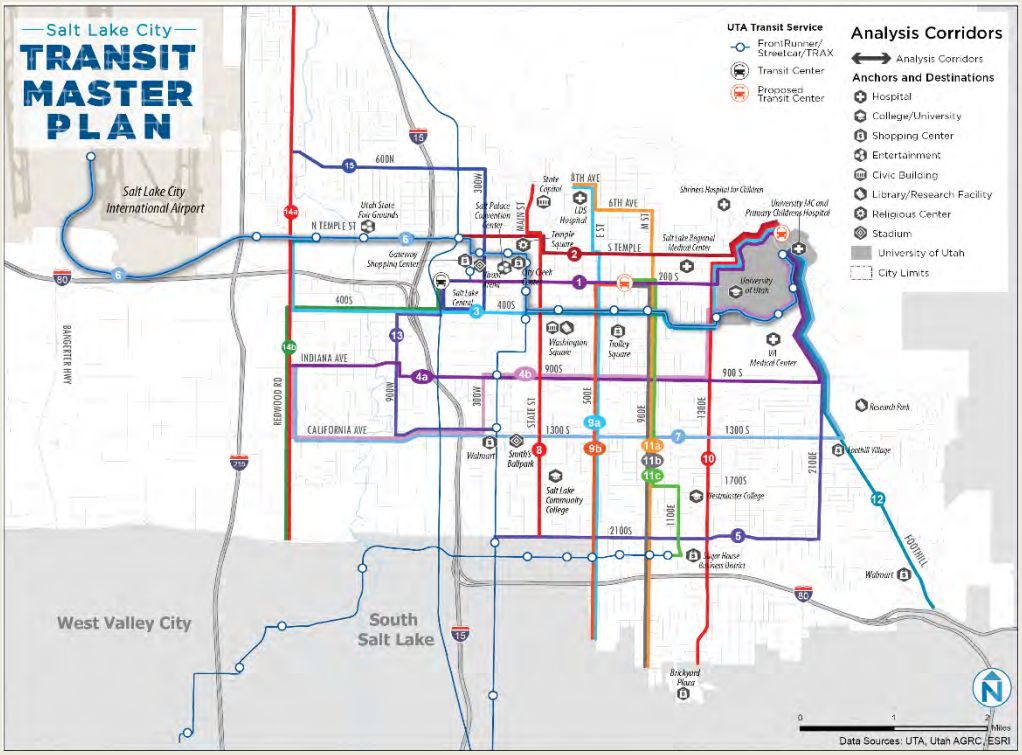
Phase II Only

- Anchor/generator strength and accessibility
- Potential for travel time savings and/or improved reliability
- Ridership potential (current and future year)
- Redevelopment Potential
- Cost effectiveness

- Additional considerations related to capital investments included corridor right-of-way and congested/uncongested travel time.

Appendix D provides additional detail on the evaluation.

Figure 3-5 Phase II Corridors



TRANSIT CORRIDORS

The Transit Master Plan corridor analysis, which was used to develop the recommended frequent transit network, was also used to develop priorities for capital investments in transit corridors. This section addresses three categories of corridor projects:

- **Transit Master Plan Priority Corridors.** High priority corridors for the City to support with capital investments in transit speed and reliability improvements and amenities. The plan includes an assessment of viable mode(s) for these corridors.
- **Additional Corridors Aligned with the Plan's Goals.** Additional corridors planned by UTA or the City and supported by the Transit Master Plan.
- **Other Capital Projects.** Additional corridors planned by UTA or others, but with more of a regional emphasis and not necessarily supported by the Transit Master Plan analysis.

Transit Master Plan Priority Corridors for Capital Investments

Transit Master Plan capital investment recommendations support investments in frequent service and long hours of operation on key travel corridors and help address challenges identified through the plan's gaps analysis.

Figure 3-6 illustrates Salt Lake City's highest priorities for transit corridor capital investments, including facilities and corridor management strategies that enhance transit speed and reliability and amenities that improve passenger comfort. These priorities are grounded in the plan's transit corridors analysis (see sidebar above) and an assessment of high performing corridors based on the capital investment principles defined above. In many cases these corridors are aligned with and support the recommended FTN described in Chapter 2. Figure 3-7 identifies these corridors in a table along with an assessment of compatible modes. A first step in developing capital improvements on these corridors would be to conduct a more detailed corridor study to refine the mode (including potential applicability of a rail mode), specific alignment, and design. The plan analysis identifies corridors where transit capital investments would be the most successful. Capital investment corridors with connections to the existing rail system can serve as a potential framework for a streetcar network.

- **200 S**. 200 S is a key east-west transit corridor for bus (and potentially, future Bus Rapid Transit and/or streetcar) service between downtown and the University. Following the City and UTA's previous capital investments in improved amenities the corridor saw an increase in transit ridership. Developing 200 S as a major transit corridor is envisioned as an initial implementation priority for the City and UTA.
- **North-south corridors.** Several Enhanced Bus corridors are recommended to create a north-south transit grid with approximately half-mile spacing between corridors, including the existing TRAX line in the 200 W corridor. These corridors extend from southern city limits through the downtown core to major destinations further north, including the State Capitol, LDS Hospital, and into the Avenues neighborhood.
  - **State Street.** An Enhanced Bus corridor or Bus Rapid Transit on State Street, currently served by UTA route 200, would connect to the State Capitol.
  - **500 E and 900 E.** Enhanced Bus corridors on 500 E and 900 E would extend beyond the downtown core to serve the Avenues neighborhood, including LDS hospital. One or both corridors would serve a recommended transit center in the vicinity of 200 S.
- **400 S**. A continuous east-west bus corridor along 400 S would connect Redwood Road and the University. A bus corridor along 400 S would run parallel to TRAX between Main Street and the University.

- **900 S and 1300 S/California**. Continuous east-west cross-town bus corridors in the center of the city would provide service to the Poplar Grove and Glendale neighborhoods, link major retail centers along 300 W, and help develop the frequent service grid. (An at-grade freight railroad crossing currently precludes using 900 S as a continuous bus corridor; freight crossings can cause significant transit delays and bus bunching, especially for frequent service. In the near-term, the recommended FTN corridor could connect 1300 S/California and 900 S using 300 W. In the long-term, this plan supports providing a grade-separated crossing on 900 S that would enable continuous frequent transit service on this corridor).
- **North/South Temple.** A combination of N. Temple and S. Temple Streets is recommended as a continuous east-west bus corridor, supporting development of the frequent service grid. N and S Temple, 200 S, and 400 S provide east-west corridors approximately a third-mile apart (i.e., less than a quarter-mile walk) through downtown and connecting to the University.
- **Redwood Road.** Redwood Road is a significant regional and local transit corridor on the western side of the city. It has an important role connecting neighborhoods with high transit propensity to the frequent grid, including recommended east-west FTN corridors. Redwood Road also serves employment areas west of Redwood Road, between I-80 and south city limits, that are expected to grow in the future. This corridor is recommended as an Enhanced Bus corridor.
- **Foothill Drive**. Foothill Drive is an important regional and local transit corridor serving the University, Research Park, Foothill Cultural District, and Medical Center, and serving neighborhoods in the southeastern part of the city. Current land use patterns and accessibility are challenging to serve effectively with local transit service. This corridor is recommended as an Enhanced Bus corridor, including treatments to optimize transit travel in the congested peak travel periods. The Foothill Drive Corridor Study was completed in 2008; the City, UDOT, UTA, the University of Utah, and other partners completed an Implementation Strategy for the corridor in 2017. As the study has strong stakeholder and community support, it is suggested that project partners consider moving forward with near-term implementation of the study's significant transit, bicycle and pedestrian supportive elements. Salt Lake City will also participate as a key stakeholder in developing updated University of Utah transportation plans. The City will partner with UTA and the University to seek resources for further study of bus, rail, and shuttle service connecting to and within campus, Research Park, VA Hospital, and Foothill Cultural District in the context of planned land use changes.
- **S-Line Streetcar Extension.** Extend the line to improve its utility, to 1700 S (consistent with the Regional Transportation Plan) with a connection to the 900 E FTN corridor. A future extension along 900 E could connect to TRAX service at 400 S.

Additional Local and Regional Capital Investment Priorities

UTA and Salt Lake City have already developed plans for a subset of the corridors included in the Transit Master Plan analysis and identified as Salt Lake City's priorities for transit corridor investments. These corridors were not directly included in the plan's mode assessment because they emerged from local or regional plans that have already conducted a detailed study to refine the preferred transit mode for the corridor. This section identifies additional priority capital investments and assesses how well additional planned projects align with Salt Lake City's transit investment priorities, based on the capital investment principles identified above.

Additional projects supported by Salt Lake City include:

- **TRAX improvements including the Black Line** and other downtown network enhancements. These enhancements would resolve capacity issues necessary to enable direct TRAX service between the Airport and the University, two of Salt Lake City's major travel demand generators.
- **Downtown Streetcar connecting to the University of Utah.** The Transit Master Plan corridor analysis supports transit investments in a downtown streetcar including a connection to the University. The analysis showed strong demand for east-west travel between Downtown and University of Utah. The locally preferred alternative includes portions of 200 S (west of W Temple Street), 100 S, and S Temple Street. In partnership with the University, Salt Lake City will pursue more detailed study of the eastern segment of the downtown streetcar corridor and its connection to campus. An additional consideration for the project could include coordination with the plan's recommendation to develop a transit center in the vicinity of 200 S and 500 E.
- **Extended Enhanced Bus or BRT corridors south of Salt Lake City limits**, e.g., on State Street, 500 E, and 900 E.
- **Additional Enhanced Bus corridors** consistent with the UTA Network Study and the Regional Transportation Plan, e.g., on 1300 E (including south of city limits) and 2100 E/2100 S. 1300 E is a key corridor connecting to the University of Utah from Sugar House and the site of forthcoming University facilities just north of I-80. Transit investments will be considered as the City works to reconstruct this corridor. Partnership with the University in improving this corridor for transit would further enhance it as a high-quality connection from points south of campus.
- **400 West (South Davis Corridor)**, where a locally preferred alternative has been selected, with BRT through South Davis County and Enhanced Bus in the 400 W corridor. In addition to improving regional connections to Salt Lake City, this project could provide infrastructure that would support additional Enhanced Bus service to the University of Utah.
- **Mountain View Corridor Transit Project** is a joint effort between UTA and UDOT to develop bus service along 5600 West from the Old Bingham Light Rail station to the International Center and from there to the Salt Lake International Airport and downtown Salt Lake City. The approved Phase 1 project was redefined to use a bus mode. This project will support significant planned employment growth in the Northwest Quadrant.

Figure 3-6 Transit Master Plan Priority Corridors for Capital Investments

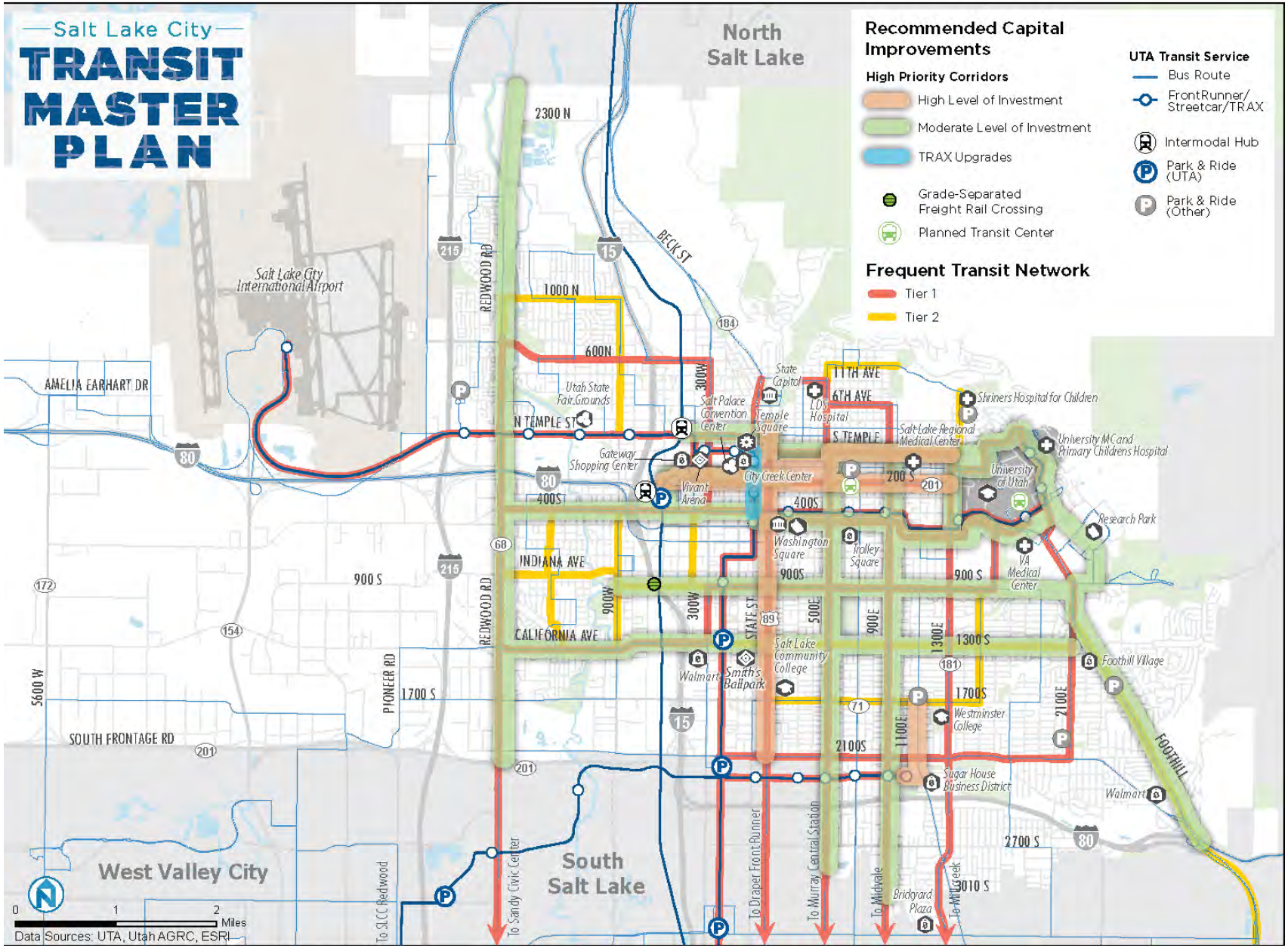


Figure 3-7 Transit Master Plan Priority Corridors for Capital Investments and Compatible Modes

Corridor #	Corridor Name	Recommended Mode Options [1]			Notes / Order-of-Magnitude Cost Estimate [2]	Past Plans Map ID [3]	Previously Planned Project	Previously Planned Mode	Primary Source Plans or Studies
		Rail	BRT	Enhanced Bus					
1	200S	--	X	X	BRT: $61 M - $182 M; Enhanced Bus: $12 M - $4 M	N	200 S E	Enhanced Bus	UTA Network Study [4]
2	South Temple	--	--	X	$11 M - $45 M	n/a	n/a	n/a	n/a
3	400S	TRAX	-	X	Continuous bus corridor from Redwood Road to University ($22 M - $ 87 M). TRAX extension also identified in corridor (see additional projects, Figure 3-9).	H	400 S TRAX Extension	TRAX	Downtown in Motion; Sustainable Salt Lake City
4a/b, 7	900 S and 1300 S	--	--	X	A continuous connection to Redwood Road on 900 S is not possible in the near-term due to an at-grade freight rail crossing. Portions of these corridors implemented in the near-term could be connected using 300 W (see Chapter 2). $31 M - $124 M, both corridors, not including grade separation.	n/a	n/a	n/a	n/a
8	State	--	X	X	BRT: $59 M - $176 M; Enhanced Bus: $12 M - $47 M	C	State Street Enhanced Bus / BRT	BRT	Downtown in Motion; UTA Network Study
9a/b	500E	--	--	X	$14 M - $55 M	J	500 E Enhanced Bus	Enhanced Bus	UTA Network Study
11a/b	900E	--	--	X	$17 M - $68 M	K	900 E Enhanced Bus	Enhanced Bus	UTA Network Study
12	Foothill Drive	--	--	X	$13 M - $53 M	O	Currently under study	Enhanced Bus or BRT	Foothill Drive Implementation Strategy
14a	Redwood	--	--	X	$20 M - $81 M	B2	North Redwood project	Enhanced Bus	UTA Network Study
14b	Redwood	--	--	X	$13 M - $53 M	B1	Redwood BRT	BRT	West Side Master Plan; UTA Network Study

Corridor #	Corridor Name	Recommended Mode Options [1]			Notes / Order-of-Magnitude Cost Estimate [2]	Past Plans Map ID [3]	Previously Planned Project	Previously Planned Mode	Primary Source Plans or Studies
		Rail	BRT	Enhanced Bus					
6	Black Line	TRAX	--	--	Capital improvements to signals and existing track would provide a fourth TRAX line connecting the Airport and University of Utah and would increase frequency on the 400 South TRAX segment (assuming no changes to other lines). This would require additional operating funds and training. Adding lines, revising termini, or increasing frequencies on existing lines thereafter would require duplicative N-S and E-W rail connections and additional study. Estimated cost of $5.5 M.	I	Black Line TRAX	TRAX	n/a
11c	S-Line Streetcar Extension	Streetcar	--	--	Included as an element of 900 E corridor in plan's evaluation. A future extension along 900 E could connect to TRAX service at 400 S.	F	S-Line Streetcar Phase II	Streetcar	Sugar House Master Plan; Sustainable Salt Lake City; UTA Network Study
1 & 2	Downtown Streetcar	Streetcar	--	--	Not specifically analyzed, but 100 S corridor performed well in plan's analysis. Estimated cost of $92 M for 1.67 mi, including five vehicles and a maintenance facility that comprise about $32.5 M of the cost (2014, Year of Expenditure).	E	Downtown Streetcar	Streetcar	Downtown in Motion; Sustainable Salt Lake City; UTA Network Study

Notes: [1] Compatible modes based on Transit Master Plan corridors analysis and capital investment principles; recommendation to be refined in a more detailed study of each corridor. [2] Order-of-magnitude capital cost estimates for BRT and Enhanced Bus use unit costs of $15 million per mile for BRT and $3 million per mile from the UTA Network Study (2013) for the low-end of each cost range. The high-end of the cost ranges is set based on per-mile costs of $45 million and $12 million for BRT and Enhanced Bus, respectively, from data from other bus corridor projects nationally. The UTA Network Study unit costs are within the range of other bus corridor projects. [3] See Figure 3-8 illustrating the relationship between Transit Master Plan priority corridors and previous plans. [4] Bus Plus is equivalent to Enhanced Bus.

Order-of-magnitude capital costs for implementing all the bus corridors identified in Figure 3-7 range from about $175 to $970 million.

Figure 3-8 Relationship of Transit Master Plan Priority Corridors to Other Local and Regional Capital Improvement Plans

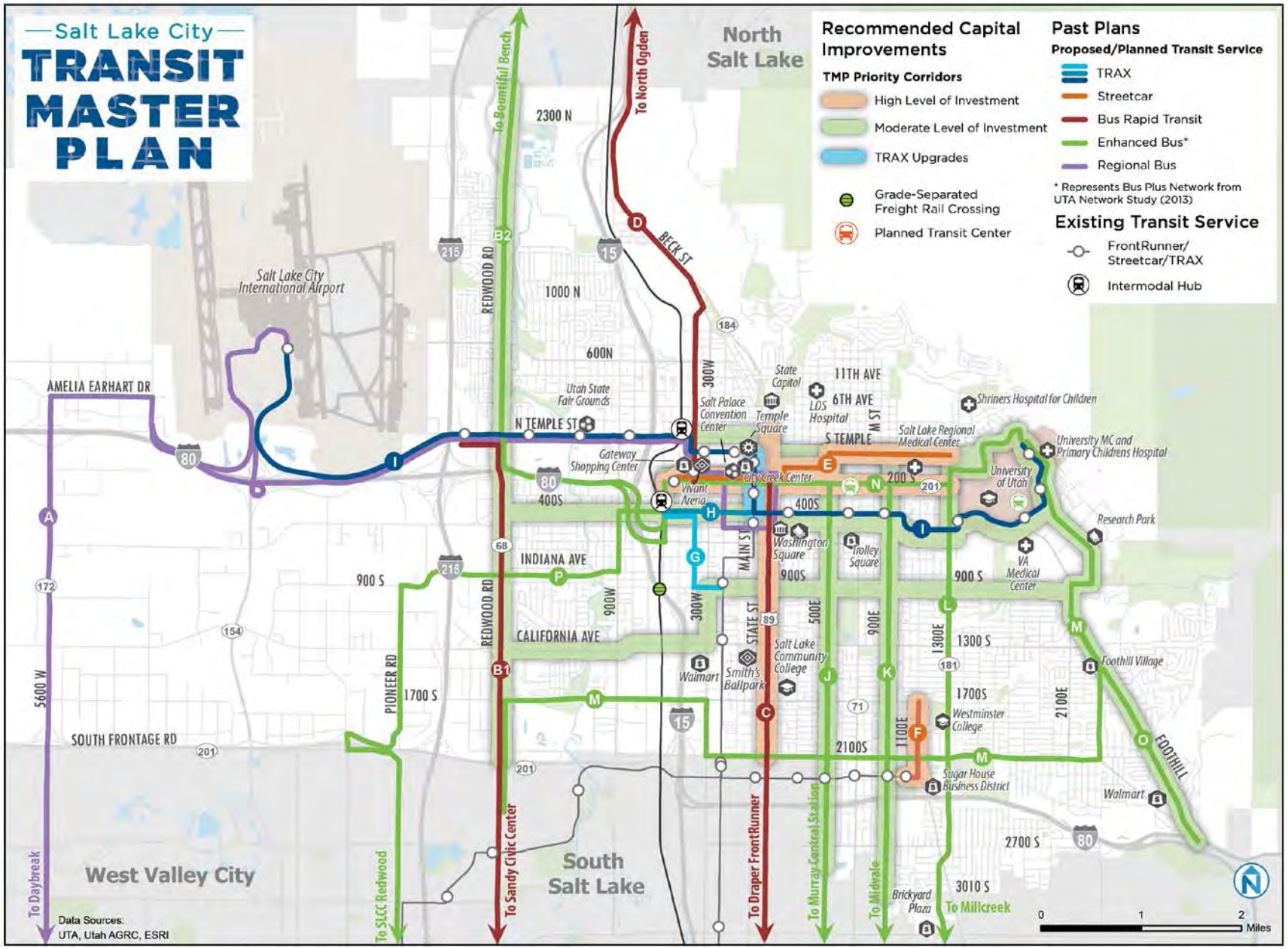


Figure 3-9 Assessment of Capital Investments in Other Corridors and Compatibility with Transit Master Plan Goals

Corridor #	Past Plans MAP ID	Previously Planned Project	Mode	Supportive of the plan's Goals	Notes	Primary Source Plans or Studies
Additional Projects Supported by Transit Master Plan						
10	L	1300 E Enhanced Bus	Enhanced Bus	Aligned	Part of the recommended FTN.	UTA Network Study
5	M	2100 S/1700 S Enhanced Bus	Enhanced Bus	Aligned	2100 S/2100 E shows strong demand in this analysis and is part of the recommended FTN. 2100 S west of I-15 did not show strong local demand in this analysis, but could have regional utility.	UTA Network Study; WFRC RTP
n/a	D	South Davis BRT	BRT	Aligned	This is a regionally-significant project that has been studied by UTA. The Transit Master Plan focused on local needs and therefore did not consider this corridor; however, the local portion of the project, which recommends Enhanced Bus along the 400 W corridor, supports the plan's local transit recommendations.	UTA Network Study; Davis SLC Community Connector Study
3	H	400 S TRAX Extension	TRAX	Aligned	Part of recommended FTN; the Transit Master Plan will support evolving capital recommendations over time.	Downtown in Motion; Sustainable Salt Lake City
n/a	G	TRAX "outer loop" of Downtown [1]	TRAX	Aligned	Part of recommended FTN; but not included in capital recommendations; the Transit Master Plan will support evolving capital recommendations over time as development patterns and market demand changes.	Downtown in Motion; UTA Network Study
n/a	A	5600 West / Mountain View Corridor Transit	Express Bus	Aligned	This is a regionally-significant project that has been studied by UTA. The City supports the Phase 1 Mountain View Corridor project, from the Old Bingham Light Rail station to the International Center, Salt Lake International Airport, and downtown Salt Lake City.	UTA Network Study; Mountain View Corridor Record of Decision (ROD)
Regionally-Significant Projects with Limited Local Transit Implications						
n/a	P	2700 W Corridor	Enhanced Bus	Neutral	This is a regionally-significant project that has been studied by UTA. The Transit Master Plan focused on local needs and therefore did not consider this corridor.	WFRC RTP
n/a	xx	Mountain Transportation System	N/A	Neutral	This is a regionally-significant project that is currently being studied, but is outside the scope of the Transit Master Plan	Sustainable Salt Lake City; UTA Network Study

Notes: [1] TRAX lines on 700 South from 200 West to 400 West, and then continuing north on 400 West connecting to the existing system near Gateway – completing outer loop that serves Downtown and the emerging southwest quadrant.

Transit Priority Toolbox

Figure 3-10 provides a list of potential roadway, stop, and vehicle treatments for Salt Lake City that can reduce system inefficiencies and improve the functionality of the transit. This toolbox can help guide future investments along the identified Transit Master Plan corridors. The toolbox is generally consistent with the NACTO Transit Street Design Guide,[1] which provides additional design options and implementation details.

Figure 3-10 Transit Priority Toolbox

Treatment	Definition	Benefits	Constraints
Roadway Treatments			
Transit signal priority (TSP)	At traffic signals, vehicles communicate with the traffic signal system to provide a green signal indication to an approaching vehicle. This often works better in conjunction with a far-side transit stop.	Reduces travel time and delay for buses at intersections. This could be particularly beneficial given long traffic signal times.	Less effective when signals are operating at capacity.
Queue jump lanes	At signalized intersections, a bus is provided with a lane adjacent to general purpose traffic and an advanced green signal indication to bypass congested areas.	Buses "jump" the queue of waiting cars, reducing travel times.	Lane must be as long as the typical queues. TSP makes these much more effective, particularly if there is no far-side receiving lane. May increase pedestrian crossing times.

Queue jump lane.
Source: Nelson\Nygaard

[1] http://nacto.org/publication/transit-street-design-guide/

Treatment	Definition	Benefits	Constraints
Dedicated bus lanes	A lane is reserved for exclusive use by buses. It may also be used for general purpose traffic right-turn movements onto cross streets and for access to adjacent properties.	Reduces travel times.	Conflicts with right-turn and delivery vehicles. Potential opposition from businesses that may lose on-street parking.
Dedicated bus median lanes	A median lane is reserved for exclusive use by buses. This treatment speeds bus travel times.	Reduces travel times.	Conflicts with left-turning vehicles. Signalization challenges.
Reversible or contra-flow lanes	A reversible transit lane is a dedicated transit facility that operates in the peak travel direction. A contra-flow bus lane is a dedicated lane of an otherwise one-way street reversed for buses and other mass transit. Contra-flow lanes can also be reversed to add capacity in the peak travel direction.	Helps transit get around bottle-necks or access limited access facilities. Applies roadway capacity to meet peak-direction travel needs.	Loss of roadway capacity. Pedestrian safety considerations. Signalization challenges.

Left: Peak-hour business-access-and-transit signage in Seattle, WA. Right: Bus-only lane in New York City.

Sources: Left – Flickr user Oran Viriyincy; Right – Nelson\Nygaard

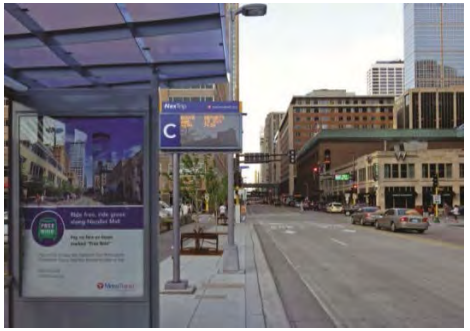
Dedicated median bus lane in Cleveland, OH.

Source: NACTO

Contraflow bus lane in Boston, MA.

Source: Nelson\Nygaard

Treatment	Definition	Benefits	Constraints
Transit priority streets	A street that is dedicated to transit or is designed primarily as a transit corridor.	Highly effective for moving high volumes in urban centers, particularly during peak hours.	Loss of roadway capacity. Limited number of streets in geographically constrained areas.
Limited or time prohibited general public (GP) turning movements	GP turning movements are restricted at all times or during peak periods. May be implemented with queue jump or dedicated bus curb lanes.	Helps implement peak period queue jump lanes or transit only lanes. Can also benefit pedestrian safety.	Impacts on other roadways from diversion of GP traffic/turning movements.
Innovative bus-bike treatments	Treatments to provide bicycles with safe routes along high-volume transit corridors, manage bicycle-transit vehicle interactions, and allow bicycles to share transit lanes. Examples include shared lane markings, colored pavement, and bicycle-only signals.	Reduce transit delay on busy bicycle corridors and improve bicycling experience.	Highly contextual and must be considered within balance of person travel delay/benefit for specific street or corridor conditions.



Transit priority street in Minneapolis, MN.

Source: NACTO

Innovative bus-bike treatment in Eugene, OR.

Source: Nelson\Nygaard

Treatment	Definition	Benefits	Constraints
Stop Treatments			
Curb extensions/bus bulbs/boarding platforms	Sidewalks are extended into the street so that buses would stop in the lane of traffic. This prevents buses from getting trapped by passing vehicles, unable to return to the flow of traffic.	Minimizes delays from merging back into traffic lane. This also reduces the pedestrian crossing distance.	Only applicable where an on-street parking lane exists. Impacts to traffic flow must be taken into account.
Boarding islands	A transit access point constructed in a lane that allows buses to use the faster moving left-lane of a roadway.	Removes side friction caused by right-turning vehicles, parking maneuvers, and delivery vehicles.	Pedestrian safety and ADA access requirements. Effects on overall traffic due to taking an additional lane.
Level boarding platforms	A boarding platform that is level with the bus to enable easier and faster boarding, particularly for passengers with mobility impairments, using wheelchairs, or bringing a stroller on-board the vehicle.	Reduces dwell times and travel times.	Mostly applicable to BRT and rail systems where vehicle and platform design is standardized.
Defined platform loading locations	Defining the locations where doors will open allows passengers to wait in nearest proximity to their bus or train.	Reduces dwell times.	May be most effective in a proof-of payment system where passengers may board through any door.

Bus boarding island in Seattle, WA, also routes cyclists around the stop.

Source: Nelson\Nygaard

Level boarding platform in Eugene, OR.

Source: NACTO

Treatment	Definition	Benefits	Constraints
Defined bus loading positions	Defining the platform loading locations at a stop allows passengers to more quickly find/walk to their bus and ensure that a bus is correctly positioned to be able to depart before a bus in front of it.	Reduces dwell times.	Most effective with "platooned" bus arrivals (e.g., buses timed to leave a common origin point at the same time).
Bus stop consolidation	Reduces the number of stops on a route, particularly where spacing is less than one stop every three blocks.	Reduces dwell times and travel times.	ADA and elderly/disabled access. Grades must be taken into account.
Off board fare payment	Users can pay their fare before boarding the vehicle. On-vehicle fare payment typically delays the loading and unloading of buses, as only one door may be used.	Speeds boarding and allow full utilization of all doors.	Capital and O&M expense of off-board payment machines. Passenger safety at night.
Vehicle Treatments			
Low-floor, wide-door vehicles	Low-floor vehicles (including in conjunction with level boarding platforms) allow passengers to board more quickly without climbing steps, particularly for passengers with mobility challenges.	Wheelchair lifts on low-floor vehicles operate more quickly. Wide-door vehicles allow passengers to enter and exit vehicles more efficiently.	Wide-door vehicles are most effective if implemented in conjunction with prepaid fare payment.
On-vehicle perimeter seating	On heavily loaded routes, increases standing capacity, makes more efficient use of seating capacity, and allows passengers to exit the vehicle more quickly.	May increase vehicle carrying capacity and reduces dwell times.	More appropriate for shorter-distance routes.

Defined platform loading locations for SWIFT BRT in Snohomish County, WA. Longer stop spacing often accompanies Enhanced Bus or BRT lines. Industry experience is that passengers are often willing to walk longer distances to high-quality stations with good amenities. Amenities at SWIFT stations include off-board fare payment.

Source: Nelson\Nygaard

Low-floor vehicle in Los Angeles, CA.

Source: Wikimedia User METRO96

Application of Transit Priority Toolbox

Figure 3-11 identifies which treatments might be applicable to Transit Master Plan priority corridors (Figure 3-7) identified as likely bus corridors and provides examples of locations where treatments have already been implemented or could be applied. Treatments that require construction should be simultaneously completed with other street reconstruction projects. A corridor study would need to be conducted to develop a detailed plan for each corridor. General phasing recommendations are provided in Chapter 7.

Figure 3-11 Treatments for Transit Master Plan Priority Bus Corridors

			Potential Treatments							
Corridor #	Corridor Name	Specific Examples	TSP	Queue Jumps	Dedicated Lane	Reversible or contra Flow	Transit Priority Street	Limited GP turns	Curb Extensions / Bus Bulbs	Stop Consolidation
1	200 S		X	X	X		X	X	X	X
2	South Temple		X							X
3	400 S	Queue jump at 700 E	X	X						X
4a/b, 7	900 S and 1300 S		X	X					X	X
8	State		X	X	X			X	X	X
9a/b	500 E	Queue jump at 400 S	X	X				X	X	X
11a/b	900 E		X	X				X	X	X
12	Foothill Drive	Queue jump at Sunnyside; Stops at Kensington Ave S & Bryan Ave S are less than 500 feet apart	X	X	X	X				X
14a/b	Redwood	Queue jump at N. Temple	X	X						X

SUMMARY OF RECOMMENDATIONS – TRANSIT CORRIDOR AND FACILITY CAPITAL INVESTMENTS

High priority strategies are highlighted in blue.

Figure 3-12 Transit Corridor and Facility Capital Investment Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Priority Corridors	3.1	Develop design standards for Enhanced Bus and BRT corridors, including branding for vehicles and stations.	Provides a distinctive identify for high-quality transit services that offer faster, reliable travel times.	Lead: City Support: UTA	Near-term
Priority Corridors	3.2	Engage with City traffic engineering staff to identify the level of transit signal priority that can be provided.	Develop a TSP standard with staff-level support.	Lead: City Support: n/a	Near-term
Priority Corridors	3.3	Develop a pilot Enhanced Bus corridor project with coordinated frequent service and capital investments. 200 S has been discussed as a potential project.	Demonstrate the benefits of frequent service and capital improvements in a corridor with near-term readiness.	Lead: City Support: UTA	Near-term
Priority Corridors	3.4	Conduct corridor studies to refine mode, alignment, and other design elements for each corridor.	Work out detailed concepts for each corridor and engage the public to work through design tradeoffs and secure broad community support.	Lead: City or UTA (varies) Support: n/a	Near to long-term (varies by corridor)
Priority Corridors	3.5	Develop a coordinated approach to implement priority corridors, including coordination with other modal plans, targeting three corridors every two years. Focus initial investments in corridors that do not require major service restructuring or other logistical challenges.	Develop a realistic implementation plan for the Transit Master Plan priority corridors (additional guidance is provided in Chapter 7).	Lead: City or UTA (varies) Support: n/a	Near-term
Priority Corridors	3.6	Partner with the University of Utah to develop and/or advance plans for the downtown streetcar connection to the University, and other key transit corridors serving the University, including Foothill Drive and 1300 E.	Support planned growth and expansion of University facilities, and help the City and University meet goals to reduce single-occupant vehicle trips to one of the major commute destinations in Salt Lake City.	Lead: City Support: University of Utah, UTA	Near-term
Facility Design	3.7	Endorse the NACTO Transit Street Design Guide and incorporate its guidance into design of transit facilities and bicycle and pedestrian access to transit.	Ensure that facilities are designed consistent with industry best practices.	Lead: City Support: n/a	Near-term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

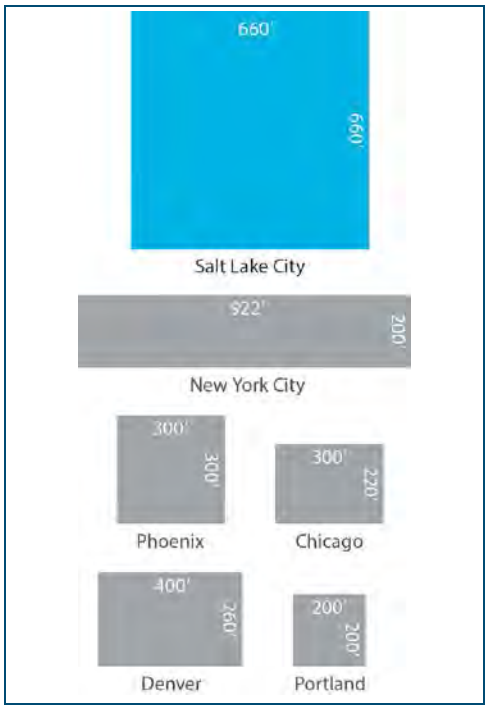
4 ACCESS TO THE TRANSIT SYSTEM

4 ACCESS TO THE TRANSIT SYSTEM

A safe and connected network of pedestrian and bicycle facilities is a foundation of a complete transit system. Providing safe, comfortable access to public transit is critical to attract new riders and improve the overall travel experience for existing riders. While Salt Lake City does not manage transit service, it does manage the streets that connect people to transit.

PEDESTRIAN AND BICYCLE ACCESS

The need for safe, convenient, and comfortable pedestrian and bicycle access to transit stops and stations has been identified through public outreach efforts for the Transit Master Plan and past Salt Lake City planning efforts. Forty-three percent (43%) of participants in the *Design Your Transit System Tool* identified "improved access to transit on foot and by bike" as a priority.[1]



Salt Lake City has much larger blocks than cities like New York, Phoenix, and Chicago.
Source: http://greatergreater.com/files/2010/gridposter.pdf

Pedestrian Access

Every transit trip begins and ends as a pedestrian trip. Safe, comfortable sidewalks that connect directly to destinations can be a deciding factor for transit riders when choosing whether or not to take transit at all, especially for those with the option to drive. A quality pedestrian network includes sidewalks that are well-lit and buffered from traffic and streets with well-marked crossings at frequent intervals. Compared to other U.S. cities, Salt Lake City has long blocks (see graphic at right). For example, Portland's blocks are 200 feet by 200 feet, while Salt Lake City blocks are more than three times as long—660 feet by 660 feet. Salt Lake City's long blocks have been identified as a key barrier to pedestrian mobility in the Pedestrian and Bicycle Master Plan and through community outreach for the Transit Master Plan.

> "My motivation for taking transit is so I can bike to work and get physical exercise; otherwise it is cheaper, quicker, and more convenient for me to drive. I am a big advocate of alternative modes of travel, but it has to make economic sense for the users."
>
> *- Design Your Own Transit System" Survey Respondent*

[1] Of note: for Salt Lake City residents that took the survey, this number jumped to 48% who selected improved access to transit on foot and by bike as a priority.

Characteristics of good pedestrian access to transit are outlined below. The Salt Lake City Pedestrian and Bicycle Master Plan and the Salt Lake City Bus Stop Design Guidelines include recommendations and guidelines addressing pedestrian and transit stop access and safety; specific Transit Master Plan recommendations for improving pedestrian access in Salt Lake City are presented in Figure 4-1.

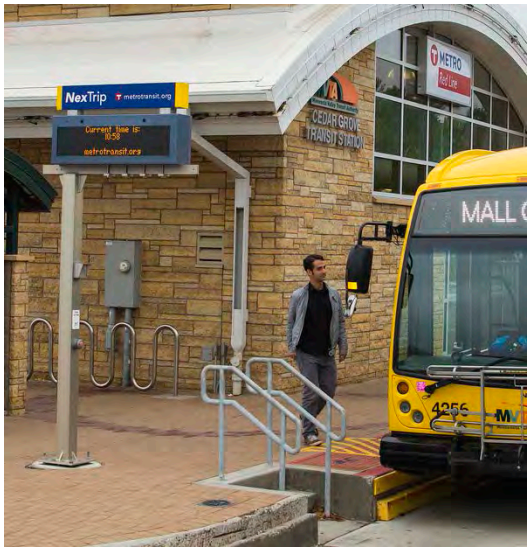
Well-marked intersection and mid-block crossings that provide a safe and visible place for pedestrians to cross the street. Mid-block crossings are especially important where blocks are long to provide more opportunity for pedestrians to cross the street safely and cut down on walking time to reach transit stops. Pedestrian-specific signals, such as RRFB (Rectangular Rapid Flashing Beacons) and HAWK (High-Intensity Activated Crosswalk), are traffic control devices used to stop traffic and allow pedestrians to cross safely either at intersections or mid-block.

- **Traffic calming measures** such as curb bulbouts and median refuge islands reduce crossing distances, vehicle speeds, and the number of travel lanes pedestrians must negotiate to cross the street.
- **Exclusive pedestrian phases** at intersections with high walking activity allow pedestrians to cross the street in both directions at the same time. A **leading pedestrian interval** (LPI) gives pedestrians a 3-7 second head start entering an intersection to increase their visibility to turning motorists.
- **Pedestrian-scale lighting** near transit stops allows riders to see and be seen, and improves both perceived and actual safety and comfort.
- **Wayfinding** along the frequent transit network improves access to transit and helps passengers connect to key destinations from transit (also see Recommendation 5.4 Wayfinding in Chapter 5).
- **Designing for Disability** (also known as **universal or inclusive design)** refers to designing the built environment so that it can inherently be used by all people to the fullest extent possible, regardless of ability. In the context of transit accessibility, this includes ensuring that sidewalks have adequate width and are not be impeded by bus stops or other elements; curb ramps that facilitate movements between the sidewalk and street crossings; reducing driveway cross-slopes; tactile treatments on curb ramps, stop platforms, and other conflicts points; providing information in audio, visual, and tactile formats, considering cultural and language differences as well as people with restricted mobility, visual, and/or audible ability (e.g., signage, audible stop announcements on vehicles and at stations, real-time information, etc.).

Pedestrian accommodation is most important within a quarter-mile radius of transit stops. Taking into account bus stops as well as rail, this includes most of the downtown, business areas, and neighborhoods of Salt Lake City. The map in Figure 2-8 in Chapter 2 highlights the quarter-mile buffer around the frequent transit network.

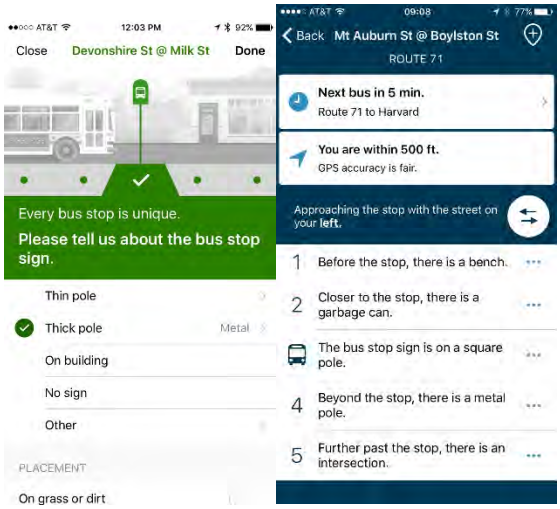
Pedestrian flashing beacons (left) and high-intensity activated crosswork (HAWK) signals (right) alert drivers to crossing pedestrians.

Source: Salt Lake City



Bus stop accessibility features include audible “next bus” announcements, activated using a button on the stop pole, and a level-boarding platform with tactile strips.

Source: Metro Transit



Crowd-sourced information is used to provide visual and audible clues through the BlindWays mobile app (currently available for MTBA in Boston), that allow transit riders to locate their bus stop sign post to within a four to five foot distance.

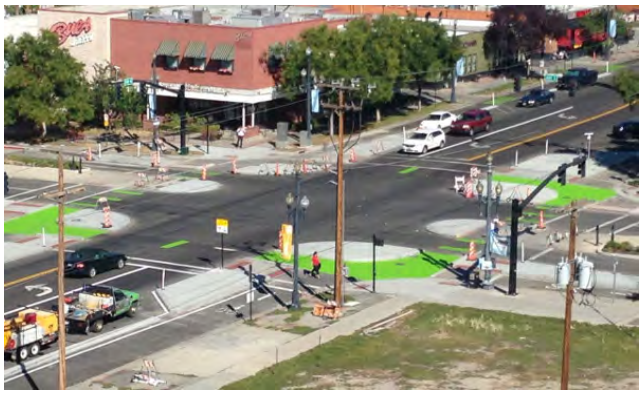
Source: Perkins School for the Blind

Bicycle Access

Safe and direct bicycle facilities that connect to transit increase the catchment area of transit service by providing important first mile/last mile connections – extending up to three miles for routine travel such as commuting. The on-street bicycling environment must be safe and comfortable for people with a broad range of skills and for all ages. On-street bicycle improvements and off-street facilities should be prioritized along the FTN.

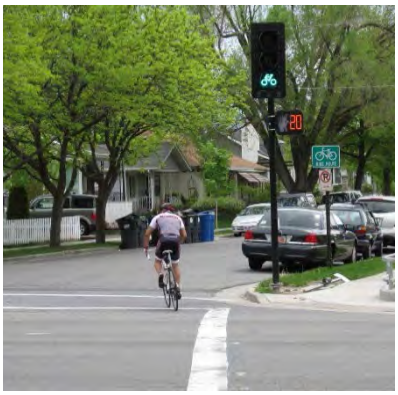
Key components that comprise good bicycle access to transit are outlined below; specific recommendations for improving bicycle access in Salt Lake City are presented in Figure 4-1.

- **Protected bike lanes** provide a dedicated space for bicycling that is separated from the roadway by a physical barrier, such as the curb, a flexible plastic post, and/or plantings. Salt Lake City built its first protected bike lanes on Broadway (300 South) and 200 West in 2014 and 2015.
- **Protected intersections** improve safety and visibility when bicycle facilities cross a roadway. Features can include bike ramps, forward waiting areas, corner refuge islands, setback crossings, and bike signals. In 2015, Salt Lake City built the second protected intersection in the U.S. on the corner of 200 West and Broadway (see photo below).
- **Bicycle lanes and boxes** are another technique to provide dedicated space in the street for cyclists and to increase driver awareness to the presence of cyclists. Increasingly, cities are using colored pavement treatments to designate bike lanes, either by coloring the beginning of the lane, the entire lane, and/or boxes at intersections. Cities are also providing a striped buffer to provide more separation between the bike lane and the roadway.
- **Neighborhood byways** are low-traffic streets that have been optimized for use by both pedestrians and bicyclists. A variety of traffic calming elements and signage are used to reduce car volumes and speeds, fostering a safe bicycling environment. Additionally, signals and other pedestrian and bicycle-specific treatments provide safe crossings of major streets.
- **GREENbike** bike share provides an important mobility option for people taking transit—either by extending the reach of transit, allowing riders to complete the first and last segments of their trip easily, or by providing a transportation option for other short trips during the day.
- **Smart placement of transit stops near bike facilities** help bicycles access transit seamlessly.



In 2015, Salt Lake City opened a protected intersection on the corner of 200 West and Broadway.

Source: Salt Lake City



Bicycle signal treatment along 600 E neighborhood byway.

Source: Salt Lake City

UTA First/Last Mile Study Demonstrates Need for Improved Access to Transit

A survey conducted in 2014 as part of UTA's First/Last Mile Study demonstrates passenger priorities for improved access to transit. Priorities identified included bike paths, improved crosswalks, improved passenger waiting areas, and UTA shuttles as the most important features at or near rail stations. Additional access strategies are needed to support first/last mile access to the FTN.

Bicycle Amenities

Bike parking, end of trip facilities such as showers and lockers, and bike racks on buses also help passengers seamlessly connect to transit by ensuring cyclists have a secure place to park their bikes at the transit stop and/or by allowing them to bring their bikes on board.

Covered bicycle parking is provided along the SelectBus BRT line in New York City.

Source: Wikimedia Commons, User Jim Henderson

Key components that comprise good bicycle amenities are outlined below; specific recommendations for improving bicycle amenities in Salt Lake City are presented in Figure 4-1.

- **Bike parking** allows transit riders to use bikes for the first and last mile of a transit trip without needing to transport the bike on bus or rail vehicles. Solutions range from simple outdoor "U" racks that are suitable for short-term parking to secure parking in locked, covered cages. Bike lockers are available at most TRAX and FrontRunner stations. Salt Lake City's bus stop guidelines specify basic bicycle parking at every stop. Chapter 6 recommends policy guidelines for bike parking at different types of transit facilities, including secure parking at Intermodal Hubs, Transit Centers, and Mobility Hubs, and at TRAX or BRT stations as appropriate based on the station land use context. The City's existing guidelines recommend increasing bike parking capacity at stations and stops to meet the level of demand. Design guidelines should also ensure that parking is attractive.

- **Bikes on transit** allow passengers to bring their bike on board transit vehicles. All UTA buses are equipped with a bicycle rack and bicycles are allowed on TRAX and FrontRunner trains even during peak commute times. Providing bike parking at stops and stations helps ensure that on-vehicle capacity is available for riders who need their bike on both ends of their transit trip.
- **Other end of trip facilities** such as bike maintenance stations allow passengers to do routine bike maintenance right at the transit stop. Amenities include repair tools and a bike pump. Showers and changing facilities can also help improve the biking experience. The City can work with employers to add these amenities and could provide them at high ridership locations.

A bike maintenance facility —called Bike Fixtation—is provided at Metro Transit Lake Street/Midtown LRT Station in Minneapolis.
Source: Bike Fixtation

SUMMARY OF RECOMMENDATIONS – PEDESTRIAN AND BICYCLE ACCESS

The following table outlines specific improvements that are recommended for improving bicycle and pedestrian access. High priority strategies are highlighted in blue.

Figure 4-1 Pedestrian and Bicycle Access Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Mid-Block Crossings	4.1	Per the Salt Lake City Pedestrian and Bicycle Master Plan, create pedestrian and bicycle routes using mid-block crossings and passageways, wide sidewalks, and signage;[1] prioritize mid-block crossings along the Frequent Transit Network; designate neighborhood byways to connect to the FTN	Blocks are long in Salt Lake City; mid-block crosswalks can help create a more well-connected, fine-grained street network that enables shorter and more direct walking connections, provides greater choice of routes, and is easier to serve with cost-effective transit	Lead: City Support: n/a	Ongoing
GREENbike Integration	4.2	Treat bike share as an extension of the transit system and prioritize expansion of bike share to provide access and connection to the Frequent Transit Network	GREENbike has proven to be an important complement to Salt Lake City's transit system, allowing people to take transit and ride the rest of the way by bike	Lead: GREENbike Support: City and UTA	Ongoing
Bike/Transit Integration	4.3	In partnership with the City's Pedestrian and Bicycle Program, designate a well-connected network of multiuse paths; buffered and protected bike lanes; neighborhood byways; and regular bike lanes that provide direct connections to local destinations and the Frequent Transit Network	Paths of travel to and from transit facilities should be comfortable, safe, and direct to expand the catchment area of transit service	Lead: City Support: n/a	Ongoing
Bike Parking at Transit Stops	4.4	Per the Salt Lake City Pedestrian and Bicycle Master Plan, encourage installation of bicycle parking spaces, including secure parking, such as bicycle lockers and secure parking areas, at high-demand transit stops[1] Work with UTA to ensure cost for secure bicycle parking is affordable and commensurate with the cost and site footprint of providing a vehicle parking stall.	Bike parking at transit stops and stations allows passengers to easily connect to transit by bike, providing a safe and convenient place for them to park their bike before riding transit	Lead: City and UTA Support: Private sector as development occurs	Near Term

[1] Salt Lake City Pedestrian and Bicycle Master Plan (2015).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Bikes on Transit	4.5	Coordinate with UTA to continue to provide bicycle storage on buses and light rail vehicles and ensure continued accommodation of bicycles on future commuter rail trains[1]	Ample capacity for bikes on transit vehicles facilitates first and last mile connections by allowing passengers to take their bikes with them	Lead: UTA Support: n/a	Near Term
Safe Routes to Transit Program	4.6	Establish an ongoing funding program that identifies and constructs bicycle and pedestrian safety improvements along the Frequent Transit Network	A Safe Routes to Transit program prioritizes safety improvements along the Frequent Transit Network	Lead: City Support: UTA	Medium Term
Complete Streets	4.7	Strengthen the City's existing Complete Streets Ordinance (per the Salt Lake City Pedestrian and Bicycle Master Plan) by integrating transit	The City's existing Complete Streets Ordinance does not include transit	Lead: City Support: n/a	Near Term
Stop Siting Near Low Stress and Other Bikeways	4.8	Support bike access to transit by including connections to low stress and other bikeways as a criterion for locating bus stops along the FTN, particularly when the transit street lacks a bike facility. Incorporate proximity to connecting bikeways as a design criterion in the City's Bus Stop Guidelines (Design Element #12).	Locating transit stops near low stress bikeways supports bike/transit integration	Lead: City Support: n/a	Near Term
Bus Stop Accessibility	4.9	Consider the finer details of accessibility as improvements are implemented. Evaluate best practices in accessibility treatments (using resources such as Center for the Blind, Utah Independent Living Center, Epilepsy Foundation) and update the Bus Stop and Bike Share Design Guidelines accordingly. The guidelines should be reviewed by the City's Accessibility Council biannually (every other year, not twice a year) and updated, as appropriate.	Designing transit and pedestrian access facilities for universal access makes the transit system more inclusive and benefits all system users	Lead: City Support: UTA	Near Term

1 Salt Lake City Pedestrian and Bicycle Master Plan (2015).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Pedestrian and Bike Safety	4.10	Encourage UTA and the Salt Lake City School District to train their bus drivers about how to safely drive near pedestrians and bicyclists. Sample Programs include Bus Operator Education (Portland, OR) and Frequent Driver Education (San Francisco, CA).	Bus driver training programs ensure that drivers know about laws related to walking and bicycling, and understand safe vehicle operation around pedestrians and bicyclists.	Lead: City Support: UTA, Salt Lake City School District	Near-Term

1 Salt Lake City Pedestrian and Bicycle Master Plan (2015).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Beaverton Transit Center Bike SPA: Beaverton, OR

Beaverton Transit Center's Bike Secure Parking Area (SPA) offers a secure bike parking facility at the transit station. The large facility is conveniently located at the transit center and is secure. There are a total of 100 bike parking spots that are accessed using a BikeLink card. This keycard allows a rider to pay a one-time $5 activation fee and then pay $.30/hr. 8am-8pm weekdays; $.01/hr. all other hours.

Source: TriMet

OTHER ACCESS TO TRANSIT SOLUTIONS[2]

Car share and park-and-ride facilities are another opportunity to improve access to transit:

- **Car share** service, particularly point-to-point service, allows passengers to connect to or access transit. The point-to-point model, such as Car2Go, allows passengers to pick up a shared car near their home (for example) and drop it at the nearest transit stop. Enterprise car share is currently offered in Salt Lake City, although this is a fixed point system where members are required to pick up and drop off the car in the same location.
- **Park and ride facilities** allow people to use transit for some or most of their journey, especially for express bus and commuter rail services. Ideally, park and rides should be located between where people live and where they are traveling to avoid out-of-direction travel that increases total travel time. For transit users who need to commute by car for a portion of their trip, park-and-rides can be a useful option. They are not the sole solution for encouraging transit ridership as they combat the air quality benefits that taking transit helps to provide. To reduce automobile trips, park-and-rides can also provide high quality bike parking and bike share stations to connect bicyclists to transit. See Chapter 6 for further details.

SUMMARY OF RECOMMENDATIONS – OTHER ACCESS TO TRANSIT SOLUTIONS

The following table outlines specific improvements that are recommended for improving access to transit.

Figure 4-2 Other Access to Transit Solutions Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Car Share	4.9	Explore the feasibility of implementing a point-to-point car sharing service that allows users to pick up and drop off shared cars within the "home" zone	Car sharing needs to be flexible; point-to-point options, such as Car2Go, allow users to reserve cars up to 30 minutes in advance and drop off cars anywhere within the "home" zone	Lead: City Support: Private car share companies	Near term
Park and Rides	See Recommendation 6.12 in Chapter 6				

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

[2] Note: Other first/last mile strategies such as on-demand ride services and shuttles are discussed in detail in Chapter 2 Service.

5 SUPPORTIVE PROGRAMS & POLICIES

5 SUPPORTIVE PROGRAMS & POLICIES

Access to clear **information** about public transit improves system **legibility**, helps customers navigate the system, and allows informed transportation choices. Knowing where and when transit operates, when the next bus will arrive, how long it will take, and how to integrate with other modes like bike share makes it easy for people to take transit. Good information can increase and sustain ridership when paired with easy-to-use tools and targeted and tailored **education and outreach** programs and messaging campaigns. **Fare and pass programs** provide a seamless and often more affordable way for passengers to access the transit system. Finally, **parking management** strategies, such as parking pricing and availability, are needed to fully leverage the City's transit investments.

This chapter describes recommendations for a range of programs and policies that support the frequent transit network and enhance the usability and attractiveness of the public transit system in Salt Lake City.

TRANSIT INFORMATION AND LEGIBILITY

For people to be able to use transit, they must first know what services exist and understand how to use those services. Providing clear and concise information in multiple formats is a fundamental element of a high-quality transit system.

Branding

Effective branding of transit service can improve awareness and understanding of the transit system. A consistent brand that visually unites transit vehicles, stops, and stations with print and online information reinforces the value of the service and improves system legibility. In April 2016, UTA underwent a comprehensive "brand refresh and update" effort. UTA published its Customer Information Standards brand guide and is in the midst of updating all existing materials and signage as well as adding new customer information materials. As the City and UTA implement the frequent transit network and enhanced services such as bus rapid transit and enhanced bus (see Chapters 2 and 3), a unified branding approach will reinforce existing UTA

Elements of a Branded Transit System

Salt Lake City's Frequent Transit System should be branded, including:

- Logo and overall look and feel
- Marketing campaigns
- Online engagement
- Customer feedback systems
- Information systems (e.g., website, real-time information, and mobile apps)
- Buses
- Stops and stations
- Maps and trip planners

branding efforts to create a dynamic, attractive public image for these high-quality transit services, and help the City and UTA retain and attract riders and cultivate support in the community.

One branding opportunity is to clearly delineate the network of transit services that meet standards for high frequency and a long service span, as defined in Chapter 2. The FTN provides an opportunity to create a recognizable subset of services that communicates quality, comfort, and convenience, regardless of mode. Establishing a distinct brand for the FTN will also communicate that the city's highest quality transit network is a permanent, integrated part of city infrastructure. The FTN brand should be implemented across vehicles, stops, stations, and schedule information, but could also be consistent with regional branding for high-frequency service and will need to recognize that frequent service on some routes may not extend the full length of all routes, e.g., outside of Salt Lake City limits.

The UTA website indicates which bus routes have a frequency of 15 or 30 minutes but this is not as visible to users riding the system. While UTA currently identifies 15 minute routes with green signs and a "15 minute" marking, comments from the general public indicate that it is not readily understood. Visible branding paired with accessible information improves awareness of the system and helps riders navigate and understand how to use the FTN. This could include an FTN map, logo, bus stop signage, or bus wraps. In addition, the UTA website uses colors to distinguish bus route frequency, but these colors could be confused with the colors used to identify rail lines. Other agencies with bus and rail systems use icons to distinguish frequent service routes.

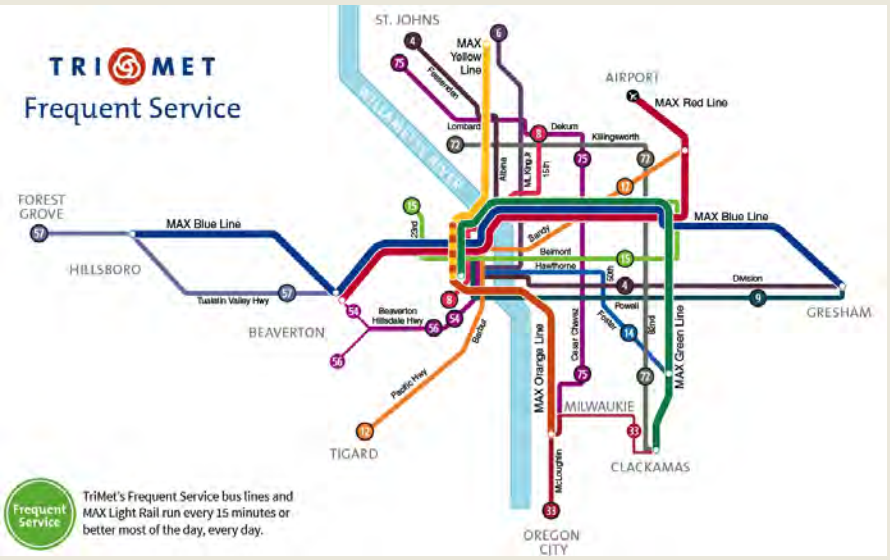
The sidebars below provide examples of frequent service branding in Portland and Minneapolis.

UTA currently indicates frequent routes with a green route sign and a small "15 minute" indicator on the sign. More prominent frequent service branding that is visible to both people driving and walking helps promote the service and improve awareness of transit.
Source: Salt Lake City

Frequent Transit Network Examples

The frequent transit network maps provided below highlight the subset of each transit agency's bus and rail lines that provide high-frequency all-day service. In most cases these maps integrate frequent service branding used on bus stop signs or vehicles to help establish a unique branding for the service. UTA has studied many peer examples and discussed implementing such a system, highlighting that there is a shared goal between UTA and SLC. Two examples are described below—Portland and Minneapolis.

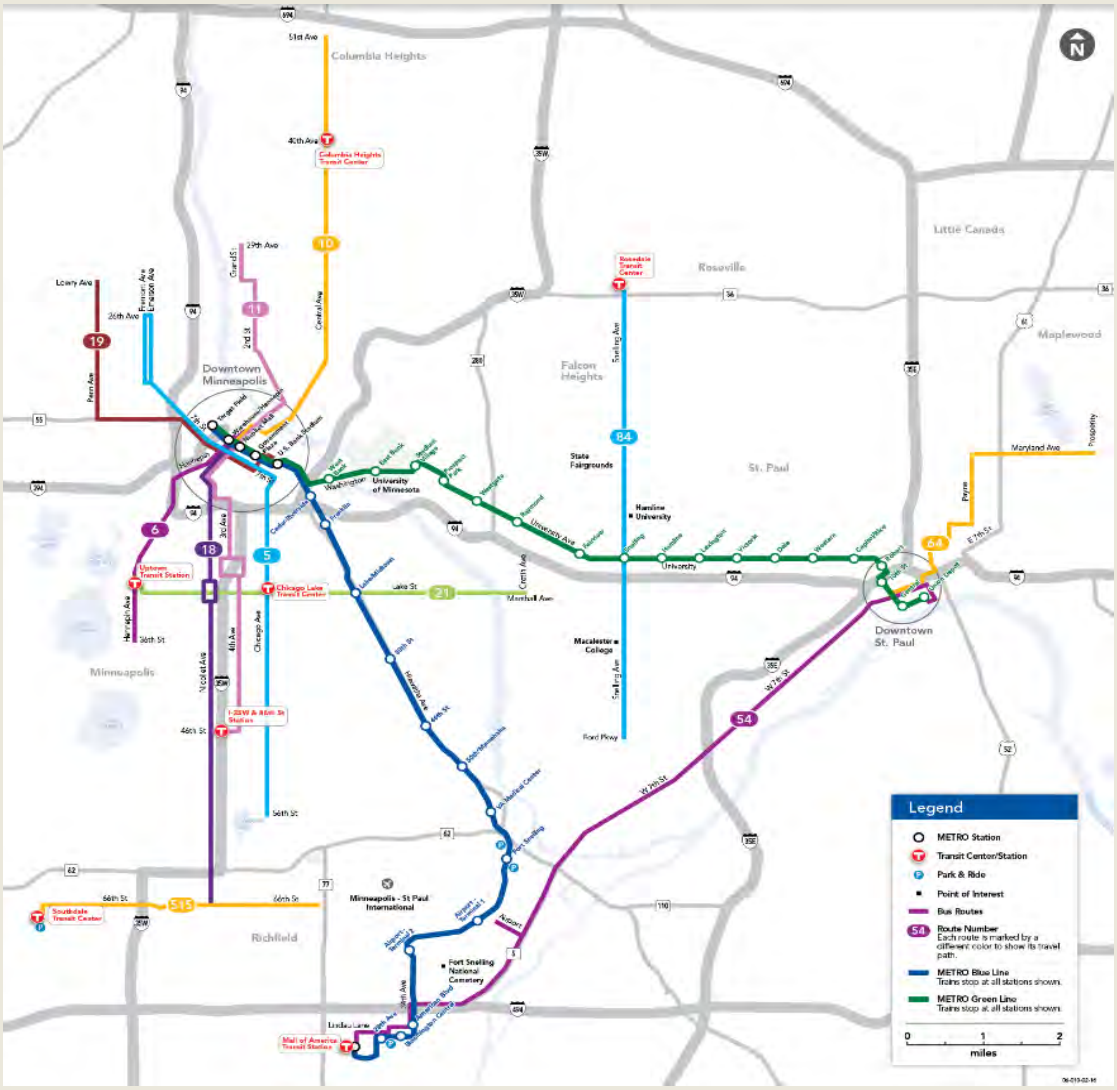
TriMet – Portland, OR



Portland's transit agency, TriMet, provides a separate map to easily highlight frequent bus and rail lines that operate every 15 minutes or better every day. The "Frequent Service" branding is also applied to other printed and online material and signage at bus stops. TriMet's frequent bus routes carry about 55% of all bus riders. In 2014, weekday ridership on frequent service bus lines increased by over 10%, and over 11% on weekends. By comparison, overall bus ridership increased by slightly less than 7%.

Source: TriMet

Metro Transit, Minneapolis-St. Paul, MN



Metro Transit in Minneapolis operates high-frequency bus and rail routes. Some routes operate at a lower frequency outside of the map area. Metro Transit's five highest-ridership bus routes are part of the high-frequency network.

Source: Metro Transit

A second branding opportunity is to provide unique branding for the enhanced bus services that UTA plans to develop in Salt Lake City. UTA already has a distinct brand for MAX Bus Rapid Transit service. It could similarly develop a unique brand for Enhanced Bus service. Both of these services would also be part of the frequent transit network, but would have additional transit priority features to improve bus speed and reliability, along with other amenities to enhance the passenger experience. Just as TRAX and FrontRunner are highly recognizable brands that communicate the regional role of these services, distinct branding would differentiate these two families of bus services. The sidebars below describe the RapidRide brand in Seattle and UTA's existing MAX BRT line.

RapidRide, Seattle, WA

RapidRide is one of Seattle's bus rapid transit systems, including fully branded vehicles, stations, and maps. Corridor improvements are geared toward reducing passenger travel time and increasing convenience. There are five existing lines (A, B, C, D, and E) and additional lines are planned. King County Metro implemented RapidRide service and capital improvements in three Seattle corridors between 2010 and 2014. All corridors have been successful in attracting new riders to the system, with increases in weekday ridership as high as 75% over the baseline service.

Source: King County Metro, http://metro.kingcounty.gov/travel-options/bus/rapidride/

MAX, Salt Lake City, UT

UTA launched MAX Bus Rapid Transit service in Salt Lake City in 2008. The current 10.8 mile route along 3500 South connects Magna and West Valley City with the 3300 South TRAX station. The route operates every 15 minutes between 5:30 a.m. and midnight. Using bus-only lanes between 2700 West and 5700 West and transit signal priority, MAX BRT has increased ridership by a third, reduced travel times by 15%, and linked MAX to TRAX to provide passengers with an efficient bus to rail connection. The service has a distinct look and feel to improve awareness and highlight its distinguishing features.

Sources: UTA Fact Sheet, ITS America http://www.itsa.org/awards-media/press-releases/779-smart_solution_spotlight_winner-_salt_lake_city%E2%80%99s_max_3500_south_bus_rapid_transit_(brt)_line

Information and Tools

Information and tools are a critical component of a legible transit system. UTA currently has two real-time information tools available at bus stops. The RideTime SMS texting service allows riders to text their stop ID to UTA-UTA (882-882) and receive a response with the next three bus departures at that stop. Information about RideTime is at http://www.rideuta.com/Rider-Tools/Ride-Time and signs are posted at bus stops. The signs also include a QR code[1] so people can simply scan the code and receive the information. The new Vehicle Locator feature on UTA's redesigned website (launched Feb 2016) also allows users with a mobile device to see where their bus is in real time.

In addition to the real-time information tools available at bus stops noted above, the City can work in partnership with UTA and the business community to install real-time information displays at bus stops. These should be prioritized along the FTN and other high ridership stops. Real-time and other information should be designed with tactile and audible options to make this information easily accessible to people who are visually-impaired (see Chapter 4 for examples).

[1] A "QR code" is a machine-readable code consisting of black and white squares typically used for storing URLs or other information that can be read by a camera or on a smartphone.

SUMMARY OF RECOMMENDATIONS – TRANSIT INFORMATION AND LEGIBILITY

Below are specific recommendations to improve transit information and the overall legibility of the transit system in Salt Lake City. High priority strategies are highlighted in blue.

Figure 5-1 Transit Information & Legibility Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Real-Time Information	5.1	Provide real-time information displays at bus stops along the FTN; partner with the business community to help sponsor real-time information signs (see Chapter 6 for Stops and Stations recommendations in Figure 6-3 and Bus Stop Guidelines in Figure 6-4)	Real-time information allows people to travel without a schedule by letting them know *exactly* when the next bus will arrive	Lead: UTA Support: City businesses	Near term
Frequent Transit Network Brand	5.2	Establish a frequent transit network (FTN) brand that is highly visible and distinguishable from other service types; brand should expand UTA's existing frequent service branding to include: printed and web/app-friendly maps and schedule information, branded vehicles, and branded stops[1] (see RapidRide side bar)	A unified, unique visual representation of the FTN on the street and in all printed/online materials will help existing passengers understand where frequent transit service is and will build recognition among potential new customers	Lead: UTA Support: City	Near term
Transit Maps	5.3	Partner with UTA to add FTN level services to existing maps	As the FTN is implemented, it will be important to clearly communicate where service is located to existing and potential transit riders, especially in neighborhoods with a high propensity to ride transit	Lead: UTA Support: City	Near term
Wayfinding	5.4	Implement on-street wayfinding to direct people to transit service; integrate with GREENbike wayfinding and Downtown and Sugar House parking wayfinding initiatives[2]	On-street wayfinding is an initiative that the City can lead to help people access transit and help passengers connect to other destinations in the community	Lead: City Support: Downtown businesses	Medium term

1 It will be important to coordinate with UTA to determine how the FTN brand will be implemented on routes that extend beyond Salt Lake City boundaries.

2 The Downtown and Sugar House Parking Study (2016) recommends a parking communications plan focused on wayfinding, information, and branding.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Mobility Platforms & Transit Screens	5.5	Support development of a mobility platform that pushes real-time transit, rideshare, car share, bike share, Uber and Lyft, and other mobility service data to web and mobile platforms; integrate with the GREENbike app	A comprehensive mobility platform that integrates real-time information for transit, bikeshare, and car share helps people understand the various transportation options available and how they can be linked together to serve their transportation needs	Lead: App developers Support: City and UTA to provide open source data	Medium term
	5.6	Work with private developers to install real-time transit screens at central locations to display mobility platform data	Transit screens displayed in the lobbies of major employers, hotels, the airport, residential developments, and at local eating establishments help improve awareness of transportation options throughout the community and improve the usability of the transit system	Lead: City Support: Developers and businesses	Medium term
Multimodal Trip Planner	5.7	Work with UTA to develop a multimodal trip planner that helps transit riders plan trips that link seamlessly between modes; integrate with the GREENbike app	A multimodal trip planner allows passengers to better understand how biking, walking, or driving can help them link to the transit system, especially if transit service is not available at their front door	Lead: UTA Support: City and app developers	Long term
Integrated Technology Development	5.8	Promote development of integrated technology, including mobility kiosks, reader boards to assist travelers with mobility planning, shared payment opportunities, and opportunity for other evolving technology applications, including designing for disability	With increased reliance on technology, transit agencies and partners will need to keep abreast of emerging technology, providing tools that help travelers transition seamlessly between modes	Lead: Private developers Support: City and UTA	Long term

[1] It will be important to coordinate with UTA to determine how the FTN brand will be implemented on routes that extend beyond Salt Lake City boundaries.

[2] The Downtown and Sugar House Parking Study (2016) recommends a parking communications plan focused on wayfinding, information, and branding.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

EDUCATION AND OUTREACH

Education and outreach programs that strategically distribute transit information and resources to target audiences are another fundamental element of a complete transit system. A lack of knowledge and understanding are often the greatest barriers to transit use. Continuing to build on Salt Lake City's "transit culture" and improving the availability, effectiveness, and delivery of transit information through education and promotional programs is a powerful way for Salt Lake City to increase the number of people riding transit for more trips.

> "We should do more to encourage students using mass transit. This saves parents time, helps with air quality and creates new habits of using mass transit for future generations."
>
> - *"Design Your Own Transit System" Survey Respondent*

Salt Lake City has had great success with its 2014 Smart Trips Program in the Sugar House neighborhood. Building off of this success, the City can develop a broader transit marketing, education, and outreach program that educates the public on the benefits of transit. Strategies might include targeting specific neighborhoods along the frequent transit network as service enhancements are made and engaging in partnerships, such as economic development organizations and schools, to promote transit use.

Salt Lake City SmartTrips Program

In 2014, Salt Lake City launched a Smart Trips campaign to educate Sugar House households on the benefits of transportation options. The goal was to get at least 15% of targeted households to use public transit and active transportation.

Residents were provided with customized information kits on how to ride the bus, bike, and walk. **Drive-alone trips decreased by 21%** among SmartTrips participants.

Source: Salt Lake City, http://www.slcgov.com/ and https://smarttripsslc.wordpress.com/

LA Metro "Naughty/Nice" Campaign, Los Angeles, CA

In August 2008, Los Angeles Metro launched an aggressive public information campaign to educate people about the benefits of transit and the social ills resulting from auto dependency. LA Metro created an in-house ad agency that focused exclusively on communicating the benefits of public transit and improving the passenger experience. The goal was to improve the public's perception of transit and increase the number of discretionary riders.

Metro's "Opposites" campaign included online content, billboards, t-shirts, and on-board graphics to create a consistent brand. The brand communicated that Metro was the solution to many of the community's problems (congestion and greenhouse gas emissions, for example). Estimates show that the newly branded system and information campaign resulted in an increase in discretionary ridership from 22% to 36%.

LA Metro also sponsors a public art campaign in which they contracted with over 200 artists to beautify transit stops and stations.

Source: LA Metro "Promoting Mass Transit" Video.

SUMMARY OF RECOMMENDATIONS – EDUCATION AND OUTREACH

Below are specific recommendations for developing an education and outreach program for the transit system in Salt Lake City. High priority strategies are highlighted in blue.

Figure 5-2 Education & Outreach Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Centralized Transportation Options Program	5.9	Establish a transportation options program that provides information, education, and resources to residents, employees, and visitors	Education and outreach, particularly to employees and schools, can be a powerful way to increase the number of people taking transit	Lead: City Support: Business community	Near term
Public Information Campaign	5.10	Expand on UTA's existing public information campaigns to educate Salt Lake City residents, employees, and visitors on the benefits of transit	Lack of information is often a key barrier to riding transit	Lead: City Support: UTA, employers, neighborhood groups	Near term
Targeted Marketing	5.11	Continue to develop an individualized marketing/ SmartTrips program that targets neighborhoods along the frequent transit network as service improvements are made; a new resident program is also an effective way to reach residents when the move to the city	Individualized marketing programs are proven to shift travel behavior; aligning targeted marketing with service enhancements leverages transit investments; a new resident targeted marketing program provides information on biking, walking, taking transit, and sharing rides before new travel behaviors are established.	Lead: City Support: Neighborhood groups and UTA	Near term
Business Outreach	5.12	Develop a SmartTrips for Business program that provides information and resources to Salt Lake City employers related to transit, carpooling, bicycle parking, walking and biking routes, and other transportation options information	Cities like Portland, OR, have had great success with their SmartTrips for Business programs; commute trips are often the easiest to influence because they are predictable and often occur during times that auto travel is least attractive due to traffic congestion	Lead: City Support: Large employers, Downtown Alliance	Medium term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Other Outreach	5.13	Engage with other key partners such as tourism organizations, high schools, and the University to educate people about transit options and incentivize use of the transit system. This should include education and outreach to help people access transit trip planners, real-time information, and on-demand ride services on both desktop and mobile devices	Partner with tourism organizations to promote use of transit for visitors starting from the airport; partner with high schools to develop student passes like at West High to get students riding the bus at an early age; partner with universities to include transit information as part of new student orientation; partner with non-profits who work with populations that may not be comfortable with transit technology applications.	Lead: City Support: Tourism groups, high schools, universities, and non-profits	Medium term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

FARE AND PASS PROGRAMS

Fare and pass programs can provide a seamless and more affordable way for individuals and families to ride transit. Improving the affordability of UTA fares for intra-Salt Lake City trips, large families, youth, and low-income residents was identified as a high priority for Salt Lake City residents during public outreach.

Salt Lake City's Hive Pass program has been a success to date. Hive Pass holders take more trips by transit. In a before and after survey conducted at the conclusion of the first year of the Hive Pass Program, the percentage of respondents who rode transit daily doubled once they had a Hive Pass. After improvements were made to the program in the second year, the number of daily riders jumped from 20% before the pass to 50% afterward. Similarly, the survey showed that people who rarely or never used transit before the pass were riding at least three days per week once they had a pass.

> "I would not be able to keep my job and get to work every day without [my Hive Pass]. I would not be able to afford the bus fare every day to get to and from work. The Hive Pass has really helped me to be successful." – A Hive Pass holder

Current UTA Payment Methods

Currently, UTA riders can purchase tickets at ticket vending machines, at Pass Sales Outlets, or online. Riders can also purchase a reloadable FAREPAY card to pay their fare. FAREPAY users simply tap the card reader when they board and tap off when they alight the vehicle.

Source: Nelson\Nygaard

SUMMARY OF RECOMMENDATIONS – FARE AND PASS PROGRAM

Below are specific recommendations for improving fare and pass programs in Salt Lake City. High priority strategies are highlighted in blue.

Figure 5-3 Fare and Pass Program Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
HIVE Pass Expansion	5.14	Promote the HIVE Pass Program to get more passes into hands of people who are not currently using transit	The HIVE Pass Program provides an affordable option for people to ride transit in Salt Lake City	Lead: City Support: UTA	Near term
Fare Affordability	5.15	Explore fare affordability; work with UTA to determine next steps for establishing more affordable fare options for intra-Salt Lake City trips[1]	The standard $2.50 fare is high for many Salt Lake City families, especially for short trips within Salt Lake City. This undermines the competitiveness of transit against other transportation options, especially in areas where parking is free; a simpler and more equitable fare system is needed	Lead: UTA Support: City	Medium term
Mobile Ticket App	5.16	Work with UTA to develop a mobile ticket app that allows people to download all types of passes on a smart phone[2]	Mobile ticket applications make it even easier to ride transit by allowing passengers to download tickets on their smart phones at the click of a button – no exact change is needed	Lead: UTA Support: City	Medium term
Integrated Fare Payment System	5.17	Work with UTA to develop an integrated fare payment system that allows public transit, bike share, and car share users to use a single ticket or pass and/or launch a multimodal access pass that integrates mobile ticketing *and* membership for transit, bike share, car share, etc. (see Recommendation 5.8 Integrated Technology Development above)	A truly multimodal transportation system would allow travelers to use a single ticket or payment method for bike share, transit, car share, and parking	Lead: UTA Support: City	Long term

1 UTA's 2020 Strategic Plan highlights the need to "develop new fare products and equitable fare policies." https://www.rideuta.com/uploads/2020StrategicPlanFinalWebVersion.pdf

2 As of August 2016, UTA is in the process of procuring a vendor to develop mobile ticketing capabilities as well as developing a comprehensive strategic plan regarding all the fare payment options available (cash, paper, FAREPAY, electronic fare payment systems, mobile ticketing, etc.).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

What is an Integrated Fare Payment System?

Fare integration between transit, bike share, and other transportation services reduces barriers to using transit by enabling the use of one payment media on multiple public and private transportation services. Simplifying fare payment can reinforce transit, bike share, and car share as an easy-to-use transfer option. Some systems coordinate fare policy—such as a discounted fixed-route transit fare for passengers who use bike share to access the route—to drive revenue and improve connections. These types of strategies are being investigated throughout North America and have been implemented in Europe and Asia. Several European examples are outlined below:

Location	Description
Paris, France[1]  Source: Navigo	The Navigo pass is an integrated transit fare payment method introduced in the Île-de-France region (which includes the city of Paris) in 2001. Bike share rental fees are structured similar to those of U.S. systems, however all membership types can be attached to a Navigo transit card as well. Both annual-subscription RFID cards and the Navigo transit card can be used at card readers at Velib stations. A separate bike share pass must be purchased, but it can be stored on the same physical card as a transit pass/ticket. Navigo uses the Calypso standard[2] and is an account-based system. Individuals can also rent a bike using direct debit (their personal debit card); a €150 fee is held against their card until the bike is returned (within 24 hours).
Montpellier, France[3]  Source: Transports de l'Agglomération de Montpellier	The Velomagg system has 50 stations, with several hundred bicycles available for short-term use, which are operated by and co-branded with the transit agency. The fully integrated fare structure offers free day use for transit pass holders. Users can track their account information online by using an account number and date of birth. The Velomagg program also includes electric bicycles, trailers for children, and long-term (12-month) rentals. Transit rides more than doubled over a 10-year period with the fare and branding integration.
Bordeaux, France[4] Source: Tram et Bus de la Cub	Bordeaux's bike share system—Vcub—has 1,500 bikes and nearly 150 stations. It was designed in conjunction with transit, with 90% of stations co-located with transit stops. The regional RFID transit card can also be used to check out bikes at a discounted subscription rate. The bike share launch was held back five months to wait for the new bus and tram lines to launch at the same time.
London, England[5]  Source: Transport for London	Transport for London (TfL) is considering adding Santander Cycles to their transit smartcard (the Oyster Card). The Oyster Card has been in use for over a decade. To make this integration work, TfL would require Oyster Card users who use the bike share system to store a deposit on their cards to secure against stolen bikes.

http://www.bikearlington.com/tasks/sites/bike/assets/File/Arlington_County_Capital_Bikeshare_TDP_FY2013-2018_Nov2012.pdf

[2] http://en.wikipedia.org/wiki/Calypso_(electronic_ticketing_system)

[3] Darren Buck. "Transit with Bike Sharing: Overview of Practice and Potential." October 16, 2012. Presented to Rail~Volution Conference. https://bikepedantic.files.wordpress.com/2012/08/railvolutiondgboct2012.pdf

[4] http://bike-sharing.blogspot.com/2010/02/bordeauxs-new-v-bike-sharing-flirts.html

[5] http://cycle.travel/city/london/news/hire_a_boris_bike_with_your_oyster_card

PARKING MANAGEMENT

The quantity, location, and price of parking has a significant impact on the use of all transportation infrastructure. Large amounts of low-cost or free parking incentivizes travelers to drive and park, rather than walk, bike, or take transit.

Parking management policies that support transit use include pricing parking relative to demand and availability of transportation options, shared parking between uses, unbundled parking from unit costs in housing developments, and removing minimum parking requirements for new development or even implementing maximum requirements in higher-density neighborhoods with ample transportation options available.

Salt Lake City already has several parking policies in place that support transit:

- **No minimum parking requirements in Transit Station Area districts:** Within the "core" of Transit Station Area (TSA) districts, no minimum number of parking spaces is required for any use.
- **Shared parking:** The zoning code recognizes that different land uses have different periods of peak demand, and different uses can share parking supply to reduce the overall number of spaces provided. Chapter 21A.44.040.B.1 provides the required methodology for determining shared parking supply based on land use, time of day, and day of the week.
- **Parking reductions for pedestrian-friendly development:** Chapter 21A.44.040.B.8 also allows for a reduction in parking spaces if the proposed development includes elements that improve walkability near the project. The provisions only apply to "recreational, cultural or entertainment" or "retail goods and services" land uses in the CB, CN, RB, MU, R-MU, R-MU-35, and R-MU-45 districts.
- **Parking reductions for proximity to mass transit:** The minimum number of spaces can be reduced by 50% if the project (new multi-family residential, commercial, office or industrial land uses are eligible) is located within 1/4 mile of a fixed transit station.
- **Parking reductions for transportation demand management plans:** To reduce the number of single-occupant vehicle trips, the parking code (Chapter 21A.44.050) allows for adjustments to the parking requirements if TDM programs are included. The provisions only apply to uses requiring at least five parking spaces. A 25% reduction or increase in parking is allowed if "major" or "minor" strategies are utilized.

SUMMARY OF RECOMMENDATIONS – PARKING MANAGEMENT

The figure below includes a recommendation to improve parking management policies to support the recommendations of the Transit Master Plan. High priority strategies are highlighted in blue.

In addition to these new recommendations, the Salt Lake City Downtown and Sugar House Parking Study includes a number of transit-related recommendations (see sidebar below).

Figure 5-4 Parking Management Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Parking Management Studies	5.18	Initiate additional parking studies for areas beyond Downtown and Sugar House to support the FTN	Model new studies on the Salt Lake City Downtown and Sugar House Parking Study	Lead: City Support: n/a	Near term
Parking Management Oversight and Coordination	5.19	Consolidate management of the City's parking functions to improve overall coordination of parking policies, align parking supply with demand, and enhance the convenience and ease-of-use of parking systems	Effectively utilize parking assets and support the City's overall transportation and mode choice goals	Lead: City Support: n/a	Near term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Salt Lake City Downtown and Sugar House Parking Study (2016)

The Downtown and Sugar House Parking Study (which is scheduled to be completed in Fall 2016) includes several strategies that support transit:

- Ensure that parking is appropriately regulated with effective parking enforcement near transit stations and stops.
- Prioritize active space over parking in the areas immediately around transit stops; effective enforcement is a critical element.
- Coordinate transportation policies across modes to support parking management. Put transit, bicycle, and pedestrian considerations on equal footing with decisions about parking in transportation impact review and other land-development processes.
- Ensure that decisions about parking requirements, pricing, and design are coordinated with overall mobility goals and multimodal investments.
- Revise minimum and maximum parking requirements to simplify the parking code, incentivize shared parking, and modify electric vehicle and bicycle parking requirements.
- Require a TDM program for any new residential development with 10 or more units and any new non-residential development with more than 20,000 SF of net new space in the D1-D4, TSA, and G-MU districts.
- Require that all shared parking be "priced" in D1-D4, TSA, and G-MU districts via unbundling and direct pricing.

Source: Draft Salt Lake City Downtown and Sugar House Parking Study (2016)

6 LAND USE & PLACEMAKING

6 LAND USE & PLACEMAKING

Continued investment in Salt Lake City's transit system is critical to providing equitable, affordable mobility options for residents, workers, and visitors. Transit also supports economic development and opportunity to create safe, walkable, and vibrant neighborhoods. This chapter supports existing City goals and policies to coordinate community planning and design efforts in the areas surrounding transit stops and stations.

TRANSIT-SUPPORTIVE LAND USE AND DESIGN

Attractive and convenient transit service is not just about how often the bus arrives and where it goes; it also depends on the attractiveness of the street, the density and mix of land uses, and a connected street network and safe and convenient crossings that allow bicyclists and pedestrians to easily and safely access transit service. Past Salt Lake City planning efforts have prioritized the connection between transit, land use, and community design, including the following:

- Encourage transit-oriented development (Plan Salt Lake, 2014)
- Create a system of connections so that residents may easily access employment, goods and services, neighborhood amenities, and housing (Plan Salt Lake, 2014)
- Encourage development of transit oriented development (TOD) through form-based codes and allowed increased density within a 10-minute walk of TRAX, streetcar and high-frequency bus routes (Salt Lake City Downtown Community Plan (2014)
- Support transit-oriented development as well as adequate, reliable public transportation so that residents may easily access employment, goods and services, and housing (City Council Philosophy Statements, 2012)

Land Use and Design - Key Concepts

Building off of existing plans and policies, the Salt Lake City Transit Master Plan recognizes the importance of land use, street connectivity, and placemaking to implement a well-used and attractive frequent transit network (FTN). The FTN must be supported by a concentration of land uses, connections to key destinations, a rich mix of uses, and interconnected streets. The Transit Master Plan embraces these concepts to help achieve the City's goals to increase transit ridership in Salt Lake City. Key land use and design concepts are described below.

Concentrate and intensify activities near frequent transit. High density development should be encouraged in areas served by the FTN. There is a strong correlation between land use density and transit demand. Residential densities should be at least 10–12 households per acre for corridors that receive high-frequency transit investments and/or have more than 12–16 jobs per acre (see Figure 6-1). For example, the dense market between the central business district and the University support high ridership on multiple bus and rail lines.

Align major destinations along reasonably direct corridors served by frequent transit. An efficient transit route connects multiple high-demand destinations in a reasonably direct line to minimize out-of-direction travel. It connects major trip origins and destinations along the route and has major activity centers at each endpoint, providing a steady flow of passengers boarding at all points. The proposed FTN was identified based in part on the presence of major activity centers along transit corridors. Transit must efficiently connect to destinations and be accompanied by a walkable street environment, a mix of uses, and safe and convenient access to transit service.

Provide a rich mix of uses that support street-level activity throughout the day and night. A diversity of land uses (including residential, commercial, industrial, institutional, and recreational uses) promotes walking and transit ridership, and reduces driving. A mix of land uses allows more daily needs to be met within shorter distances, encouraging people to walk and take transit for more trips. Land use diversity also creates a more interesting and active urban environment that makes walking and taking transit feel safer and more attractive at all times of the day and night.

Support transit access by providing safe and convenient crossings. Every transit rider is at some point a pedestrian, whether they are dropped off at a park-and-ride or walk from their home to access transit. Research published by Transit Center in July 2016 (see sidebar) found that 80% of transit riders walk to transit. Safe and convenient access to transit is essential to building transit ridership. Of utmost importance is to ensure that crossings are conveniently located and well-marked. Strategies include interior block connections and mid-block crossings, in addition to other strategies discussed in further detail in Chapter 4.

Interconnect streets in a grid pattern shorten distances between transit stops and destinations. Intersection density strongly influences transit ridership. Short blocks and well-connected streets make it easier and faster to access transit and contribute to a high-quality pedestrian experience. Block length is a challenge in Salt Lake City; the recommendations in Chapter 4 support safer and more accessible streets that will help people access transit more easily and feel safe doing so.

Who's On Board 2016: What Today's Riders Teach us about Transit that Works

A study published by Transit Center in July 2016 supports the importance of comfortable and convenient access to transit and locating transit near a mix of uses:

- 80% of "all-purpose" transit riders walk to transit
- All-purpose ridership – or those who ride transit for all types of trips – is stronger where it is easy to walk to transit and where transit is frequent and provides access to many destinations within walking distance

Source: Transit Center. "Who's on Board 2016: What Today's Riders Teach us about Transit that Works." http://transitcenter.org/wp-content/uploads/2016/07/WOB-2016-7_12_2016.pdf

Transit service and land use should complement each other. Transit service is most efficient in areas that have a moderate-to-high density of people and jobs, a variety of destinations, and good bicycle and pedestrian access.

Source: Lance Tyrrell

Land Use Density and Transit in Salt Lake City

The value of investment in the frequent transit network is exponential when supported by land use policies and strategies that facilitate activity density where transit service quality and capital investment is highest. In any growing city, the success of transit in attracting riders is dictated by the type and density of development and the other characteristics of urban form. Similarly, higher-density development depends on high-quality transit service to move large numbers of people efficiently on limited street right-of-way. Therefore, it is advantageous to develop land use and transit policies in concert to ensure their mutual benefit and success. Salt Lake City should work with UTA to ensure quality transit will be available when land use and street design take transit-oriented forms.

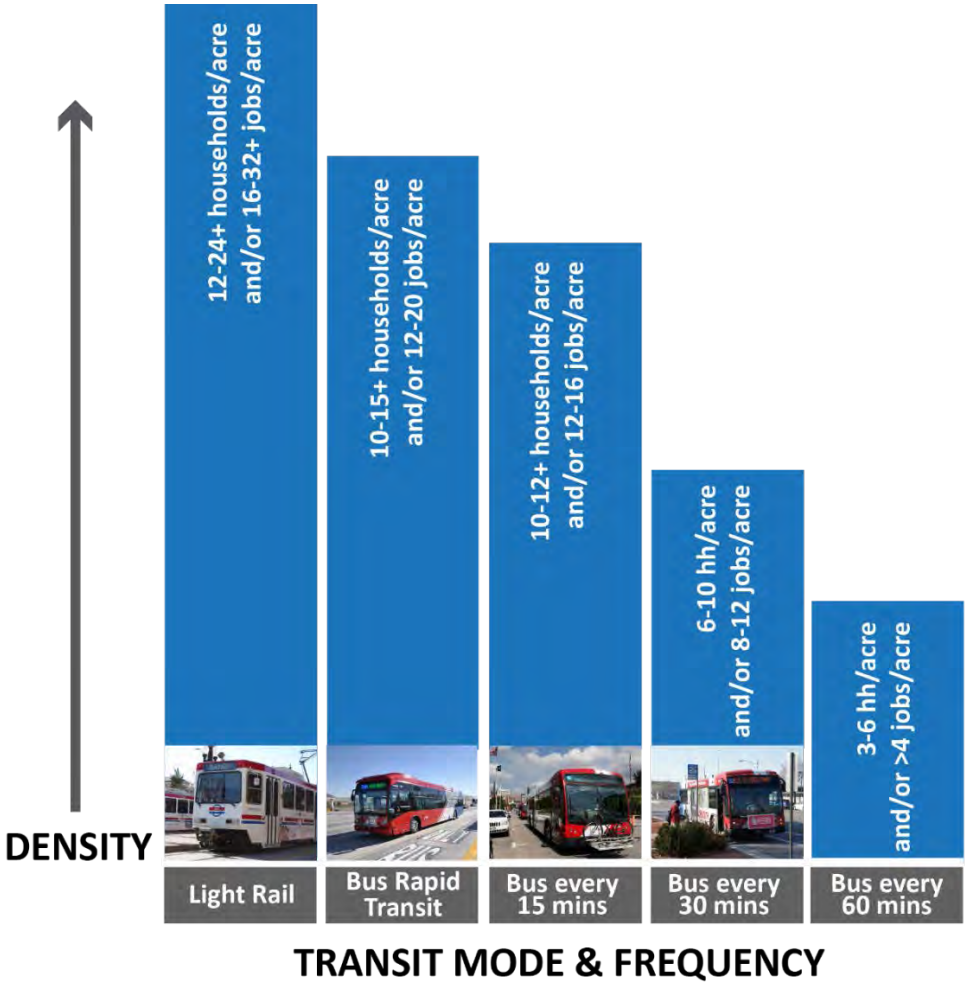
While transit service and infrastructure investment are primarily controlled by UTA, Salt Lake City can influence development along the FTN. Furthermore, Salt Lake City can work with UTA to ensure that transit service levels are adequate to support areas as they grow and become more transit-oriented. The Transit Master Plan does not dictate priorities for land use plan updates; rather it provides information for coordination of land use plans, to ensure that future land development patterns are supportive of Transit Master Plan goals.[1]

As a living document, the Transit Master Plan will continue to evolve as land use conditions change over time. Development that occurs throughout the city could impact travel patterns and alter transit needs; this is particularly expected to be the case in the Northwest Quadrant, given significant new employment growth that is already occurring. The City should encourage developers to pursue transit-supportive design throughout the development review process but also maintain flexible transit policies that can adapt as the needs of the area change.

