Engineering Six-Year Pavement Plan
2022

Proposal for Street Reconstruction and Pavement Preservation

Engineering Division
Department of Public Services
Salt Lake City Corporation

Table of Contents

List of Figures

List of Tables

Executive Summary

Salt Lake City's transportation network includes 1830 lane miles of Class C streets. Class C streets are maintained by the City. Engineering continues surveying the extensive alleyway network throughout the City which include a vast network of public and privately-owned alleyways. There are over 1400 alleys in the City comprising over 92 miles of alleyways. 47 miles of those alleyways designated as public alleyways. The remaining alleyways are classified as private, mixed or unknown. These streets are a mix of asphalt, concrete, and unsurfaced pavement types. The network of streets is further classified as Local/Residential streets (Local) and Arterial/Collector (Arterial) streets.

The City's pavement assets are subdivided into administrative segments units comprising the City-wide network. A segment is a measurable portion of the roadway used for the analysis. The segments provide a means of tracking asset condition and work within the Cartegraph OMS asset management system.

This plan's first iteration was produced in 2019. This year's plan will include updates to several areas including updating project lists; an overview of the new pavement survey; and update review of strategies for funding.

Management of a well-maintained street system requires a balanced program of pavement maintenance and preservation strategies. The objective of the ongoing six-year pavement management plan is to extend the functional life of the City's street network to the highest degree possible with available funds. This is accomplished through periodic pavement surface treatments (preservation and maintenance techniques) and major rehabilitation or reconstruction at appropriate times in the pavement life cycle. In summary, the goal of this management plan is to:

- Review previous pavement projects and successes;
- Summarize the findings from the pavement condition report and review pavement condition ratings;
- Explore updated decision trees and suggested treatment types used for developing scenarios;
- Update budget plan scenarios for various roadway type and construction methods;
- Provide project lists including those identified within the $87M Streets Bond which comprise part of Funding our Future project scope; and,
- Make recommendations to address preservation methods and scenarios.

Responsibilities

Engineering partners with the Transportation Division on the planning, design, reconstruction and day-to-day operations of the street and trail transportation system. The Streets Division, who are part of the Public Services Department, provide for the maintenance of the roadways through filling potholes, applying necessary preservation treatments, street sweeping and winter operational activities on City pavement assets.

Past Pavement Projects

The following is a list, by year, of pavement reconstruction projects completed by Salt Lake City Engineering. Previous years, we reported reconstruction of 43 lane miles. Since 2020, GO Bond funding has allowed for reconstruction of approximately 29 more lane miles of roadway. A lane mile is a measurement of pavement area. It is calculated by multiplying the length of a road segment by lane width(s).

The list of these projects follows:

2016

Street	From	To	Treatment Type
1300 South (phase 2)	400 West	500 West	Concrete Reconstruction
Rose Park Ln.	2000 North	2200 North	Concrete Reconstruction
Regent St.	100 South	200 South	Concrete Reconstruction
Sunnyside Dr.	Guardsman Way	Foothill Dr.	Asphalt Reconstruction

2017

Street	From	To	Treatment Type
900 West	400 South	950 South	3” Asphalt Overlay
900 West	North Temple	400 South	3” Asphalt Overlay
Berkeley St.	2100 South	Wilmington Ave	Concrete Reconstruction
Normandie Cir.	Harvard Ave.	Terminus	Concrete Reconstruction
900 South/Indiana Ave.	Surplus Canal	3600 West	Concrete Reconstruction
East Capitol Blvd.	500 North	Ensign Vista Dr.	3” Asphalt Overlay

2018

Street	From	To	Treatment Type
S Gladiola St.	500 South	900 South	Concrete Reconstruction
2100 East	1700 South	2100 South	3” Asphalt Overlay
1500 East	900 South	1300 South	3” Asphalt Overlay
1200 East	600 South	800 South	Asphalt Reconstruction
Simpson Ave.	Wyoming St.	Broadmoor St.	Concrete Reconstruction
Wilmington Ave.	Highland Dr.	1300 East	Concrete Reconstruction
Wilmington Ave.	2000 East	2100 East	Concrete Reconstruction