The thresholds outlined in Figure 6-1 relate density of households and jobs to transit service quality (based on industry standards for when service and capital investments are justified). These thresholds were used to develop FTN recommendations and can be adjusted over time as land use changes. The densities outlined in Figure 6-1 should occur on average in an area; there may be much higher concentrations adjacent to stations and lower concentrations further from station areas. As areas in Salt Lake City reach certain densities, service levels should be adjusted.

[1] Note: The Transit Master Plan does not include any specific land use or zoning recommendations; area master plans could be re-visited to bring density to match desired transit service levels.

Figure 6-1 Transit Mode & General Frequency by Gross Density



Source: Adapted from TCRP Report 100: Transit Capacity and Quality of Service manual, TCRP Report 102: Transit-Oriented Development in the United States, and other sources; employment is converted from household density based on a typical relationship of 4 jobs: 1 dwelling unit.

Standards for New Development

Salt Lake City also plays an important role in working with developers to set standards for new development. These standards can help ensure land uses support the FTN, including:

- **Parking management policies:** The number of parking spaces and whether or not parking is free for employees and visitors (see Chapter 5).
- **Transportation Demand Management (TDM) policies:** Integrating TDM plans and strategies into the approval process for new development can ensure that developments of certain sizes, that meet certain thresholds, or that are located in certain places implement TDM strategies (such as subsidized bus passes, on-site transportation coordinators, etc.).
- **Bicycle, pedestrian, and transit improvements:** Depending on the size or location of the development, the City could require specific bicycle and pedestrian improvements or bus stop improvements be implemented as a requirement of development approvals.
- **Pedestrian-oriented design:** Identify design standards that promote pedestrian-oriented urban design features, such as active frontages built right to the street with parking located at the rear of the building and landscaping that provides a buffer between the sidewalk and the street. See Chapter 4 for further details on pedestrian improvements to the right of way.

City policies that promote pedestrian-oriented design support use of transit.

Source: Lance Tyrrell

SUMMARY OF RECOMMENDATIONS – LAND USE

The recommendations below provide guidance for how land use policies can support success of the Transit Master Plan. High priority strategies are highlighted in blue.

Figure 6-2 Land Use and Placemaking Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Land Use	6.1	Concentrate and intensify uses along the Frequent Transit Network	Density is a key driver of transit ridership	Lead: City Support: Developers	Ongoing
	6.2	Establish density thresholds that indicate when certain frequency levels are justified (see Chapter 2 Service)	Density is a key indicator for transit ridership	Lead: City Support: UTA	Near term
	6.3	Continue to monitor zoning along the FTN to ensure transit is supported by a mix of uses, adequate densities, parking requirements, and other transit supportive elements[1]	Zoning can help support transit service with mixed use development, streetscape elements, and transit-supportive parking requirements	Lead: City Support: n/a	Near term
	6.4	Provide a mix of housing options along the FTN to support housing affordability and diversity	Providing a mix of housing options along the FTN is critical to affordability and diversity of residents, leading to better, more active public spaces and the creation of an equitable city	Lead: City Support: n/a	Medium term

[1] Zoning around the FTN could include: increased development capacity, maximum zoning setbacks, outdoor seating, active frontage buildings, increased bicycle parking requirements, reduced minimum parking requirements, and limitations of driveways that cut across sidewalks where pedestrians access transit. Salt Lake City's Transit Station Area Development Guidelines (which has been successfully applied along North Temple and 400 S) provides guidance for development near transit stations, including mix of uses, housing affordability, development density, accessibility, parking, and other urban design elements.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Placemaking & Design	6.5	Provide interior block connections, mid-block crossings, and a pedestrian and bicycle network that connects to destinations and transit stops (See Chapter 4 Access, recommendation 4.1)	A well connected pedestrian and bicycle network supports access to transit	Lead: City Support: n/a	Ongoing
	6.6	Direct economic development activities to locate transit-supportive uses, such as cafes, restaurants, shops, etc. along the FTN	These types of uses contribute to an attractive streetscape	Lead: City Support: Business community	Near term
	6.7	Create community gathering places around transit stops and stations (such as plazas, parklets, squares, or parks), consistent with the City's Parklet Pilot Program Design Guidelines.[2] (See also parklet sidebar)	Community gathering places near transit make transit a more attractive option	Lead: City Support: Business community	Ongoing
	6.8	Invest in shade treatments, weather protection, pedestrian-scaled lighting, street furniture, bus shelters, street trees, and public art to enhance the attractiveness and safety of the street environment surrounding the FTN	Provision of these elements makes the street a more attractive and safe place and facilitates access to transit	Lead: City Support: Business community	Near term
Development Standards	6.9	Integrate transportation demand management (TDM) strategies into the development review process by either requiring or incentivizing TDM Plans for new developments[3]	TDM plans ensure that transit-supportive programs and infrastructure are implemented as service enhancements are made	Lead: City Support: Development community	Medium term

[2] Salt Lake City Outdoor Design Guidelines & Parklet Pilot Program, Parklet Pilot Program Design Guidelines, Summer 2013, p 9 of PDF. http://www.slcdocs.com/planning/projects/odpf.pdf

[3] This would require an assessment of which new developments would be required to develop and implement TDM Plans (either based on geographic location and/or number of employees, number of residential units, or square footage).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Seattle's Parklet Program

A concept originated in San Francisco, parklets re-purpose street space for people instead of cars by providing space for the general public to sit and enjoy the street where existing narrow sidewalks would preclude such occupancy. The City of Seattle launched its Pilot Parklet Program in summer 2013 to evaluate how well parklets would serve neighborhoods and businesses in Seattle. The evaluation showed that the pilot program was a resounding success. Today, the now permanent program has enabled dozens of parklets across the city. Parklets are paid for by the businesses that sponsors them, including design, materials, construction, and maintenance costs, as well as review and permit fees (about $1,000 for the first year). Additionally, businesses pay $1.56 per square foot for the use of the space each year (the same fee as for a sidewalk café) since the business is making money by using the right-of-way. If the parklet is in an area with paid parking, there is also a fee of $3,000 per space per year for the recovery of lost parking revenue.

This parklet in Seattle provides a comfortable and inviting place for people to dine and visit.

Source: City of Seattle

Temporary parklet created in the 21st and 21st business district under Salt Lake City's pilot program. A permanent design is being developed for this location.

Source: Salt Lake City

STOPS AND STATIONS

Transit stops and stations are important destinations that can bring people together and build community. More than just a connection to the transit system, stops and stations must be comfortable, weather-protected, and safe (e.g., well-lit). Salt Lake City supports, encourages, and collaborates with UTA to enhance safety and security of transit within city limits, such as through the City's Bus Stop Design Guidelines (summarized below), which include elements such as proximity to existing lighting in bus stop relocation criteria.

Figure 6-3 and Figure 6-4 provide recommendations for a range of transit facilities in Salt Lake City, including:

- **Intermodal Hubs**. Existing facilities at Salt Lake Central and North Temple Station support connections between FrontRunner, TRAX, and local and regional bus routes, as well as with intercity transit providers at Salt Lake Central. A small park-and-ride facility is located at Salt Lake Central. UTA is working to develop the Depot District Clean Fuels Center on UTA-owned property adjacent to Central Station, which would provide additional layover space that would support the Transit Master Plan (see Chapter 2 for additional detail). UTA plans to develop a small park-and-ride facility at north Temple Station; this would be integrated into new development.
- **Transit Center**. As described in Chapter 2, two transit centers are recommended to support transfers on the FTN. These include one in East Downtown, in the vicinity of 200 S and 700 E, and on the University of Utah campus.
- **Mobility Hubs**. As described in the sidebar below, mobility hubs facilitate transfers between intersecting bus lines and other mobility options including car and bike sharing.
- **Transit Stations**. Transit stations provide a higher level of passenger capacity and investment in amenities at TRAX light rail and Bus Rapid Transit stations. For TRAX stations, the UTA First-Last Mile Study differentiated between Multimodal and Urban/Institutional Stations based on urban context; existing park-and-ride facilities are located at several of the Multimodal TRAX stations, including Ballpark and Central Pointe Stations.
- **Transit Stops**. While stop amenities are better in Salt Lake City than throughout the UTA system, of the over 1,200 bus stops in Salt Lake City, only 17% of bus stops have a bench or a shelter for people to wait for transit to arrive. Salt Lake City recently adopted Bus Stop Guidelines (which were adapted from the UTA guidelines); see Figure 6-6. The Transit Master Plan supports the implementation of these guidelines for prioritizing stop improvements based ridership levels and also recommends prioritizing improvements on a corridor basis along the Frequent Transit Network.

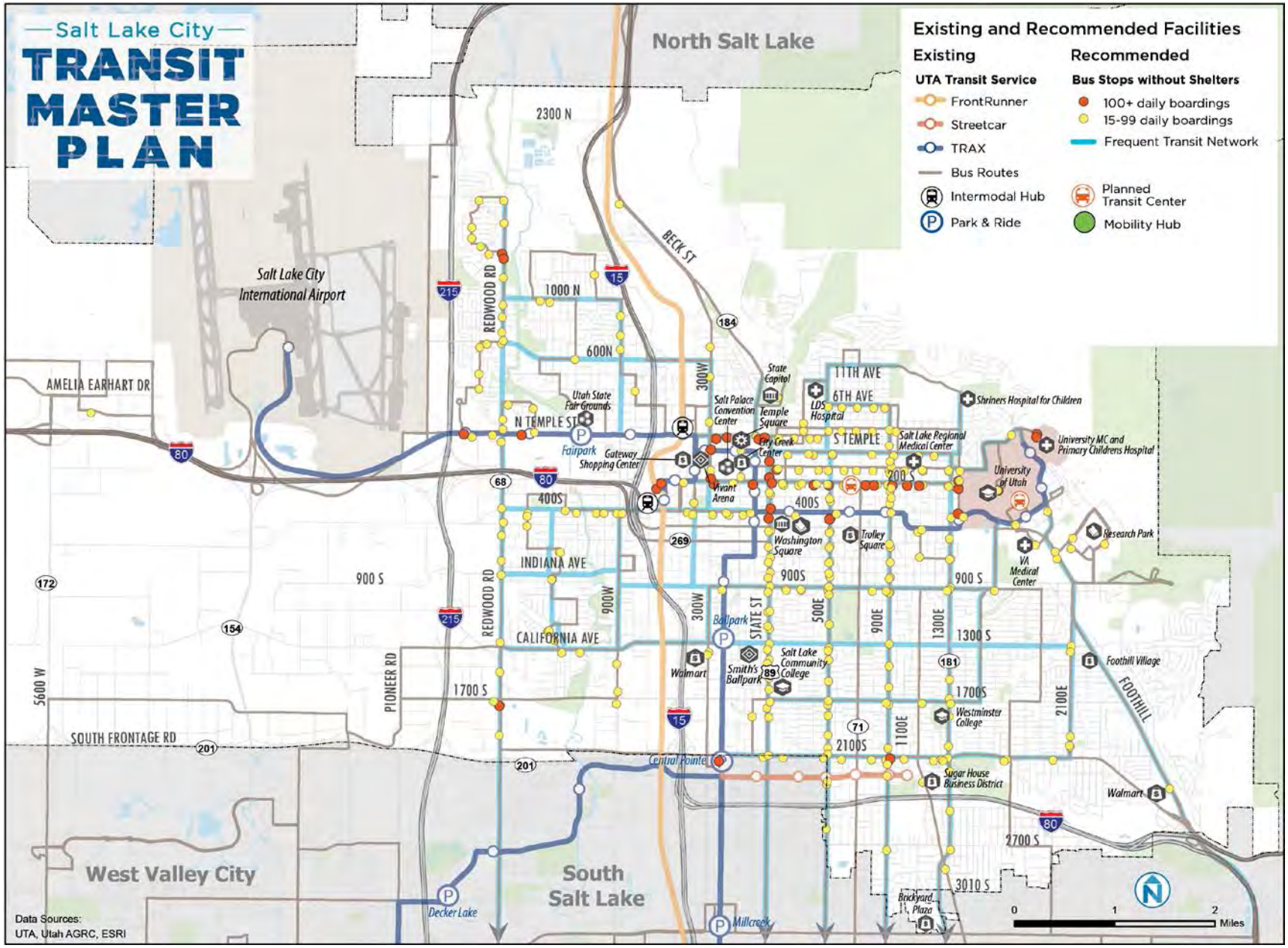
There is also an opportunity to leverage support from the private sector; for example, as new developments are built, the City can provide business owners and developers with incentives if they sponsor and/or build transit stops and stations.

Figure 6-3 Facilities Hierarchy and Amenity Prioritization Guidelines

				Modes			Access (Context-Appropriate)				Other Amenities [2]	
Facility Type	Station Typology [1]	Location(s)	Existing / Proposed	Front-Runner	TRAX / Streetcar	Bus	Park & Ride	Car Share	Bike Share	Bike Parking [2]	Shelter and Seating	Information and Fare Technology
Intermodal Hub	Multimodal	Salt Lake Central	Existing	X	X	X	X	X	X	Bike racks and secure parking	Custom shelters	Real time information; pre-board fare payment
	Multimodal	N. Temple	Existing	X	X	X	Future	X	X			
Transit Center	Urban/Institutional	200S & 700E	Proposed	-	-	X	-	X	X			
	Urban/Institutional	Univ. of Utah	Proposed	-	X	X	-	X	X			
Mobility Hub	Urban/Institutional	Various – see map	Proposed	-	X	X	-	X	X	Bike racks and/or secure parking	Based on stop guidelines	
Transit Station (TRAX/BRT)	Multimodal	Various	Existing or Future	-	X	X	Context Appropriate	X	X	Bike racks and/or secure parking	Custom shelters	
	Urban/Institutional	Various	Existing or Future	-	X	X	-	X	X	Bike rack		
Transit Stops [2]	Tier I (≥ 200 boardings per day)	Various	Various	-		X	-	-	X	Bike rack	Custom Shelter	
	Tier II (150 to 199 boardings per day)	Various	Various	-		X	-	-	X		16’ ADA shelter	
	Tier III (100 to 149 boardings per day)	Various	Various	-		X	-	-	-		12’ ADA shelter	
	Tier IV (15 to 99 boardings per day)	Various	Various	-		X	-	-	-		8’ ADA shelter	Schedule; real-time info. access panel
	Tier V (1 to 14 boardings per day)	Various	Various	-		X	-	-	-		Bench or Simme Seat [3]	Real time access information panel

Notes: [1] A station typology for TRAX and FrontRunner stations was a key outcome of the UTA First-Last Mile Study, including Urban, Multimodal, and Institutional station types in Salt Lake City. These designations are based on the built environment are each transit station. A map is provided in Figure 6-5 of the Fact Book (See Appendix A). [2] The Salt Lake City Bus Stop Design Guidelines, adapted from UTA’s bus stop guidelines, prioritize stop amenities based on boarding thresholds and provide additional details on the types of amenities recommended for each stop tier. Amenities are also prioritized based on available funding. [3] A seat that is incorporated into the bus stop sign.

Figure 6-4 Facilities Map



SUMMARY OF RECOMMENDATIONS – STOPS AND STATIONS

Recommendations related to improving stops and stations are described below. High priority strategies are highlighted in blue.

Figure 6-5 Stops and Stations Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Stop and Station Upgrades Along the FTN Network	6.10	Stop and station upgrades should be prioritized along the FTN, in alignment with the priority corridors recommended for service upgrades	Implementing stop enhancements along an entire corridor in conjunction with enhancements to the frequency of transit service and other elements to support a coherent look and feel along a corridor work in concert to allow transit service to be more accessible, comfortable, and attractive	UTA/City Partnership	Near term
Transit Shelter Program	6.11	Initiate a Transit Shelter program that allows a private company to own/maintain transit stops and stations in exchange for advertising space	Transit stops and stations are improved and maintained at no cost to UTA or the City	Lead: Private company Support: UTA	Medium term
Developer Incentives	6.12	Create incentives for developers to build or improve transit stops as part of the development review process	This program ensures transit stops are built and improved where new development occurs	Lead: City Support: UTA	Near term
Mobility Hubs	6.13	Implement mobility hubs along the FTN that integrate high ridership stops, bike sharing stations, bike fixit stations, and car sharing options	Mobility hubs are important focal points for community and transportation activity	Lead: City Support: UTA, Wasatch Front Regional Council (WFRC)	Long term
Park and Ride Facilities	6.14	Integrate shared use park and ride into new development at North Template intermodal hub as opportunities arise.	Context-appropriate park & rides at intermodal hubs help commuters access regional transit, e.g., Frontrunner	Lead: UTA Support: City	Long term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Salt Lake City Bus Stop Design Guidelines

Salt Lake City developed guidelines for bus stops and bike share stations in 2014. These guidelines are aligned with UTA standards and ridership thresholds for prioritizing improvements.

Figure 6-6 Salt Lake City Bus Stop Guidelines and Ridership Thresholds

Tier	Bus Stop Amenity	# of Average Daily Boardings
Tier I	Custom shelter with bench; bike rack; trash receptacle; shielded lighting; current bus schedule; real-time bus data; pre-board fare pay facility; vegetation[1]	≥ 200 boardings per day
Tier II	16' ADA compliant shelter with bench; bike rack; trash receptacle shielded lighting; current bus schedule; real-time bus data; pre-board fare pay facility; vegetation[1]	150 to 199 boardings per day
Tier III	12' ADA compliant shelter with bench; bike rack; trash receptacle; shielded lighting; current bus schedule; real-time bus data; pre-board fare pay facility; vegetation[1];	100 to 149 boardings per day
Tier IV	8' ADA compliant shelter with bench; bike rack; current bus schedule; route information panel with instructions on accessing real-time arrival data; vegetation[1]	15 to 99 boardings per day
Tier V	Seating (bench or Simme Seat[2]) on hard surface; bike rack; route information panel with instructions on accessing real-time arrival data	1 to 14 boardings per day

Notes: [1] Shade tree, or planter at least 36" diameter and 24" tall with maintained vegetation within 10' of primary bus stop feature. [2] A seat used by UTA that is incorporated into the bus stop sign. See guidelines for examples.

Source: Adapted from Salt Lake City Bus Stop Design Guidelines, which are based on UTA Bus Stop Design Guidelines

What is a Mobility Hub?

The goal of a Mobility Hub is to fully integrate the transit network with multimodal access and connections at the intersection of Frequent Transit Network corridors. Mobility Hubs include pedestrian and bicycle improvements and other sustainable modes (e.g., car or bike sharing) designed to connect transit passengers to adjacent neighborhoods and nearby land uses. Key elements of a Mobility Hub include:

- Accessible, universal design allows people of all physical abilities to access transit stops/stations and nearby destinations
- Shared mobility services—including bike share stations, car share vehicles, and loading space for other private or shared mobility services—enable access outside of the stop walkshed
- Integrated mobility technology—including kiosks, reader boards with real-time information on transit and other modes, and shared payment interfaces—assists travelers with trip planning and arranging shared rides, and provides opportunities for other evolving applications
- Placemaking elements, such as public art and seating, active street environments with a mix of land uses, and strong land use anchors invite social interaction and vibrant business opportunity
- Secure, covered bicycle parking and access to the surrounding bicycle transportation network
- Excellent pedestrian infrastructure within a quarter- to half-mile walkshed
- Context-appropriate parking, including shared and/or paid on- and off-street parking

The image below illustrates a mobility hub developed in Hamburg, Germany.

Hamburg, Germany

Source: NISTO

Transit Shelter Program, San Francisco, CA

San Francisco Municipal Transportation Agency (SFMTA) was one of the first transit agencies to develop a formal shelter program in 1987. The purpose of the program was to replace old shelters in San Francisco with new shelters that provide improved travel information, seating, lighting, and weather protection and to maintain the shelters on an ongoing basis to keep them in good repair. Previously, many shelters were not well maintained and had become covered in graffiti.

SFMTA initiated its shelter program through an innovative arrangement with a private contractor, CBS Outdoor. Under the arrangement, the contractor owns and maintains the shelters and pays for improvements. SFMTA does not pay the contractor to manage the shelters; the contractor pays for the improvements by selling advertising, which is placed prominently in the shelters. In 2007, SFMTA entered into a 15-year contract with Clear Channel with the option of one 5-year renewal after 2017. The contract with Clear Channel requires that the company install between 1,110–1,500 new shelters over five years, replace 39 kiosks, provide 1,500 traffic controllers, and install 3,000 solar-powered customer-information signs. It stipulates that the contractor make a one-time signing payment of $5 million and pay $500,000 for administration costs. In addition, they will make minimum annual payments to the agency during the duration of the contract—for example, they will have to pay $8.6 million to SFMTA in 2010.

Note: In these types of partnerships it is important to have clear guidelines written into the contract that indicate where stops are upgraded to make sure these shelters are equitably distributed to neighborhoods based on Salt Lake City's prioritization scheme not based on advertising markets.

SFMTA bus shelters are made of recycled materials and include energy efficient LED lighting, wireless internet, real-time arrival information through NextMuni, and Push to Talk capabilities for customers with low vision.

Source: Jamison Wieser on Flickr

7 IMPLEMENTATION & FUNDING

7 IMPLEMENTATION AND FUNDING

This chapter highlights key strategies to implement the service, capital, and programmatic recommendations and policies in the Transit Master Plan. It provides additional guidance on implementation and outlines potential revenue sources the City and UTA can use to fund these enhancements and programs, and options for structuring the relationship between the City and UTA to most effectively meet Transit Master Plan goals.

IMPLEMENTATION

The previous chapters of the plan summarize the implementation strategies. This section highlights the overall priorities for the City, identifies key strategies to build momentum for the plan in the first year following adoption, and provides additional guidance on how the City and UTA can implement the frequent transit network (FTN) and employer and residential-oriented local shuttle and ride services partnerships to improve connections to the FTN.

Key Transit Master Plan Strategy Areas

Salt Lake City Transit Master Plan strategies fall into four basic categories. Within each strategy area, the City and UTA should look to implement relatively quick "wins" that are achievable given current funding levels, make the transit system more usable, and demonstrate the benefits of faster, more reliable, and frequent service that operates all day every day.

- **Implement a frequent transit network** to provide reliable, efficient, and frequent transit service all day every day that takes advantage of the City's strong street network grid. The FTN would be implemented through enhanced or new fixed-route service, including longer hours of operation on weekdays and on weekends, increased frequency, service on new corridors, and route extensions to more directly serve key destinations.

  Initial priorities include:

  - **"Buying up" evening service on key routes.** One of the most significant gaps in transit service is on weekday evenings (see Appendix A, State of the System Report, Figures 4-5 and 4-11). Providing service longer into the evenings makes transit more usable for both work and non-work trips. (The concept of buying up service is described below.)
  - **Implementing frequent service in the 200 S corridor**, in coordination with capital improvements (see below for more detail).
- **Develop pilot programs and partnerships for employer shuttles and on-demand ride services** that extend the reach of fixed route service for employment areas or neighborhoods that lack sufficient density or demand to support cost-effective frequent transit service.
- **Develop enhanced bus corridors** that help transit run faster and more reliably and offer high quality stop amenities that make riding transit comfortable and attractive. **An initial priority is to implement more frequent service and capital**

improvements on 200 S, a primary east-west transit corridor for bus (and potentially future bus rapid transit and/or streetcar) service between downtown and the University. The City and UTA have already partnered to enhance stops on 200S and UTA provides a relatively high level of service (15-minute weekday service from about 6 am to 8 pm). Enhancing service and facilities on this corridor is a key step in implementing a grid transit network since it enables convenient transfers from routes serving north-south transit corridors.

- **Implement a variety of transit-supportive programs and transit access improvements** that overcome barriers to using transit in terms of information, understanding, and access (including pedestrian and bicycle facilities and affordability). **Initial plan priorities include:** Developing a highly visible frequent service brand and focusing access improvements, rollout of real-time transit information, and targeted transit marketing programs on corridors that will be prioritized for FTN service enhancements.

Implementation of the Frequent Transit Network

FTN Implementation Strategies

There are three basic approaches that Salt Lake City could follow to implement frequent service on the corridors identified in Chapter 2, as well as coordinated capital improvements and transit-supportive programs and policies. UTA already plans to implement frequent service on its "Core Route Network," which will overlap with a number of the corridors identified in the Salt Lake City FTN. These approaches may be focused to develop frequent service where UTA does not provide the City's desired minimum level-of-service. Illustrative examples are given below; further analysis will be needed to determine actual routing.

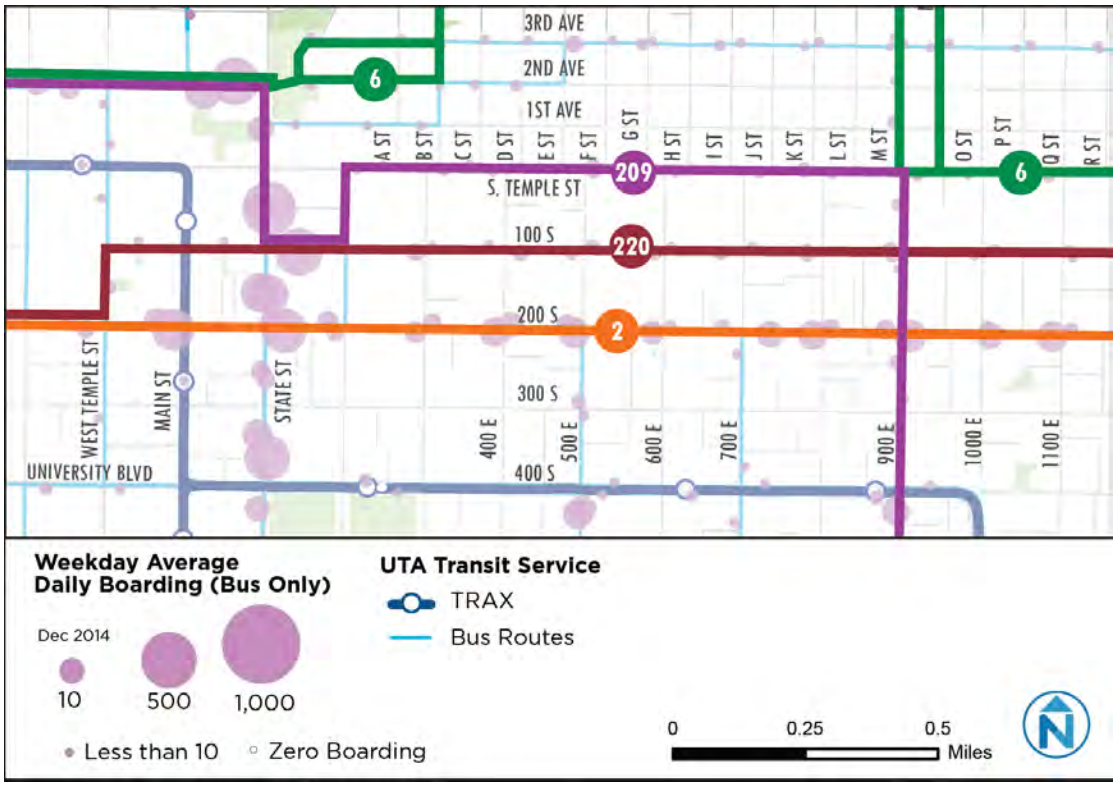
- **Restructure existing service**. Redesigning existing routes, e.g., changing the streets on which they operate or modifying route terminal locations, is the most cost-effective approach to providing frequent service. The City will work with UTA to consider ways to use existing operating funds to implement the plan's priorities. For example, UTA operates service on N. Temple Street, 100 S, and 200 S, which are each 500 feet apart. Route 220 serves 100 S between 1300 E and State Street. Route 209 operates on S. Temple Street between 900 E and State Street (it turns west from 900 E onto S. Temple). Route 6 also serves N. Temple Street, east of 900 E. A potential scenario where Route 220 would move from 100 S to N. Temple Street, illustrated in Figure 7-1, would have the following benefits:
  - Provide a continuous route on N. Temple Street connecting downtown and the University with approximately a quarter-mile separation from 200 S; this is a more appropriate spacing between routes (consistent with recommendations in Chapter 2).
  - Focus ridership on N. Temple Street stops, allowing those stops to meet ridership thresholds for a higher level of amenities.
  - Provide better service along the southern edge of the Avenues neighborhood and potentially enable better service to LDS Hospital by allowing Route 209 to be extended north (given a frequent service grid that offers convenient transfers, e.g., on N. Temple and 200 S).
  - Potentially support future implementation of a downtown streetcar, which is planned to run on 100 S between W. Temple Street and 500 E.

  Some changes could be cost-neutral or reduce costs (as with N. Temple and 900 S), while others may require additional operating cost and/or vehicles.

- **City service buy-up**. Salt Lake City could provide UTA with a financial contribution to increase frequency or span of service on a route. If the change does not require additional vehicles, i.e., increasing midday or evening service to the same level of service provided at a different time period, no additional vehicles would be required. For example, Routes 205, 209, and 220 already provide frequent service on 500 S, 900 S, and 1300S, respectively, during weekday daytime hours; increasing frequency on weekday evenings would not require additional vehicles. However, Route 228, which provides service along 400 S between the University and Salt Lake Central, only operates with 30-minute frequency and additional vehicles would be required.

  Where the City desires to buy-up service on routes that extend beyond Salt Lake City limits, the City would invest only in service that is within city boundaries. UTA would be responsible for how that service is connected to the rest of the system. For example, service increases that the City buys up could terminate at/near city limits. It is anticipated that once service is demonstrated to meet UTA service standards, the agency would take over provision of that service, as funding allows. UTA and the City would need to document any such agreements in a memorandum of understanding.
- **Introduce new service**. Service on new transit corridors that cannot be achieved through restructuring existing routes would be the most costly option in terms of both operating and capital costs. For example, extending Route 228 to provide continuous service along 400 S between Redwood Road and the University would likely require additional operating resources for the Redwood Road to 600 W portion of the route, as well as to increase service to frequent levels. Additional vehicles would also likely be required. Providing service when and where there wasn't service before requires an analysis and possible implementation of paratransit service as well.

Figure 7-1 Service Restructuring Example: Existing Service on S. Temple, 100 S and 200 S



UTA Routes 2, 220, and 209 serve 200 S, 100 S, and S. Temple Street, respectively. As described above, restructuring Route 220 to serve S. Temple Street is an example of cost-neutral or low cost changes to existing service that can help implement the FTN.

Figure 7-2 summarizes needs and applicability of implementation strategies to FTN corridors along with key considerations.

FTN Cost Estimates

In 2016, UTA provided a cost estimate of **$6 per vehicle-mile** for additional service that could be operated by the existing bus fleet, such as midday, in the evening, or on weekends. The number of buses required to operate a route is typically driven by peak periods when service is the most frequent. The estimated cost is **$7 per vehicle-mile** if additional vehicles are required, such as to operate new service on a corridor or increase frequency during peak periods.

The **net incremental cost** to provide frequent service on the Tier 1 FTN is **$4.1 million annually, and $3.6 million annually on the Tier 2 FTN ($7.7 million total)**, based on an order-of-magnitude estimate using the latest information available at the time of analysis (Spring 2016). This cost does not include portions of the FTN corridors where UTA had existing plans to provide frequent service, i.e., the estimate represents the additional cost to extend frequent service beyond existing plans, nor does it include costs for any additional paratransit service that may be required.

For example, the **total annual cost** to provide frequent service on a one-mile route segment of an existing transit corridor would be approximately $240,000 (roughly 40,000 annual vehicle miles at a cost of $6 per mile), comprised of approximately $180,000 for weekdays, $40,000 for Saturdays, and $20,000 for Sundays. For service on a new corridor, this cost would be $1 per mile higher, or an additional $40,000 per year. The **net cost** accounts for existing or planned service on some corridors, and may be significantly lower than the total cost if only enhancements to midday, evening, or weekend are required.

Figure 7-2 Incremental Cost Estimates to Implement FTN Vision

	Daily Vehicle Miles			Incremental Annual Costs*			
Tier	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Total
1	1,800	2,100	800	$3,000,000	$800,000	$300,000	$4,100,000
2	1,500	1,800	700	$2,700,000	$700,000	$300,000	$3,600,000
1+2	3,300	4,000	1,500	$5,700,000	$1,500,000	$600,000	$7,700,000

Notes: * Based on $6 per vehicle mile for service if no additional vehicles are required, or $7 per vehicle mile if additional vehicles are required, and 40,000 annual vehicle miles.

Figure 7-3 FTN Implementation Considerations

Corridor	Potential Time Frame	Primary Route(s)	FTN Service Needs				Potential Implementation Strategies				Key Elements / Considerations
			Peak	Mid-day	Eve	Sat/ Sun	UTA Core Network*	City Buy-Up	Service Restructure	New Service	
200 S (Transit Spine)	Tier 1	2			X	X	X	X			▪ Possible initial joint City-UTA project ▪ Incorporate clean vehicles (UTA "No-Low" Emission vehicle grant) ▪ Bulb-outs, other amenities, community-oriented features
North/South Temple	Tier 1	220, 3, 6			X	X		X	X		▪ Consider restructuring 220 to consolidate east-west service on North-South Temple ▪ Consider restructuring Route 3 to terminate at North Temple Station, or serve SLC Central via 600 W
500 E / 900 E; to LDS Hospital and Avenues Neighborhood	Tier 1	205, 209			X	X	X	X	X		▪ Identify potential layover location near LDS ▪ Coordinate with 200 S and N. Temple corridors (frequent east-west connections)
State Street; to State Capitol	Tier 1	200			X	X	X	X	X		▪ Part of larger BRT project; could SLC portion be advanced as the initial segment of a broader project ▪ Consider rerouting Rt 200 to serve State Capital in the shorter-term, e.g., in conjunction with 200S transit spine ▪ Identify potential layover location
400 S	Tier 1	228, 500	X	X	X	X		X	X	X	▪ Identify Redwood Road terminus options (e.g., N. Temple)

Corridor	Potential Time Frame	Primary Route(s)	FTN Service Needs				Potential Implementation Strategies				Key Elements / Considerations
			Peak	Mid-day	Eve	Sat/ Sun	UTA Core Network*	City Buy-Up	Service Restructure	New Service	
California / 300 W / 900 S Indiana (west of 300 W) 1300 S (east of 300 W)	Tier 1 Tier 2 Tier 2	9	X	X	X	X		X	X	X	▪ Identify Redwood Road terminus options (e.g., N. Temple) ▪ Consider modifying Rt 9 to serve California segment (e.g., split tail of Rt 9 between California and 300W portion, 1300S – Central Pointe Station, or serve via alternative route). West end of Route 17 could also potentially be rerouted to serve 300W between 1700S & Central Pointe Station ▪ Western segment of 900 S contingent on grade-separated freight rail crossing
1300 E	Tier 1	220			X	X	X	X			▪ See also N./S. Temple
Rose Park	Tier 1 / 2	519, 520	X	X	X	X		X	X	X	
2100 S / 2100 E	Tier 1	21			X	X	X	X			
Redwood Road	Tier 1	217			X	X	X	X	X		▪ See also 900 S / California and 400 S corridors
1700 S	Tier 2	17			X	X		X			
Foothill Drive	Tier 2	228, 313, 354	X	X	X	X	X	X			▪ Although Foothill is identified as a Tier 2 corridor, a recent implementation study has been completed and it has strong stakeholder and community support. It is therefore suggested that project partners consider moving forward with the implementation of that corridor, including its significant transit, bicycle and pedestrian supportive elements, in the nearer term.
TRAX	Tier 1					X	X				▪ 15 minute weekend service

*UTA is in the process of defining its Core Route Network.

Implementation of Alternative Service Pilot Projects

Establishing partnerships with employers and ride services companies are key steps in developing pilot projects to provide employer- and residential-oriented services to extend the reach of fixed route service in Salt Lake City. The City and/or UTA will need to foster partnerships with employers and non-profits and develop agreements with private transportation providers to develop these pilot projects. The following sections outline key implementation steps and parameters that should be addressed in these agreements.

Employer-Oriented Service

The City and/or UTA will need to work with employers to structure effective shared ride shuttle services to employment sites that cannot be served effectively by the FTN. As described in Chapter 2, Transportation Management Associations (TMAs) are often effective ways to organize employers to coordinate schedules and provide funding for shuttle programs. Key information required to plan an employer-oriented shuttle program includes:

- Primary employee shift times (start and end)
- Employee origins (home locations) and the rail or FTN station(s) that would most efficiently provide connections for the most employees

A TMA can also provide the City and UTA with a more centralized way to facilitate education and outreach to employers and employees, and foster incentives to use transit including company-sponsored passes (such as the Hive Pass) which can be supported by an employer-sponsored guaranteed ride home program. Although employees use guaranteed ride home programs relatively infrequently, they remove a key barrier to use of transit and employee shuttles; if a participating employee unexpectedly needs to leave work early or late, the program would cover the cost of a taxi or shared ride home or to the transit station.

Residential-Oriented Service

As described in Chapter 2, residential-oriented ride services would extend the reach of the FTN in Salt Lake City. A number of issues and concerns emerged in early discussions of the concept of partnering with ride services companies to offer subsidized shared ride services. These concerns could be addressed through the contracting/procurement process for such a partnership, i.e., ride services companies would need to be able to address these concerns in order to be eligible for the subsidized ride program. Figure 7-3 summarizes the likely service parameters and issues/concerns along with potential resolution of those issues.

UTA would need to determine whether this model is specific to Salt Lake City or could be applied elsewhere in the UTA service area.

Residential-Oriented Shared Ride Cost Estimate

The cost to subsidize an on-demand shared ride service in the conceptual residential service zones identified in Chapter 2 would vary depending on contractual arrangements with ride services companies, service parameters (geographies and hours of availability), and residents' demand for the service. Based on rough assumptions, the net cost to Salt Lake City could be on the order of **$500,000 to $900,000** to subsidize rides for such a service for the full operating hours of the FTN (17 hours Monday-Saturday and 12 hours on Sundays) in the identified zones. Assumptions include that average daily rides would total 1% of residents in the zones and that residents would pay a small premium over the cost of a transit fare. The current, unsubsidized cost of a single person on-demand ride to a nearby transit station ranges from $5 to $8 for each of the zones.

Figure 7-4 Ride Services Partnership Service Parameters/Concerns

Issue/Concern	Principle or Contractual Stipulation to Address
Service Parameters, e.g., where and when is the service available?	
Eligible Origins	▪ Defined areas outside of the geographic coverage of the FTN (see Chapter 2)
Eligible Destinations	▪ Rail and FTN stations (i.e., connections available to Salt Lake Central or other major transit stations) ▪ *Potentially* direct access to other key nodes defined within each service area, e.g., neighborhood shopping area
Eligible Hours of Operation	▪ Hours of FTN service, i.e., 17 hours per day Monday-Saturday and 12 hours per day Sundays (see Chapter 3) ▪ If an area has only partial frequent service, e.g., daytime but not evenings, trips could be made eligible for a subsidy only outside of actual frequent service hours (the model could also potentially be used in this way to extend service hours in other neighborhoods in Salt Lake City)
Other Considerations	
Fare Payment	▪ Desirable to integrate with Hive Pass
Fiscal Sustainability	▪ Program availability would need to be constrained by available funds and estimated costs; testing the program in a pilot neighborhood or zone would help refine the budget
Environmental Sustainability	▪ The service would balance shared rides (to maximize sustainability) with efficient travel times in order to avoid the perception that the service offers single-passenger rides ▪ Align with SLC Sustainability Goals, i.e., shared ride, clean vehicle requirements or incentives ▪ A premium subsidy or preferential allocation of rides could be offered to incentivize clean-fuel vehicles
Equity	▪ Address potential or perceived equity implications of providing shared ride services program in some neighborhoods that may be generally higher-income than others, i.e., providing better (door-to-door) service to a higher-income area than is available in lower income areas ▪ Address potential equity concerns related to accessibility for people without smart phones (e.g. partner with a third party to allow riders to schedule via the web instead of a smart phone)
Accessibility	▪ Availability of accessible vehicles
Technology	▪ Desirable to integrate into development of a shared mobility platform

FUNDING STRATEGIES

Implementing the service, capital, and programmatic recommendations of the Transit Master Plan will require the City and UTA to develop new, sustainable transit funding sources. This section describes potential funding mechanisms including federal, state, and local sources as well as public-private partnerships.

Existing Funding Sources

Existing funding for transit in Salt Lake City is primarily provided by UTA. UTA revenue sources for the FY 2015-2016 budget year, illustrated in Figure 7-4, total approximately $347 million and include:

- **Local option sales tax:** Largest revenue source for UTA, imposed by service area and varies by county—Salt Lake County: 0.6875 cents per dollar in retail sales; Weber, Davis, Box Elder counties: 0.55 cents; Utah County: 0.526 cents; Tooele County (select cities): 0.3 cents. Sales tax revenues were projected to increase by 4.2% from 2014 to 2015.[1]
- **Federal grants:** UTA has secured nearly $1.7 billion in discretionary and formula federal grants over the past decade.[2]
- **Passenger revenue:** UTA recovers 17% of transit operating costs from fares.[3] This percentage is an average and includes all modes. Fare revenues are projected to increase based on growth in ridership.
- **Advertising:** From lease of exterior space on the sides and rear of bus and light rail vehicles.
- **Investment income:** Interest earned on invested operating funds not yet expended and funds held for future capital expenditures.
- **Other income:** Income from rents and leases on the right-of-way.[4]

Salt Lake City pays for transportation investments using primarily general funds—there are no funds dedicated to public transit. Funding contributions from the City for FY 2015-2016 include: [5]

- $2.2 million for Transportation Operations including one HIVE program administrator[6]
- $50,000 of general funds for Ground Transportation
- $1.8 million for Bikeway Infrastructure projects including:
  - $1.77 million of general funds
  - $46,000 of impact fee funds

Additionally, the City dedicates $7,500 to a Rail~Volution Partner level membership, which further supports future transportation investments in Salt Lake City.

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[1] UTA. 2015 Budget Document. Retrieved from http://www.rideuta.com/uploads/2015MasterBudgetDoc.pdf

[2] Utah Transit Authority. UTA Year in Review 2014. Retrieved from https://www.rideuta.com/uploads/UTAYearinReview2014.pdf.

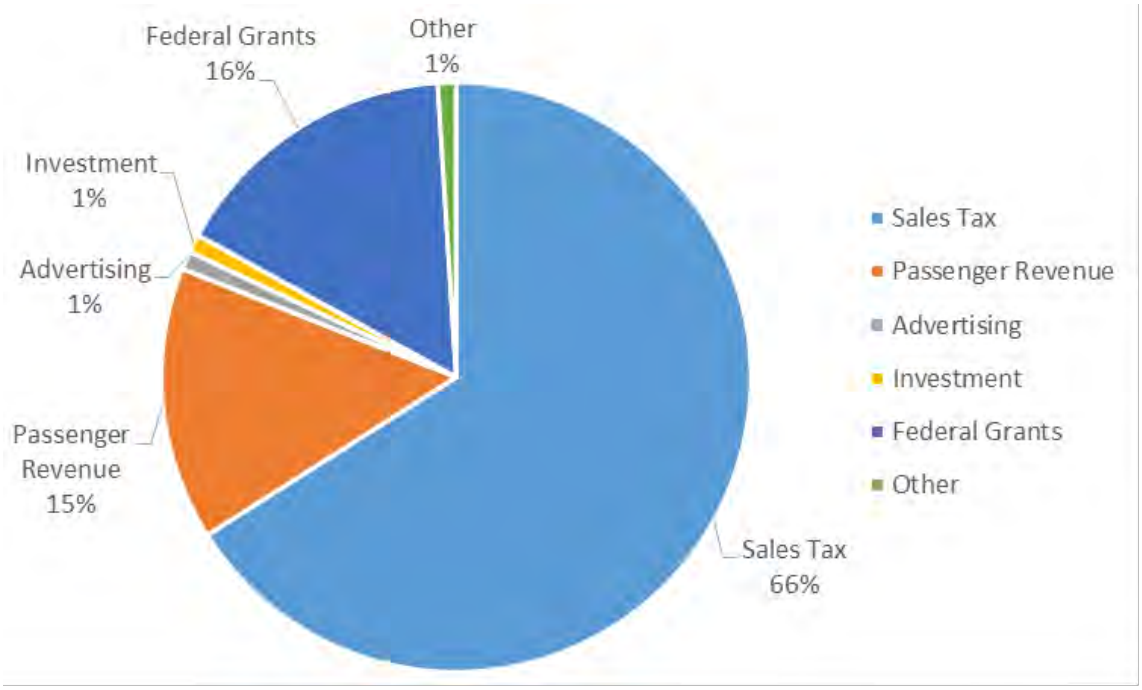
[3] National Transit Database. https://www.transit.dot.gov/sites/fta.dot.gov/files/ntd/tap/2013_Utah_Transit_Authority_ID8001.pdf

[4] UTA. 2015 Budget Document. Retrieved from http://www.rideuta.com/uploads/2015MasterBudgetDoc.pdf

[5] Salt Lake City. Capital and Operating Budget Fiscal Year 2015-2016. Retrieved from http://www.slcdocs.com/budget/bookFY16.pdf

[6] The Hive Pass is a program provided by Salt Lake City through an agreement with UTA that allows residents to purchase reduced cost monthly or annual transit passes.

Figure 7-5 2015 UTA Operating Budget



Source: UTA 2015 Master Budget

Potential Funding Sources

A variety of funding sources exist to help support public transportation. Program eligibility, match requirements, and use of funding vary by program and whether distributed at the federal, state, or local level. This section describes the funding sources available, some of which the City already receives, and some which would be new sources of funding.

Federal

On December 4, 2015, President Obama signed into law P.L. 114-94, the Fixing America's Surface Transportation (FAST) Act. Funding surface transportation programs at over $305 billion for fiscal years (FY) 2016 through 2020, the FAST Act continues many of the streamlined and performance-based surface transportation programs established in the Moving Ahead for Progress in the 21st Century Act (MAP-21). Federal transportation funding is generally formula or discretionary-based. Formula-based programs have a pre-determined amount of funding allocated each year to states and metropolitan planning organizations, whereas discretionary programs are competitive and provide grants to communities that submit funding applications.

The following formula-based programs for urbanized areas are relevant to Salt Lake City, and unless otherwise noted, generally require a 20% local match for capital assistance and a 50% match for operating assistance (if applicable). Revenue from these funding sources is typically allocated at the regional level; UTA is the recipient for these funds.

Urbanized Area Formula Program (FTA Section 5307). This program is primarily intended to fund fixed-route transit projects. For urbanized areas over 200,000 in population,

5307 funds can only be used for capital expenditures, including preventative maintenance.[7] In addition, certain expenses associated with mobility management programs are eligible and some Americans with Disabilities Act (ADA) complementary paratransit service costs are considered capital costs. Up to 10% of 5307 funds can be applied to ADA Paratransit service; up to 20% of program funds can be used for complementary paratransit service if certain conditions are met. A 20% local match is required for all capital expenditures; the local share may be lowered to 10% for the cost of vehicle-related equipment attributable to compliance with the ADA.

Enhanced Mobility of Seniors and Individuals with Disabilities Program (FTA Section 5310). This program provides formula funding for services to seniors and persons with disabilities that go beyond traditional fixed-route services and ADA paratransit. It can be used for operating and capital costs. In general, this funding source requires a 20% local match for capital and a 50% local match for operating expenditures, however only a 10.27% match is required for purchased transportation services.

A sub-component of this program created in the FAST Act is a new discretionary pilot program for innovative coordinated access and mobility. This pilot program is open to 5310 recipients to assist in financing innovative projects for the transportation disadvantaged that improve the coordination of transportation services and non-emergency medical transportation (NEMT) services; such as: the deployment of coordination technology, projects that create or increase access to community, One-Call/One-Click Centers, etc. In the first year of the discretionary program (2016) Congress appropriated $2 million, followed by $3 million in 2017, $3.25 million in 2018, and $3.5 million in 2019.

Buses and Bus Facilities Grants Program (FTA Section 5339). There are three components to this program. The first is a continuation of the formula bus program established under MAP-21 that provides funding to states and transit agencies to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. The FAST Act added two new components: a bus and bus facilities competitive grant program based on asset age and condition and a low or no emissions bus deployment program. Both the formula and competitive funding require a 20% local match and are only eligible for capital expenditures.

A pilot provision in the FAST Act allows designated recipients in urbanized areas between 200,000 and 999,999 in population to participate in voluntary state pools to allow transfers of formula funds between designated recipients during the period of the authorized legislation.

Capital Investment Grant Program. This program is the primary federal funding source for development of new major transit capital investments. The program funds fixed guideway transit projects including: commuter rail, light rail, heavy rail, bus rapid transit, streetcars, and ferries. There are three components to the program: New Starts, Core Capacity, and Small Starts; projects can be grouped into "Programs of Interrelated Projects" that are comprised of any combination of two or more New Starts, Small Starts, or Core Capacity projects.

- New Starts projects must have a total capital cost over $300 million or request $100 million or more in funding.

[7] Capital projects include: planning, engineering, design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement, overhaul and rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. In addition, associated transit improvements and certain expenses associated with mobility management programs are eligible under the program. All preventive maintenance and some ADA complementary paratransit service costs are considered capital costs.

- Core Capacity projects are major capital investments in existing fixed guideway systems that increase capacity on corridors that are at capacity today or will be in five years.[8]
- Small Starts projects must have a total capital cost of less than $300 million and seek less than $100 million in funding.

Local match requirements are 20% of that total cost; in recent years the FTA has been pushing recipients to pay closer to a 50% local match.

Communities seeking funding under the capital investment grants programs must complete a series of steps over several years to be eligible for funding. New Starts and Core Capacity projects have two phases: (1) Project Development: the evaluation of alternatives leading to the selection of a locally preferred alternative, and (2) Engineering: during which cost and designs are finalized and environmental issues are addressed. The process can take five or more years from initiation of an alternatives analysis (AA) to execution of a full funding agreement.

A pilot program in the FAST Act allows communities seeking funding or that recently received funding under the Capital Investment Grants programs to apply to the Pilot Program for Transit-Oriented Development Planning. This program funds local community initiatives to integrate land use and transportation planning to improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access for pedestrian and bicycle traffic, engage the private sector, identify infrastructure needs, and enable mixed-use development near transit stations.

Congestion Mitigation and Air Quality (CMAQ) Program. Administered by the Federal Highway Administration (FHWA), this program funds a wide variety of surface transportation projects – including transit – that contribute to air quality improvements and provide congestion relief in areas that do not meet federal air quality standards (non-attainment) or former nonattainment areas that are now in compliance (maintenance areas). Funding is provided to the State, which has discretion to prioritize and fund projects. Salt Lake County is a non-attainment or maintenance area for some pollutants, making it eligible for funding under this program.

Surface Transportation Block Grant Program. Also administered by the FHWA, this program can be used by the State and larger metropolitan regions to fund a wide variety of transportation projects. A percentage of the program is set aside for bicycling and walking projects (called "Transportation Alternatives") and there is a requirement that at least half of each state's funding be provided to geographic areas in proportion to their relative shares of the State's population.

TIGER Discretionary Grants. The U.S. Department of Transportation's Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program invests in projects that address national objectives in safety, economic competitiveness, state of good repair, quality of life, and environmental sustainability. DOT also evaluates projects on innovation, partnerships, project readiness, benefit cost analysis, and cost share. The eligibility requirements of TIGER allow project sponsors to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional federal programs. There have been rounds of funding each year since 2009. However, since the program is not authorized, it is subject to the annual appropriations process year to year. A TIGER grant was used to develop the Sugarhouse Streetcar (see sidebar).

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[8] FTA calculates capacity for light rail and heavy rail projects as useable space per passenger in the peak hour in the peak direction. Levels below 5.7 square feet are considered to be at capacity now or within 5 years and is eligible. More information on the calculations can be found on page 85 of the Final Capital Investment Grant Program Interim Policy Guidance, June 2016 available at www.transit.dot.gov/sites/fta.dot.gov/files/docs/FAST_Updated_Interim_Policy_Guidance_June%20_2016.pdf

Public Transportation Innovation (FTA Section 5312). This program provides annual discretionary funding to develop innovative products and services to better meet the needs of transit agency customers. For the first round of the program, the FTA announced $8 million in funding for Mobility on Demand Sandbox. The FTA seeks to fund project teams to innovate, explore partnerships, develop new business models, integrate transit and mobility on demand solutions, and investigate new solutions, enabling technical capabilities such as integrated payment systems, decision support, and incentives for traveler choices. Future grant opportunities could be pursued to help develop the recommended on-demand ride services partnership to extend the reach of frequent transit service.

Sugarhouse Streetcar Funding Partnership

The S-Line was funded through a partnership between Salt Lake City, South Salt Lake, and UTA.

- UTA received a $26 million TIGER II grant in 2010 and provided the three streetcar vehicles (valued at $12 million) and the right-of-way (valued at $6.3 million) at no cost to the cities of South Salt Lake and Salt Lake City.
- The gap in funding to complete the project ($11.18 million) was shared between Salt Lake City ($5.38 million), South Salt Lake ($4.2 million), and UTA ($1.6 million). Salt Lake City and South Salt Lake also shared in the cost of operating the line along with UTA for three years.

Source: http://www.shstreetcar.com/files/MasterStreetcarTransmittal.pdf

State Funding

State funding for transit operations and capital projects can be a good local match for federal sources and also provides stable funding over many years.

Gas Tax. During the 2015 General Session, the State of Utah passed H.B. 362 which increased the statewide gas tax by 4.9 cents from 24.5 cents per gallon to 29.4 cents per gallon.[9] In addition, beginning in 2016, there is an additional 12% sales tax on wholesale gas that will fluctuate based on the statewide average wholesale pretax price of a gallon of regular unleaded motor fuel during the previous three fiscal years, not to exceed 40 cents. The new taxes provide an annual adjustment as the statewide average wholesale price of fuel fluctuates within the floor ($2.45) and ceiling ($3.33) prices.

These revenues are deposited into the state Transportation Fund and Transportation Investment Fund and project funding decisions are made by the Transportation Commission each year. Utah's transportation commissioners are appointed by the governor and serve as part of an independent advisory committee. The local option sales tax provision of H.B. 362 is discussed below under Local Funding.

Sales Tax. Counties within the Utah Transit Authority service area assess sales taxes that are earmarked for transit, including both operations and for the local share of capital expenditures. Approved local option sales taxes include:

- Salt Lake County 0.6875%
- Davis County 0.5500%
- Weber County 0.5500%
- Box Elder County 0.5500%
- Utah County 0.5260%
- Tooele County 0.3000%

[9] http://www.wfrc.org/new_wfrc/index.php/resources/house-bill-362-transportation-infrastructure-funding

Salt Lake City SmartTrips

Salt Lake City's SmartTrips program is an on-the-ground effort to educate and encourage local residents to use public and active transportation for their travel needs. This program targeted households and businesses in the Fairmont and Westminster neighborhoods of lower Sugar House. Residents were educated on the importance of decreasing polluting activities associated with driving. One goal of the program was to empower at least 15% of the targeted households to successfully negotiate barriers to adopt and sustain the use of public and active transportation to reduce vehicle emissions.

The Salt Lake City Sustainability Division applied for a Utah Clean Air (UCAIR) grant to support six activities of this program:

1. Community Listening and Collaboration Cultivation
2. Business Recruitment
3. Participant Recruitment
4. Participant Engagement
5. Community Partnering Events
6. Evaluation/Feedback

Of the $29,424 originally granted to SmartTrips by UCAIR, $8,852 (approximately 30%) was spent on personnel costs. The remaining $20,571 (approximately 70%) was used for program materials.

Source: 2014 SmartTrips Salt Lake City UCAIR Final Grant Report

Local Funding Options

Many recent capital projects in the United States have relied largely, if not solely, on local funding for construction and operations. Avoiding complex requirements associated with federally-funded construction projects has allowed many cities to implement more cost-effective and rapid construction and implementation of service. The following are some of the potential local sources of funding for constructing and operating transit projects.

General Obligation Bonds. Bonds are a primary source of funds for constructing major capital improvements. Voter-approved bonds are sold to provide up-front funding for transportation projects, including street and transit corridor improvements. A set of projects may be grouped into a "bond package" that goes before the public for voter approval. General obligation bonds could be supported through the city's existing property tax base, or backed with incremental increases in universally-applied city taxes, such as those on sales or property, or parking meter revenues.

Taxes

Sales Tax

General sales taxes can provide a large source of funding for transit operations or capital projects, though revenues tend to fluctuate with the overall economy introducing uncertainty year to year. While transit agencies have traditionally relied on sales tax commitments from local governments, many agencies are moving to diversify their revenue sources after the economic downtown in 2008 severely impacted operating budgets, service levels, and fares. As described above under the statewide sales tax section, H.B. 362 allowed counties to impose a 0.25% general sales tax for transportation, with voter approval. Salt Lake City (urban area) and UTA would each receive 0.10% (a tenth-cent) of the sales tax increase, and Salt Lake County would receive 0.05% (0.05 of a cent); however, Salt Lake County voters did not approve Proposition 1 on November 3, 2015 so this potential funding source is currently not available to UTA and Salt Lake City.

Payroll Tax

In this scenario, a payroll tax is imposed directly on employers served by transit. It is based on payroll for services performed within a transit district, including traveling sales representatives and employees working from home. This tax applies to covered employees and self-employed workers. Advantages include flexibility of revenues (capital and operating purposes), administrative ease, and equity.

Employee Head Tax

While not a common source of transit funding, employee head taxes can be a way to tie transit benefits to employment and economic growth. Head taxes charge employers a flat tax on each worker, typically annually. An example is the Employers' Expense Tax in Chicago, which applies to employers with more than 50 employees. The rate is $2.00 per employee per month. (This tax was repealed in 2014.)

Usage Fees

Congestion Pricing and Toll Revenue

Congestion pricing and toll revenue can provide a potential funding source for transit when coupled with improvements to transit services along the same corridor. It also increases the cost of driving, which can make transit more cost-competitive. Revenues are often flexible (operating or capital purposes) but in some cases their use is limited to a specific corridor or zone. Typically, tolls are only implemented on new roads or roads that have recently undergone major improvements.

Vehicle-Miles Traveled (VMT) Fees

The recently passed H.B. 362 included provisions directing the Utah Department of Transportation to study the feasibility of a mileage-based user fee. VMT fees have been considered by many states and municipalities, but none have been implemented for personal vehicles in the United States. Unlike tolls, VMT fees are distance-based fees that are not facility- or zone-specific.

Vehicle Registration Fee

Many communities levy a fee on residents who register a car within the jurisdiction to cover the costs associated with using the local transportation system. The revenues from this fee can be directly tied to improvements in the transportation network that benefits drivers, including transit projects and service improvements. Utah currently levies a uniform fee based on the age of the vehicle between $10 and $150 as well as a registration fee based on vehicle type, fuel type, and county.

Travel and Tourism Fees

Visitors traveling within the Salt Lake City region place demands on the transportation system. This fee would assess a tax on rental cars or hotel rooms to account for these costs and provide revenues to operate the transit system. Utah state law allows a county, city, or town to impose a transient room tax on the rental of rooms in hotels, motels, inns, trailer courts, campgrounds, tourist homes, and similar accommodations for stays of less than 30 consecutive days.

Transit Access (Utility) Fee

A transit access (utility) fee is paid by households and businesses and is a stable source of support for the transit agency over time. While only a handful of cities have adopted this revenue source, a transit access fee could be assessed for all households within the city and generate significant

revenues. Transit access fees are typically a monthly charge of between $1 and $5 per household. For equity reasons, a discounted rate for low-income households would need to be considered.

Corvallis Transit Operation Fee

In the City of Corvallis, Oregon the Transit Operation Fee (TOF) is a monthly charge to City of Corvallis utility customers to generate revenue for the exclusive purpose of funding Corvallis Transit System (CTS) operations. This revenue source was developed to replace property tax funds that previously supported transit operations and transit fares revenues. Single-family residential customers are charged $2.75 per month and multi-family residential customers are charged $1.90 per housing unit per month. Fees for commercial and industrial customers are based on the type of business.

The fee has generated consistent revenue with $1,200,000 in FY 2013–14 and slightly less than $1,200,000 in FY 2014–15. This approach provides significantly more revenue than the property tax revenue, which previously provided about $400,000 in annual revenues.

Source: City of Corvallis. Transportation Operations Fee. January 2016. Retrieved from http://www.corvallisoregon.gov/modules/showdocument.aspx?documentid=4248

Development Impact Fees

Municipalities often tax developers based on the impact of a new development on the transportation system. These fees are used to pay for infrastructure improvements that will mitigate the level of service concerns brought by the new development. This is a common fee used for road infrastructure but is increasingly being used to fund transit or transportation demand management (TDM) measures associated with new development. San Francisco, for example, collects fees to ensure the new development receives adequate transit service. Depending on local implementation, use of this revenue source can be flexible, paying for operating or capital improvements. Salt Lake City has an impact fee mechanism with funds eligible for streets, parks, and public safety projects, but not for maintenance of existing facilities. A one-year moratorium went into effect in Fall 2015 while the City updated policies to ensure funds are used within six years, as required by the impact fee ordinance.

Utah Foundation Report: Fueling Our Future, 2013-2040: Policy Options to Address Utah's Future Transportation Needs

The Utah Foundation published a report in February 2013 (Report Number 713: Fueling Our Future, 2013-2040: Policy Options to Address Utah's Future Transportation Needs) that outlined the following potential transit funding options:

- Sales tax increase of 0.25% ($3.8 billion over the next 30 years)
- 1% increase in hotel taxes ($139 million over the next 30 years)
- 1% increase in rental car tax ($71 million over the next 30 years)
- Transit property tax of $0.1 for counties in the UTA service area ($5.8 billion over the next 30 years)

Source: UTA Network Study, p. 91

Special Districts

Business Improvement District

A business improvement district (BID) is an area within which businesses pay an additional tax to enhance the area within the district's boundaries. Often used to support streetscape improvements and to activate parks and open spaces, some BIDs have funded circulator buses, transit shuttles, and bus stop amenities that improve access and enhance the sense of place in the area.

Parking Benefit Districts

Pricing parking provides a stable revenue source and also reduces reliance on single-occupant vehicles. Parking meter revenue may be prioritized to support transit services in the area where the parking fees were collected. Many cities are exploring these funding approaches for downtown areas, universities, and employment centers that have specific transit service needs.

City of Seattle Transit Benefits District

In 2010, the Seattle City Council authorized the creation of a transportation benefit district – the Seattle Transit Benefits District (STBD). Voter approval of the STBD in November 2014 authorized a 0.1% sales tax increase and a $60 annual vehicle license fee (VLF) per registered vehicle. The current VLF stands at $80 per year, with a $100 cap.

Based on state legislation, funding sources that may be used without voter approval include an up to a $20 annual VLF and a transportation impact fee on commercial and industrial buildings. Subject to voter approval, the following additional revenue sources are available:

- Property taxes (one-year excess levy or an excess levy for capital purposes)
- Sales and use tax (up to 0.2%)
- Annual VLF of up to an additional $80 ($100 total) per vehicle registered in the district
- Vehicle tolls

This funding mechanism is expected to raise $45 million per year to address overcrowding and reliability issues with Metro service and to add frequency to meet demand for more transit.

Source: SDOT. Seattle Transit Master Plan. 2016. Retrieved from http://www.seattle.gov/transportation/docs/TMP/final/TMPSupplmtALL2-16FINAL.pdf

Public-Private Partnerships

Public/private partnerships are agreements between public and private partners that can benefit from the same improvements. While traditionally considered primarily for the construction of large transit projects, they have been used in several places around the country to provide public transportation amenities within the public right-of-way in exchange for operational revenue from the facilities, such as sidewalks, bike lanes, and multi-use trails, in addition to transit services. Transit agencies can work with major employers and trip generators to help pay for transit service and facilities.

Advertising/Sponsorships

UTA permits the sale and placement of ads on many of its vehicles as a means to generate additional revenue. Revenues from advertisement currently make up approximately 1% of total revenues.

Institutional Partners

Institutions can provide financial contributions by helping fund transit operations, partnering on capital projects, and purchasing transit passes. The University of Utah is a significant demand

center for transit in Salt Lake City with more than 30,000 students and more than 17,000 faculty and staff. Four TRAX stations and more than 15 bus routes serve the campus and approximately 35% of University trips are made by transit. The University operates eight free campus shuttles, an express shuttle to Salt Lake Central Station, and provides staff, faculty, and students with transit passes.[10] The University can partner with the City and UTA to develop a recommended transit hub with layover space for UTA buses. UTA and City could also work with the University to identify high trip generators on campus and throughout the city that might warrant additional levels of service, such as the University of Utah Research Park and the University of Utah Health Sciences Center.

Other institutional partners could include the VA Salt Lake City Health Care System, state and county government offices and city agencies, or other educational institutions, such as Westminster College. Finally, the Church of Jesus Christ of Latter-day Saints, with locations throughout the city could be an important potential service partner with UTA, particularly for special events and major functions.

Transit Oriented Development and Joint Development

Property access fees, and benefit assessment districts are approaches to sharing transit costs with owners of property located near a transit resource (e.g., a transit station or a park and ride) who benefit directly from proximity to the transit resource. These funding mechanisms, sometimes referred to as land value capture, provide a way to finance transit through taxes or fees paid by nearby private development, where property values are expected to increase as a result of transit investments. Implementing strategies to capture a portion of the increase can be used to help fund public transit infrastructure. These revenues can be used for operations, administration, and capital expenses.

[10] State of the System Fact Book, Appendix A. See p. 4-20.

Summary of Existing and Potential Funding Sources

A number of the potential transit funding sources that have been used to fund transit in other cities and regions are currently available or *could* be available to the City and UTA. Some of the potential options may be less appropriate for Salt Lake City. Figure 7-5 displays a conceptual assessment of these options, organized based on their revenue potential and likely ease of implementation (estimates for revenue potential are based on high-level assumptions for illustrative purposes).

A number of the "easy" sources are already in use for existing services and programs, but a package of relatively small and easy sources is likely to be the best path to increase funding for transit in the near term. The "big and challenging" sources shown in the upper left quadrant are likely to be challenging to implement for various reasons, but could be longer term sources to contemplate. The "small and challenging" sources shown in the lower left would likely be low on the City's list of potential transit revenue sources.

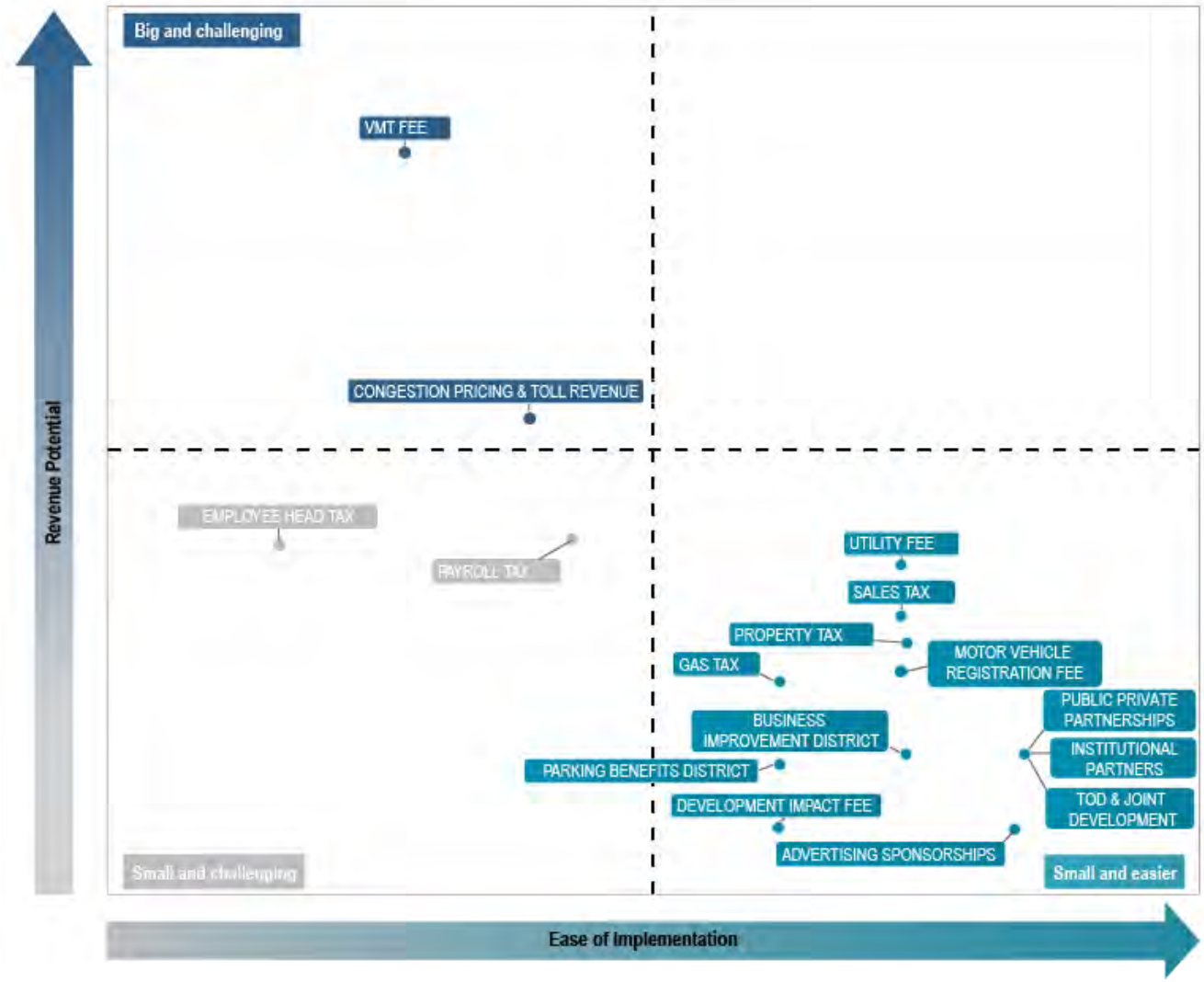
Qualitative considerations affecting ease of implementation include:

- Cost (initial and ongoing operation) and complexity of implementation
- Time frame to implement
- Need for partnerships
- Potential need for local government (e.g., City Council), state government (Legislature), and/or voter approval
- Likely political support

Issues of affordable, accessible transportation, affordable, accessible housing, and strengthening the local economy are interrelated. As funding options are considered, their applicability to a variety of City plans will allow for a more comprehensive, cost-effective approach.

The illustration of potential transit revenue sources is based on funding mechanisms used in other regions. Some of the options may be less appropriate for Salt Lake City.

Figure 7-6 Conceptual Illustration of Funding Sources by Revenue Potential and Ease of Implementation



Assumptions used for conceptual purposes in developing order-of-magnitude estimates of revenue potential included:
Utility fee: Monthly fee of approximately $3 per housing unit (range of $1 to $5 monthly possible based on peer cases.
Gas Tax: Rate of 2 cents per gallon; current Utah statewide gas tax is 24.5 cents.
Property Tax: Rate of 0.01%; current tax rate is 0.015288%.
Sales Tax: Rate of 0.01%. As noted above, H.B. 362 allowed counties to impose a 0.25% general sales tax for transportation, with voter approval. Salt Lake City (urban area) and UTA would each receive 0.10% (a tenth-cent) of the sales tax increase, and Salt Lake County would receive 0.05% (0.05 of a cent); however, Salt Lake County voters did not approve the tax.
Payroll Tax: Rate of 0.01%, applied to covered private employment (i.e., subject to the National Labor Relations Act).
Employee Head Tax: Rate of $12 per employee annually at firms of 100 people or more.
Congestion Pricing & Toll Revenue: $0.50 charge per vehicle within a downtown zone for 250 days per year.
VMT Fee: Rate of 1 cent per mile, applied to per capita VMT of about 9,339 (Source: Salt Lake City Carbon Footprint Report, 2010).
Development Impact Fee: $75 per new residential unit and $0.25 per square foot of new commercial development.
Parking Benefits District: Assumes 25 cents per hour over 12 metered hours per day with parking occupancy of 60%.
Motor Vehicle Registration: $5 fee per year. As noted above, current fees in Utah range from $10 and $150.
Business Improvement District, Public Private Partnerships, Institutional Partners, and TOD & Joint Development: Revenue potential is highly dependent on specific cases.

TRANSIT SERVICE DELIVERY

Cities around the country are investing resources in their transit systems and expect greater accountability from their transit provider. A key outcome of the Transit Master Plan is to define an approach to delivering local service that is more responsive to Salt Lake City's needs and desired outcomes. A focus of the Transit Master Plan has been to build on the strong existing partnership between the City and UTA, and implementation of the Transit Master Plan relies on continued collaboration and partnership between the City and UTA. This section explores a range of options for how the City could structure its relationship with UTA and influence the delivery of transit to achieve the plan's goals – most importantly, to achieve the highest quality public transit services for current or potential future passengers.

Transit Master Plan Recommendation

Given the already strong City-UTA partnership that the plan has built upon, the Transit Master Plan recommends developing a local service delivery approach that strengthens this relationship and provides the City with additional accountability. The City and UTA should develop an agreement or memorandum of understanding (or a set of agreements) that comprehensively and clearly outlines mutual responsibilities, decision-making structure, and commitments to promote transparency and ensure accountability. The FTN, which represents the City's policy vision for frequent service corridors and service levels, is a key area that could be addressed in such as agreement. The City can provide local funding support to increase frequency and hours of operation on high priority corridors and implement capital improvements that enhance transit speed and reliability; the City controls management of streets and public right-of-way and is well-positioned to take on such a role. UTA can commit to maintain frequent, stable, and consistent service on FTN corridors once implemented, provided service standards are met. The City and UTA can also partner to implement specific services such as the recommended on-demand ride services partnership. Funding partnerships, described above, would help the City work with UTA to support implementation of the plan vision, similar to what cities such as Boulder and Seattle have done to support their priorities.

On the other hand, contracting local service would entail a host of complex funding and governance issues that Salt Lake City would need to resolve, and risks making the transit passenger experience more complex. These issues include:

- Lack of a substantial dedicated local funding source for transit operations, which is necessary to ensure stable and consistent service; the operating cost for local bus routes serving Salt Lake City was nearly $16 million in 2014 [11]
- State or other legal restrictions, including restrictions on accessing federal funds
- Service coordination/integration between local and regional services, including service that crosses city limits.
- Fare/fare policy implications, including transfers and revenue sharing
- Americans with Disabilities Act (ADA) implications, including responsibility for bus stops and complementary ADA Paratransit service
- Significant cost and staffing requirements
- Control over decision-making and plan implementation

[11] State of the System Fact Book, Appendix A.

City-UTA Collaboration

The City and UTA have been working in close collaboration throughout development of the Transit Master Plan. Continuing to build on this working relationship, grounded in a mutual commitment to providing high-quality transit service will be critical to carrying out and securing funding for the plan's recommendations.

Several of the key areas identified in the plan where a range of City departments and UTA will need to work together include:

- Jointly develop the 200 S corridor as an initial, pilot branded bus corridor, with coordinated service, capital facility, and transit-supportive improvements
- Develop an approach for improving service on FTN corridors (i.e., where the City would like to prioritize frequent service) that are outside of the UTA Core Network of frequent service routes
- Develop a standardized branding approach for frequent service corridors, including an approach for routes/corridors that extend beyond Salt Lake City
- Prioritize implementation of the next phases of frequent service, enhanced bus, and/or BRT corridors
- Define the parameters for and work to establish partnerships for pilot employer- and residential-oriented shared ride services
- Rollout real-time information and improve pedestrian and bicycle access to transit stops along the FTN and other corridors
- Develop (or support private sector development of) a multimodal trip planner that helps people link seamlessly between modes
- Pursue a potential funding measure to provide funding for transit operations, capital improvements, and supportive programs

The City and UTA will need to define areas of mutual agreement and areas that will require joint decision-making. While some of these areas can be anticipated, most importantly the City and UTA will need to adapt to changing circumstances throughout the life of the plan, and address issues and concerns as they emerge.

Potential Service Delivery Options

A range of potential service delivery structures are available in Salt Lake City. Options range from maintaining regional agency operations (the status quo), strengthening a City-Transit Agency partnership (recommended approach), and contracting all local service (to UTA or a third-party). Operating transit in-house is not considered. These options are briefly described below including the key benefits and challenges, and peer examples.

Regional Agency Operation (Status Quo)

Similar to today, a single regional agency, UTA, would operate both local and regional transit service in Salt Lake City. This service delivery option would maintain the benefits of the current service delivery structure. It would not entail a significant effort to reorganize transit governance and operations, as would be required with some other options. It is important to recognize that UTA has been an engaged and closely involved partner throughout the City's Transit Master Plan process and shares many aspects of the City's transit vision and goals. However, UTA must also balance meeting regional obligations and manage its own internal constraints, such as union rules.

Description	UTA, the regional transit agency for a six-county service area, operates local and regional transit service within and to/from Salt Lake City
Key Benefits	▪ UTA has been a willing and engaged partner in the City's Transit Master Plan process and shares many aspects of the City's transit vision and goals ▪ City staff can focus efforts on implementing Transit Master Plan recommendations rather than on a potentially major reorganization of transit service delivery and governance; the City does not need to take on the large-scale infrastructure and staffing needed to directly operate transit ▪ Trips across city boundaries are transparent to the customer; people focus on where they want to travel to and from ▪ Maintains a unified local and regional system, including fare policy and transit information
Key Challenges	▪ More limited opportunity for the City to influence service planning, design, and implementation compared to a City-led local service delivery model ▪ As a regional provider, UTA must balance regional obligations with Salt Lake City's needs ▪ UTA may not be able to overcome organizational or institutional barriers that prevent it from being more responsive to Salt Lake City's needs
Peer Examples	▪ In Denver, CO, the Regional Transportation District (RTD) provides local and regional service in the city. ▪ This service model is prevalent in many cities and regions. Additional examples highlighted within the discussion of other models include a large number of cities and regions where cities have developed incremental transit programs or contracting approaches, often in partnership with the regional provider.

City-Transit Agency Partnership (Recommended)

In various cities where the local and regional transit system is primarily operated by a regional agency (i.e., UTA), cities have incrementally expanded oversight and management of selected local transit routes or services. This provides the city with more influence over these services and ability to meet local transit needs. It also creates potential challenges such as multiple fare systems, local and regional system coordination, additional responsibilities for existing staff or additional costs for new staff, and more complex governance of transit service. In some cases, cities partner with regional transit agencies to implement this type of structure, which can reduce the barriers and complexity.

Description	City provides targeted local service through an interlocal agreement with the transit agency or a third-party contractor. (This is similar to the GREENBike model used in Salt Lake City or the peer models highlighted below.) UTA would continue to operate other local and regional service.
Key Benefits	▪ City has more control over selected local transit services ▪ City may be able to deliver local services at lower cost if operated by a private contractor
Key Challenges	▪ Potential issues include local and regional service coordination ▪ Additional responsibilities for existing city staff and more complex governance
Peer Examples	In Seattle, WA, SDOT (City) owns and operates the Seattle Streetcar through an interlocal agreement with a regional transit provider, King County Metro. The City of Seattle developed a transit master plan to articulate local transit priorities and developed local funding sources to support these priorities. The City partners with King County Metro to invest in bus service frequency and service span. The City developed the Seattle Transit Benefits District (STBD) to provide funding for service investments. SDOT pays for additional Metro service through this local funding source, purchased on a per-hour basis (with a fully-loaded cost including capital). City staff also plan and implement transit capital improvements, working in close coordination with King County Metro. In Boulder, CO, RTD provides both local and regional transit service. The City of Boulder developed the Community Transit Network (CTN), which includes seven local bus routes operated primarily by RTD, but with smaller, community-oriented buses and a high level of service. The City subsidizes, or buys-up, service on selected routes. When high service levels are warranted based on RTD's service standards, the agency has assumed financial responsibility. The City contracts operation of one CTN route, the HOP, to a local non-profit, VIA. In Portland, OR, TriMet provides local transit service within the city of Portland and regional service to in a tri-County area. The City of Portland owns and operates Portland Streetcar, in partnership with TriMet. The City contracts with a non-profit entity, Portland Streetcar, Inc., that manages and operates the Streetcar. Operations staff include both City and TriMet personnel.

City Contracts Operation of All Local Service

Salt Lake City could assume responsibility for all local service and contract it out. This would maximize its control over local transit service delivery, but entails a variety of practical issues. There are two potential options, contracting service to UTA or contracting to a third-party contractor. (Alternatively, Salt Lake City could operate service in-house instead of contracting to a third-party; this option is not discussed in detail, but entails a significantly greater level of effort and commitment than contracting service). Related to all of these options, it should be emphasized that Salt Lake City lacks a dedicated, long-term transit funding source, an essential element to make any of these approaches feasible given the need for service to be stable over time.

City Contracts Operation of Local Service to UTA

If the City contracts with UTA to operate local service, UTA would continue to operate the majority of local and regional service. The City would be able to define how service is provided, but as a single provider UTA could determine how to provide it most efficiently.

Description	City contracts with the regional transit agency (i.e., UTA) to operate all local service through a formalized procurement process, resulting in a contract between government agencies known as an interlocal agreement; this is a more formalized agreement and requires legislative approval.
Key Benefits	▪ City exercises more control over local transit service provision ▪ Maintains local and regional transit service under a single provider ▪ Passengers experience little change in transit service operations ▪ Maintains a unified regional fare system and transit information
Key Challenges	▪ Additional responsibilities for existing City staff and more complex governance ▪ Requires development of a dedicated local transit funding mechanism; funding and potential legal and legislative issues are likely to be significant and require extensive study
Peer Examples	

City Contracts Operation of All Local Service to a Third-Party

Alternatively, the City could contract all local service to a third-party transit provider, either a non-profit or a private operator. UTA would continue to operate regional service. The City would have more control over local service but it would likely be challenging to integrate multiple providers to ensure a seamless passenger experience, including local/regional service coordination, fares, and transit information.

Description	City contracts with a third-party to provide local service through a formalized procurement process (e.g., Request for Proposals). UTA continues to provide regional service. UTA could also bid on and be awarded the contract, which would result in the previous option.
Key Benefits	▪ City exercises more control over local transit service provision through a formalized procurement process
Key Challenges	▪ With multiple providers, need to resolve issues including service across city limits, i.e., UTA routes currently provide local service within Salt Lake City ▪ Increased complexity of local and regional service coordination, fare policy, responsibility for ADA Paratransit service, and responsibility for bus stop conditions and ADA accessibility ▪ Significant expanded responsibilities for City transit program staff and additional administrative staff time and resources would be needed to transition to a City-led local service delivery model ▪ Requires development of a dedicated local transit funding mechanism; funding and potential legal and legislative issues associated are likely to be significant and require extensive study ▪ A competitive bidding process carries the risk that the lowest bid may not provide the best value from a customer perspective; the procurement process should incorporate a best value selection approach.
Peer Examples	▪ In Phoenix, AZ, Valley Metro provides regional and local transit (bus and rail). It has statutory authority to allocate some funds to separate municipal transit providers. On behalf of Valley Metro, First Transit provides bus service for the City of Tempe. First Transit utilizes the Valley Metro fare system and brand, providing a seamless travel experience for users across the region. ▪ In Alexandria, VA, the DASH System operates local service within city limits. Arlington County also operates transit service to several other cities within the Washington Metropolitan Area Transit Authority (WMATA) service area. A regional fare collection system is in place to ensure revenue sharing between the transit providers. ▪ In Chapel Hill, NC, Chapel Hill Transit (CHT) provide bus service to the cities of Chapel Hill and Carrboro as well as the University of North Carolina (UNC) campus while regional transit is provide by Triangle Transit. ▪ In Los Angeles, CA, LADOT (City) operates a local and commuter express bus service known as the DASH that supplements the regional transit system. This service has been incrementally expanded, replacing transit routes formally served by the regional transit provider, the Los Angeles Metropolitan Transportation Authority (Metro). ▪ In both the Portland, OR, and Minneapolis, MN regions, state and/or regional legislative mechanisms have been developed that allow smaller jurisdictions to withdraw or opt-out of the Metro Transit service district. These providers have the option of contracting service or operating it in-house. None of these jurisdictions are comparable in size to Salt Lake City, however.

Note: Some of the peer examples include cities that operate local transit in-house. These options are instructive as to the benefits and challenges of operating local service; however, Salt Lake City does not desire to operate service in-house due to the significant staff and financial resources required to become a full-service transit provider.

MEASURING SUCCESS

Salt Lake City will work closely with UTA to develop a performance monitoring process that documents continued progress toward the vision laid out in the Transit Master Plan. Building off of UTA's Year in Review, which provides an overview of system performance, special projects, and upcoming initiatives, Salt Lake City should publish an annual Report on Transit Master Plan Progress.

Some measures will track the quantitative performance of the UTA transit system in Salt Lake City, while others will more qualitatively track how transit has supported economic development and placemaking. Capturing the complete picture of success – how transit supports vulnerable populations, job access, environmental goals, and overall quality of life – will help communicate progress to the public and position the City and UTA to continue to invest in a high quality transit system in Salt Lake City.

Figure 7-7 provides a summary of the goals outlined in Chapter 1 and associated performance measures and data sources to document progress toward Transit Master Plan goals.

Figure 7-7 Transit Master Plan Performance Measurement Process

Transit Master Plan Goal	Goal Description	Performance Measure (s)	Data Source
Improve air quality	Reduce vehicle miles traveled per capita	▪ Per capita vehicle miles traveled (VMT) ▪ Transit mode share	Federal Highway Administration or best local source for VMT estimates; e.g. regional model, SLC Carbon Footprint, etc. (VMT) Census (transit commute mode share)
Increase the number of people riding transit	Make transit useful for more types of trips	▪ Percent of transit trips for work or school ▪ Percent of transit trips for non-commute or school	UTA On-Board Survey (If a question does not already exist, consider adding a question about trip type)
	Improve competitiveness of transit with auto travel	▪ Ridership ▪ On-time performance ▪ Service hours in Salt Lake City ▪ Travel and access time for transit trips compared to auto trips for 3-5 key origin/destination points	UTA (ridership, on-time performance, service hours) Google (travel time competitiveness)
Provide a safe and comfortable transit access and waiting experience	Improve bicycle and pedestrian access to transit	▪ % of streets that have sidewalks within ½ mile of a frequent transit network stop ▪ % of frequent transit network stops that are within ½ mile of a bikeway or low-stress bikeway	Salt Lake City
	Improve the transit waiting experience and universal accessibility of stops and stations	▪ Passenger comfort rating ▪ % of frequent transit network stops (that meet ridership threshold) with shelters	UTA On-Board Survey (If a question does not already exist, consider adding a question about the transit waiting experience) Salt Lake City & UTA

Transit Master Plan Goal	Goal Description	Performance Measure (s)	Data Source
Provide access to opportunity for vulnerable populations	Design a transit network that supports daily needs including access to jobs, education, etc., for transit-dependent populations	▪ % of transit dependent populations that live within ¼ mile access to frequent transit network ▪ % of transit dependent populations that work within ¼ mile access to frequent transit network	Salt Lake City & UTA American Community Survey
	Provide affordable transit options, particularly for low-income households	▪ Cost of transit fares ▪ Discount pass usage	UTA
Create economically vibrant, livable places that support use of transit	Align transit investments with transit-supportive land use policies and development	▪ % of new office, mixed-use, and multi-family housing development within ¼ mile of a frequent transit stop	Salt Lake City
	Catalyze economic development and jobs in Salt Lake City by providing effective transit service that employers, businesses, and the development community can depend upon	▪ Job growth within ¼ mile of the frequent transit network ▪ Amount of new or redeveloped square footage within ¼ mile of frequent transit network	Salt Lake City

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The Salt Lake City Transit Master Plan is a Salt Lake City document. It has been prepared by the Salt Lake City Transportation Division in coordination with multiple City divisions and other community and regional organizations.

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Salt Lake City TRANSIT MASTER PLAN

Appendices

2017

APPENDICES

APPENDIX A: STATE OF THE SYSTEM

APPENDIX B: COMMUNITY OUTREACH

APPENDIX C: GAPS ANALYSIS

APPENDIX D: TRANSIT SCENARIO ANALYSIS

Appendix A: STATE OF THE SYSTEM

Salt Lake City
TRANSIT MASTER PLAN

STATE OF THE SYSTEM

Fact Book

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1 INTRODUCTION

BACKGROUND

The Salt Lake City Transit Master Plan responds to community and policy mandates to improve public transportation for the benefit of all members of the community. The City's overall Transportation Master Plan emphasizes providing choices in travel and reducing dependence on the single occupant automobile. Both the City Council and the Mayor have adopted policy statements about the importance of continued improvements and investment in public transportation. Finally, residents and other community leaders have also expressed strong support for accessible, safe, reliable, affordable public transportation.

In September 2013, the Salt Lake City Council crafted goals to enhance transit quality and transit passenger experience for Salt Lake City residents and workers. The Transit Master Plan was initiated to help the City and Utah Transit Authority (UTA) partner to meet Council goals and find new resources to expand transit use and value to the community. The project officially launched in January 2015. The schedule for the project is shown at the end of this chapter.

PROJECT OVERVIEW

The Transit Master Plan will help Salt Lake City and UTA set priorities for the next 20 years, guide decisions about the timing and location of capital investments, and increase the use of transit citywide. The Plan will include an in-depth analysis of how people are traveling today, the strengths and weaknesses of the current mass transit system, and projections for future growth to identify a network of corridors for investment.

Salt Lake City is leading the Plan and is focusing on identifying transit needs, desires and investments that will benefit the whole city rather than any one neighborhood. However, it will build on and coordinate with other local and regional planning efforts and will be developed in close coordination with Utah Transit Authority, city departments, and regional agencies. The Plan also hinges on an inclusive public process to ensure community needs and desires are captured.

Why a Transit Master Plan for Salt Lake City?

- Increase safe, reliable, and affordable transportation options for city residents
- Foster business relationships and economic development
- Accommodate urban growth in a sustainable, cost-effective manner
- Provide access to jobs, housing, and recreation
- Enhance partnerships with UTA
- Represent the community's ideal network of buses, trains, and streetcars

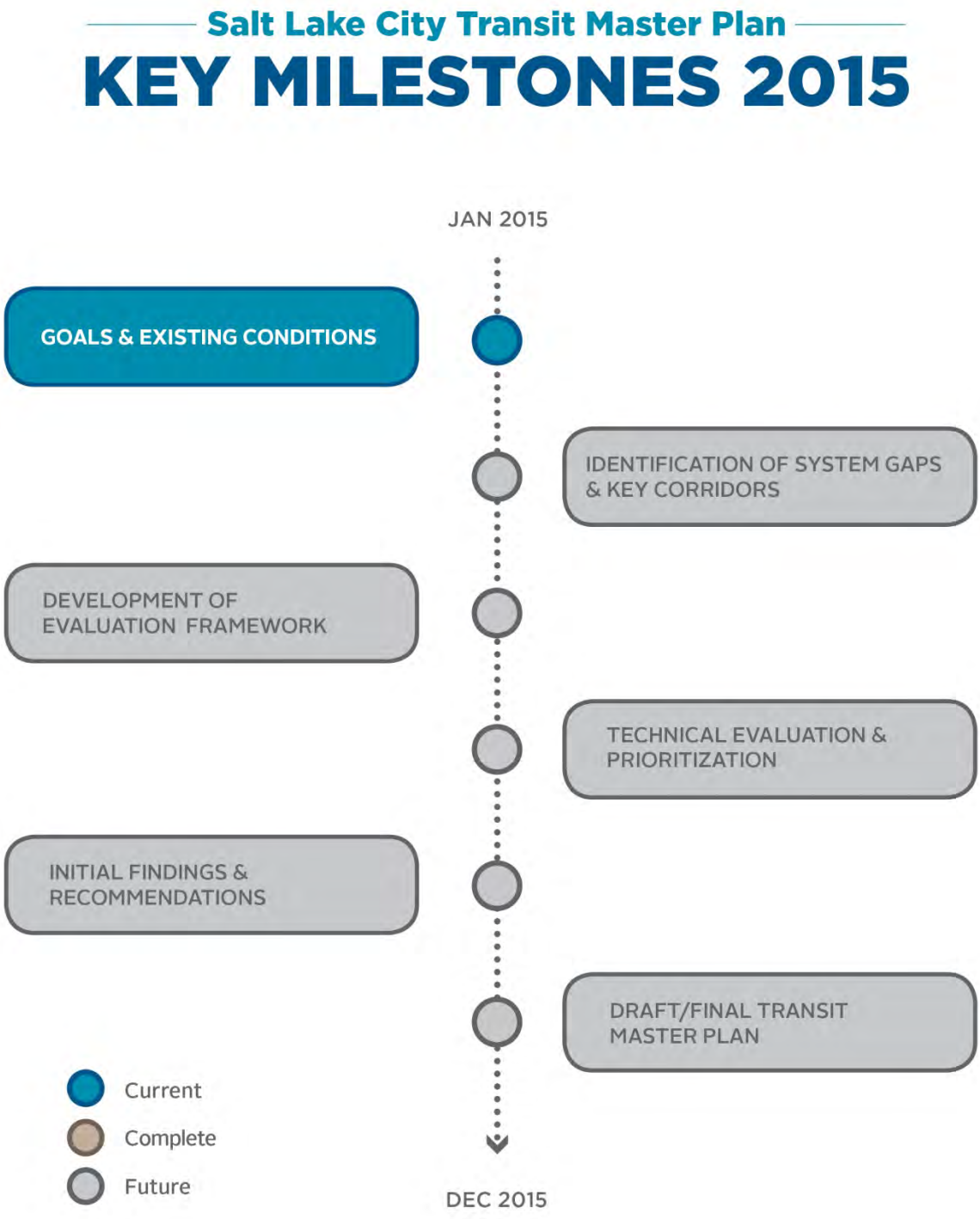
REPORT ORGANIZATION

This report describes existing conditions for transit and identifies key factors – such as travel demand and land use patterns – that affect the performance of transit in Salt Lake City. It serves as a foundation for service and capital policies and recommendations to be developed in later phases of the project.

This report is organized into seven chapters:

1. **Introduction**: Overview of the Transit Master Plan, its goals, schedule, and key outcomes, and introduction to this report
2. **Existing Plans, Policies and Goals**: Summarizes the preceding planning and policy work upon which the Transit Master Plan will build
3. **Travel Demand and Transit Market Analysis**: Analyzes current travel behavior and a variety of factors that influence current and future travel behavior
4. **Transit Service in Salt Lake City**: Provides an overview of existing transit service in Salt Lake City and its performance as well as transit system expansions and enhancements planned for the future
5. **Who Rides Transit**: Describes the demographics and other characteristics of current Salt Lake City transit riders
6. **Amenities and Access to Transit**: Summarizes access to transit and amenities that are available at transit stations and stops
7. **Conclusion**: Summarizes findings from the review of existing conditions

Figure 1-1 Salt Lake City Transit Master Plan Schedule



2 EXISTING PLANS, POLICIES, AND GOALS

Salt Lake City has done considerable planning that is relevant to the Transit Master Plan. This chapter summarizes key themes from these prior efforts. This review of past plans will be used during the next phase of study to inform development of the Transit Master Plan's goals and priorities. A full summary of the purpose, goals/vision, policies/principles, and recommended strategies from each of the previous planning efforts is included in Appendix A. The following plans were considered in this summary:

Salt Lake City Transportation Plans/Policies:

- City Council Goals for Transit (Retreat 2013)
- Complete Streets Policy (2010)
- Downtown in Motion (2008)
- Salt Lake City Transportation Master Plan (1996)
- DRAFT Pedestrian and Bicycle Master Plan (2015)
- Sugar House Circulation and Streetscape Amenities Plan (2013)
- Sugar House Alternatives Analysis (2013)

Utah Transit Authority Plans/Policies:

- UTA First/Last Mile Study (in progress)
- Five Year Service Plan (2013)
- UTA Network Study (2013)
- UTA Strategic Plan (2013)

Salt Lake City Land Use/Sustainability Plans/Policies:

- Sustainable Salt Lake Plan (2015)
- DRAFT Salt Lake City Downtown Community Plan: Story of Our Future (2014)
- DRAFT Plan Salt Lake (In progress)
- West Side Master Plan (2014)
- Mayor's Livability Agenda (2012)
- City Council Philosophy Statements (2012)
- North Temple Boulevard Master Plan (2010)
- Downtown Rising (initiated in 2006)
- Sugar House Master Plan (2005)
- Central Community Master Plan (2002)

Regional Plans/Policies:

- Wasatch Choice for 2040
- Wasatch Front Regional Council Regional Transportation Plan (2011)
- Utah's Unified Transportation Master Plan (2011)
- Envision Utah

Key Themes from Prior Planning Efforts

Transportation, and public transit specifically, are prevalent throughout Salt Lake City's planning efforts. Throughout prior and current plans, the availability of safe, high quality, convenient transportation choices is seen as a critical tool to support achievement of broader outcomes, e.g. health, economic competitiveness, and quality of life. Several plans also include goals, policies, and specific targets that address design and performance of the public transit system.

Common themes that appeared in past planning efforts related to transportation were:

- Providing transportation choices
- High quality transit system
- Multimodal transportation
- Opportunity for all (equity)
- Health and safety
- Economic vitality/economic development
- Efficiency/effectiveness
- Sustainability
- Quality of life and culture
- Engagement/inclusivity/community building
- Coordination/partnership

The Transit Master Plan will refine the transit-related goals and further clarify how transit can support the broader goals under each of these themes. One of the next phases of the project is to refine the goals adopted by the City Council in 2013, shown below. The information presented here will be used to support this effort. Fortunately, there are many commonalities among the goals and aspirations put forth by Salt Lake City, UTA, and the regional agencies related to performance of the transit system which provides a solid base on which to build.

The figure on the following page provides more specifics under each key theme, and calls out specific numerical targets from past plans related to each theme.

City Council Adopted Goals for Transit (2013)

- **Ease of Use:** Anyone in Salt Lake City can get from Point A to Point B using only one transfer
- **Affordability:** Cost for service should be scaled to the length of each trip – or everyone should get a transit pass
- **Destinations:** Everyone should be able to get to two transit routes within a quarter mile of where they live or work
- **Time of Day:** Mass transit hours of operation should mirror the times people leave and return from work and play
- **Immediacy:** Mass transit service should be available every 10 minutes so people can presume service
- **Route Reliability:** Routes should remain stable so residents and developers can make transit part of their long-term housing choice

Figure 2-1 Key Themes and Targets from Prior Planning Efforts

Salt Lake City Plans	UTA and Regional Plans	Specific Targets Relevant to Transit
Quality Transit System		
▪ Frequency: Frequent enough service that riders don't have to consult schedules ▪ Service span: Match breadth of service to all people's daily needs (not just commute trips) ▪ Easy to use and understand: System is legible and convenient; increase awareness of system ▪ Connected and direct: Allow for one-seat rides to major destinations ▪ Access: Improved amenities at bus stops and access to stops; improve last mile connections ▪ Coverage: Service for all Salt Lake residents ▪ Stable and reliable: Limit services changes and provide service people can count on	▪ Frequency: Increase route frequency (UTA) ▪ Service span: Increase daily service span (later in evening), add weekend service (UTA) ▪ Easy to use and understand: Improve system simplicity; establish frequent transit network (UTA) ▪ Connected and direct: Improve route directness (UTA) ▪ Access: Improved amenities at bus stops and access to stops; Improve last mile connections (UTA) ▪ Increase service: Increase service to major activity centers and to target new customers (UTA)	▪ Every downtown resident/worker within a 1/4 mile of a light rail, street car or bus route with 15 minute service or less (Salt Lake City Downtown Community Plan) ▪ Public transit within quarter mile of all homes (Plan Salt Lake) ▪ Two transit routes within a quarter mile of every resident's home or work (City Council 2013 goals) ▪ 10-minute service frequency (City Council 2013 goals) ▪ Creating an interconnected network of routes with 10-minute headways (UTA Network Study)
Multimodal Transportation		
▪ Provide transportation choices ▪ Complete streets (safely accommodate pedestrians and bicyclists) ▪ Optimize pedestrian experience, prioritize walking as core mode of transportation, pedestrian-oriented design ▪ Parking policies that support multimodal transportation system	▪ Improve first mile/last mile connections (UTA) ▪ Active transportation improvements, integration with transit (UTA) ▪ Variety of interconnected transportation choices (regional)	▪ Double transit ridership by 2020 and double it again by 2040 (Salt Lake City Downtown Community Plan) ▪ Double transit ridership (UTA Five Year Service Plan, UTA 2020 Strategic Plan) ▪ More evenly balanced mode share (Salt Lake City Downtown Community Plan)
Opportunity for All (equity)		
▪ Transportation system should be accessible to all income levels ▪ Access to opportunity for all regardless of age, ability, or income	▪ Develop new fare products and equitable fare policies (UTA) ▪ Housing and transportation choices for people at all life stages and incomes (regional)	▪ Reduced-cost transit pass program for Salt Lake City residents (Salt Lake City Downtown Community Plan) ▪ Expand fare-free zone (Downtown in Motion)

Salt Lake City Plans	UTA and Regional Plans	Specific Targets Relevant to Transit
Sustainability		
Sustainable transportation choices		
▪ Reducing use of single-occupancy vehicles/ decrease auto dependency ▪ Providing incentives for the use of transit and other non-auto modes	▪ Increase transit ridership ▪ Attract new markets for transit riders (UTA)	▪ Transportation services that result in a zero carbon footprint (Sustainable Salt Lake) ▪ Reduce Single Occupancy auto trips (Plan Salt Lake) ▪ Reduce growth in per capita vehicle miles of travel (Wasatch Choice 2040) ▪ Vehicle emissions resulting from the transportation projects proposed in the 2040 RTP may not exceed the level or "budget" set for them in the SIP (WFRC Regional Transportation Plan)
Sustainable growth		
▪ Sustainable growth, e.g. transit-oriented development ▪ Encourage sustainable mixed-use urban living ▪ Increased intensity/density	▪ Partner to support UTA station area planning processes and transit-oriented development (UTA) ▪ Compact development (regional) ▪ Jobs/housing balance (regional) ▪ Integration between local land use and development centers with regional transportation (regional, UTA)	
Clean air / emissions / environmental initiatives		
▪ "Green" city ▪ Reduce emissions ▪ Alternative fuels for mass transit systems for cleaner air ▪ Zero carbon footprint ▪ Integration of green infrastructure into rights-of-way and transportation network	▪ Clean air initiatives (UTA) ▪ Balanced fleet of alternative fuel vehicles (UTA) ▪ Protect and enhance the environment (regional)	
Health and Safety		
▪ Encourage active transportation modes ▪ Promote bicycling and walking as ways to enhance personal health ▪ Clean air ▪ Provide parks and natural spaces ▪ Safety for all modes of transportation	▪ Ensure public health and safety (regional)	▪ Decrease pedestrian, bike, and auto accidents (Plan Salt Lake) ▪ Zero fatalities (UDOT Unified Transportation Master Plan)

Salt Lake City Plans	UTA and Regional Plans	Specific Targets Relevant to Transit
Economic Vitality/ Economic Development		
▪ Support a vibrant economy ▪ Transportation investments that yield economic benefits ▪ Utilize transit as a catalyst ▪ Mobility as a competitive advantage in 21st century economy	▪ Promote economic benefits of transit (UTA) ▪ Enhance/strengthen regional economy (regional)	▪ Investment in high quality street infrastructure yields increases in residential and commercial property values and retail activity (North Temple Boulevard Master Plan)
Efficiency/ Effectiveness		
▪ Integrated, efficient system for all modes	▪ Service efficiency/effectiveness (UTA) ▪ Reduce duplication of service (UTA) ▪ Efficient public infrastructure (regional) ▪ Maintain and preserve infrastructure (regional)	▪ Increase levels of service by 50% (UTA Network Study, UTA 2020 Strategic Plan) ▪ Reduce average customer trip time by 25% (UTA Network Study, UTA 2020 Strategic Plan) ▪ Improve reliability on key bus routes (UTA Network Study)
Quality of Life and Culture		
▪ Reinforce community identity, enhance quality of life, e.g. through art and high quality design ▪ Livability ▪ Memorable streets that help define unique character of the city and of neighborhoods ▪ High aesthetic standards, high quality public spaces ▪ Encourage vibrancy and interaction ▪ Welcoming, green, international community ▪ Embrace arts, culture, and entertainment	▪ Strengthen sense of community (regional) ▪ Keep Utah beautiful, prosperous, healthy, and neighborly for future generations (regional)	
Engagement/ Inclusivity/ Community Building		
▪ Inclusivity, engagement, and community building ▪ Support broad community engagement ▪ Facilitate civic, cultural, recreational, and economic interactions ▪ Stronger relationships (local businesses, entertainment, and arts organizations)		

Salt Lake City Plans	UTA and Regional Plans	Specific Targets Relevant to Transit
Coordination/ Partnership		
▪ Balance regional/local needs: Ensure travel within Salt Lake is as easy as travel to Salt Lake from other regional destinations ▪ Integration of jobs, housing, and transportation planning	▪ Public-private partnerships to leverage UTA assets to generate revenue that can support more transit service (UTA) ▪ Partner with communities and external stakeholders (UTA) ▪ Promote regional collaboration (regional) ▪ Integrated decision-making based on comprehensive understanding of impacts (regional) ▪ Coordinate transportation with regional employment, housing, educational and activity centers (regional)	

3 TRAVEL DEMAND & TRANSIT MARKET ANALYSIS

INTRODUCTION

Assessing the current market for public transportation – within Salt Lake City, between its neighborhoods, and between Salt Lake City and the region – is a foundational component of the Transit Master Plan. The population of Salt Lake City is projected to grow by 19% to 250,800 by 2040. Employment is also projected to grow by 8% to 313,300 by 2040.[1] Understanding how transit can serve a growing population and workforce is a key outcome of the Transit Master Plan.

Extensive industry research shows that the built environment significantly impacts travel behavior; this includes land use density and mix of uses, neighborhood form and urban design, and connectivity in the transportation network. Demographics (income, household size, age, etc.) are also important determinants of transit demand.

This chapter explores travel patterns, demographic trends, land use patterns, and how these factors influence demand for transit in Salt Lake City. Each of the following topics is explored in turn to reveal the current and emerging transit markets in Salt Lake City:

- Existing and future land use patterns
- Existing and future residential and employment density
- Major growth areas
- Transit-dependent populations
- Current mode choice and employment patterns
- Transit use patterns
- Overall travel patterns

A note on terminology: For clarity, the term "downtown" in this document is defined according to the area's master plan. A large portion of this zone does not have much density or travel demand today, but is planned to have substantial future growth. Downtown includes the Central Business District, Central City, and East Downtown, which are the densest concentrations of population and jobs in the whole city.

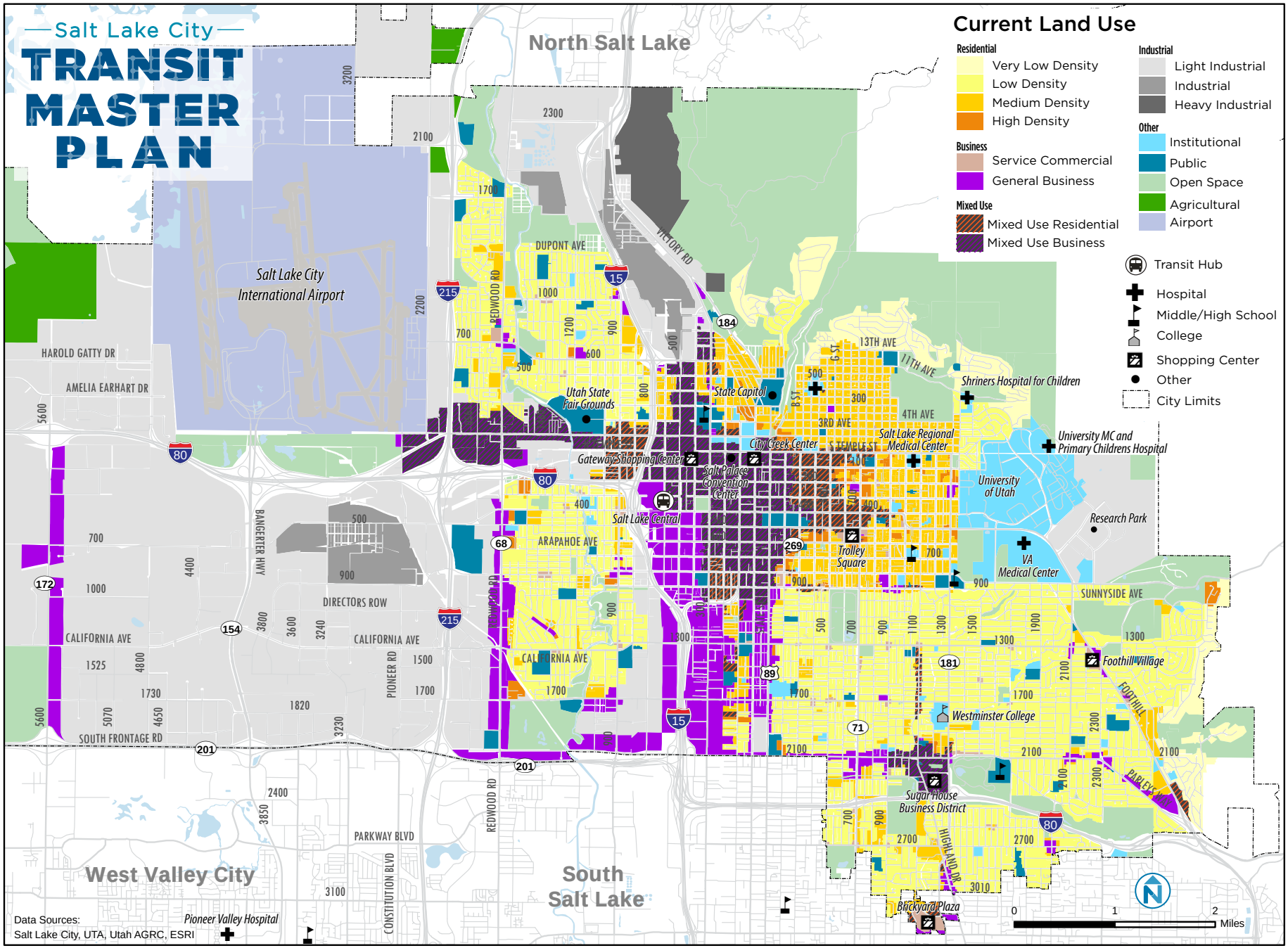
[1] Wasatch Front Regional Council Population and Employment Projections. These projections show 210,381 residents and 291,121 employees in Salt Lake in 2015. www.wfrc.org/new_wfrc/index.php/resources/data

WHAT ARE THE EXISTING LAND USE PATTERNS?

Figure 3-1 shows existing land use designations in Salt Lake City.

- **Mixed-use development** is concentrated in and around downtown Salt Lake City, extending northward into Capitol Hill, and along the TRAX Green Line to the airport in the west.
  - Zoning transitions from mixed-use business in the core of downtown to more residential mixed-use character in east downtown.
  - Sugar House Business District is also zoned mixed use business.
- The TRAX light rail lines are generally supported by mixed-use residential and **business** designations throughout the city.
  - The S-Line streetcar and Redwood Road corridors are also zoned for **business.**
- The west third of the city, west of Highway 215, is designated **industrial.**
- Much of the rest of Salt Lake City is zoned **residential.**
  - Most neighborhoods are low density residential.
  - The areas east and north of downtown are medium density residential (including East Central to the University of Utah, the Greater Avenues, and Capitol Hill)

Figure 3-1 Existing Land Use



WHERE DO PEOPLE LIVE AND WORK IN SALT LAKE CITY?

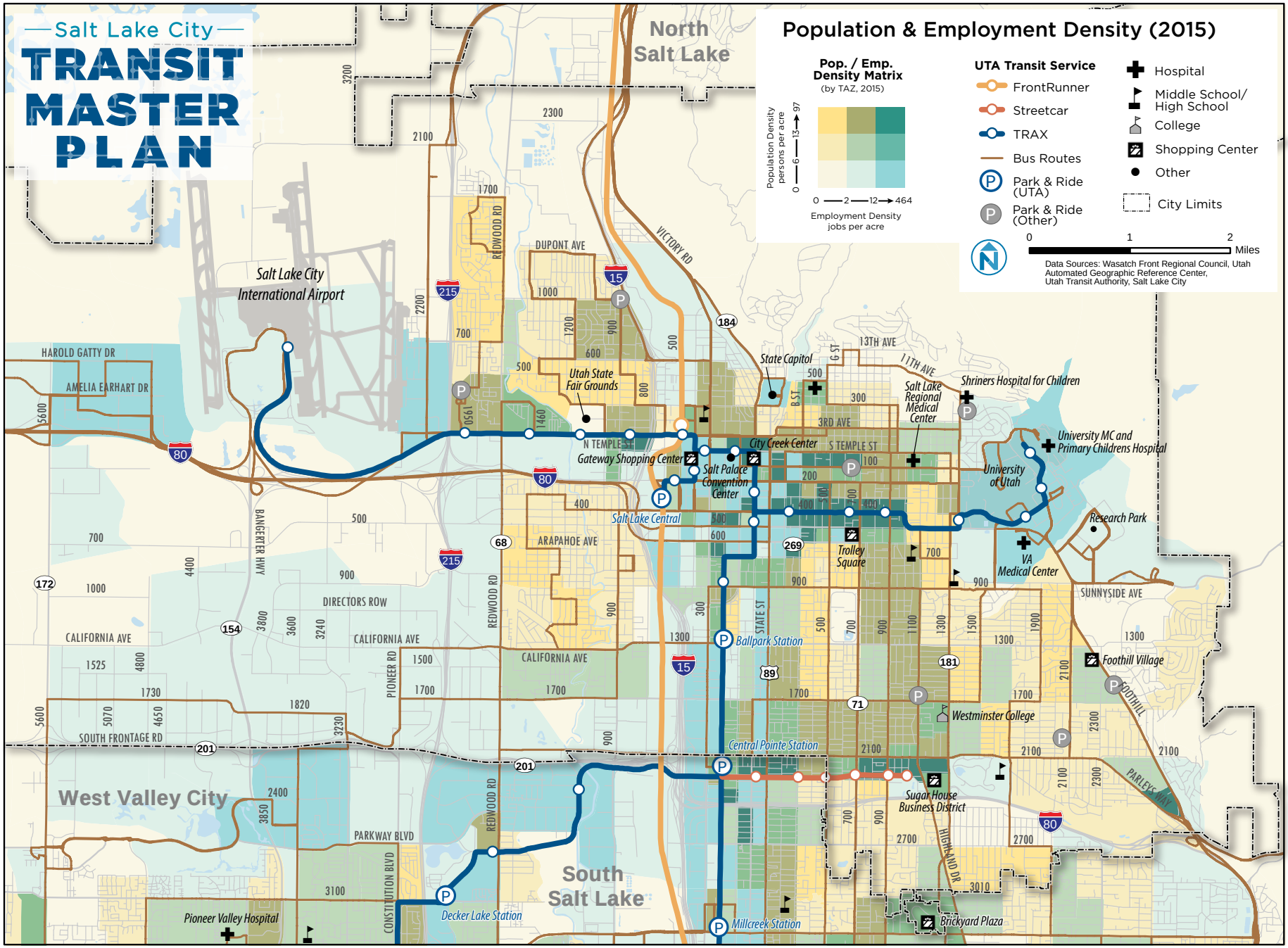
Population and employment density have a significant impact on transit demand. As density increases, incentives to use transit (or disincentives to drive) such as traffic congestion, parking availability, and parking costs tend to increase. In addition, the more people there are, the more cost effective it is to provide frequent transit service.

Figure 3-2 shows population and employment density in Salt Lake City (people and jobs per acre), illuminating the realities of where people are living and working in Salt Lake City. Areas that are the darkest represent the highest concentration of both population and employment combined.

- Major employment centers are:
  - University/Research Park
  - Central Business District
  - North-West quadrant:
    - Airport
    - International Center
    - 2200 West corridor
- Areas of **high employment and residential density** (mixed-use areas) are concentrated in downtown and east downtown, extending east along the 400 South corridor towards the University. There is also a higher density mixed-use node in Sugar House along the S-Line.
- Areas of **high residential density with moderate employment** mixed in are found in the central southeast part of the city (East Liberty Park, Liberty-Wells), the inner parts of the Greater Avenues and Capitol Hill, and the Fair Grounds and Glendale neighborhoods.
- Areas of **high residential density** only are found in the northwest and southwest areas of the city (in parts of Poplar Grove, Glendale, and Rose Park).[2]

[2] Population density is measured in terms of people per acre. Therefore large family size can make areas have higher population density, despite a relatively "low-density" development pattern, as occurs in Poplar Grove and Glendale neighborhoods.

Figure 3-2 Existing Population and Employment Density (2015)



HOW WILL POPULATION AND EMPLOYMENT CHANGE BY 2040?

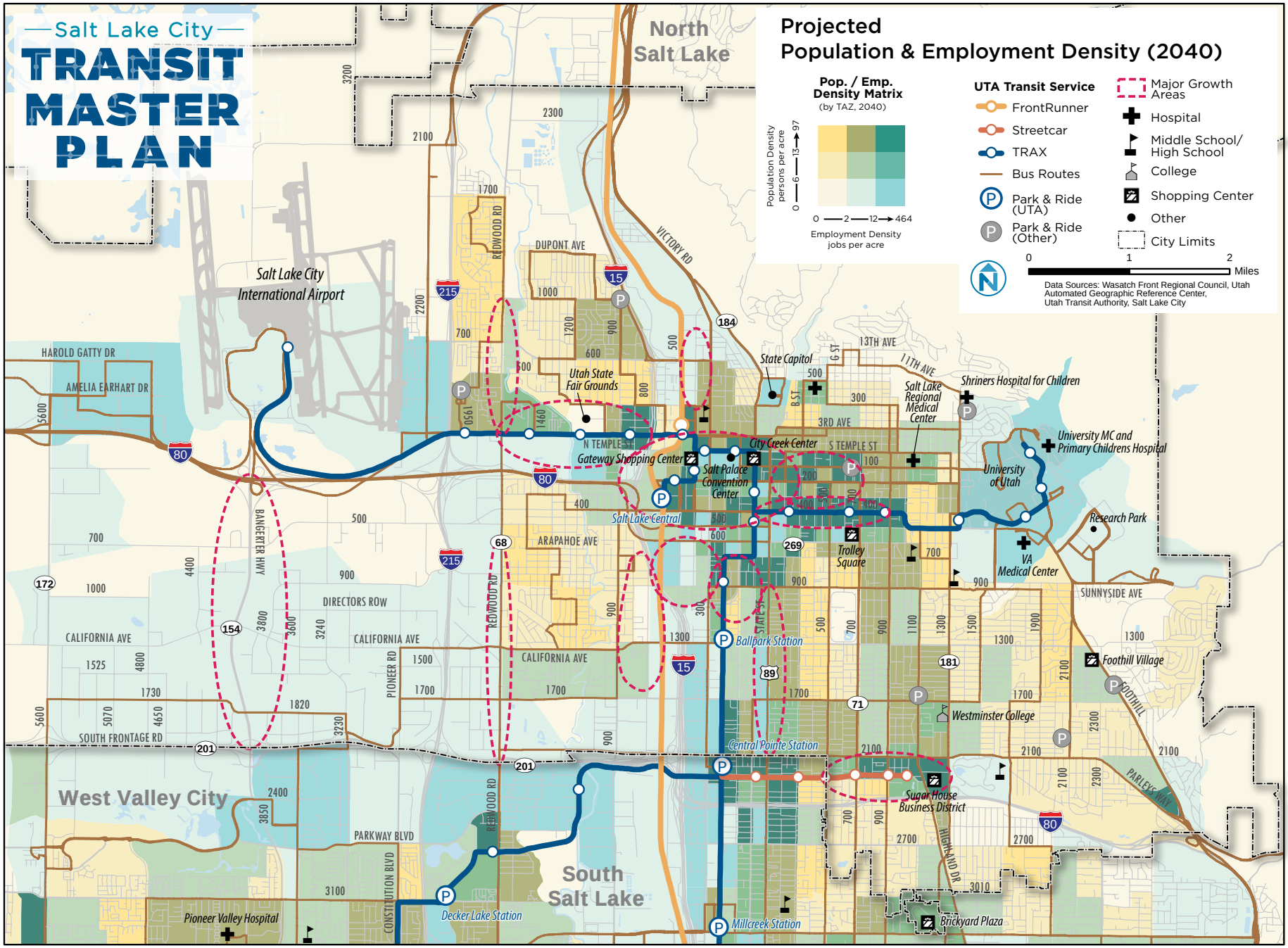
Population and employment in Salt Lake City are expected to grow substantially. By 2040, more than 40,000 new residents and 20,000 new employees are expected in Salt Lake City (19% and 8% growth respectively).[3] This growing population of residents and employees will change demand for transit service.

Figure 3-3 shows future projected population and employment density in Salt Lake City (2040).

- Residential growth is expected in existing higher density mixed-use areas in and around downtown.
  - Population and employment intensity will increase around Salt Lake Central Station in the Granary and Depot Districts.
- Growth is also expected in the following areas:
  - Along the State Street corridor and along 900 South in the Central Ninth neighborhood
  - Along North Temple to the northwest of downtown
  - Along 400 East near the Central Pointe Station
  - In the Sugar House District
- The industrial areas west of Redwood Road are expected to see employment growth.
- Much of the rest of Salt Lake City is not expected to change significantly in terms of overall density of jobs or residents.

[3] Wasatch Front Regional Council Population and Employment Projections. These projections show 210,381 residents and 291,121 employees in Salt Lake in 2015. www.wfrc.org/new_wfrc/index.php/resources/data

Figure 3-3 Future Population and Employment Density (2040)



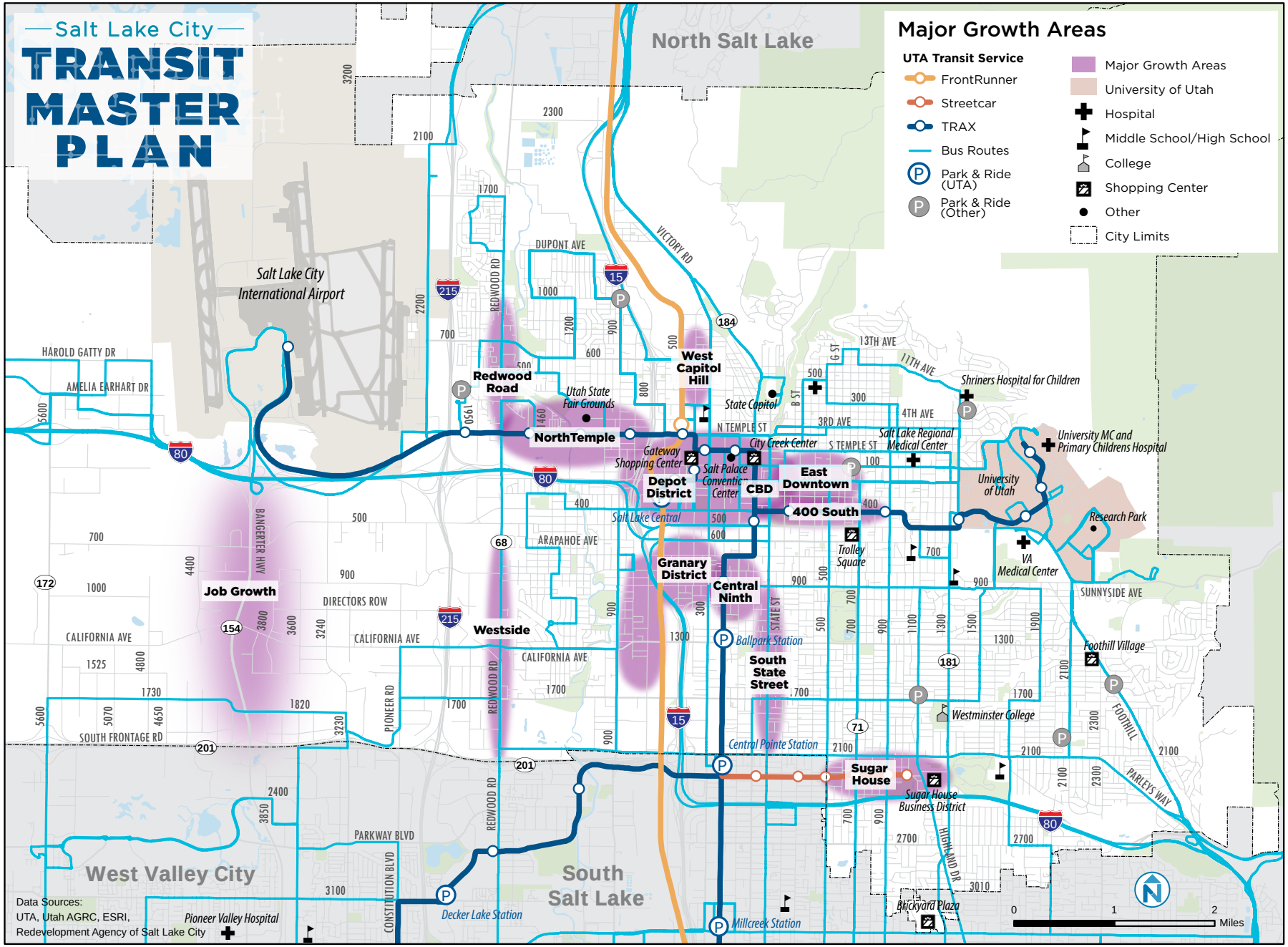
WHERE IS SALT LAKE EXPECTING TO GROW?

Salt Lake City has been planning to accommodate growth in several areas. Planned development areas in Salt Lake City include economic development areas managed by the Redevelopment Agency[4] and several other areas that are experiencing growth:

- **Central Business District, East Downtown, and 400 South Corridor:** As the central core of the city and economic hub of the region, downtown will continue to see a large amount of mixed-use development. The Redevelopment Agency is also working to bring a number of performing arts facilities to downtown including the Utah Performing Arts Center and create a "Cultural Core District" to promote all of the performing arts facilities in the downtown.
- **Depot District:** The Depot District is located on the western edge of downtown, just east of Interstate 15, and includes Salt Lake Central Station. Plans for this area envision a mixed-use development area and preservation of historic buildings.
- **Granary District:** This district is located south of the Depot District west of Interstate 15 and east of 300 West. This district is also envisioned to be a mixed-use neighborhood that supports commercial businesses and reclaims open space.
- **North Temple:** North Temple is a corridor heading west from downtown to the airport. This corridor is envisioned to maximize transit-oriented development and redevelopment opportunities brought by the presence of the TRAX Green Line to the airport. Guided by the North Temple Boulevard Plan, this corridor is planned to be a vibrant, walkable, mixed-use community.
- **Sugar House:** Sugar House is envisioned to be one of the city's mixed-use business districts. There are a number of potential redevelopment sites in the neighborhood. This area is ripe for transit-oriented development since the introduction of the S-Line streetcar in 2013 and improved access to open space, retail, restaurants and entertainment options. The area is already experiencing significant transition at both the Salt Lake City and South Salt Lake City end of line stations.
- **West Capitol Hill:** The West Capitol Hill area is located north of West High School and west of 300 West. The area includes 88 acres of privately owned property including a mix of residential, commercial, and light industrial uses. The focus of this area will continue to be residential while at the same time strengthening the commercial business corridor along 300 West.
- **Redwood Road**: The Northwest area of the city is also anticipated to change, especially along the main corridors (e.g. Redwood Road, 2200 West, 700 North) and at the smaller nodes in the neighborhoods.
- **State Street**: Growth is expected along the State Street corridor and in the Central Ninth neighborhood.
- **Westside job growth**: The Westside Master Plan identifies a potential mixed-use area east of Redwood Road around the Glendale Golf Course (mix of apartments, condominiums, office, commercial, and light industrial) and along 900 West.
  - West of Redwood Road will continue to develop to have a growing concentration of jobs.
- **The East Bench** area has a master plan under way; growth is expected along the corridors, mainly Foothill and Parleys Way, however change may be relatively limited due to the lack of major opportunity sites.

[4] These development areas utilize tax increment funding to fund urban renewal projects.

Figure 3-4 Salt Lake City Major Growth Areas



WHERE ARE SALT LAKE CITY'S TRANSIT-DEPENDENT POPULATIONS?

The demand for transit is determined in part by the demographic make-up of the community.

- **Youth, the elderly, and college-age populations** typically depend more on transit to access their daily needs because they are either too young or too old to drive or do not have the means to own a vehicle.
- **Residents with lower incomes** or residents who do not have access to a vehicle are more dependent on transit.
- **The disabled population** is also more likely to be transit dependent if their disability does not allow them to drive a car.

Figure 3-5 provides a summary of demographic characteristics in Salt Lake City that likely affect the demand for transit. Low-income households (those whose income is below 150% of the poverty level) represent over 32% of the Salt Lake City population. Seniors currently account for over 9% of the population and this number is projected to increase as the Baby Boomer generation reaches retirement; Utah's population of seniors over 65 is projected to double by 2050.[5]

The transit use propensity index, illustrated in Figure 3-7 below, combines the strongest indicators of transit demand noted above (low-income households, persons with disabilities, and seniors aged 65+) with rates of access to automobiles. Analyzing how the TUP aligns with the existing transit network will be a key component of the Gaps Analysis, which is the next phase of this study.
In Salt Lake City, TUP scores are the highest in:

- Neighborhoods between downtown and the University
- Southern portion of the Capitol Hill neighborhood
- Portions of Liberty Wells
- Western Salt Lake City (Rose Park, Glendale, and Poplar Grove neighborhoods)

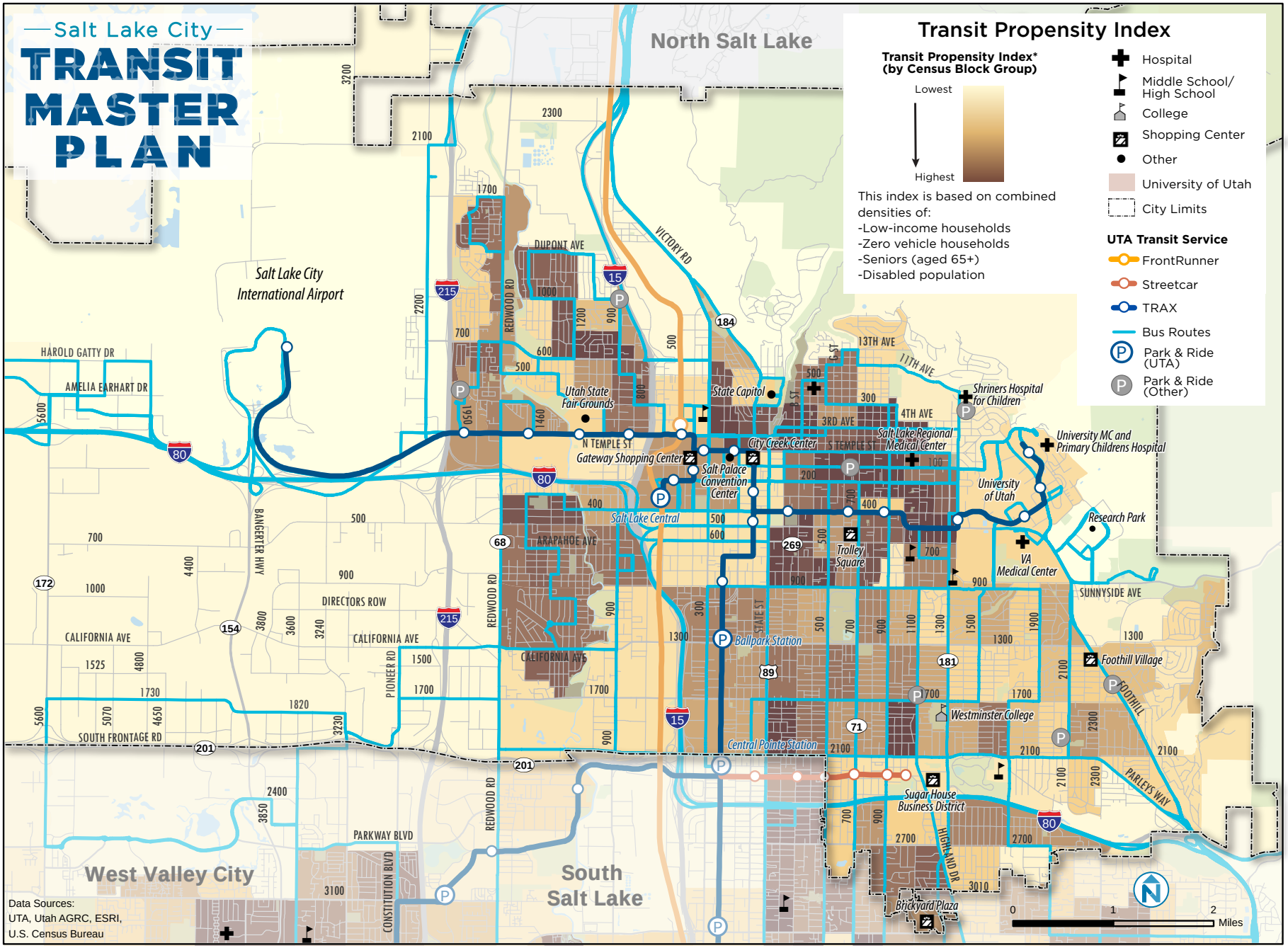
Figure 3-5 Summary of Demographic Characteristics in Salt Lake City (2010)

Demographic Category	Population (2010)	Unit	%
Total Population	186,440	Persons	--
Seniors 65 or older	17,516	Persons	9%
People with disabilities (aged 16-64)	12,836	Persons	10%
Low-income*	60,776	Persons	32%
Zero vehicle households	9,257	Households	12%

Source: Census 2010 (total population and Seniors 65 or older); ACS 5-Year Estimates (2008-2013) (people with disabilities, low-income, and zero vehicle households)
*Note: Population whose income is below 150% of the poverty level

[5] Utah Foundation. A Snapshot of 2050: An Analysis of Projected Population Change in Utah (2014)

Figure 3-6 Transit Use Propensity Index



WHERE DO EMPLOYEES IN SALT LAKE CITY LIVE AND HOW ARE THEY TRAVELING?

Salt Lake City is the region's employment hub. Every day, the population in Salt Lake City nearly doubles with commuters from around the region. This in-commute population has been growing slightly over the last decade as shown in figure 3-7). Of the 81,000 employees who live in Salt Lake City, approximately half work within Salt Lake City limits and half commute out of the city. One outcome of the Transit Master Plan will be to determine how to increase the number of these trips made by transit.

Although Salt Lake City has not set mode share goals, numerous local plans and policies call out the need to increase the number of people who bike, walk, and take transit to support a sustainable Salt Lake. For example, Plan Salt Lake – the city's vision plan for the next 25 years – sets a goal to reduce the number of single occupancy auto trips, increase the mode share for public transit, bicycling, walking, and carpooling, and provide public transit within ¼ mile of all homes.

For more than a decade, the mode split for Salt Lake City residents' commute trips has remained relatively steady at 81% auto (69% drive alone, 12% carpool) and 6% transit (Figure 3-8).

Regionally, transit ridership has kept pace with population growth so transit mode share has stayed reasonably steady as well.[6] Overall, employees who live in Salt Lake commute by transit at a higher rate than those who work elsewhere, illustrating the Salt-Lake City-centric orientation of the regional transit network (Figure 3-9). Transit mode share is highest for commuters who work in Salt Lake City and live outside the city at 6.5%. Employees who both live and work outside of Salt Lake City have a much lower transit mode share, between 1%-3% depending on the county.[7]

According to the 2012 Utah Household Travel Survey, mode share varies by district within Salt Lake City:

- Transit mode share is well above the city-wide average in University of Utah (18.4%) and the Airport district (13.2%).
- Transit mode share is aligned with or slightly above the citywide average in downtown (6.4%) and areas surrounding University of Utah (7.4%).
- Transit mode share is below the city-wide average in Capitol Hill/Avenues (3.3%)
- Transit mode share is well below the city-wide average in the following districts: Sugar House/East Bench (1.6%), Rose Park (1.6%), and Glendale/Poplar Grove (0.7%) (notably, bike share is highest in Glendale/Poplar Grove at 7.5%)[8]

[6] UTA.

[7] US Census, Transportation Planning Products, 2006-2010 CTTP. Note: these numbers do not include more recent rail expansions in the SLC region.

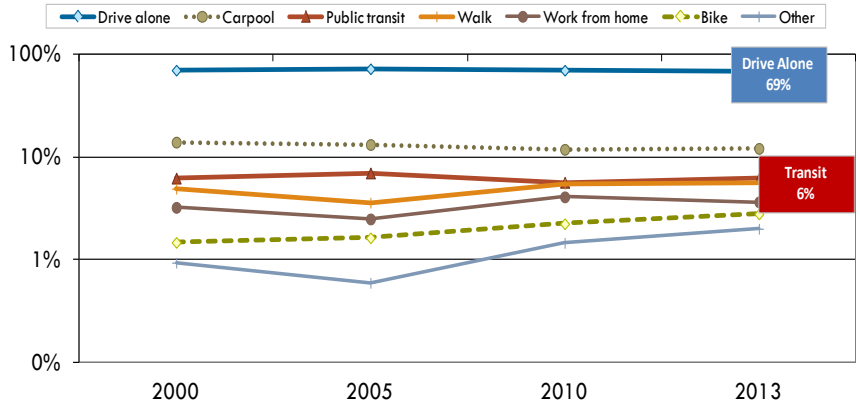
[8] 2012 Utah Household Travel Survey

Figure 3-7 Salt Lake City Employee Home Locations (2003 – 2011)

	2003		2005		2007		2009		2011	
	# of Jobs	% of Jobs	# of Jobs	% of Jobs	# of Jobs	% of Jobs	# of Jobs	% of Jobs	# of Jobs	% of Jobs
Total Jobs	206,943	100%	213,062	100%	219,913	100%	219,451	100%	227,846	100%
In-Commuters	162,007	78%	168,136	79%	175,746	80%	173,656	79%	186,759	82%
Live Here/Work Here	44,936	22%	44,926	21%	44,167	20%	45,795	21%	41,087	18%
Out-Commuters	36,355	18%	38,801	18%	46,486	21%	46,502	21%	38,970	17%

Source: LEHD On the Map "Inflow/Outflow Analysis for All Jobs"

Figure 3-8 How Salt Lake City Residents Travel to Work (2000 – 2013) (Logarithmic Scale)



Source: Census 2000 SF 3 Table P030: Means of Transportation to Work for Workers 16 years and over; 2005 ACS Table B08006: Sex of Workers by Means of Transportation (Workers 16 years and over); 2006-2010 ACS Table B08301: Means of Transportation to Work (Workers 16 years and over); 2009-2013 ACS 5-Year Estimates Table S0802: Sex of Workers by Means of Transportation to Work

Figure 3-9 How Salt Lake City Residents Travel to Work Compared to the Region (2010)

Home Location	Work Location	Transit Mode Share
Salt Lake City Resident	Salt Lake City	6%
	Outside Salt Lake City	4%
Non-Salt Lake City Resident	Salt Lake City	6.5%
	Outside Salt Lake City	1%-3%*

Source: US Census, Transportation Planning Products, 2006-2010

*Depending on the county of origin.

WHERE ARE PEOPLE BOARDING TRANSIT?

To understand current use of the transit system, Figure 3-10 and Figure 3-11illustrate the location of existing transit boardings.

TRAX:

- In Salt Lake City, transit ridership is highest in downtown and at the University of Utah, especially along the TRAX lines. Transit demand tends to be highest at ends of the lines, where park-and-rides are located, and at major transfer points between bus, TRAX, FrontRunner, and Streetcar lines.
- TRAX stations in downtown get the highest usage. The most boarding activity occurs along Main Street (100 N to 400 S). Courthouse Station has the highest ridership, other high usage stations, in descending order are: City Center, Salt Lake Central, Arena, Gallivan, and Temple Square.
- There is also high TRAX usage at the Airport, Stadium Station at the edge of the University, and Central Pointe (due to the park-and-ride. there are also high bus boardings).

Bus Ridership:

- The highest ridership bus corridors are: 200 S between downtown and the University and State Street. Other high bus ridership corridors are: Redwood Road, 500 E, 900 E, and 2100 S.
  - Major transfer points between these corridors have particularly high boardings.
  - Other key transfer nodes appear to be Redwood Road where it meets: 1700 S, North Temple, and 1300 N.
- In downtown, the majority of bus boarding activity is on State Street from 200 N to 400 S, and at Salt Lake Central.
- Other key bus nodes are (north to south and west to east): 200 N and 500 W, 2nd Ave at 300 W and between State and Main, 300 W and 200 S, and at the University of Utah.

Figure 3-10 Average Daily Transit Ridership by Stop in Salt Lake City

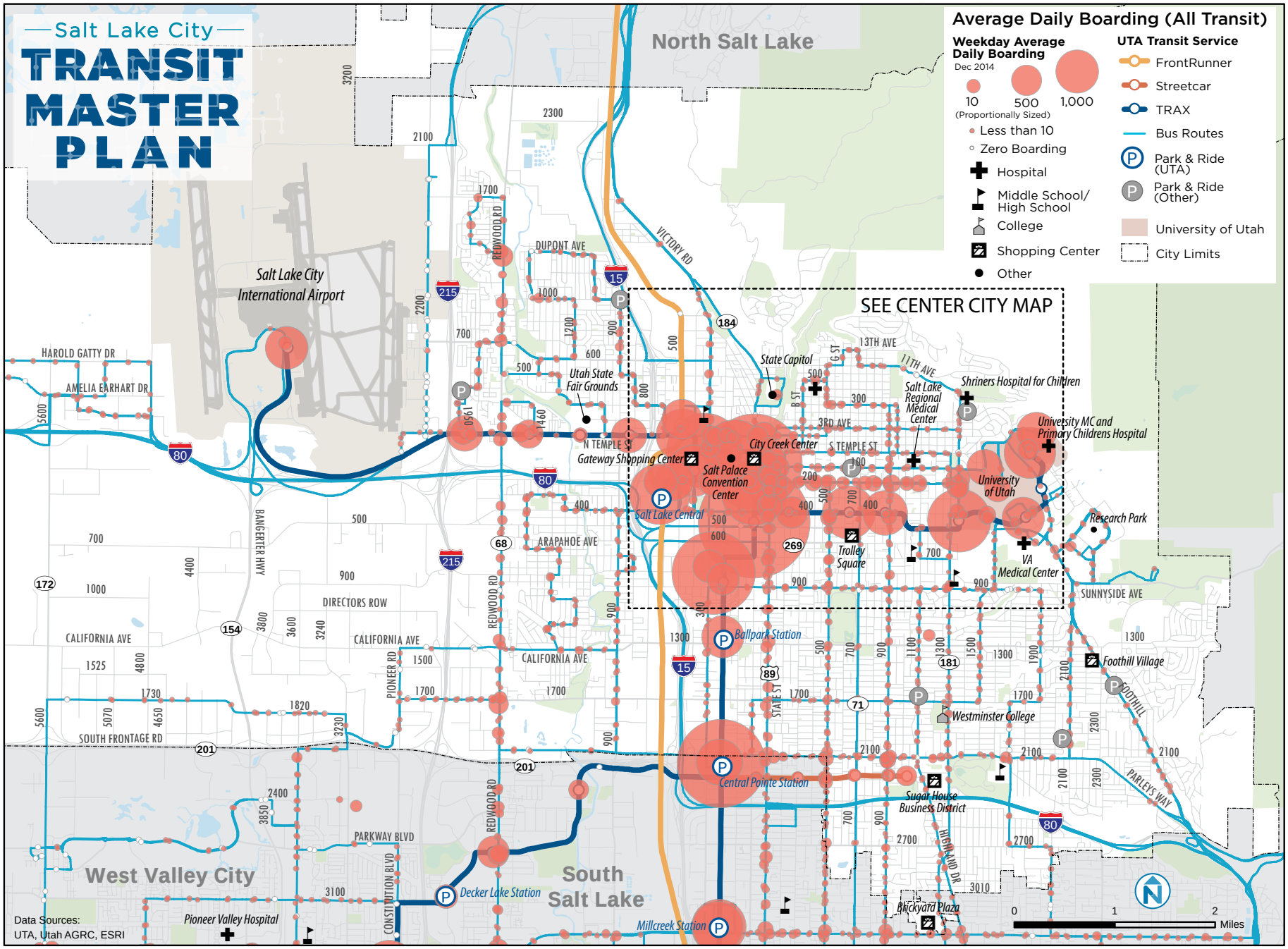


Figure 3-11 Average Daily Transit Ridership by Stop in Central Salt Lake City

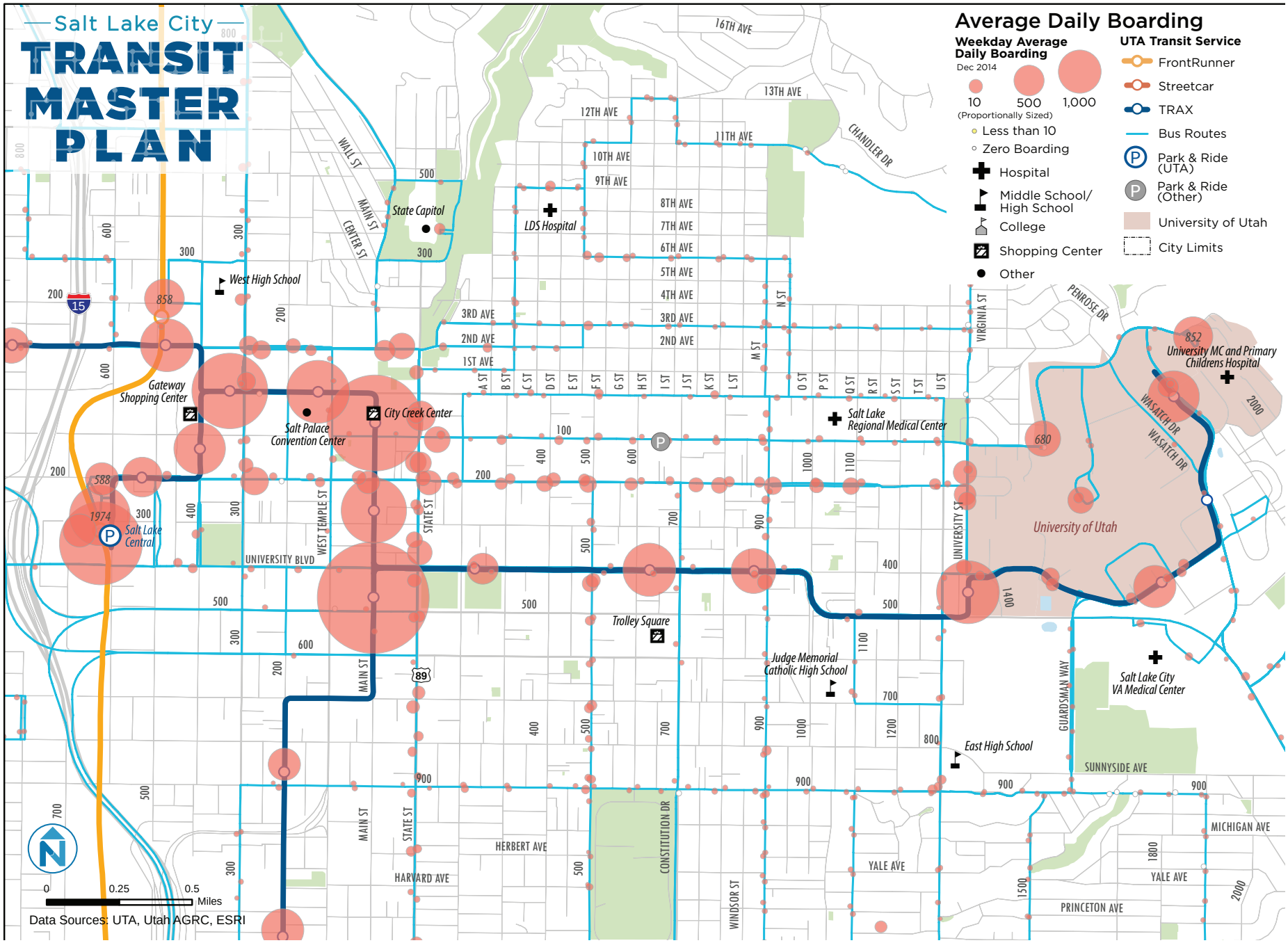


Figure 3-12 Average Daily Ridership by Stop in Salt Lake City (Bus Only)

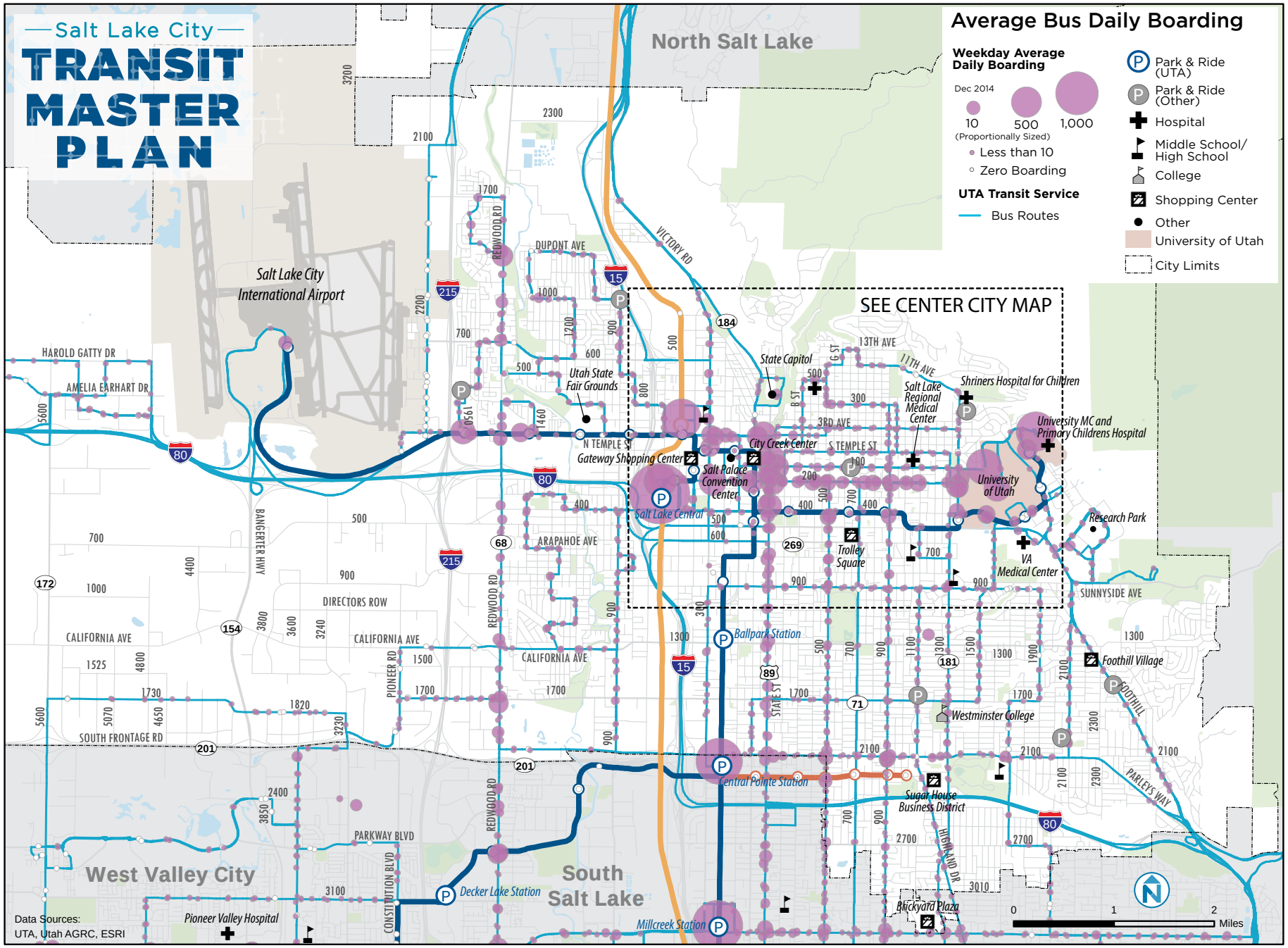
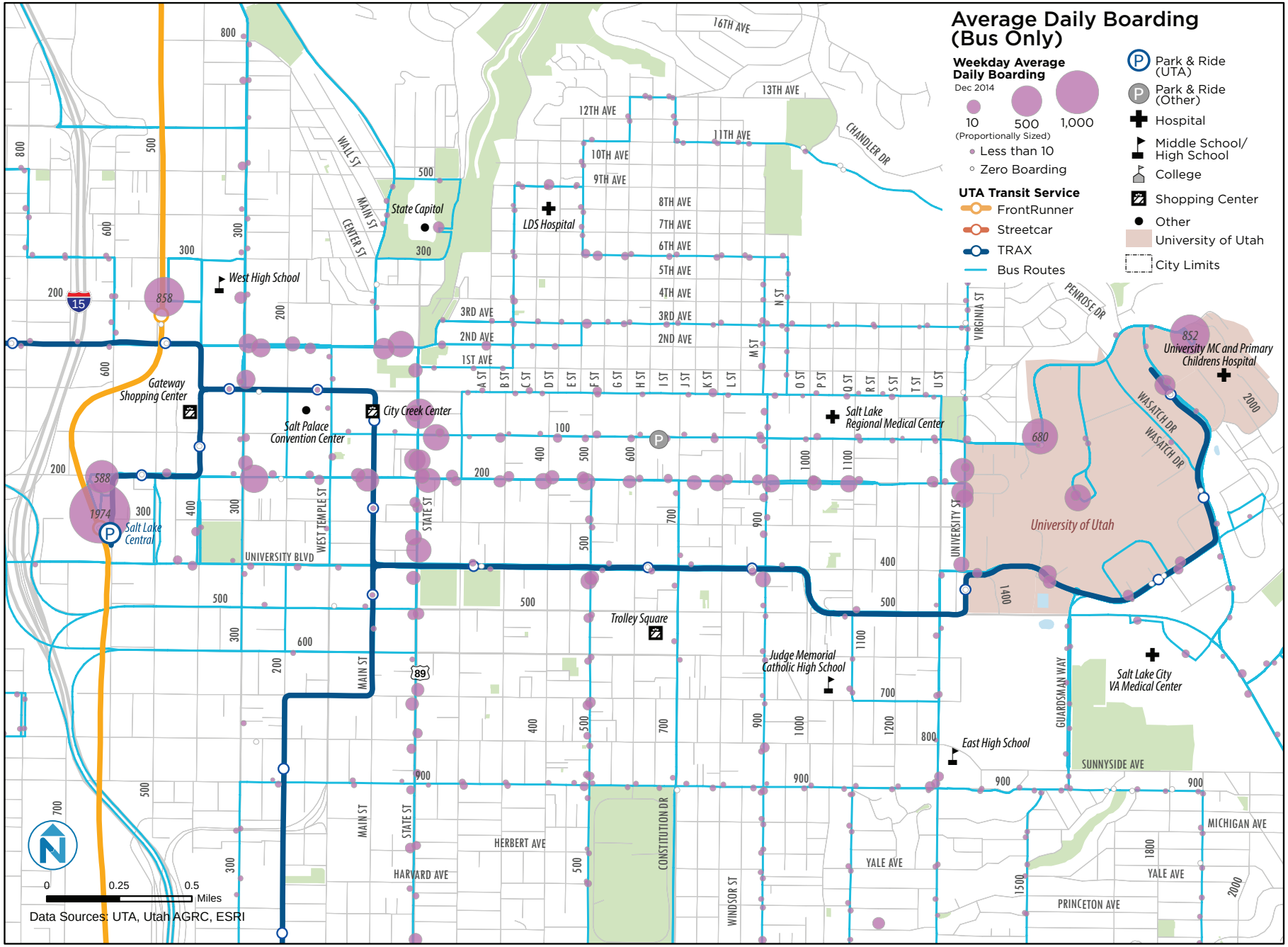


Figure 3-13 Average Daily Ridership by Stop in Central Salt Lake City (Bus Only)



WHERE ARE PEOPLE TRAVELING?

A key goal of the Salt Lake City Transit Master Plan is to increase transit use. To plan effectively, it is important to know where trips start and end today and how trip making might change in the future. It is also important to understand how transit trips differ from trips made by other modes and how commute trips differ from non-commute trips. Further analysis of the information presented here will be a key part of the Gaps Analysis, which constitutes the next phase of this study.

To understand the point-to-point travel patterns both within Salt Lake City and from the region to Salt Lake City, a travel pattern analysis was conducted based on the Wasatch Front Regional Council regional model using origin destination data for the year 2011 and a forecast of trips for the year 2040.

The analysis is illustrated in Figure 3-14 through Figure 3-20 below. It explores trip making from several different angles:

1. Local trips (Salt Lake City only):
    a. All trips by all modes (2011 and 2040)
    b. All transit trips (2011 and 2040)
    c. Commute trips (2011)
    d. Non-commute trips (2011)
2. Regional trips to/from Salt Lake City
    a. All trips by all modes (2011)

Origin Destination Map Methodology

In this section, the origin destination data is summarized and illustrated in a series of maps to describe major point-to-point travel patterns between Salt Lake City neighborhoods and between Salt Lake City and the region.

For the local Salt Lake City maps, data was aggregated at the TAZ level and combined to create neighborhood zones. It is important to note that the arrows on the maps point to neighborhood zones, not to individual destinations. Trip paths are shown “as the crow flies” between the centroid of the different neighborhood zones. The top 50 origin-destination pairs are displayed (i.e. the origin-destination pairs that have the highest volume of trips being made between two destinations).

For the regional map, Salt Lake City was segmented into four analysis areas (downtown, the University of Utah, southeast, and west). All trips within Salt Lake City were eliminated on the regional map. Trip paths are shown “as the crow flies” between the centroid of the cities in the region (or the centroid of each of the four analysis zones in Salt Lake City). The top 50 origin-destination pairs are displayed (i.e. the origin-destination pairs that have the highest volume of trips being made between two destinations).

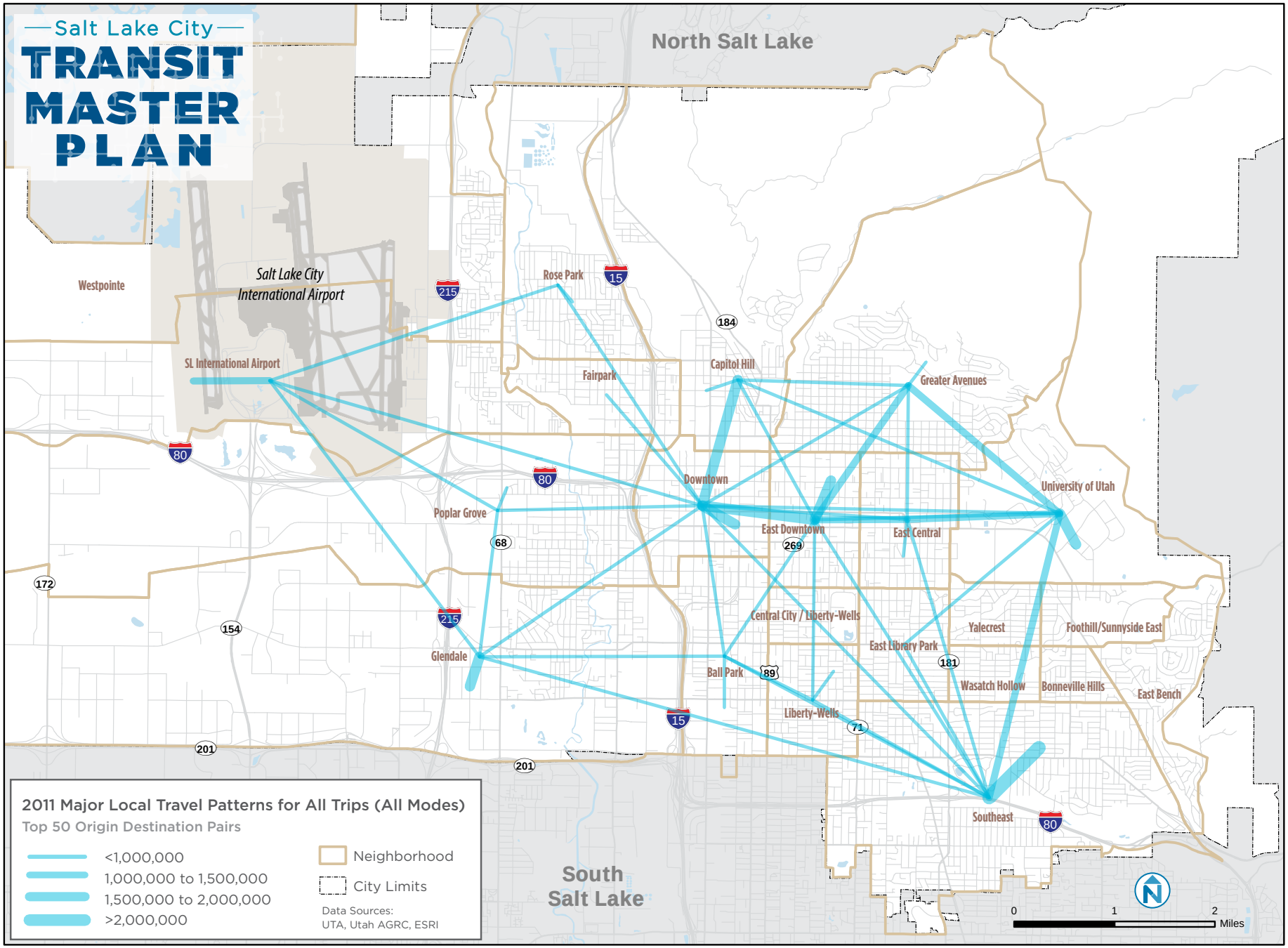
LOCAL TRAVEL PATTERNS – ALL MODES (2011)

Figure 3-14 illustrates major local travel patterns for all modes of travel in 2011.[9] Key findings include:

- The highest origin-destination pairs in Salt Lake City are between Central City East Downtown and downtown, and Capitol Hill and downtown
- Other notable trip pairs are:
  - Sugar House Southeast and the University of Utah
  - Greater Avenues and the University
  - Greater Avenues and Central City East Downtown
  - Central City East Downtown and East Central
  - East Central and the University
- The airport attracts trips from several residential neighborhoods in eastern Salt Lake and from downtown.
- There is significant internal zone travel within downtown, Central City East Downtown, the University of Utah, Sugar House Southeast, and Glendale.
- Major feeders to the University of Utah include Sugar House Southeast, Central East Downtown, and Greater Avenues.
- Central City East Downtown has the highest overall trip demand, which reflects its mixed-use character including office, commercial, and some of the city's highest density residential.

[9] This is consistent with the 2012 Utah Household Travel survey findings, illustrated in the Travel Almanac provided by Salt Lake City staff.

Figure 3-14 2011 Major Local Travel Patterns for All Trips (All Modes)

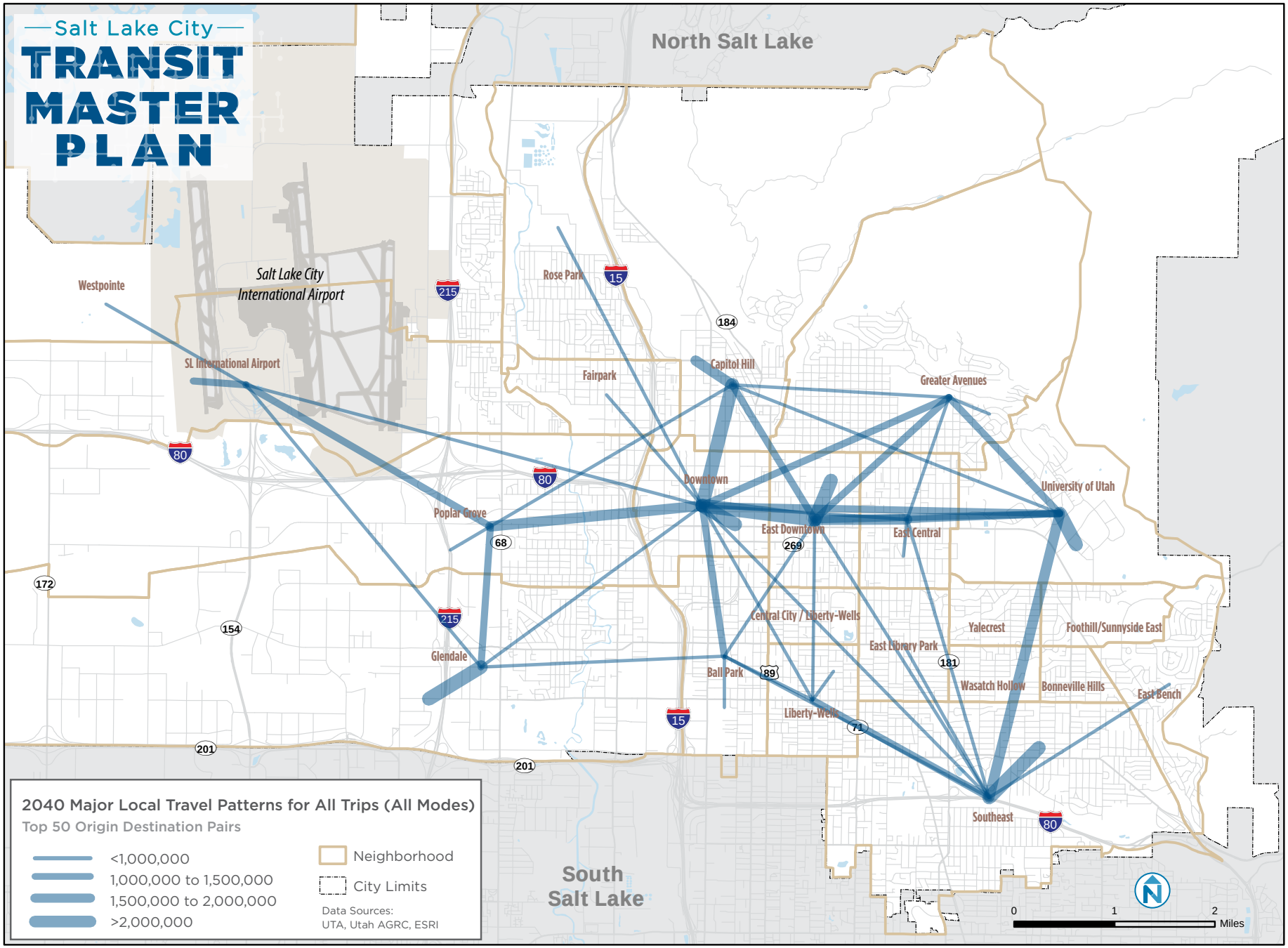


FUTURE PROJECTED LOCAL TRAVEL PATTERNS – ALL MODES (2040)

Figure 3-15 illustrates major local travel patterns for all modes of travel in 2040. Key findings include:

- In 2040, the major travel patterns are projected to be similar to those in 2011; however the intensity of trips between key destinations is projected to increase.
- Several trip pairs are projected to intensify by 2040:
  - Downtown – Central City East Downtown – University of Utah
  - Capitol Hill – Downtown
  - Sugar House Southeast – University of Utah
  - Ballpark – Downtown y
  - Poplar Grove – Glendale
  - Poplar Grove - Downtown
  - Airport – Poplar Grove
- Internal zone travel in many neighborhoods intensifies as well.
- New trips in the top 50
  - Airport – Westpointe
  - Poplar Grove – Capital Hill
  - Liberty Wells – Downtown
  - Sugar House Southeast – East Bench

Figure 3-15 2040 Major Local Travel Patterns for All Trips (All Modes)



LOCAL TRAVEL PATTERNS – PUBLIC TRANSIT (2011)

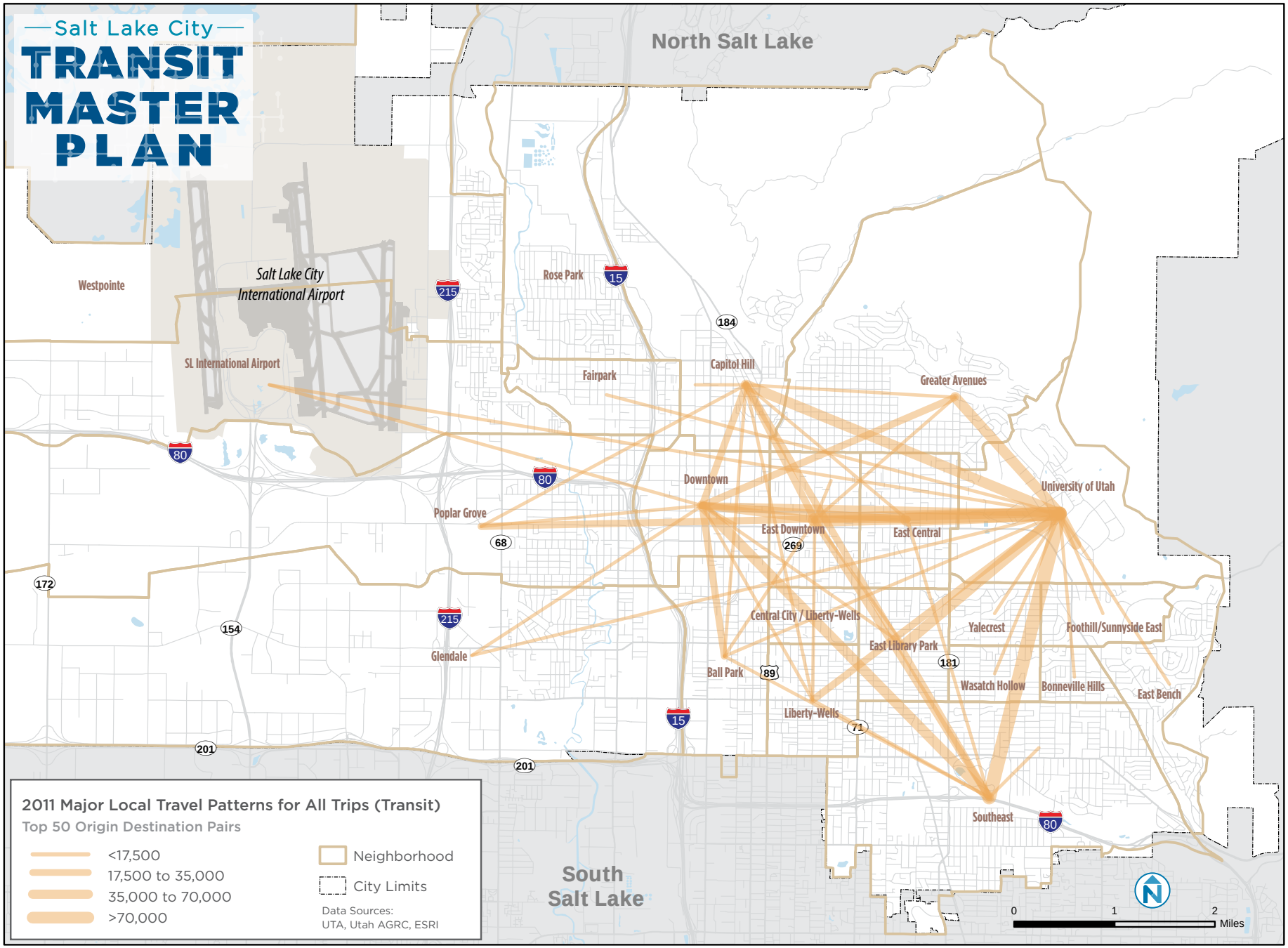
Figure 3-16 illustrates major local travel patterns for trips made on public transit in 2011. Key findings include:

- Transit trips account for just over 2% of *all* trips in Salt Lake City in 2011 and 6% of work trips.[10]
- Downtown, Central City East Downtown, University of Utah, and Sugar House Southeast are the most significant generators for transit trips in Salt Lake City.
- Eight of the 10 origin-destination pairs with the highest number of trips[11] include an end at the University of Utah, making it one of the most traveled to destinations in the city on transit.
- A number of key travel patterns shown in Figure 3-12 above (that represents all trips) do *not* show up as key travel patterns on the transit map in Figure 3-14. This gap indicates that the market for travel is there, yet these trips are not currently being well served by transit. The majority of these key transit gaps are located to south and west of downtown. Top origin-destinations that may not be well served by transit include:
  - Glendale – Salt Lake City International Airport
  - Poplar Grove – Salt Lake City International Airport
  - Glendale – Ball Park
  - Glendale – Poplar Grove
  - Glendale – Sugar House Southeast
  - Rose Park – Salt Lake City International Airport
  - Liberty Wells – Ball Park
  - Sugar House Southeast – East Liberty Park

[10] "All trips" per the Wasatch Front Regional Travel Demand Model includes all types of trips (commute and non-commute) for all people in Salt Lake City (including residents, employees, and visitors). "Work trips" per the Regional Travel Demand Model includes commute trips for all employees in Salt Lake City (including those who live in Salt Lake City and those who travel in to Salt Lake City). The regional travel demand model data for transit work trips is consistent with the mode share from the American Community Survey noted on page 3-15.

[11] "Highest transit trip pairs" refers to the origin and destination with the highest number of trips. This is the top 10 of the top 50 that are mapped.

Figure 3-16 2011 Major Local Travel Patterns for All Transit Trips

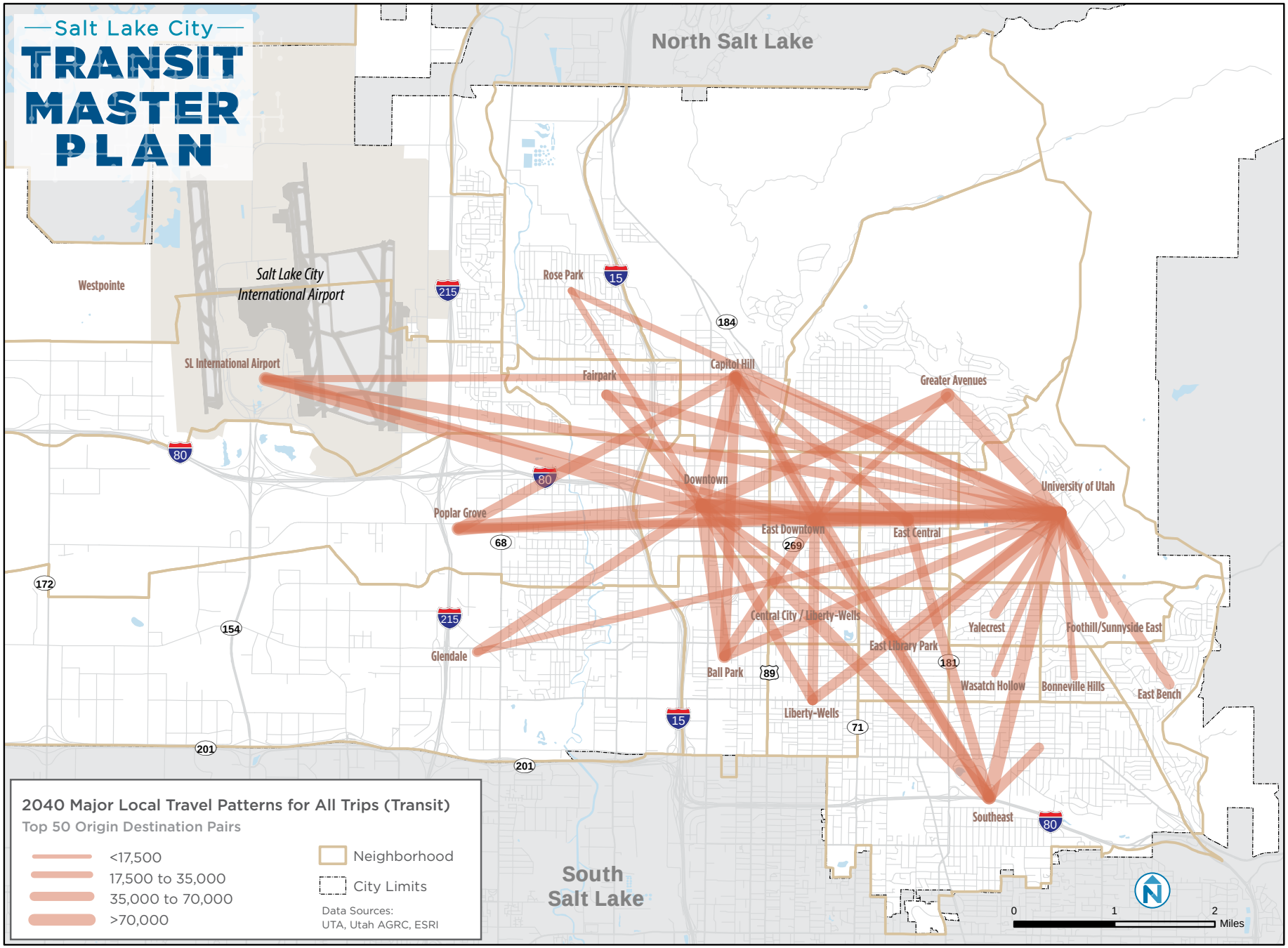


FUTURE PROJECTED LOCAL TRAVEL PATTERNS – PUBLIC TRANSIT (2040)

Figure 3-17 illustrates major local travel patterns for trips made on public transit in 2040. Key findings include:

- Transit trips in 2040 are projected to account for 5% of *all trips* in Salt Lake City (up from 2% currently).
- Transit travel patterns in 2040 are projected to be similar as they were in 2011, although vastly intensified, as would be expected given that the share of trips is projected to more than double and population is expected to grow.
- Some new trip pairs that emerge in the future are:
  - Rose Park-Downtown
  - Rose Park-University
  - Capitol Hill-Airport
  - Fair Park-Downtown

Figure 3-17 2040 Major Local Travel Patterns for All Transit Trips



LOCAL TRAVEL PATTERNS – COMMUTE TRIPS (2011)

In Salt Lake City, as in many cities, commute trips actually comprise a very small portion of overall trip making. If transit systems can be designed to serve both commute and non-commute trips it can lead to greater efficiencies for the transit agency and better service for consumers.

Figure 3-18 illustrates major local travel patterns for commute trips by all modes in 2011 (i.e. "home-based work trips" made from home to work):

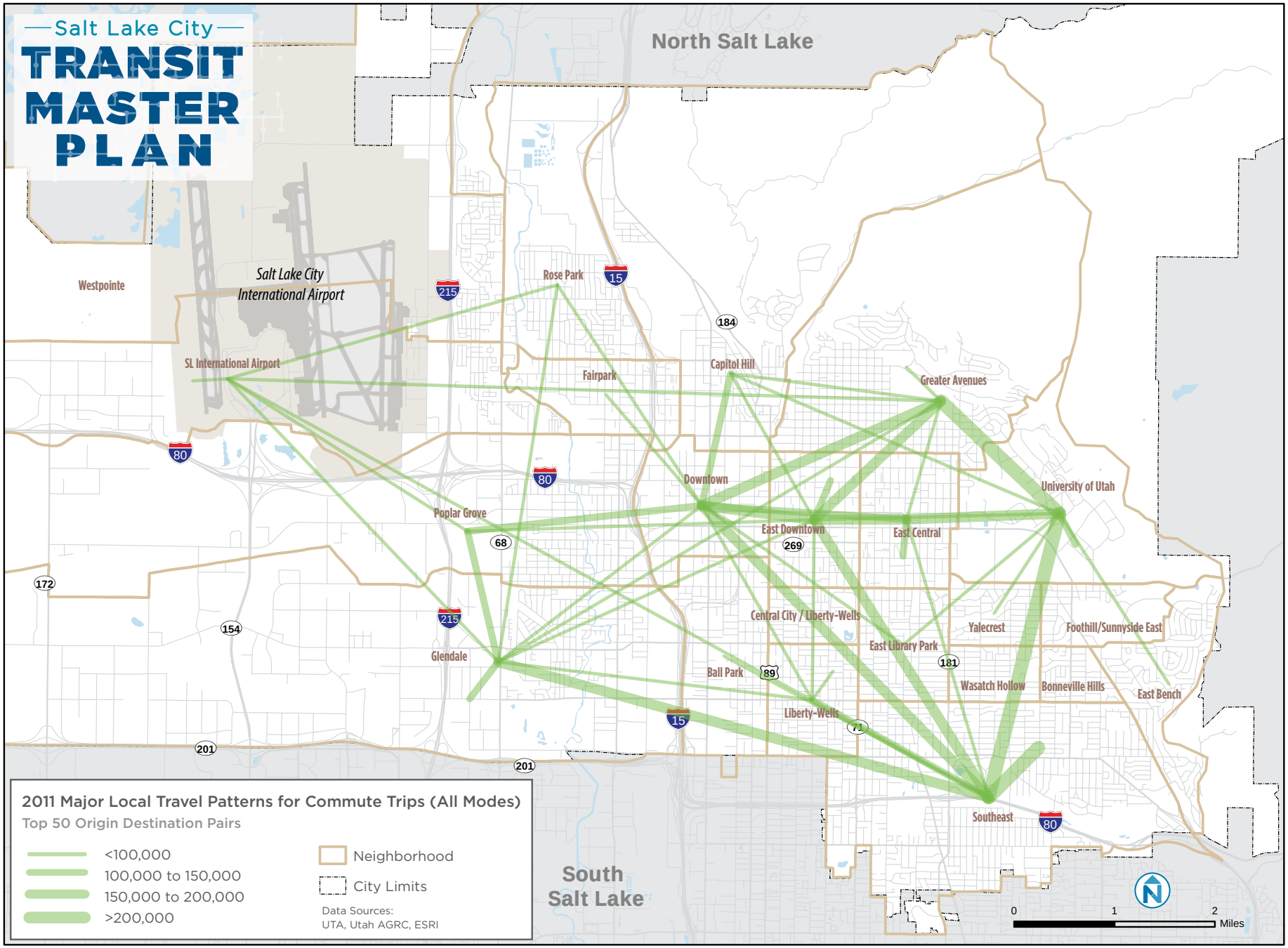
- Commute trips only account for 14-22% of overall trip making in Salt Lake City.[12]
  - Home-based school trips account for another 5% of trips.[13]
  - Non-home-based work trips account for another 18% of trips.[14]
- Downtown is an employment draw for the greatest number of travel markets.
- After downtown, Central City East Downtown,, the University of Utah, and Sugar House Southeast are the most significant work trip destinations.
- Sugar House Southeast, followed by Central City East Downtown and the University of Utah are neighborhoods that see the most internal commuting (in zone trips from home to work/school).
- Viewed in comparison to the non-commute trips map in Figure 3-17 below, the general travel pattern of commute and non-commute trips is similar. Key differences include:
  - The large number of commute trips between Sugar House Southeast and Glendale
  - Sugarhouse Southeast is a less common destination for non-commute trips than for commute
  - Ball park to Central City East Downtown emerges as a non-commute trip
- Lower density neighborhoods such as East Bench have stronger attraction to the University of Utah than Downtown/Central City East Downtown.

[12] The 2012 Utah Household Travel Survey shows that 22% of trips are home-based work trips, the regional model shows that 14% of trips are home-based work trips because it is calibrated to regional averages.

[13] 2012 Utah Household Travel Survey.

[14] Ibid.

Figure 3-18 2011 Major Local Travel Patterns for Commute Trips (All Modes)



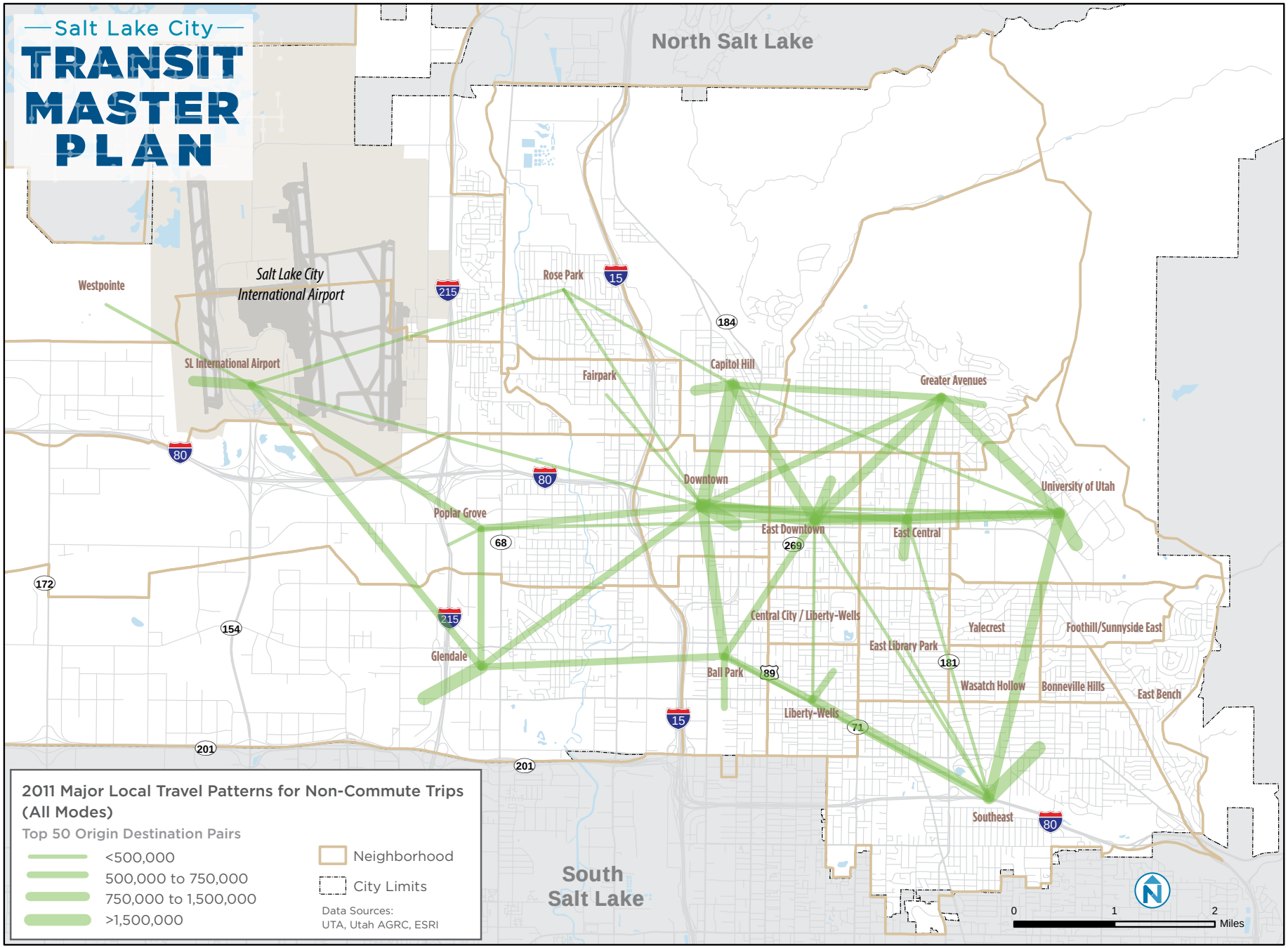
LOCAL TRAVEL PATTERNS – NON-COMMUTE TRIPS (2011)

Figure 3-19 illustrates major local travel patterns for non-commute trips by all modes in 2011 (i.e. those trips that are not for traveling from home to work). Key findings include:

- The vast majority of daily trips made in Salt Lake City are non-commute trips (78-86%).[15]
- Neighborhoods that have the highest levels of internal trip making include downtown, Central City East Downtown, the University of Utah, Glendale, and Sugar House Southeast.
- Relatively short north – south oriented trips between neighborhoods like downtown/Capitol Hill and the University of Utah are more significant for non-work travel than for work/school travel.
- Residents of western neighborhoods such as Poplar Grove and Glendale are more likely to travel east-west to seek services.

[15] The 2012 Utah Household Travel Survey shows that 22% of trips are home-based work trips, the regional model shows that 14% of trips are home-based work trips because it is calibrated to regional averages.

Figure 3-19 2011 Major Local Travel Patterns for Non-Commute Trips (All Modes)

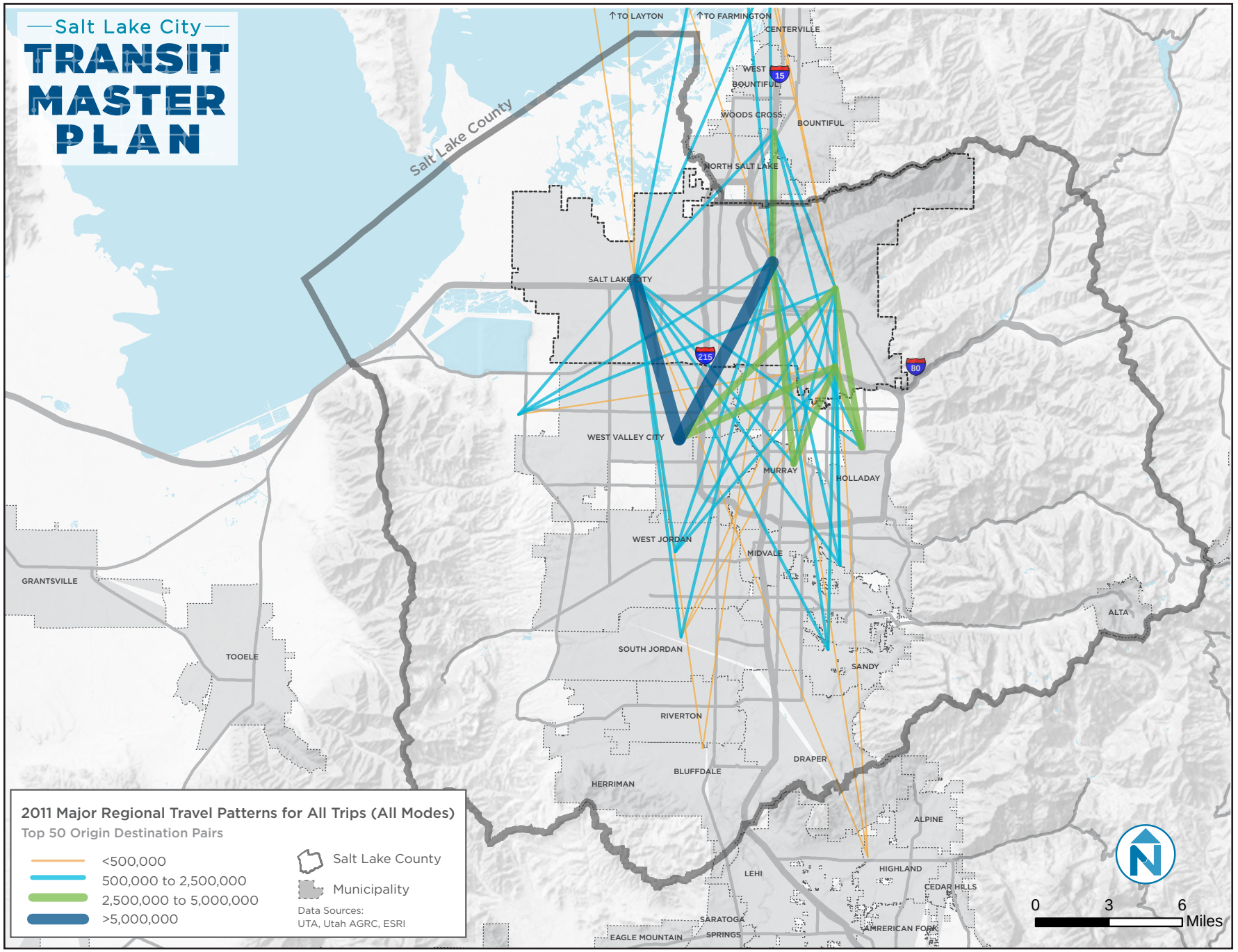


REGIONAL TRAVEL PATTERNS – ALL MODES (2011)

Figure 3-20 illustrates major regional travel patterns for all trips by all modes in 2011. Key findings include:

- From a regional perspective, the majority of trips traveling into Salt Lake City come from West Valley City to downtown and the airport.
- Other major travel patterns are between West Valley City and the Sugar House Southeast neighborhood, West Valley City and the University of Utah, and Murray to downtown and the University.
- Overall, the majority of travel between Salt Lake City and the region is southward.