2019

Street	From	To	Treatment Type
1700 South	1700 East	1900 East	Concrete Reconstruction
2500 East	Foothill Drive	2100 South	Concrete Reconstruction
Downington Avenue	2500 East	Foothill Drive	Concrete Reconstruction
2700 South	Highland Drive	1930 East	Asphalt Reconstruction
1000 West	700 South	800 South	Concrete Reconstruction
Post Street	700 South	800 South	Concrete Reconstruction
900 South	950 East	1300 East	Concrete Reconstruction

2020

Street	From	To	Treatment Type
500 East	1700 South	2100 South	Asphalt Reconstruction
2000 East	Parley's Way	City Limit	Asphalt Reconstruction
700 West	1600 South	2100 South	Asphalt Reconstruction
1900 E	WILMINGTON AVE	PARLEYS CANYON BLVD	Concrete Reconstruction
500 North	JORDAN RIVER	REDWOOD RD	Concrete Reconstruction
ARIES CIR	CULDESAC END	NEW STAR DR	Concrete Reconstruction
BRIARCLIFF AVE	AMERICAN BEAUTY DR	AUTUMN AV	Concrete Reconstruction
COATSVILLE AVE	800 East	900 East	Asphalt Reconstruction
DUPONT AVE	CAPISTRANO DR	AMERICAN BEAUTY DR	Concrete Reconstruction
DUPONT AVE	CAROUSEL ST	1500 West	Concrete Reconstruction
ELIZABETH ST	CRYSTAL AV	STRATFORD AV	Asphalt Reconstruction
ELIZABETH ST	STRATFORD AV	WHITLOCK AV	Asphalt Reconstruction
HASLAM CIR	CULDESAC END	GARNETTE ST	Concrete Reconstruction
KENSINGTON AVE	1400 E	1500 East	Asphalt Reconstruction
PARKWAY AVE	ELIZABETH ST	HIGHLAND DR	Asphalt Reconstruction
RAMONA AVE	900 East	LINCOLN ST	Asphalt Reconstruction
RAMONA AVE	LINCOLN ST	1000 East	Asphalt Reconstruction
TALISMAN DR	800 North	1200 W	Concrete Reconstruction
TALISMAN DR	CULDESAC END	CORNELL ST	Concrete Reconstruction
ZENITH AVE	800 East	900 E	Asphalt Reconstruction

Colors - Arterial/Collector Local Street

2021

Street	From	To	Treatment Type
300 West – Phase 1	1300 South	2100 South	Asphalt Reconstruction
900 East	Hollywood Ave	2700 South	Asphalt Reconstruction
900 South – RDA Phase	300 West	West Temple	Asphalt Reconstruction
100 South	University Ave	900 East	Asphalt Reconstruction
1500 South	Redwood Rd	Pioneer Rd	Asphalt Reconstruction
1900 East	SUNNYSIDE AV	900 South	Asphalt Reconstruction
200 North	400 West	W TERMINUS END	Concrete Reconstruction
ALTA ST*	2ND AV	3RD AV	Asphalt Reconstruction
ALTA ST*	3RD AV	FEDERAL HEIGHTS DR	Asphalt Reconstruction
BLAINE AVE	NEVADA ST	FOOTHILL DR	Asphalt Reconstruction
CAMBRIDGE WAY*	CHANDLER DRIVE	TOMAHAWK DR	Asphalt Reconstruction
GREENWOOD TER	900 South	SUNNYSIDE AV	Asphalt Reconstruction
FOLSOM AVE	900 West	1000 West	Asphalt Reconstruction
KENSINGTON AVE	KEN REY ST	2100 East	Asphalt Reconstruction
L ST	7TH AV	8TH AV	Asphalt Reconstruction
L ST*	9TH AV	10TH AV	Asphalt Reconstruction
M ST	3RD AV	4TH AV	Asphalt Reconstruction
NEVADA ST	WILSON AV	BLAINE AV	Asphalt Reconstruction
WALL ST	COLUMBUS ST	400 N	Asphalt Reconstruction

Colors - Arterial/Collector Local Street

*To Be Completed in 2022

Pavement Condition Report Summary

A pavement condition report was funded by Salt Lake City Council and Administration in 2016 and completed in 2017. Due to the critical nature of the pavement network, the decision to expedite a new survey in 2021 was approved. The results of most recent 2021 survey are forthcoming this summer (2022).

The 2021 survey was performed by Roadway Asset Services, LLC (RAS) and began on October 10, 2021. Date collection was completed on October 31, 2021 for approximately 591.78 centerline miles of the City's roadways. RAS used a **Roadway Asset Collection** (RAC) vehicle to collect street level right-of-way (ROW) images and **Laser Crack Measurement System** (LCMS-2) pavement images. The pavement images were used to identify street segment pavement distresses and severities through analysis and the 360-degree panoramic right-of-way images were used to confirm pavement distresses and identify right-of-way assets.

All Class C (City-maintained assets) roadways were analyzed using a series of instruments which include images of all roadway segments. Pavement distress type, distress extent, and distress severity were quantified from these images. A **Pavement Condition Index** (PCI) was assigned to each roadway segment.

International Roughness Index (IRI) values were also collected along the survey segments, as part of the analysis, utilizing a laser profiler and accelerometer.

The **Overall Condition Index** (OCI) is calculated using the PCI and IRI values. This survey project used proprietary pavement management software for calculating the PCI and OCI value, as well as analyzing the network PCI and OCI ranges. An Overall Condition Index (OCI) was applied to all City-maintained roadway segments. The OCI measure is a classification of the overall pavement condition, on a scale of 0-100 with the highest numbers representing the best roadway segments in the City. The summary of results of the recent survey will be presented in a Council transmittal later this year.

Automated Data Collection and Equipment

To determine the general distress characteristics of each roadway segment, RAS utilized one RAC collection vehicle, represented in Figure 1. The vehicle collected street level (ROW) imagery and downward (LCMS-2) pavement imagery. The automated distress data collection was performed in general accordance with ASTM D6433-11 (Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys) and ASTM Standard E1656 (Standard Guide for Classification of Automated Pavement Condition Survey Equipment), utilizing a Class 1 device as defined by the specifications.

Figure 1 - Laser Profiler and Van Survey Equipment

RAS's vehicles combine multiple engineered technologies to collect real-time pavement data, ROW data, and images at posted speed limits. This effectively eliminates the need to place pavement inspection technicians in the field.

IRI indexes were obtained from measured longitudinal road profiles and provides a driver's perspective to the bumpiness and roughness of the ride.

In 2017, the network average was rated as poor (48 OCI). This figure was obtained by averaging all street segments, regardless of type and length to obtain an overall network average.

Salt Lake City utilizes **Cartegraph OMS** to manage their pavement network for maintenance decisions and budget optimizations. Within the Cartegraph program, PCI is listed as one index that may be combined with other selected indices, such as IRI, to calculate the Overall Condition Index (OCI). Further, Cartegraph utilizes a deterioration curve to predict pavement deterioration between cycles of survey. This will be discussed in later sections of this plan.

The 2021 data will be presented later in 2022. The condition of the network as of 2017 is presented below for reference. **GO Bond funded projects already specified for CY 2020-2025 will not be changed or rescheduled as a result of the new survey.**

Table 1 - Overall Condition Percentages from the 2017 inspection

Overall Condition Index (OCI) Range	Condition Description	Percentage of Network	Legend
86 - 100	Good	1.60%	
71 - 85	Satisfactory	8.89%	
56 - 70	Fair	25.84%	
41 - 55	Poor	36.61%	
26 - 40	Very Poor	21.31%	
11 - 25	Serious	5.41%	
0 - 10	Failed	0.34%	
	Total	100.00%	

The 2017 survey and report are available on the Funding Our Future website here. The 2017 survey summary states that approximately 63% of the roadway segments within the City are rated in the poor or worse classifications. As the table depicts, more than half of local streets, arterials and collectors, in 2017, are no longer candidates for preservation or rehabilitation treatments. Many pavement segments have deteriorated below a level where preservation methods are effective. Most are candidates for reconstruction.