Figure 3-20 2011 Major Regional Travel Patterns for All Trips (All Modes)



4 TRANSIT SERVICE IN SALT LAKE CITY

Salt Lake City is home to a diversity of transit services managed and operated by the Utah Transit Authority. Transit service includes local and regional bus service, streetcar, light rail, and commuter rail. Over the years, the completion of several major north/south transit capital projects such as TRAX and FrontRunner have improved regional connections and accommodated the large numbers of commuters coming in to Salt Lake City from around the region every day.

OVERVIEW OF THE UTAH TRANSIT AUTHORITY

The Utah Transit Authority (UTA) was founded in 1970 and its service area extends over 732 square miles[1] and six counties, serving over 1.8 million people. The population served by UTA accounts for nearly 80% of Utah's population. Geographically speaking, UTA is one of the largest public transportation agencies in the country. Within Salt Lake City, UTA operates 44 bus routes, three light rail lines (TRAX), one commuter rail train (FrontRunner), and a streetcar line (the S-Line).[2] In addition to traditional fixed-route service, UTA operates one flex route in Salt Lake City. UTA also provides complementary paratransit service.

The UTA service area extends over 1,400 square miles along the Wasatch Front.
Source: Nelson\Nygaard

Organizationally, UTA is governed by a 16-member Board of Trustees, which is the legislative body of UTA and determines all policy questions. Twelve members of the board, including one nonvoting member, are appointed by each county, municipality, or combination of municipalities that have been annexed to UTA. The board also includes one member who is appointed by the State Transportation Commission and acts as a liaison between UTA and the Transportation Commission; one member of the board is appointed by the Governor; one member is appointed by the Speaker of the Utah State House of Representatives; and one member is appointed by the President of the State Senate.

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[1] National Transit Database. Methodology is based on all area within ¾ mile from all bus routes and rail stations.

[2] UTA also operates two ski bus routes that originate in Salt Lake City and connect passengers to Solitude, Brighton, Snowbird, and Alta resorts on Fridays, Saturdays, and Sundays from December to April.

Operationally, UTA is divided into five separate business units – Mt. Ogden, Salt Lake, Timpanogos, Rail Service, and Special Service. Home to a key regional employment center and the University of Utah, the Salt Lake Business Unit (which includes Salt Lake City) accounts for a substantial portion of all of UTA's transit trips – nearly 70% of UTA transit trips begin or end in Salt Lake County and 60% of weekday revenue hours operate within the county.[3]

UTA is funded by a combination of federal, state, and local sources, including local-option sales tax measures in all six counties or cities therein.[4] Over the last 10 years, UTA has secured nearly $1.3 billion in discretionary federal grants.[5]

Several factors guide decision-making about the geographic distribution and levels of transit service within UTA's large service area. UTA Corporate Policy No. 1.1.9 states that "UTA annually compares the operating, capital, and administrative expenditures associated with transit service within each county with the revenue generated within that county according to an approved procedure." The policy goes on to direct UTA to make changes to or add service based on measures of quality and effectiveness such as: on-time and frequency of service, seat availability, vehicle type and age, transfers, ridership, investment per rider, and land use and urban design.

OVERVIEW OF TRANSIT SERVICE IN SALT LAKE CITY

UTA operates fixed-route bus, light rail, streetcar, and commuter rail services in Salt Lake City, illustrated in the map in Figure 4-1. The most service is provided on bus routes in terms of total number of service hours (shown in Figure 4-16).

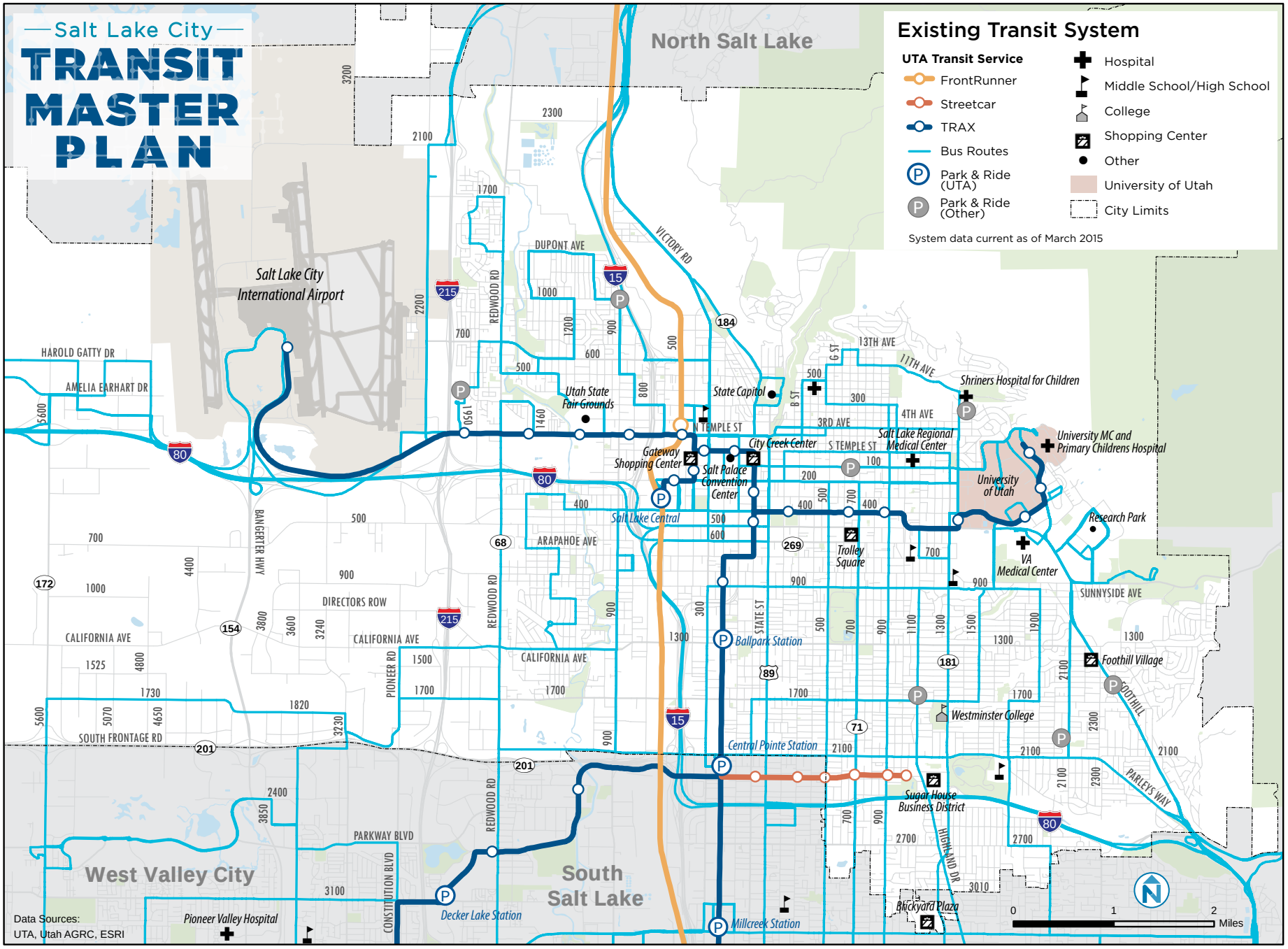
A network of local and regional buses serve Downtown Salt Lake City.
Source: Nelson\Nygaard

[3] UTA. Five Year Service Plan (2013)

[4] Sales tax amounts for transit by county: Utah County – 0.526 cent; Salt Lake County – 0.6875 cent; Davis, Weber, and Box Elder counties – 0.55 cent; Toole and Grantsville cities – 0.3 cent.

[5] UTA Year in Review (2013)

Figure 4-1 Existing Transit Service in Salt Lake City



Fixed-Route Bus

UTA operates 44 bus routes in Salt Lake City, shown in Figure 4-2. Of these:

- Seventeen of the routes are classified as "local" in terms of fare and operate within Salt Lake City only.
  - Of the seventeen, nine routes are classified as "shuttle" or "flex" routes that provide specialized service to specific employment sites and educational destinations.
- Ten routes follow a similar stop pattern as local routes, but have one end-of-line in Salt Lake City and one end outside city boundaries.
- Eight commuter routes provide peak only directional service into and out of the city at a local fare price.
- Five are classified as "express" buses which operate along major highways and connect park-and-rides to major activity centers and require premium fare.
- Four are classified as "fast bus" routes which are similar to "express routes" in terms of operating hours and limited stops, however they operate on a combination of arterial streets and highways in one county and may not connect to park-and-rides.

UTA Route Numbering

< 100: Primarily east-west routes within Salt Lake County

200s: Primarily north-south routes within Salt Lake County

300s: Fast Bus routes within Salt Lake County

400s: Inter-county routes – Express and Commuter

500s: Local circulator-type, shuttle, or flex route within Salt Lake County

900s: Seasonal

Bus routes that serve Salt Lake City account for about 45% of overall UTA bus service hours.

UTA Service Standards

UTA operates under Corporate Policy Number 1.1.19 Corporate Service Standards which define the quality of service UTA is committed to providing. The service standards are summarized in Figure 4-3.

In addition to the quality of service standards, the Corporate Service Standards Policy outlines standards for UTA to track service effectiveness. These standards include: ridership, investment per rider, and investment per passenger mile. Light rail and commuter rail services are also evaluated on ridership relative to seating capacity. When planning new service, the Corporate Service Standards outline land use and urban design guidance to ensure new service is supported by existing land use.

The 2013 UTA Network Planning Study recommended revising UTA's existing service standards for each type of bus service to ensure that service planning principles and performance measures are consistent across all UTA business units. These recommended standards, outlined in Figure 4-4 below, have not been put into effect to date.

Figure 4-2 Bus Routes Serving Salt Lake City

Service Type / Route	Description	Service span
Local		
2	200 South	All-Day
3	3rd Avenue	All-Day
6	6th Avenue	All-Day
9	9th Avenue	All-Day
11	11th Avenue	All-Day
17	1700 South	All-Day
21	2100 South/2100 East	All-Day
200	State Street North	All-Day
205	500 East	All-Day
209	900 East	All-Day
213	1300 East/1100 East	All-Day
217	Redwood Road	All-Day
220	Highland Drive/1300 East	All-Day
223	2300 East/ Holladay Blvd	All-Day
228	Foothill Blvd / 2700 East	All-Day
453	Tooele - Salt Lake Via Airport	Peak-Only
454	Grantsville/Salt Lake	Peak-Only
455	UofU/Davis County/Weber State Univ.	All-Day
456	Ogden/Unisys/Rocky Mountain Express	Peak-Only
460	Woods Cross	Peak-Only
461	Bountiful via State Capitol	Peak-Only
462	North Salt Lake	Peak-Only
463	West Bountiful	Peak-Only
470	Ogden-Salt Lake Intercity	All-Day
471	Centerville	Peak-Only
500	State Capitol	All-Day
516	Poplar Grove / Glendale	All-Day
519	Fairpark	All-Day
520	Rose Park	All-Day
551	International Center	Peak-Only

Service Type / Route	Description	Service span
Fast bus		
307	Cottonwood Heights Fast Bus	Peak-Only
313	South Valley/U of U Fast Bus	Peak-Only
320	Highland Drive Fast Bus	Peak-Only
354	Sandy / U Of U Fast Bus	Peak-Only
Express		
2X	200 South Express	Peak-Only
451	Tooele Express	Peak-Only
472	Ogden-Salt Lake Express	Peak-Only
473	SLC-Ogden Hwy Express	Peak-Only
902	Park City-SLC Connec	Peak-Only
Shuttle		
509	900 W Shuttle	All-Day
513	Industrial Business Park Shuttle	Peak-Only
919	Fairpark (West HS)	Peak-Only
920	Fairpark (West HS)	Peak-Only
Flex		
F522	2200 West Flex Shuttle	Peak-Only
Seasonal		
951	Downtown SLC - Snowbird/Alta	Seasonal
952	U of U - Snowbird/Alta	Seasonal
954	Maverik Center - Snowbird/Alta	Seasonal

Figure 4-3 UTA Quality of Service Standards

Quality of Service Standard Category	Bus	Light Rail	Commuter Rail
On-time performance	0 seconds early and no more than 4 minutes and 59 seconds late 95% of the time	0 seconds early and no more than 4 minutes and 59 seconds late 98% of the time	0 seconds early and no more than 4 minutes and 59 seconds late 95% of the time
Seat availability	Corrective action shall be taken when the maximum number of customers on board exceeds 100% on more than 25% of the trips over two consecutive months	Corrective action shall be taken when maximum occupancy repeatedly exceeds 175% of available seats on more than 33% of trips over 90 consecutive days	Corrective action shall be taken when maximum occupancy exceeds 90% north of the Woods Cross Station more than 25% of trips over two consecutive months
Frequency of service	System-wide average number of minutes between buses on scheduled weekday fixed-route bus service shall not exceed 28 minutes (actual for August 2007) for the service plans implemented prior to August 2015 and 25 minutes for the August 2015 service plan	System-wide average number of minutes between light rail trains on weekdays shall not exceed 20 minutes	Average number of minutes between regional commuter rail trains shall not exceed 30 minutes in peak direction during peak commuting hours
Vehicle type	Over-the-road coaches shall operate on a minimum of 70% of express trips (excluding FastBus) between Utah County, north Davis County, Weber County, Tooele County and the downtown Salt Lake City/University of Utah corridor		
Vehicle age	12-year buses replaced before completing the 13th year; 10-year buses replaced before completing the 11th year; 7-year buses replaced before completing the 8th year	Replaced no later than 30th year	Locomotives replaced no later than 20th year; rail cab cars replaced no later than 30th year; rail coaches no later than 50th year
Transfer coordination	UTA shall coordinate transfers at strategic locations as determined and documented by the business units each service change period. A transfer is considered coordinated when the customer's out-of vehicle time is more than 2 minutes plus the walk time and less than 7 minutes (standard for on-time reliability and walk time contingency) plus the walk time.		

Source: UTA Corporate Service Standards Policy 1.1.19

Figure 4-4 2013 UTA Network Study Recommended Services Standards

Route Type	Description
BRT	Frequent limited stop service with key investments supporting transit speed and reliability. Operates in dedicated lanes.
Bus Plus* (proposed)	Same as BRT except does not operate in dedicated lanes.
Core Arterial	Frequent local bus service, mostly providing direct service along an arterial.
Arterial	All day local bus service, mostly operating along an arterial.
Circulator	All day or peak hour service connecting specific destinations.
Flex Routes	Community or neighborhood service providing route deviation upon demand.
Commuter Routes	Any peak directional service for longer-distance travel, including Fast Bus and Express.

*Note: Bus Plus is a proposed network of high-frequency transit service in the UTA Network Study (2013). It is referred to as Enhanced Bus in the Regional Transportation Plan. See sidebar on the following page for more details.

Source: UTA Network Study

Transit is Fare Free in Salt Lake City's Downtown

Downtown Salt Lake City has a Free Fare Zone where bus and TRAX service is free to use. The zone runs from Salt Lake Central Station on the western border to 200 E to the east and from the State Capitol on the northern border to Courthouse Station to the south.

Bus and TRAX services are free within the Free Fare Zone in Downtown Salt Lake City.
Source: UTA

TRAX

Three TRAX Light Rail lines provide service throughout the UTA service area connecting major destinations such as the Salt Lake City International Airport and the University of Utah to Downtown Salt Lake City.
Source: Nelson\Nygaard

UTA's light rail system – TRAX – opened in 1999 to connect the city of Sandy and downtown Salt Lake City. In 2001, an additional line (then called the University Line) opened to the University of Utah; in 2003 this line was extended to the university's medical complex. Two additional lines – the Red Line to Daybreak in South Jordan and the Green Line to West Valley City – opened in 2011. The Red Line became the new service to the University of Utah. The Green Line and Blue Line extensions to the Salt Lake City International Airport and Draper Town Center, respectively, opened in 2013.

The TRAX system currently has three lines:

- **Red Line** provides service between South Jordan, West Jordan, Sandy, Midvale, Murray, South Salt Lake, and Downtown Salt Lake, and the University of Utah campus.
- **Blue Line** provides service between Draper, Sandy, Midvale, Murray, South Salt Lake, and downtown Salt Lake.
- **Green Line** provides service between West Valley, South Salt Lake, Downtown Salt Lake City, and Salt Lake City International Airport.

TRAX operates seven days a week, every 15 minutes on weekdays, and every 20 minutes on Saturdays and Sundays. Service is provided from approximately 5:00 a.m. to 11:30 p.m. on weekdays, from 6:00 a.m. to 11:30 p.m. on Saturdays, and 9:00 a.m. to 9:00 p.m. on Sundays.

S-Line

The S-Line streetcar connects South Salt Lake to the Sugar House Business District in Salt Lake City.
Source: Nelson\Nygaard

The S-Line (formerly called the Sugar House Streetcar) opened in December 2013 and provides service between the Central Pointe Station in South Salt Lake and the Sugar House Business District in Salt Lake City. The S-Line is funded through a partnership between Salt Lake City, South Salt Lake, and UTA. [6]

The streetcar is two miles long and has seven stops, three of which are located within the City of Salt Lake City. The S-Line operates every 20 minutes from 6:00 a.m. to 9:00 p.m. on weekdays and Saturdays and every 20 minutes from 9:00 a.m. to 7:00 p.m. on Sundays. During its first full year in operation (2014), the S-Line carried just over 1,000 riders on average per weekday. [7]

[6] UTA received a $26 million TIGER II grant in 2010; UTA provided the three streetcar vehicles (valued at $12 million) and the right-of-way (valued at $6.3 million) at no cost to the cities of South Salt Lake and Salt Lake City. The gap in funding to complete the project ($11.18 million) was shared between Salt Lake City ($5.38 million), South Salt Lake ($4.2 million), and UTA ($1.6 million). Salt Lake City and South Salt Lake also share in the cost of operating the line along with UTA for three years. http://www.shstreetcar.com/files/MasterStreetcarTransmittal.pdf

[7] UTA. "Route Operating and Cost Indicators."

FrontRunner

FrontRunner stops at two stations in Salt Lake City: Salt Lake Central Station and North Temple Station.
Source: Flickr Paul Kimo McGregor

FrontRunner provides service from Provo to the south, through Salt Lake City, to Ogden to the north. FrontRunner makes two stops in Salt Lake City – at the North Temple Station and at Salt Lake Central Station.

FrontRunner operates full-length service on weekdays from 4:50 a.m. to 10:20 p.m. every 30 minutes during the peak hour and every hour during the midday and in the evenings. On Saturdays, service is limited to every hour all day from 7:50 a.m. to 1:20 a.m. FrontRunner does not operate on Sundays.[8]

UTA considers FrontRunner a premium service and fares are distance based starting at $2.50 for travel to one station and $0.60 for each additional station. Within Salt Lake City, however, Frontrunner passengers can use either the North Temple or Salt Lake Central Station for the same fare. FrontRunner tickets can be used to transfer to all other UTA fixed route services at no additional cost.

[8] The first FrontRunner train leaves Salt Lake Central Station northbound at 3:25am on weekdays, however full-length runs do not begin until 4:50 a.m.; on Saturdays, the first train leaves Salt Lake Central at 6:03 a.m. or 6:55 a.m. depending on direction and full-length service commences at 7:50 a.m.

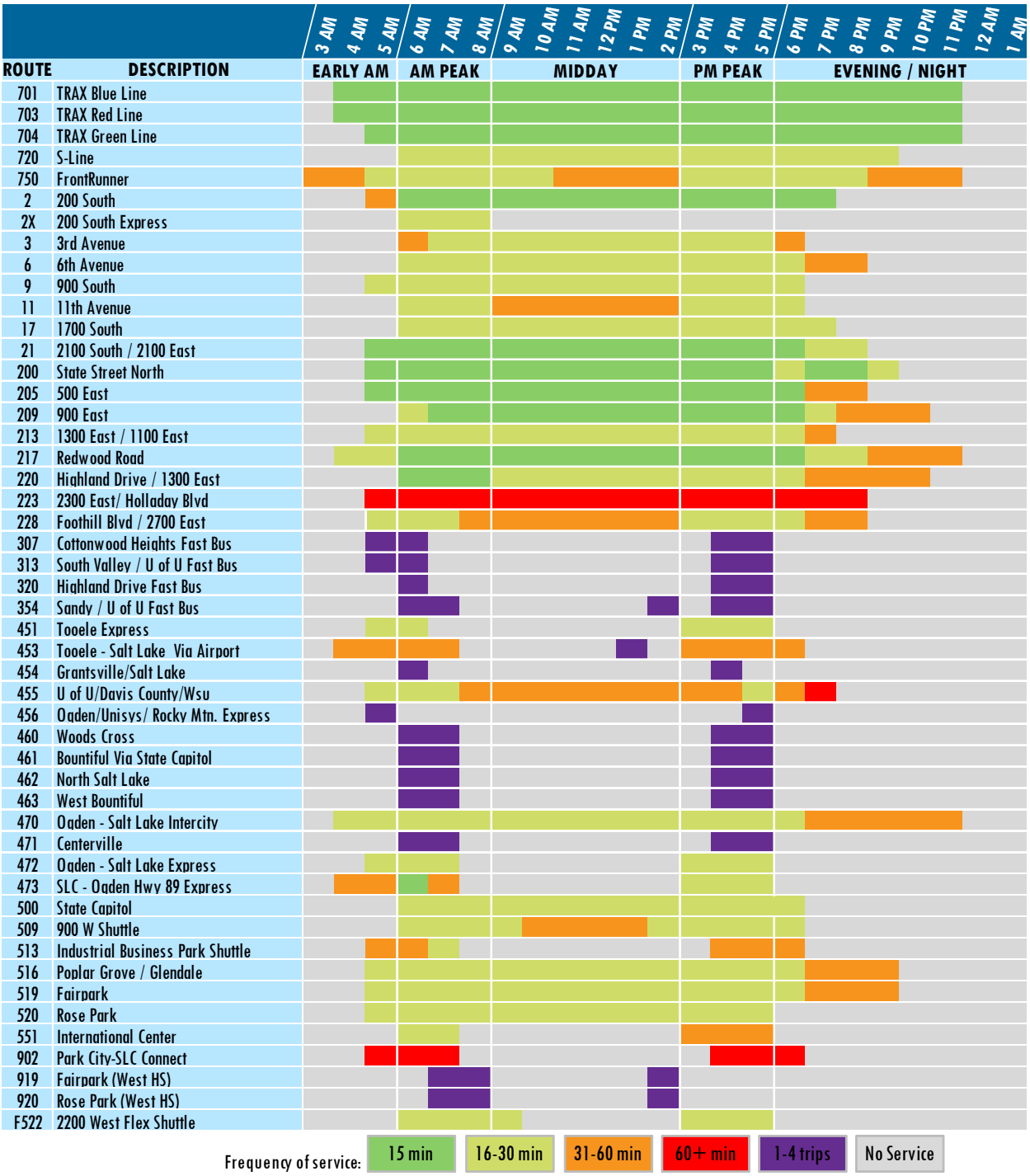
TRANSIT SERVICE CHARACTERISTICS IN SALT LAKE CITY

Figure 4-5 and Figure 4-6 illustrate transit frequency and service span for each transit route provided by UTA in Salt Lake City. Transit frequency is how often vehicles arrive along a route and service span is how early and late transit operates. Frequency varies considerably between the peak and midday hours on weekdays and service span varies between weekdays, Saturdays, and Sundays. TRAX provides the most frequent service and longest span, but a core set of bus routes also provide frequent service (every 15 minutes) over a long span on weekdays. The number of core bus routes and their frequency and span are reduced on Saturdays and Sundays.

On weekdays, bus service starts early in Salt Lake City – most routes begin between 4:30 and 6:00 a.m. Weekday evening service, on the other hand, tends to end relatively early, between 7:30 and 9:30 p.m. on most routes. Saturday service is more limited: express and Fast Bus routes do not run on the weekends and some local routes also are not in service. Saturday service starts running between about 6:30 or 7:30 a.m. Some Saturday routes end service at around 7:00 p.m. and about half operate until 10:00 p.m. On Sundays, service is even more limited. Only nine bus routes operate in Salt Lake City on Sundays primarily between the hours of 8:30 a.m. and 6:30 p.m.

Figure 4-7 through Figure 4-11 illustrate transit frequency geographically in Salt Lake City for the weekday morning peak and midday, Saturdays, and Sundays. These maps illustrate the major north–south and east–west arterial corridors that have service every 15 minutes all day on weekdays, while some other arterial corridors have service every 30 minutes all day. Service frequency on several routes varies over the course of the day. The midday, Saturday, and Sunday maps illustrate corridors that are not served during these time periods. Among corridors that retain service, the highest-frequency service is generally every 30 minutes on Saturdays and every 60 minutes on Sundays. An exception is service on State Street North, which runs every 15 minutes on Saturdays and every 30 minutes on Sundays.

Figure 4-5 Summary of Transit Service Span and Frequency in Salt Lake City–Weekday



Note: Service hours are approximate, rounded to the nearest hour

Source: Data from UTA and UTA schedules

Figure 4-6 Summary of Transit Service Span and Frequency in Salt Lake City–Weekend

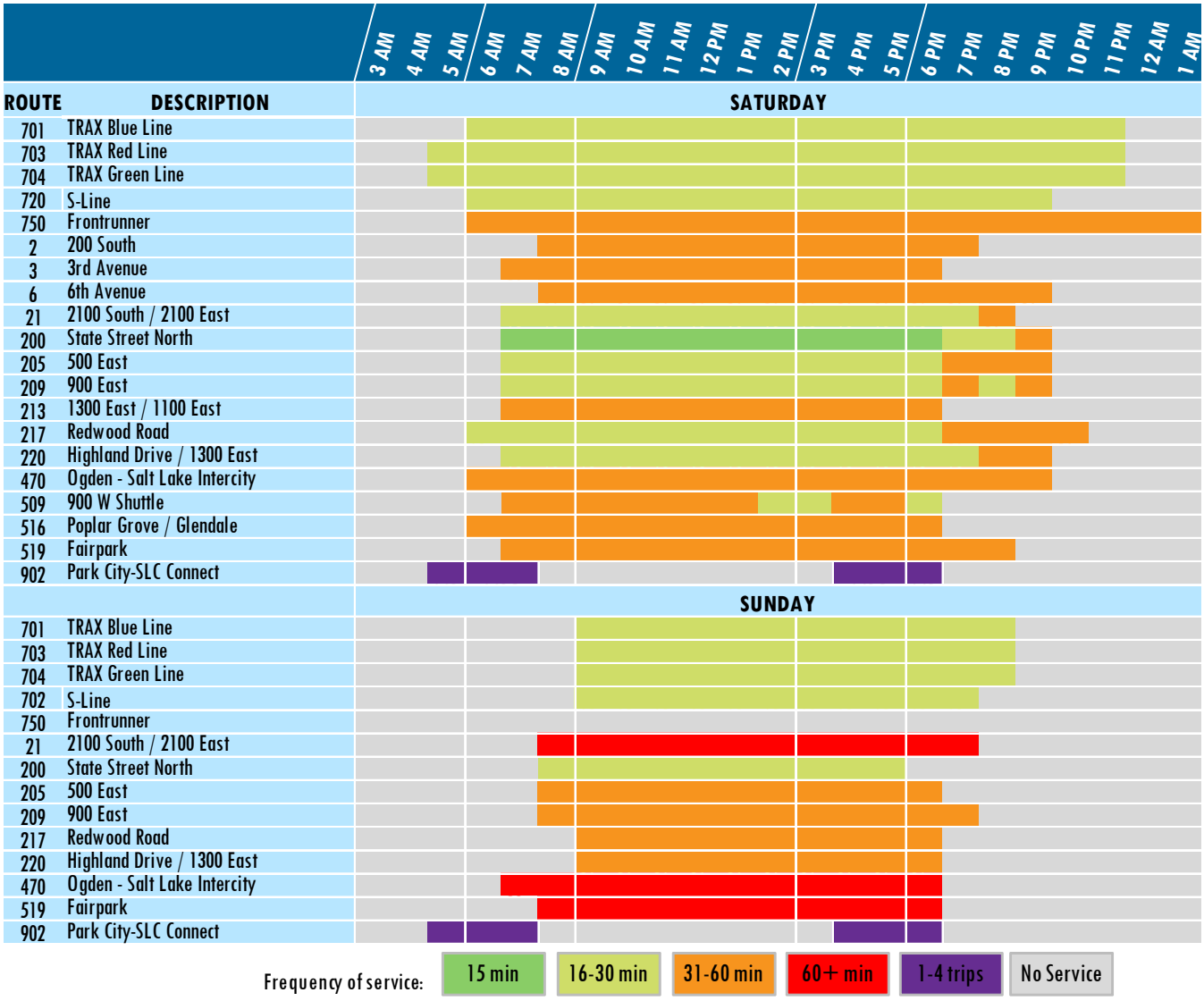


Figure 4-7 Service Frequency (AM Peak Weekday)

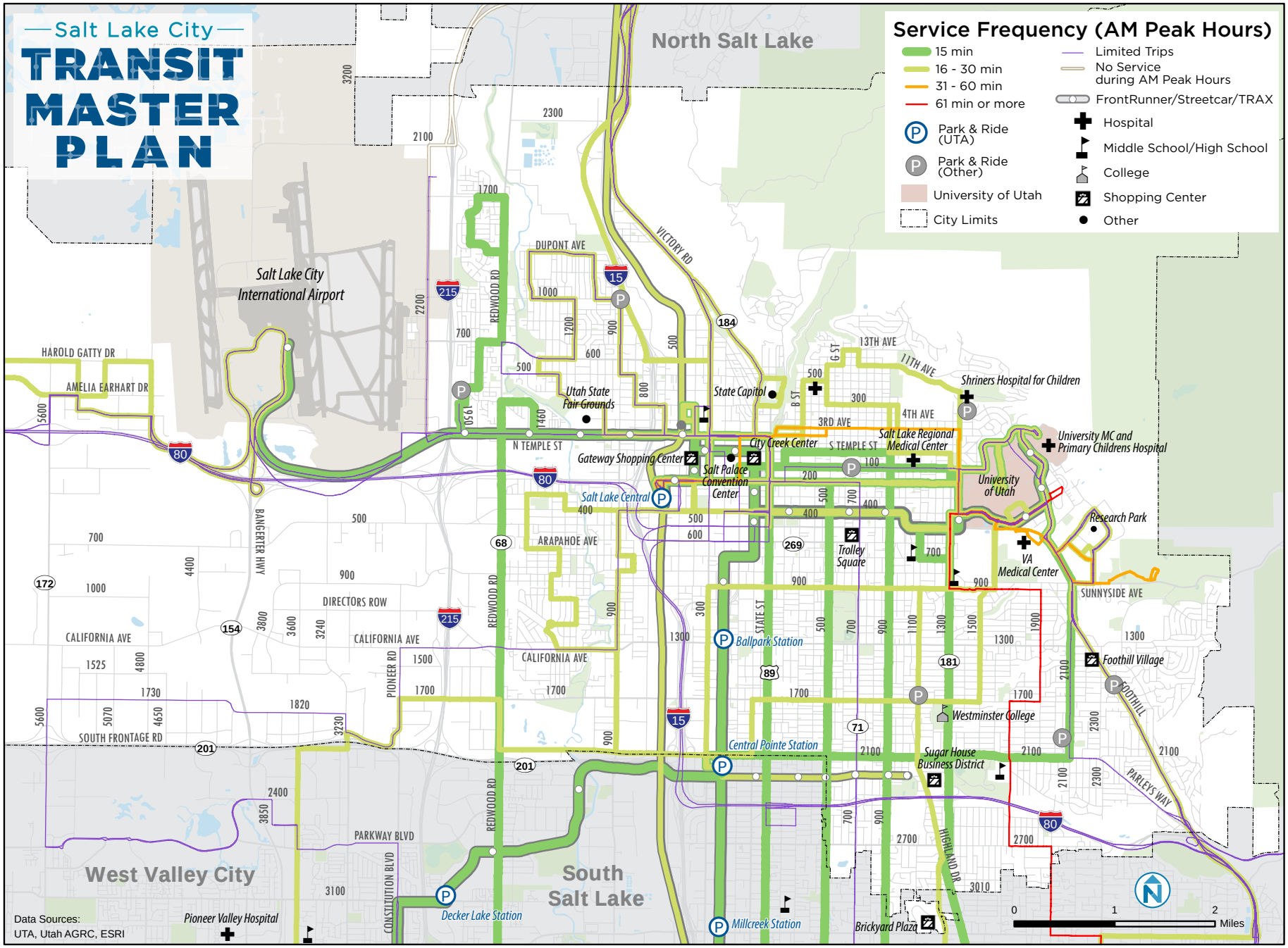


Figure 4-8 Service Frequency (Midday Weekday)

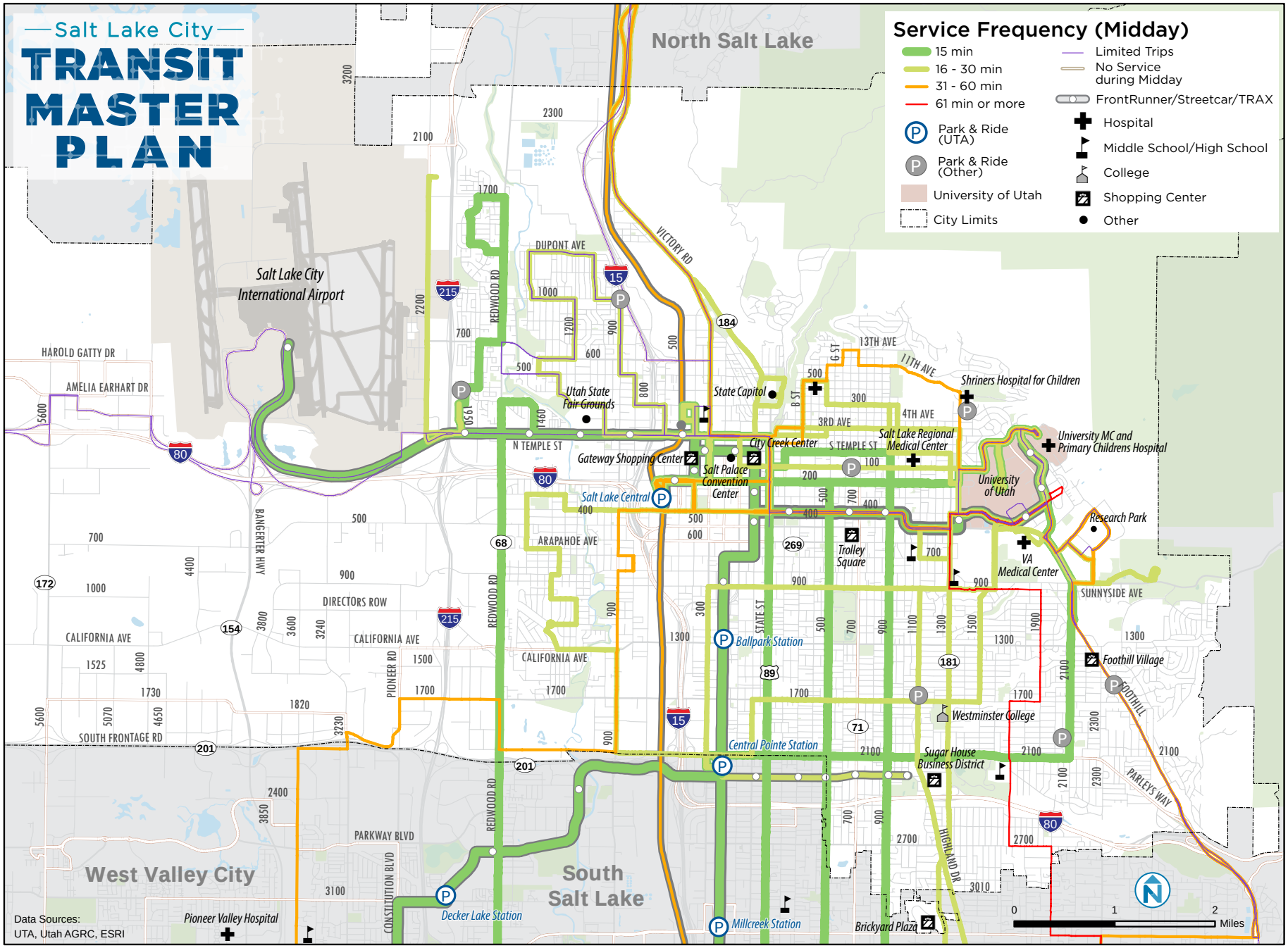


Figure 4-9 Service Frequency (Saturday)

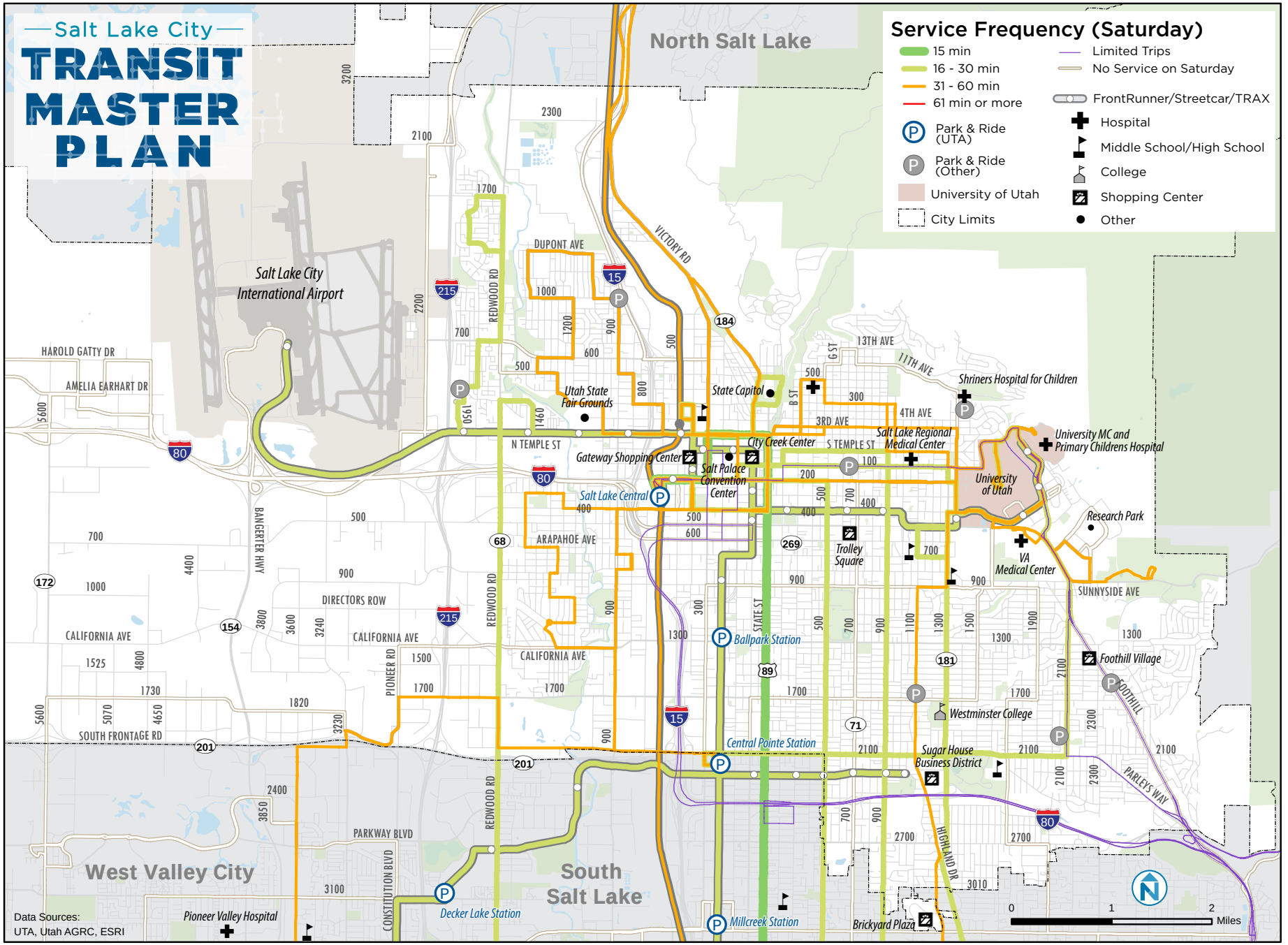


Figure 4-10 Service Frequency (Sunday)

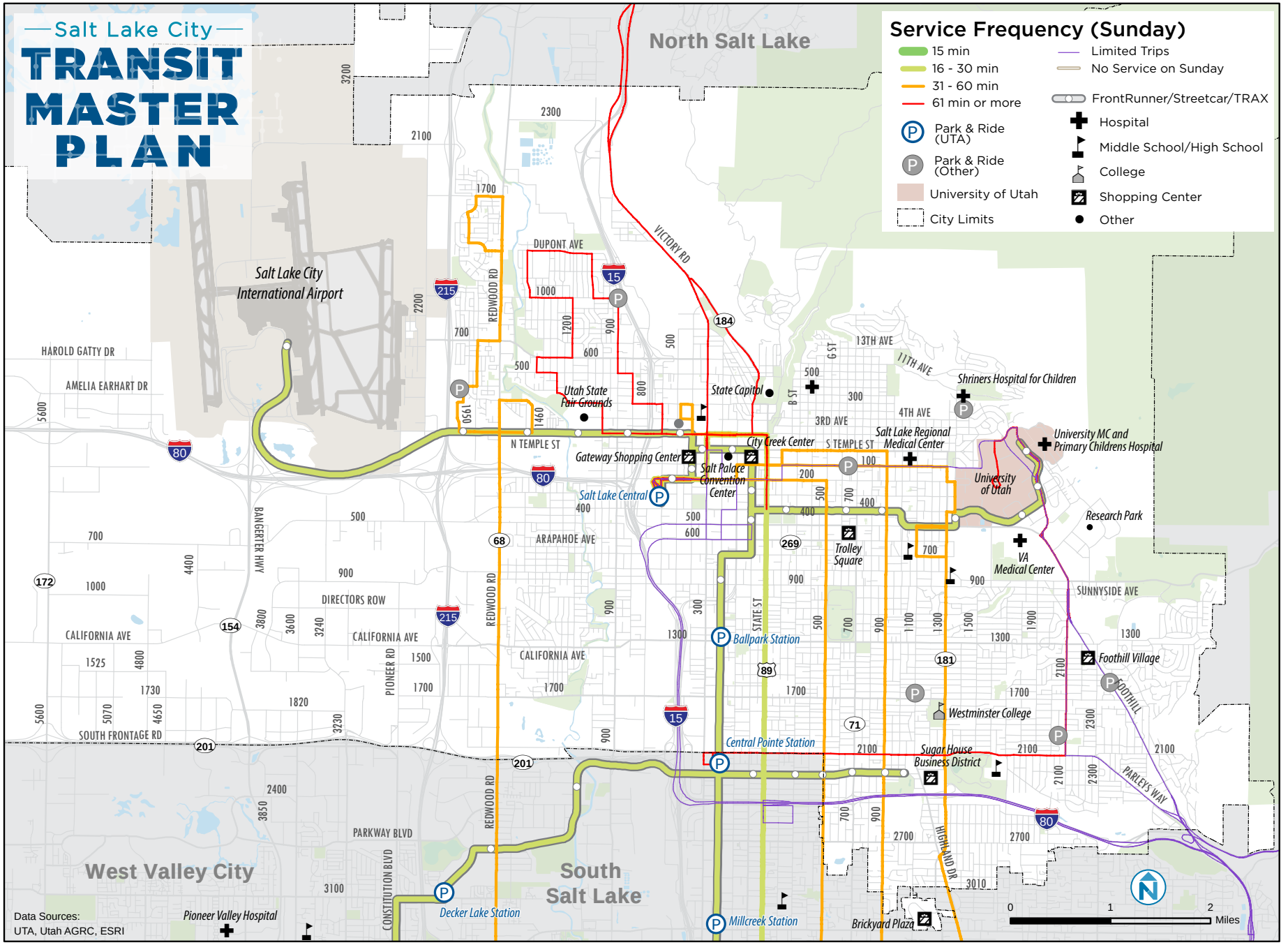
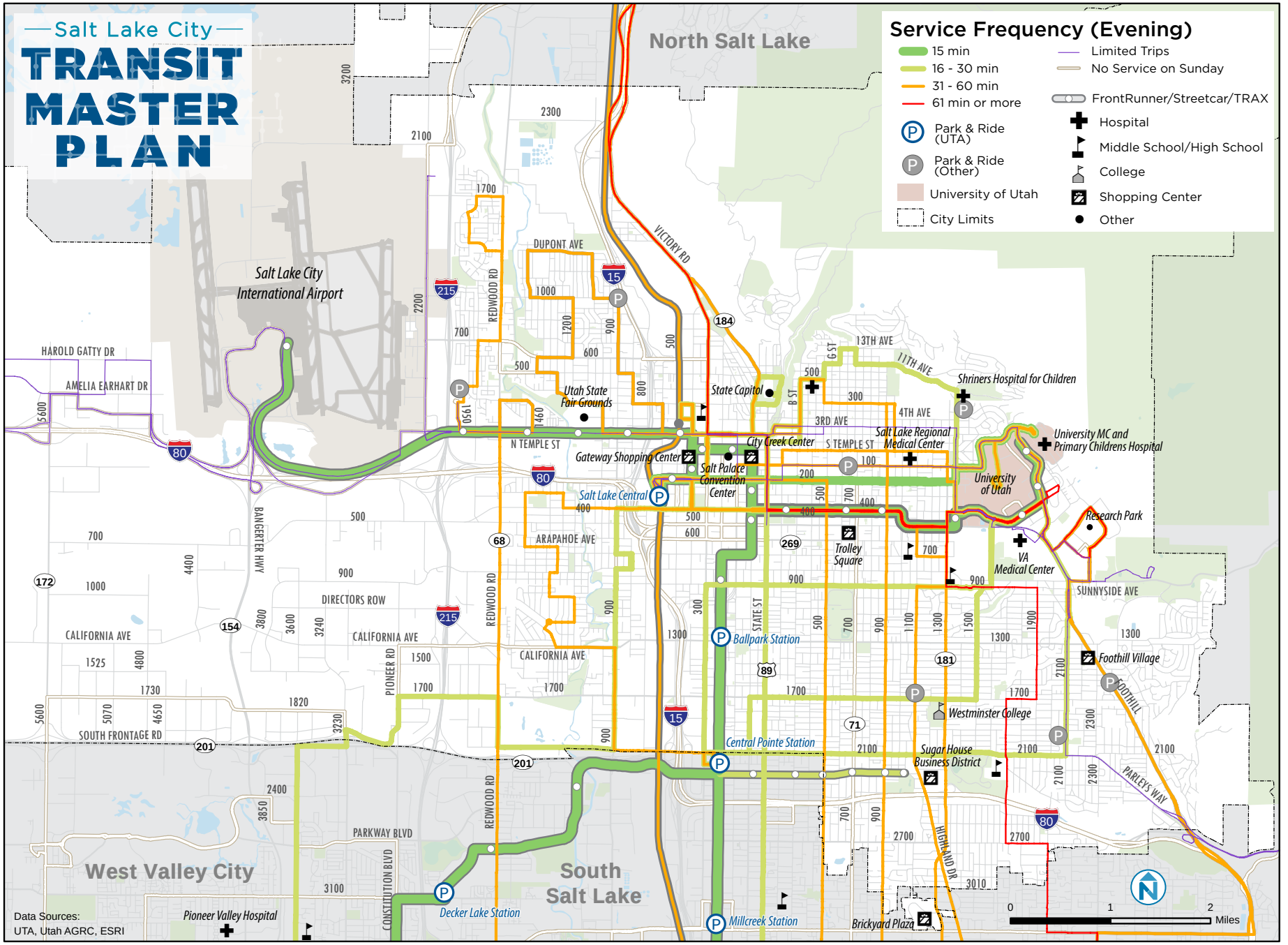


Figure 4-11 Service Frequency (Evening)



Transportation Services and Programs at the University of Utah

The University of Utah is a significant demand center for transit in Salt Lake City with more than 30,000 students and more than 17,000 faculty and staff. With four TRAX stations, more than 15 bus routes, and eight free campus shuttles, university students, faculty, and staff have numerous transit options available. Currently, approximately 35% of university trips are made by transit.[9] Further, Route 2 – 200 South that travels between the University Medical Center and Salt Lake Central Station is one of the most productive routes in Salt Lake City, carrying nearly 1,700 passengers per day and over 40 passengers per revenue hour.[10] UTA Route 2X provides five morning express trips (for local fare) on this route.

University transit programs and services include:

- **U-Card:** Provides staff, faculty, and students access to TRAX, UTA buses, and FrontRunner. In order to be eligible to obtain a pass, an individual must have a valid University of Utah ID Card, and be either a current employee of the University of Utah or a student who has paid tuition and associated student fees for the current semester – including the transportation fee. As of 2009, the transportation fee was $23.16 per semester for a student registered for 12 academic hours and $33.60 for a student registered for 20 academic hours.
- **Free campus shuttles:** The University operates eight routes. Service is generally provided between 6:00 a.m. and 6:00 p.m.; the Gold and "O-Zone" routes operate until 9:20 p.m. and 10:00 p.m. respectively. A live tracker is available on The U website to provide real-time arrival information.
- **Express shuttle:** The University also operates an express shuttle to/from Salt Lake Central Station that circulates the campus. This started as a pilot and has continued. The shuttle runs during the AM peak and makes six trips between 6:00 a.m. and 8:30 a.m. (once every 30 minutes).

The University of Utah provides free shuttle service on campus for faculty, staff, students, and visitors.
Source: Flickr Paul Kimo McGregor

[9] Hal Johnson, UTA

[10] UTA. Route Operating and Cost Indicators (2014)

TRANSIT PERFORMANCE

This section summarizes transit performance for UTA fixed-route transit in Salt Lake City, including transit ridership, revenue hours, and cost per revenue hour. An overview of how transit travel times compare with drive times from key local and regional destinations is also provided.

This analysis includes data for all UTA rail lines, however bus data is limited to UTA bus routes that enter Salt Lake City limits. The analysis categorizes data as follows:

- *Total* ridership/boardings includes: Bus routes that enter Salt Lake City limits, and S Line, FrontRunner, and TRAX boardings for the entire lines, not just within Salt Lake City boundaries.
- *Salt Lake City (SLC)* ridership/boardings includes: Same bus data and S-Line data as total ridership, and TRAX and FrontRunner boardings only at within Salt Lake City limits.
- Revenue hours include: Total revenue hours for bus routes that enter Salt Lake City limits, S-Line, TRAX, and FrontRunner.

All boardings and revenue hour data came from UTA including route operating and cost indicators, historical and current boarding and ridership data.

Trends in Transit Ridership and Revenue Hours

Overall transit ridership and service hours trends from 2011 through 2014 of UTA services serving Salt Lake City are shown in Figure 4-12. Total transit ridership on UTA services that operate in or through Salt Lake City increased by 28% between 2011 and 2014—a slightly higher rate than the increase in revenue hours over this time period (26%). Transit boardings that occurred within Salt Lake City also increased, but at a slower rate (13%) than boardings on the full lines. Ridership increases were largely due to several new lines that opened.

Figure 4-13 through 4-15 show annual average ridership compared to revenue hours for Salt Lake City bus routes, TRAX, FrontRunner, and the S-Line from 2011 to 2014, including both weekdays and weekends. Overall, over this four-year period:

- **Bus** ridership (Salt Lake City routes) decreased slightly (-3%) despite a 14% increase in revenue hours. This drop occurred between 2011 and 2012; ridership has held steady every since. The trend varied by type of bus service—but was driven by a decrease in local ridership, which comprises the majority of bus ridership and service provided.
- **TRAX** ridership and revenue hours increased, reflecting extensions in 2011 and 2013.
- **FrontRunner** ridership and revenue hours increased, reflecting the opening of extensions in late 2012.
- **S-Line** streetcar opened in late 2013 so trend data since 2011 is not available.

A sidebar on the following pages gives an overview of major historical changes in UTA service in Salt Lake City, providing some additional context for historical trends.

Figure 4-12 Total Annual Weekday and Weekend Transit Ridership and Revenue Hours in Salt Lake City (2011-2014)

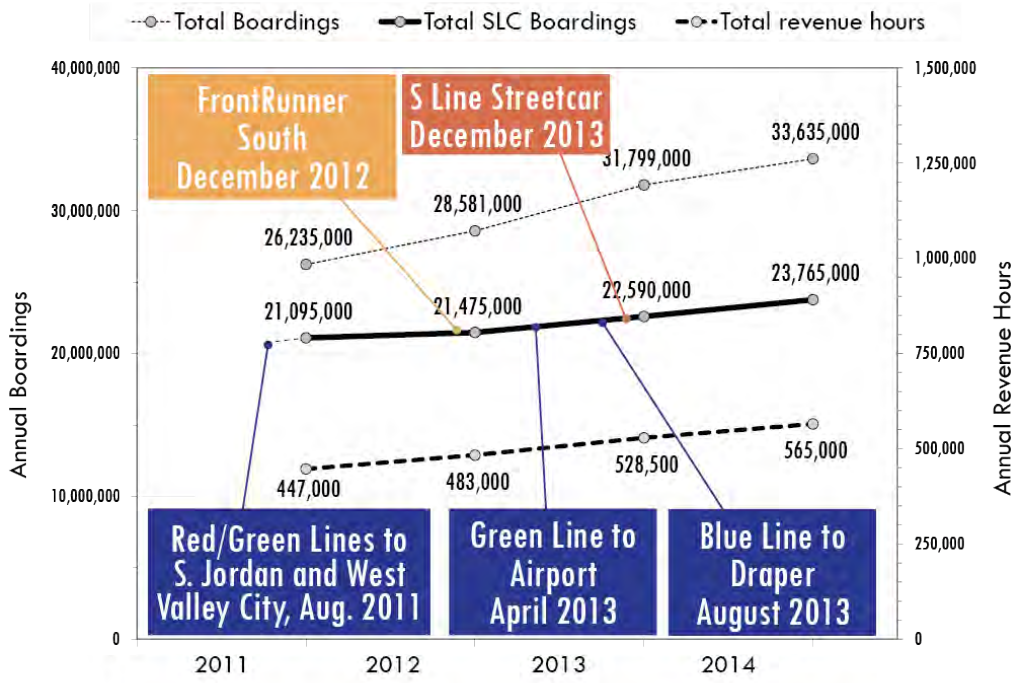
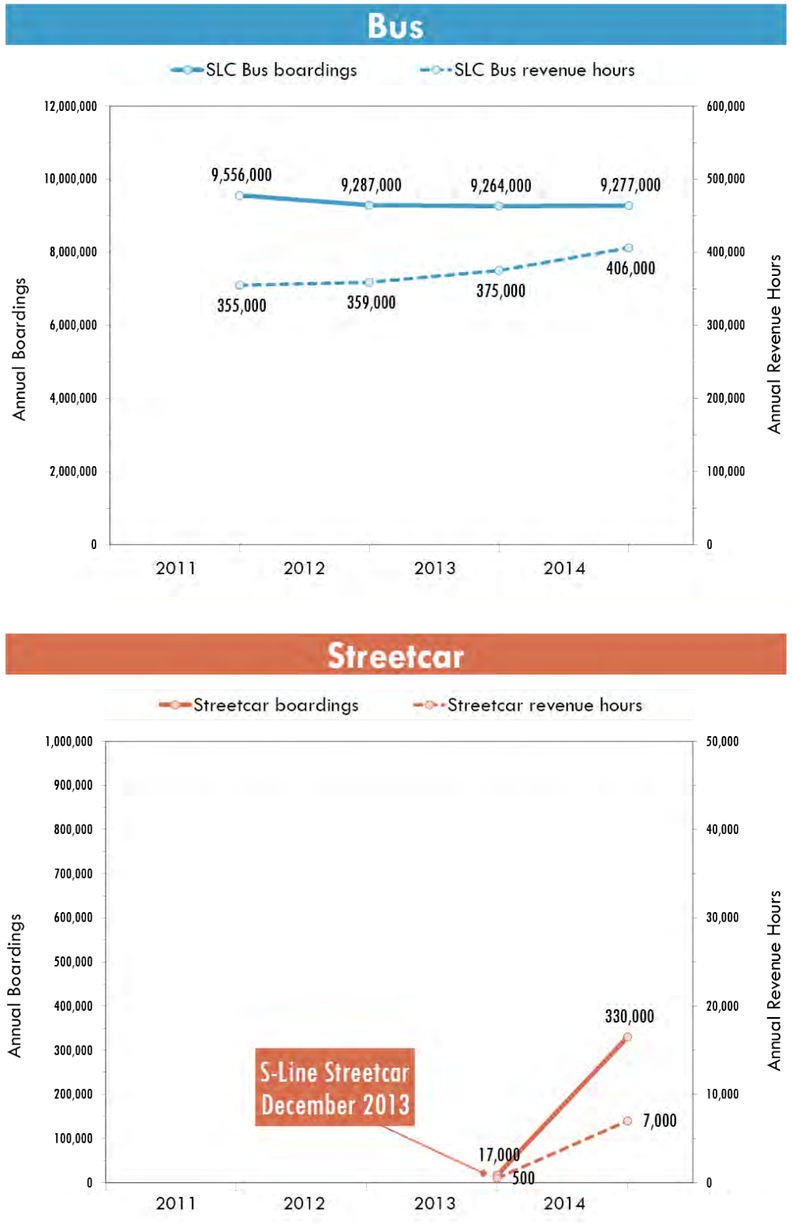
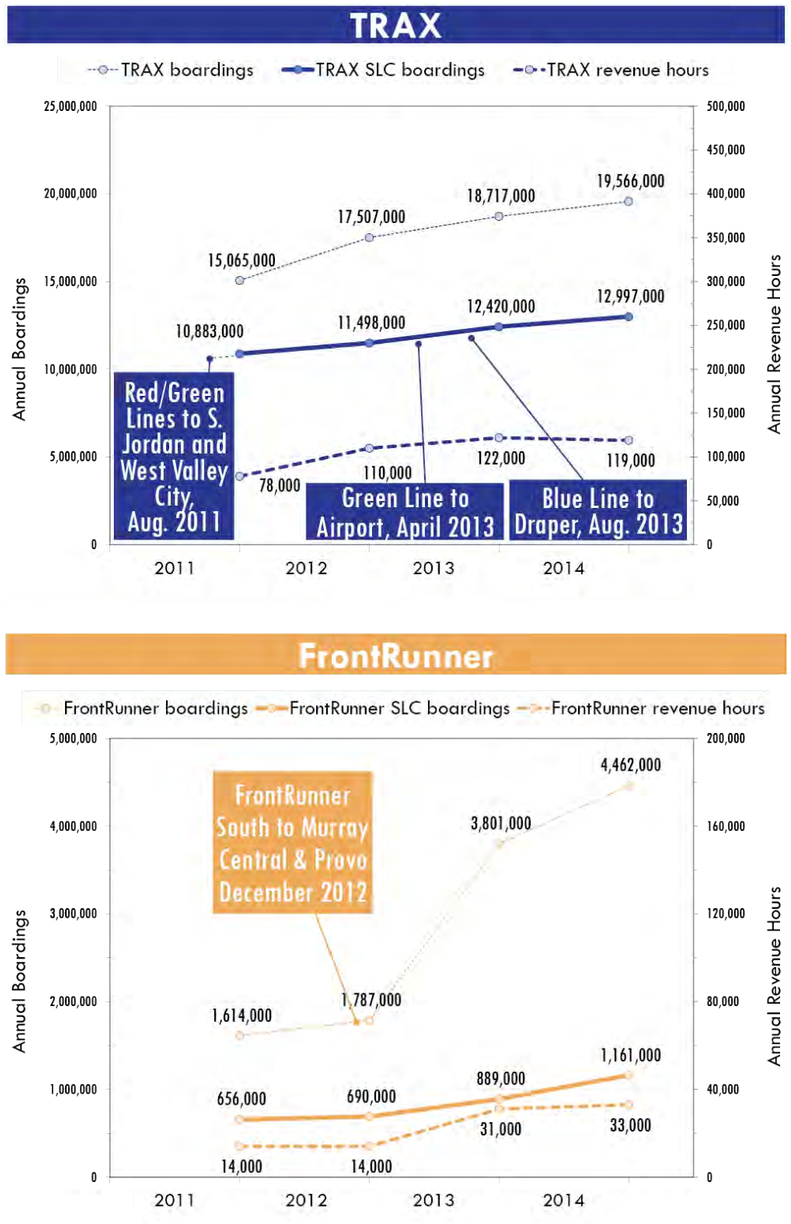


Figure 4-13 Salt Lake City Total Annual Weekday and Weekend Transit Ridership Compared to Revenue Hours, 2011-2014





Note: SLC bus boardings and service hours are defined as any boardings or service hours on bus routes that pass through or stop in Salt Lake City. Therefore, these figures include boardings and service hours on these routes that occur outside of Salt Lake City limits.

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Figure 4-14 Total Annual Weekday and Weekend Boardings and Revenue Hours (All Modes, 2011-2014)

	2011	2012	2013	2014	Change (2011-2014)	% Change
Boardings						
SLC Bus [1]	9,556,000	9,287,000	9,264,000	9,277,000	(279,000)	-3%
TRAX - Total	15,065,000	17,507,000	18,717,000	19,566,000	4,501,000	30%
TRAX - SLC Only [2]	10,883,000	11,498,000	12,420,000	12,997,000	2,114,000	19%
FrontRunner - Total	1,614,000	1,787,000	3,801,000	4,462,000	2,848,000	176%
FrontRunner – SLC Only [2]	656,000	690,000	889,000	1,161,000	505,000	77%
S-Line	--	--	17,000	330,000	330,000	n/a
Total Boardings	26,235,000	28,581,000	31,799,000	33,635,000	7,400,000	28%
SLC Boardings [2]	21,095,000	21,475,000	22,590,000	23,765,000	2,670,000	13%
Revenue Hours [3]						
SLC Bus	355,000	359,000	375,000	406,000	51,000	14%
TRAX	81,000	111,000	123,000	122,000	41,000	51%
FrontRunner	14,000	14,000	31,000	34,000	20,000	143%
Streetcar	--	--	500	7,000	7,000	n/a
Total Revenue Hours	450,000	484,000	529,500	569,000	119,000	26%

Notes: (1) Bus boardings include UTA bus routes that enter Salt Lake City limits. (2) TRAX and FrontRunner boardings that occur within Salt Lake City limits. [3] Revenue hours for TRAX, FrontRunner, and S-Line include the entire systems, since all lines serve Salt Lake City.

Figure 4-15 Annual Weekday and Weekend Boardings and Revenue Hours (SLC Bus Only, 2011-2014)

	2011	2012	2013	2014	Change (2011-2014)	% Change
SLC Bus Boardings						
All-Day Local/Shuttle	8,735,000	8,409,000	8,392,000	8,411,000	(324,000)	-4%
Peak-Only Local/ Shuttle/Flex	250,000	266,000	285,000	291,000	41,000	16%
Express/Fast Bus	562,000	601,000	576,000	564,000	2,000	0%
SLC Bus Revenue Hours						
All-Day Local/Shuttle	320,000	322,000	338,000	368,000	48,000	15%
Peak-Only Local/ Shuttle/Flex	12,000	13,000	14,000	15,000	3,000	25%
Express/Fast Bus	22,000	23,000	22,000	22,000	-	0%

Note: Bus ridership and boardings include only UTA bus routes that touch Salt Lake City limits.

Overview of Historical Changes in Transit Service

UTA makes changes to their system three times per year (3 "change days per year" is required by their collective bargaining agreement). Changes can include re-numbering of routes, re-routing of lines, and schedule adjustments. This can make historical route-by-route ridership and performance data difficult to compile (especially prior to 2011). However, historical milestones can be noted based on information provided by UTA and Salt Lake City staff:

- 2006/2007: The Salt Lake Central Intermodal Hub was completed and much of UTA's transfer activity moved from Main Street to the Hub.
- 2007: UTA undertook a major redesign of their bus service network in 2007 in which bus routes were re-designed to feed rail lines, bus schedules were aligned to rail schedules to facilitate timed transfers, the route numbering system was changed, and a network of bus lines operating at 15-minute frequency was established.
  - Since then, UTA has made some changes to reestablish direct local routes and has established a more iterative scheduling process between rail and bus services.
- 2011: The primary downtown transfer point changed from Gallivan to Courthouse Station upon the opening of the TRAX Red Line and Green Line to South Jordan and West Valley City. This resulted in significant changes in TRAX boarding patterns in Downtown Salt Lake City as shown in the table below.

TRAX Boardings by Station

	2011	2012	% Change
Courthouse Station	1,068	6,616	520%
City Center Station	2,251	2,800	24%
Salt Lake Central Station	4,125	2,663	-35%
Gallivan Plaza Station	3,883	2,009	-48%

Salt Lake City Transit Performance in 2014

The relationship between ridership and revenue hours—productivity, or riders per revenue hour—is an important measure of transit effectiveness. Salt Lake City bus routes on average carry fewer passengers per revenue hour than the S-Line, TRAX, and FrontRunner, which operate with higher-capacity vehicles; however some of these routes are the most productive routes in the entire UTA system. Productivity on routes serving Salt Lake City is as follows:

- **Salt Lake City bus routes,** on average, carried about 23 riders per revenue hour in 2014, slightly higher than average productivity for all UTA bus routes (21 riders per revenue hour). However, the most productive local and express bus routes carry 42 and 85 riders per hour respectively.
- **TRAX** productivity averaged over 160 riders per revenue hour in 2014.
- **FrontRunner** productivity was over 130 riders per revenue hour in 2014.
- **S-Line** carried about 50 riders per revenue hour in 2014.

The list below includes the highest ridership and/or most productive bus routes with all-day service in Salt Lake City.[11] In general, long bus routes, such as those that connect downtown Salt Lake City to Ogden and Murray for most of the day, and all-day local routes that serve University of Utah tend to have the highest average annual ridership.

- **Route 200 – State Street North (900,000 weekday boardings, 32 boardings/hour)** is a north–south route between Salt Lake Central Station and South Murray Central Station. It is the highest ridership route in Salt Lake City.
- **Route 217 – Redwood Road (815,000 weekday boardings, 24 boardings/hour)** is a north–south route on the west side of the city, serving North Temple and West Jordan TRAX stations.
- **Route 209 – 900 East (710,000 weekday boardings, 24 boardings/hour)** is a north–south route between North Temple Station and Fashion Place West in Murray.
- **Route 205 – 500 East (590,000 weekday boardings, 28 boardings/hour)** is a north–south route between Salt Lake Central Station and Murray North Station.
- **Route 21 – 2100 South/2100 East (520,000 weekday boardings, 30 boardings/hour)** is a north-south/east-west route between University of Utah and Central Pointe TRAX station.
- **Route 2 – 200 South (500,000 weekday boardings, 42 boardings/hour)** is an east–west route connecting Salt Lake Central Station to the University of Utah. It is the most productive local bus route at over 42 boardings per revenue hour. An express version (2X) provides over 85 boardings per hour.
- **Route 6 – 6th Avenue (235,000, 36 boardings/hour)** is an east–west route connecting downtown North Temple Station to the University of Utah and the University Medical Center; it travels through the Greater Avenues passing the LDS Hospital and Salt Lake Regional Medical Center. This route's ridership is not as high as the others, but it is the second most productive route.

Figures 4-16 and 4-17 show the breakdown of how much service was provided on each mode in terms of total revenue hours in 2014. Figures 4-18 and 4-19 illustrate performance of Salt Lake City transit in 2014 on several key performance measures: boardings per hour, cost per hour, and cost per passenger (average weekday).[12] The charts illustrate how each route performs relative to the average cost and productivity for all routes. Both charts show productivity (riders per revenue hour) on the horizontal axis. Figure 4-18 illustrates cost per boarding on the vertical axis while Figure 4-19 shows the cost per passenger mile.

The charts differentiate local and shuttle services that provide all-day service (darker blue circles) from routes that provide peak-only or limited service. In Figure 4-18, all-day routes are clustered along the top of the chart as they tend to cost less to operate per passenger trip. Figure 4-19 shows that express and other routes that provide longer-distance, peak-period trips are cost-effective on a per-passenger mile basis. Appendix B provides a table of performance measures for individual routes and services.

[11] Annual weekday boardings and boardings per service hour, 2014. Boardings rounded to nearest 5,000.

[12] Operating cost is the direct, incremental cost per service hour and service mile for each route.

Figure 4-16 Breakdown of 2014 Total Annual Weekday and Weekend Salt Lake City Transit Revenue Hours and SLC Boardings

Service Type	2014 Revenue Hours	% of Total	2014 Boardings	% of Total
Bus	406,000	71%	9,277,000	39%
TRAX	122,000	21%	12,997,000	55%
FrontRunner	34,000	6%	1,161,000	5%
S-Line	7,000	1%	330,000	1%
Total Revenue Hours	569,000	100%	23,765,000	100%

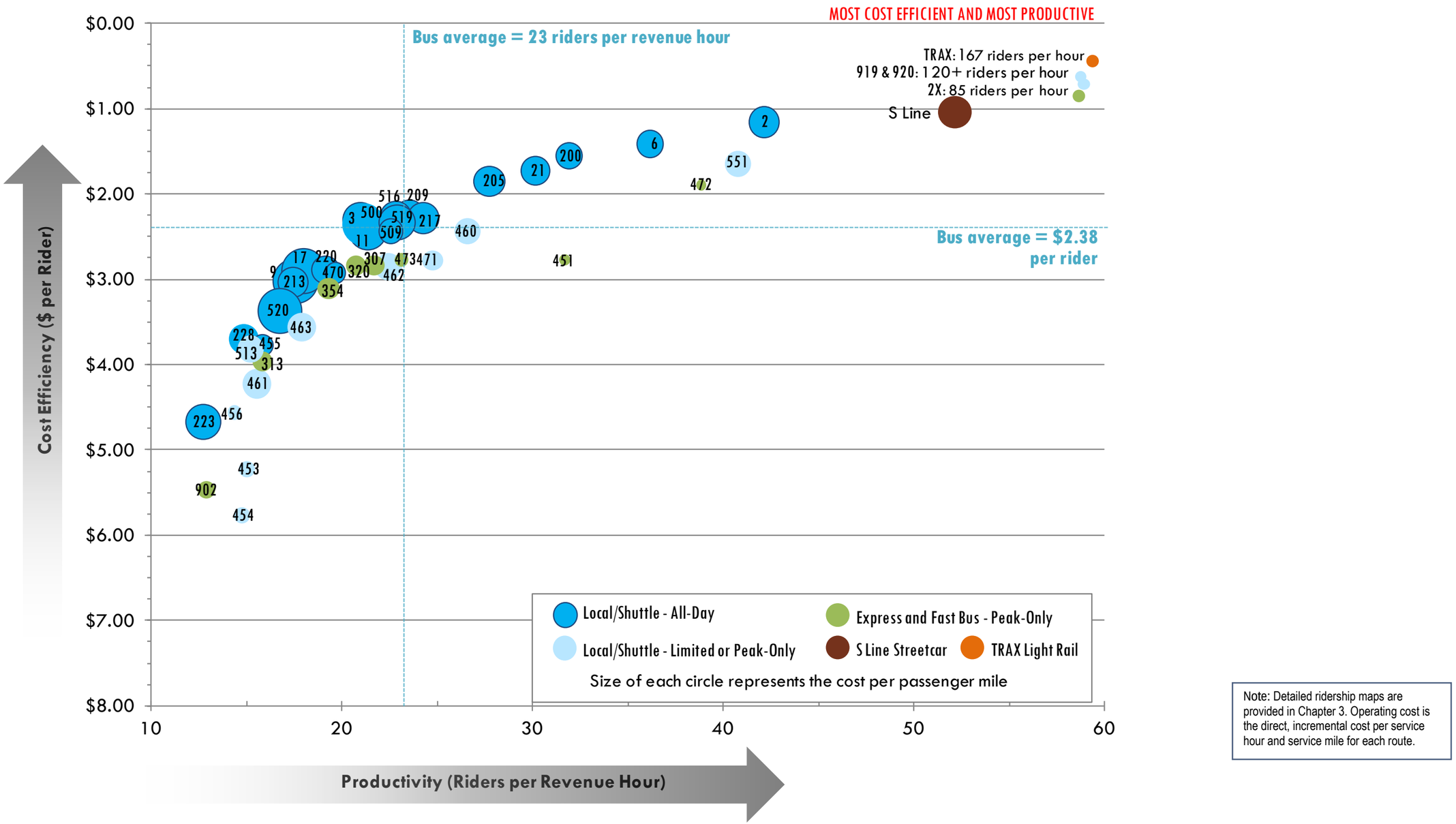
Note: Bus hours and ridership include only UTA bus routes that touch Salt Lake City limits. Revenue hours for TRAX, FrontRunner and S-Line include the entire systems, since all lines serve Salt Lake City.

Figure 4-17 Breakdown of 2014 Total Annual Weekday and Weekend Salt Lake City Bus Revenue Hours and Boardings

Service Type	2014 Bus Revenue Hours	% of Total Bus Hours	2014 Boardings	% of Total
All-Day Local/Shuttle	368,000	91%	8,411,000	91%
Peak-Only Local/Shuttle/Flex	15,000	4%	291,000	3%
Express/Fast Bus Rev Hours	22,000	5%	564,000	6%

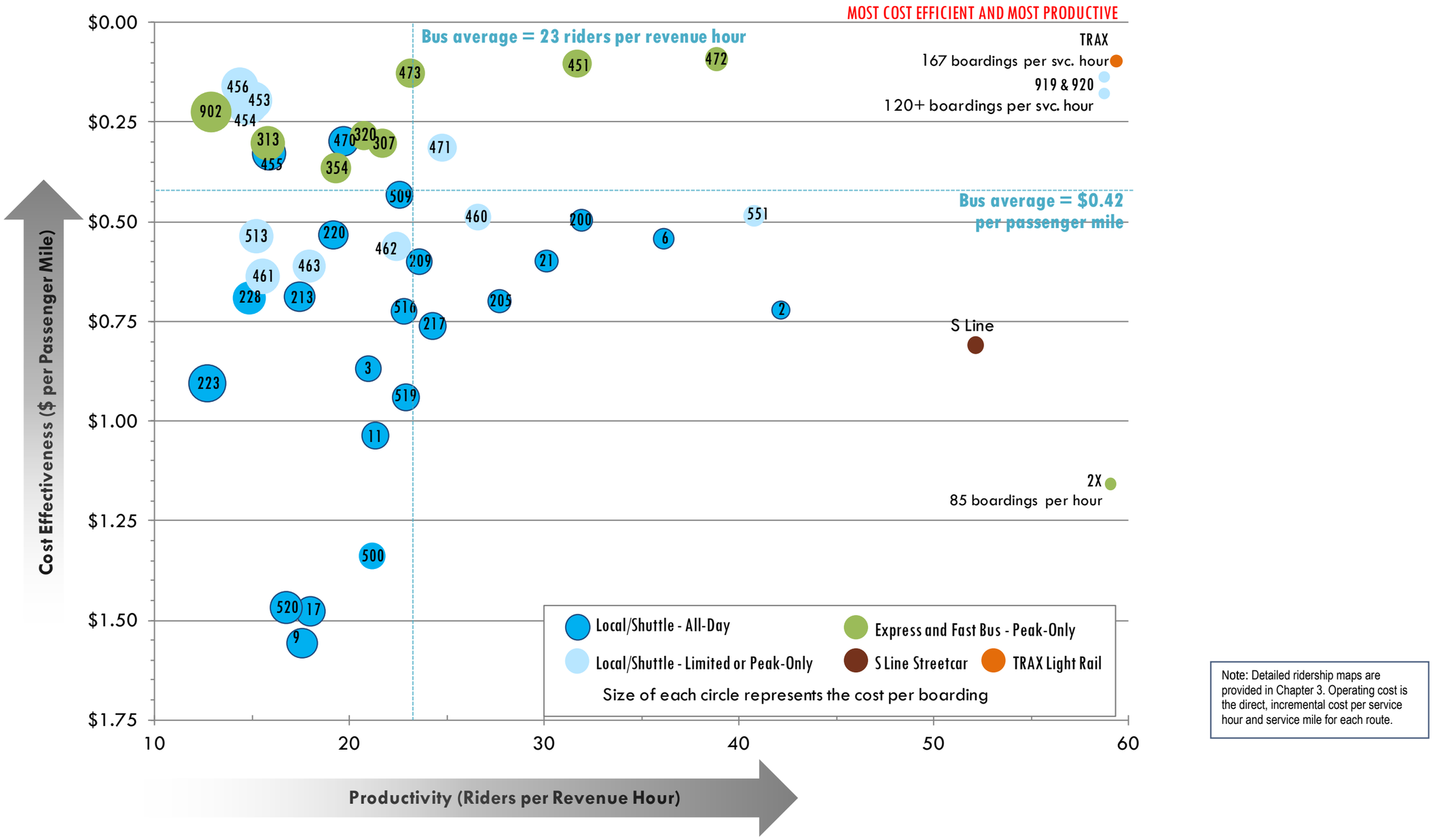
Note: Includes only UTA bus routes that touch Salt Lake City limits.

Figure 4-18 Salt Lake City Bus Route Productivity (riders per hour) and Cost Efficiency (cost per rider), Average Weekday (2014)



Note: Detailed ridership maps are provided in Chapter 3. Operating cost is the direct, incremental cost per service hour and service mile for each route.

Figure 4-19 Salt Lake City Bus Route Productivity (riders per hour) and Cost Effectiveness (cost per passenger mile), Average Weekday (2014)



Note: Detailed ridership maps are provided in Chapter 3. Operating cost is the direct, incremental cost per service hour and service mile for each route.

TRANSIT TRAVEL TIME VS. DRIVE TIME

Anecdotally, using transit for east–west travel in Salt Lake City has been particularly challenging for riders. Figure 4-20 below illustrates a theoretical comparison of travel times by car and transit between several Salt Lake City neighborhoods and downtown and between key regional destinations and downtown.[13] This comparison serves not as a specific illustration of travel time, but rather to highlight the neighborhoods where transit carries a particularly high time disadvantage compared to auto travel:

- Sugar House neighborhood
- Glendale neighborhood
- East Bench neighborhood

Figure 4-20 Drive Time vs. Transit Time

Origin	Destination	Drive Time	Transit Time	How many times slower is transit
Sugar House neighborhood	Downtown SLC	0:11	0:26	2.4
University of Utah	Downtown SLC	0:12	0:18	1.5
Rose Park Neighborhood	Downtown SLC	0:08	0:13	1.6
Poplar Grove Neighborhood	Downtown SLC	0:08	0:14	1.8
Glendale Neighborhood	Downtown SLC	0:11	0:23	2.1
Greater Avenues Neighborhood	Downtown SLC	0:11	0:18	1.6
East Bench Neighborhood	Downtown SLC	0:16	0:36	2.3

Note: The times were calculated using the trip planning tool on Google Maps. Drive times were taken at 5 p.m. Transit times were calculated by selecting 5 p.m. as the beginning travel time for weekday trips. For the purposes of this analysis, Salt Palace Convention Center was selected as the default "downtown SLC destination." Walk times are not included for drive time or transit time.

[13] Note: The times were calculated using the trip planning tool on Google Maps. Drive times were taken at 5 p.m. Transit times were calculated by selecting 5 p.m. as the beginning travel time for weekday trips. For the purposes of this analysis, Salt Palace Convention Center was selected as the default "downtown SLC destination." Walk times are not included for drive time or transit time.

PLANNED TRANSIT SERVICE

UTA participates in developing the Regional Transportation Plan (RTP) led by the metropolitan planning organization, Wasatch Front Regional Council. The UTA Network Study had been completed and the results were considered during the drafting of the most recent plan, due to be adopted in May, 2015. The RTP is a fiscally constrained plan and many transit projects and services had to be moved to later phases due to revenue availability.

The UTA Network Study completed in 2013 identifies the next group of capital and operating improvements that the UTA will focus on delivering after completion of the FrontLines 2015 program (see Figure 4-21). Planned capital and service investments by 2040 in Salt Lake City include a range of Bus Plus enhancements, new BRT routes, and a new downtown streetcar line:

- Expansion of the Bus Plus Frequent Transit Network on the following corridors:[14]
  - Salt Lake Central Station to the University of Utah
  - Salt Lake Central Station to Sandy Civic Center south along State Street
  - Other Enhanced Bus improvements
- New BRT routes on the following corridors:
  - BRT along Redwood Road to Sandy Civic Center
  - BRT from the International Center south along 5600 to the Daybreak TRAX Station
  - BRT from Salt Lake Central along State Street to the Draper FrontRunner Station
- Downtown Streetcar along 100 South, 200 South, or another parallel road in same travel corridor.
- Direct TRAX connection from the Salt Lake Intermodal Center to the University of Utah via a new 1-mile track segment from Main Street to Salt Lake Central Station via 400 South.

[14] The Bus Plus Transit Network is a network of high-quality bus service (or BRT-light) proposed to expand the high-quality transit coverage. Bus Plus service would include all of the amenities of BRT without the exclusive lanes.

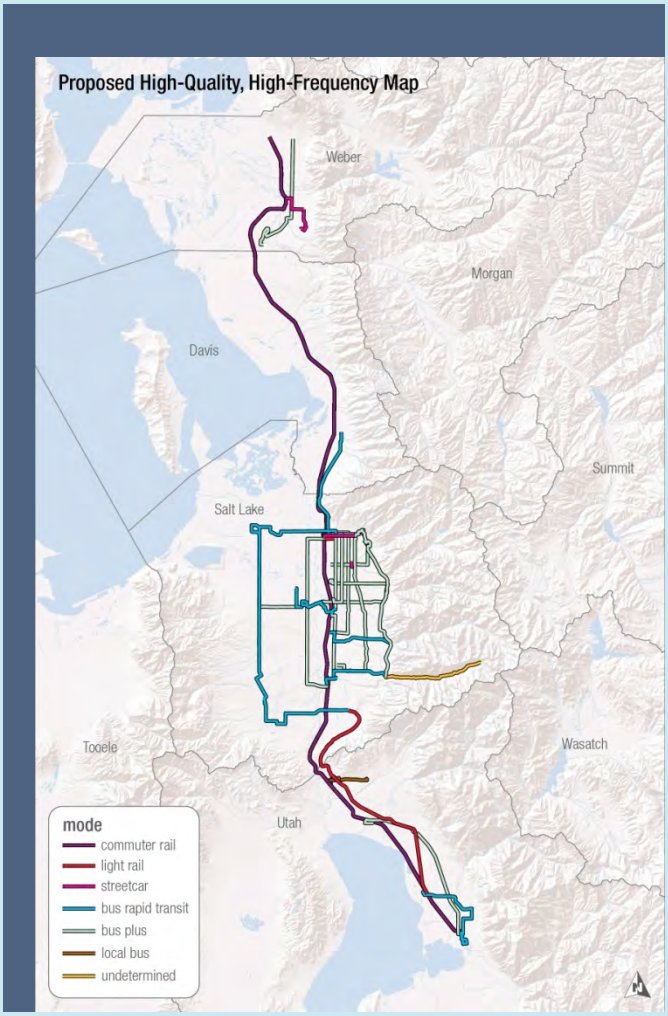
UTA Proposed "Bus Plus" Network

With the completion of FrontLines 2015 (UTA's 70-mile rail investment project), UTA initiated a Network Study to identify the agency's next round of major capital and operating improvements.

Building on UTA's recent investments in light rail, streetcar, and commuter rail, the Network Study proposed a series of network priorities, including a proposed "Bus Plus" network of high-quality, high-frequency transit in Salt Lake City and beyond. Bus Plus, also called Enhanced Bus, is similar to bus rapid transit except that it does not operate in dedicated lanes.

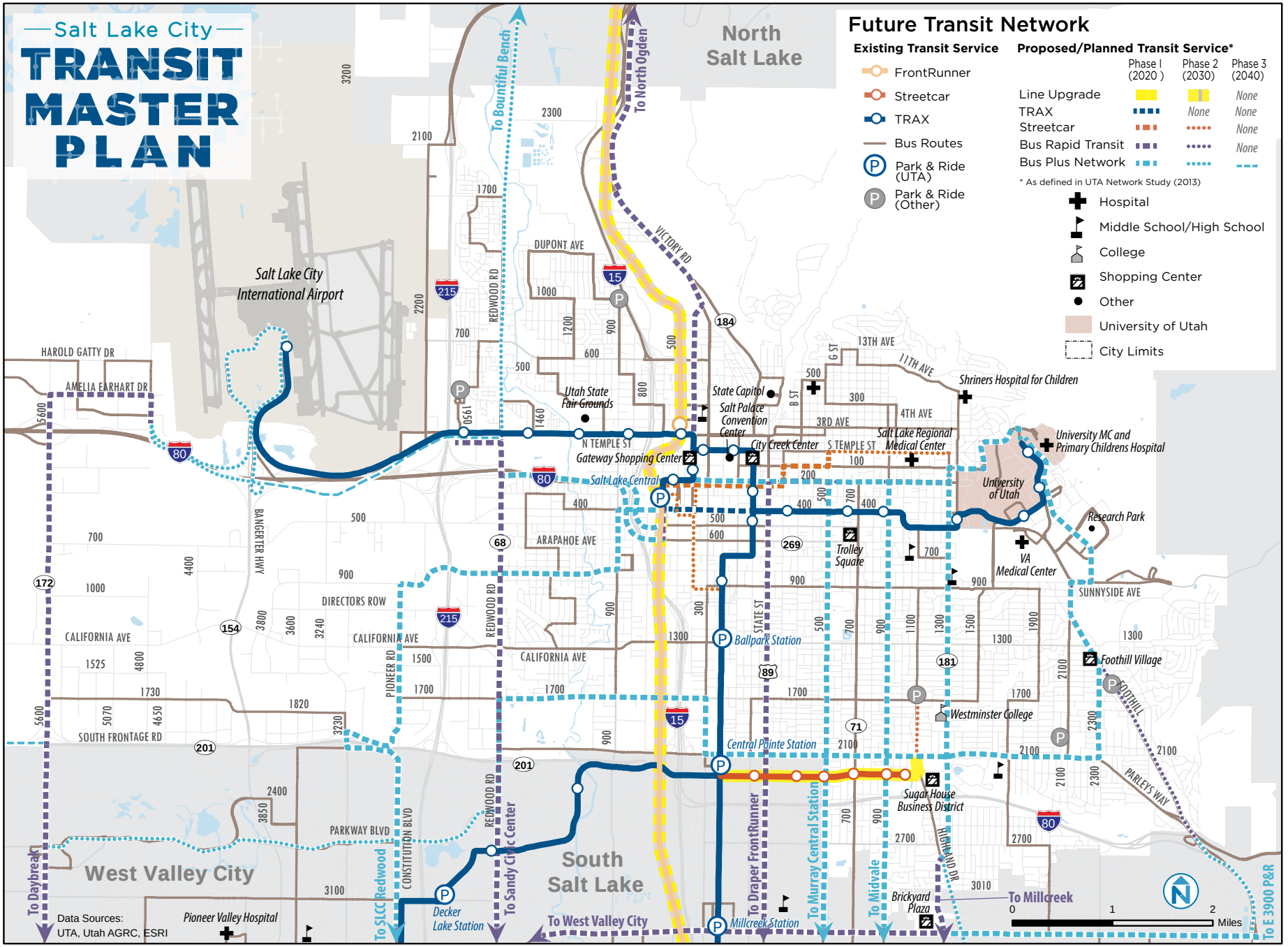
The proposed Bus Plus network proposes key north–south and east–west connections to TRAX, FrontRunner, and key destinations in Salt Lake City. The proposed network:

1. Expands the high-quality transit network
2. Increases service frequency on key routes
3. Decreases travel time across Salt Lake City
4. Improves reliability on key routes using transit signal priority, reduced stops, and pre-board ticketing
5. Provides high-amenity stations including seating, shelters, and real-time information



Source: UTA Network Study (2013)

Figure 4-21 Planned Transit Service in Salt Lake City



SALT LAKE CITY TRANSIT FACILITIES

Salt Lake City Central Station

The Salt Lake City Central Station (also called the Intermodal Hub or "the Hub") is a multimodal transportation hub in Salt Lake City connecting UTA's TRAX, FrontRunner, and numerous buses. Amtrak service also converges at Salt Lake Central Station, along with Greyhound Lines and U Car Share.

Salt Lake Central Station (also referred to as the Salt Lake City Intermodal Hub or "the hub") connects bus, commuter rail, light rail, and other regional transportation services.

Source: Flickr Matt' Johnson

North Temple Station

The North Temple Station is a multimodal transportation hub just north of Downtown Salt Lake City that connects UTA's TRAX, FrontRunner, and numerous bus routes.

Park-and-Ride Facilities

Park-and-ride facilities offer a convenient place for commuters and visitors to park their cars and connect to transit, ridesharing, and bike options. Park-and-ride locations are illustrated in Figure 4-1 at the beginning of this chapter. UTA manages 40 park-and-ride lots at TRAX and FrontRunner stations along the Wasatch Front. Three UTA park-and-rides are located within city boundaries:

- **Salt Lake Central Station** in downtown Salt Lake City has 30 park-and-ride spaces and operates at 100% capacity.[15]
- **Ballpark Station** at W 1300 S has 193 parking spaces and operates at 80% capacity.[16] Ballpark Station has a bus loop, but it is not currently utilized by any UTA routes.
- **Central Pointe Station** has 71 parking spaces and operates at 100% capacity. [17] Central Pointe Station provides transfer opportunities between TRAX, the S-Line Streetcar, and buses.

There are also a number of park-and-ride locations listed on the UTA website that are owned and managed by the LDS Church that serve the local bus routes.[18] These include:

- 1955 West 400 North: 171 spaces
- 1000 North 900 West: no parking space data available
- 630 East 100 South: 80 spaces available
- 1651 South 1100 East: 193 spaces available
- 1930 South 2100 East: 199 spaces available
- 1565 Foothill Drive: 94 spaces available

There is also the potential for a shared lot by the Fairpark (just to the West of the Fairgrounds) that UTA is currently negotiating. The park-and ride will not be available during the Fair, but will serve as a park-and-ride location the rest of the year.

UTA Maintenance Facilities

UTA has two maintenance facilities in Salt Lake City: Central Garage is the bus maintenance facility just north of Salt Lake Central Station and Warm Springs Service Center is a maintenance facility for FrontRunner locomotives located at 900 North just west of 500 West.

[15] UTA. TRAX and FrontRunner Counts, Fall 2014.

[16] Ibid.

[17] Ibid.

[18] LDS lots are based on a master agreement with the LDS church which is re-negotiated every two years – there is no guarantee that UTA will maintain access to these locations on an ongoing basis.

UTA Operational Constraints in Salt Lake City

Bus Layover

In order to increase UTA service in Salt Lake City, especially in areas that already have significant amounts of service, such as Downtown and the University of Utah, UTA would need to identify additional bus layover locations. A layover location is an area where a bus and driver can safely wait after finishing a route, before starting the return trip. Sufficient layover time is required to keep buses on-time and to provide opportunities for drivers to take breaks.

Layover locations, or lack thereof, can be a significant contributor to operational costs. The more centrally located a layover location is, the more operating costs are minimized. If layover locations are located far away, UTA must spend operating dollars travelling to and from the layover location.

There are four primary "nodes" that would make the most sense for additional layover space operationally. However, each has a unique set of constraints that would need to be taken into consideration in development of recommendations of the Transit Master Plan. They are:

- **Salt Lake Central** – This facility is at capacity for buses and cannot accommodate more bus activity at peak periods. Moreover, this location is not optimally located for layover purpose, as it requires out-of-direction travel for many routes to reach.
- **North Temple Station** – This station appears to have capacity for additional vehicles. However, it lacks operator amenities such as bathrooms and/or food and it also lacks facilities for passengers waiting for buses.
- **Core Downtown** – Layover facilities in downtown have been studied and recommended in the past, but these sites are no longer viable (e.g. potential site at 2nd S/State is being developed). Additional downtown layover would be needed for any increased service in this area, and would likely require transitioning on-street space for layover purposes.
- **University of Utah** – The University is a major transit trip generator, but UTA does not have any dedicated operational facilities on campus. Currently, UTA uses three different areas for layover and none of them have sufficient capacity, including the University Medical Center, the Union Building loop, and at Fort Douglas on Hempstead Road. Additional UTA layover facilities would need to be taken into consideration for any expansion of service to/from the University.

TRAX Capacity Issues

TRAX is currently operating three lines through south downtown Salt Lake City. According to UTA, the TRAX interlocking (intersection where tracks come together) at 4th South and Main Street cannot accommodate any additional trains during peak periods. This severely limits the ability to add trains to any of the existing corridors and limits the ability to connect downtown directly with the University of Utah via TRAX. Both are important considerations for the Transit Master Plan.

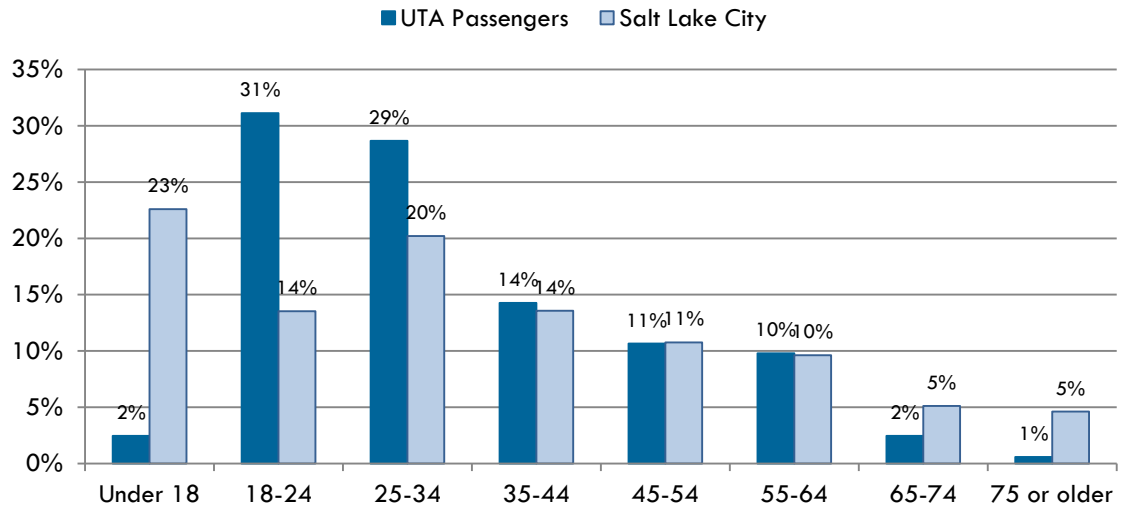
5 WHO RIDES TRANSIT IN SALT LAKE CITY?

This chapter analyzes the demographic data received in the 2014 UTA On-Board Survey for passengers who ride fixed route transit. For the purpose of this study, only respondents whose trips began or ended within Salt Lake City limits are analyzed. Of the 13,282 responses to the UTA survey, 8,491 respondents (64%) meet this criterion. The other 4,791 responses are not included in this analysis.

Gender and Age

Transit riders in Salt Lake City are slightly more male than female at 58% to 42% respectively. Riders are also more likely to be young, due in part to the large population of students at the University of Utah: 62% of riders are 34 years of age or younger and nearly one third are 18 to 24 years old (31%). When compared to demographics of the Salt Lake City population as a whole, the percent of people ages 18 to 34 is higher for UTA passengers than it is in the city as a whole (31% compared to 14%).