New collection techniques and utilization of Artificial Intelligence (AI) for analysis of pavement defects are utilized in the 2021 survey. Engineering expects improved accuracy and an improved prediction strategies going forward from the summer of 2022. These will be shared with the Council and Administration as soon as the data is made available to the City from Roadway Asset Services, LLC.

Decision Trees and Recommendations

Decision trees are a helpful mechanism to determine strategies for roadway maintenance on an overall street network scale. The Overall Condition Rating (OCI), previously mentioned, is a good guide, but final decisions and prioritizations should be done with human interaction, field verification, and sound engineering judgement.

The following chart is a refined decision tree used to determine the preservation and maintenance methods meant to be used alongside the Overall Condition Rating results. Engineering will create a decision tree, in cooperation with Streets, specific to Salt Lake City.

Updated Decision Tree

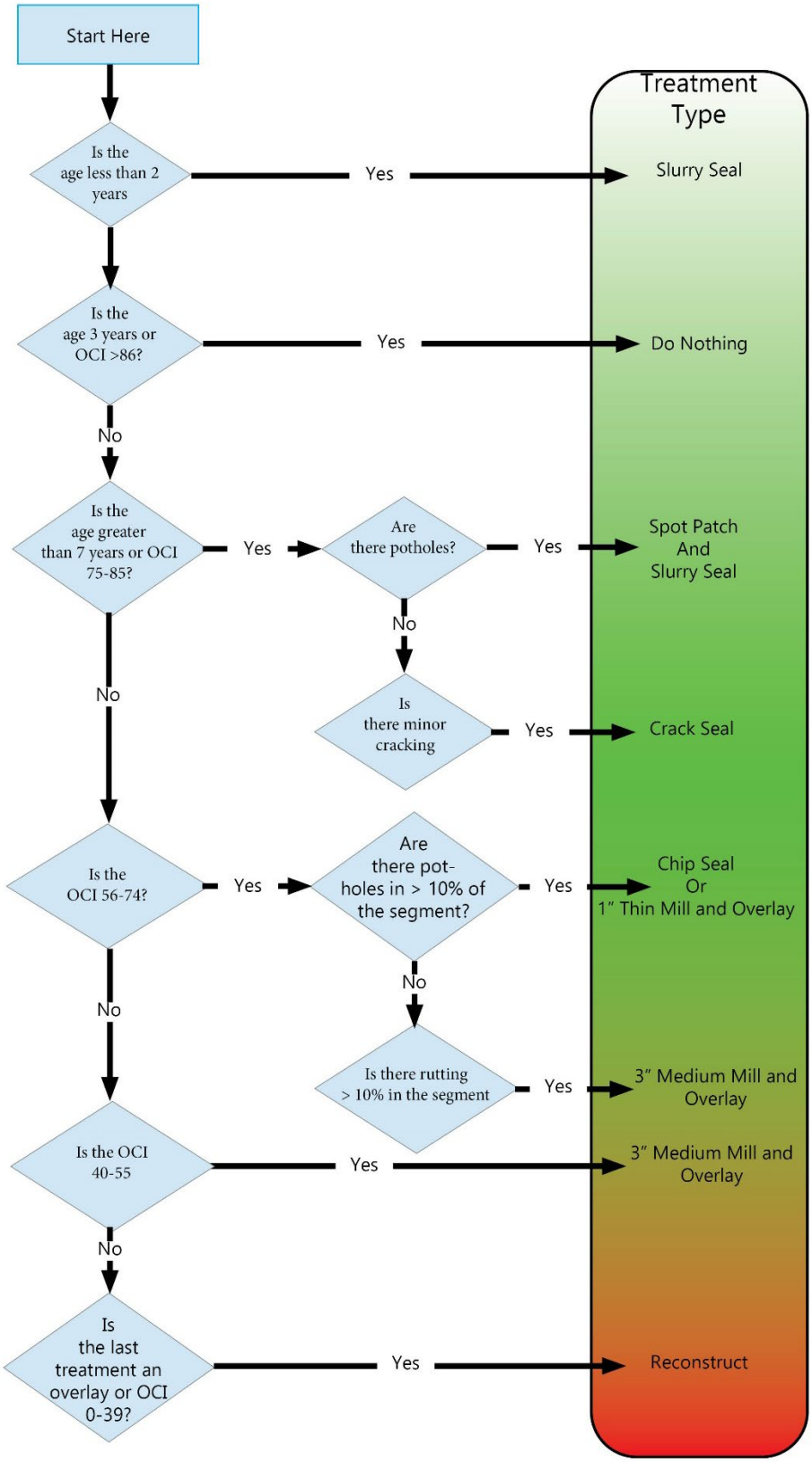


Figure 2 - Sample Preservation and Maintenance Tree

Remaining Service Life

Remaining Service Life (RSL) is another strategy the Engineering Division is evaluating as a measure of pavement maintenance and preservation. RSL is defined as the anticipated number of years that a pavement can remain structurally and functionally sound with expected scheduled maintenance. Ideally the pavement service life proceeds in the following manner:

- The service life begins when the pavement has been constructed or reconstructed;
- Preservation techniques should be employed within the following two years to provide the new pavement surface with adequate protection;
- Next, rehabilitation treatments must be applied before the roadway has suffered too much damage. Therefore, the timing of rehabilitation techniques is crucial to make the properly leverage funding;
- Pavement segments in advanced states of degradation require reconstruction in order to restart the service life clock. Pavement in deteriorated condition are not suitable candidates for maintenance activities. Moreover, maintenance of deteriorated pavement is an inefficient use of funds and these activities are best used elsewhere.

Determining the optimal threshold for treatments is the key strategy to preserving and rehabilitating pavement assets. Those thresholds are set to correspond to the ideal conditions for preservation and maintenance activities while the life-cycle cost is within an optimal cost range. The graph below depicts the concept of applying the proper treatment at the proper time within the pavement's life cycle.