Figure 5-1 Age of Transit Riders

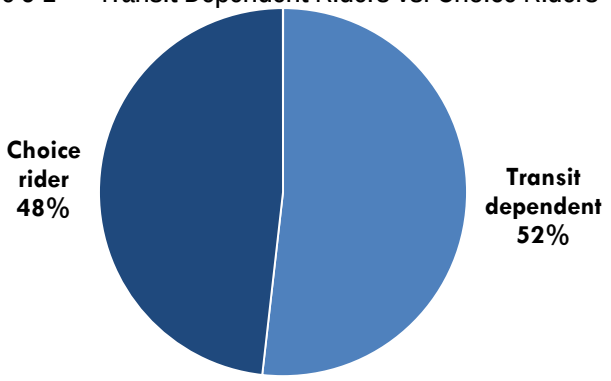


Source: 2014 UTA On-Board Survey; 2009-2013 ACS 5-year Estimates

Transit Dependency

For a variety of reasons, a portion of the population is dependent on the transit system to meet their transportation needs. These include having a disability, not having access to a private vehicle, insufficient income to pay for other modes, or not having a driver's license. According to the survey responses, more than half of UTA transit passengers in Salt Lake City (52%) are transit dependent (Figure 5-2). This means that without adequate transit service, these individuals would not be able to meet their daily needs. The remaining forty-eight (48%) of passengers are "choice riders" which means they have the ability to travel using a mode other than transit.

Figure 5-2 Transit Dependent Riders vs. Choice Riders



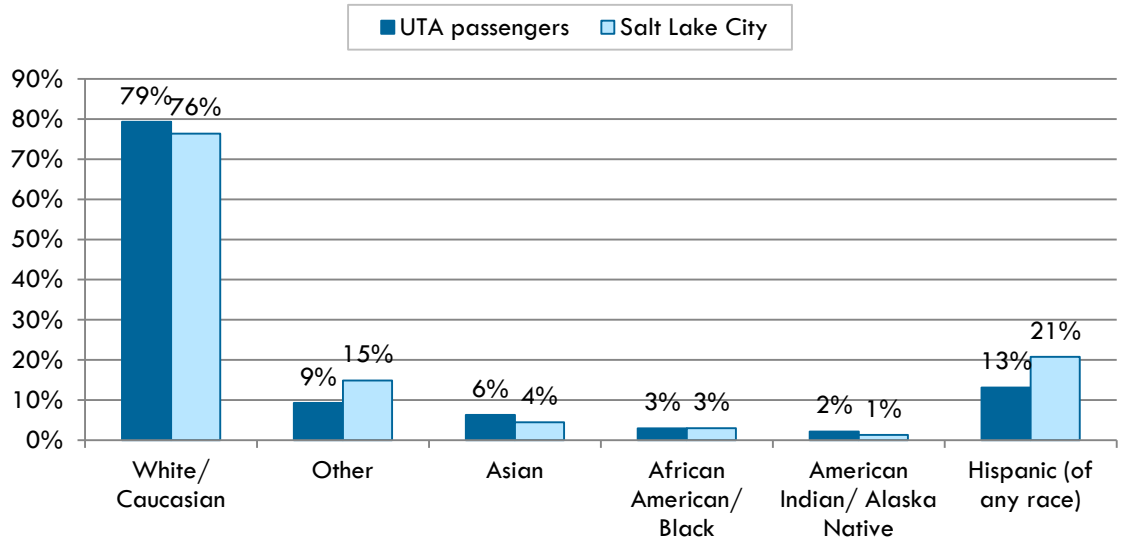
Source: 2014 UTA On-Board Survey

A transit dependency map is provided in Chapter 3.

Race and Ethnicity

Racially, Salt Lake City transit passengers are largely white. Approximately 79% classify themselves as white or Caucasian, followed by Asian (6%), African American/Black (3%), and American Indian or Alaska Native (2%). Ethnically, the majority of respondents indicated they are not Hispanic or Latino (of any race). Only 13% indicated they were Hispanic (Figure 5-3). The racial and ethnic makeup of UTA passengers in Salt Lake City closely matches the Salt Lake City population as a whole. These passengers are less likely to be Hispanic and slightly more likely to be white/Caucasian.

Figure 5-3 Race and Ethnicity (UTA Passengers vs. Salt Lake City Residents)

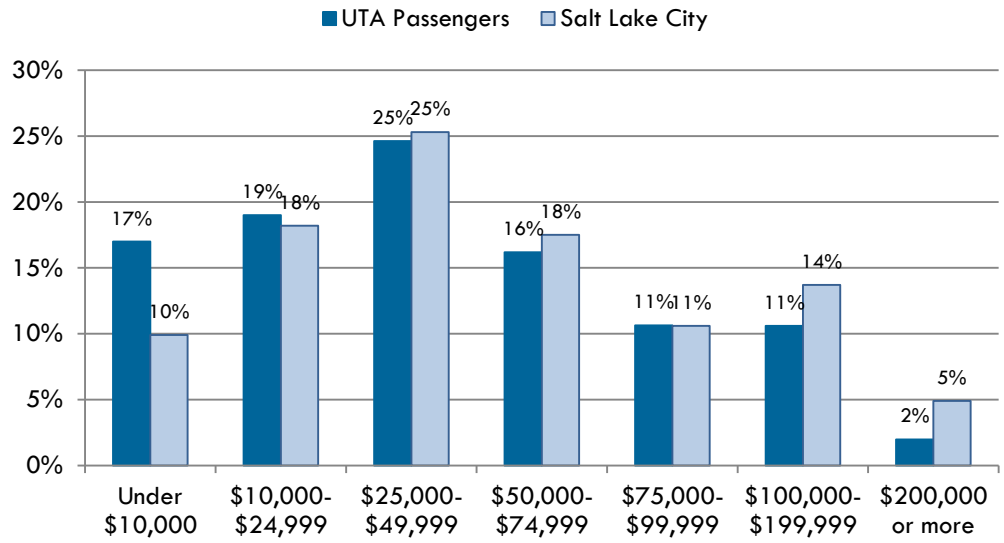


Sources: 2014 UTA On-Board Survey; 2009-2013 ACS 5-year Estimates

Income and Employment

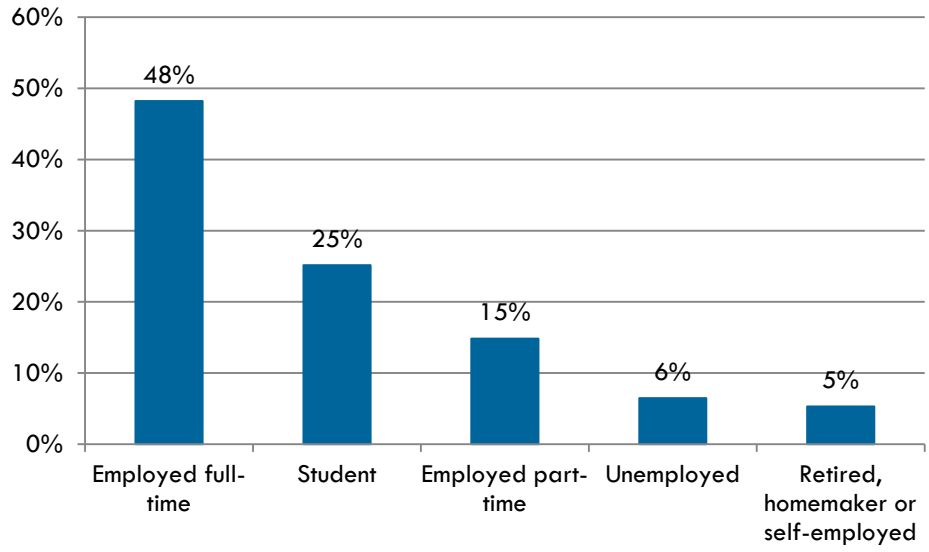
The majority (61%) of UTA passengers in Salt Lake City have a household income of less than $50,000 (Figure 5-5). This is due in part to the population of University of Utah students who rely on transit in Salt Lake City (students account for 25% of the transit passengers in the City). Only 48% of passengers are employed full-time (Figure 5-6). When compared to the income of Salt Lake City residents as a whole, UTA riders are lower income with 17% of UTA passengers earning $10,000 or less versus 10% of Salt Lake City residents.

Figure 5-4 Household Income



Source: 2014 UTA On-Board Survey; 2009-2013 ACS 5-year Estimates

Figure 5-5 Employment Status

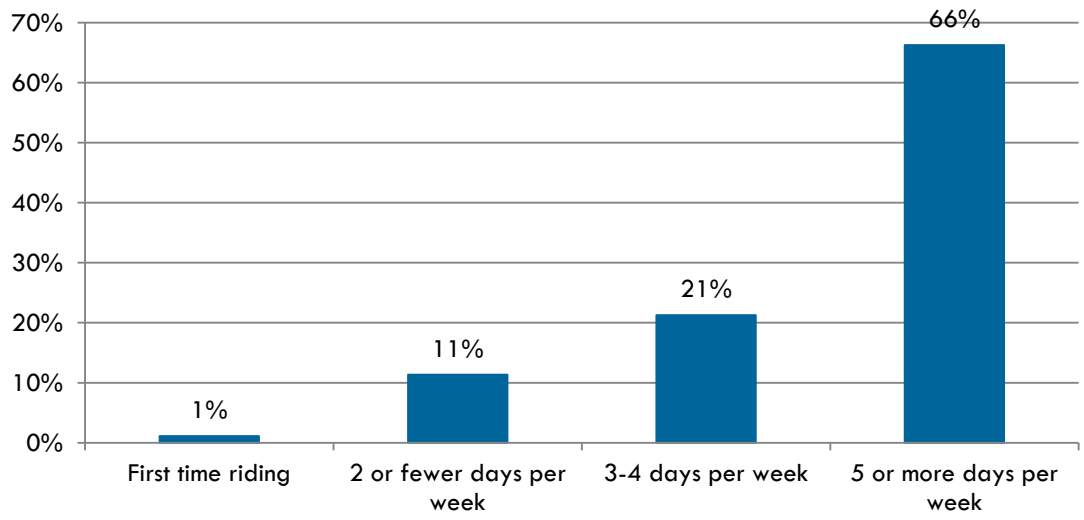


Source: 2014 UTA On-Board Survey

Ridership Frequency and Fares

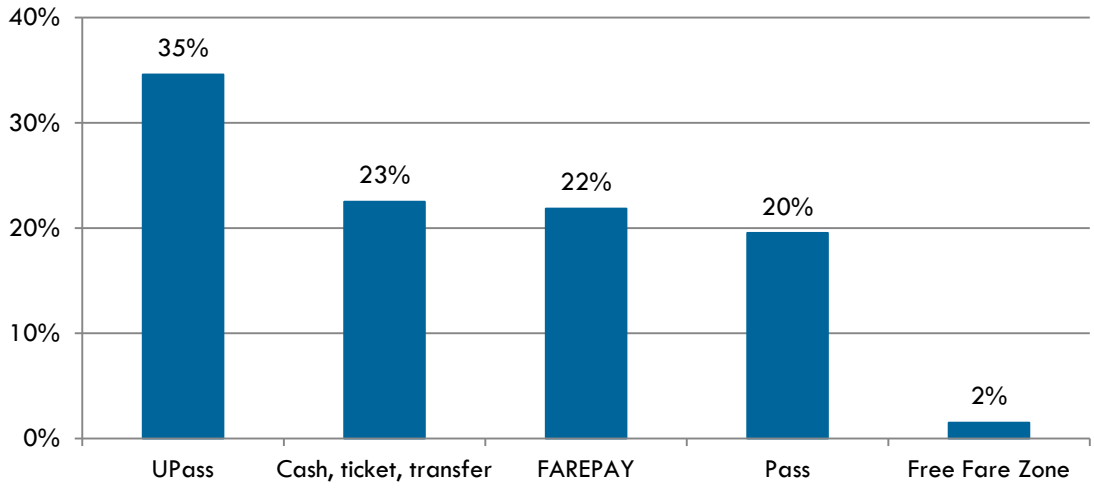
Most Salt Lake City passengers (66%) use UTA five or more days per week (Figure 5-7). Eleven percent ride two or fewer days per week. The UPass is the most common method of payment for Salt Lake City transit trips (used by 35% of passengers), followed by cash, tickets and transfers (23%)[1], FAREPAY (22%), and passes (20%)[2] (Figure 5-8). Trips within the Fare Free Zone account for 2% of Salt Lake City trips.

Figure 5-6 Trip Frequency



Source: 2014 UTA On-Board Survey

Figure 5-7 Fare Payment



Source: 2014 UTA On-Board Survey

[1] Includes cash, tokens, one-way tickets, round-trip tickets, paper bus transfers and reduced fare products.

[2] Includes day/group passes, Medicaid punch cards and paper monthly passes.

Hive Pass Survey Results

In 2013, Salt Lake City, in partnership with UTA, launched a one-year pilot project that allowed people living in Salt Lake City to purchase an unlimited annual transit pass for $360 – called the Hive Pass. A total of 3,200 passes were sold during the pilot project; 233 Hive Pass users participated in an online survey following the pilot. Key findings from the survey include:

- Among those who had ridden transit before, there was a significant increase in the frequency of transit use.
- Seventy percent of Hive Pass holders use transit three times a week or more.
- More than 90% of Hive Pass users are satisfied with their Hive Pass.
- The majority of Hive purchasers live between State Street (west) and the University of Utah (east) and North Temple (north) and 400 South (south).
- Hive Pass users primarily used the bus (51%) followed by the TRAX (38%), FrontRunner (9%), and Streetcar (2%).
- Fifty one percent (51%) of Hive Pass purchases previously paid cash fares; 17% used Farepay cards; 23% purchased monthly passes, and 9% were new riders.

Source: Salt Lake City Hive Pass Pilot Program Evaluation (2014)

6 AMENITIES, FARES, AND ACCESS TO TRANSIT

This chapter looks beyond transit service in Salt Lake City (e.g. where the bus goes and how often it arrives) and outlines elements of the transit system that relate to the overall passenger experience – what is it like to wait for transit to arrive? How easy is it to walk to a transit station? What information is available to help passengers understand the system? What multimodal options are available to connect passengers between transit and the places people start and end their trips?

Salt Lake City plays an important role in ensuring safe and comfortable access to transit. The City controls sidewalks and rights-of-way that pedestrians and cyclists use to access transit stops and stations. It also controls much of the space where transit stops, stations, and amenities are located. A key outcome of this Transit Master Plan will be to identify strategies and investments that improve access to transit and make the overall transit experience more comfortable and convenient.

This section includes an overview of:

- Bus stop amenities
- Physical/geographic transit access barriers
- Transit information and legibility
- Fares and fare payment options
- Supportive programs

Just 17% of bus stops in Salt Lake City have either a bench or shelter for people to wait comfortably for the bus to arrive.
Source: Nelson\Nygaard

BUS STOP AMENITIES

Bus stops are a key component of building a complete transit system; they provide the foundation of a comfortable passenger experience by providing a space for passengers to wait comfortably, seek weather protection, access line and system information, buy fare media, and other practical functions.

Bus stops in Salt Lake City range from just a basic sign at low ridership stops to a shelter with benches, trash cans, and other amenities at high ridership stops. Real time arrival information is available at bus stops via text message. (Real-time information signs are only available at TRAX stations.)

There are over 1,200 bus stops and stations in Salt Lake City. Figure 6-1 provides an overview of the bus stops by level of amenity. Of the 1,227 bus stops in Salt Lake City, 48 of them have a shelter and a bench, 15 have a shelter only, and 143 have a bench only. The majority (82%) only have a sign. Figure 6-3 below illustrates bus stops by amenity in Salt Lake City. High amenity stops are clustered in downtown, in the corridor between downtown and the University of Utah, and at the University of Utah. High amenity stops are also located at Westminster College, the airport, and along E 2100 South in the Sugar House neighborhood.

All TRAX, FrontRunner, and streetcar stations include benches, shelters, and signs.

Figure 6-1 Bus Stop Amenities in Salt Lake City

Stop Amenity	Number	Percent
Shelter and bench	48	4%
Shelter only	15	1%
Bench only	143	12%
Sign only	1,008	82%
No amenities	13	1%
Total	1,227	

Salt Lake City Bus Stops and Bike Share Stations Design Guidelines *(November 2014)*

UTA has Bus Service Design Guidelines, however in 2014, Salt Lake City adopted its own Bus Stops and Bike Share Stations Design Guidelines, building on what UTA had developed. In several instances, the City has additional or differing preferences. Implementation of these additional requirements often depends upon identifying City funding sources. Staff always seeks to capitalize on existing amenities whenever possible.

Salt Lake City Bus Stop Design Guidelines complement UTA's Bus Service Design Guidelines. Stops are prioritized based on the number of boardings per day.
Source: Nelson\Nygaard

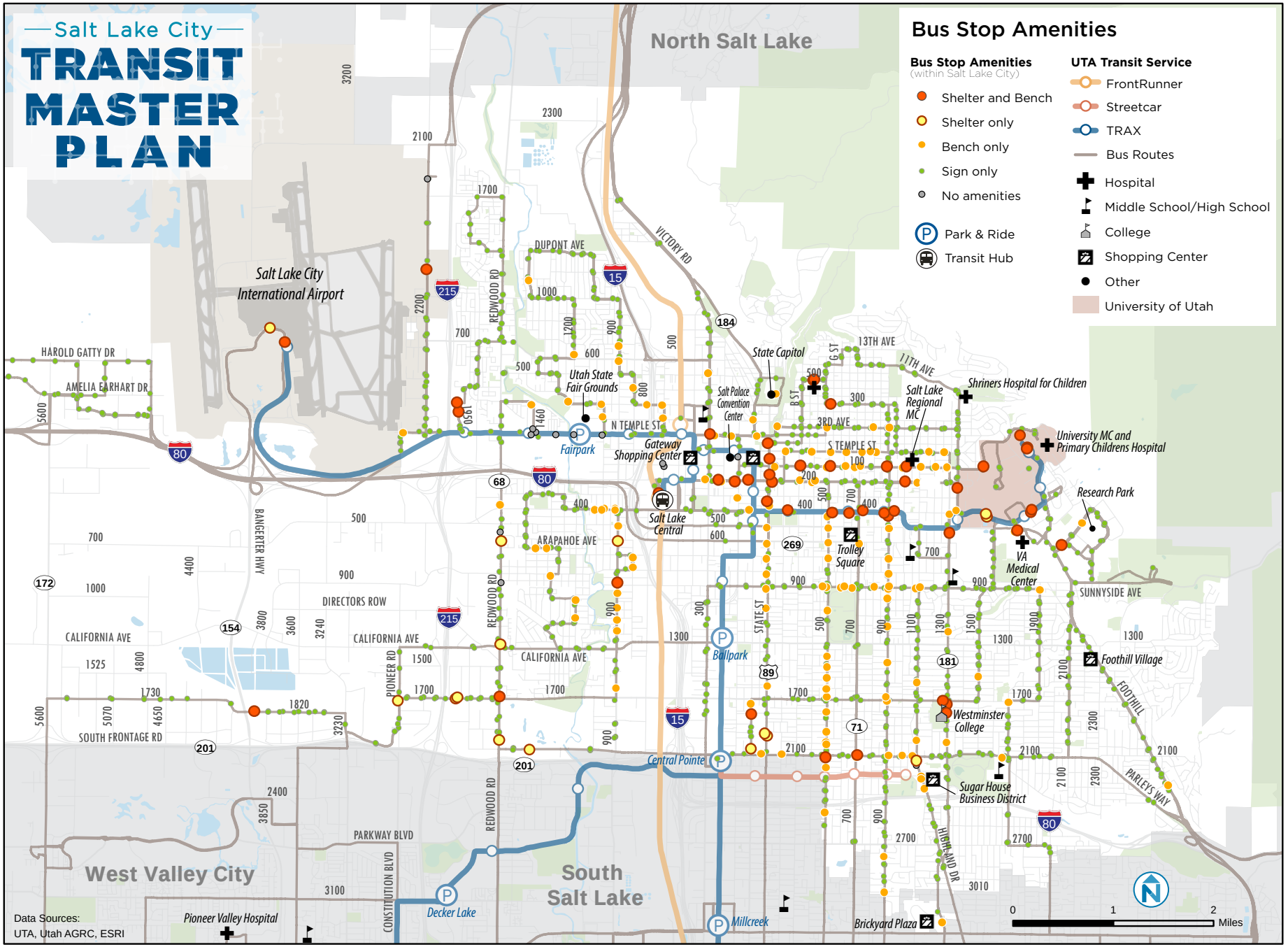
Salt Lake's bus stop design guidelines based on the average number of daily boardings are provided below.

Figure 6-2 Salt Lake City Bus Stop Guidelines by Tier

Tier	Bus Stop Amenity	# of Average Daily Boardings
Tier I	Custom shelter with bench, bike rack, trash, shielded lighting, current bus schedule, real-time bus data, vegetation, pre-board pay	≥ 200 boardings per day
Tier II	16' ADA compliant shelter w/bench, bike rack, trash receptacle shielded lighting, current bus schedule, real-time bus data, vegetation, pre-board fare pay facility	150 to 199 boardings per day
Tier III	12' ADA compliant shelter w/bench, bike rack, trash receptacle, shielded lighting, current bus schedule, real-time bus data, pre-board fare pay facility	100 to 149 boardings per day
Tier IV	8' ADA compliant shelter w/bench, bike rack, current bus schedule, route information panel with instructions on accessing real-time arrival data, vegetation	15 to 99 boardings per day
Tier V	Seating (bench or Simme Seat) on hard surface, bike rack, route information panel with instructions on accessing real-time arrival data	1 to 14 boardings per day

Source: Salt Lake City Bus Stops and Bike Share Stations Design Guidelines (2014)
http://slcdocs.com/council/agendas/2014agendas/November/Nov4/110414A5.pdf

Figure 6-3 Salt Lake City Bus Stop Amenities



UTA FIRST/LAST MILE STUDY

UTA is currently undertaking a First/Last Mile Study, due to be completed spring 2015. The purpose is to identify a list of prioritized strategies to enhance the first- and last-mile connections to the existing transit network in order to increase system ridership. Geographically, the study covers the entire UTA system, but is focused primarily on TRAX and FrontRunner stations, with very little attention to strategies for the bus network. First mile/last mile strategies identified during this process will be verified as part of this Transit Master Plan.

First Mile/Last Mile Survey

A survey conducted in 2014 as part of UTA's First/Last Mile Study demonstrates passenger priorities for improved access to transit. The priorities identified by survey respondents for each last mile category are listed below (1 = highest priority; 4 or 5 = lowest priority). In summary, respondents identified bike paths, improved crosswalks, improved passenger waiting areas, and UTA shuttles as the most important features at or near transit stops.

Bicycle Facilities (in order of priority)

1) *Bike paths (separated trail)*
2) *Onboard bike racks (on train/bus)*
3) *Bike paths (on road)*
4) *Bike racks/lockers*
5) *Bike sharing (GREENbike)*

Pedestrian Facilities (in order of priority)

1) *Improved crosswalks*
2) *Roadway lighting*
3) *Pedestrian-specific signage*
4) *Access improvements for wheelchairs, strollers or people with health concerns(i.e. curb ramps)*

Station Facilities (in order of priority)

1) *Improved passenger waiting areas (i.e. covered shelters, real-time info, etc.)*
2) *Lighting*
3) *Wayfinding and signage*
4) *On-site staffing*

Carpool/Shuttle Options (in order of priority)

1) *UTA shuttles*
2) *Work-based shuttles (i.e. employer shuttles)*
3) *Carpools*
4) *Carsharing programs (Enterprise Carshare)*

Note: Includes responses from entire UTA service area, not just Salt Lake City.

Station Typologies

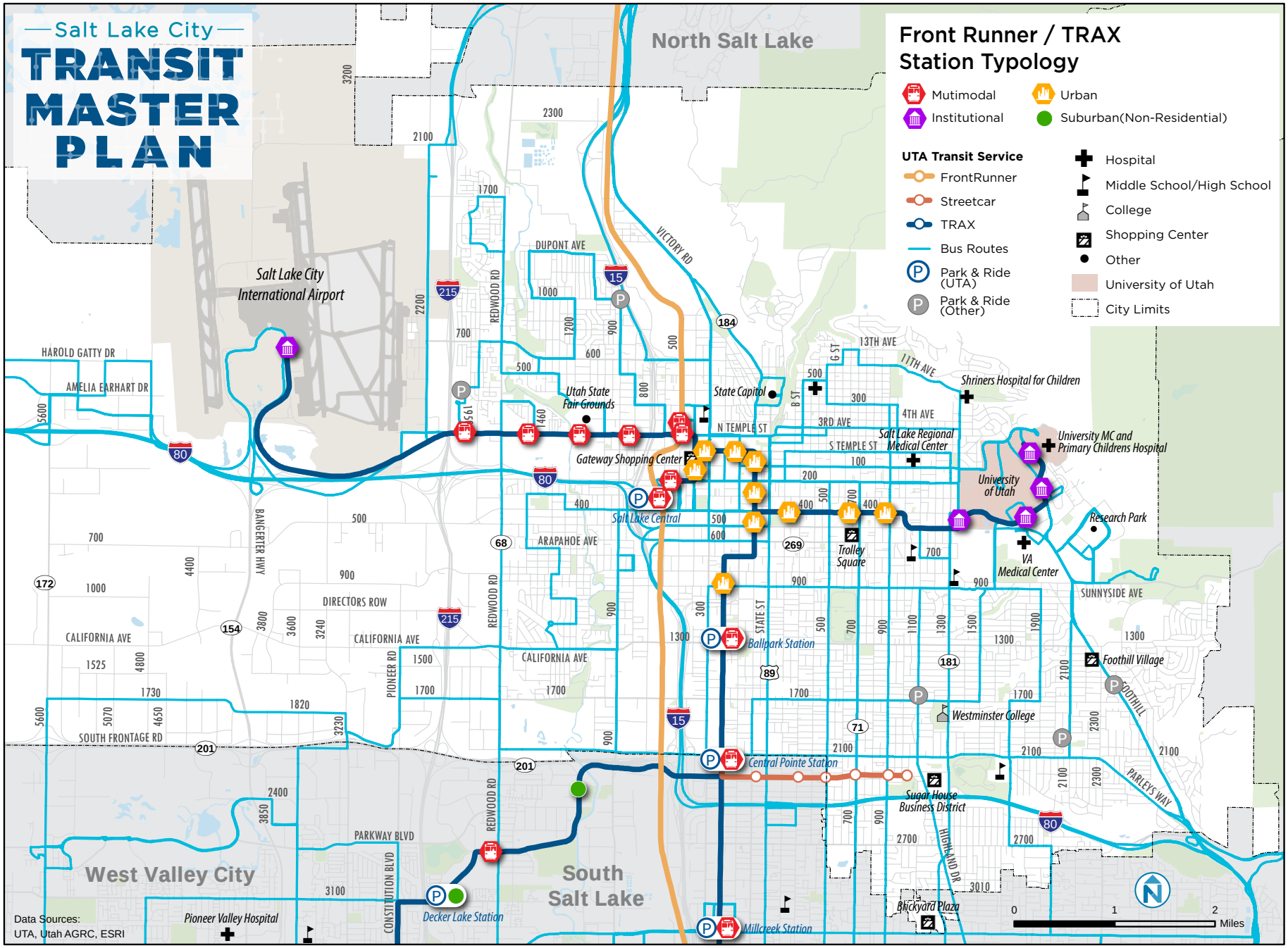
A key outcome of the first mile/last mile study was a station typology for UTA TRAX and FrontRunner stations. Several built environment and ridership-based characteristics were used to identify the types, including connectivity around station areas, modes of transportation currently used by transit riders to get to and from the stations, amount of parking available, and demographic information. Six station types were identified: urban, multi-modal, institutional, suburban, suburban non-residential, and auto-dependent. Only three of these types are represented in Salt Lake City. These three types and the highest priority first/last mile strategies for these stations are shown in Figure 6-4 (the high priority strategies are those which should yield the highest possible benefit for investment). Figure 6-5 shows a map of stations by type.

Figure 6-4 Recommended Strategies by Typology for Salt Lake City TRAX and FrontRunner Stations

Typology	Wayfinding	Bicycle Network Improvem'ts	Access Connections	Ped. Network Improvem'ts	Crossing Treatments	Bike Sharing	Car Sharing	Rail/Bus Stop Enhancem'ts
Urban	▲	▲				▲	▲	
Multimodal	▲	▲	▲	▲	▲			▲
Institutional		▲				▲		

Note: If a box is not "checked" above, it does not mean that this strategy is not important under this typology, it means that these features already exist at the stations in Salt Lake City.

Figure 6-5 Station Typology for Salt Lake City

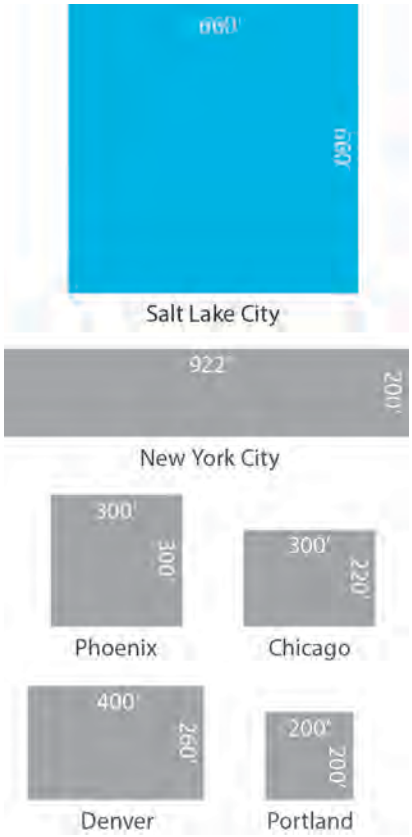


PHYSICAL/GEOGRAPHIC TRANSIT BARRIERS IN SALT LAKE CITY

Salt Lake City has a number of physical and geographic barriers that make accessing and planning transit service difficult. These barriers include large blocks, steep hills (particularly in the residential neighborhoods to the east), freeways with a lack of undercrossings, and rail beds that slice through the middle of the city.

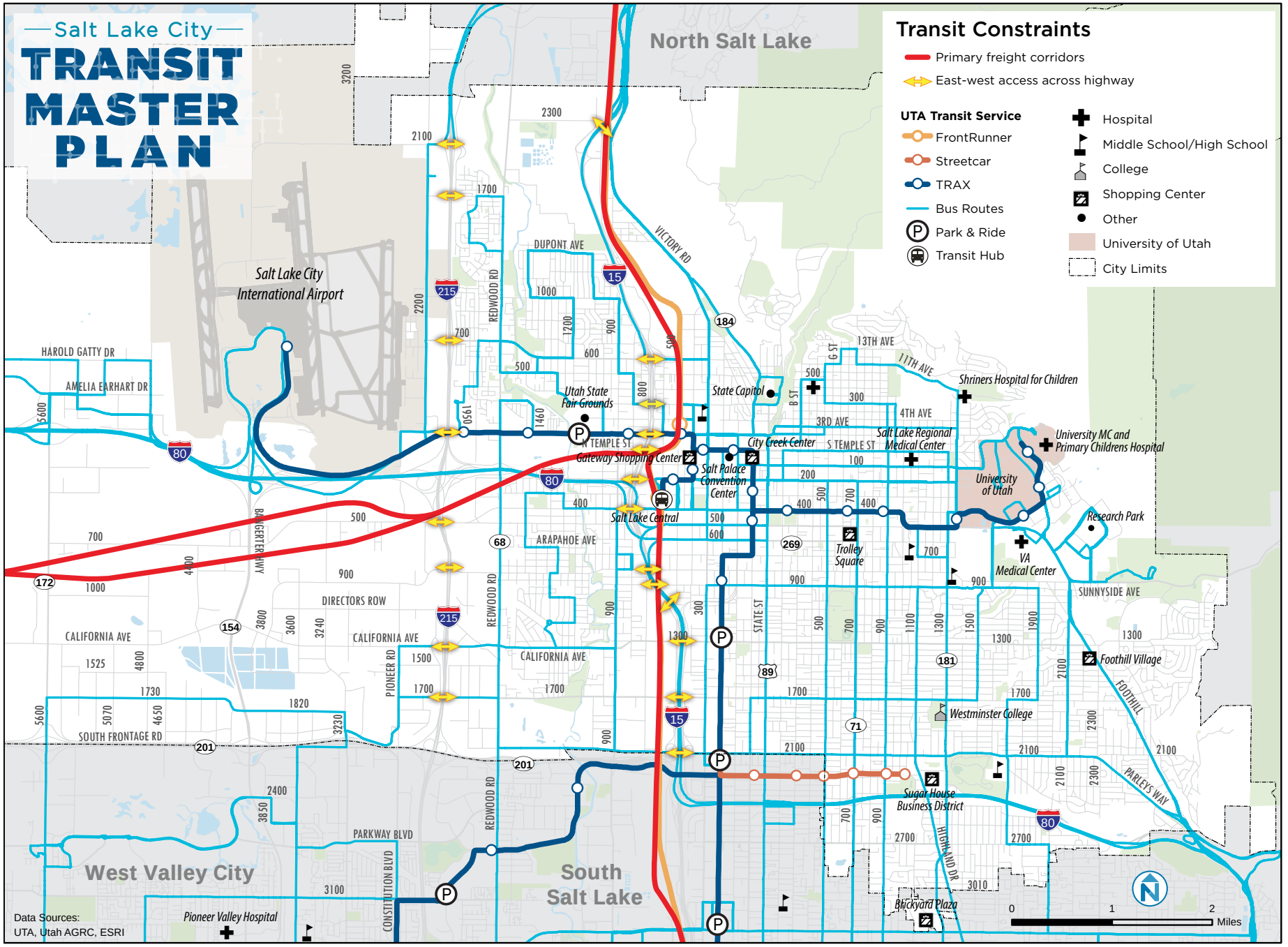
- **Block Size/Density:** Block density is a key street connectivity measure. Blocks in Salt Lake City are among the largest of its peers. Large blocks or low-block density can discourage people to bike or walk because distances to destinations are too long. Lack of mid-block crosswalks can make riders have to walk very long distances to transit stops that are very close as the crow flies.
- **Topography:** Steep hills, particularly in neighborhoods to the east of downtown, are quite steep. Steep topography limits people's desire and ability to walk and bike to transit.
- **Highway barriers:** Interstate 15 slices through the center of Salt Lake City, limiting the opportunities for transit passengers, bicyclists, and pedestrians to cross under or over the highway when traveling east to west (see Figure 6-6).
- **Freight Line:** Rail beds that run north–south chop the city in half. Freight trains travel along the rail lines 30-60 times per day for several minutes up to half an hour, making east–west connections difficult in terms of operating efficient transit service and providing easy and comfortable bicycle and pedestrian connections to transit stops.
- **Built Environment:** There are some significant built environment barriers that break up the street grid, such as the Salt Palace Convention Center, the Rio Grande building, the Gateway, and multi-block schools and parks.

City Block Size Comparison



Salt Lake City has much larger blocks than cities like New York, Phoenix, and Chicago.
Source: ttp://greatergreater.com/files/2010/gridposter.pdf

Figure 6-6 Transit Constraints in Salt Lake City



TRANSIT INFORMATION AND LEGIBILITY

Key to accessing transit is a legible system with tools to help people understand where, when, and how often transit service operates. Transit passengers and potential passengers have a range of tools available to them in Salt Lake City, including real-time information at some stations and on private apps, an online trip planner, and a mobile app center.

Schedule Information and Trip Planner

Individual route maps, a systemwide map, a downtown map, and the University of Utah map are all available on the UTA website. Route schedule information is available, however the user has to know the route number or name and type it in to the website in order to obtain the information (no drop down menu is available). Route maps are also difficult to use. These maps only show the major destinations along the route, making it difficult for passengers to orient themselves.

UTA's online trip planner underwent major renovations in 2013. The tool now allows users to engage in both map-based and address-based trip planning and provides improved address recognition. The trip planner also features walking directions and allows users to plan trips by preferred mode.

Apps help passengers understand the UTA system at a click of a button on their smart phones.
Source: ksl.com

Real-Time Information

UTA's Ride Time SMS text message service gives riders real-time bus departure information for more than 7,500 stops throughout the UTA service area. Real-time arrival information is not available on the UTA website, however. It is just available through text or using one of the apps in the mobile app center (see below). Some high ridership TRAX, FrontRunner, and streetcar stops do have real-time information signs.

Mobile App Center

UTA made its real-time data feed available to private developers in 2012. This has resulted in over 30 mobile apps for Android, Apple, and Windows users that help UTA passengers use the system in real time.

UTA FARES AND FARE PAYMENT OPTIONS

Eliminating the hassle of having to keep exact change to ride transit is often a key to attracting choice riders. Over the last several years, UTA has developed pass programs for different travel markets.

UTA FAREPAY

In October 2013, UTA unveiled its new FAREPAY reloadable, prepaid fare card. FAREPAY is available for purchase at the UTA website and at more than 300 Wasatch Front retailers. This system allows customers to load a contactless fare card with any amount between $5 and $500. Customers can also schedule automatic fund reloading and manage their account balance online. To help drive the adoption of FAREPAY, UTA offered a 20 percent fare discount to passengers using the card. By the end of 2013, nearly 5,400 FAREPAY cards had been sold at 170 retailers throughout the UTA service area.

Electronic Fare

UTA's electronic fare collection system allows passengers to "tap on" and "tap off" when boarding and exiting TRAX and FrontRunner stations. Card taps provide data about trip origin and destination so that UTA can better evaluate and improve service. Passengers can use this electronic fare system with the following electronic fare products: student passes, Eco Passes, Ski Passes, UTA FAREPAY cards, contactless credit or debit cards, smart phone applications including Isis and Google Wallet. The card will be "charged" the appropriate fare (for FrontRunner, the fare will be charged for only the distance traveled). Electronic fare collection is available on all buses, FrontRunner, TRAX, and streetcar services.

UTA Fare Structure

UTA fares can be purchased online or at any of the UTA Pass Sales Outlets. The fare structure for local bus, TRAX, Streetcar, express bus, and FrontRunner is outlined below. Fares vary significantly depending on the type of service selected.

Local Fares (Local Bus, TRAX, and Streetcar)

- One-way fare: $2.50
- Senior and reduced one-way fare: $1.25
- Day pass: $6.25
- Roundtrip (TRAX only): $5.00
- Adult monthly: $83.75
- Senior and reduced fare monthly: $41.75
- Student 30-day pass: $62.75
- Minor monthly pass: $62.75
- Route deviation (Flex Route) one-way fare: $1.25
- Route deviation (Flex Route) punch pass: $12.50

Premium Fares (Express Buses and FrontRunner)

- One-way fare: $5.50
- Senior and reduced one-way fare: $2.75
- Adult monthly: $198
- Senior and reduced fare monthly: $99
- Minor monthly pass: $148.50
- FrontRunner one-way fare (distance based): $2.50-$10.30
- FrontRunner senior and reduced roundtrip: $2.50 - $10.30
- Individual monthly upgrade* for pass holders: $114.25
- Student 30-day pass: $148.50

* The Individual Monthly Upgrade when presented with another valid pass is good for unlimited travel on all buses including Express buses, FrontRunner, TRAX and Streetcar for one calendar month. The Upgrade Pass is valid with an Eco/Ed/Med Pass, Salt Lake Community College Semester Pass, Student Monthly Pass, Minor Monthly Pass, or Horizon Monthly Pass.

Source: rideuta.com March 2015

Transfers

UTA local fare tickets can be used to transfer to other local fare services for up to two hours from purchase. An upgrade is required to transfer to premium service. A premium ticket may be used to transfer to any other service, also if used within two hours of purchase.

Discount Pass Programs

UTA works with local jurisdictions, businesses, and universities to promote transit through five discount pass programs.

- **Eco Pass** is an employer-sponsored annual pass issued to employees for use on bus and TRAX services. Eco Passes must be purchased for all employees and the cost of the program is based on the level of transit service at the work location. Eco Pass users can also use the pass on express buses and FrontRunner, but are required to pay an additional fare on top of the $2.50 it guarantees.
- **Eco Trip Rewards** is another employer-sponsored annual pass, but employers only pay for the trips employees take.
- **Student Passes** is a program in which students, faculty, and staff at participating schools can obtain a pass to ride UTA services. Valid school IDs are required to use the pass. The University of Utah partners with UTA to provide the U-Pass. As of September 2104, there were 49,127 active U-Pass passes distributed to University of Utah students, faculty, and staff.
- **Co-Op Transit Pass** is a discounted pass available to employees of participating companies. UTA discounts the cost of the passes by 20 percent and the company pays for another 30 percent of the cost. Employees purchase the passes at 50 percent of the price they would pay if they purchased it themselves.
- **RideVan Plus** is a pass program that is available to passengers who use both UTA transit services and the RideVan program to travel between home and their place of work.

Salt Lake City HIVE Pass Pilot Program

In 2013, Salt Lake City, in partnership with UTA, launched a one-year pilot project that allowed people living in Salt Lake City to purchase transit passes for $360. Of the 8,500 passes available for the pilot project, over 3,200 passes were activated during the seven month pilot project period indicating high interest in the program. The program added approximately 300 new transit riders to the system and 160,000 new boardings during the seven month pilot project period. Ninety percent (90%) of HIVE Pass users were satisfied and indicated they would purchase it again.

In March 2015, HIVE 2.0 was approved. This new program will make monthly passes available to Salt Lake City residents. The cost will be shared by the purchaser (who pays 50% of the cost), Salt Lake City (who pays 30% of the cost), and UTA (who pays 20% of the cost). For Salt Lake City residents, that means passes will be available for $42.00 a month compared to $83.75.

Source: Salt Lake City staff; Salt Lake City Hive Pass Pilot Program of Salt Lake City and the Utah Transit Authority Evaluation

SUPPORTIVE PROGRAMS

Transit service in Salt Lake City is supported by a number of programs that help people meet their daily travel needs. These programs range from bike share to car share to rideshare applications. This section provides an overview of these programs.

GREENbike Share Program

GREENbike is Salt Lake City's bike share system in downtown. The system launched with 10 stations and 80 bikes in 2012; just 16 months later, the program's ridership success and private support warranted GREENbike to double in size to 20 stations and 160 bikes.

Users can purchase one of three kinds of memberships: annual ($75), 7-day ($15), or 24-hour ($5). Each bike station includes a map showing the available stations for bike rental/return in the network. Mobile apps such as B-cycle and Spotcycle also show the bikes and docks available at every station in real time.

GREENbike is a 501©3 charitable organization and public/private partnership between Salt Lake City, The Downtown Alliance, The Salt Lake Redevelopment Agency, Salt Lake Chamber, UTA, Visit Salt Lake, SelectHealth, and other private sponsors.

GREENbike is Salt Lake City's bike share program.
Source: Flickr, rudi riet

Bicycle Accommodations on Board and at Stations

Bicycles are currently allowed on UTA buses, TRAX, and FrontRunner, with specific loading areas identified at the stations for cyclists. FrontRunner cars can accommodate between 4-12 bicycles each, depending on the type of car; TRAX cars can accommodate up to 4 bicycles in each car. UTA is currently exploring methods of more efficient bicycle storage on cars, including the installation of hooks on TRAX vehicles for hanging bikes. Bike lockers are also available for rent at TRAX and FrontRunner stations. All UTA buses are also equipped with a bicycle rack that can hold up to two bikes. All new CNG buses will be equipped with three position bike racks.

UTA buses are equipped with bicyle racks with enough room for two bicycles.
Source: Nelson\Nygaard

Enterprise Car Share Program

Enterprise is currently the Car Share vendor in the Salt Lake City area, and their program allows people to reserve a car by the hour. Members reserve the car online or by phone, access the vehicle with a membership card, and then return it to the dedicated parking space once their trip is finished. The cost of the car is $8.00 per hour, including fuel and physical demand/liability protection included.

UTA Rideshare

UTA provides a free ridematching system (www.utacommuter.com) to help pair rideshare users. UTA also sponsors a vanpool program where they provide the van.

TravelWise Travel Demand Management (TDM) Program

UDOT's TravelWise program promotes multimodal transportation across the state by issuing travel alerts during crucial times including major traffic accidents, traffic warnings, weather related road conditions, or periods of poor air quality. People can access the alerts via website (udottraffic.utah.gov) or mobile app. Each alert is associated with a travel suggestion that relates to the TravelWise strategies. Strategies promoted through the program include alternative work schedules, active transportation, carpool/vanpool, public transit, "skip the trip," teleworking, and trip chaining.

7 INITIAL FINDINGS AND CONSIDERATIONS

This chapter summarizes the key findings that emerged from analysis of the rich body of existing transit, land use, demographic, and travel behavior data provided by Salt Lake City, UTA, and the Wasatch Front Regional Council. It summarizes the state of transit service and the myriad factors that impact the use and performance of transit in Salt Lake City today. The key findings (bolded below) will serve as a foundation for the next phase of study.

REVIEW OF EXISTING PLANS AND POLICIES

- **The Salt Lake City Transit Master Plan responds to community and policy mandates to improve public transportation for the benefit of all members of the community.**
  - The City's overall Transportation Master Plan emphasizes providing choices in travel and reducing dependence on the private automobile.
  - The Mayor has adopted policy statements about the importance of continued improvements and investment in public transportation.
  - The City Council has adopted goals that call for a public transit system that is easy to use, affordable, accessible, stable, reliable, frequent, and available for work and play activities.
  - Residents and other community leaders have also expressed strong support for accessible, safe, reliable, affordable public transportation.
- **Salt Lake City has set goals to increase transit use.** Draft Plan Salt Lake – the city's vision plan for the next 25 years, which is currently underway – establishes goals to reduce the number of single occupancy auto trips through the following strategies: increase the mode share for public transit, bicycling, walking, and carpooling; and provide public transit within a quarter mile of all homes.
- **High quality public transit is critical to meeting Salt Lake City's other goals.** A review of goals and themes from prior planning efforts shows that the availability of safe, high-quality, convenient transit service is a critical tool to support achievement of broader outcomes, e.g. health, economic competitiveness, and improved quality of life.
- **UTA and Salt Lake City goals are largely aligned.** When comparing goals from prior planning efforts by both UTA and Salt Lake City, there were far more similarities than differences. One salient difference is that UTA emphasizes efficiency whereas Salt Lake City is more focused on ease of use and passenger convenience.

LAND USE AND GROWTH

- **Density is concentrated in downtown and east downtown with pockets in other parts of the city.** Population and employment density, measured by residents and jobs per acre, is primarily concentrated downtown and east of downtown. Dense population and job clusters are also found in inner parts of the Greater Avenues and Capitol Hill, the Fair Grounds neighborhood, and the central southeast part of the city (East Liberty Park, Liberty-Wells, and Sugar House). Western Salt Lake also has areas of high residential density (Poplar Grove, Glendale, and Rose Park).
- **The highest density areas in Salt Lake are east of the major downtown transfer points.** There is a gap between downtown's primary transit transfer points (Central Station, State Street, and Main Street) and some of the densest areas of the city in eastern downtown. This poses a first/last mile connectivity barrier that is exacerbated by large blocks in downtown.
- **Salt Lake City is the region's employment hub.** Every workday, the population in Salt Lake City nearly doubles with commuters from around the region. Salt Lake has three major employment centers:
  - Central Business District (~69,000 jobs)
  - University of Utah /Research Park (~17,000 jobs /11,000 jobs)
  - Northwest quadrant (~70,000 jobs):
    - Airport
    - International Center
    - 2200 West corridor
- **Salt Lake City is growing.** Between 2015 and 2040, population and employment in Salt Lake City is expected to grow substantially (19% and 8% respectively). By 2040, more than 40,000 new residents and 20,000 new employees are expected in Salt Lake City. Major growth is expected in redevelopment areas, other planned growth districts, and areas that are currently experiencing development activity. These include:
  - Central Business District, East Downtown, and 400 South corridor
  - Depot District and Granary District
  - State Street
  - West Capitol Hill
  - North Temple
  - Sugar House
  - Redwood Road and other job growth in the northwest quadrant

OVERALL TRAVEL PATTERNS

- **The vast majority of trips are non-commute trips.** Approximately 4 out of 5 trips in Salt Lake City are for purposes other than traveling from home to work.
- **East downtown has the highest overall trip demand in Salt Lake City.** This reflects its mixed-use character including offices, commercial buildings, and some of the city's highest density of homes.

- **The areas stretching from downtown to the University of Utah are the most common origins/destinations for trips in Salt Lake City**. Trips between these zones (downtown, eastern downtown, and the University of Utah) are also very common.
- **Travel within neighborhoods represents a very common trip pattern**. These are likely representative of the high portion of non-commute trips, to get to services, run errands, or meet other daily needs.

TRANSIT USE

- **6% of Salt Lake City residents take transit to work.** For over a decade, the mode split for Salt Lake City residents' commute trips has remained relatively steady at 6% transit and 81% auto (comprised of 69% drive alone and 12% carpool).
  - Salt Lake City employees commute by transit at a higher rate than those who work elsewhere.
  - Transit mode share at University of Utah is well above the city-wide average (18.4%).
  - Transit mode share is well below the city-wide average in western Salt Lake City (Rose Park, Glendale, and Poplar Grove) and in Sugar House/East Bench.
  - Bike mode share is highest in Glendale/Poplar Grove (~7%).
  - Walk mode share is highest in the Downtown area (~27%).
- **2% of all trips are made on transit.** This indicates that a smaller share of non-commute trips are made on transit than commute trips.
- **The majority of transit trips in Salt Lake City are on TRAX.** Of all transit boardings in Salt Lake City in 2014, 55% were TRAX boardings followed by 39% bus boardings.
- **Transit ridership is highest in downtown and at the University of Utah.** TRAX stations have particularly high numbers of boardings. Major transfer points between routes also have particularly high boardings, as do park-and-ride lots.
- **State Street and Main Street are high use transit locations**. In downtown, there is significant transit boarding activity along State Street and Main Street, equal to or more than the activity at Salt Lake Central Station.
  - The most TRAX boarding activity occurs along Main Street (100 N to 400 S).
  - The most bus boarding activity occurs along State Street (200 N to 400 S) and at Salt Lake Central.
- **The highest ridership bus routes are generally long inter-city routes, such as those that connect downtown Salt Lake City to Ogden and Murray for most of the day, and all-day local routes that serve University of Utah**; they are:
  - Route 200 – State Street North
  - Route 217 – Redwood Road
  - Route 209 – 900 East
  - Route 205 – 500 East
  - Route 21 – 2100 South/2100 East
  - Route 2 – 200 South
- **Transit doesn't serve all common trips.** An examination of overall travel patterns in Salt Lake City compared to travel patterns on public transit reveals that there may be

some common trip patterns that are not well served by transit. The next phase of study will continue to explore these and other gaps in more detail.

- **West side demographics, land use, and densities should be supportive of transit use, but show less transit use than other areas.** These neighborhoods are higher density, and have high concentrations of seniors, people with disabilities, low-income and zero-vehicle households, but show less transit activity than other areas.

TRANSIT SERVICE AND CONNECTIONS

- **More bus service is provided than service on other modes**. 71% of total revenue hours of routes that served Salt Lake City in 2014 were bus revenue hours, 91% of these bus hours were all-day local services or specialty shuttle services.
- **The structure of the transit network is different on the east and west sides of the city.** In the eastern half of the city, bus lines generally follow a regular grid pattern along major corridors. In the west side of the city, bus lines follow somewhat circuitous patterns and service is more sparse.
  - Barriers such as north-south running highways and freight rail traffic undermine access to service on the west side.
- **There is more limited east-west service than north-south service.** UTA has made significant north-south rail investments over the last several years that have made traveling between key north-south destinations easier on transit. East-west connections can still be challenging, though there are improvements that UTA is currently studying to improve some of these connections.
- **There is limited high frequency bus service, especially on weekends.** Although Salt Lake City has 44 bus routes that operate within city limits, very few operate frequent service that is available every 15 minutes or less (6 routes). Service that operates every 15 minutes or less is considered the minimum service level that allows people to use transit without consulting a schedule.
  - Service frequency on several routes varies over the course of the day.
  - Among corridors that retain service on weekends, the highest-frequency service is generally every 30 minutes on Saturdays and every 60 minutes on Sundays.
- **There is limited evening bus service.** Of the 44 transit routes that operate in Salt Lake, only about half operate outside commute periods and provide midday service. Evening bus service is limited all days of the week after 8:00 p.m. TRAX, FrontRunner, and the streetcar line run on a somewhat later schedule.
- **There is limited weekend bus service.** Bus service on the weekend in Salt Lake City is limited. Sixteen of the 44 bus routes operate on Saturdays and nine operate on Sundays. Most bus routes operating on weekends run no more frequently than every 30 minutes on Saturdays and no more than every 60 minutes on Sundays.
- **Transit travel in some neighborhoods carries a higher time disadvantage compared to auto travel than others**. The following neighborhoods appear to have a particularly high transit time disadvantage when compared to auto travel to downtown Salt Lake City: Sugar House, Glendale, and East Bench neighborhoods.
- **The Regional Transportation Plan includes several future improvements to the transit network.** These improvements include: expansion of the Bus Plus Frequent Transit Network, new BRT routes, a Downtown Streetcar, and a direct TRAX connection

from the Salt Lake Intermodal Center to the University of Utah (potentially through providing direct service on existing rails and/or building an extension from Central Station eastward along 400 S) .

- **UTA needs additional layover space in Salt Lake City.** In order to increase UTA service in Salt Lake City, especially in areas that already have significant amounts of service such as downtown and the University of Utah, UTA would need to identify additional bus layover locations.
- **The TRAX system has a capacity constraint at 4th South and Main Street.** This limitation does not allow UTA to operate any additional trains during peak periods.
- **The University of Utah runs its own transit service.** The University of Utah is a significant demand center for transit in Salt Lake City with more than 30,000 students and more than 17,000 faculty and staff.
  - The University provides an express peak period shuttle from Salt Lake Central and eight free campus shuttles for campus affiliates to use. These routes are not closely coordinated with UTA service.
  - The University is looking to increase transit mode share as part of their current Transportation Master Plan.[1]
- **UTA makes changes to their system three times per year.** UTA is required by their collective bargaining agreement to have three "change days per year." Changes can include re-numbering of routes, re-routing of lines, and schedule adjustments. This can make historical route-by-route ridership and performance data difficult to compile and historical changes and trends more difficult to understand; it may also impact legibility of the system for riders, an issue that will be further explored as part of public outreach.
- **UTA has made some major structural changes in their service in the last 10 years that changed boarding patterns.** Notable changes include construction of Salt Lake Central Intermodal Hub and a redesign of the whole system that occurred in 2006-2007, and the opening of the TRAX Red and Green lines, which changed the main downtown transfer location from Gallivan to Courthouse in 2011.

TRANSIT PERFORMANCE

- **Transit boardings in Salt Lake City increased since 2011, but at a slower rate than the system as a whole and at a slower rate than service hours**. Total transit ridership on all lines that touch Salt Lake City increased by 28% between 2011 and 2014 whereas boardings in Salt Lake City on these lines increased by 13%. During this period, service hours increased by 26%.
  - **Bus** ridership (Salt Lake City routes) decreased slightly (-3%) between 2011 and 2014 despite a 14% increase in revenue hours over this time period. 91% of bus ridership is on local and shuttle routes in Salt Lake City.
  - **TRAX** ridership overall increased by 30% between 2011 and 2014 due in large part to a 50% increase in service hours, largely on new lines; TRAX boardings in Salt Lake City increased by approximately 20%.

[1] Note: UTA has studied a TRAX "black line" that would provide service from University directly to the airport, but is constrained by the fact that the interlocking at Courthouse Station (400 South and Main Street) is at capacity and cannot handle any more transit through movement.

  - **FrontRunner** ridership increased the most over this time period (176% overall, 77% in Salt Lake City), due to addition of major new services (143% increase in service hours overall).
- **On average, local bus routes carry fewer passengers per revenue hour than other modes, though express buses have higher productivity**. Bus average productivity is 23 riders per hour, S-Line productivity is approximately 50 riders per hour, TRAX average productivity is 160 riders per hour, and FrontRunner is approximately 130 riders per hour (rail services operate with higher-capacity vehicles).
  - Route 2 and 2x are the most productive local and express bus routes and carry 42 and 85 riders per revenue hour respectively.
  - All-day routes tend to cost less to operate per passenger trip.
  - Express and other routes that provide longer-distance, peak-period trips are more cost-effective on a per-passenger mile basis.

TRANSIT RIDER DEMOGRAPHICS

- **Transit riders are younger than the population as a whole.** 62% of UTA riders in Salt Lake City are 34 years of age or younger and nearly one-third are 18 to 24 years old (31%). Only 14% of the Salt Lake City population as a whole is 18 to 24 years old.
- **Students account for 25% of the transit passengers in Salt Lake City.** 25% of riders in Salt Lake City are students (this does not include ridership on the free routes operated by the University).
- **Most riders are lower income and many are dependent on transit.**
  - A large portion of UTA riders in Salt Lake City are low income (61% have household income less than $50,000); UTA riders in Salt Lake are lower income than the Salt Lake City population as a whole.
  - Approximately half of UTA passengers in Salt Lake City are dependent on transit service to meet their daily needs:
  - 33% of riders are under the age of 18, most of whom can be characterized as transit dependent
  - A small percentage of riders (10%) are over the age of 65 – an age group that is typically transit dependent
  - The following neighborhoods have high concentrations of transit-dependent populations:
    - Neighborhoods between downtown and the University
    - Southern portion of the Capitol Hill neighborhood
    - Portions of Liberty Wells
    - Western Salt Lake City (Rose Park, Glendale, and Poplar Grove neighborhoods)
- **Less than half of transit riders are employed.** 48% of riders in Salt Lake City are employed full time.
- **Most riders use transit regularly.** Two-thirds of UTA riders in Salt Lake City use UTA five or more days per week and 87% use UTA at least three days per week.

FARE PAYMENT

- **The UPass is the most common method of payment for Salt Lake City transit trips.** 35% of riders use UPass, followed by cash, tickets and transfers (23%), FAREPAY (22%), and miscellaneous types of passes (20%).
- **Trips within the Fare Free Zone account for 2% of Salt Lake City transit trips.**
- **Salt Lake has a new HIVE pass program for travel within Salt Lake.** For the first HIVE pass program, the majority of HIVE purchasers lived between State Street (west) and the University of Utah (east) and North Temple (north) and 400 South (south). HIVE Pass users primarily used the bus (51%) followed by the TRAX (38%), FrontRunner (9%), and Streetcar (2%).

ACCESS AND AMENITIES

- **Salt Lake City has a number of physical and geographic barriers that make accessing and planning transit service difficult.** These include large blocks, steep hills, major interstates, the freight line, and major buildings that break up the street grid.
- **There are limited amenities for passengers at bus stops.** 83% of bus stops do not have a bench or a shelter for people to wait for the bus to arrive.
- **UTA offers several tools to connect passengers to services.** UTA provides a series of online and electronic information resources including an online trip planner, real-time information, and a mobile app center.
- **There are several programs that support transit use in Salt Lake City.** Supportive options include GREENbike Share, bicycle accommodations on vehicles and at stations, Enterprise Car Share, UTA Rideshare, and the TravelWise Travel Demand Management (TDM) Program.

Appendix A:

Inventory of Plans and Policies

INVENTORY OF PLANS AND POLICIES

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	City Council Retreat 2013			▪ Ease of Use: Anyone in Salt Lake City can get from Point A to Point B using only one transfer ▪ Affordability: Cost for service should be scaled to the length of each trip – or everyone should get a transit pass ▪ Destinations: Everyone should be able to get to two transit routes within a quarter mile of where they live or work ▪ Time of Day: Mass transit hours of operation should mirror the times people leave and return from work and play ▪ Immediacy: Mass transit service should be available every 10 minutes so people can presume service ▪ Route Reliability: Routes should remain stable so residents and developers can make transit part of their long-term housing choice	
Salt Lake City	City Council Philosophy Statements (2012)	This document provides several guiding philosophy statements to set a vision for historic preservation, housing, the economic health of the city, arts and culture, neighborhood quality of life, transparency, transportation and mobility, parks and open spaces, sustainability, and education.	Transportation Vision: Salt Lake City residents should have choices in modes of transportation which are safe, reliable, affordable, and sustainable. Residents should reap the value of well-designed transportation systems that connect residents to neighborhoods and the rest of the region. The City encourages alternatives to motorized-vehicular transportation and making those options more appealing and accessible to visitors and residents.	Transportation Values: ▪ We support maximizing the accessibility, affordability, and reliability of transportation options into and around the City and support increasing accommodations for non-automotive transportation options. ▪ We support educational efforts that will help residents make informed choices about the types of transportation they use. ▪ We support reducing the environmental and health impacts created by vehicle emissions. ▪ We support efforts that will reduce the need for people to drive alone in vehicles. ▪ We value the social, economic and health benefits that come from active transportation options such as bicycling and walking. ▪ Pedestrian and bicycle safety are a high priority and we believe they can be compatible with other modes of transportation. ▪ We support establishing and maintaining safe routes to schools. ▪ We value coordinating with transportation agencies and other municipalities to improve the movement of people throughout the city. ▪ As the population of Salt Lake City and the region increases, land use design decisions should reflect the intention to better accommodate all modes of transportation and focus on the movement of people.	TOD Recommendations: ▪ The City should support transit-oriented development as well as adequate, reliable public transportation so that residents may easily access employment, goods and services, and housing. ▪ The City should support housing densities, mixed-use and mixed-income projects, parking policies, and pedestrian-oriented urban designs that encourage walking and the use of alternative and public transportation.

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	Downtown in Motion (2008)	With roots in Envision Utah, the plan promotes sustainable growth and provides a blueprint for downtown Salt Lake City. Its vision is grounded in measurable, incremental steps that make all modes of movement— to, from, and within—Downtown more integrated, efficient, and accessible.	Goal 1 Serving Downtown: Downtown transportation will be supportive of and compatible with Salt Lake City's vision of Downtown and Downtown land uses, activities and businesses. Goal 2 Pedestrian Friendly: Downtown Salt Lake City will be pedestrian friendly, where walking is the primary mode of transportation. Goal 3 Easy to Use All forms of Downtown transportation will be easy to use and understand. Goal 4 Enhanced Transit Accessibility and Mobility All transit resources available in Downtown will be used to enhance regional accessibility to Downtown and mobility within Downtown. Goal 5 Balanced Modes Salt Lake City will creatively address congestion and enhance mobility in ways that are compatible with the other goals and objectives for Downtown.		▪ Develop comprehensive network of TRAX light rail lines to improve general transit access and connectivity ▪ Constructing new TRAX lines along 400 South from Main Street to 600 West and the Intermodal Hub (at 300 South and 600 West) – completing an inner loop of rail circulation in Downtown. ▪ Constructing new TRAX lines on 700 South from 200 West to 400 West, and then continuing north on 400 West connecting to the existing system near Gateway – completing an outer loop that serves Downtown and the emerging southwest quadrant. ▪ Building a bus system that encourages use in and around Downtown and not just for getting to and from Downtown. ▪ Continue State Street and 200 South as the main corridors for bus service in Downtown. ▪ A new bus passenger center will be constructed at State Street and 200 South on the east side of Downtown to complement service on the west side of Downtown at the Intermodal Hub. ▪ Increasing bus service in Downtown, which includes using Branded Bus Corridors, to help visitors circulate easily along set routes without worry of being on the wrong bus. ▪ More attractive and comfortable bus stops Downtown, including better information about bus service. ▪ Expanding the Free Fare Zone in Downtown. The Free Fare Zone will be extended to include the Library TRAX Station and three new stations on the west side of Downtown, including the Intermodal Hub and the hotels on 600 South. ▪ Downtown circulator/shuttle service

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	Salt Lake City Downtown Community Plan: Story of Our Future (2014)	The Downtown Community Plan is a 25-year vision and implementation plan that directs growth and development in the downtown. It is a shared citywide vision drawn on already established, adopted City plans and policies. It creates a framework for more focused plans like the Downtown Master Plan.	Vision: Downtown Salt Lake will be the premier center for sustainable urban living, commerce, and cultural life in the Intermountain West. Goal 1: Double transit ridership by 2020 and double it again by 2040 Goal 2: More evenly balanced mode share Goal 3: Improved transit connections to major job, neighborhood, and activity centers (i.e. airport, University of Utah, Sugar House Business District, State Capital) Goal 4: A simple public parking system that balances the city's role as the economic center of the State supports small and large retailers, and supports the restaurant, cultural, and night life of the city.	Principles: A transportation and mobility network that is safe, accessible, reliable, affordable, and sustainable, providing real choices and connecting people with places. Air that is healthy and clean. Targets: The desired trend is to see more people walking, biking, or using transit. The long term trend related to housing and jobs being located close to housing is to have every downtown resident/worker within a 1/4 mile of a light rail, street car or bus route with 15 minute service or less.	▪ Encourage development of Transit Oriented Development (TOD) through form-based codes and allowed increased density within a 10-minute walk of Trax, streetcar and high frequency bus routes. ▪ Work with UTA to implement a downtown circulator that improves local transportation through the downtown. ▪ Continue reduced-cost transit pass program (Hive Pass) for Salt Lake City residents ▪ Work with other agencies to improve access to transit for City residents. ▪ Work with UTA to find ways to improve the efficiency of the transit system for commuters. • Improve the "last mile" transit connections to encourage ridership. ▪ Work with UTA to ensure downtown remains the center of the regional transit system. ▪ Improve the "last mile" transit connections to encourage ridership. ▪ Provide a direct transit connection between Central Station and the University of Utah. ▪ Work with UTA to improve transit access between downtown and other major destinations in the City. ▪ With development of the new airport terminals, parking, and associated facilities, work with the Airport to improve access between downtown and the airport.
Salt Lake City	Complete Streets Policy (2010)			...the city supports the concept of complete streets, requiring the accommodation of pedestrians and bicyclists throughout the planning process. All city owned transportation facilities in the public right of way on which bicyclists and pedestrians are permitted by law, including, but not limited to, streets, bridges, and all other connecting pathways, shall be designed, constructed, operated, and maintained so that users, including people with disabilities, can travel safely and independently.	

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	West Side Master Plan (2014)	The Westside Master Plan is a visioning document for the Glendale and Poplar Grove neighborhoods. One of the most common issues brought up in community meetings was the lack of connectivity between the Westside and the rest of the city. Isolation is due to historical development of the city, the railroads, and the placement of I-15 and I-80.	Vision: the Westside Will Be: ▪ Clearly connected to the rest of Salt Lake City through a variety of reliable transportation modes that give residents convenient options for getting around ▪ Home to a healthy and diverse industrial business community that provides a growing employment and economic base for Salt Lake City Goals: ▪ Strengthen the connections both within and between the Westside and other parts of Salt Lake City by improving the community's gateways and corridors and strengthening the transportation network for all modes of travel.		Salt Lake City should encourage the Utah Transit Authority to improve the overall reliability and quality of bus service in the Westside and make efforts to improve the quality and accessibility of bus stops in the community. As part of Salt Lake City's citywide transit master plan, the role of rail service—especially streetcar—in the Westside should be reviewed and the city should consider how it can be used to strengthen the east west connections between the Westside and downtown. Salt Lake City should focus efforts on realizing the proposed bus rapid transit (BRT) route on Redwood Road, as identified in the *2011- 2040 Wasatch Front Regional Transportation Plan*, as redevelopment necessitates direct and efficient travel to both Redwood Road employment centers (from outside the community) and those downtown, at the University of Utah and at Research Park. BRT on Redwood Road within Salt Lake City should, at minimum, feature dedicated rights-of-way for buses with stations similar to those found at light rail stations. As a potential long-term project, Salt Lake City should consider the feasibility of a light rail or streetcar route on Redwood Road.

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	Sugar House Master Plan	The Sugar House Master Plan is a visioning document for the Sugar House neighborhood. The Sugar House neighborhood is slated to undergo significant redevelopment.	▪ An integrated program for mobility throughout the community with a commitment toward optimizing the pedestrian experience and alternatives to automobile travel, particularly in the Sugar House Business District, which is a necessary element of a viable commercial center.	▪ Develop the Sugar House Community to be a sustainable, attractive, harmonious and pedestrian oriented community. ▪ Provide a mix of housing types, densities, and costs to allow residents to work and live in the same community. Locate higher density housing on or near public transportation routes to afford residents the ability to reduce their reliance on the automobile. ▪ Direct a mixed-land use development pattern within the Sugar House Business District to include medium- and high-density housing and necessary neighborhood amenities and facilities. These developments will be compatibly arranged, taking full advantage of future transit stations, Sugar House Park, Fairmont Park, and the proximity to the retail core. ▪ Provide for multiple modes of transportation that are safe, convenient and comfortable. ▪ Support the use of transit for commuters and college students. ▪ Support the construction of light rail along the Sugar House rail corridor and determine locations for future transit stations and park and ride facilities within the Sugar House Business District, near the Brickyard Plaza and on 2100 South near 2300 East. ▪ Direct land use decisions to support a light rail station in the Business District. ▪ Create a Citywide transit-oriented development (TOD) zoning district or overlay zone that may be applied to strategic areas and that require development, both public and private, to facilitate transit use. ▪ Encourage UTA to acquire the Union Pacific rail line in order to preserve the options of converting the line to a “rails-with-trails” corridor for cycling, hiking, skating and a light rail line. ▪ Prohibit development that encroaches upon or utilizes the Union Pacific railroad line right-of-way if that development compromises future use of the right-of-way for a trail or light-rail system. ▪ Enforce against those individuals who have illegally built structures that encroach upon the railroad right-of-way. ▪ Encourage UTA to provide more frequent and efficient bus service throughout Salt Lake City. ▪ Improve bus stops to ensure adequate access, safety and comfort for transit riders, including more bus shelters that are fully enclosed glass structures at bus stops. ▪ Create a mini-shuttle system between shopping areas, hotels, offices, and metro links in the Sugar House community. ▪ Support the use of alternative fuels for mass transit systems for cleaner air such as electric, methanol, and other methods of cleaner burning engines.	

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	Plan Salt Lake (In progress - August 2014 last version)	Plan Salt Lake sets a citywide Vision for Salt Lake City for the next 25 years.	Sustainability: The goal of livability and making our city one of the greenest, most inclusive, and economically viable cities in the country. Connectivity & Circulation: Connectivity and circulation are critical to responsible, sustainable growth. We must ensure that our neighborhoods and districts are well connected by both providing a wide-range of transportation and mobility options and increasing the number of connections in our community. Smaller blocks and a diversity of connections are necessary to achieve this. 2040 TARGETS: 1. Public transit within 1/4 mile of all homes 2. Reduce Single Occupancy auto trips 3. Decrease pedestrian, bike, and auto accidents	Plan is broken into 13 guiding principles, each with a set of initiatives, #4. Transportation & Mobility: A transportation and mobility network that is safe, accessible, reliable, affordable, and sustainable, providing real choices and connecting people with places. ▪ More affordable, safe, and accessible choices for all ▪ More accessible and more convenient transit ▪ Multimodal transportation network to decrease automobile dependency ▪ Embedded art and pedestrian elements into our transportation network to reinforce community identity, enhance quality of life, and better utilize public right-of-ways for people, not just cars.	Initiatives: 1. Create a complete circulation network and ensure convenient equitable access to a variety of transportation options by: ▪ Having a public transit stop within 1/4 mile of all residents ▪ Expanding pedestrian and bicycle networks and facilities in all areas of the City ▪ Providing incentives for the use of transit ▪ Enhancing the regional transportation network ▪ Creating a system of connections so that residents may easily access employment, goods and services, neighborhood amenities, and housing. 2. Reduce automobile dependency and single occupancy vehicle trips. 3. Make walking and cycling viable, safe, and convenient transportation options in all areas of the City. 4. Prioritize maintenance of existing infrastructure (enhancing quality of life, safety, sustainability, and mobility). 5. Encourage transit-oriented development (TOD). 6. Support and enhance the Salt Lake International Airport as a regional and international amenity (including freight). 7. Collaborate with regional partners to relieve congestion and enhance rights-of-way for alternative modes of transportation. 8. Enhance rights-of-way to join, rather than segregate, adjacent neighborhoods. 9. Incorporate green infrastructure into our rights-of-way and transportation network. 10. Incorporate pedestrian oriented elements, including street trees, pedestrian scale lighting, signage, and embedded art, into our rights-of-way and transportation networks.
Salt Lake City	Bike/Ped Master Plan (2004)	The purpose of the bicycle and pedestrian master plan is to provide SCL with a strong planning tool that will facilitate the continued and orderly development of bicycle and pedestrian facilities and implementation strategies that encourage their use.	Enhance use of the bicycle for transportation and recreation, and walking for pleasure and mobility. Foster community respect for bicycling and walking. Promote bicycling and walking as ways to enhance personal health and improve the community environment.		Incorporate a multiple use trail into the planning for the future transit use of the UTA rail corridor to Sugar House. Coordinate with the UTA to continue to provide bicycle storage on buses and light rail vehicles and to ensure bicycle accommodation on future commuter rail trains. Coordinate with UDOT to provide sidewalks on UDOT roads within SLC to improve pedestrian access to transit stops and other community facilities.

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	Sustainable Salt Lake Plan (2015)	Salt Lake City's sustainable transportation system provides safe travel options for residents, is affordable and efficient, limits waste and resource use, and supports a vibrant economy.	▪ Deliver transportation services that result in a zero carbon footprint and make the environment better ▪ Develop a sustainable, high-performance transportation system that supports a robust economy ▪ Enhance quality of life by integrating transportation with the built environment	"Livability" has emerged as a unifying theme for framing our priorities. We have focused on making our city one of the greenest, most inclusive, and economically viable municipalities in the country.	▪ Increase, improve, and promote transit service to and within the city: ▪ Complete and open the Sugar House Streetcar, and complete implementation plan for Phase 2. ▪ Fund or begin construction on a downtown streetcar. ▪ Complete a citywide streetcar network plan. ▪ Finalize plans to extend TRAX along 400 South from Main Street to the Intermodal Hub. ▪ Work with Utah Transit Authority to extend TRAX service until 1:00 a.m., and to provide a "Next Bus" pilot program. ▪ Work with UTA to finalize plans for a mountain transportation system.
Salt Lake City	Central Community Master Plan (2002)	The Central Community Master Plan provides policy guidelines for Salt Lake City commissions, boards and administrative entities to use when directing and implementing projects, programs and public policies that require review, recommendations and approval. This master plan serves the community by providing policies and principles for a sustained and enhanced environment for living and working in the Central Community.	▪ Protect and improve the quality of life for everyone living in the community, regardless of age or ability. ▪ Improve and support community involvement, public participation, and neighborhood activism in the Central Community. ▪ Provide a basis for funding specific programs that assist housing, capital improvement programs, and public services. ▪ Provide opportunities for smarter and more creative development practices to better serve the community. ▪ Prevent inappropriate growth in specific parts of the community. ▪ Encourage specific types of growth in designated parts of the community. ▪ Establish financial incentives to support alternative modes of mobility. ▪ Preserve historic structures and residential neighborhoods. ▪ Establish recommendations for better coordination and administrative review of construction projects and city applications.		

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake City	North Temple Boulevard Master Plan (2010)	This plan provides a framework for land use and urban design decisions that will be required as North Temple changes from an auto oriented street to a street that accommodates all modes. This plan covers 2 ½ miles along North Temple Boulevard from 600 West out to 2200 West. The plan covers five station areas: Viaduct, 800 West, Fairpark, Cornell, and a combined area for 1950 West and 2200 West (future station area). This street serves as a major thoroughfare between downtown and neighborhoods and businesses in the Northwest Community. The addition of the Airport Light Rail Line will result in North Temple Blvd. playing a new role in the community – it will be a major element of the region's mass transit system connecting the entire system to the airport. The Light Rail line will require removal of a center turn lane and one vehicle lane in each direction.	Boulevard Design Book Goals: ▪ Provide policy and urban design direction and guidelines. ▪ Promote high quality and functional street design with efficient project implementation. ▪ Develop a more balanced approach to street design, giving equal weight to transportation, transit, community and environmental goals. ▪ Ensure that the investment in high quality street infrastructure yields economic benefits and increases in residential and commercial property values and retail activity. ▪ Make all expenditures on this project cost effective.	Design Principles: ▪ Design for transit: Utilize transit as a catalyst. Integrate transit into the design of the street to improve the physical character, livability, functionality and economic vitality while providing a memorable welcoming experience for all users. ▪ Design for safety: Design safe and functional streets for all users. ▪ Design for access and mobility: Multimodal streets should accommodate all users by prioritizing the most energy and space efficient modes. ▪ Design for context: Streets help define the character of the City and should respond to the unique qualities and the environment around the street. ▪ Design for livability: Create vibrant, high quality public spaces that facilitate civic, cultural, recreational and economic interactions. ▪ Design for sustainability: Contribute to a healthier, greener, and more sustainable environment. ▪ Design for excellence: Create memorable streets designed to the highest aesthetic standards possible, using durable materials. ▪ Design for cost effectiveness: Provide the greatest possible value to the public that meets today¡¦s needs as well as the needs of the future. ▪ Each Station Area has its own set of policies many of which overlap: ▪ Development: Use innovative zoning techniques to create high quality projects that build on the station area's assets. ▪ Connectivity: Improve the pedestrian environment to create a safe and walkable transit-oriented neighborhood. ▪ Mix of Uses: Intensify the mix of uses. ▪ Placemaking: Create safe, vibrant and useful public spaces and urban infrastructure. ▪ Destinations: Enhance the area as a regional destination and transfer location. ▪ Mobility: Improve the pedestrian environment to create a walkable transit-oriented neighborhood. ▪ Residential Density: Increase the residential density around the 800 West Station.	Recommends Transit Station Area Types that include: ▪ Mix of land uses ▪ Design standards and guidelines ▪ Circulation and connectivity ▪ Station access ▪ Public spaces ▪ Parking Specific strategies include (not a comprehensive list): ▪ Effectively manage parking around station areas ▪ Recognize streets as being important public spaces ▪ Establish minimum residential density of 20 DU per acre ▪ Provide a range of housing options ▪ Rezone the station areas ▪ Develop design guidelines that support pedestrian-friendly environment ▪ Design direct pedestrian routes to station areas ▪ Identify transit-friendly land uses that are appropriate in the station area
Salt Lake City	Mayor's Livability Agenda (2012)	Second term mayor agenda and vision for SLC	The Administration will work to further develop connections between the City's activity centers with a safe, clean and green travel network that will help us 1) use resources and time efficiently and wisely to get around town; 2) connect with our fellow residents through personal interactions; 3) foster stronger relationships with our local businesses, entertainment, and arts organizations; and 4) share and enjoy our parks and natural spaces.	▪ Expand and raise awareness of various transportation options. ▪ Lead the region in user-friendly applications that help people move around the city. ▪ Use mobility as a defining feature to compete in the 21st century economy and environment. ▪ Ensure secure and comfortable experience for all transportation system users	▪ Aggressively develop a neighborhood transit system with a streetcar network as its backbone. ▪ Evaluate the potential for an "owl" TRAX. Provide a late night schedule for after last call ▪ Partner to develop a "Next Bus" pilot program. ▪ Advocate for a year-round Canyons Shuttle and Mountain Transportation System. Through an expansion of the recently established UTA bus route to Park City that may include Mill Creek and Big and Little Cottonwood Canyons, our residents and visitors could have direct, year-round access from Salt Lake City to the Wasatch Canyons via transit. ▪ Work with UTA to bring back the direct TRAX connection between downtown and the University of Utah. ▪ Build a better bus stop. Develop bus stops that are safe, inviting and entertaining places to wait.

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
Salt Lake Chamber and Downtown Alliance	Downtown Rising (initiated in 2006)	Led by the Salt Lake Chamber and the Downtown Alliance, Downtown Rising is an evolving vision for the future of Downtown SLC. The vision includes creating character districts, signature projects, and shared ideas about shaping the future of the city.	Downtown Rising is a shared vision for a great American City that embraces art, culture and education. It envisions a community that is welcoming, green and international.	TOD Goal: Establish the benefits of TOD through land use designations, design guidelines, zoning, and public funding.	TOD: Includes section on transit-oriented development and designates three transit-oriented development land use classifications for the neighborhood (low-, medium-, and high-density). Specific strategies include: ▪ Support a variety of low-, medium- and high-density residential uses around light rail stations in TOD districts, based on the Future Land Use map designations. ▪ At light rail stations in TOD districts, establish a centralized core of land uses that support transit ridership. Anchor transit centers with land uses that act as destination points. ▪ Encourage a variety of commercial uses that share the same clientele and patrons. For example, movie theaters provide a clientele to patronize restaurants, arcades, and retail businesses. Other Access and Mobility Strategies: ▪ Design: With new development encourage the construction of direct pedestrian pathways and/or pedestrian zones to connect with neighboring land uses, parking lots and mass transit.
UTA	Five Year Service Plan (2013)	The Five-Year Service Plan (2013-2018) synthesizes and prioritizes service improvement concepts across multiple modes and business units within the UTA system. This document shows the level of resources necessary to meet unmet needs, address capacity issues, and expand the high-frequency service network throughout Utah, Salt Lake, Weber, and Davis Counties. Plan looks at how to improve the efficiency and effectiveness of UTA's service; purely ridership driven process.		Basis for development of service improvement concepts: ▪ Service level improvements ▪ Improve route headway ▪ Increase hours of operation ▪ Add weekend service where appropriate ▪ System design improvements ▪ Streamline alignments to improve directness and simplicity ▪ Reduce service duplication and improve route spacing ▪ Increase service to major activity centers ▪ Introduce new services targeting potential customers	▪ Recommended route classifications (page 2-2) ▪ Three service concepts were developed based on different funding levels and the following improvements: – Operating on fewer streets within downtown Salt Lake City – Creating an interconnected network of routes with 10 minute headways o Route 2 ¡V 200 South o Route 21 ¡V 2100 South/2100 East o Route 33 ¡V 3300 South o Route 35M ¡V 3500 South MAX o Route 200 ¡V State Street North – Shortening or interlining several routes within the University of Utah campus to reduce running time and improve schedule reliability – Improving headways and service span for many routes – Adding Sunday service to all core arterial routes – Adding Saturday service to all arterial routes

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
UTA	UTA Network Study (2013)	The Network Study identifies the next group of capital and operating improvements that the Utah Transit Authority (UTA) will focus on delivering after completion of the FrontLines 2015 program.	Customer focus Finances/funding Economic development Ridership/service ▪ Double ridership through full funding of the Unified Plan ▪ Increase levels of service by 50% ▪ Reduce average customer trip time by 25% ▪ Develop a fully integrated first/last mile ▪ Find and attract new markets for ridership Accountability Transit oriented development ▪ Partner with stakeholders on station area planning ▪ Pursue public-private partnerships Sustainability ▪ Operate a balanced fleet of alternative fuel vehicles ▪ Support clean air initiatives including pass programs and partnerships with other state and local air quality groups		▪ Salt Lake County State Street Bus Plus ▪ 5600 West Transit Corridor – BRT from Daybreak TRAX to International Center via I-80 to downtown SLC ▪ Bus Plus frequent transit network ▪ More frequent FrontRunner service and operational improvements ▪ SLC Downtown LRT Connection ▪ South Davis Transit Corridor – fixed-guideway transit from SL Intermodal Center to 400 North (BRT assumed) ▪ Active transportation improvements (bike share, bike access on FrontRunner vehicles, and more direct access to transit) ▪ SLC Downtown Streetcar from SL Intermodal Center to 1300 East ▪ Sugarhouse Streetcar ▪ Mountain Transportation – improved transit from SLC to recreation in Big and Little Cottonwood Canyons

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
UTA	UTA Strategic Plan (2013)	2020 Strategic Plan	Relevant Focus Areas/Goals: Finance/funding Ridership/service ▪ Double ridership through full funding of the Unified Plan ▪ Increase levels of service by 50 percent ▪ Develop new fare products and equitable fare policies ▪ Reduce the average customer trip time by 25 percent ▪ Develop a fully integrated First/Last Mile Strategy ▪ Find and attract new markets for ridership Accountability Transit oriented development ▪ Partner with communities and external stakeholders on UTA station area planning processes ▪ Pursue more public-private partnerships to leverage UTA assets in order to generate revenue that can support more transit service Economic Development ▪ Promote economic benefits of transit to existing companies along the Wasatch Front Sustainability ▪ Support clean air initiatives including pass programs and partnerships with other state and local Air Quality groups ▪ Operate a balanced fleet of alternative fuel vehicles		

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
UTA	UTA First/Last Mile Study (in progress)	The purpose of this First/Last Mile Strategies Study is to identify a short list of strategies to prioritize that would be most effective in increasing system ridership. Scope of study focuses primarily on FrontRunner and TRAX facilities however BRT and streetcar line facilities were also considered. The study estimated ridership increases by station typology assuming recommended strategies are implemented.			Recommendations provided based on established station typologies. Station typologies based on walk access, active transportation mode split, non-auto access mode split, and availability of parking supply: ▪ Urban ▪ Multimodal ▪ Institutional ▪ Suburban ▪ Suburban non-residential ▪ Auto-dependent FMLM strategies were recommended by station typology. Urban typology strategies (for example): ▪ Wayfinding and information ▪ Bicycle network connections ▪ Pedestrian network improvements ▪ Crossing treatments ▪ Bikesharing ▪ Car sharing ▪ Rail/bus stop enhancements
WFRC	Wasatch Choice for 2040	The Wasatch Choice for 2040 is a vision for how agencies and communities will develop our communities and transportation system to accommodate projected population growth. In the next 30 years, the population in Salt Lake, Davis, Weber, and Utah counties is projected to increase by 65 percent, adding another 1.4 million residents. Wasatch Choice 2040 is an Envision Utah project.		Growth principles and objectives: ▪ Provide Public Infrastructure that is Efficient and Adequately Maintained ▪ Provide Regional Mobility through a Variety of Interconnected Transportation Choices ▪ Integrate Local Land-Use with Regional Transportation Systems ▪ Provide Housing for People in all Life Stages and Incomes ▪ Ensure Public Health and Safety ▪ Enhance the Regional Economy ▪ Promote Regional Collaboration ▪ Strengthen Sense of Community ▪ Protect and Enhance the Environment	Relevant Objectives for the TMP ▪ Develop a balanced, multi-modal transportation system. ▪ Coordinate transportation with regional employment, housing, educational and activity centers. ▪ Encourage future commercial and residential areas within close proximity of each other to reduce travel distances. ▪ Encourage a balance of jobs and housing in each part of the region to reduce travel distances. ▪ Support actions that reduce growth in per capita vehicle miles of travel. ▪ Coordinate regional transportation with centers of development. ▪ Coordinate transportation decisions with schools and educational centers. ▪ Make land-use and transportation decisions based on comprehensive understanding of their impact on each other.

Plan Owner	Name of Plan	Plan Purpose	Goals/Vision	Policies/Principles	Recommended Strategies
WFRC	WFRC Regional Transportation Plan (2011)	The Regional Transportation Plan is the transportation element of Wasatch Choice for 2040 covering the period 2011 to 2040. The RTP is the plan for all regionally significant road and highway, public transit capacity-expansion and preservation projects in the Wasatch Front. The RTP also incorporates other modes of transportation, including bicycle, pedestrian, trucking and transportation for seniors and persons with disabilities.		The 2040 Regional Transportation Plan (RTP) must conform to the Utah State Implementation Plan (SIP) for air quality. This means that the vehicle emissions resulting from the transportation projects proposed in the 2040 RTP may not exceed the level or "budget" set for them in the SIP.	Downtown SLC Major Transit Projects ▪ 200 South Streetcar and BRT from 600 W/200S to 200S/200E ▪ Downtown SLC Branded Bus ▪ University TRAX Line to SL Central TRAX Connection ▪ SW Downtown SLC Streetcar (Granary Line) ▪ SL Downtown Transit Center (transit hub at 200 S/State Street ▪ Interstate-80 Transit Only Freeway Ramps
Envision Utah	Envision Utah	Beginning in 1997, Envision Utah launched a public effort to keep Utah beautiful, prosperous, healthy, and neighborly for future generations. It's a strategy developed by the people of Utah to make our lives better – that provides more choices for how we, and the next generation, would like to live.	Envision Utah engages people to create and sustain communities that are beautiful, prosperous, healthy and neighborly for current and future residents.		
UDOT	Unified Transportation Master Plan	The Unified Transportation Master Plan is the state's long range transportation plan (2011 to 2040).	▪ Preserve infrastructure ▪ Optimize Mobility ▪ Zero fatalities ▪ Strengthen the economy		Salt Lake County Transit Projects ▪ 200 South — Salt Lake Central to Downtown Salt Lake Streetcar and Enhanced ▪ SLC - Foothill Drive - Wasatch Drive Corridor — SLC to Little Cottonwood Canyon (1st of 3 phases) Enhanced Bus/BRT ▪ State Street Bus Rapid Transit — Salt Lake Central to Draper FrontRunner (1st of 3 Phases) Enhanced Bus ▪ Draper Line TRAX Extension (South) — 10000 South TRAX Station to 12600 South TRAX Station Light Rail ▪ WFRC Redwood Road Bus Rapid Transit — Downtown SL to Draper FrontRunner (1st of 3 Phases) CorPres/BRT/Enhanced ▪ 5600 West Corridor — Downtown Salt Lake to Daybreak CorPres/BRT ▪ West Bench Corridor Preservation (11400 South) CorPres Local Contribution ▪ Sugarhouse Streetcar (1st Phase) — 2100 South TRAX to Highland Drive/Sugarmont Streetcar ▪ 3900 South/3500 South Corridor (west) — Meadowbrook TRAX Station to West Bench (2nd of 4 Phases) Bus Rapid Transit ▪ Taylorsville Murray Central Segment — Murray Downtown to SLCC Redwood (1st of 2 Phases) Enhanced Bus ▪ Taylorsville Murray West Valley Segment — SLCC Redwood to W.V. Intermodal (1st of 2 Phases) Enhanced Bus

APPENDIX B

Route-Level Performance Measures (2014)

APPENDIX B: ROUTE-LEVEL PERFORMANCE MEASURES (2014)

Service Type / Route	Description	Service span	Annual weekday boardings	Annual weekday service hours	Annual weekday passenger miles	Annual weekday incremental operating cost	Weekday operating cost / boarding	Weekday operating cost / service hour	Weekday operating cost / passenger mile	Weekday boardings / service hour
Local			7,777,269	336,857	36,360,467	$ 18,357,893	$2.36	$54.50	$0.50	$23.09
2	200 South	All-Day	503,180	11,938	804,679	$ 579,901	$1.15	$48.57	$0.72	$42.15
3	3rd Avenue	All-Day	146,703	6,996	389,689	$ 338,407	$2.31	$48.37	$0.87	$20.97
6	6th Avenue	All-Day	234,539	6,485	612,715	$ 331,461	$1.41	$51.11	$0.54	$36.16
9	9th Avenue	All-Day	100,223	5,703	194,430	$ 302,706	$3.02	$53.08	$1.56	$17.57
11	11th Avenue	All-Day	102,466	4,798	241,241	$ 249,822	$2.44	$52.06	$1.04	$21.35
17	1700 South	All-Day	95,940	5,330	188,699	$ 278,885	$2.91	$52.33	$1.48	$18.00
21	2100 South/2100 East	All-Day	519,287	17,225	1,499,094	$ 897,078	$1.73	$52.08	$0.60	$30.15
200	State Street North	All-Day	898,639	28,166	2,823,918	$ 1,399,357	$1.56	$49.68	$0.50	$31.90
205	500 East	All-Day	588,829	21,241	1,558,319	$ 1,089,005	$1.85	$51.27	$0.70	$27.72
209	900 East	All-Day	709,114	30,091	2,642,680	$ 1,582,290	$2.23	$52.58	$0.60	$23.57
213	1300 East/1100 East	All-Day	271,857	15,580	1,200,820	$ 825,202	$3.04	$52.97	$0.69	$17.45
217	Redwood Road	All-Day	812,906	33,472	2,437,646	$ 1,855,885	$2.28	$55.45	$0.76	$24.29
220	Highland Drive/1300 East	All-Day	442,982	23,129	2,403,409	$ 1,280,563	$2.89	$55.37	$0.53	$19.15
223	2300 EAST/ HOLLADAY BLVD	All-Day	37,154	2,920	191,703	$ 173,691	$4.67	$59.48	$0.91	$12.72
228	FOOTHILL BLVD / 2700 EAST	All-Day	210,045	14,140	1,126,847	$ 777,200	$3.70	$54.97	$0.69	$14.86
453	TOOELE - SALT LAKE VIA AIRPORT	Peak-Only	69,775	4,633	1,865,164	$ 364,905	$5.23	$78.77	$0.20	$15.06
454	Grantsville/Salt Lake	Peak-Only	10,096	683	285,733	$ 58,260	$5.77	$85.24	$0.20	$14.77
455	UofU/Davis County/Weber State University	All-Day	395,481	24,946	4,563,861	$ 1,493,275	$3.78	$59.86	$0.33	$15.85
456	Ogden/Unisys/Rocky Mountain Express	Peak-Only	9,918	690	285,274	$ 45,276	$4.57	$65.61	$0.16	$14.37
460	Woods Cross	Peak-Only	19,471	732	97,318	$ 47,469	$2.44	$64.84	$0.49	$26.60
461	Bountiful via State Capitol	Peak-Only	22,821	1,468	151,469	$ 96,460	$4.23	$65.69	$0.64	$15.54
462	North Salt Lake	Peak-Only	24,199	1,079	123,411	$ 69,180	$2.86	$64.10	$0.56	$22.42
463	West Bountiful	Peak-Only	13,033	727	76,079	$ 46,496	$3.57	$63.99	$0.61	$17.94
470	Ogden-Salt Lake Intercity	All-Day	891,868	45,298	8,772,891	$ 2,609,512	$2.93	$57.61	$0.30	$19.69
471	Centerville	Peak-Only	21,441	866	189,783	$ 59,565	$2.78	$68.79	$0.31	$24.76
500	State Capitol	All-Day	134,731	6,367	236,776	$ 317,122	$2.35	$49.81	$1.34	$21.16
516	Poplar Grove / Glendale	All-Day	257,680	11,298	805,898	$ 583,623	$2.26	$51.66	$0.72	$22.81
519	Fairpark	All-Day	122,376	5,342	303,595	$ 285,796	$2.34	$53.50	$0.94	$22.91
520	Rose Park	All-Day	79,821	4,761	183,159	$ 268,918	$3.37	$56.49	$1.47	$16.77
551	International Center	Peak-Only	30,694	753	104,169	$ 50,584	$1.65	$67.18	$0.49	$40.76
Fast bus			108,688	5,706	1,108,362	$ 348,513	$3.21	$61.08	$0.31	$19.05
307	Cottonwood Heights Fast Bus	Peak-Only	30,772	1,418	288,017	$ 87,492	$2.84	$61.69	$0.30	$21.70
313	South Valley/U of U Fast Bus	Peak-Only	28,076	1,774	367,433	$ 111,232	$3.96	$62.71	$0.30	$15.83
320	Highland Drive Fast Bus	Peak-Only	18,919	912	190,118	$ 53,715	$2.84	$58.90	$0.28	$20.75
354	SANDY / U OF U FAST BUS	Peak-Only	30,921	1,602	262,794	$ 96,073	$3.11	$59.97	$0.37	$19.30
Express			452,019	16,094	9,560,091	$ 1,140,683	$2.52	$70.87	$0.12	$28.09
2X	200 SOUTH EXPRESS	Peak-Only	36,954	434	126,948	$ 22,642	$0.61	$52.23	$0.18	$85.24
451	Tooele Express	Peak-Only	92,847	2,928	2,475,051	$ 257,284	$2.77	$87.86	$0.10	$31.71
472	Ogden-Salt Lake Express	Peak-Only	124,811	3,213	2,572,312	$ 236,503	$1.89	$73.61	$0.09	$38.85
473	SLC-Ogden Hwy Express	Peak-Only	168,773	7,300	3,688,280	$ 467,587	$2.77	$64.05	$0.13	$23.12
902	Park City-SLC Connec	Peak-Only	28,634	2,220	697,500	$ 156,666	$5.47	$70.58	$0.22	$12.90
Shuttle			254,200	10,766	1,392,348	$ 598,729	$2.36	$55.61	$0.43	$23.61
509	900 W Shuttle	All-Day	192,303	8,521	1,082,810	$ 468,071	$2.43	$54.93	$0.43	$22.57
513	Industrial Business Park Shuttle	Peak-Only	30,248	1,987	215,241	$ 115,384	$3.81	$58.08	$0.54	$15.23
919	FAIRPARK (WEST HS)	Peak-Only	16,674	130	50,407	$ 7,620	$0.46	$58.45	$0.15	$127.90
920	FAIRPARK (WEST HS)	Peak-Only	14,975	128	43,891	$ 7,655	$0.51	$59.82	$0.17	$117.02
Flex										
F522	2200 West Flex Shuttle	Peak-Only	7,770	1,130	N/A	$ 57,620	$7.42	$51.01	N/A	$6.88
Seasonal			6,872	506	110,075	$ 32,845	$4.78	$64.96	$0.30	$13.59
951	Downtown SLC - Snowbird/Alta	Seasonal	4,153	249	79,558	$ 16,597	$4.00	$66.55	$0.21	$16.65
952	U of U - Snowbird/Alta	Seasonal	2,350	212	29,018	$ 13,477	$5.73	$63.66	$0.46	$11.10
954	Maverik Center - Snowbird/Alta	Seasonal	369	44	1,500	$ 2,771	$7.51	$62.30	$1.85	$8.30
TRAX			16,192,817	97,000	85,744,887	8,301,953	$0.51	$85.59		$166.94
Red	West Jordan - University Medical Center	All-Day	6,128,227	37,388	40,734,794	$ 3,349,975	$0.55	$89.60	$0.08	$163.91
Green	West Valley City to Airport	All-Day	4,020,770	28,009	14,440,606	$ 2,214,993	$0.55	$79.08	$0.15	$143.55
Blue	Draper to Downtown SLC	All-Day	6,043,820	31,604	30,569,487	$ 2,736,985	$0.45	$86.60	$0.09	$191.24
Streetcar										
720	S Line	All-Day	257,870	4,945	331,235	$ 268,035	$1.04	$54.20	$0.81	$52.15
FrontRunner										
FR	Ogden - SLC - Provo	All-Day	4,001,220	29,433	112,284,616	$ 11,809,412	$2.95	$401.23	$0.11	$135.94
All Services			29,051,853	501,931	246,782,006	40,882,837	$1.41	$81.45	$0.17	$57.88
Bus Only*			8,599,946	370,553	48,421,268	$ 20,503,437	$2.38	$55.33	$0.42	$23.21

* Excludes Seasonal Services

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Appendix B: COMMUNITY OUTREACH

Appendix B Community Outreach

Public outreach is a key element in any master planning effort. The purpose of the Salt Lake City Transit Master Plan public outreach was to engage a broad and diverse section of the population in order to discuss and solicit ideas related to the development of the plan. To this effect, public outreach was conducted in all seven Council Districts of Salt Lake City and online. To ensure that a significant segment of the population had the opportunity to provide feedback, multiple opportunities for public involvement were offered, including: stakeholder interviews, mobile event outreach, public open houses, and on-line engagement.

This section includes an overview and summary of key findings from the following outreach events:

- Salt Lake City Transit Master Plan Meet-and-Greet
- Stakeholder Interview
- Mobile Outreach Events
- September 2015 Open House
- Website Surveys
- Design Your Transit System Survey

KEY THEMES

Much of the feedback received during all the public outreach activities for the Salt Lake City Transit Master Plan coalesced around a number of key themes. For example, many of the open-ended suggestions and comments received during the public outreach process focused on providing a complete and convenient transit system that allows for a car-free lifestyle, which was the top priority goal selected by Open House participants. In addition, many respondents expressed that public transit works relatively well for commuting to a few major employment centers, but that it is not a viable option for commuting at off-peak hours or for travel to areas outside the central business district. Other common themes included:

- Provide TRAX service later in the evening (past-midnight)
- Run neighborhood busses later in the evening
- Improve transit stops
- Develop frequent routes to areas other than downtown and the University of Utah
- Develop a citywide network
- Improve connections between routes and neighborhoods
- Service non-sporting cultural events (plays, symphony, opera)
- Service the west side and East Bench areas
- Improve the maps and transit route information provided online and in print
- Improve real-time information to better allow riders to know when the next bus is coming
- Make prepaid fares more visible and accessible
- Improve bicycle and pedestrian access to transit to increase usability of transit (bike share, bike paths, crosswalks)
- Make sure that operators/transit personal are informed and courteous

OVERVIEW OF OUTREACH EFFORTS AND INPUT

Salt Lake City Transit Master Plan Meet-and-Greet

The project commenced with a "Meet-and-Greet," held on January 27, 2015 at the City Creek Harmons grocery store. This event gave the project team the opportunity to meet and have casual conversations about the intent of the Plan with members of the public early in the process. Key stakeholder groups that were invited to the Meet-and-Greet were: Salt Lake City Community Councils, Salt Lake City Council, Salt Lake City Transportation Advisory Board, Salt Lake City Planning Commission, Utah Transit Authority (UTA) Board of Trustees, Salt Lake County, Wasatch Front Regional Council, UDOT, Breathe Utah, Heal Utah, Salt Lake City School District, Envision Utah, Salt Lake Chamber of Commerce, Downtown Alliance, Crossroads Urban Center, University of Utah, Westminster College, Sugar House Chamber, and Salt Lake County Agency on Aging Adults.

Stakeholder Interviews

The project team met with several key stakeholder groups in the community during spring of 2015 to understand the needs of their organizations and constituencies. Interviews focused specifically on their goals for the Transit Master Plan, pros and cons of the current UTA network, level of understanding of the services provided, and any other issues such as accessibility, affordability, etc.

Interviews were conducted with the following groups:

- UTA – the project team was also in regular communication with UTA throughout the process
- Wasatch Front Regional Council – 1/27/15
- Utah Transit Riders Union – 1/28/15
- University of Utah – 1/28/15 and 4/7/15
- Salt Lake City Council – 4/7/15
- Salt Lake City Transportation Advisory Board (TAB) – 4/7/15
- Breathe Utah – 4/7/15
- Salt Lake City's UTA Trustees – 4/7/15
- South Salt Lake City – 4/7/15
- UDOT – 4/8/15
- Salt Lake City Chamber of Commerce – 4/8/15
- Salt Lake City Downtown Alliance – 4/8/15
- Salt Lake City Planning Commission – 4/8/15
- Salt Lake County Aging and Adult Services – 6/18/15
- Crossroads Urban Center – 6/18/15
- Salt Lake City School District – 6/19/15

In addition to the stakeholder interviews, there were a number of presentations and question and answer sessions for interested parties. Participants at these presentations included: Community Councils, the Business Advisory Board, Friends of the S Line, the Bicycle Advisory Board, the Transportation Advisory Board, FTA Region 8, and the Sugar House Chamber of Commerce.

Common themes from the interviews are summarized here.

- Goals/Vision
  - Competitiveness with auto: To attract riders, public transit must be competitive with private automobile (in time and convenience). In addition to quality of transit service provided, the ease and low cost of driving impacts decision-making (cost and availability of parking, peak rush hour is only ~20 minutes)
  - Support current and future growth areas
  - Desire to be regional destination for culture/commerce
  - Need to meet local needs, not just commuter needs, e.g. intra-neighborhood and neighborhood to neighborhood travel
- Service gaps
  - Better east-west service connectivity and more user-friendly west side service
  - Access to and between neighborhood business nodes/commercial districts
  - Employment centers
    - Better connections between service sector jobs and trunk routes
    - Better connections to final destination in downtown
    - Better service to Research park/University, which is a major employment hub
- Other transit improvements stakeholders would like to see
  - Improved reliability/speed
  - Increased frequency
  - Improved bus stops (most stops have only a sign, no bench, no shelter)
  - Better, safer access to stops
  - Ease of use – simplicity of system and "legibility"/ease of understanding; especially utilize technology to improve access to information and system
  - Affordability of fares
  - Span of service, esp. late night service
- Build transit "culture"
  - Individualized travel education program
  - Raise awareness/marketing – get opinion leaders riding transit and embracing it vocally/publically
  - Promote, promote, promote
  - Utilize pass programs and improved service to build transit culture
  - Overcome UTA public perception problem
- Coordination between modes
  - Coordinate the Transit Master Plan with other transportation modal plans: Bike/Ped Master Plan, signal plan, parking plan, etc.
  - Integration with bike share is particularly important (esp. last mile connections)
  - Parking: Plentiful inexpensive parking undermines transit competitiveness
  - Focus on complete streets
  - TNCs, Car-to-go, other innovative modes

Mobile Outreach Events

To develop a presence in the community and engage members of the public that do not traditionally attend open houses, the team launched a mobile outreach effort during the summer of 2015. This effort took advantage of existing city-wide and neighborhood events. A number of these events included the use of a "trolley" that was modified to allow members of the public to board, interact with members of the project team, and engage in the outreach activities.

Mobile outreach at the Avenues Street Fair, summer 2015.
Source: Fehr & Peers

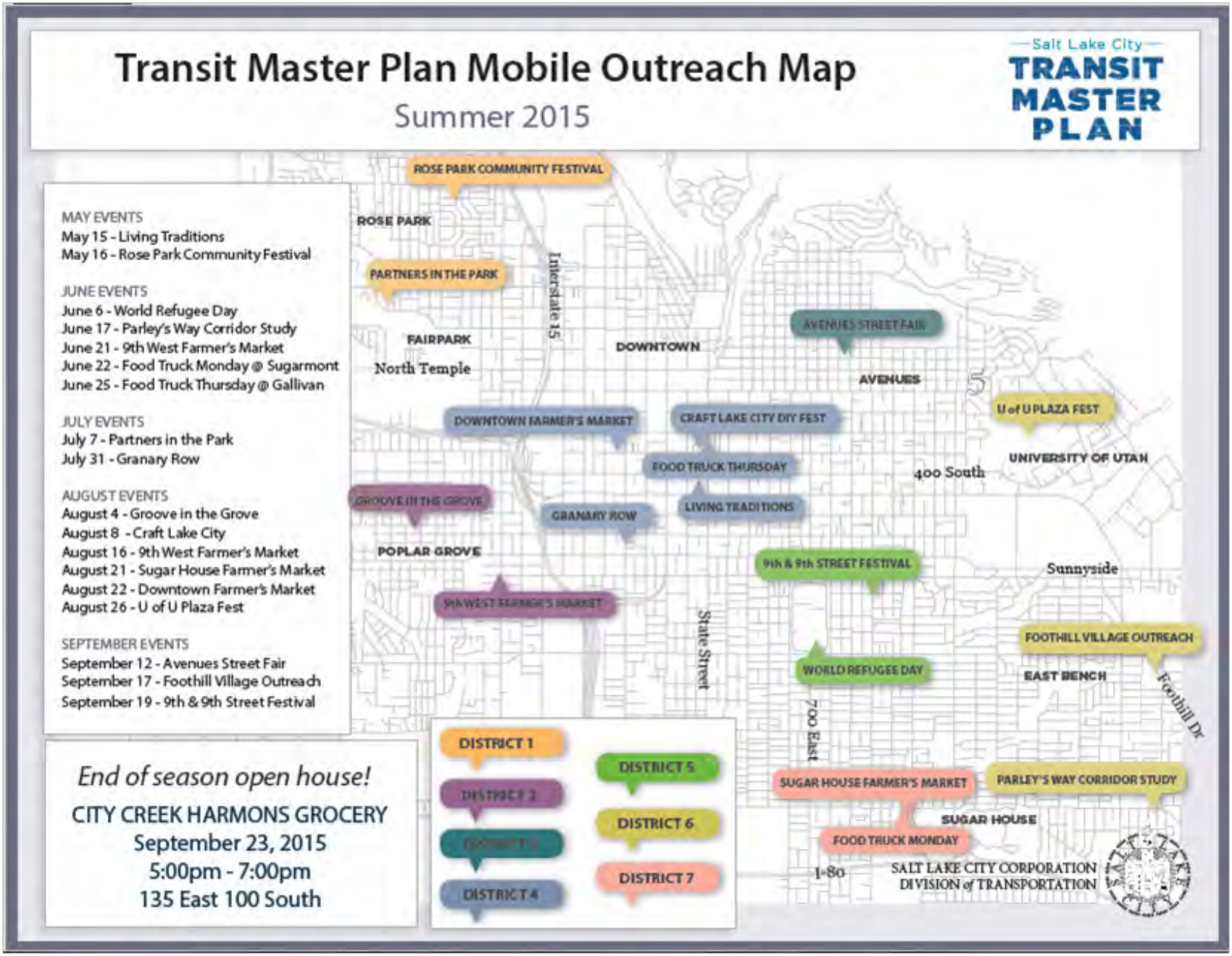
At all events, the project team used presentation boards to convey key findings about the existing transit system and its users from the State of the System Fact Book. Attendees were invited to provide feedback via comment boards and a map where they could indicate key service needs. Over 400 individual comments were collected during the Mobile Outreach events. The mapping exercise allowed event attendees the opportunity to geographically highlight routes that need improvement in one of the following areas: improved service, longer service, or new service.

The team attended a total of 17 mobile outreach events, shown in the map on the following page:

- Living Traditions – 5/15/15
- Rose Park Fest – 5/16/15
- World Refugee Fest – 6/6/15
- Parley's Way Corridor Study – 6/17/15
- 9th West Farmers Market – 6/21/15
- Food Truck Thursday – 6/25/15
- Partners in the Park – 7/7/15

- Granary Row – 7/31/15
- Groove in the Grove – 8/4/15
- DIY Fest – 8/8/15
- 9th West Farmers Market – 8/16/15
- Sugarmont Farmers Market – 8/21/15
- Downtown Farmers Market – 8/22/15
- University of Utah Plazafest – 8/26/15
- Avenues Street Fair – 9/12/15
- Foothill Village Outreach – 9/17/15
- 9th & 9th Street Fair – 9/19/15

Mobile outreach at Groove in the Grove, summer 2015.
Source: Fehr & Peers


Transit Master Plan Mobile Outreach Map
Summer 2015
Salt Lake City
TRANSIT MASTER PLAN
MAY EVENTS
May 15 - Living Traditions
May 16 - Rose Park Community Festival
JUNE EVENTS
June 6 - World Refugee Day
June 17 - Parley's Way Corridor Study
June 21 - 9th West Farmer's Market
June 22 - Food Truck Monday @ Sugarmont
June 25 - Food Truck Thursday @ Gallivan
JULY EVENTS
July 7 - Partners in the Park
July 31 - Granary Row
AUGUST EVENTS
August 4 - Groove in the Grove
August 8 - Craft Lake City
August 16 - 9th West Farmer's Market
August 21 - Sugar House Farmer's Market
August 22 - Downtown Farmer's Market
August 26 - U of U Plaza Fest
SEPTEMBER EVENTS
September 12 - Avenues Street Fair
September 17 - Foothill Village Outreach
September 19 - 9th & 9th Street Festival
End of season open house!
CITY CREEK HARMONS GROCERY
September 23, 2015
5:00pm - 7:00pm
135 East 100 South
DISTRICT 1
DISTRICT 2
DISTRICT 3
DISTRICT 4
DISTRICT 5
DISTRICT 6
DISTRICT 7
ROSE PARK COMMUNITY FESTIVAL
ROSE PARK
PARTNERS IN THE PARK
FAIRPARK
North Temple
Interstate 15
DOWNTOWN
AVENUES STREET FAIR
AVENUES
5
U of U PLAZA FEST
UNIVERSITY OF UTAH
400 South
DOWNTOWN FARMER'S MARKET
CRAFT LAKE CITY DIY FEST
FOOD TRUCK THURSDAY
LIVING TRADITIONS
GROOVE IN THE GROVE
GRANARY ROW
POPLAR GROVE
9th & 9th STREET FESTIVAL
Sunnyside
9th WEST FARMER'S MARKET
State Street
FOOTHILL VILLAGE OUTREACH
EAST BENCH
Foothill Dr
WORLD REFUGEE DAY
700 East
SUGAR HOUSE FARMER'S MARKET
PARLEY'S WAY CORRIDOR STUDY
SUGAR HOUSE
FOOD TRUCK MONDAY
I-80
SALT LAKE CITY CORPORATION
DIVISION of TRANSPORTATION

Comment Boards

At the Mobile Outreach events, participants wrote their comments on sticky notes and placed them on the comment board. These comments were then classified into one of the following typologies: Frequency, Span of Service, Connectivity, Speed and Reliability, Stop access, Stop Amenities, Fares, System Legibility, Transit Culture, Other Transit Related Comments, and Not Relevant. The following list and graph (Figure B-1) shows the portion of total comments that fell into each typology and a sample representative comment that was received at a Mobile Outreach event attributed to this typology.

- Connectivity (18%)

  "Better East-West connections!!"
- Fares (13%)

  "Sell Farepay cards at more places and be in every neighborhood"
- Other Transit Related Comments (13%)

  "No tracks on 1100 East. Run electric bus instead"
- Frequency (12%)

  "More frequent and longer services. Services not only geared toward 9-5 crowd"
- Span of Service (9%)

  "Run TRAX 1 hr. later on weekends"
- Speed and Reliability (8%)

  "Faster/more direct service between Salt Lake and Airport"
- Transit Culture (6%)

  "Provide drivers with adequate pay to be genial to riders"
- Stop Amenities (6%)

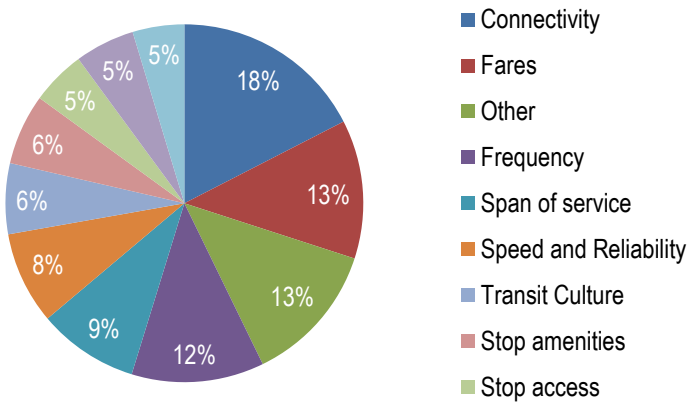
  "More benches and station amenities like covered stops and garbage cans"
- Stop access (5%)

  "I love the paved path by the Sugar House Trolley!"
- System Legibility (5%)

  "Not being accurate on the GPS is a problem"
- Not Relevant (5%)

  "The newer 300 South bike lanes are dangerous due to inattentive drivers attempting to enter/leave driveways"

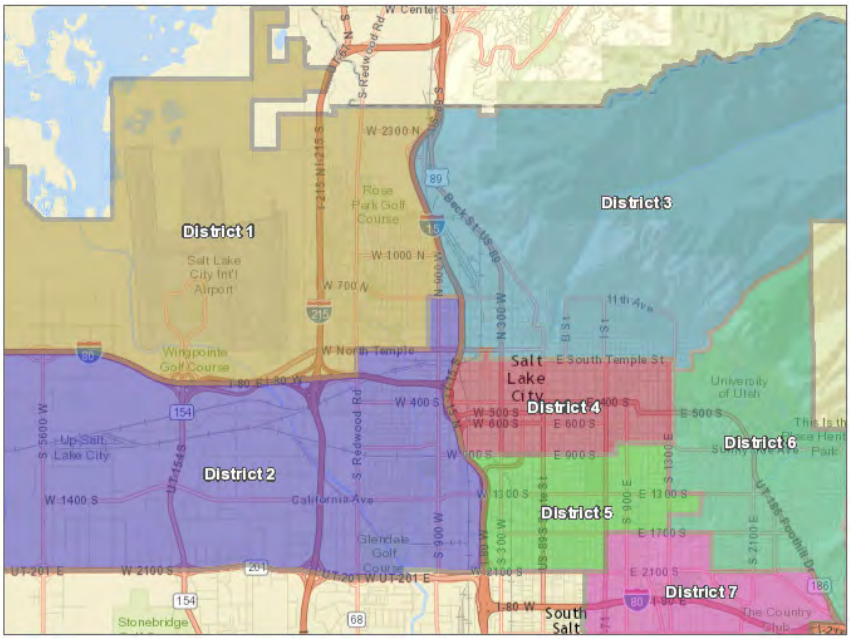
Figure B-1 Mobile Outreach Key Themes



Mapping Exercise

At the Mobile Outreach events and September Open House, attendees were invited to identify areas on a map that they believed needed transit improvements. Options for transit service improvements included improved service, longer service, or new service. The most frequent location for improved service quality was District 1, with travel to District 4 most sought after. District 4, with travel to District 6, was the location most frequently identified in need of longer hours of service. Travel from District 1 to Districts 4 and 6 were the most frequently identified areas for new transit routes.

Figure B-2 Salt Lake City Council Districts



The culmination of the Salt Lake City Transit Master Plan's summer outreach efforts was an Open House held at the City Creek Harmons grocery store on September 23, 2015. The team presented the educational boards from the mobile outreach effort as well as boards that showed key gaps where land use density or demographics indicate a propensity to ride transit, but where there is little transit use. The Open House also had an opportunity for participants to provide input on three "conversation boards." One allowed them to prioritize goals for the Transit Master Plan, one asked for input on service design principles, and one invited conversation on maps & information, fares, and access & station improvements.

Salt Lake City Transit Master Plan Open House
Source: Fehr & Peers

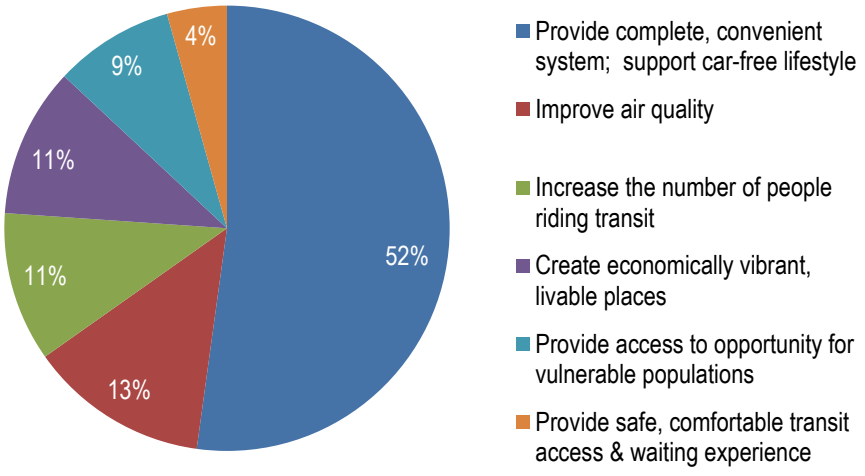
Key participations statistics were:

- Open house attendees – 60
- Board exercise participants – 40
- Comments – 64

Goals Board

At the Open House participants were invited to identify which of the Salt Lake City Transit Master Plan goals most resonated with their vision for an ideal transit network. Over 50% of respondents identified "Provide a complete and convenient transit system that supports a car-free lifestyle" as their top goal (Figure B-3).

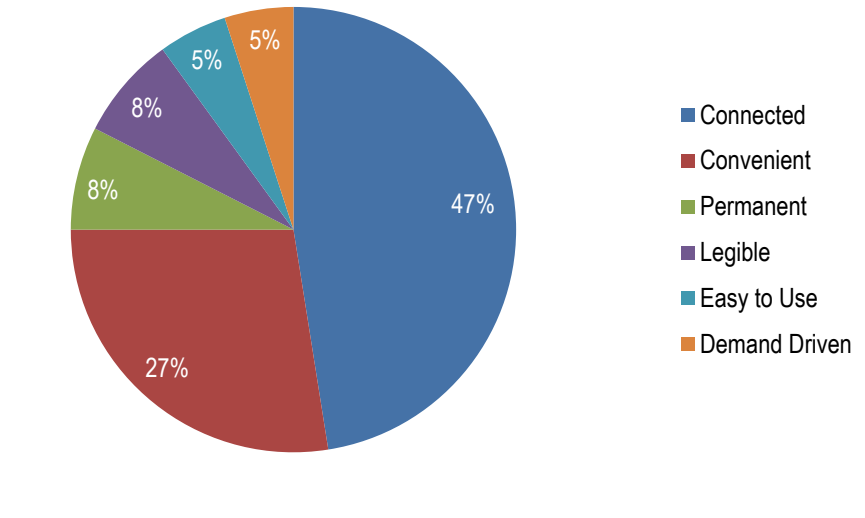
Figure B-3 Goals



Service Design Principle Board

At the Open House, participants were invited to identify which of the Salt Lake City Transit Master Plan's service design principles was the most important to the success of the project. Almost 50% of respondents identified "Connected: provide simple citywide connections on a high-frequency network" as the most important service design principle (Figure B-4).

Figure B-4 Service Design Principles



Website Surveys

The project team also developed a project website: SLCRides.org. This website ensured that Salt Lake City residents who were unable to attend one of the in-person public outreach events could learn about the Salt Lake City Transit Master Plan. SLCRides.org included detailed information about the project, outreach events planned and completed, project reports and documentation, and any survey tools open to the public.

The project team created a short online survey during the summer (open July 30 to October 1, 2015) through Open City Hall that was linked from the project website. UTA also developed a survey that was open to the public during summer 2015 (closed October 1, 2015) that was accessible from the UTA website.

Key participation statistics were:

- Open City Hall – 535 responses
- Open UTA – 461 total respondents with 74 respondents of these residing in Salt Lake City
- Direct Comments on SLCRides – In addition to the available online surveys, 7 participants wrote direct emails through the SLCRides website

Open City Hall Survey

The Salt Lake City Transit Master Plan website (SLCRides.org) allowed residents to take an Open City Hall survey. This survey asked respondents to identify their top choices regarding key outcomes from the Plan, desired improvements, and "big ideas" they have related to transit.

Each of the questions and breakdown of responses are shown in the following graphics. The most salient findings are:

- Air quality (49%) and transit system convenience and reliability (41%) are the most important outcomes (Figure B-5) of the plan for the large majority of respondents (90% combined)
- Pedestrian and bicycle access to stops (28%) was the highest ranking improvement (Figure B-6)
- A citywide network is the most important big idea (Figure B-7) for a majority of respondents (51%)

Figure B-5 Outcomes

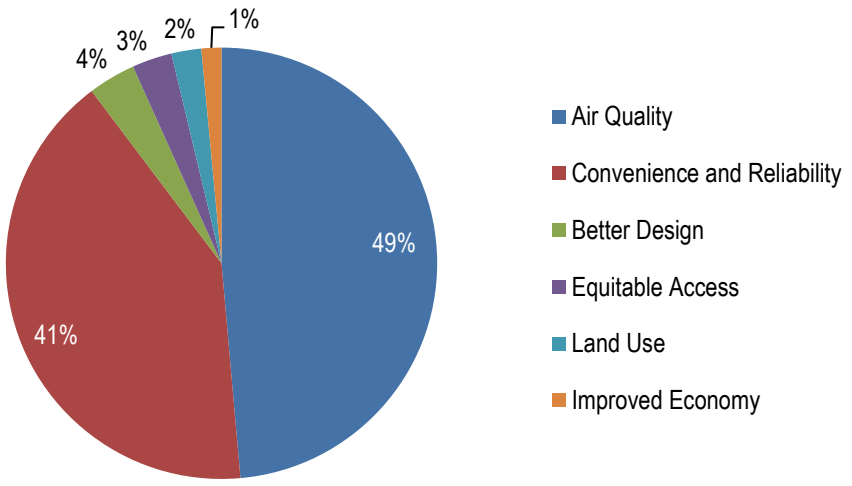


Figure B-6 Improvements

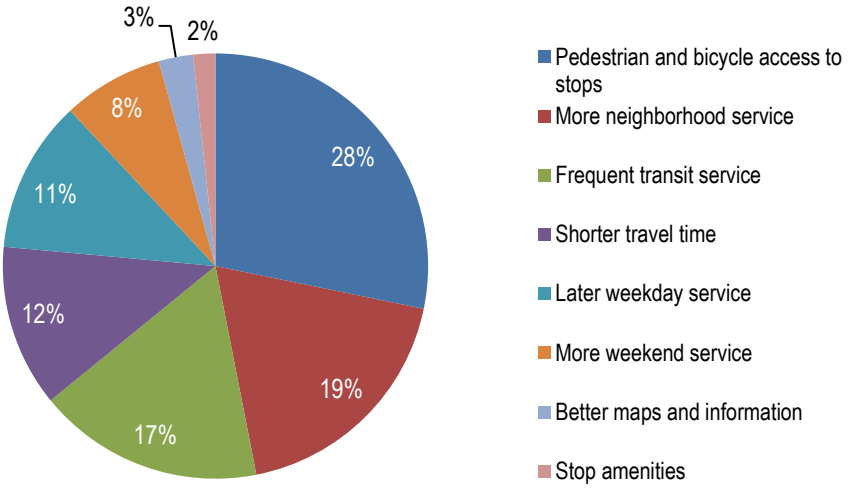
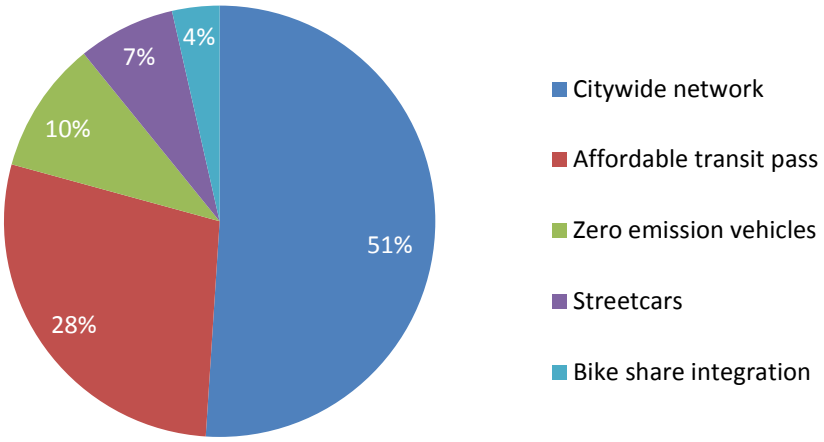


Figure B-7 Big Ideas



Open UTA Survey

UTA's survey asked responders to identify their top choices regarding service improvements, bus improvements, light rail (TRAX) improvements, and FrontRunner improvements. The following graphs represent responses from Salt Lake City residents. The most salient findings are:

- Bus is the most important mode for improvement (45%), followed by TRAX and Streetcar (35%) – (Figure B-8)
- Improving service span is the most important bus improvement (50%), followed by service later at night (31%) – (Figure B-9)
- Late night service is the most important TRAX improvement (47%), followed by direct service between the Airport to the University (19%) – (Figure B-10)
- Sunday service is the overwhelming top priority for FrontRunner enhancement (59%) – (Figure B-11)

Figure B-8 Service Improvements

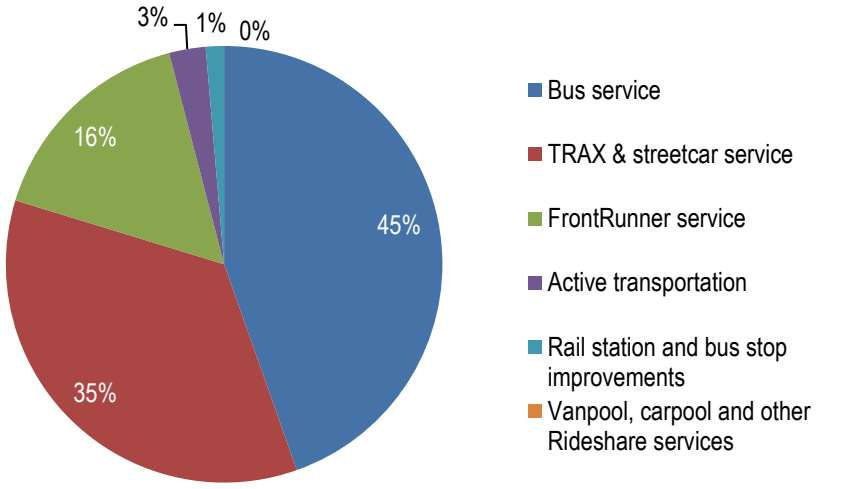


Figure B-9 Bus Improvements

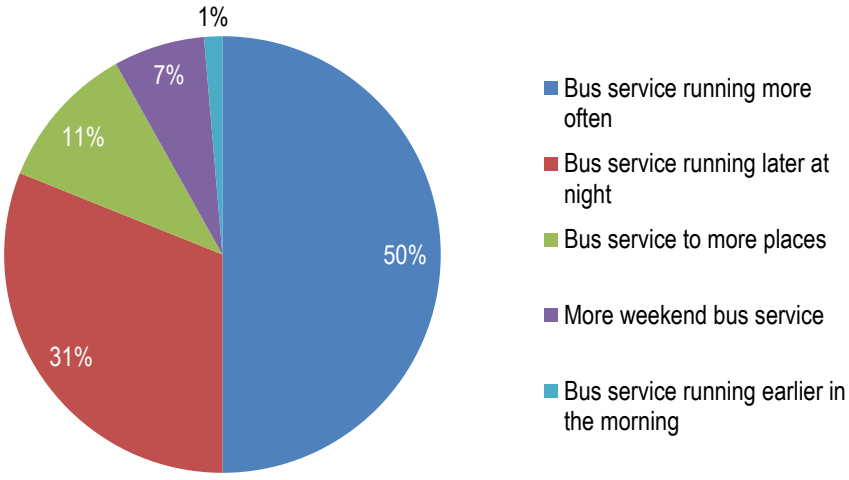


Figure B-10 Light Rail (TRAX) Improvements

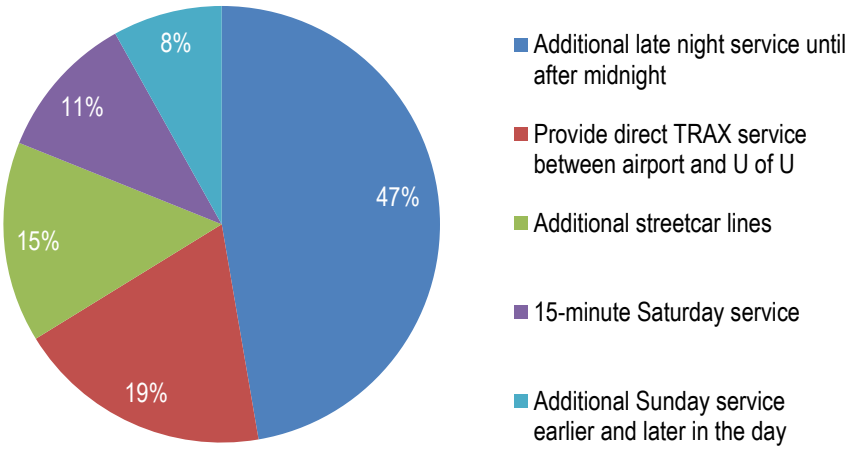
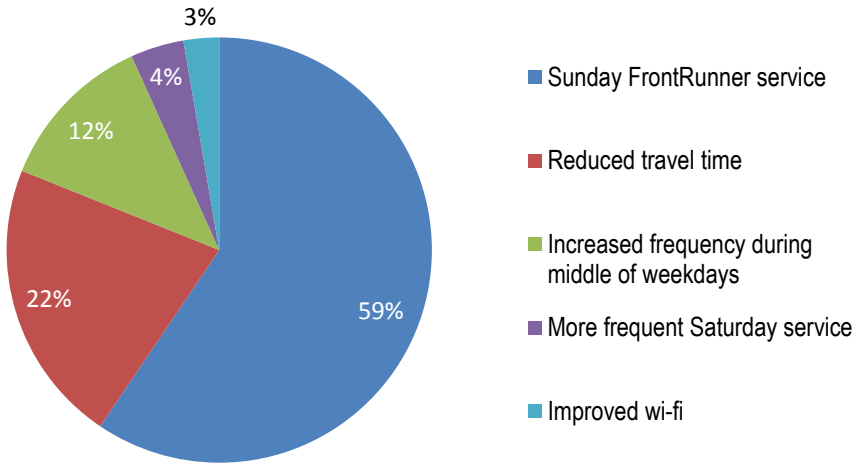


Figure B-11 FrontRunner Improvements



Design Your Transit System Survey

The Design Your Own Transit System survey tool was launched by the Salt Lake City in February 2016. The survey tool was comprised of three tasks:

- Task 1 allowed users to create their own transit system by allocating hypothetical money to different system needs. Spending was calculated based on how much area the participants system covers (system coverage), how often service runs (service frequency), and the days of the week it operates. If participants ran over budget, they were forced to go back and revise their selections.
- Task 2 allowed participants to determine their long term investment strategy by selecting the mode or modes they wanted to build.
- Task 3 allowed participants to select additional improvements to accompany the transit service they created.
- After completion of the Design Your Own Transit System tool, participants were asked to take a short demographic survey (1,269 of 1,412 participants completed the demographic survey).

Summary of Key Findings

Survey Participants

- 1,412 people participated in the Design Your Transit System survey tool, of which 65% live in Salt Lake City.
- The survey reached a wide audience. Seniors (over 65), low income populations (less than $35,000 per year), and residents of western Salt Lake City were somewhat under-represented as compared to their share of the general population.

Transit Use

- 40% of respondents ride transit multiple times per week and 60% ride at least once a month.
- The top reason cited for riding transit was environmental reasons (25% of respondents).
- The top reasons for not riding transit more often were related to convenience, with more than 50% of respondents indicating transit takes too long or doesn't go where they need it to go.

Service Coverage

- The highest priority destinations to serve were Utah's top job centers (52%) and mixed use and major growth areas (49%). These two destinations were priorities for all groups regardless of frequency of transit use, age, or income.
- Service to LIMITED neighborhoods was a particular priority for adults 65 or older (2nd most common response) and low income respondents (3rd most common response).

Service Periods

- Respondents most desired new service in the evening (70%), followed by Saturday service (58%) and finally Sunday service (39%). The order of new service priorities were identical, regardless of frequency of transit use, age, or income.

Capital Improvements

- The top investment priority was to increase investments in a rail based system (46%). This was the top priority regardless of frequency of use, age, or income.
- Adults over 45-64, 65 and older, and low income respondents were somewhat more likely than other groups to indicate a preference for a bus based system or incremental improvements to the current system.

Other Improvements (to support coverage, service period, and capital investment selections)

- Increased investment in access to transit on foot or by bike was the most preferred improvement overall (43%) and for all groups except those age 65 or older.
- Respondents age 65 and older indicated a preference for investments in benches, shelters, and amenities at transit stops.

Survey Participants

Participants Location

The Design Your Own Transit System tool reached 1,412 participants, with 1,269 completing the subsequent demographic survey, which were mapped in Figure B-12.

- More than 65% of survey participants lived within Salt Lake City (Figure B-13).

For responses within Salt Lake City, Figure B-14 illustrates responses by City Council boundaries.

- More than 30% of respondents live in District 4 and 22% live in District 5.
- District 6 and western Salt Lake City had limited respondents.

Figure B-12 Location of Participants

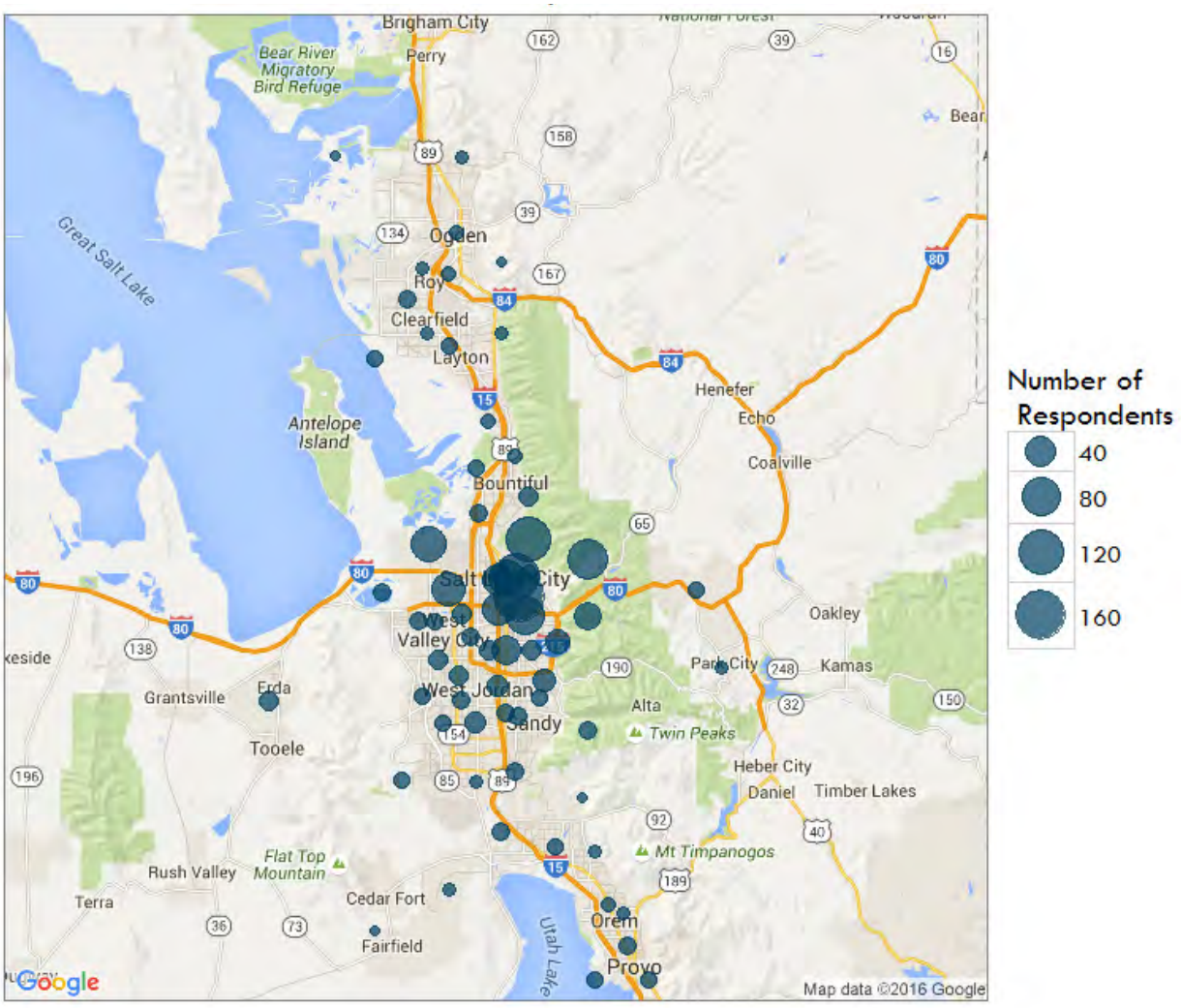


Figure B-13 Salt Lake City Residency

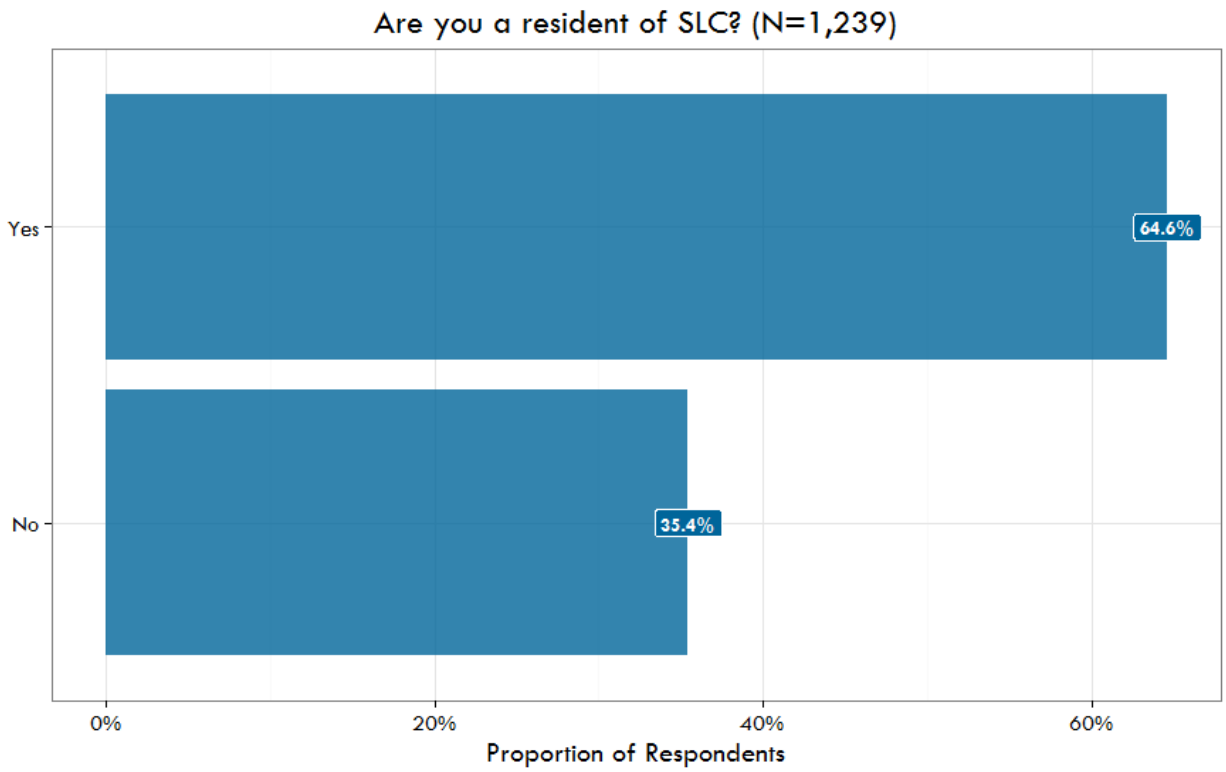
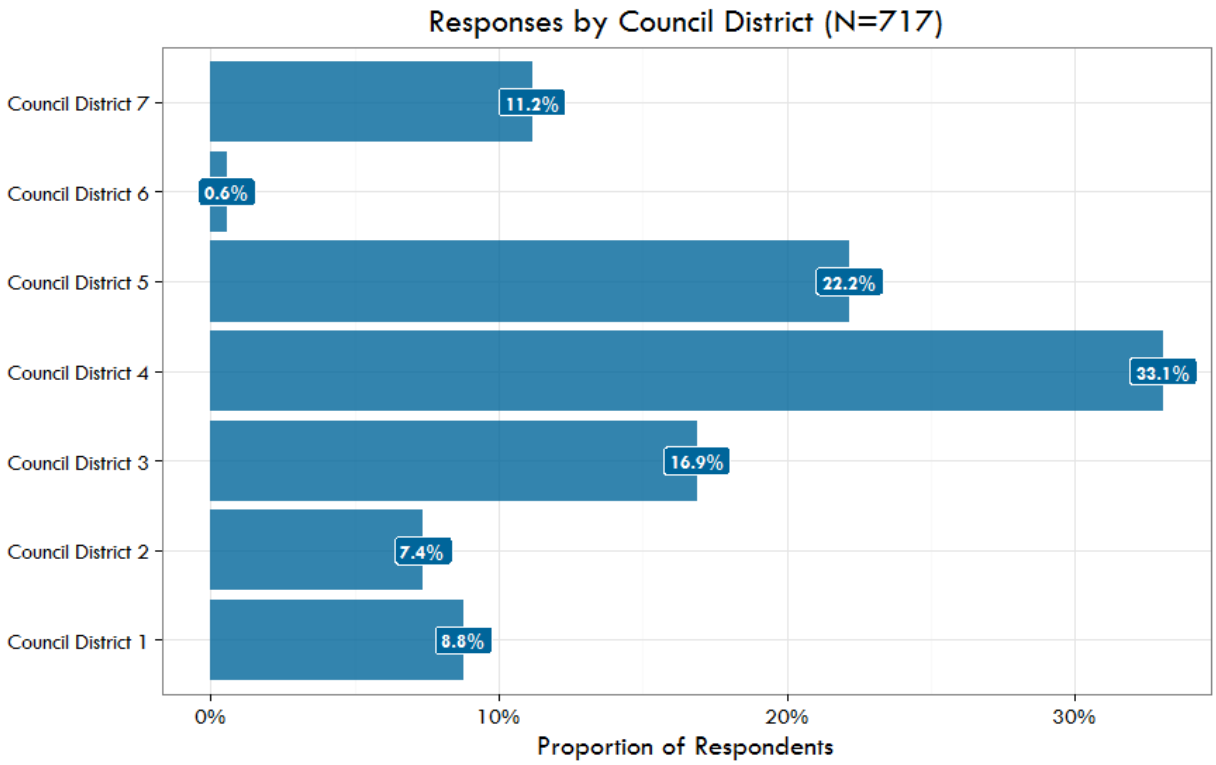


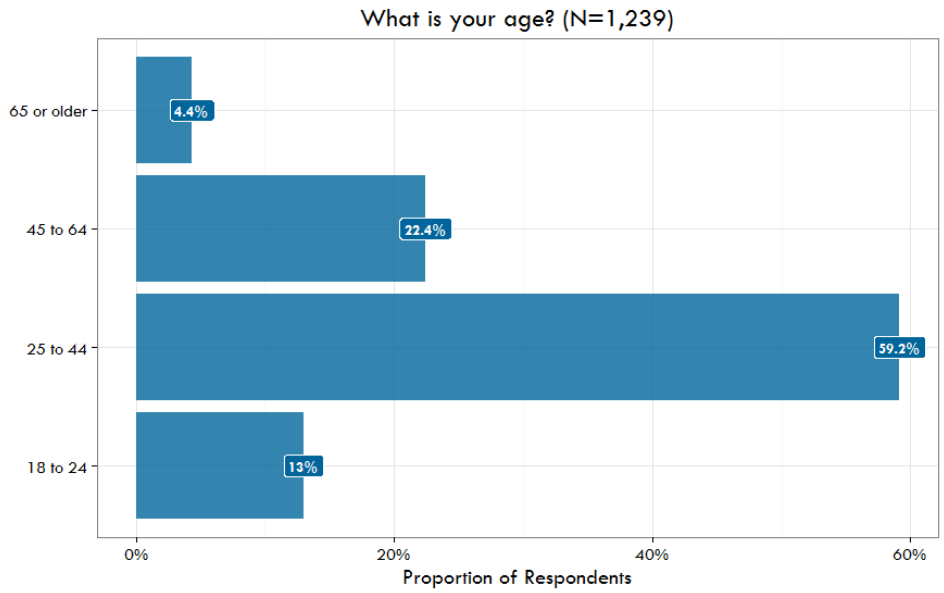
Figure B-14 City Council District



Age and Gender

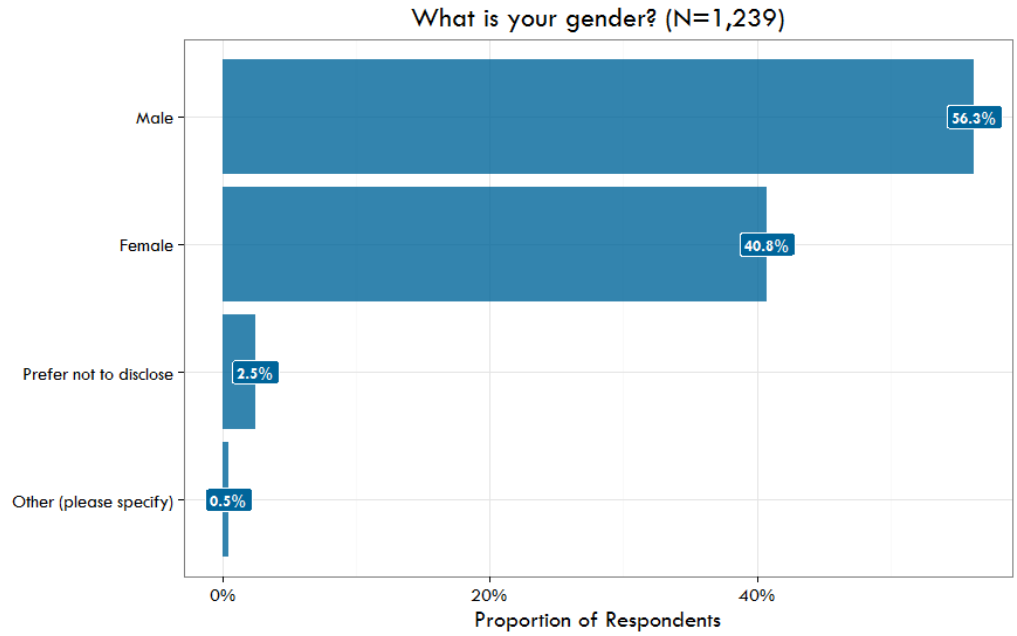
The age of respondents was categorized to highlight groups including college students (18-24), adults (25-44), older adults (45 to 64), and seniors (65 or older). The majority of participants were between 25-64 years old as shown in Figure B-15. Respondents older than 65 were somewhat under represented, as this group makes up 10% of the city population.[1].

Figure B-15 Age



Survey participants were more likely to be male, at 56% of respondents (Figure B-16).

Figure B-16 Gender

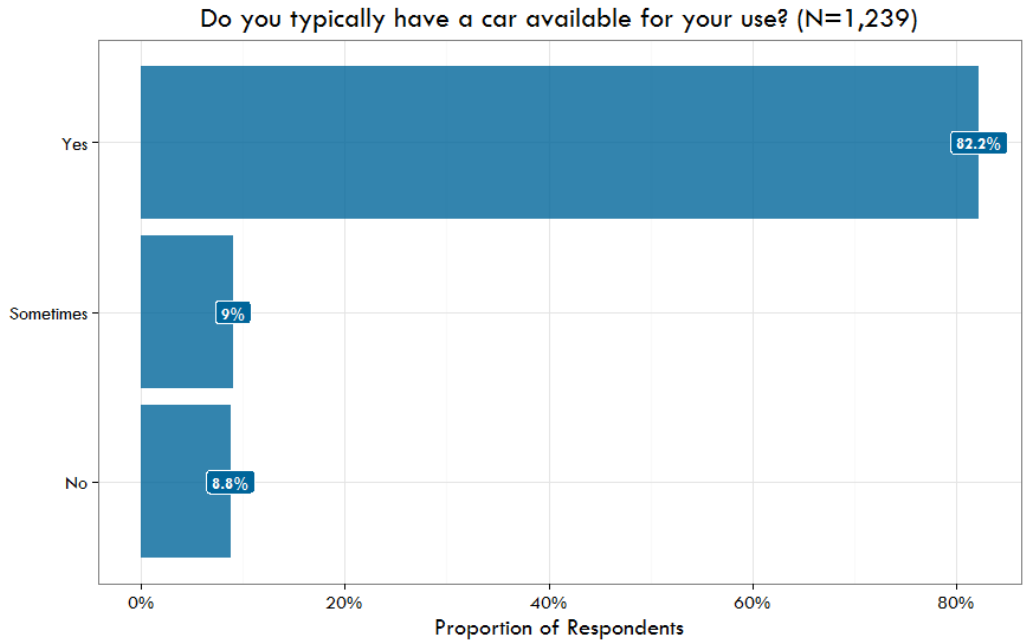


[1] 2010-2014 American Community Survey 5-Year Estimates, Table S0101

Income and Vehicle Access

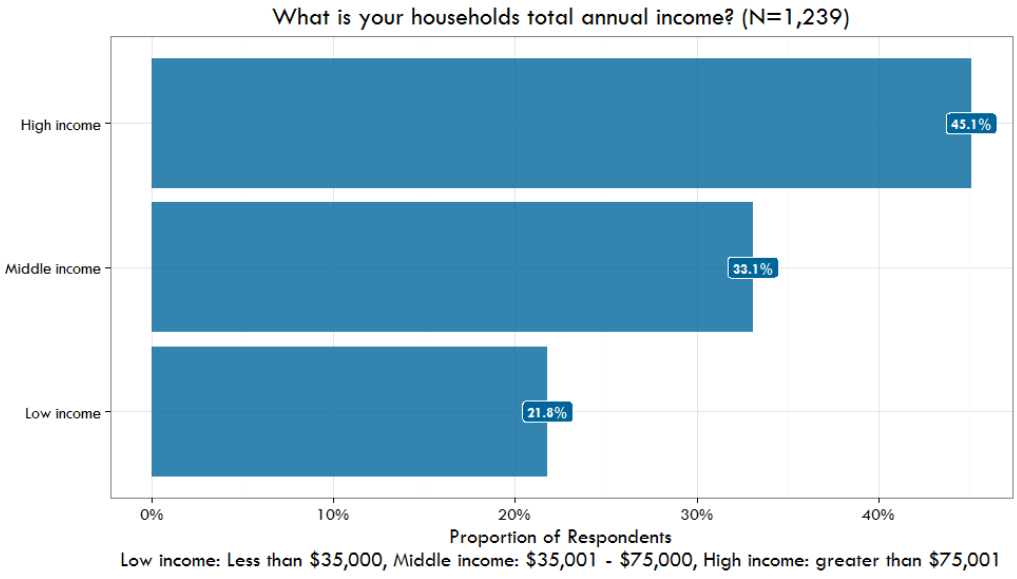
Approximately 18% of respondents either did not have a car available or only had one available sometimes (Figure B-17).

Figure B-17 Car Availability



Survey participants tended to have higher incomes, with nearly half (45%) earning more than $75,000 per year (Figure B-18). Low income populations were underrepresented in this survey, as 22% of participants earn less than $35,000 per year, while 40% of the population of Salt Lake City earns below that threshold.[2]

Figure B-18 Income

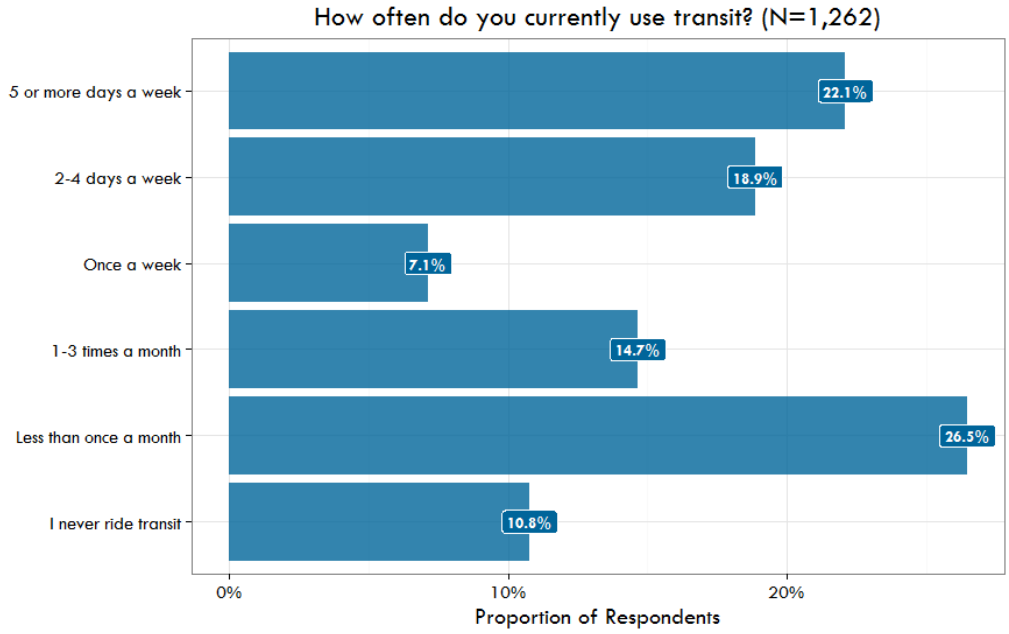


[2] 2010-2014 American Community Survey 5-Year Estimates, Table: DP03

Existing Transit Use

Nearly 90% of survey participants have used some form of public transit in Salt Lake City (Figure B-19). Approximately 40% ride public transit multiple times per week. Over a quarter ride less than once a month, while 10% do not ride transit.

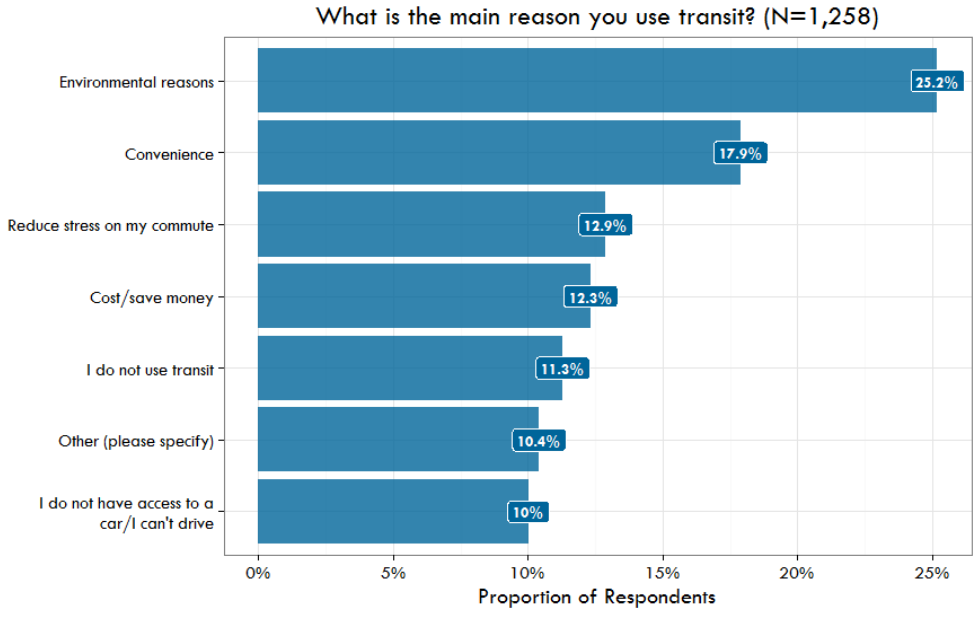
Figure B-19 Frequency of Transit Use



Reasons for Using Transit

Respondents cited both "choice" and "transit dependent" factors in their decision to use transit (Figure B-20). The largest share of respondents indicated that environmental reasons and convenience as very or somewhat important to their decision to use transit. A substantial share of riders also cited reducing stress and cost savings as important factors.

Figure B-20 Reason for Transit Use



What Are the Main Reasons You Don't Use Transit More Often?

Survey respondents were asked to identify reasons why they do not use transit more often.

Participants identified convenience as a key barrier to transit use in Salt Lake City (Figure B-21).

- The top three responses, each chosen by approximately half of respondents, indicated transit is not a convenient option because it takes too long, doesn't go where they need to go, or doesn't run at the right time. Respondents identified other convenience-related factors, including finding driving and parking more efficient and needing a car for work or errands.
- Notably, fewer than 20% of respondents indicated they would not ride even if it were convenient, indicating that most would be receptive to using transit if it were more convenient.

Fewer than 10% of respondents don't feel safe riding the bus and approximately 8% are unclear about how to use the system.

Trends for respondents living in and outside of Salk Lake City were similar (Figure B-22), though Salt Lake residents were more likely to not use transit because they walk and bike most places.

Nearly 17% of participants identified "other" reasons for not using transit more often, including transit concerns of efficiency, cost, and limited service (Figure B-23).

Figure B-21 Reason for Not Using Transit More Often – All Respondents

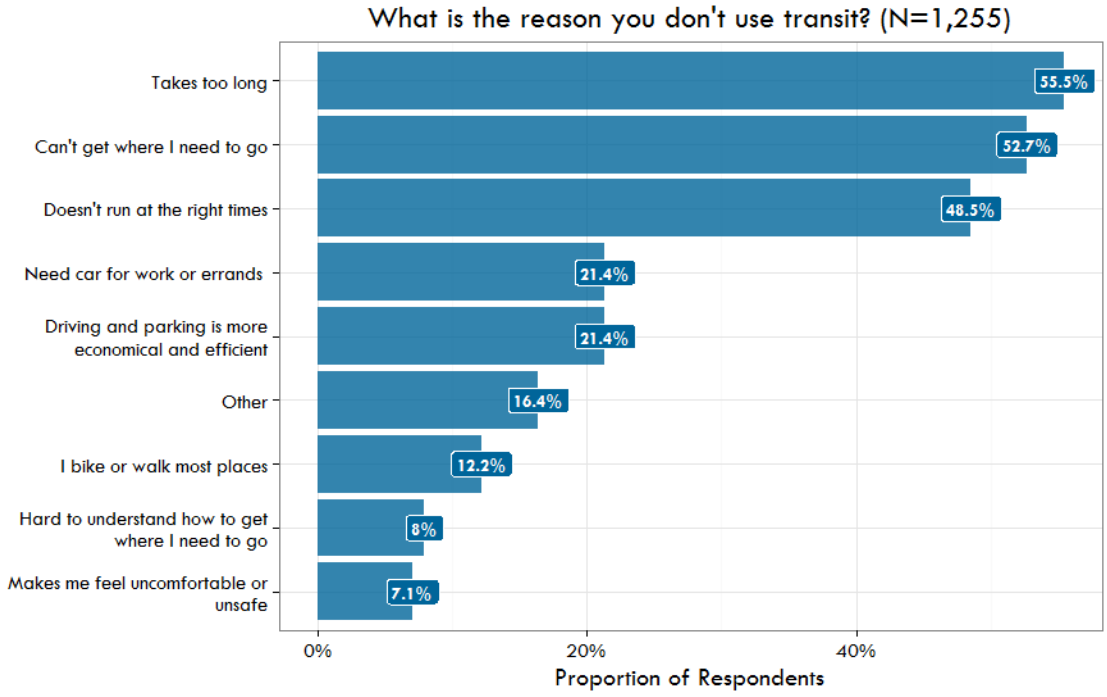


Figure B-22 Reason for Not Using Transit More Often - SLC Residents Only

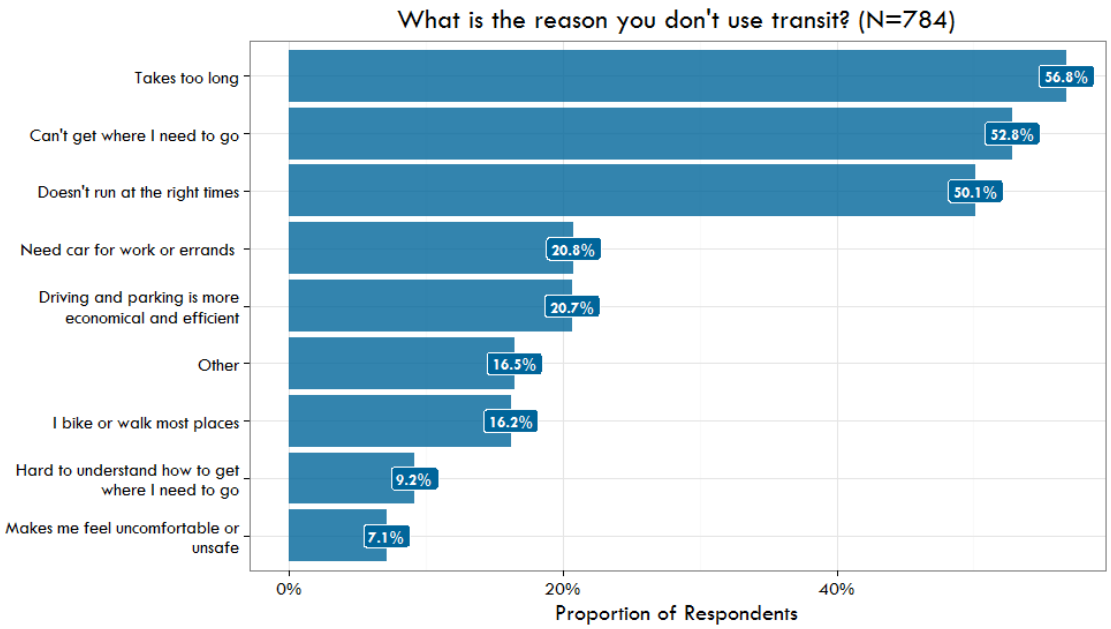
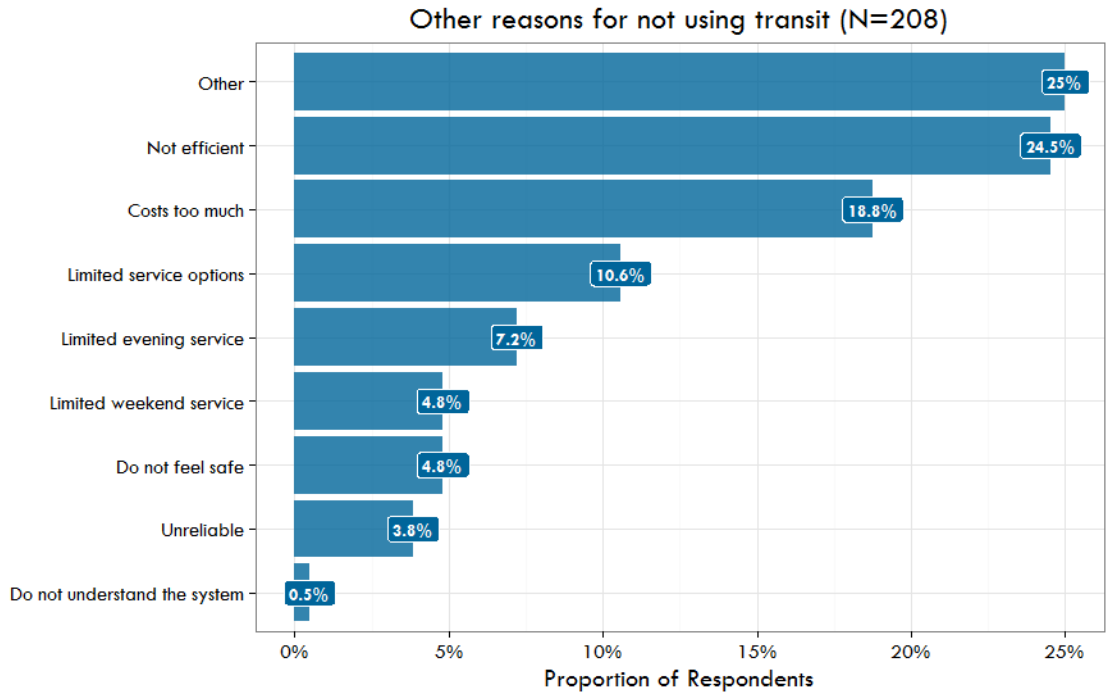


Figure B-23 "Other" Reasons for Not Using Transit More Often



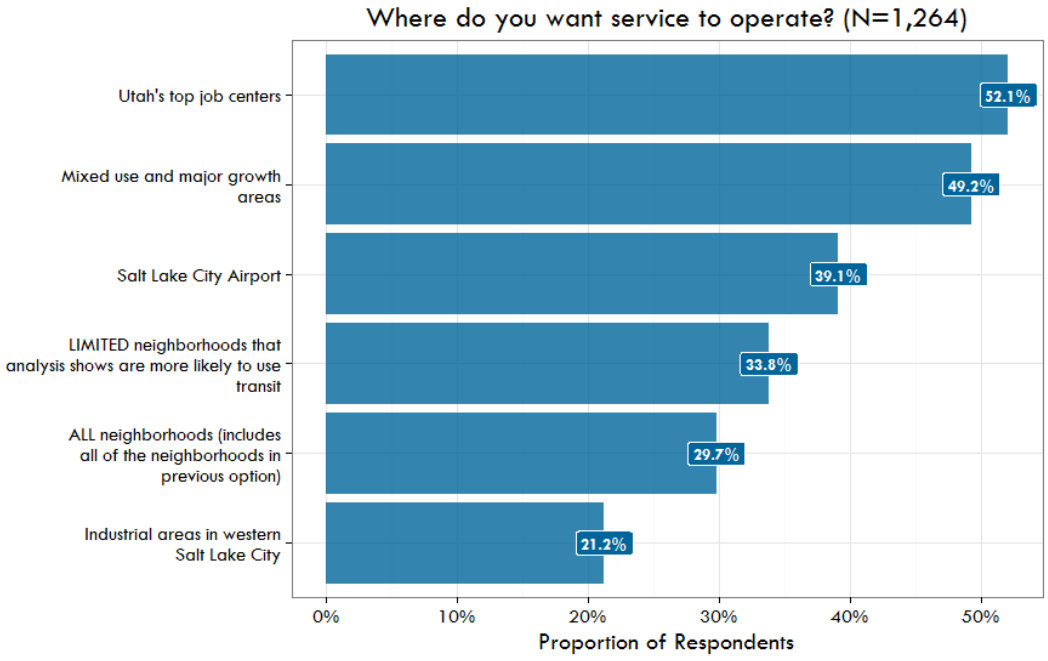
Service Coverage

Respondents were given the opportunity to designate specific service areas in which their transit system could operate.

Reponses were further analyzed to identify any trends for particular demographic groups:

- **Overall –** The highest share of respondents indicated that Utah's top job centers and mixed use and major growth areas were priority destinations (Figure B-24). Service to industrial areas in western Salt Lake City was the least selected coverage improvement. Responses from residents of Salt Lake City mirrored the overall trends (Figure B-25).
- **Frequency of Use** - Participants were grouped based on how frequently they use transit; the top choice for all groups was to serve Utah's top job centers followed by mixed use and major growth areas (Figure B-26).
- **Age** – Utah's top job centers was the top response for all age groups, except the 18-24 age group for which showed a slight preference for service to mixed use and major growth areas. For older adults, service to LIMITED[3] neighborhoods was the second most common response (Figure B-27).
- **Income** - All income groups selected service to Utah's top job centers as the most preferred destination. High income participants were more likely to select service to mixed use and major growth areas or the airport, while preferred destinations for low income participants were spread across multiple responses. (Figure B-28).

Figure B-24 Desired Service Coverage (Select all that apply, within your budget) – All Respondents



[3] Neighborhoods that are more likely to use transit such as higher concentrations of car free or low-income households, youth, seniors, or people with disabilities

Figure B-25 Desired Service Coverage (Select all that apply, within your budget) - SLC Residents Only

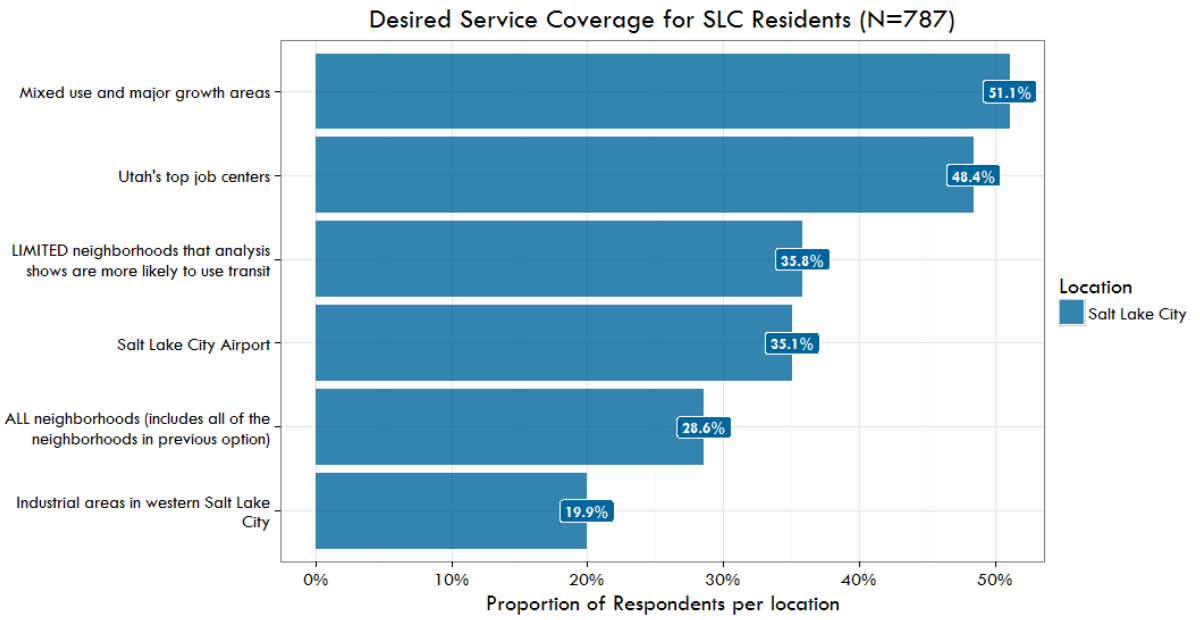
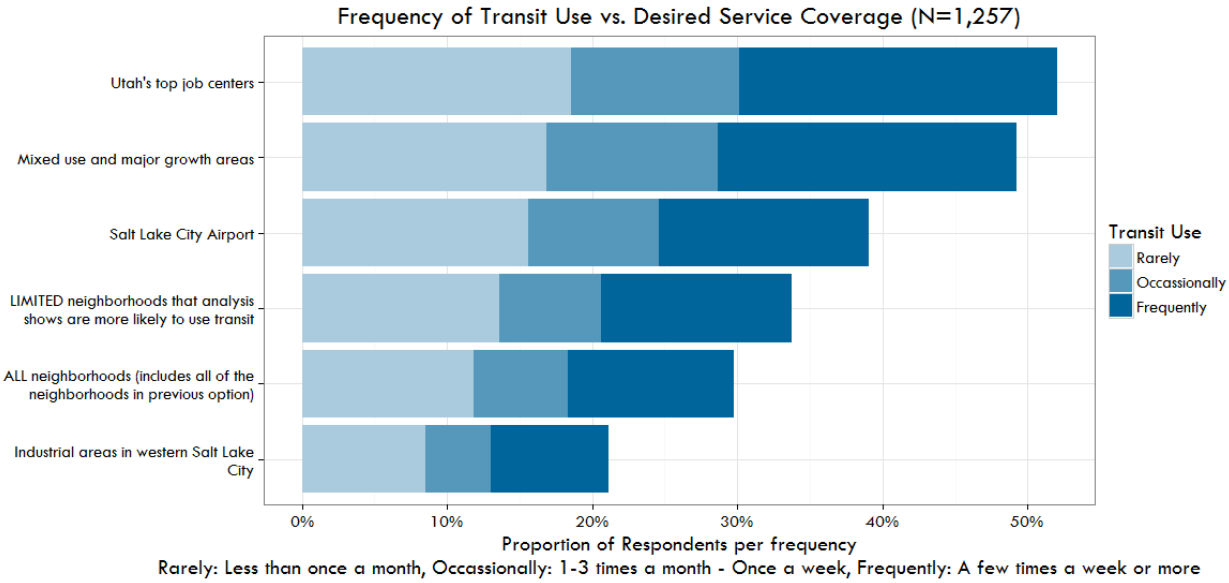


Figure B-26 Desired Service Coverage by Frequency of Transit Use



Rarely: Less than once a month, Occassionally: 1-3 times a month - Once a week, Frequently: A few times a week or more

Figure B-27 Desired Service Coverage by Age

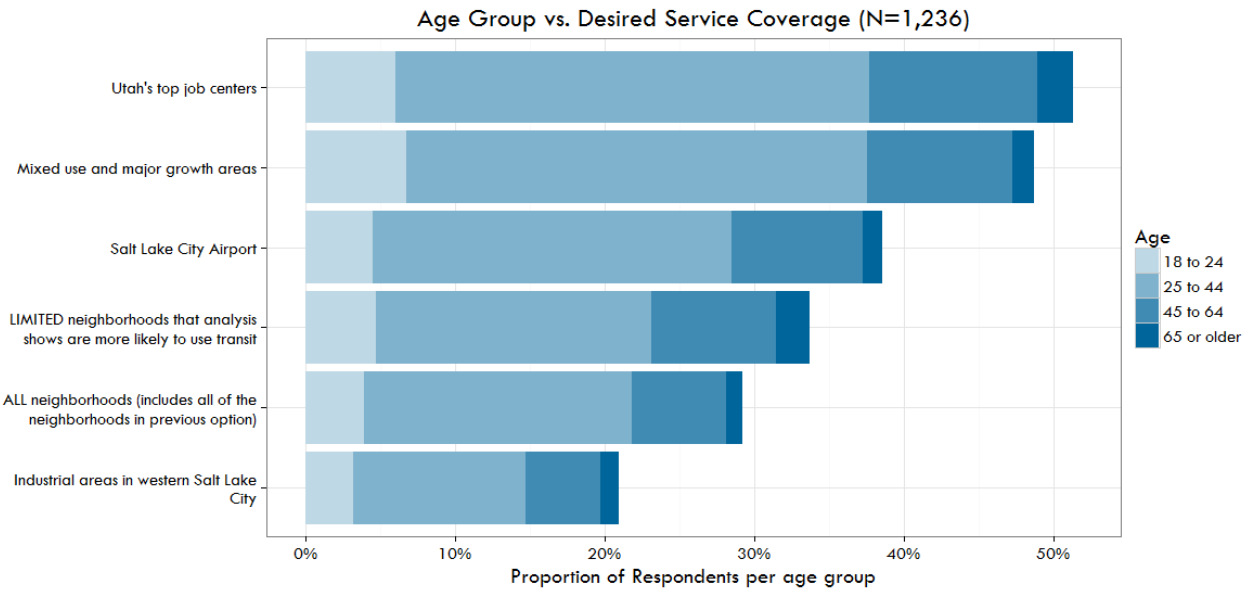


Figure B-28 Desired Service Coverage by Income

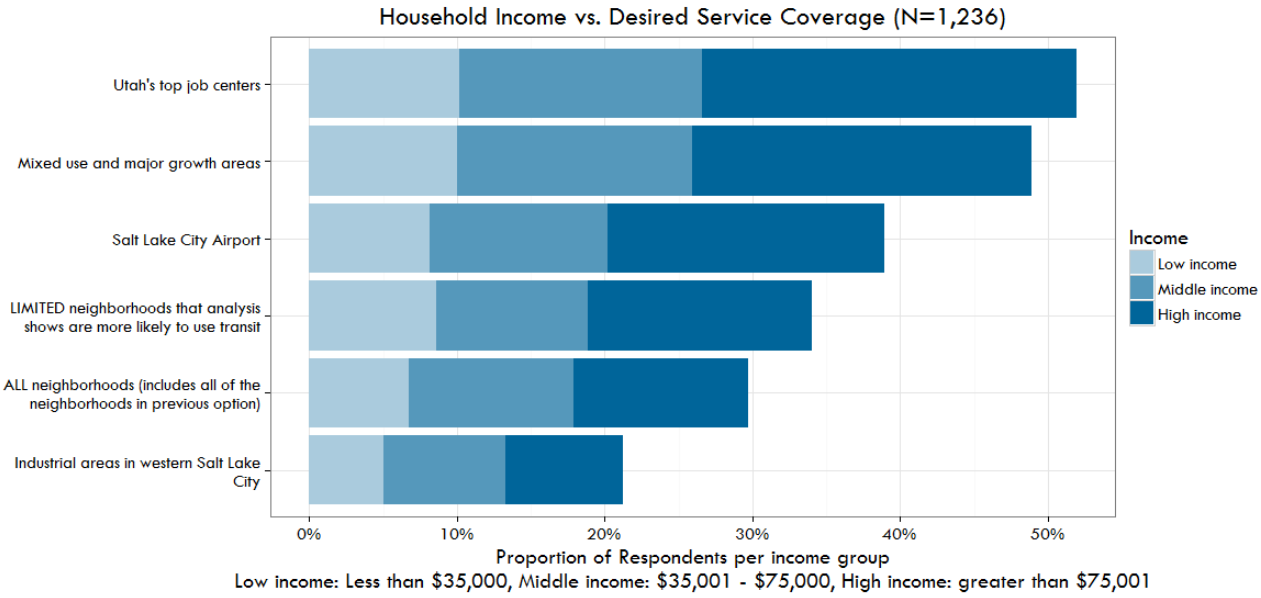
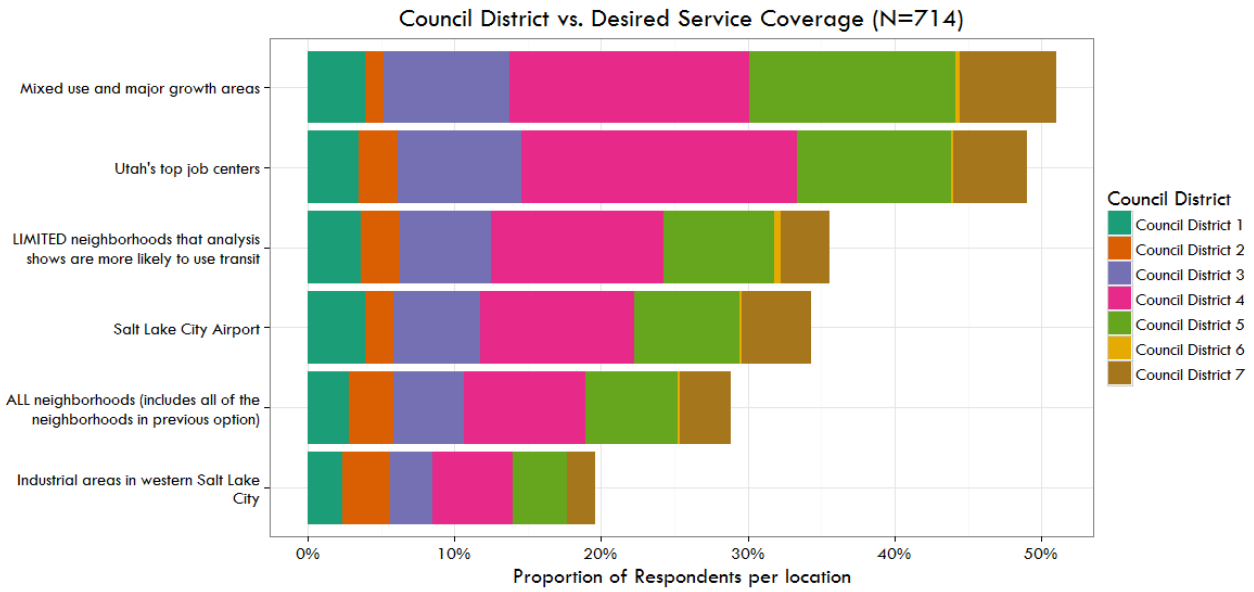


Figure B-29 Desired Service Coverage by City Council District



Service Periods

Respondents were asked to designate additional service periods within which their transit system would operate.

- **Overall –** The highest share of respondents indicated a preference for evening service and Saturday service (Figure B-30). Sunday service was the least selected period for service improvement. Responses for Salt Lake City residents only mirrored this trend (Figure B-31).
- **Frequency of Use** - All groups cited increased evening service as their top service period investment priority, followed by Saturday, and then Sunday service (Figure B-32).
- **Age** – All groups cited increased evening service as their top service period investment priority, followed by Saturday, and then Sunday service (Figure B-33).
- **Income** – All groups cited increased evening service as their top service period investment priority, followed by Saturday, and then Sunday service (Figure B-34).

Figure B-30 Desired Service Periods (Select all that apply, within your budget) – All Respondents

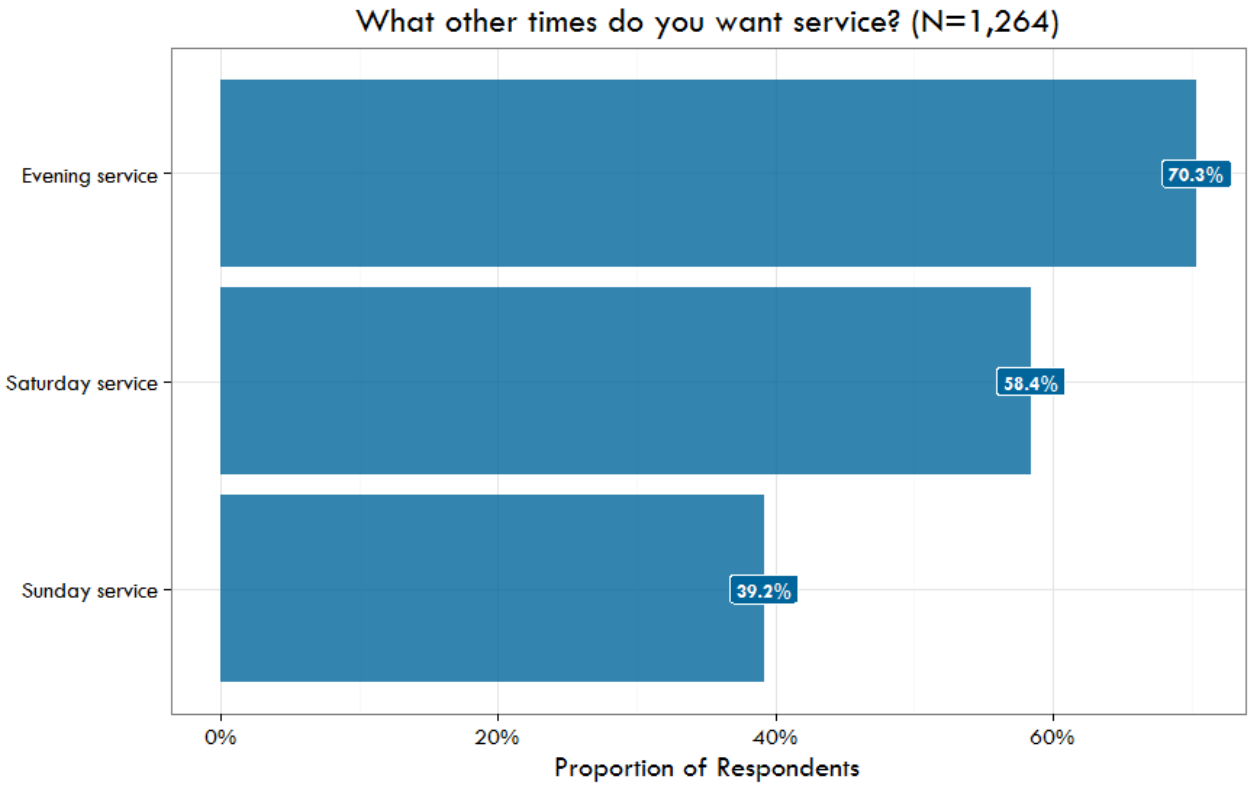


Figure B-31 Desired Service Periods (Select all that apply, within your budget) - SLC Residents Only

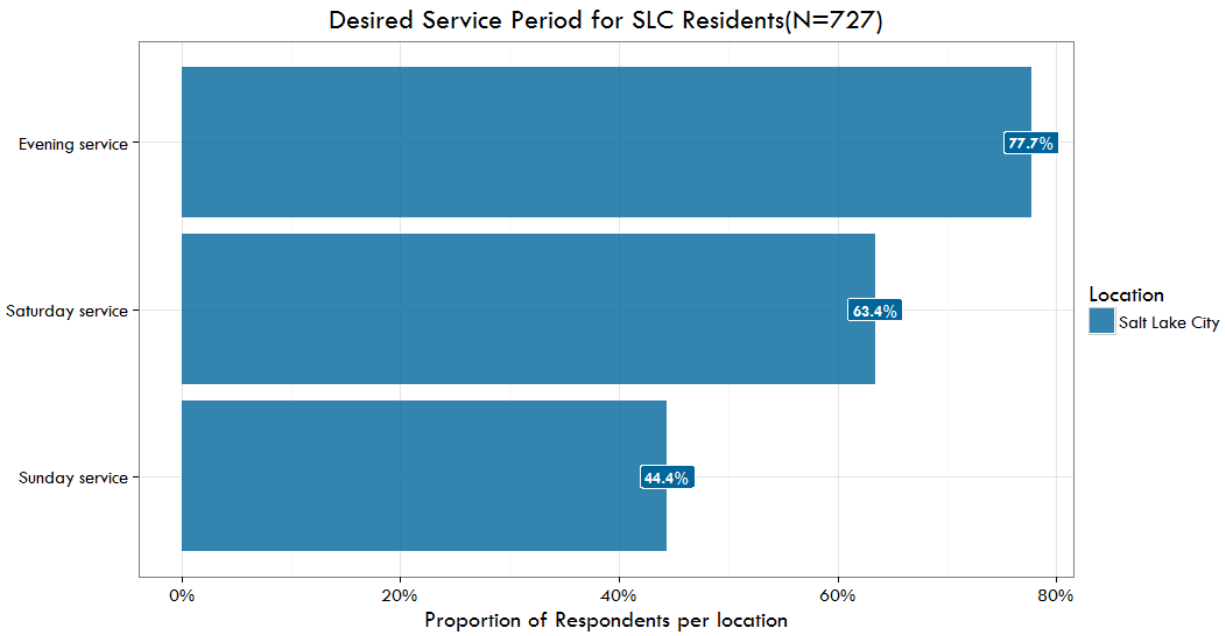
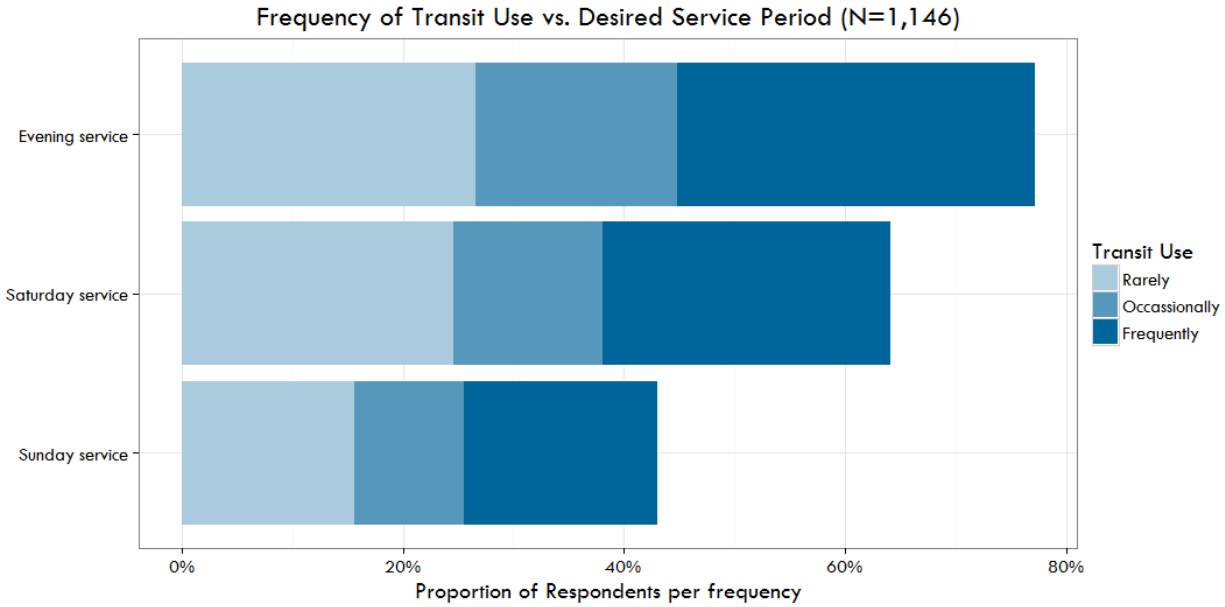


Figure B-32 Desired Service Periods by Transit Use



Rarely: Less than once a month, Occassionally: 1-3 times a month - Once a week, Frequently: A few times a week or more

Figure B-33 Desired Service Periods by Age

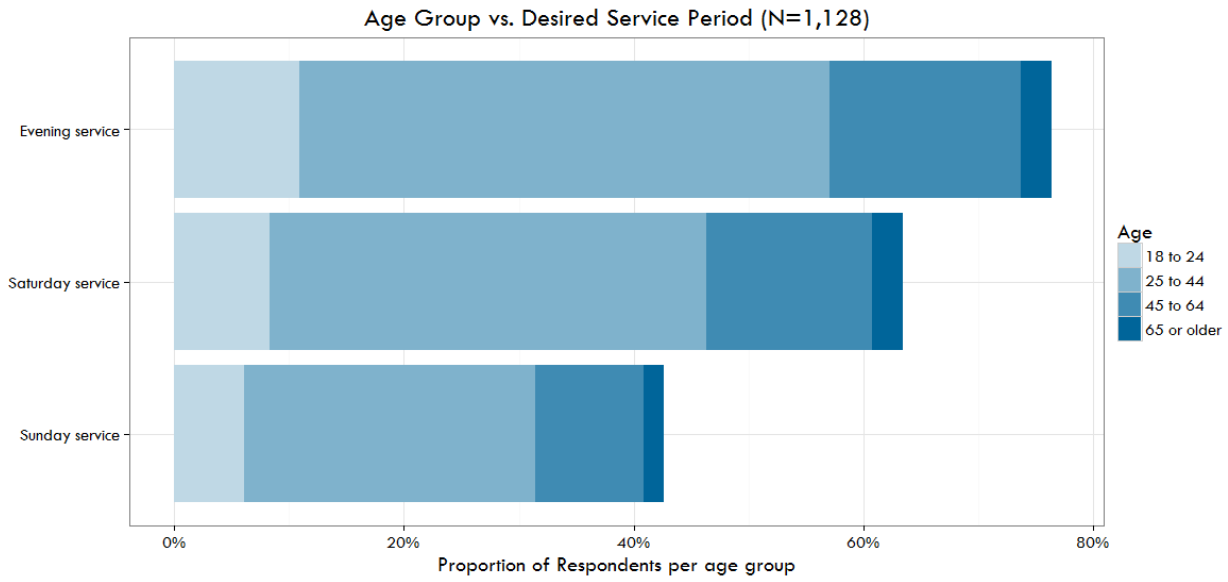


Figure B-34 Desired Service Periods by Income

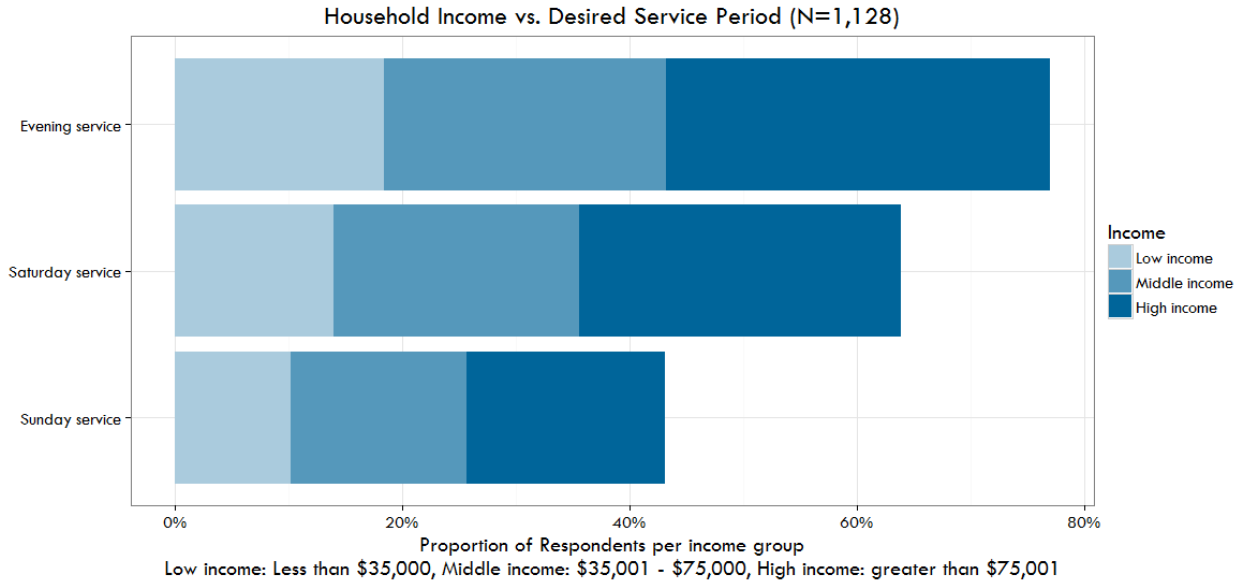
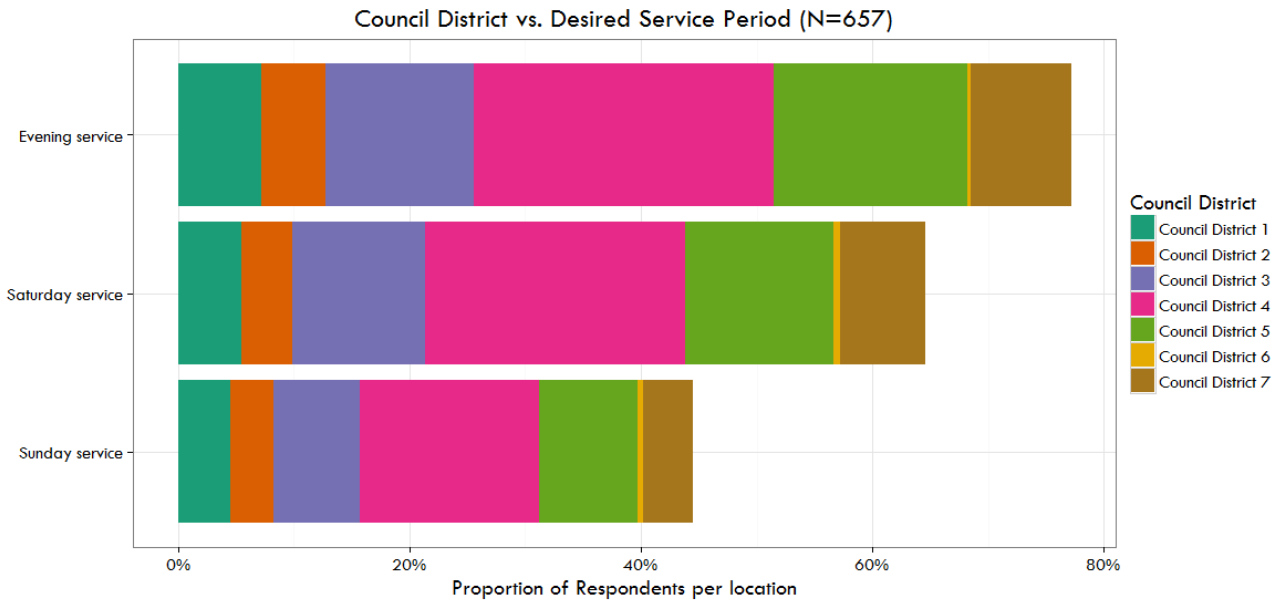


Figure B-35 Desired service Periods by City Council District



Capital Improvements

Respondents were given the opportunity to designate specific capital improvements in which their transit system could invest.

- **Overall** - The highest share of respondents (46%) indicated a preference for a rail based system (Figure B-36). Responses from Salt Lake City residents were similar to those of the entire survey sample (Figure B-37), though Salt Lake City residents were somewhat more likely to want to increase investment in a bus only system.
- **Frequency of Use** - All frequency of use groups were most likely to choose to increase investment in a rail based system, followed by a bus AND rail based system (Figure B-38).
- **Age** – All age groups selected increased investment in a rail based system as the preferred capital investment. The second most common response varied by age, with 18-24 and 25-44 year olds choosing bus and rail improvements, older adults (45-64) selecting incremental improvements to the current system, and seniors (65 or older) selecting increased investments in a bus based system (Figure B-39).
- **Income** - High income participants indicated a preference for investing in a rail based system (their two top responses included rail investment). Investments in a rail based system was also the top response for low income participants, but many also prioritize investments bus and rail, bus, and improvements to the current system (Figure B-40).

Figure B-36 Desired Capital Improvements (Select all that apply, within your budget) – All Respondents

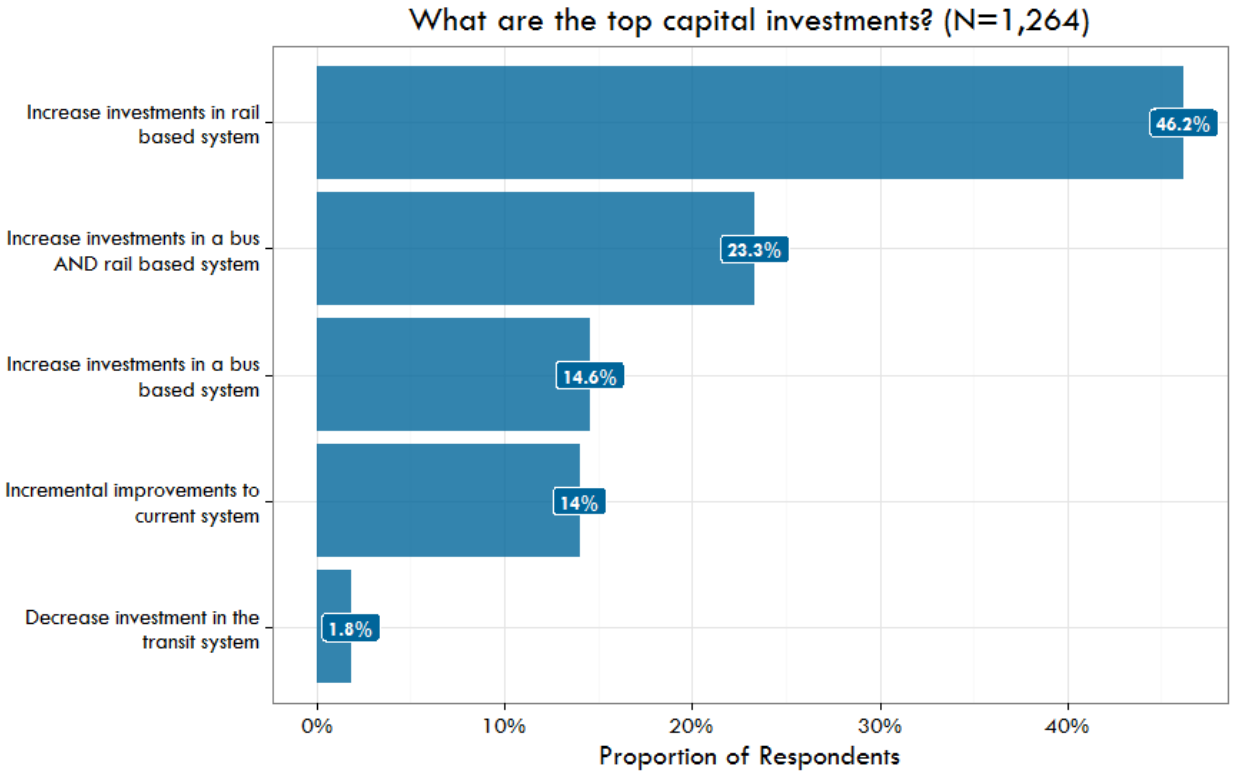


Figure B-37 Desired Capital Improvements (Select all that apply, within your budget) - SLC Residents Only

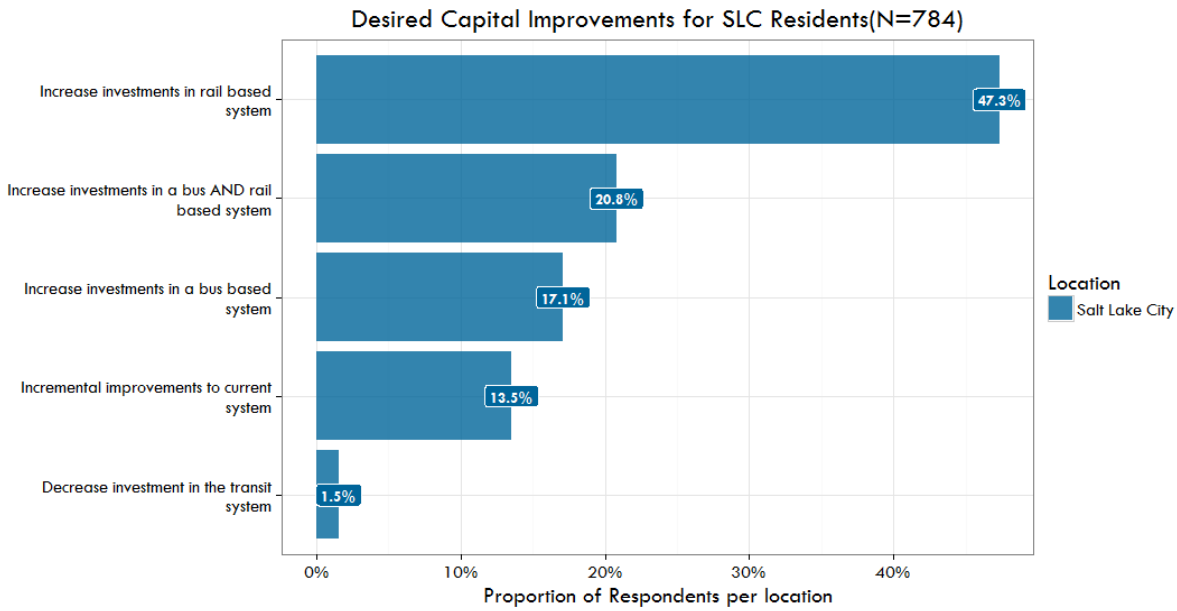


Figure B-38 Desired Capital Improvements by Transit Use

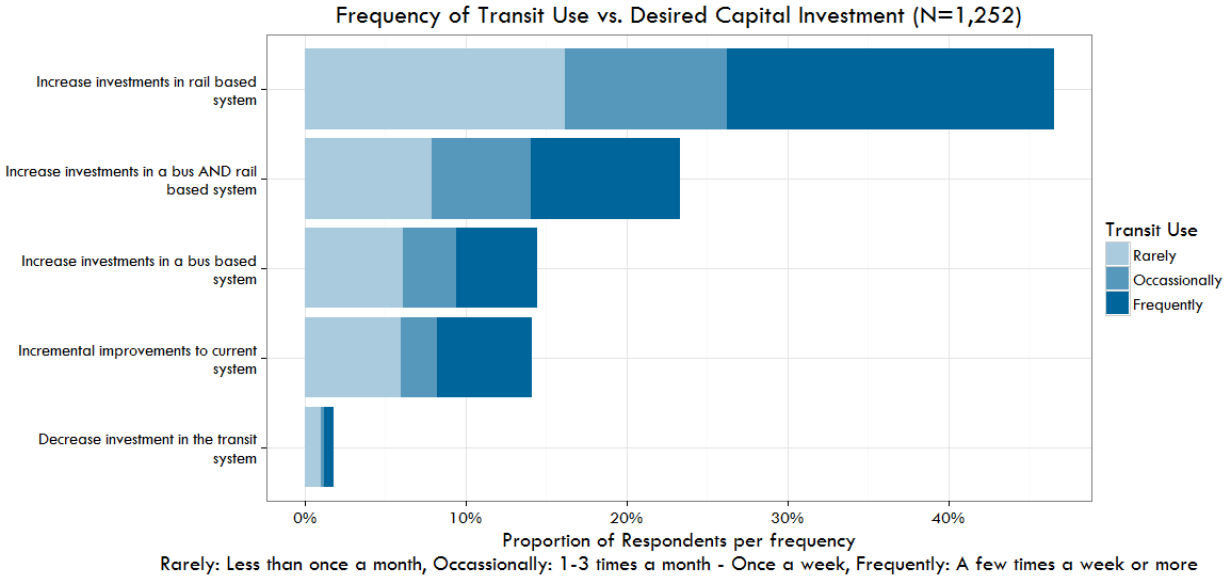


Figure B-39 Desired Capital Improvements by Age

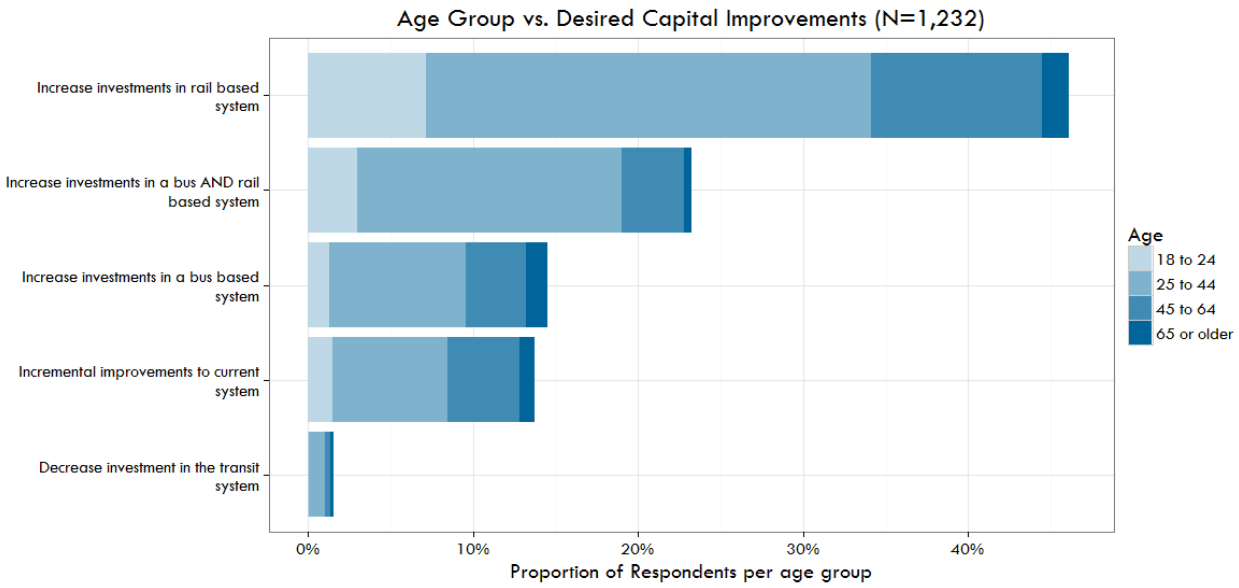


Figure B-40 Desired capital Improvements by Income

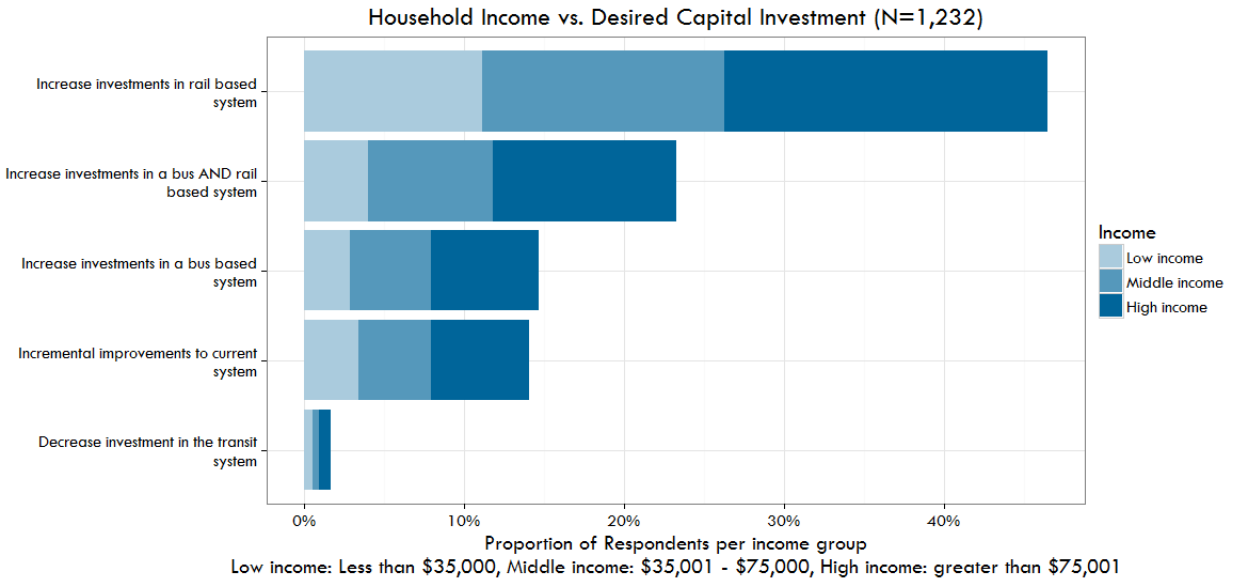
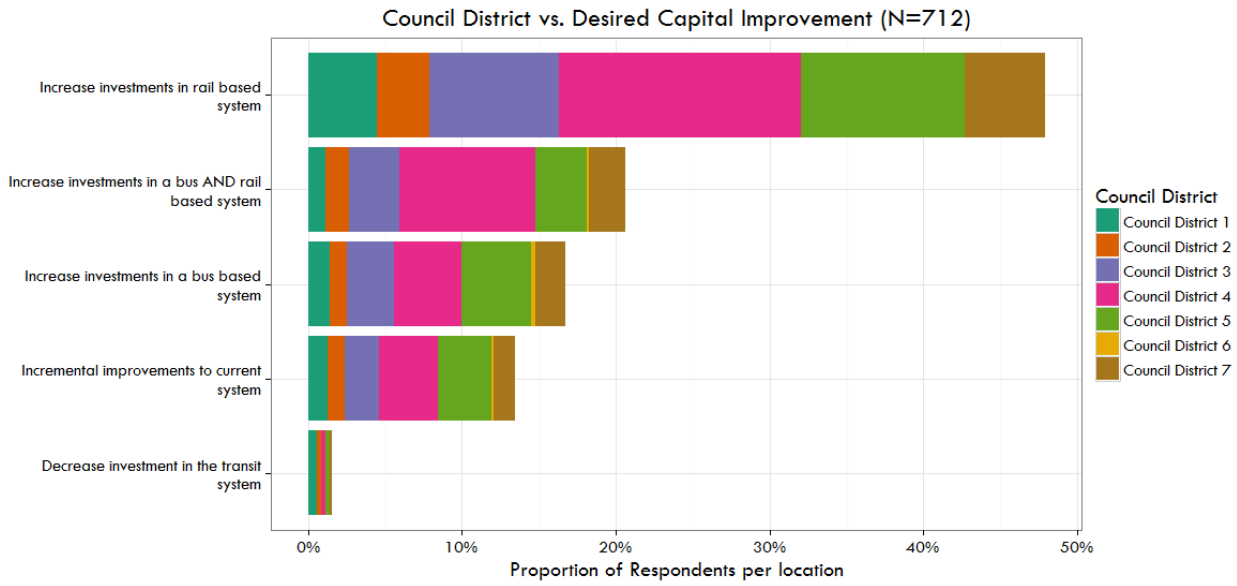


Figure B-41 Desired capital Improvements by City Council District



Other Improvements

Respondents were asked to select other improvements that would support their coverage, service period, and capital investment selections.

- **Overall** - The highest share of respondents (43%) indicated improved access by foot and bike as their preferred improvement (Figure B-42). Real time arrival information and transit stop amenities were each selected by over a quarter of respondents. Salt Lake City residents exhibited similar preferences as the overall survey sample (Figure B-43).
- **Frequency of Use** - All frequencies of transit use groups selected access to transit on foot and by bike as the most important other improvement. While occasional and rare transit riders selected real time arrival information as the second most preferred improvement, frequent users indicated a preference for transit stop amenities (Figure B-44).
- **Age** - Improved access to transit on foot and by bike was the most preferred option by all age groups with the exception of those age 65 and older, who were most likely to prefer benches, shelters, and amenities at transit stops (Figure B-45).
- **Income** - All income groups cited improved access to transit on foot and by bike as the most preferred other improvement. Real time arrival information was the second most preferred improvement for both low and high income respondents, while the second most common response for middle income respondents was transit stop amenities (Figure B-46).

Figure B-42 Other Desired Improvements (Select all that apply, within your budget) – All Respondents

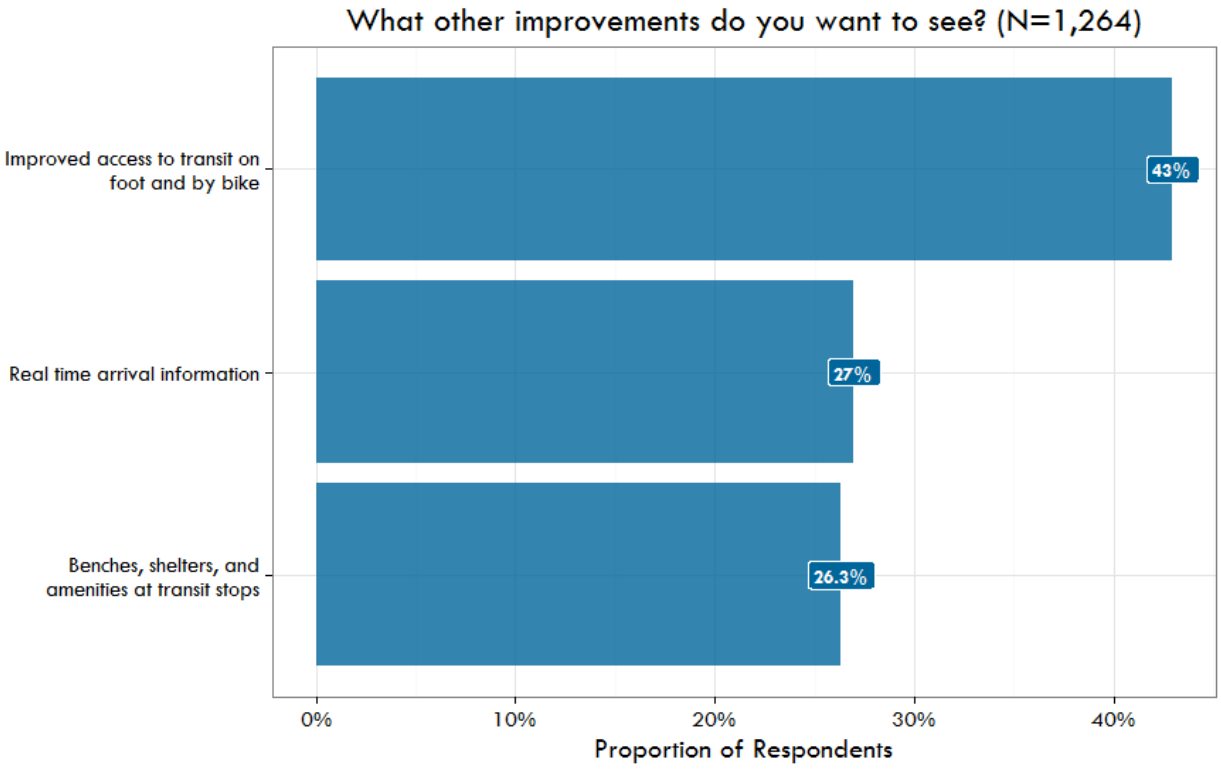


Figure B-43 Other Desired Improvements (Select all that apply, within your budget) - SLC Residents Only

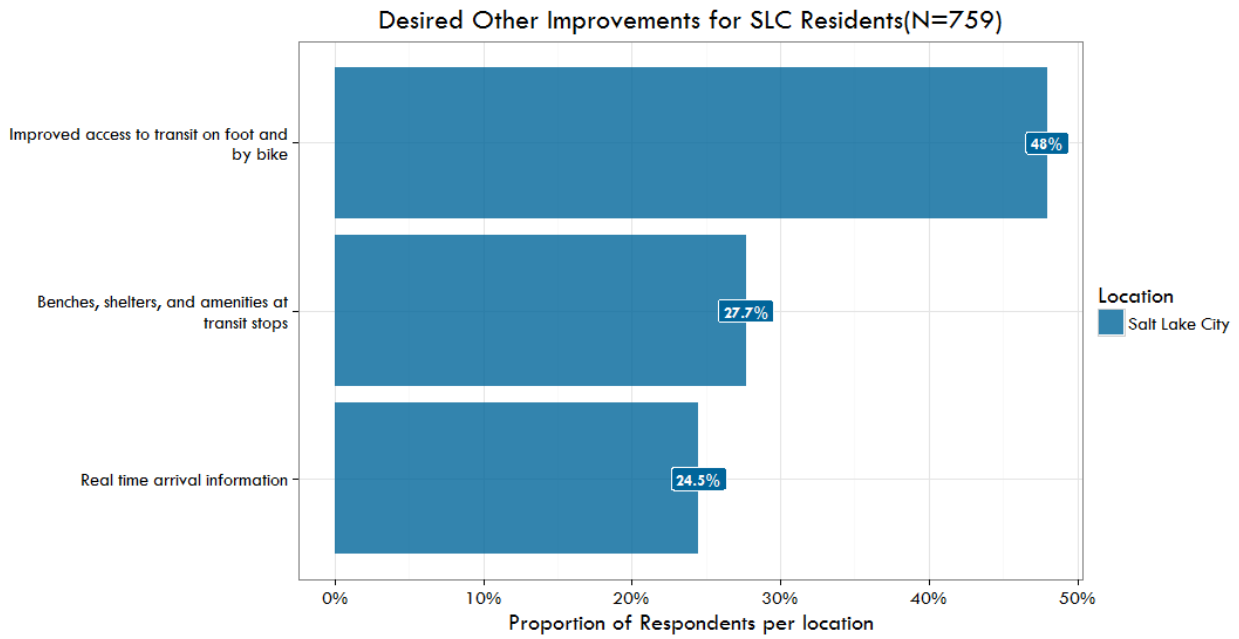


Figure B-44 Other Desired Improvements by Transit Use

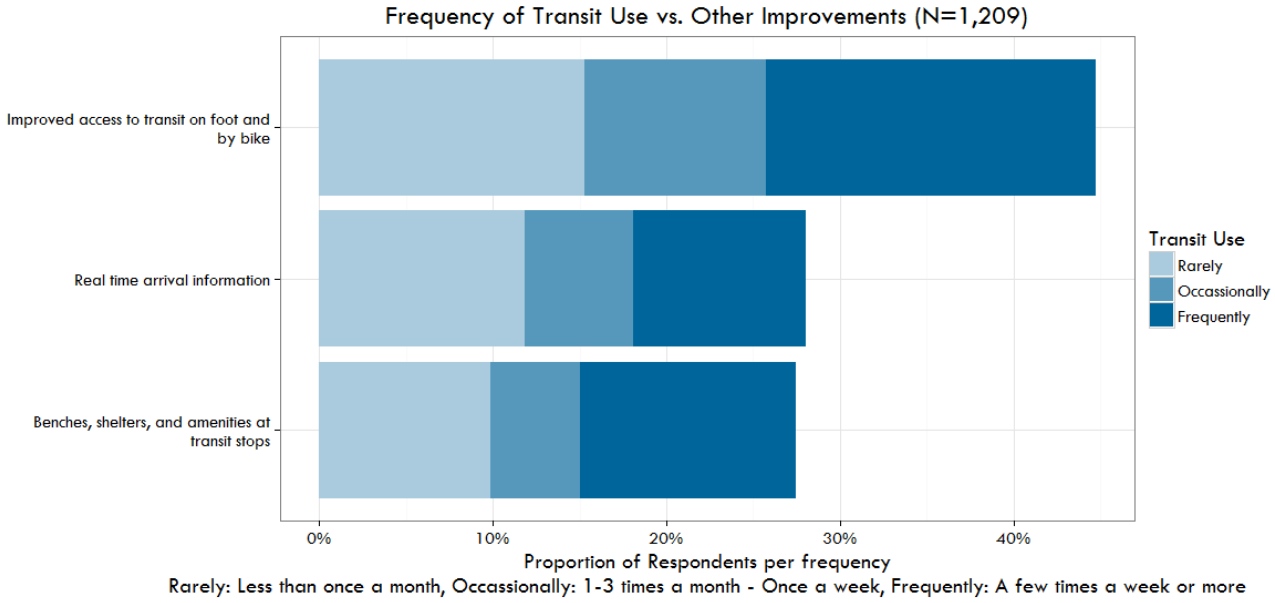


Figure B-45 Other Desired Improvements by Age

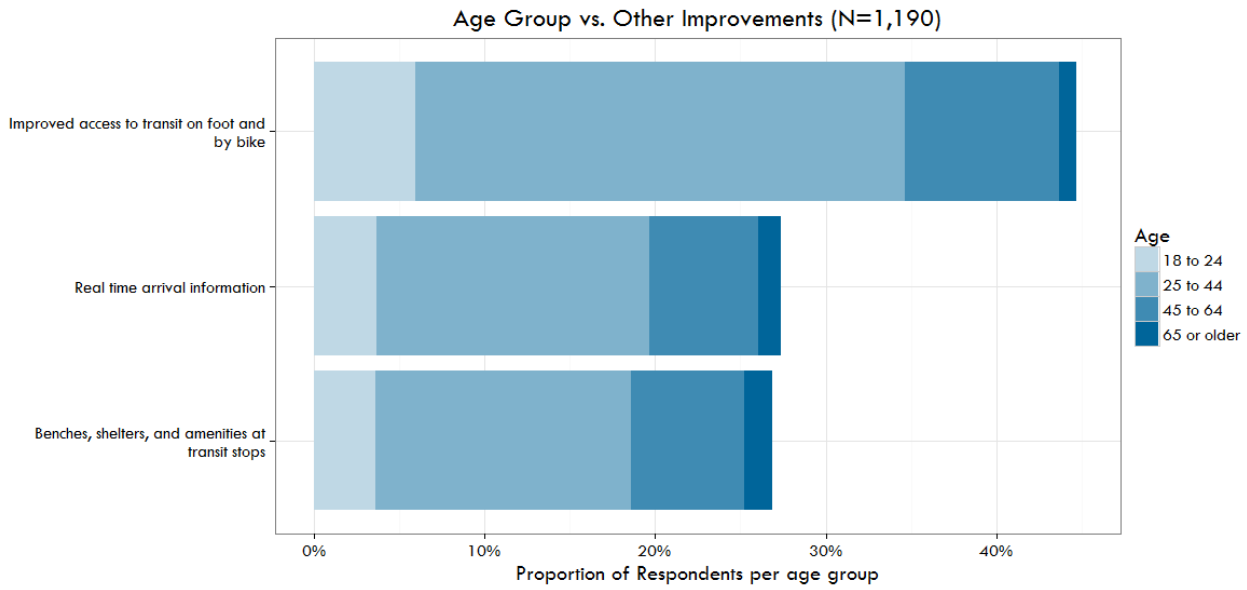


Figure B-46 Other Desired Improvements by Income

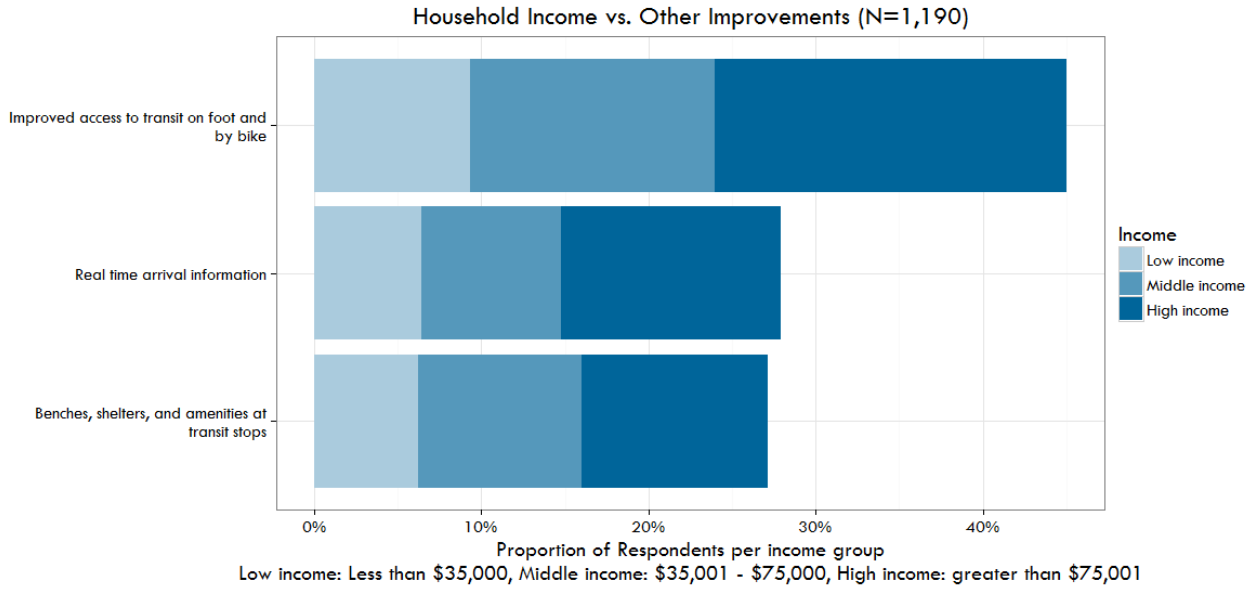
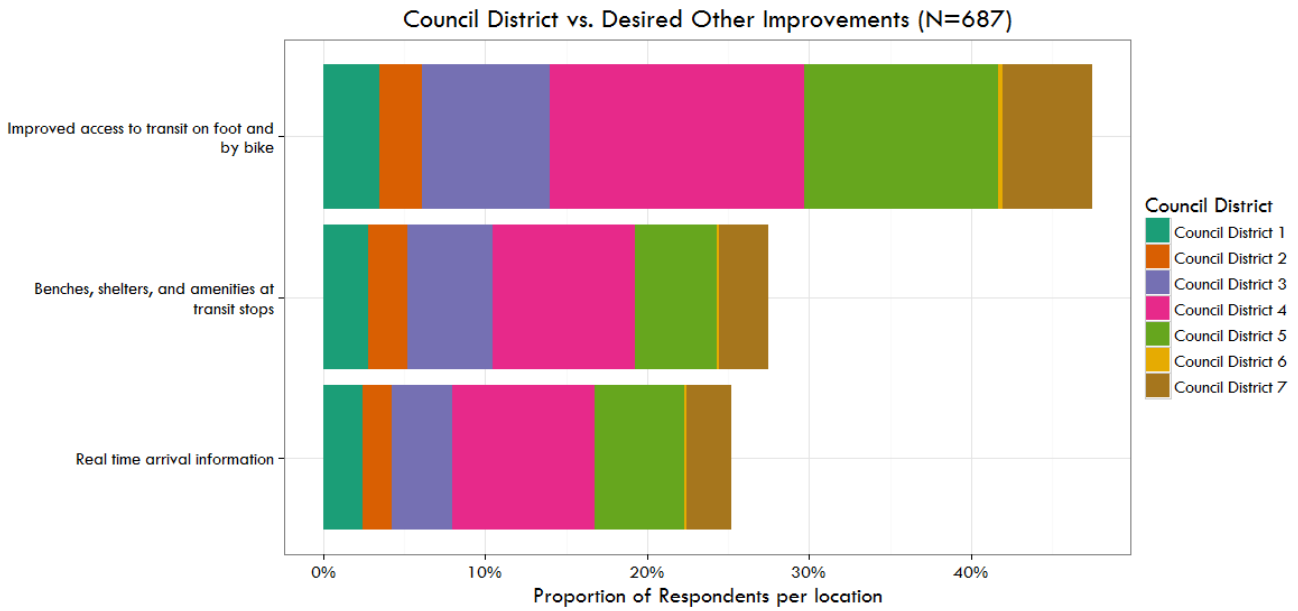


Figure B-47 Other Desired Improvements by City Council District



Appendix C: GAPS ANALYSIS

Appendix C Gaps Analysis

While portions of Salt Lake City are well served by transit, some portions of the city experience a mismatch in the existing transit supply and current demand, resulting in a "gap." To determine where gaps exist, an analysis was conducted to identify underserved corridors or markets, areas with too much service, and areas ineffectively served by transit.

Key transit service opportunities identified in this analysis include:

- Increased frequency and span of service to support a "transit lifestyle"
- Increased midday and evening service to frame Salt Lake City as a regional destination
- Better connections between neighborhood nodes
- Improved reliability and speed to be more competitive with automobiles
- Improved stability of service
- Higher quality bus stops with more amenities
- Better and safer access to stops
- More affordable service
- Better maps and information

State of the System Report

The State of the System provided an analysis on the existing transit, land use, demographic, and travel behavior data provided by Salt Lake City, UTA, and the Wasatch Front Regional Council. It summarized the state of transit service and the myriad factors that impact the use and performance of transit in Salt Lake City today. Some of the key findings included:

- **Land Use and Growth:** Salt Lake City is the region's employment hub and is continuing to grow.
- **Travel Patterns:** The majority of trips are non-commute trips.
- **Transit Use:** Currently, 6% of Salt Lake City residents take transit to work. Transit use is lower for non-commute trips.
- **Transit Service and Connections:** More bus service is provided than service on any other modes, but evening and weekend transit service is limited. Capacity constraints and limited layover space are limiting to transit service.
- **Transit Performance:** Transit boardings in Salt Lake City increased since 2011, but at a slower rate than the system as a whole and at a slower rate than service hours.
- **Access and Amenities:** Large block size and other barriers makes first/last mile access to transit difficult. Eighty-three percent of bus stops do not have a bench or a shelter for people to wait for the bus to arrive.

CURRENT TRANSIT DEMAND

Population & Employment Density

Figure C-1 shows the average weekday boardings overlaid on the population and employment density for Salt Lake City. The highest number of boardings are concentrated around areas with high population and employment density, particularly in downtown and the University of Utah. On the contrary, some dense areas do not have high transit boardings, such as the Sugar House Business District. Park-and-ride stations south of downtown—Ballpark Station, Central Pointe Station, and Millcreek Station, also have a high number of boardings.

Taking a closer look at the boardings in the dense area of downtown, Figure C-2 shows that transit boardings are concentrated on the western side of downtown. Central Station, State Street, and Main Street are some of the primary transit transfer points in downtown. Low transit boardings east of these transfer points indicates a first/last mile connectivity barrier to eastern downtown.

Figure C-1 Population/Employment Density and Weekday Transit Boardings: Salt Lake City

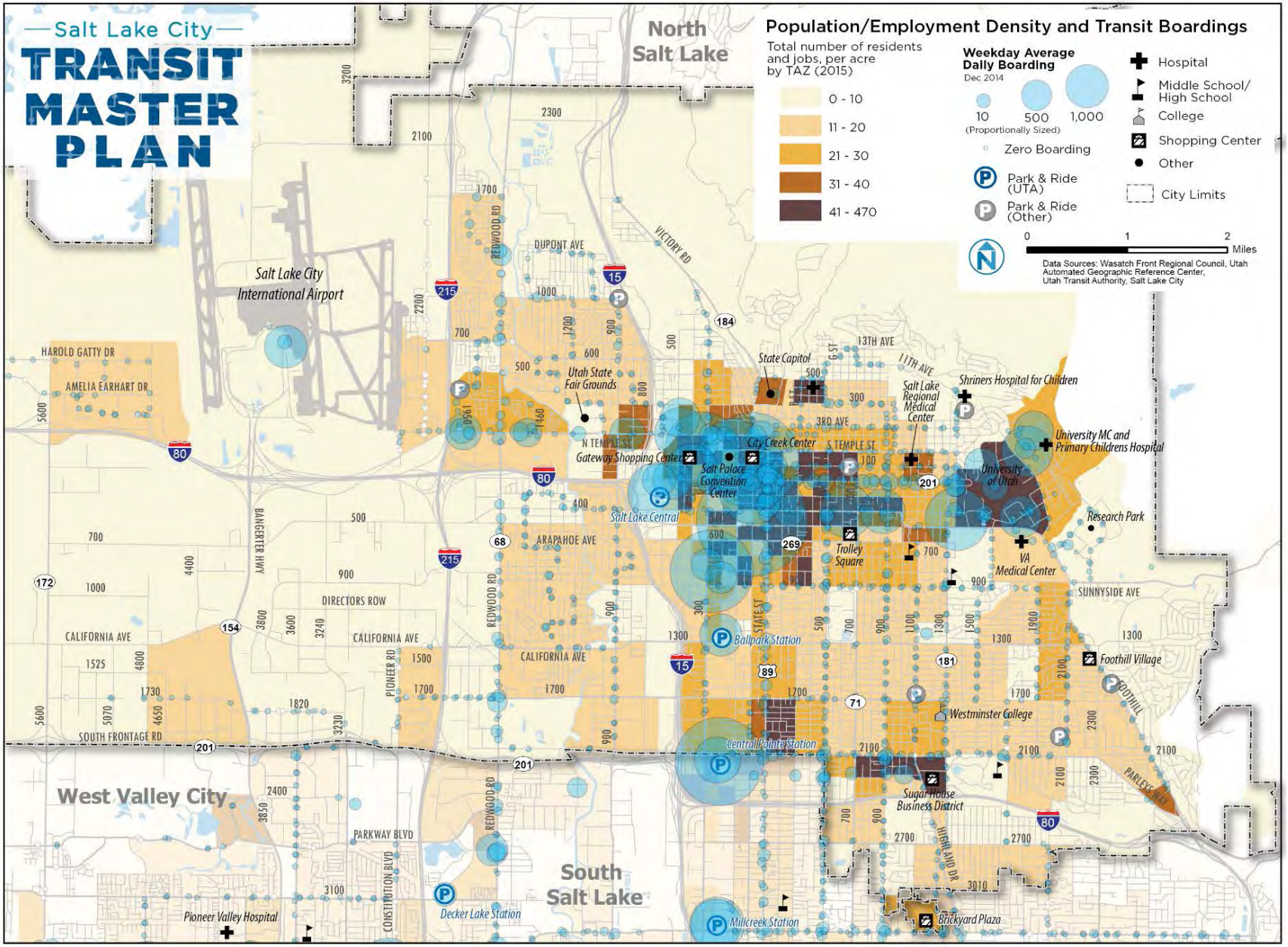
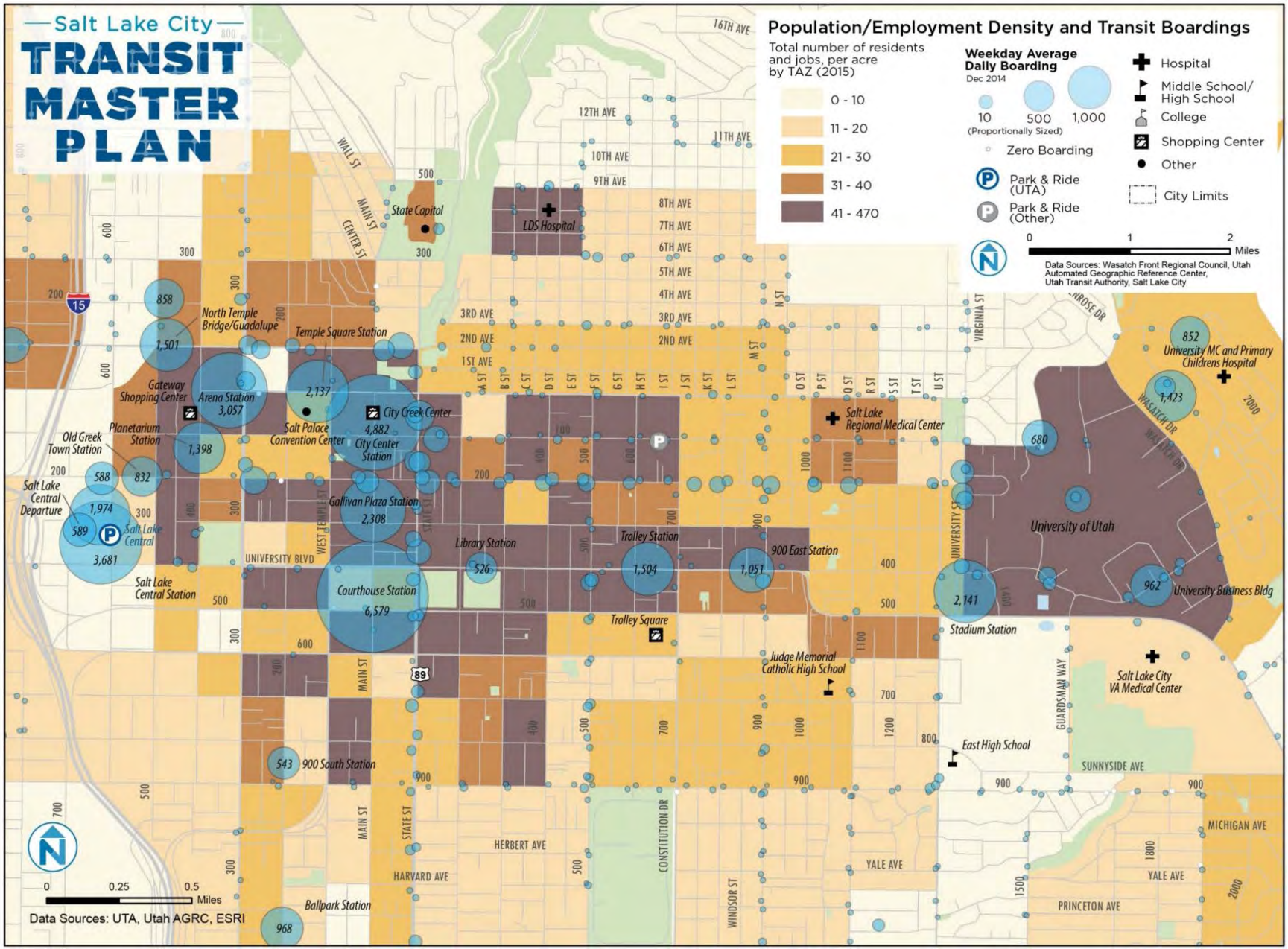


Figure C-2 Population/Employment Density and Weekday Transit Boardings: Downtown



Transit Propensity

The Transit Propensity Index (TPI) helps to determine the likelihood of transit use within a given geography. Some populations have a higher propensity to ride transit. This TPI is based on the combined densities of four populations: low-income households, zero vehicle households, seniors (ages 65+), and person with disabilities.

As illustrated in Figure C-4 and Figure C-5, some neighborhoods show high propensity for transit but lower transit boardings. This includes the area between the Central Business District and the University of Utah, the southern portion of the Capitol Hill neighborhood, portions of Liberty Wells, and neighborhoods west of I-15 (Rose Park, Glendale, and Poplar Grove neighborhoods). These high density areas have high concentrations of low-income, zero-vehicle households, seniors, and persons with disabilities but show less transit activity than other areas.

Transit Mode Share

Transit mode share—the percentage of trips made on transit—varies by district in Salt Lake City (Figure C-3). For the city overall, approximately 6% of Salt Lake City residents travel to work via transit.[1] According to the 2012 Utah Household Travel Survey, the University of Utah and the Airport Districts had the most transit use. Areas in the southern portion of the city (Sugar House/East Bench and Glendale/Poplar Grove) had the lowest transit mode share. When traveling to downtown Salt Lake City, these neighborhoods have a particularly high transit time disadvantage compared to auto travel.

Figure C-3 Transit Mode Share by District

District	Percent of total trips made on transit
University of Utah	18.4%
Airport district	13.2%
Areas surrounding University of Utah	7.4%
Downtown	6.4%
Capitol Hill/Avenues	3.3%
Sugar House/East Bench	1.6%
Glendale/Poplar Grove	0.7%

Source: 2012 Utah Household Travel Survey

[1] Salt Lake City State of the System Factbook. June 2015. Retrieved from http://slcrides.org/wp-content/uploads/2015/06/SLC-TMP-Factbook.pdf

Figure C-4 Transit Propensity Index and Weekday Transit Boardings: Salt Lake City

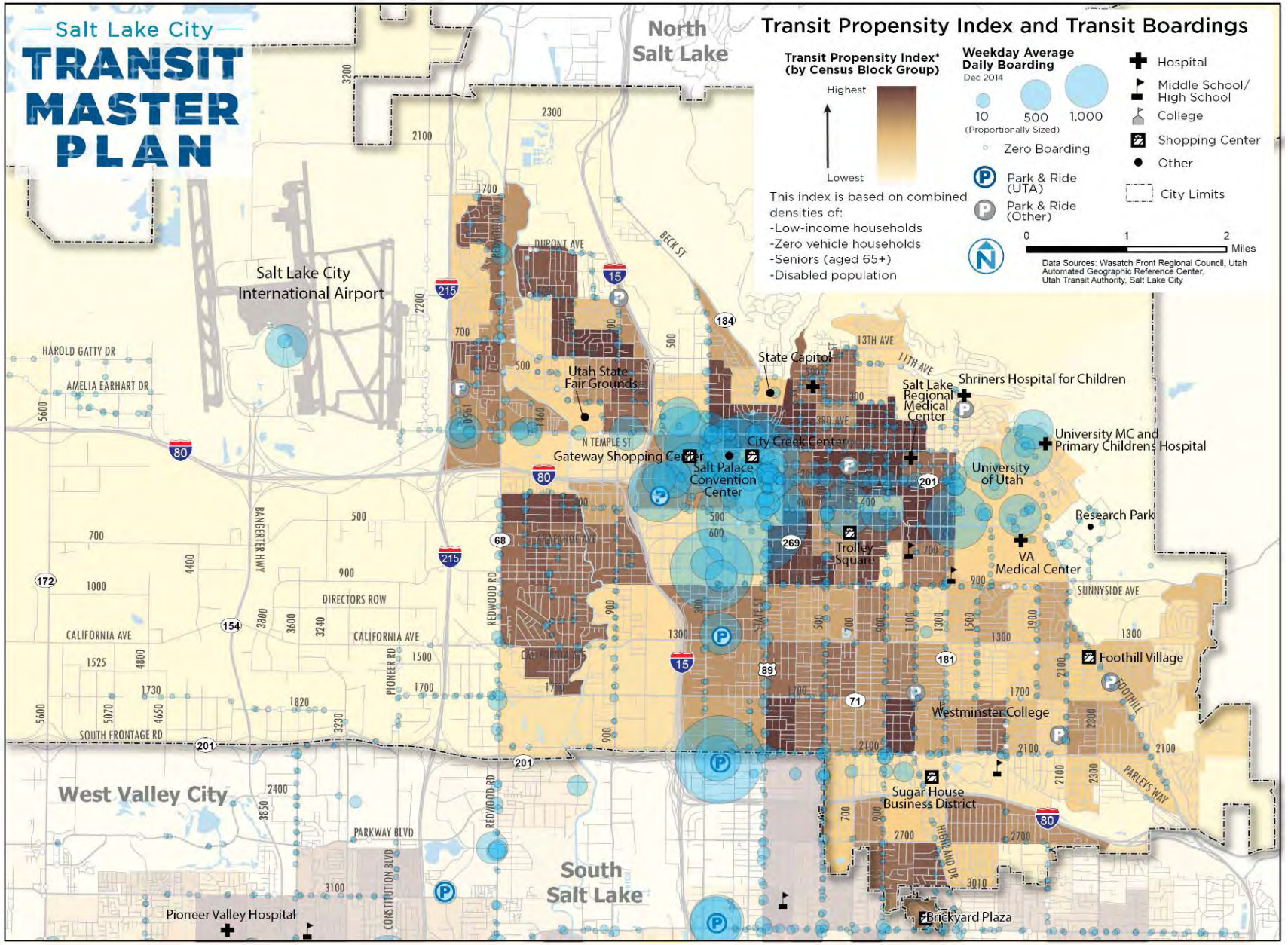
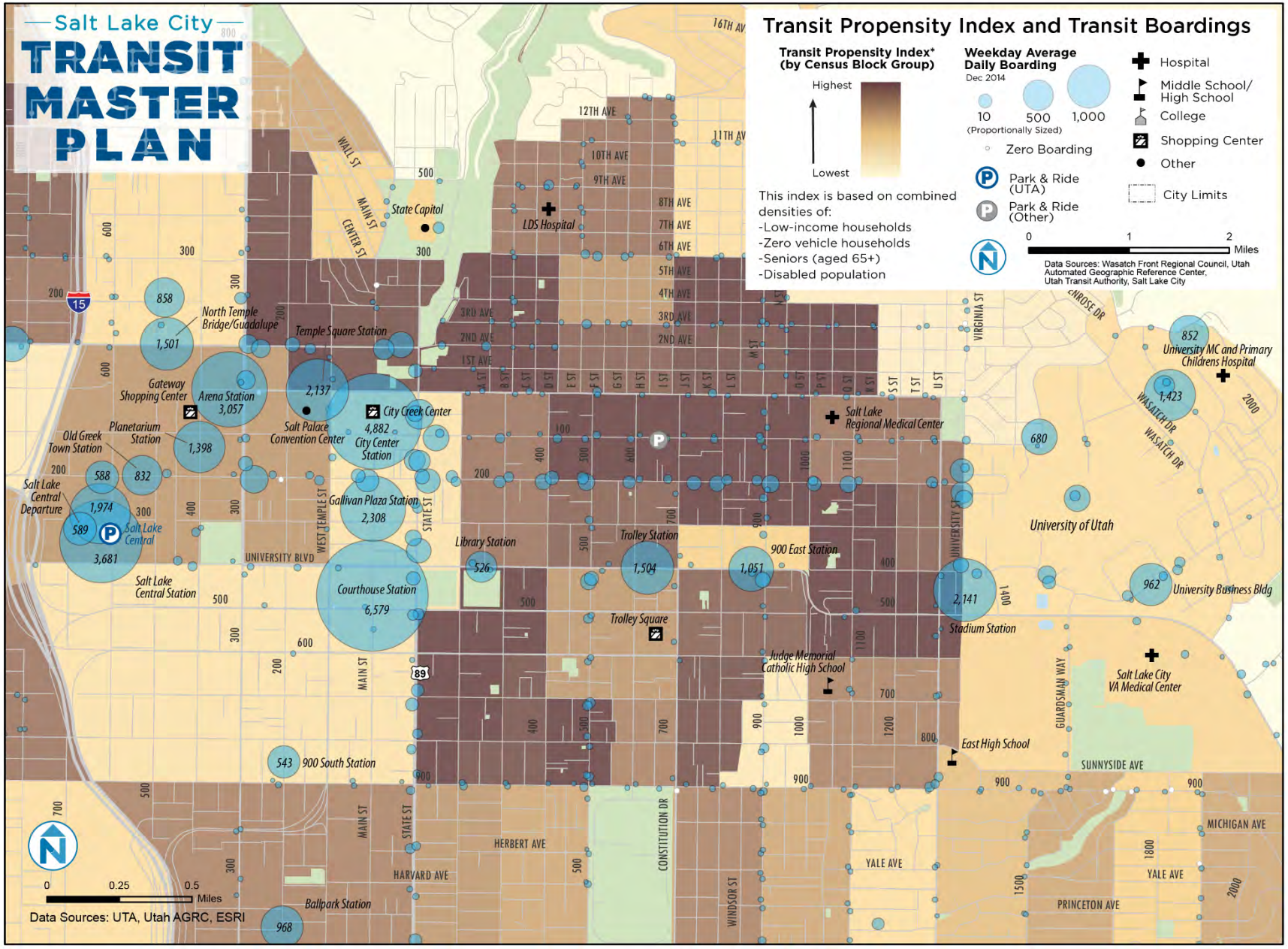


Figure C-5 Transit Propensity Index and Weekday Transit Boardings: Downtown



EXISTING TRANSIT SERVICE

Hours & Frequency

Frequent service is very limited outside of standard commute times, such as midday, evenings, and weekends. Service with a frequency every 15 minutes or less is considered the minimum that allows people to use transit without consulting a schedule. Of Salt Lake City's 44 bus routes, only six routes operate service that is available every 15 minutes or less.

> "I would love to be able to take the bus to and from work, however I start at 4 AM and there are no services available at that time."
>
> - *"Design Your Own Transit System" Survey Respondent*

Service frequency on several routes varies over the course of the day.

- **Weekday Service Frequency and Span (Figure C-8):** Only about half of the 44 bus routes operate outside commute periods and provide midday service during the week.
- **Weekend Service Frequency and Span (Figure C-9):** Only 16 of the 44 bus routes operate on Saturdays and nine operate on Sundays. Among corridors that retain service on weekends, the highest-frequency service is generally every 30 minutes on Saturdays and every 60 minutes on Sundays.

Service gaps that do not meet the FTN Minimum Service Level Definition (Figure C-7) are circled in black in Figure C-8 and Figure C-9. Evening bus service is limited all days of the week after 8:00 p.m. TRAX, FrontRunner, and the S-Line streetcar line run on a somewhat later schedule. Limited service hours and low service frequency presents challenges for visitors, service sector workers, and those who want to live a "transit lifestyle."

> "If there were more frequent buses and more frequency getting me across town, I would use transit more."
>
> - *"Design Your Own Transit System" Survey Respondent*

Transit service frequency for Weekday AM Peak, Weekday Midday, Saturday, and Sunday is also illustrated in Figure C-10 through Figure C-13. Service coverage decreases over different time periods and there is distinctly less service in west than east Salt Lake City.

Figure C-6 FTN Minimum Service Level Definition

Day of the Week	Frequency	Span
Monday – Saturday	30 minutes	5am – 6am
	15 minutes	6 am – 7pm
	30 minutes	7pm – 11pm
Sunday	30 minutes	7am – 7pm

Figure C-7 Service Frequency and Span – Weekday

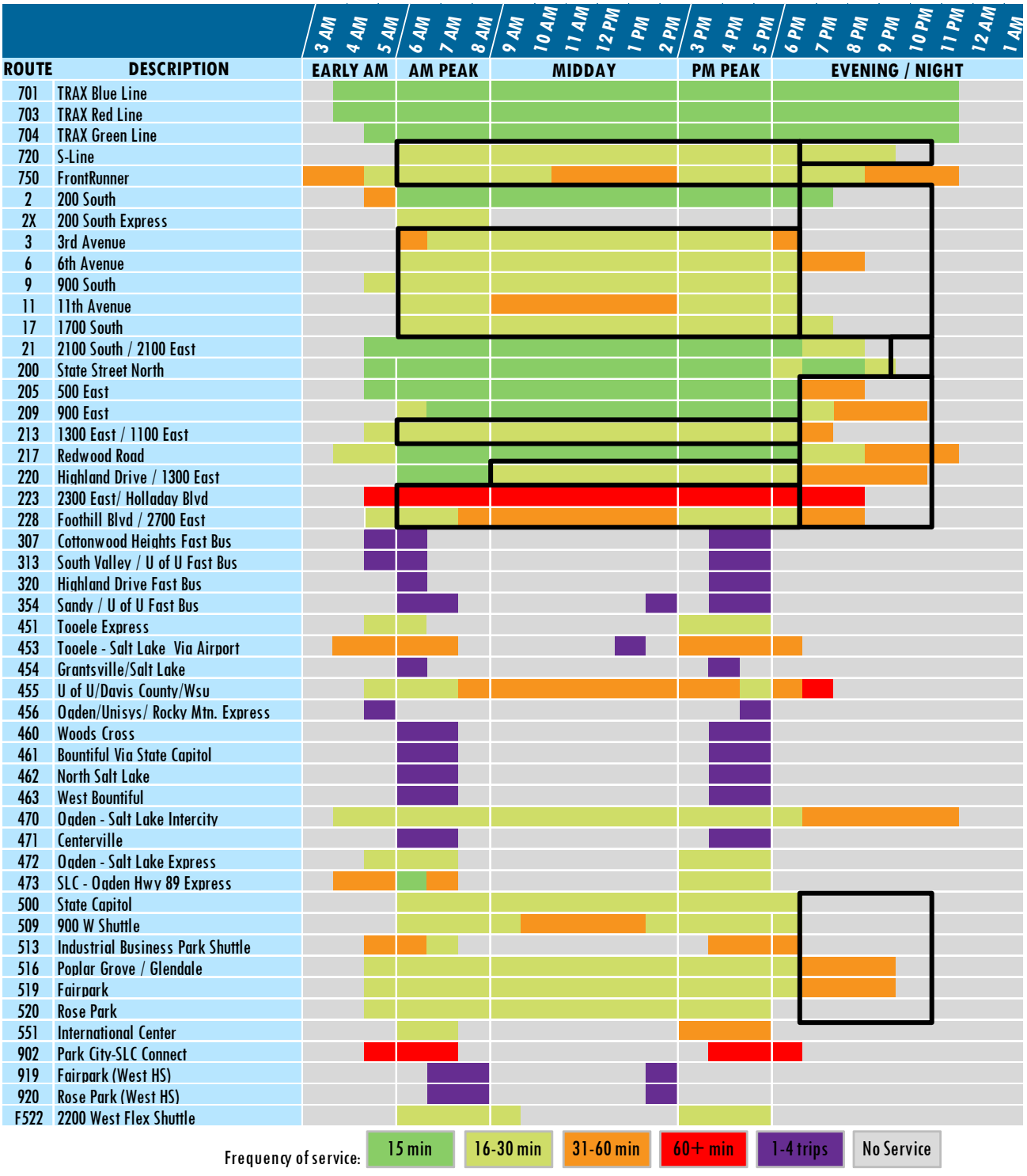


Figure C-8 Service Frequency and Span – Weekend

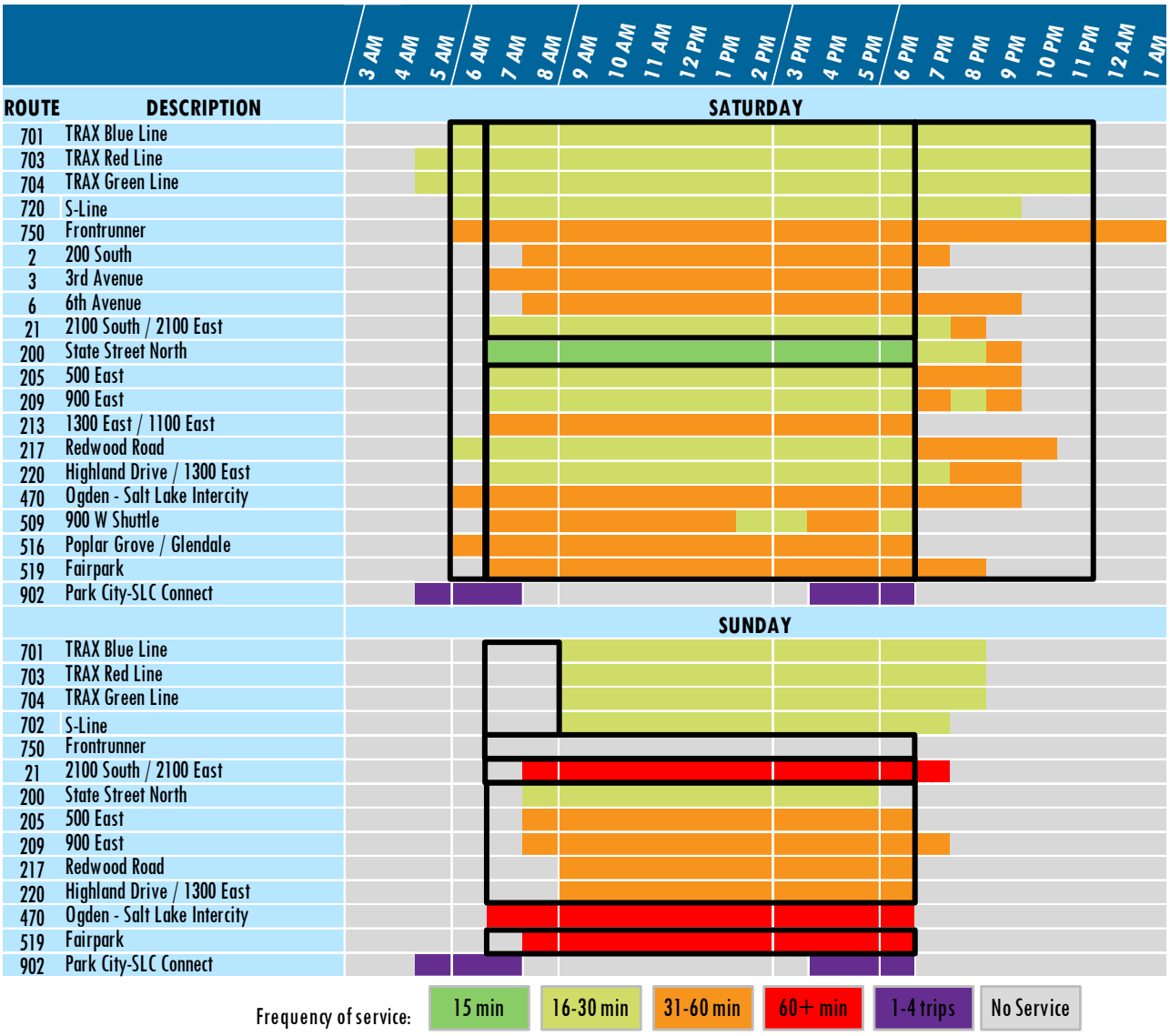


Figure C-9 Transit Service Frequency – Weekday AM Peak

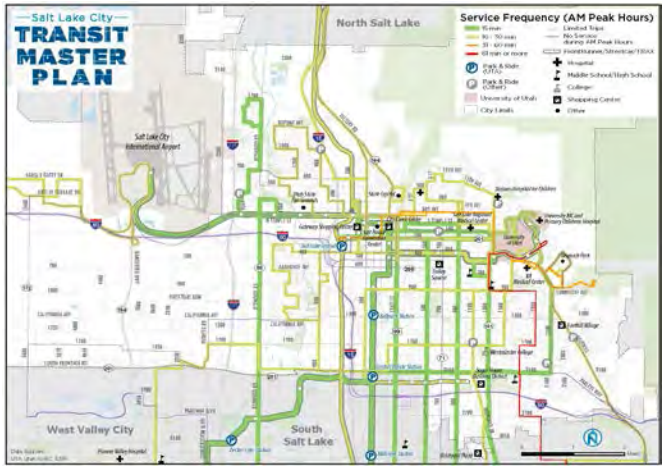


Figure C-10 Transit Service Frequency – Weekday Midday

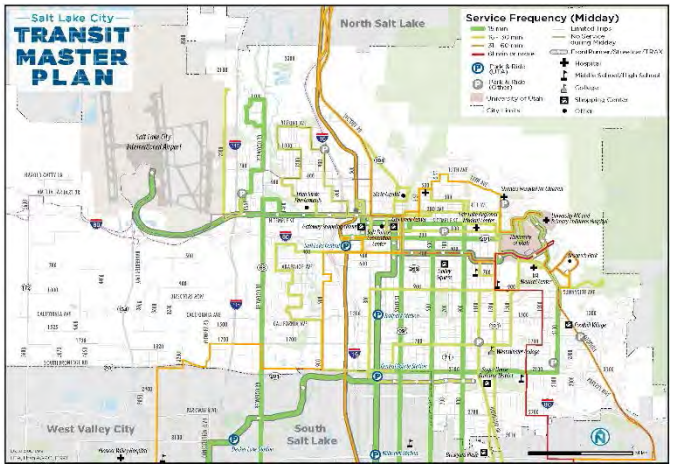
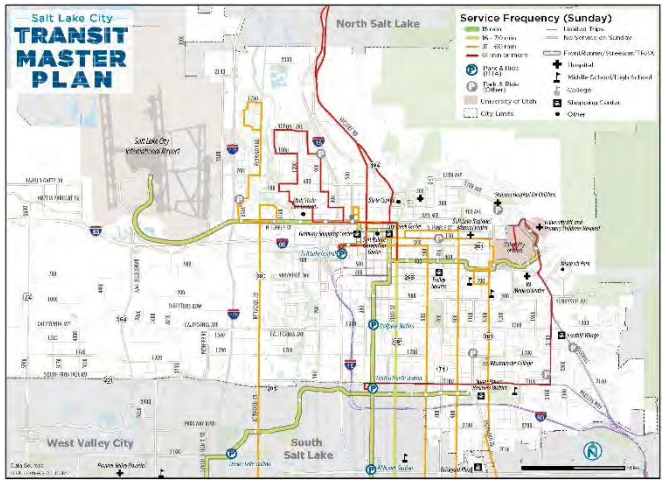


Figure C-11 Transit Service Frequency – Weekday Saturday

Figure C-12 Transit Service Frequency – Weekday Sunday



Note: Refer to the State of the System Factbook for full size maps (Figures 4-7 to 4-11).

Transit Travel Time vs. Drive Time

Figure C-6 below illustrates a theoretical comparison of travel times by car and transit between several Salt Lake City neighborhoods and downtown and between key regional destinations and downtown. This comparison serves not as a specific illustration of travel time, but rather to highlight the neighborhoods where transit carries a particularly high time disadvantage compared to auto travel:

- Sugar House neighborhood
- Glendale neighborhood
- East Bench neighborhood

> "I used transit regularly for daily commute for about 6 months while I was without a vehicle. It more than doubled my commute time, and I was constantly worrying about missing the "last bus". The (bus) system worked; it was just slow."
>
> - *"Design Your Own Transit System" Survey*

Figure C-13 Drive Time vs. Transit Time

Origin	Destination	Drive Time	Transit Time	How many times slower is transit
Sugar House neighborhood	Downtown SLC	0:11	0:26	2.4
University of Utah	Downtown SLC	0:12	0:18	1.5
Rose Park neighborhood	Downtown SLC	0:08	0:13	1.6
Poplar Grove neighborhood	Downtown SLC	0:08	0:14	1.8
Glendale neighborhood	Downtown SLC	0:11	0:23	2.1
Greater Avenues neighborhood	Downtown SLC	0:11	0:18	1.6
East Bench neighborhood	Downtown SLC	0:16	0:36	2.3

Note: The times were calculated using the trip planning tool on Google Maps. Drive times were taken at 5 p.m. Transit times were calculated by selecting 5 p.m. as the beginning travel time for weekday trips. For the purposes of this analysis, Salt Palace Convention Center was selected as the default "downtown SLC destination." Walk times are not included for drive time or transit time.

ADDITIONAL NEEDS

Bus Stop Amenities

There are limited amenities for passengers at bus stops. Eighty-three percent (83%) of bus stops do not have a bench or a shelter for people to wait for the bus to arrive. Figure C-14 illustrates which bus stops have a shelter and a bench, a shelter only, a bench only, a sign only, and no amenities. Improving bus stops with well-marked signage and amenities could make waiting for the bus safer and more comfortable for the user.

> "I really think that every bus station should have a shelter so that during bad weather people can have a safe place to wait for the bus."
>
> - *"Design Your Own Transit System" Survey Respondent*

Service Stability

UTA has the option of making changes to their system three times per year, which creates uncertainty about system stability and undermines the City's ability to organize growth around

transit. Changes can include re-numbering of routes, re-routing of lines, and schedule adjustments. This can make historical route-by-route ridership and performance data difficult to compile and historical changes and trends more difficult to understand; it may also impact legibility of the system for riders, an issue that will be further explored as part of public outreach.

UTA has made some major structural changes in their service in the last 10 years that changed boarding patterns. Notable changes include construction of Salt Lake Central Intermodal Hub and a redesign of the whole system that occurred in 2006-2007, and the opening of the TRAX Red and Green lines, which changed the main downtown transfer location from Gallivan to Courthouse in 2011.

Opportunities may exist to build more stable, long-term ridership and encourage transit-oriented development through limiting service changes

Affordability

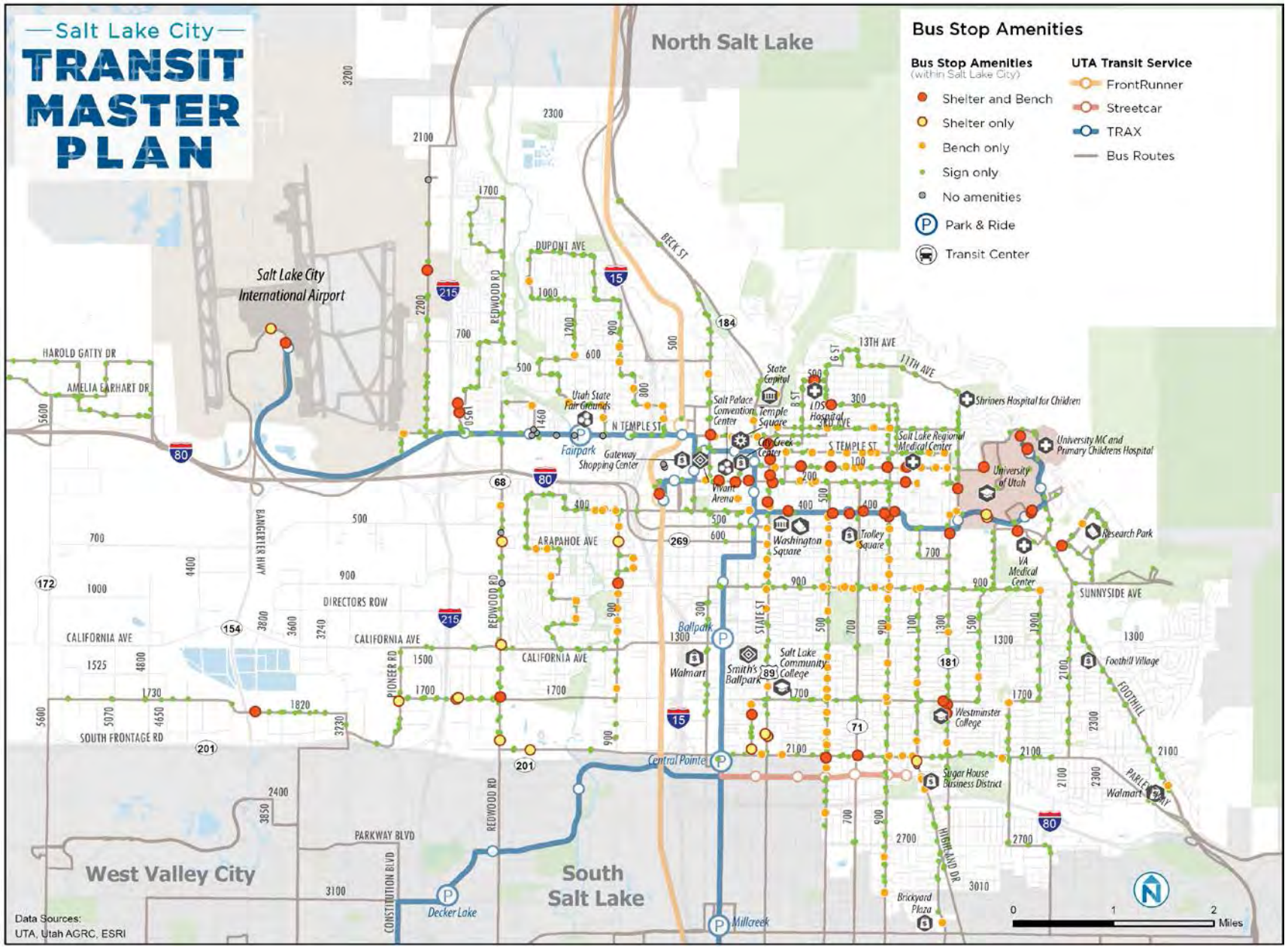
The cost of transit can be particularly burdensome on large families, youth, and transit dependent populations—low-income, older adults, persons with disabilities, and zero car households. Affordability is particularly relevant for the west side population of Salt Lake City, of which 50% are youth. Solutions to the affordability issue might include a low-income transit pass, a family transit pass, or discounts for major trip patterns, e.g. University-Downtown.

Access

Access to transit can be challenging in Salt Lake City due to the wide streets and large blocks. Solutions for this issue might include mid-block connections as development occurs and enhanced pedestrian environments. Other travel modes available in Salt Lake City—GREENbike Share, UTA Rideshare, demand-responsive rideshare, and Transportation Network Companies (e.g. Uber and Lyft)—can also feed into the transit system to provide a multimodal connection.

> "I rode the bus consistently for about six months but quit after the closest stop to my house moved from one block away to six. Arrival times were so inconsistent, it was frustrating. I would rather see fewer routes with ACCURATE and RELIABLE stop times. I could plan accordingly then."
>
> - *"Design Your Own Transit System" Survey Respondent*

Figure C-14 Bus Stop Amenities



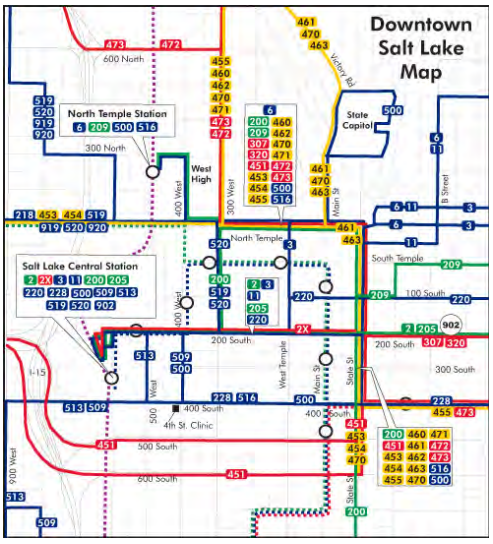
Source: State of the System Factbook, Figure 6-3

Information

UTA provides a series of online and electronic information resources including an online trip planner, real-time information, and a mobile app center to connect passengers to services.

Opportunities to improve the understanding of the system include:

- Awareness and education of the services offered (e.g. fare free zone, guaranteed ride home, next bus info available via text message);
- Ease of use through simplified and legible information; and
- Improved access through technology.



This map titled "Routes Leaving Downtown" is available on the UTA website but it's difficult to comprehend what the different colors and lines mean for each route.

Source: UTA

Facilities

To provide additional service in the future, UTA will need new facilities to accommodate expansion. Additional bus layover space would be useful near areas of high transit use, such the University of Utah and downtown Salt Lake City. 4th S/Main Street also has an issue with capacity as no additional trains are able to move through the intersection.

KEY FINDINGS

- Higher density areas tend to have higher use of transit, however **some high density areas in Salt Lake do not show high transit boardings**, such as eastern downtown, portions of Liberty Wells, Sugar House, and neighborhoods west of I-15
- Some areas with high propensity to use transit have **low transit boardings and low transit mode share**, therefore not as well-served by existing transit system.
- Service enhancements including **increased frequency and span of service** could support a transit lifestyle and help transit be more competitive with driving alone.
- To improve and enhance the transit user experience, future transit investments should consider **affordability, access, and information**.
- **Additional transit facilities** will be needed to accommodate future growth and system expansion.


UTA
Salt Lake Map
Salt Lake County and South Davis County
TRANSIT SYSTEM MAP
Effective May 1, 1979
See enlargement on reverse side for:
Downtown Salt Lake City & Avenues Area
University of Utah
South Davis County
SALT LAKE INTERNATIONAL AIRPORT
UTAH STATE BUILDING
Salt Lake City
INTERNATIONAL CENTER
NORTH TEMPLE
SHRINERS HOSPITAL
UNIVERSITY OF UTAH
SO. TEMPLE
GUARDSMAN WAY
SO. CAMPUS DR.
HEMPSTEAD
ARAPEEN WAY
EAST VILLAGE
WEST VILLAGE
V.A. HOSPITAL
KENNEDY DR.
ST. MARY'S WAY
CONCORD
INDIANA
GLENDALE
CALIFORNIA AVE.
GARFIELD AVE.
STRATFORD AVE.
LOUISE AVE.
METROPOLITAN WAY
VALLEY FAIR MALL
ATWOOD
W. VINE
VAN WINKLE
EXPRESSWAY
HIGHLAND CIR.
LINCOLN LN.
OAKVIEW DR.
OLYMPUS COVE
BERNADA
FASHION PLACE MALL
CAROLINA DR.
SOMERSET DR.
DIXIE VALLEY
CENTER ST.
WASATCH AVE
FERN DR.
FT. UNION BLVD.
CREEK RD.
HILLSIDE PLAZA
BIG
PIONEER RD.
REDWOOD RD.
WEST TEMPLE
MAIN ST.
STATE ST.
HIGHLAND
WASATCH BLVD.
HOLLADAY BLVD.
I-15

Appendix D Transit Corridor Evaluation

The Transit Master Plan included an extensive technical evaluation that informed draft transit service and capital recommendations. These recommendations evolved into the service and capital elements of the plan (Chapters 2 and 3). The recommendations were the outcome of a technical evaluation process that started with an existing conditions analysis (see Appendix A), was complemented by a multi-faceted public outreach process during the spring, summer, and fall of 2015 (see Appendix B), and a gaps analysis based on both the existing conditions analysis and public outreach findings (see Appendix C).

The **service element** of the Transit Master Plan includes a vision for an expanded high-frequency transit network for Salt Lake City, a core component of the plan. The long-term frequent transit network (FTN) is a 20-year vision for where frequent service should be provided in Salt Lake City. Defining an FTN allows Salt Lake City to work closely with Utah Transit Authority (UTA) to set priorities for service provision now and in the future. The service element contains three principal components:

- FTN Map – The expanded vision for where frequent service should be provided throughout the city
- FTN Service Level Definition – The definition of the standardized service level that will be provided on all FTN routes, e.g., frequency, span, and days of service
- Service Design Principles – Principles that are used to design the network of corridors recommended for capital investment and service investment

A network map including an initial phasing recommendation for FTN implementation is provided here. During the next stage of analysis, the phased FTN vision will be finalized based on the online "Design Your Own Transit System" survey and input from key stakeholders.

The **capital element** provides direction for where capital investment in the transit system will provide the greatest community benefits. The corridor evaluation was used, in conjunction with existing plans, to identify corridors for infrastructure improvements. The subsequent, final stage of the evaluation process will be a modal analysis that will define which improvements are appropriate in each of these recommended corridors, e.g. investments to improve transit performance, modal upgrades to Bus Plus, Bus Rapid Transit, or rail.

The Transit Master Plan also includes a set of recommendations for **programs, policies, and other supportive investments**.

This appendix describes analysis that informed Transit Master Plan recommendations. It includes initial draft versions of service and capital recommendation maps. These maps were refined through input from Transit Master Plan advisory committees; final maps are provided in Chapters 2 and 3 of the Transit Master Plan.

PROJECT BACKGROUND AND GOALS

The Transit Master Plan responds to community and policy mandates to improve public transportation for the benefit of all members of the community in Salt Lake City. The Plan will help Salt Lake City and UTA set priorities for the next 20 years, guide decisions about the timing and location of capital investments, and increase the use of transit citywide.

Salt Lake City is leading the Plan, focused on identifying transit needs, desires and investments citywide. However, the Plan builds on other local and regional planning efforts and is being developed in close coordination with UTA, City departments, and regional agencies. The Plan has been developed with an inclusive public process to ensure community needs and desires are captured. The goals and objectives of the Plan are shown in Figure D-1.

Figure D-1 Transit Master Plan Goals and Objectives[1]

	Goals	Objectives
1	Improve air quality.	Reduce per capita vehicle miles traveled.
		Improve competitiveness of transit with auto travel.
2	Increase the number of people riding transit.	Increase transit ridership.
		Make transit useful for more types of trips.
		Improve the competitiveness of transit with auto travel.
3	Provide a complete transit system that supports a transit lifestyle.	Provide reliable, efficient, frequent transit service.
		Provide service on a citywide network that serves a broad range of important community destinations.
		Maintain stable service on the core transit network.
		Provide service on the core transit network during the evening and on weekends to support all types of trips, including work and non-work trips.
		Provide information and maps that make the transit system easy to understand.
4	Provide a safe and comfortable transit access and waiting experience.	Improve bicycle and pedestrian access to transit.
		Improve the transit waiting experience and universal accessibility of stops and stations.
5	Provide access to opportunity for vulnerable populations.	Design a transit network that supports access to jobs, education, daily needs, and services for transit-dependent populations.
		Provide affordable transit options, particularly for low-income households.
6	Create economically vibrant, livable places that support use of transit.	Align transit investments with transit-supportive land use policies and development.
		Catalyze economic development and jobs in Salt Lake City by providing effective transit service that employers, businesses, and the development community can depend upon.

[1] For more information on Goals and Objectives, please see the memo entitled Final Goals & Evaluation Framework for Salt Lake City Transit Master Plan, September 28, 2015.

METHODOLOGY

The screening and evaluation process assessed a range of existing transit and potential transit corridors to determine where current and future demographics, land use patterns, and population and employment concentrations are most likely to support high-quality transit service, and support the broader community goals established for the Plan (see Figure D-1). As fully described in the Goals & Evaluation Framework memo, the investments that were evaluated were drawn from stakeholder and public outreach, input from Salt Lake City and UTA, and technical analysis completed for the State of the System Fact Book and the gaps analysis (Appendices A and C).[2]

The evaluation process was iterative, gradually narrowing from a broad list of potential corridors to identify a final set of recommended corridors. Figure D-2 illustrates the evaluation process and Figure D-3 illustrates the phase I and phase II evaluation criteria.

The first phase was a fine-grained analysis of primarily land use and demographic data at the corridor segment level. This eliminated from consideration those corridors that are least likely to deliver significant return on transit investments within the plan time frame and helped the team assemble a set of corridors for the second phase of analysis. During phase II, the team analyzed 15 corridors against a broader range of evaluation criteria.

At this stage, there were several factors held constant, including the operating plan, mode, and capital cost per mile (assumptions for the operating plan were taken from the FTN service level definition). In addition, two potential new transit hubs were included based on discussions with UTA and Salt Lake City staff during the September site visit, one in East Downtown near 700 E and 200S and the second at the University. Several of the corridors that were evaluated terminate at one of these new hubs.

This yielded the draft FTN and capital investment corridor recommendations, presented in Figure D-5 and Figure D-6 below, respectively. A range of mode options are identified for capital investment corridors.

The attachments to this memo show full results from the phase I (Appendix A) and phase II (Appendix B) corridor evaluation.

[2] See http://slcrides.org/documents/ for documents developed previously for this Plan.

Figure D-2 Evaluation Process

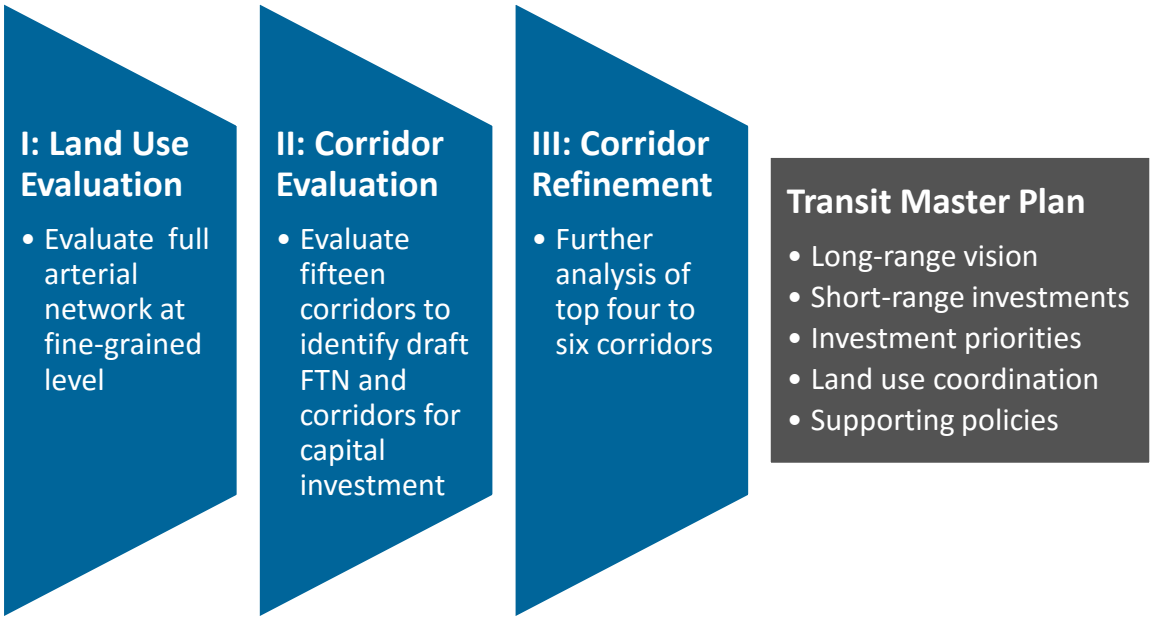


Figure D-3 Evaluation Criteria

Relationship to Transit Master Plan Goals						Evaluation Criteria (Segment screening criteria shaded)
Air quality	Transit ridership	Complete transit system	Safe/comfortable experience	Access to opportunity	Economic vibrancy/ livability	
Phase I & II						
●	●	●	●			Existing ridership*
			●	●		Transit Propensity Index (TPI)
					●	Land use density current (population and employment)
					●	Land use density future (population and employment)
		●	●	●		Lack of access to a vehicle
Phase II only						
					●	Anchor/generator strength and accessibility
	●				●	Potential for travel time savings and/or improved reliability
●	●	●	●			Ridership potential (current and future year)
					●	Redevelopment Potential
					●	Cost effectiveness

*The analysis accounts for the fact that corridors without any nearby transit service would be disadvantaged.

SERVICE ELEMENT

Overview of a Frequent Transit Network

What is a Frequent Transit Network?

A frequent transit network (FTN) is a set of designated transit corridors that offers frequent, reliable service connecting major destinations and neighborhood centers throughout the day including evening hours, every day including weekends. A frequent transit network can be comprised of both bus and rail technologies. Regardless of mode, the network should be developed to provide a consistently high standard of capacity, reliability, frequency, and customer service amenities. The FTN should be clearly communicated so that it is easily understood and marketed to riders to ensure ease of use (Chapter 5 provides further recommendations related to branding the FTN).

To create a complete transit system, other local transit routes and alternative service models provide feeder service to FTN corridors (see Chapter 2). In addition, the value of a FTN can only be fully realized by fostering supportive land use development and high-quality pedestrian and bicycle access to stops/stations. Therefore, a truly effective FTN must be developed as a partnership between a city, its multiple departments, and a transit agency.

Once a desired FTN is defined, a City and its transit partner can work together to obtain funding and make the improvements necessary to achieve the level of service that is envisioned.

Key Performance Characteristics of a Frequent Transit Network

To meet City goals to increase transit mode share and truly support residents' ability to live a car-free lifestyle, a frequent transit network should ideally have the following characteristics:

- **Fast and Reliable**: Operate transit on arterial streets/transit priority streets where it will be most rapid and reliable; make improvements that reduce transit travel time and make it more competitive with automobile travel.
- **Frequent**: Connect major destinations and neighborhood centers with 15 minute or better, all day service. Service that operates every 15 minutes or less is considered the minimum service level that allows people to use transit without consulting a schedule.
- **All Day**: 15 minute or better service frequency between at least 6 a.m. – 7 p.m. on weekdays and Saturdays, with 30-minute service in the evening and on Sundays.
- **Every Day**: 7 day per week service that maintains a basic level of frequent service on weekends.

What investments are typically made on a Frequent Transit Network?

Once the network is defined, coordinated transit service, transit capital, access, and land use investments should be made on these corridors. Investments include:

- **Intersection and Signal Management**: It is critical how signals and rights-of-way are managed in FTN corridors. Since these corridors carry the highest volume of transit riders and have the greatest potential to capture more non-auto users, signal management at intersections should favor transit vehicles; on-street parking uses should be sacrificed in the interest of moving full, high-capacity buses through congested commercial districts; and integrated solutions should be sought to allow transit and bicycles to safely coexist.
- **Stops/Stations:** The quality of stop and station amenities on FTN corridors is critical. Stops/stations also represent an opportunity to brand the FTN network differently so that

it is clear to riders where high frequency service operates (see Chapter 6 for more information).

- **Multimodal Investment**: Coordinated multimodal investments along the FTN allow easy, safe access to frequent service (see Chapter 4 for further discussion).
- **Land Use**: Zoning and other land use policies must support high frequency service along the FTN (see Chapter 6 for further discussion).

Service Design Principles for Salt Lake City

In conjunction with the corridor evaluation process, these principles were used to design the network of corridors recommended for service investment and capital investment. These principles respond to the goals of the Plan, the gaps analysis, and input from stakeholders and the public.

- **Convenient**: Provide frequent, reliable daytime and evening transit service
- **Connected**: Provide simple, citywide connections on a high-frequency network
- **Legible**: Brand the core frequent transit network differently and design for ease of understanding
- **Easy to Use**: Make the transit network easy to access and comfortable
- **Demand Driven**: Invest in transit where overall travel market demand is high
- **Permanent**: Provide stable service that riders and investors can rely on now and in the future

These service design principles inform the service and capital recommendations, as well as the recommendations for programs, policies, and other supportive investments which are presented in a separate memo.

Frequent Transit Network in Salt Lake City

A High-Frequency Grid System for Salt Lake City

UTA altered its route structure to a largely hub-and-spoke system several years ago with the construction of the Intermodal Hub, which is located in an area west of downtown that does not have considerable current activity or density. Currently, many of UTA's routes terminate at the Hub to take advantage of the centralized layover space that is available there. The gaps analysis and public outreach has revealed that this creates challenges for people who need to travel to other destinations throughout the city, necessitating multiple transfers and/or indirect trips. Further, in some cases, route productivity is undermined as routes must go to the Hub despite a lack of demand.

Salt Lake City's strong linear street grid is well-suited for a grid-based system if new layover locations can be identified. This change could allow for more frequency on heavily used routes and/or offering better service in currently under-served areas where there is demand.

The corridor evaluation process was designed to support Salt Lake City's evolution towards a more grid-based system. The phase II analysis used continuous and direct citywide corridors and explored two new locations for transit hubs – one in East Downtown near 700 E and 200 S and one at the University of Utah (indicated on the maps in this memo). Creating more layover space for UTA buses is a major factor in whether changes can be made to the transit system, including implementation of the envisioned FTN network.

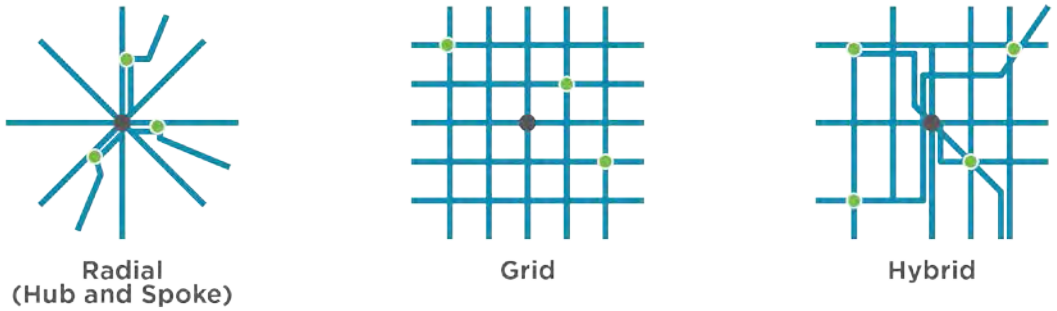


Illustration of basic concepts in transit network design.
Source: Nelson\Nygaard

Frequent Transit Network Service Level Definition

High frequency is critical to the functioning of a grid-based transit system as riders depend more on transfers. Based on the general principles described above, the level of service shown in Figure D-4 is recommended for the FTN. All designated FTN routes should operate according to these parameters, which were designed not only to be frequent, but also to operate relatively consistently all day, every day. The service design is simple and easy to understand so that riders can use an FTN route without referencing a schedule. In conjunction with clear branding, this provides a level of certainty and reliability on which riders can depend.

Figure D-4 FTN Service Level Definition

Day of the Week	Frequency	Span
Monday – Saturday	30 minutes	5 am – 6 am
	15 minutes	6 am – 7 pm
	30 minutes	7 pm – 11 pm
Sunday	30 minutes	7 am – 7 pm

Frequent Transit Network Recommendation

Figure D-5 illustrates the draft recommendation for a grid-based FTN for Salt Lake City. The FTN is a long-range vision that is intended to be phased in over time. There are two basic FTN phases:

1. **Tier 1**

   Existing: Corridors that are already served by frequent service.*

   Future: Corridors that have conditions now or in the near-term that merit FTN status. These were the top performing corridors in both phases of analysis.

2. **Tier 2**

   Future: Corridors that are projected to have conditions that merit FTN status in the future. These are corridors that performed well in one of the phases of evaluation or are high priorities from a community outreach standpoint.

**Note: those corridors designated as "Existing" do not meet the FTN service level definition shown in Figure D-4, with the exception of State Street (Route 200). For the most part, they provide frequent service (at least every 15 minutes) during weekdays during the day (peak periods and midday). As of completion August 2015,[3] there were no routes that operate at 15 minute frequency every day of the week, there was one route (200-State Street) that operated at this frequency 6 days per week, and only the TRAX network operated at this frequency during weekday evenings. With implementation of Tier 1, service on these corridors should be upgraded to meet the FTN definition.*

Relationship to UTA Service Categories

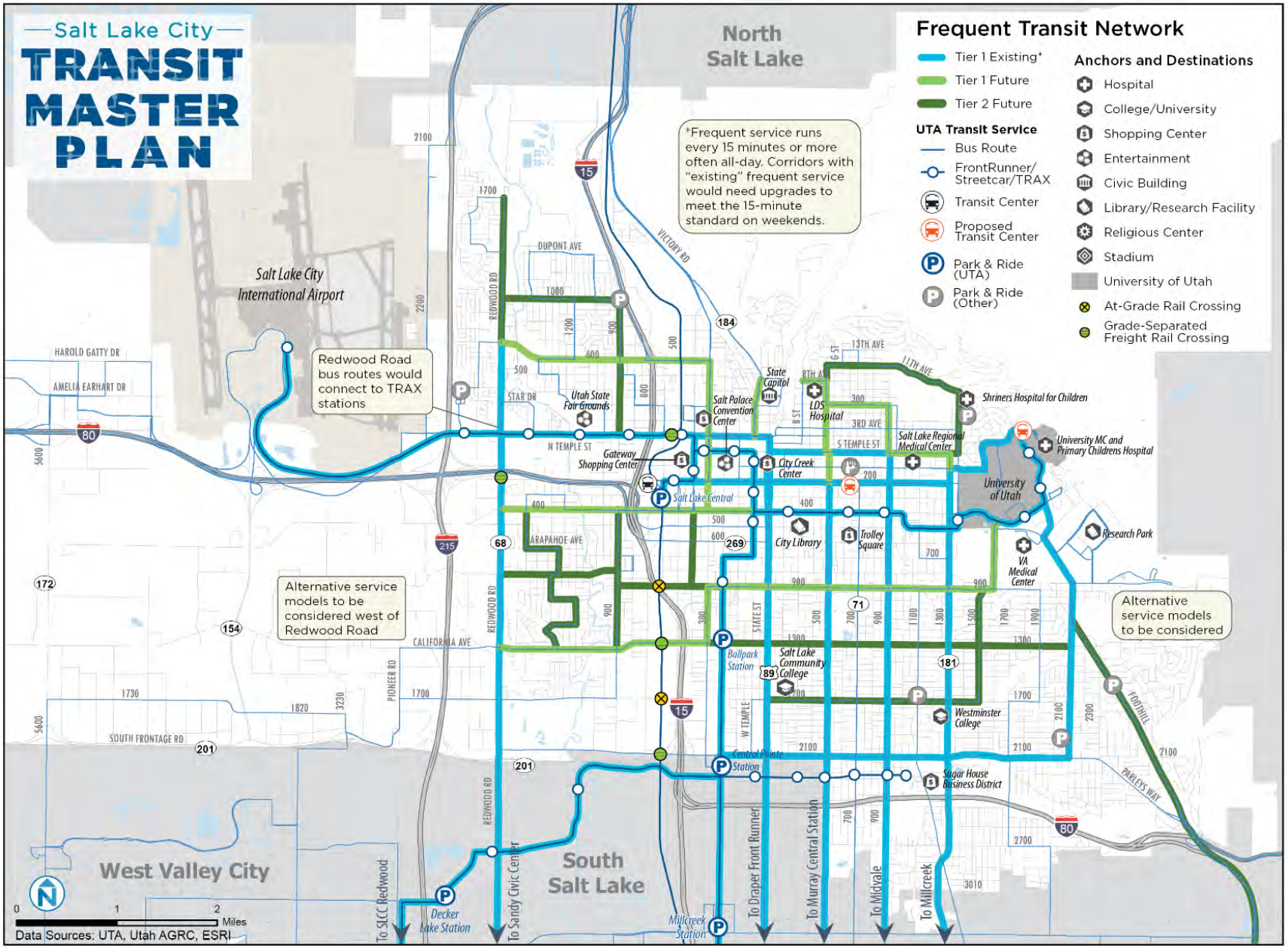
Based on outreach findings, the current UTA frequent transit network branding is not readily visible to the average rider. UTA's current service types are not defined primarily based on frequency, but on a combination of service qualities including purpose, stop spacing, and frequency, e.g., types include local, shuttle, flex, commuter, express, and fast bus. UTA is rolling out Bus Rapid Transit lines and a Bus Plus network that will be branded high-frequency services with improved reliability and higher level of stops/stations. These recommendations should be coordinated with UTA's roll out of more branded service categories based on service level and reliability, e.g., local/neighborhood access/feeder routes, high frequency trunk lines (straight lines city wide). (See Programs and Supportive Investments memo for further discussion.)

Route Stability

One adopted, it is critical that the FTN become a stable, relatively unchanging part of the transit system so that riders can rely on it much as they do the TRAX system.

[3] See http://www.rideuta.com/uploads/Aug2015BusFrequency_Large.jpg

Figure D-5 Draft Frequent Transit Network Vision Recommendation



Note: The Final FTN Vision maps are provided in Chapter 2.

Local Service Network

The FTN is designed to serve long, direct citywide corridors. For a complete and easy-to-use transit system, it is critical that the transit system also includes complementary local routes that provide feeder service to the FTN and neighborhood circulation. Coverage rather than speed is the goal for the local network. Stop spacing as close as 600 feet can be acceptable in some cases. As with the FTN, transit access improvements are critical to maximizing usefulness of the local services and providing equitable access to transit service for all populations.

The local network that feeds the FTN is not a key focus of this plan, since the City's limited transit resources will be focused on the development of the FTN. However, the City should support UTA actions to:

- Maintain a basic or "lifeline" level local service to within ½ mile of most residents. This level of service is defined by a minimum of 60 minute frequencies for 12 hours per day. If a route cannot support this level of service, then provision of alternative service models should be considered (see below).
- As the FTN is implemented, the local route network should be adjusted to ensure it complements and supports new frequent services.

Community Shuttles

Public outreach findings indicated a desire for services that provide better neighborhood connectivity. Community shuttles, sometimes described as neighborhood circulators, are a model that is used in some cities to serve short trips within communities, feed major transit routes (rail, BRT, or other frequent transit network service), shopping, employment, and other activities. Community shuttles often use smaller capacity vehicles, such as 20 to 25 passenger mini-buses, to provide local transit service in lower density residential neighborhoods or areas of challenging topography that are more difficult to serve with conventional fixed-route transit service. The cost-effectiveness of this model may be maximized through a special contracted rate for community shuttle operators. (See Chapter 2 for examples and further discussion).

Alternative Service Models

Several neighborhoods in Salt Lake City have transit needs, but lack sufficient density or demand to justify providing FTN or even local service, as defined above. These neighborhoods are candidates for alternative service models which can provide critical first mile/last mile connections in low-demand areas, such as demand-responsive public transportation services, private and institutionally-operated shuttles targeted at specific populations, and on-demand shared ride services (see Chapter 2 for examples and further discussion).

CAPITAL INVESTMENTS

Overview of Capital Investment

The Plan includes recommendations for where capital investment in the transit system will provide the greatest community benefits. Capital improvements can include investments in right-of-way management and intersections to benefit transit performance, as well as modal upgrades to Enhanced Bus, Bus Rapid Transit, and/or rail. At this stage, the corridors recommended for infrastructure improvements are highlighted. Capital corridors were analyzed to identify potential modes that are appropriate in each of these recommended corridors.

Capital Investment Initial Recommendations

The top performing corridors in the phase II evaluation are recommended for capital improvements (see Figure D-6). A first step in developing capital improvements on these corridors would be to conduct more detailed corridors studies to refine the mode, specific alignment, and design.

East-West Corridors:

Analysis of capital improvements is recommended along three east-west corridors that serve the University of Utah, spaced about one quarter- to one half-mile apart:

- **#1: 200 S** (Salt Lake Central - University of Utah)
- **#2: North and South Temple** (North Temple station - University of Utah)
- **#3: 400 S** (Redwood Road- University of Utah)

In addition, the following corridor is recommended for inclusion, as this corridor has been studied by UTA as an upgrade to the TRAX system to enable a direct connection between the Airport and the University of Utah:

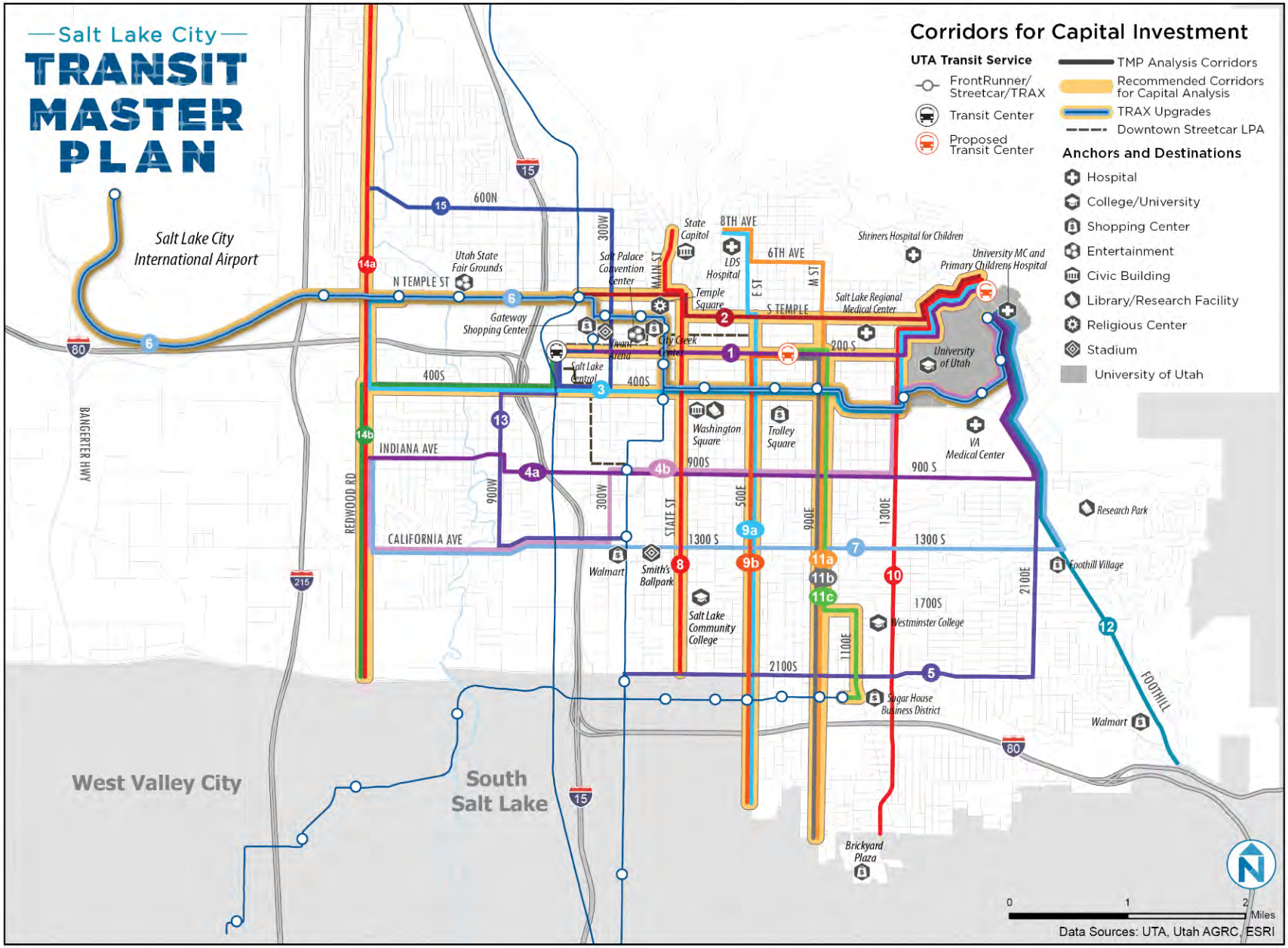
- **#6: North Temple/400 S** (Airport – University of Utah)

North-South Corridors

Analysis of capital improvements is recommended along four north-south corridors:

- State Street is the highest performing north-south corridor in the evaluation:
  - **#8: State Street** (SLC Southern border - State Capitol)
- Analysis of improvements is recommended along two high-performing corridors that could potentially serve a recommended new transit center located along 200 S between 500 E and 900 E and/or provide north-south connections into the Avenues neighborhood and to LDS Hospital. Significant changes would likely not be proposed to the right-of-way in the Avenues, so capital improvements to these corridors are not indicated north of South Temple Street.
  - **#9 a/b: 500 E** (SLC southern border - 200 S or S. Temple)
  - **#11 a/b/c: 900 E** (SLC southern border - 200 S or S. Temple)
- Although the Redwood Road corridor does not score as highly on density metrics as other corridors, it is an important continuous transit corridor for connectivity on the west side of the city and thus is recommended for further capital investment analysis:
  - **14 a/b: Redwood Road** (SLC southern border - 1700 N)

Figure D-6 Draft Capital Corridors Recommendation



Note: The final Capital Investment Corridors map is provided in Chapter 3.

ATTACHMENTS

Attachment A: Phase I Evaluation Results

Attachment B: Phase II Evaluation Results

Salt Lake City

TRANSIT MASTER PLAN

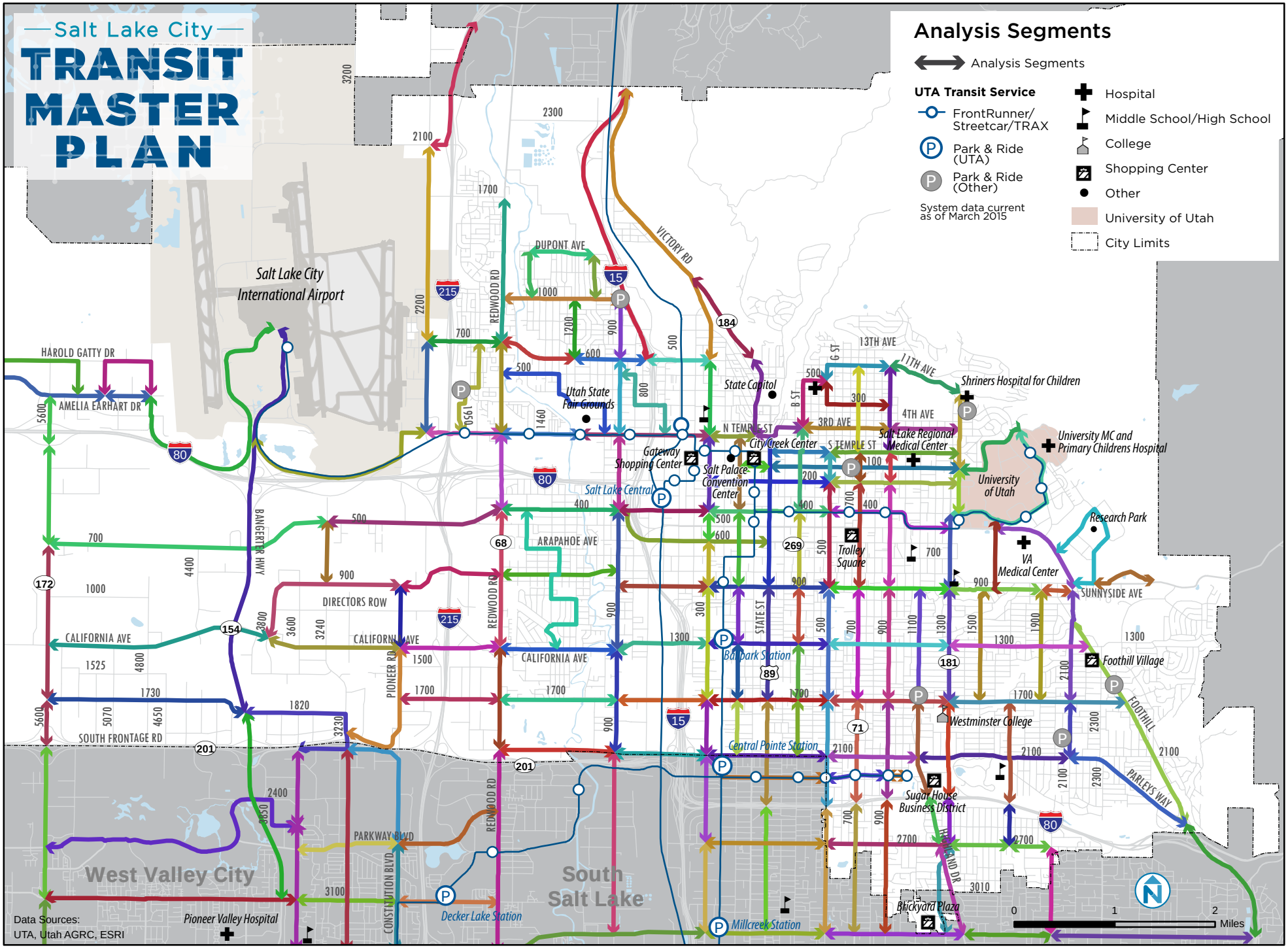
Attachment A - Phase I Evaluation Results

September 2015

NELSON NYGAARD

Attachment A - PHASE I EVALUATION

For Phase I of the evaluation, the corridors did not represent a network of transit routes, but a series of arterial roadway segments. Segments were created using logical breakpoints (e.g., key intersections) to provide more granular representation of current and/or potential transit-carrying arterials. The following pages show the corridor segment map for Salt Lake City that was used for the first phase of the evaluation and maps of the results.


Salt Lake City
TRANSIT MASTER PLAN
Analysis Segments
Analysis Segments
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
System data current as of March 2015
Hospital
Middle School/High School
College
Shopping Center
Other
University of Utah
City Limits
Salt Lake City International Airport
HAROLD GATTY DR
AMELIA EARHART DR
DUPONT AVE
VICTORY RD
REDWOOD RD
Utah State Fair Grounds
State Capitol
N TEMPLE ST
Gateway Shopping Center
City Creek Center
Salt Palace Convention Center
Salt Lake Central
S TEMPLE ST
Salt Lake Regional Medical Center
Shriners Hospital for Children
University MC and Primary Childrens Hospital
University of Utah
Research Park
VA Medical Center
13TH AVE
11TH AVE
4TH AVE
3RD AVE
G ST
B ST
ARAPAHOE AVE
DIRECTORS ROW
CALIFORNIA AVE
BANGERTER HWY
PIONEER RD
STATE ST
Trolley Square
Ballpark Station
SUNNYSIDE AVE
Foothill Village
FOOTHILL
Westminster College
Central Pointe Station
Sugar House Business District
PARLEYS WAY
HIGHLAND DR
Blickyard Plaza
SOUTH FRONTAGE RD
PARKWAY BLVD
CONSTITUTION BLVD
West Valley City
South Salt Lake
Pioneer Valley Hospital
Decker Lake Station
Millcreek Station
Data Sources:
UTA, Utah AGRC, ESRI
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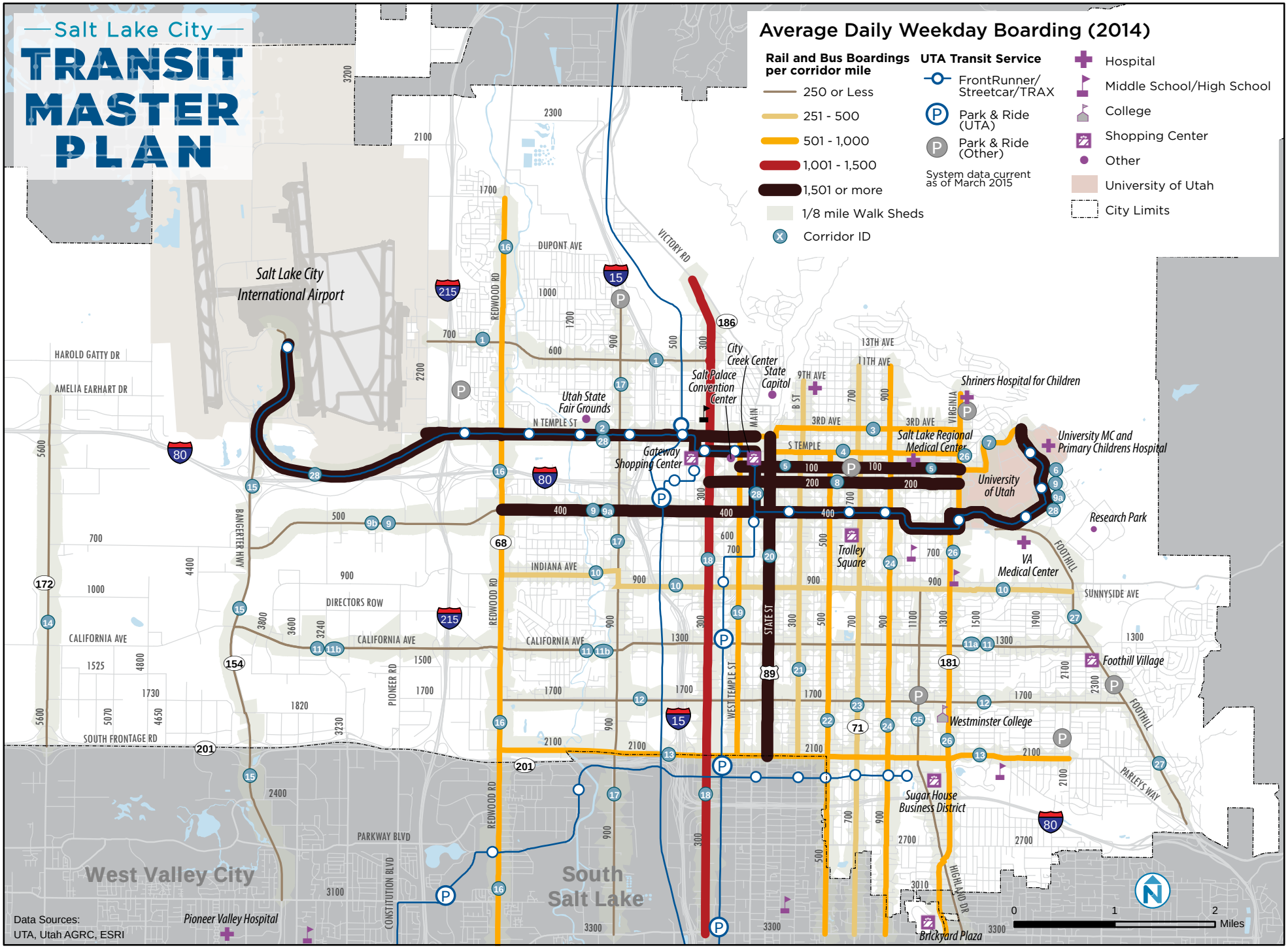
Miles


Salt Lake City
TRANSIT MASTER PLAN
Average Daily Weekday Boarding (2014)
Rail and Bus Boardings per corridor mile
250 or Less
251 - 500
501 - 1,000
1,001 - 1,500
1,501 or more
1/8 mile Walk Sheds
Corridor ID
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
System data current as of March 2015
Hospital
Middle School/High School
College
Shopping Center
Other
University of Utah
City Limits
Salt Lake City International Airport
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South Salt Lake
Utah State Fair Grounds
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Research Park
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VA Medical Center
Foothill Village
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Sugar House Business District
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WEST TEMPLE ST
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DIRECTORS ROW
CALIFORNIA AVE
SOUTH FRONTAGE RD
PIONEER RD
BANGERTER HWY
PARKWAY BLVD
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PARLEYS WAY
Data Sources:
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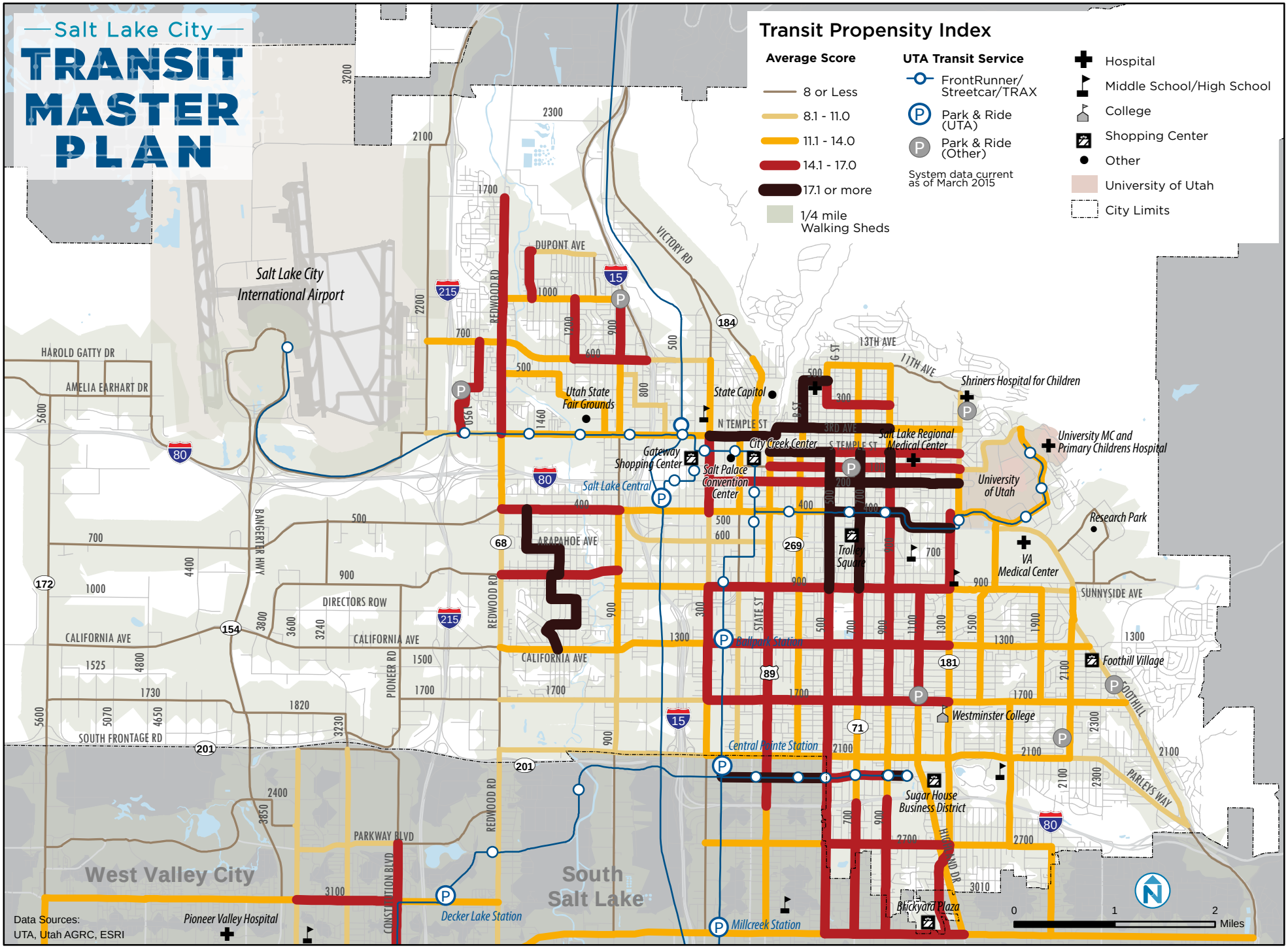
Salt Lake City
TRANSIT MASTER PLAN
Transit Propensity Index
Average Score
8 or Less
8.1 - 11.0
11.1 - 14.0
14.1 - 17.0
17.1 or more
1/4 mile Walking Sheds
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
System data current as of March 2015
Hospital
Middle School/High School
College
Shopping Center
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University of Utah
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Salt Lake City International Airport
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PIONEER RD
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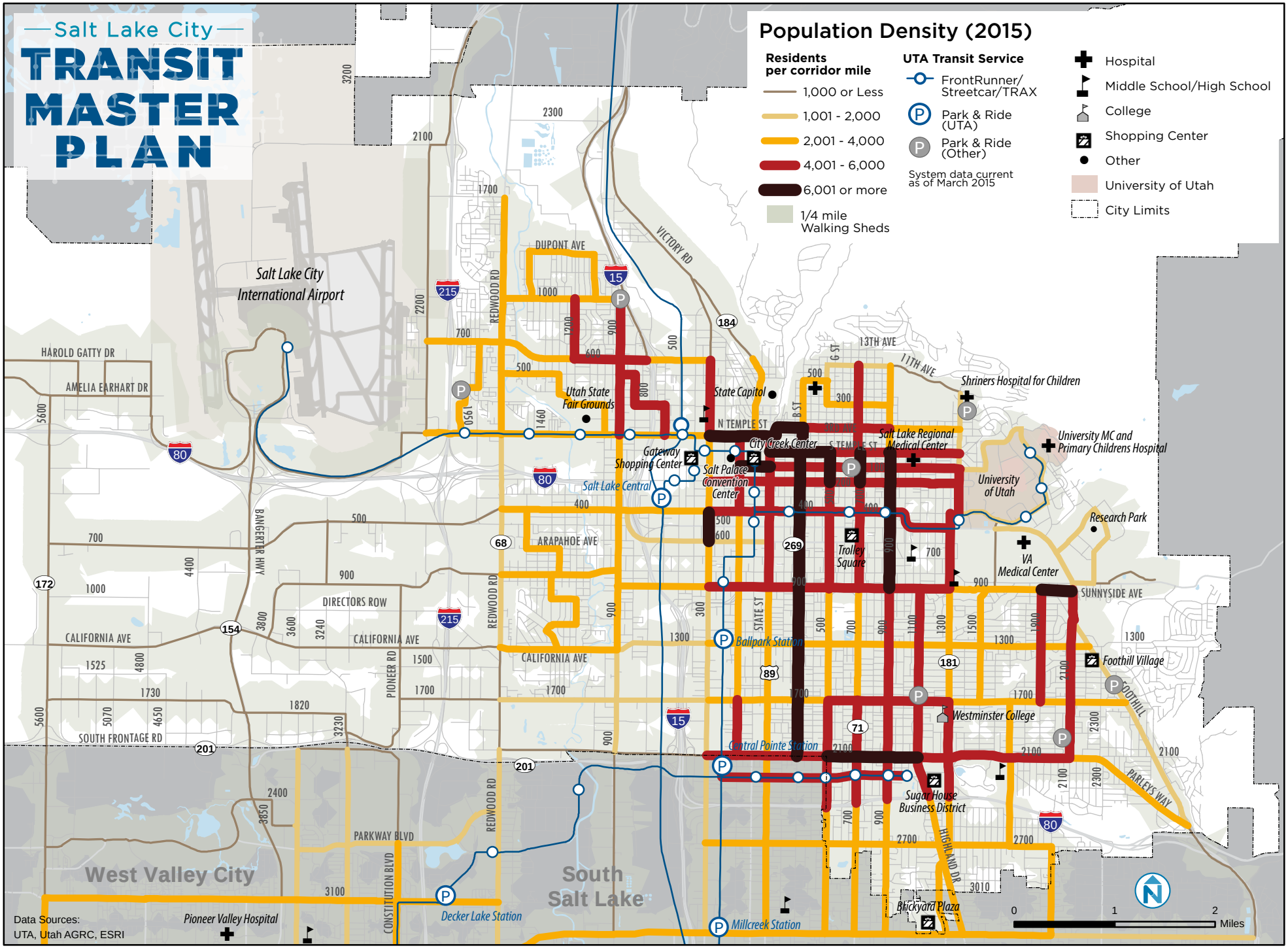
Salt Lake City
TRANSIT MASTER PLAN
Population Density (2015)
Residents per corridor mile
1,000 or Less
1,001 - 2,000
2,001 - 4,000
4,001 - 6,000
6,001 or more
1/4 mile Walking Sheds
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
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Hospital
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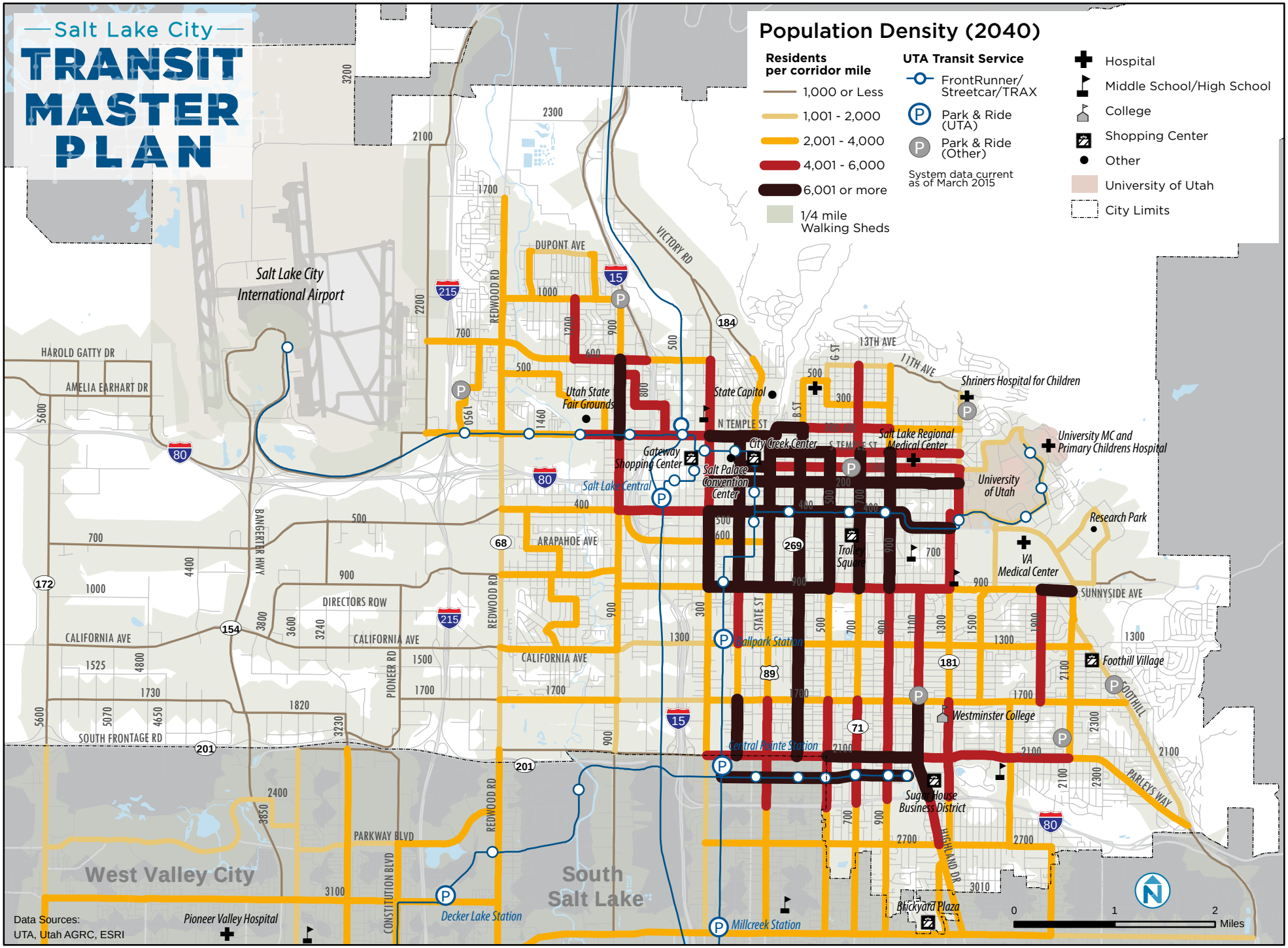
Salt Lake City
TRANSIT MASTER PLAN
Population Density (2040)
Residents per corridor mile
1,000 or Less
1,001 - 2,000
2,001 - 4,000
4,001 - 6,000
6,001 or more
1/4 mile Walking Sheds
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
System data current as of March 2015
Hospital
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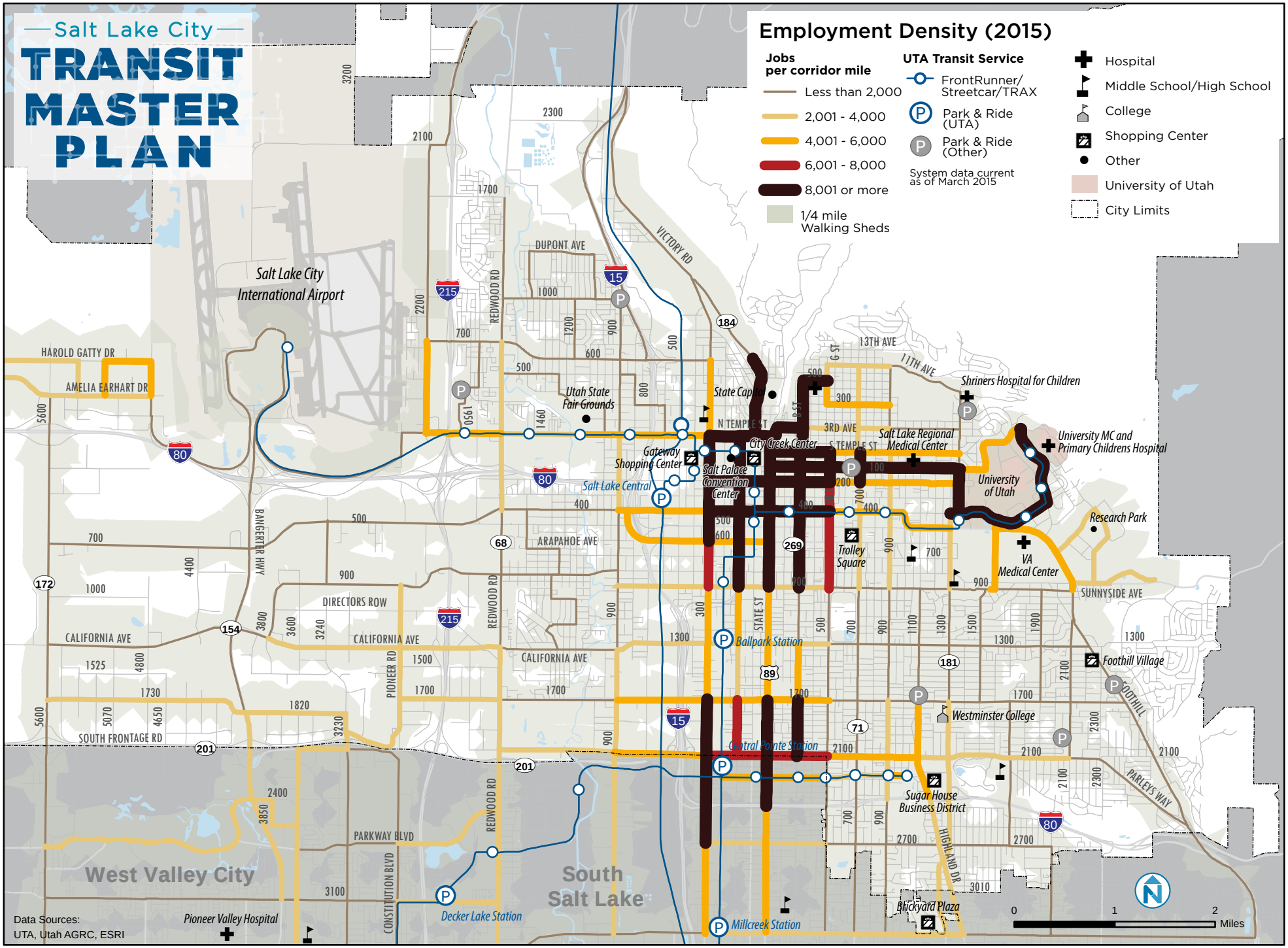
Salt Lake City
TRANSIT MASTER PLAN
Employment Density (2015)
Jobs per corridor mile
Less than 2,000
2,001 - 4,000
4,001 - 6,000
6,001 - 8,000
8,001 or more
1/4 mile Walking Sheds
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
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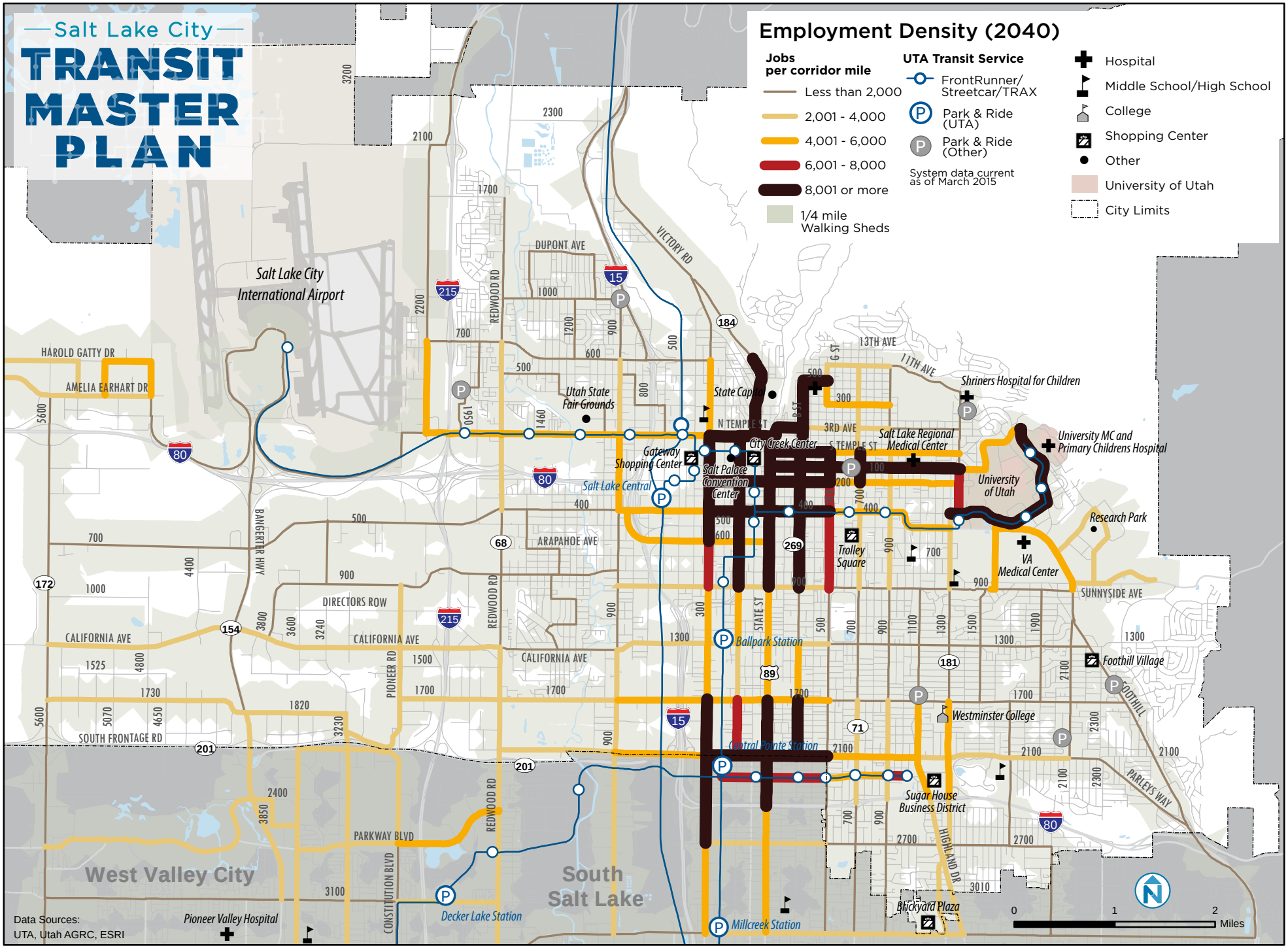
Salt Lake City
TRANSIT MASTER PLAN
Employment Density (2040)
Jobs per corridor mile
Less than 2,000
2,001 - 4,000
4,001 - 6,000
6,001 - 8,000
8,001 or more
1/4 mile Walking Sheds
UTA Transit Service
FrontRunner/ Streetcar/TRAX
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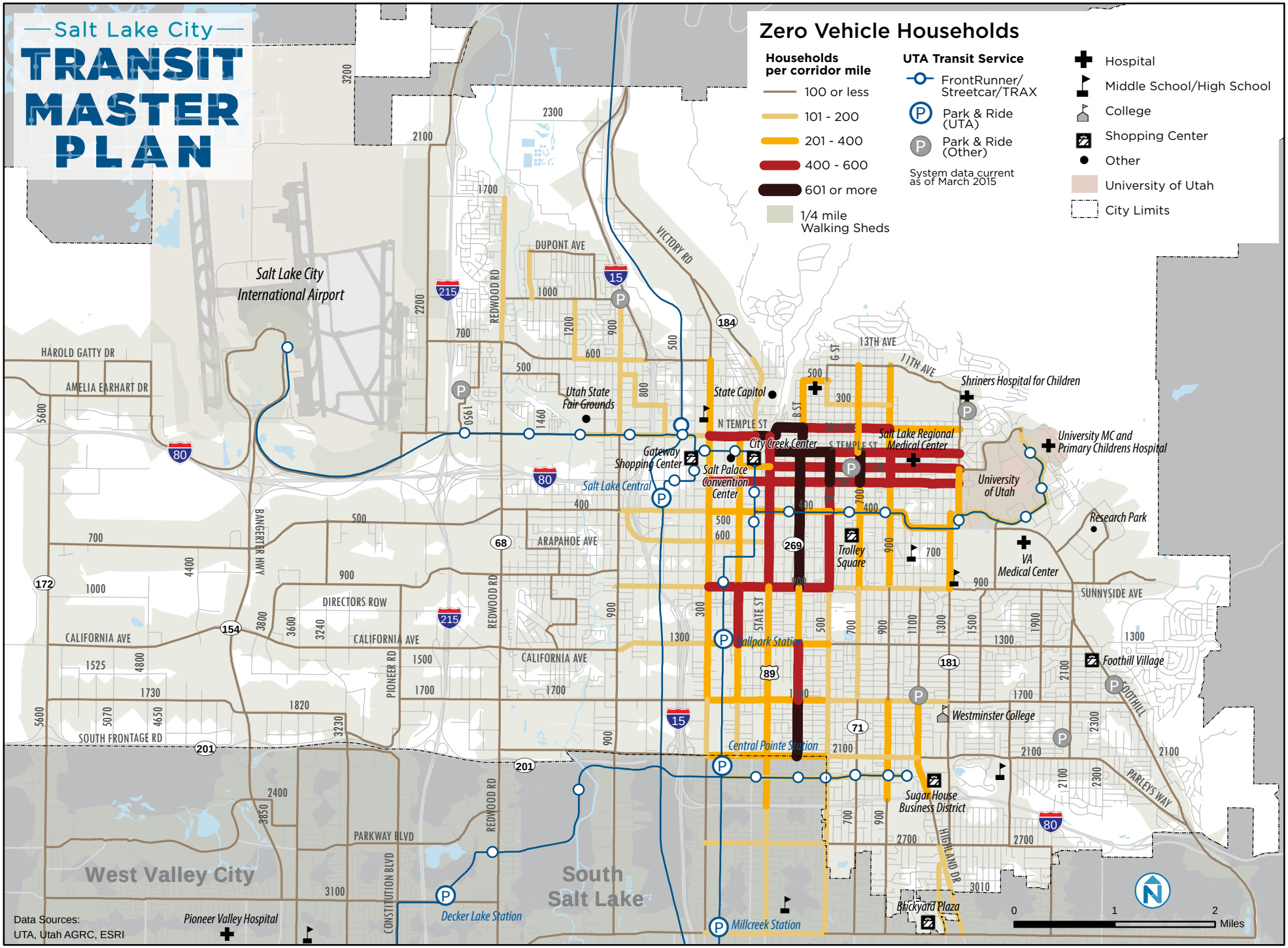
Salt Lake City
TRANSIT MASTER PLAN
Zero Vehicle Households
Households per corridor mile
100 or less
101 - 200
201 - 400
400 - 600
601 or more
1/4 mile Walking Sheds
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
System data current as of March 2015
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ARAPAHOE AVE
DIRECTORS ROW
CALIFORNIA AVE
SUNNYSIDE AVE
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PARLEYS WAY
HIGHLAND DR
SOUTH FRONTAGE RD
PARKWAY BLVD
CONSTITUTION BLVD
PIONEER RD
BANGERTER HWY
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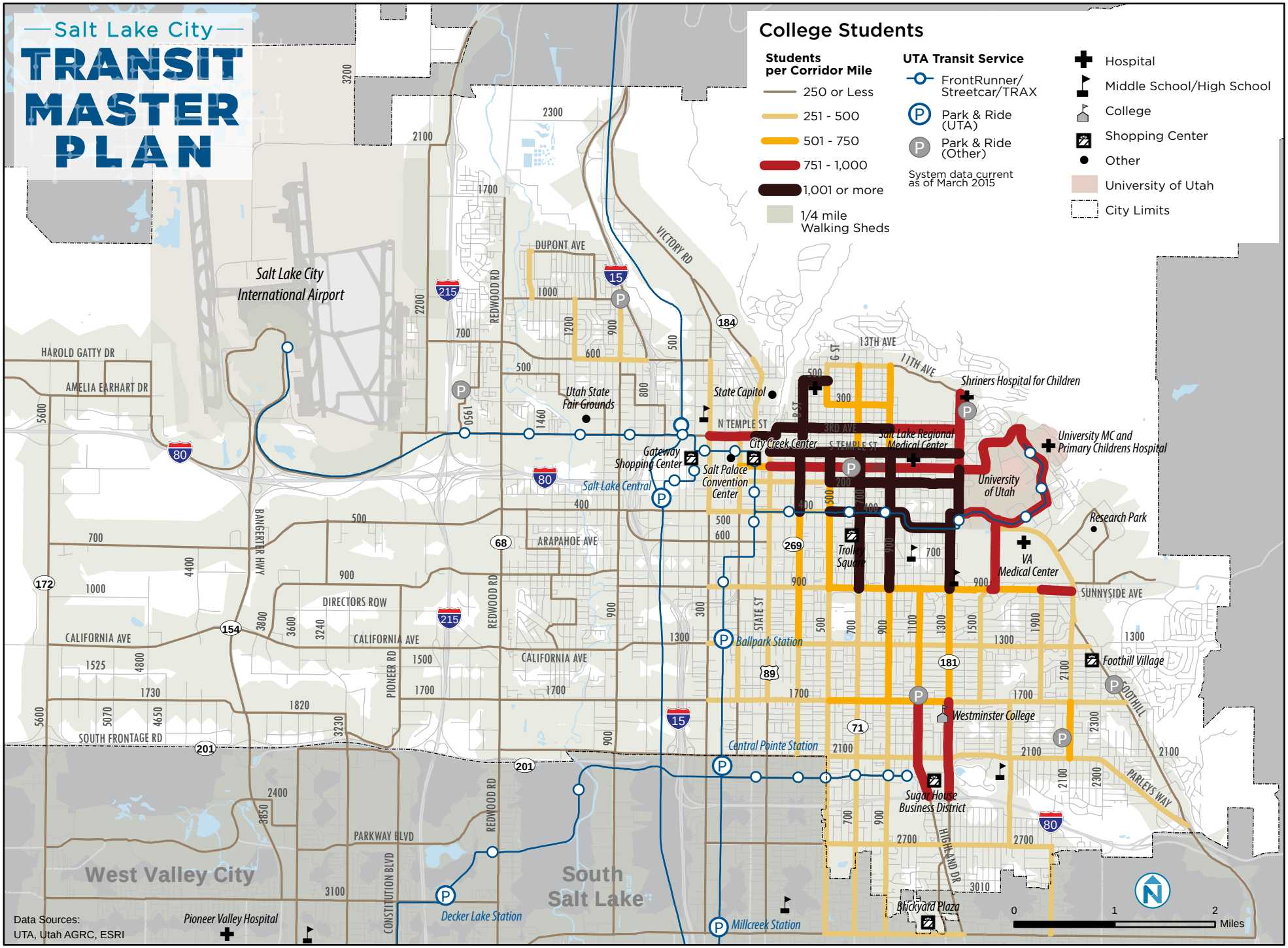
Salt Lake City
TRANSIT MASTER PLAN
College Students
Students per Corridor Mile
250 or Less
251 - 500
501 - 750
751 - 1,000
1,001 or more
1/4 mile Walking Sheds
UTA Transit Service
FrontRunner/ Streetcar/TRAX
Park & Ride (UTA)
Park & Ride (Other)
System data current as of March 2015
Hospital
Middle School/High School
College
Shopping Center
Other
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Brickyard Plaza
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SOUTH FRONTAGE RD
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BANGERTER HWY
STATE ST
SUNNYSIDE AVE
FOOTHILL
PARLEYS WAY
HIGHLAND DR
Data Sources:
UTA, Utah AGRC, ESRI
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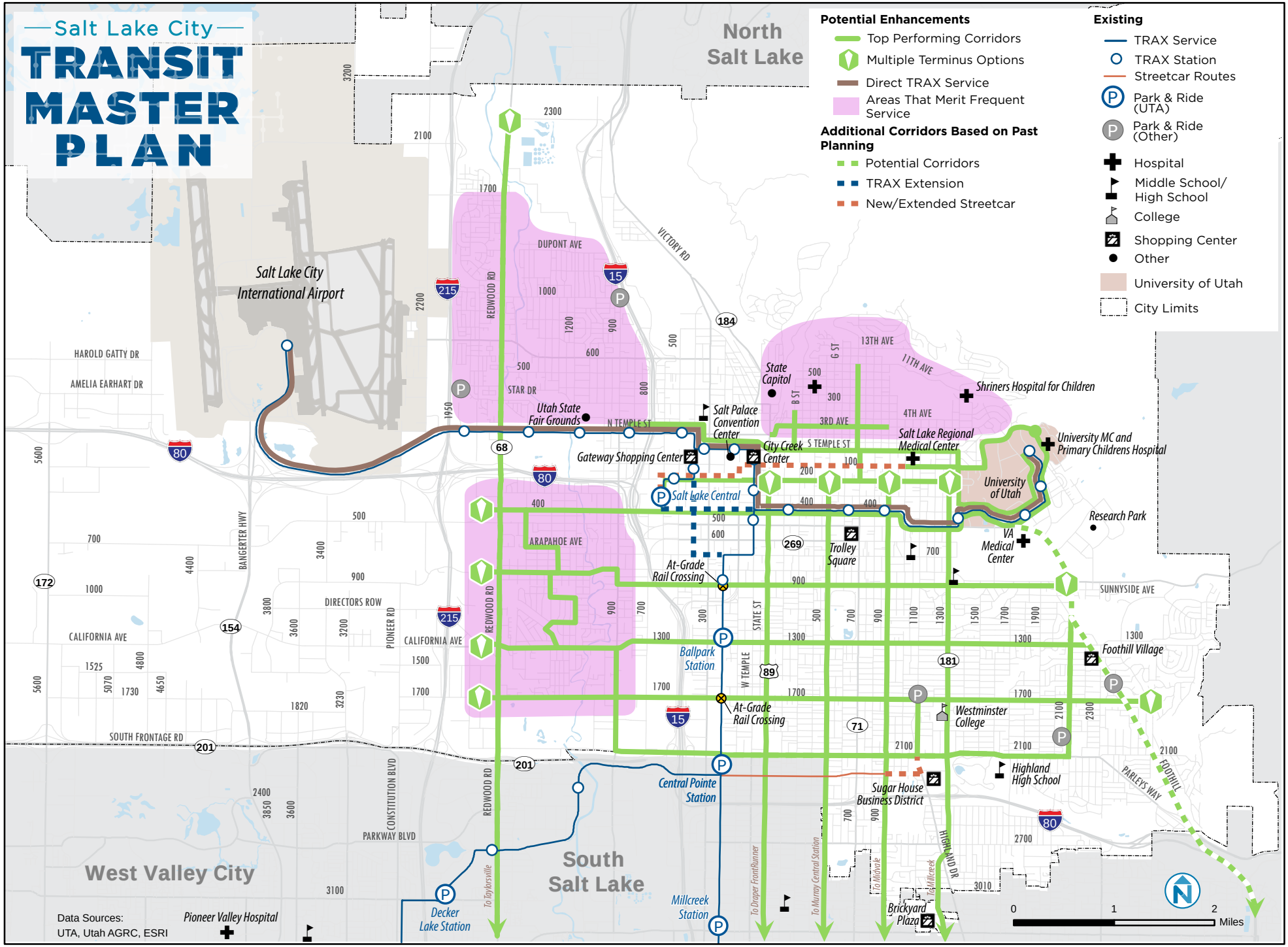
Miles

OUTCOMES OF PHASE 1 SCREENING



Salt Lake City

TRANSIT MASTER PLAN

Attachment B - Phase II Evaluation Results

December 2015

NELSON NYGAARD

Attachment B PHASE II EVALUATION

This section provides additional detail on the phase II corridor evaluation.

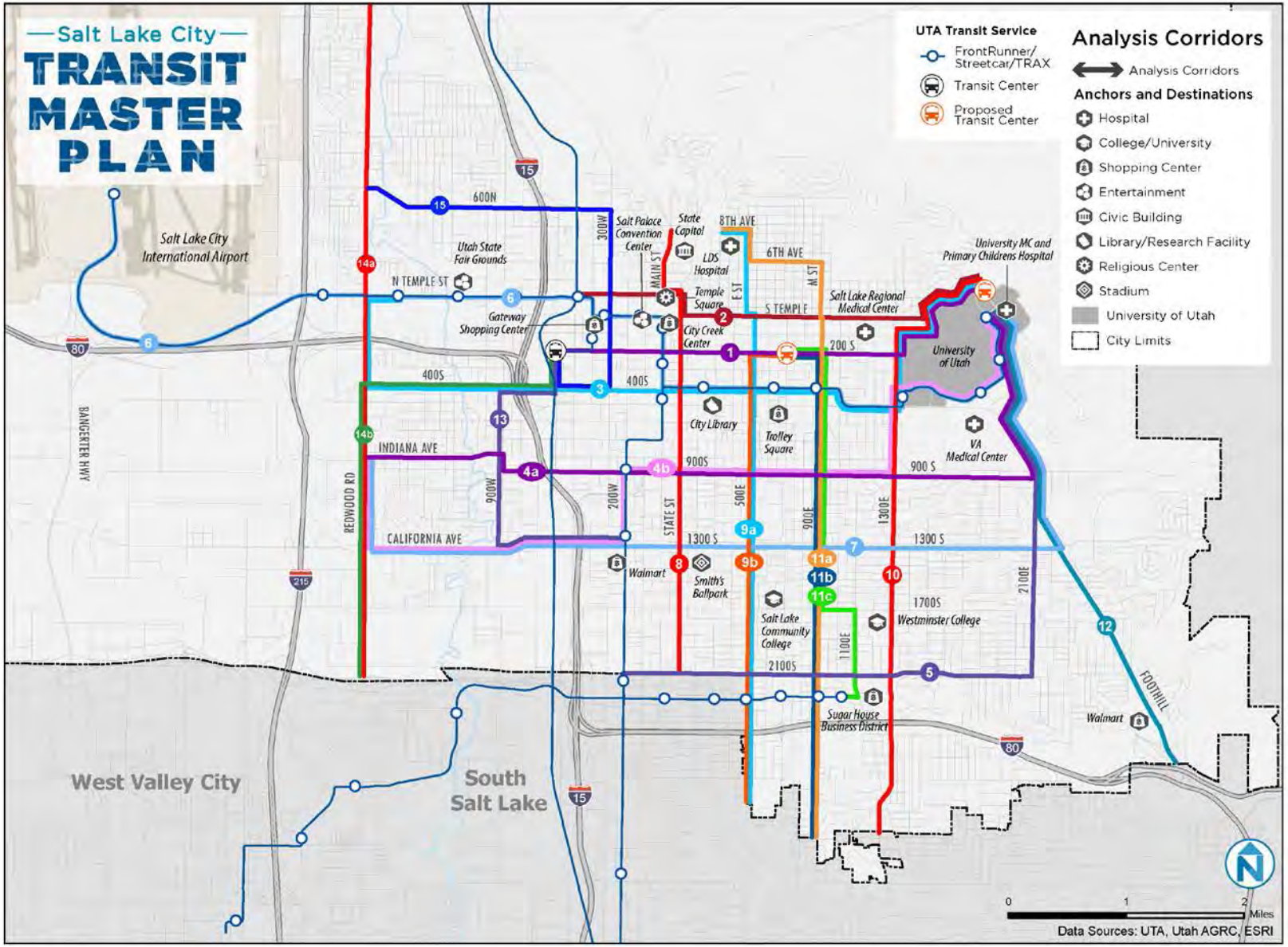
Corridors

Figure B-1 identifies the corridors that were considered in the phase II evaluation, as identified through the phase I screening process. The corridors are categorized as primarily east-west and north-south and are illustrated in Figure B-2. For the purposes of this phase of evaluation, all corridors are assumed to use a bus mode, with exception of Corridor 6 (the previously planned TRAX Black Line project), and operating characteristics and capital costs are also held constant.

Figure B-1 Corridors for Phase II Evaluation

Ph2 ID	Type	Corridor Name	Corridor Distance	Assumed Mode	Anchor 1	Anchor 2
1	East-West	200 S	4.0	Bus	Central Station	University
2	East-West	North Temple + South Temple	3.7	Bus	North Temple TRAX	University
3	East-West	400 S	7.2	Bus	Power TRAX station	University
4a	East-West	900 S	7.5	Bus	Redwood and Indiana	University via 2100 E/Foothill
4b	East-West	900 S (via 1300 S)	8.3	Bus	Redwood and Indiana	University southern alignment (#6)
5	East-West	2100 S - 2100 E	6.8	Bus	Central Pointe TRAX	University
6	East-West	North Temple - 400 S (TRAX Black Line)	10.9	TRAX	Airport	University
7	East-West	1300 S	8.9	Bus	Redwood and Indiana	University
8	North-South	State Street	3.9	Bus	State Capital	SLC Southern border
9a	North-South	500 E (to LDS Hospital)	4.6	Bus	LDS Hospital	SLC Southern border
9b	North-South	500 E (to New Hub)	3.9	Bus	New Hub (700 E/200 S)	SLC Southern border
10	North-South	1300 E	5.3	Bus	University	SLC Southern border
11a	North-South	900 E (to LDS Hospital)	5.7	Bus	LDS Hospital	SLC Southern border
11b	North-South	900 E (to New Hub)	4.4	Bus	New Hub (700 E/200 S)	SLC Southern border
11c	North-South	900 E-1100 E (Sugarhouse-New Hub)	3.7	Bus	New Hub (700 E/200 S)	Sugarhouse Streetcar terminus
12	North-South	Foothill Dr	4.4	Bus	SLC Southern border	University
13	North-South	900 W	3.1	Bus	Ballpark TRAX	Central Station
14a	North-South	Redwood Road	6.8	Bus	SLC Northern border	SLC Southern border
14b	North-South	Redwood Road (to Central Station)	4.4	Bus	Central Station	SLC Southern border
15	North-South	700 N/600 N	4.4	Bus	Redwood and 700 N	Central Station

Figure B-2 Phase II Corridors Map



Evaluation Measures

Figure B-3 summarizes the methodology used to calculate each measure.

Figure B-3 Evaluation Criteria

ID	Evaluation Criteria	Measure	Methodology
	Phase I and II		
A	Existing ridership	Boardings in corridor	Daily weekday boardings, 2014, within ¼ mile of corridor
B	Transit Propensity Index (TPI)	Transit dependent residents within ¼ mile (low-income, seniors, disabled)	Density of older adults (65+), low-income households, and persons with disability (excludes households without access to a vehicle, considered separately) within ¼ mile of corridor. Data from American Community Survey.
C	Land use density current (population and employment)	Current jobs and residents within ¼ mile of corridor (per corridor mile)	Density of current (2015) population and employment within ¼ mile of corridor
D	Land use density future (population and employment)	Future jobs and residents within ¼ mile of corridor (per corridor mile)	Density of future (2040) population and employment within ¼ mile of corridor
E	Lack of access to a vehicle	Residents without access to a vehicle within ¼ mile of corridor (per corridor mile)	Density of households without access to a vehicle within ¼ mile of corridor. Data from American Community Survey.
	Phase II Only		
F	Anchor/generator strength and accessibility	Presence of and accessibility to major institutions, high visitation cultural/recreational sites, large employers	Average Walk Score (https://www.walkscore.com/) at points along each corridor
G	Potential for travel time savings and/or improved reliability	Potential for travel time improvement based on existing travel times	Corridor travel time sampled from Google Maps for different time periods in each direction: morning peak (8 am), midday (noon), afternoon peak (5 pm), evening (8 pm), late night (1 am). A ratio of the maximum to minimum travel time was calculated, representing the additional time a traveler would need to allocate to ensure arriving at a destination at the desired time.
H	Ridership potential (current and future year)	Ridership potential based on current and future land use, current ridership, travel demand patterns, and type of investment	Boardings from routes serving bus stops along each corridor, adjusted based on population/employment growth, accessibility, and service changes.
I	Redevelopment Potential	Data source TBD based on available data	Ratio of improvements to land value. Percent of area redevelopable within ¼ mile of corridors. Average of measure within designated redevelopment areas and overall.
J	Cost effectiveness	Cost per rider	Ratio of corridor capital cost (Bus Plus corridor cost per mile, held constant for all corridors) to future ridership potential.

Key Assumptions

The following sections describe key assumptions used in the analysis.

Operating Plan

Figure B-4 provides a conceptual operating plan assumed for each corridor, with "frequent" service provided for a minimum of 13 hours on weekdays, 12 hours on Saturdays, and 12 hours on Sundays. This conceptual operating plan aligns with the Frequent Transit Network Service Level Definition described in the memo. To allow for comparison between corridors, the operating plan was assumed to be constant for each corridor.

Figure B-4 Conceptual Operating Plan (FTN Service Level Definition)

Time Period	Start	End	# of Hours	Peak Headway (by period)	# of Round Trips
Weekday Early Morning	5:00 AM	6:00 AM	1	30	2
Weekday AM Peak	6:00 AM	9:00 AM	3	15	12
Weekday Day	9:00 AM	3:00 PM	6	15	24
Weekday PM Peak	3:00 PM	7:00 PM	4	15	16
Weekday Eve	7:00 PM	11:00 PM	4	30	8
Total Weekday			18		62
Sat AM	5:00 AM	7:00 AM	2	30	4
Sat Day	7:00 AM	7:00 PM	12	15	48
Sat Eve	7:00 PM	11:00 PM	4	30	8
Total Saturday			18		60
Sun AM	7:00 AM	8:00 AM	1	30	2
Sun Day	8:00 AM	7:00 PM	11	30	22
Total Sunday			12		24

Capital Costs

The bullets below summarize capital cost assumption used in the phase II evaluation. To provide a comparison between corridors, base costs were assumed to be constant for each corridor, but major capital costs such as railroad crossings were added (see Figure B-5).

- Constant capital cost of $15 million per mile based on Bus Plus assumption in UTA network study
- TRAX line (Corridor 6): Capital cost of $5.5 million assumed based on preliminary information from UTA.
  - Major capital elements: At grade railroad crossing for Corridor 4A

Figure B-5 Capital Cost Assumptions

Corridor	Additional Costs	Notes
4a	$25,000,000	Grade separation, high-level estimate
6	$5,500,000	Per UTA

Evaluation Results

The corridors were rated for each evaluation measure and scored from 0 to 3 based on natural breaks in each data element, with a score of "0" indicating the lowest performance and "3" indicating the best performance relative to the corridors evaluated.

A brief description of each evaluation criterion is below. The remaining figures in this appendix illustrate results from the phase II evaluation.

Criterion A: Existing Ridership

- See Criterion H.

Criterion B: Transit Propensity Index

- Maps and explanation of the transit propensity index (TPI) are provided in the State of the System Fact Book and Appendix A. TPI was illustrated for corridor segments as part of the phase I analysis.

Criterion C1, C2, D1, and D2: Existing and Projected Population and Employment Density

- Maps of existing and future population and employment density are provided in the State of the System Fact Book and Appendix A. Population and employment density was illustrated for corridor segments as part of the phase I analysis.

Criterion E: Lack of Access to a Vehicle (Household Density)

- A map showing the density of households without access to a vehicle is provided in the State of the System Fact Book and Appendix A. Density of households without access to a vehicle was illustrated for corridor segments as part of the phase I analysis.

Criterion F: Anchor/Generator Strength and Accessibility (Walk Score)

- The average Walk Score was calculated for points along each corridor (data from www.walkscore.com). Figure B-8 illustrates scores, sampled at 0.10 mile intervals for all of Salt Lake City.

Criterion G. Travel Time Savings Potential

The opportunity for improvements to improve transit speed and reliability of transit was based on a measure of travel time reliability. Existing auto travel times were sampled from Google Maps for different weekday time periods. A ratio of congested to free-flow travel times was calculated (this is sometimes referred to as a travel time planning index, representing the maximum additional time a traveler or bus rider would need to allow to ensure arriving at their destination at the desired time). The maximum travel time was used to represent congested conditions and the minimum travel time was used to represent free-flow conditions. Each corridor was given a score ranging from:

- 0 – Low ratio: lack of congestion and relatively little need for speed and reliability improvement based on current traffic conditions, to
- 3 – High ratio: congestion and potential for capital improvements to improve transit travel time

Other factors compiled for qualitative assessment include street classification and cross section (e.g., number of lanes and lane designations) and current or funded investments in speed and reliability improvements.

Figure B-9 summarizes travel time information for each corridor, general right-of-way conditions, and whether the corridor is recommended for modal analysis.

Criterion H: Future Ridership Potential

A sketch-level analysis of future ridership potential used the followed steps:

- **For corridors with existing service:**
  - Base Ridership: Boardings from routes serving similar travel patterns to the proposed corridor were tabulated at each stop along the corridor.
  - Population/Employment Adjustment: population and employment growth was calculated for a quarter-mile buffer around each stop, and existing ridership was assumed to increase in proportion to projected growth.
- **For corridors without existing service:**
  - Ridership was based on corridors with similar land use (e.g., population/employment densities) and/or anchors.
- **Response to Proposed Service Levels**
  - Future ridership calculation included industry-standard elasticities for rider response to changes in transit service levels (# of weekday trips) and travel times.
  - Ridership growth at stops with substantial projected increases in density, higher transit propensity (based on Measure B: TPI), and/or greater accessibility (based on Measure F: Walk Score) was assumed to be more responsive to service changes.

Note: Analysis for this criterion differs from phase I analysis in this it is limited to existing ridership on routes that serve similar travel patterns.

Criterion I. Redevelopment Potential

Figure B-10 illustrates redevelopment potential for parcels close to the analysis corridors and designated redevelopment areas. This measure is based on the ratio of the value of improvements, e.g., buildings, to land value (I/L). Parcels where improvements are valued at 100% or less of the land value are considered to be underutilized. The area of such parcels within a quarter-mile of the analysis corridors was calculated in two ways: 1) for the entire corridor (reflects simple I/L measure) and 2) limited to redevelopment areas (reflects I/L measure as well as city adopted policy for where redevelopment should occur). The rating was based on the average of the two calculations.

Corridors 13 (900W) and 14b (Redwood Road) had the highest share of redevelopable parcels within redevelopment areas, and Corridors 6 (TRAX Black Line), 12 (900w), and 14a (Redwood Road) had the highest share corridor-wide.

Figure B-6 Phase II Corridor Scores

ID	Length (Miles)	Category	Description	A.Existing ridership (per mile)	B.Transit Propensity Index (TPI)	C1. Land use density current - population	C2. Land use density current - Employment	D1. Land use density future - Population	D2. Land use density future - Employment	E. Lack of access to a vehicle	F. Anchor/generator strength and accessibility	G. Travel Time Savings Potential	H. Future Ridership Potential (per mile)	I. Revelopment Potential: Average of I1 and I2	I1. Revelopment Potential: % of redevelopable area in RDAs	I2. Revelopment Potential: % of redevelopable area overall	J. Cost-Effectiveness	Average	TOTAL	RANK
1	4.0	East-West	200 S	3	2	2	3	3	3	3	2	0	3	0.5	0	1	3	2.3	27.5	1
9a	4.6	North-South	500 E (to LDS Hospital)	2	3	3	2	3	2	3	3	0	2	1.0	1	1	3	2.3	27.0	2
8	3.9	North-South	State Street	1	2	2	3	3	3	3	3	1	1	1.5	2	1	2	2.1	25.5	3
9b	3.9	North-South	500 E (to New Hub)	2	3	3	2	3	2	3	3	0	1	0.5	1	0	3	2.1	25.5	3
2	3.7	East-West	North Temple + South Temple	1	2	2	3	3	3	3	2	1	1	0.5	0	1	2	2.0	23.5	5
11c	3.7	North-South	900 E-1100 E (Sugarhouse-New Hub)	2	3	3	1	3	1	2	2	0	2	0.0	0	0	3	1.8	22.0	6
6	10.9	East-West	North Temple - 400 S (TRAX Black Line)	3	0	1	2	1	2	2	1	1	2	1.5	0	3	3	1.6	19.5	7
11a	5.7	North-South	900 E (to LDS Hospital)	2	3	3	0	2	0	2	2	0	2	0.0	0	0	3	1.6	19.0	8
3	7.2	East-West	400 S	0	2	2	2	2	2	2	2	2	0	1.0	1	1	1	1.5	18.0	9
11b	4.4	North-South	900 E (to New Hub)	1	3	3	0	3	0	2	2	2	0	0.0	0	0	1	1.4	17.0	10
15	4.4	North-South	700 N/600 N	0	1	2	2	2	2	1	2	1	0	1.5	2	1	0	1.2	14.5	11
13	3.1	North-South	900 W	0	2	1	1	1	1	1	2	1	0	2.0	3	1	0	1.0	12.0	12
7	8.9	East-West	1300 S	1	1	1	0	1	0	0	1	1	1	1.5	2	1	3	1.0	11.5	13
10	5.3	North-South	1300 E	1	2	2	1	1	1	0	1	1	0	0.0	0	0	1	0.9	11.0	14
12	4.4	North-South	Foothill Dr	0	0	0	1	0	1	0	0	3	1	1.5	0	3	2	0.8	9.5	15
4a	7.5	East-West	900 S	0	1	1	1	1	1	1	1	0	0	2.0	2	2	0	0.8	9.0	16
5	6.8	East-West	2100 S - 2100 E	0	1	1	1	1	1	0	1	1	0	1.0	0	2	1	0.8	9.0	16
14b	4.4	North-South	Redwood Road (to Central Station)	1	0	0	1	0	1	0	1	0	1	2.0	3	1	2	0.8	9.0	16
4b	8.3	East-West	900 S (via 1300 S)	0	1	1	1	1	1	1	1	0	0	1.5	2	1	0	0.7	8.5	19
14a	6.8	North-South	Redwood Road	1	0	0	0	0	0	0	1	0	1	2.5	2	3	2	0.6	7.5	20

Figure B-7 Phase 2 Corridor Analysis Data

ID	Length (Miles)	Category	Description	A. Existing ridership (per mile)	B. Transit Propensity Index (TPI)	C1. Land use density current - population	C2. Land use density current - Employment	D1. Land use density future - Population	D2. Land use density future - Employment	E. Lack of access to a vehicle (HH density)	F. Anchor/generator strength/ accessibility (walk score)	G. Travel Time Savings (congested to free-flow travel time)	H. Future Ridership Potential (per mile)	I. Redevelopment Potential: Average of I1 and I2	I1. % of redevelopable area in RDAs	I2. % of redevelopable area overall	J. Cost-Effectiveness (capital cost per annual rider)
1	4.0	East-West	200 S	1,500	9.5	11.0	27.0	14.6	27.5	0.96	64	1.3	1,900	16%	1%	31%	$30
2	3.7	East-West	North Temple + South Temple	400	9.5	11.1	26.9	14.6	27.2	0.91	63	1.5	600	19%	3%	35%	$90
3	7.2	East-West	400 S	200	9.5	11.1	26.9	14.6	27.2	0.91	63	1.5	300	19%	3%	35%	$190
4a	7.5	East-West	900 S	100	8.9	8.5	9.5	9.6	9.7	0.47	58	1.2	200	32%	15%	50%	$280
4b	8.3	East-West	900 S (via 1300 S)	100	8.7	8.0	10.6	9.1	10.7	0.49	58	1.3	100	29%	22%	36%	$380
5	6.8	East-West	2100 S - 2100 E	200	8.1	8.8	11.4	9.5	11.8	0.30	54	1.5	300	22%	0%	44%	$190
6	10.9	East-West	North Temple - 400 S (TRAX Black Line)	1,100	7.4	7.4	16.9	9.4	17.5	0.66	57	1.3	1,100	31%	2%	60%	$50
7	8.9	East-West	1300 S	400	8.5	7.8	7.7	8.1	7.8	0.33	54	1.4	700	25%	15%	35%	$80
8	3.9	North-South	State Street	500	9.9	12.0	26.1	15.5	26.5	1.04	76	1.4	600	27%	19%	34%	$90
9a	4.6	North-South	500 E (to LDS Hospital)	700	11.4	13.5	18.2	15.1	18.3	0.94	74	1.1	900	20%	6%	34%	$60
9b	3.9	North-South	500 E (to New Hub)	600	11.5	14.2	16.3	15.9	16.4	0.99	74	1.1	800	20%	11%	28%	$70
10	5.3	North-South	1300 E	300	9.4	10.0	8.8	10.4	9.0	0.36	60	1.4	300	15%	0%	29%	$160
11a	5.7	North-South	900 E (to LDS Hospital)	600	9.4	10.0	8.8	10.4	9.0	0.36	60	1.4	800	15%	0%	29%	$70
11b	4.4	North-South	900 E (to New Hub)	300	11.5	13.8	8.1	14.8	8.3	0.68	71	1.6	400	13%	2%	23%	$130
11c	3.7	North-South	900 E-1100 E (Sugarhouse-New Hub)	800	11.3	14.5	9.1	15.7	9.3	0.73	73	1.2	900	12%	2%	21%	$60
12	4.4	North-South	Foothill Dr	100	6.3	5.4	9.2	5.4	9.4	0.11	47	1.9	500	27%	0%	54%	$120
13	3.1	North-South	900 W	100	9.2	7.5	10.5	10.1	11.1	0.42	62	1.4	200	39%	46%	33%	$340
14a	6.8	North-South	Redwood Road	500	7.3	5.5	4.3	5.8	5.0	0.19	48	1.2	600	35%	14%	56%	$100
14b	4.4	North-South	Redwood Road (to Central Station)	500	7.4	5.6	8.5	7.6	9.6	0.24	59	1.2	700	37%	36%	38%	$80
15	4.4	North-South	700 N/600 N	100	8.9	10.2	17.2	13.1	18.1	0.46	70	1.3	100	25%	17%	33%	$530

Figure B-8 Measure F: Accessibility (Walk Score)

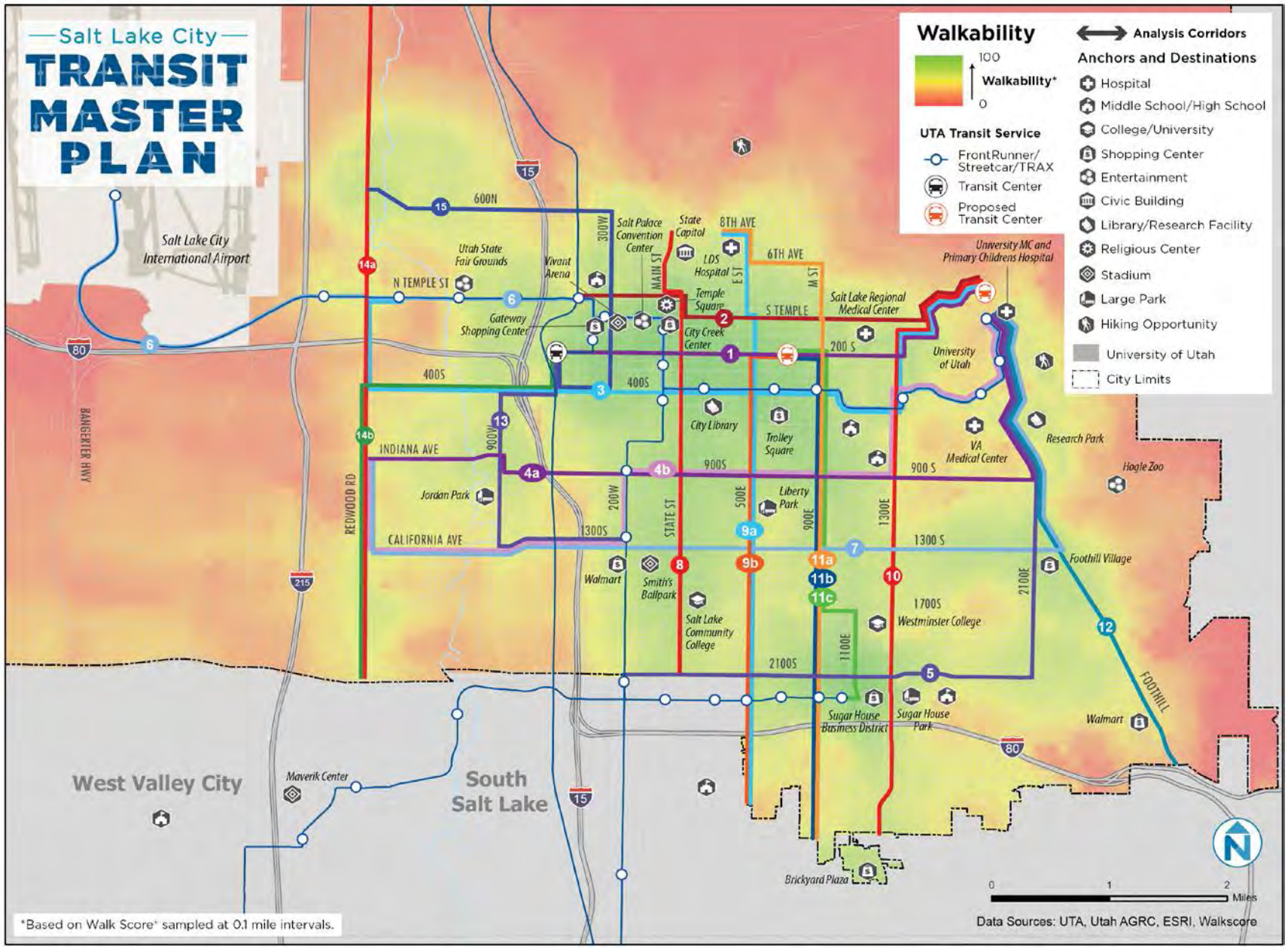
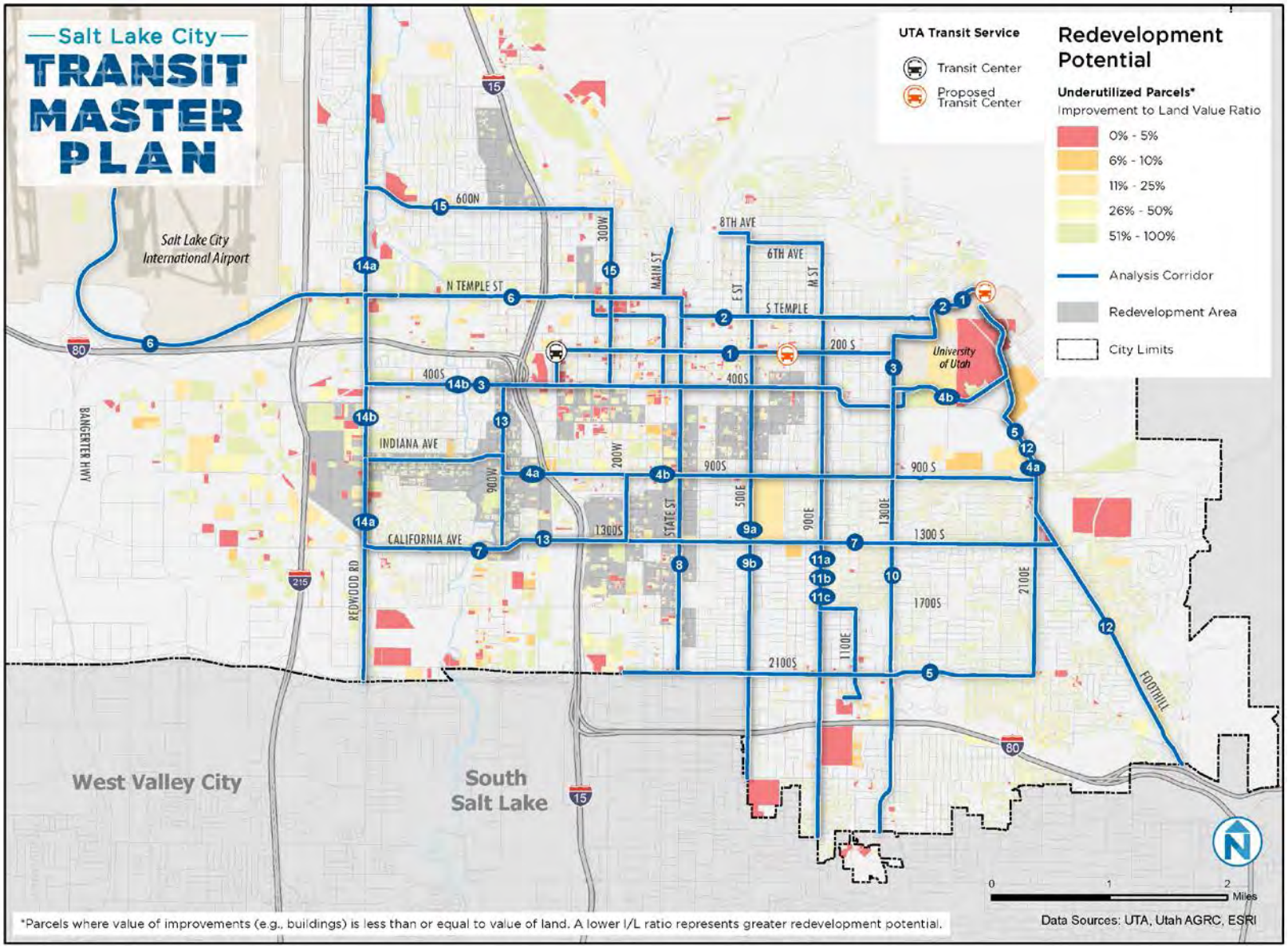


Figure B-9 Corridor Travel Time and Right-of-Way

Corridor ID	Corridor Name	Travel Time (Minutes, Round Trip)				Right-of-Way Notes	Recommended for Capital Analysis
		Min	Max	Range	Max/Min		
1	200 S	29	38	9	1.31	1-2 GP lanes per direction, center turn lane, parking, bike lanes	☑
2	North Temple + South Temple	24	35	11	1.46	N. Temple: 2 GP lanes per direction, center turn lane, parking or bike lanes. S. Temple: 2 GP lanes per direction, center-turn lane or parking	☑
3	400 S	36	58	22	1.61	3 GP lanes per direction, parking, TRAX	☑
4a	900 S	44	54	10	1.23	2 GP lanes per direction, center turn lane/median, bike lanes, parking or parking/curb extensions	
4b	900 S (via 1300 S)	48	63	15	1.31	see 4a and 7	
5	2100 S - 2100 E	36	54	18	1.50	2 GP lanes per direction, center turn lane (varies), curb extensions/parking (varies)	
6	North Temple - 400 S (TRAX Black Line)	63	85	22	1.35	see 2 and 3	Improvements; planned by UTA
7	1300 S	48	67	19	1.40	2 GP lanes per direction, center turn lane	
8	State Street	24	33	9	1.38	3 GP lanes per direction, center turn/median, parking	☑
9a	500 E (to LDS Hospital)	32	34	2	1.06	2 GP lanes per direction, center turn lane (varies), street parking (varies)	☑
9b	500 E (to New Hub)	28	31	3	1.11	see 9a	☑
10	1300 E	28	39	11	1.39	1 or 2 GP lanes, center turn lanes/median (varies), street parking (varies), bike lane (varies)	
11a	900 E (to LDS Hospital)	38	42	4	1.11	2 GP lanes per direction, center turn lane, parking	☑
11b	900 E (to New Hub)	20	31	11	1.55	see 11a	☑
11c	900 E-1100 E (Sugarhouse-New Hub)	24	28	4	1.17	see 11a; 1100E: 2 GP lanes, bike lanes, parking	☑
12	Foothill Dr	17	32	15	1.88	2-3 GP lanes, center turn lane, parking	
13	900 W	19	27	8	1.42	2 GP lanes, center turn lane, parking	
14a	Redwood Road	28	34	6	1.21	2-3 GP lanes, center turn lane, bike lanes (varies)	☑
14b	Redwood Road (to Central Station)	24	28	4	1.17	See 14a	☑
15	700 N/600 N	24	32	8	1.33	700/600N: 2 GP lanes per direction, center-turn lane; 300W: 3 GP lanes per direction	

Figure B-10 Measure I: Redevelopment Potential



FREQUENT TRANSIT NETWORK ANALYSIS

Population and employment density along the analysis corridors was calculated to help recommend FTN corridors. Figure B-11 provides general rules-of-thumb relating transit service frequency to the minimum intensity of land use (e.g., household size, population, and employment) required to support that level of service. These relationships provide useful guidance, however other factors also help determine the level of service justified on a corridor, including serving major activity centers such as the University of Utah, downtown Salt Lake City, or other major anchors or activity centers at one or both ends of a line, as well as the spacing between parallel corridors and providing access to opportunity for vulnerable and transit-dependent populations.

Figure B-11 Density – Frequency Relationship

Service level (frequency)	Minimum Household Density	Minimum Population Density	Household Size	Minimum Employment Density
60 min	3	8	2.70	4
30 min	6	16	2.70	8
15 min	10	27	2.70	13
10 min	18	49	2.70	24
<=5 min	36	97	2.70	48

Source: Adapted from TCRP Report 100: Transit Capacity and Quality of Service manual and other sources

Figure B-12 evaluates potential level-of-service warranted on the analysis corridors based on population and employment density alone as well combined population and employment density.

Figure B-12 Corridor Analysis of Density-Service Level Thresholds

Corridor Number	Corridor Description	Miles	2040 Population Density	2040 Employment Density	2040 Population + Employment Density	Meets Minimum Threshold For:			Highest Level Met
						Based on Population	Based on Employment	Based on Population + Employment	
1	200 S	4.0	14.6	27.5	66.2	60 min	10 min	10 min	10 min
2	North Temple + South Temple	3.7	14.6	27.2	65.5	60 min	10 min	10 min	10 min
3	400 S	7.2	12.1	19.8	49.2	60 min	15 min	10 min	10 min
4a	900 S	7.5	9.6	9.7	27.7	60 min	30 min	15 min	15 min
4b	900 S (via 1300 S)	8.3	9.1	10.7	29.2	60 min	30 min	15 min	15 min
5	2100 S - 2100 E	6.8	9.5	11.8	31.6	60 min	30 min	15 min	15 min
6	North Temple - 400 S (TRAX Black Line)	10.9	9.4	17.5	42.2	60 min	15 min	15 min	15 min
7	1300 S	8.9	8.1	7.8	22.7	60 min	60 min	30 min	30 min
8	State Street	3.9	15.5	26.5	65.2	60 min	10 min	10 min	10 min
9a	500 E (to LDS Hospital)	4.6	15.1	18.3	49.5	60 min	15 min	10 min	10 min
9b	500 E (to New Hub)	3.9	15.9	16.4	46.7	60 min	15 min	15 min	15 min
10	1300 E	5.3	10.4	9.0	27.4	60 min	30 min	15 min	15 min
11a	900 E (to LDS Hospital)	5.7	13.3	7.4	27.2	60 min	60 min	15 min	15 min
11b	900 E (to New Hub)	4.4	14.8	8.3	30.5	60 min	30 min	15 min	15 min
11c	900 E-1100 E (Sugarhouse-New Hub)	3.7	15.7	9.3	33.1	60 min	30 min	15 min	15 min
12	Foothill Dr	4.4	5.4	9.4	22.9	No service	30 min	30 min	30 min
13	900 W	3.1	10.1	11.1	30.9	60 min	30 min	15 min	15 min
14a	Redwood Road	6.8	5.8	5.0	15.2	No service	60 min	60 min	60 min
14b	Redwood Road (to Central Station)	4.4	7.6	9.6	25.6	No service	30 min	30 min	30 min
15	700 N/600 N	4.4	13.1	18.1	47.0	60 min	15 min	15 min	15 min

Notes: [1] PopDens+0.75*2.5*EmpDens 2040