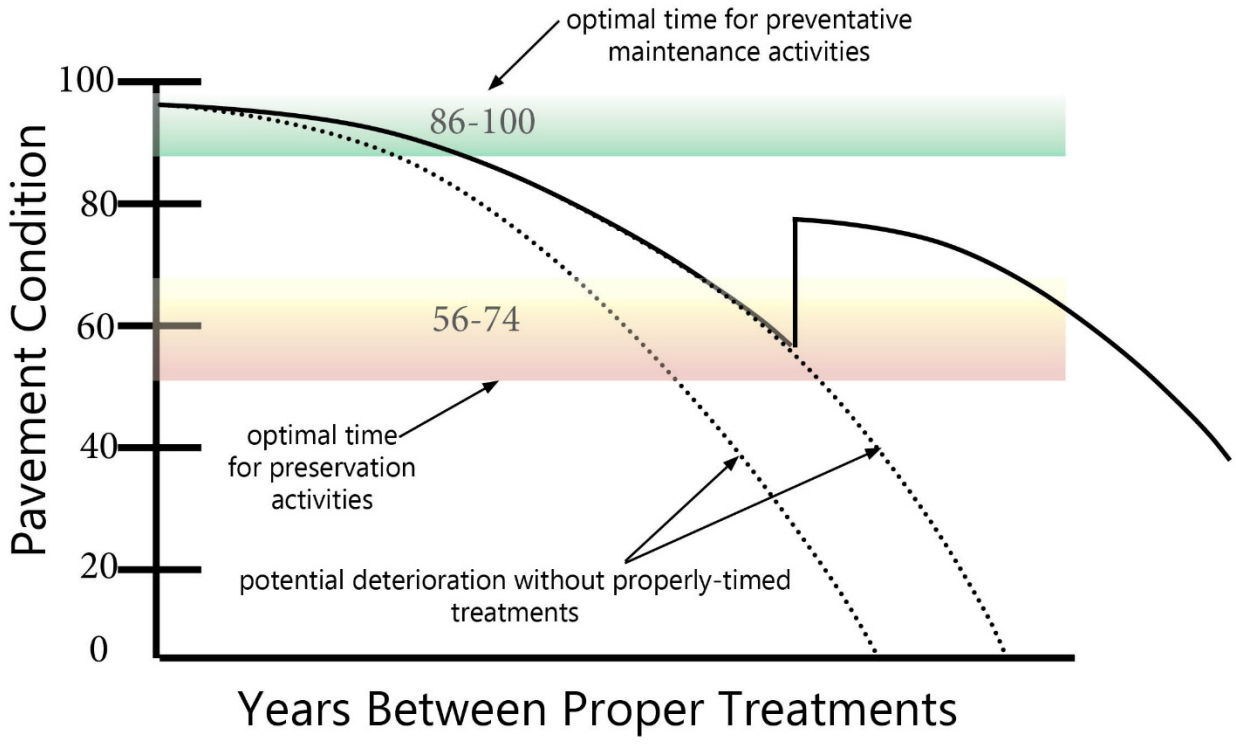


Figure 3- Optimal Pavement Treatment Timing

Two of the key components to an effective pavement management plan is to recognize the optimal timing for treatments and establishing acceptable thresholds for roadway performance. A balanced perspective of observing OCI, understanding the remaining service life, and knowing when the last maintenance activity occurred is fundamental to maintaining optimal pavement network health.

The use of Cartegraph by Streets and Engineering has led to further collaboration and alignment of preservation, rehabilitation, maintenance, and construction activities. Using a balanced view of RSL and OCI to establishes a framework and will continue to refine our processes. Cartegraph will be used to track the asset condition and Engineering, in cooperation with Streets, will plan work accordingly. This is explained in further detail in the Project Prioritization section below.

Cartegraph OMS uses a prediction model to understand where an asset is at in its lifecycle, Scenario Builder examines the data captured in each asset's condition category, prediction group, deterioration curve, and condition group. These data points along the curve help estimate how a particular set of assets will deteriorate over time if no maintenance is performed**.** While Cartegraph comes with sample deterioration curves, Engineering expects to continue fin-tuning the data to be applicable to our region, and asset material. The 2021 survey data will prove indispensable validating the initial prediction curves established in 2016.

Project Prioritization

Maintenance

The Streets Division began utilizing Cartegraph extensively in 2018 to capture and plan streets maintenance activities. The Engineering Division and the Streets Division interact cooperatively to develop a 3-year fiscal plan for maintenance. The flow chart in Figure 2 provides the framework for the segment selection and Cartegraph is used to document and plan work. The schedule for maintenance roughly follows:

- A slurry seal is applied 2 years after a roadway reconstruction as a general maintenance strategy. As mentioned above, this provides a roadway section with protective sealant preventing oxidation and moisture intrusion.
- Another round of slurry seal is applied within 7 years of reconstruction or when the OCI is estimated to be within 75-85. Spot patching or pothole repair might also be required during this time. If there is minor cracking, crack-sealing can be utilized to prevent infiltration of water.
- Once the segment has deteriorated or when the OCI is estimated to be within 56-74, or if there are potholes in more than 10% of the roadway surface, a preliminary crack-seal is applied. Specific areas can be patched and filled to level the adjoining areas of deterioration, then the segment receives a chip-seal. Highly deteriorated sections may require a thin 1" overlay to further extend the roadway surface. A deeper overlay of 3" may be required for roadway surfaces which are significantly rutted but are still within this OCI range. Per the State Code, overlays of 2" or less in thickness are considered a maintenance activity while overlays over 2" are considered a construction project.
- Additional maintenance considerations:

- Areas unusually impacted by traffic loads or construction may receive inlays to keep them passable until reconstruction funds are available.
- Chip seal is sometimes used on poorer roads to keep them pothole free.
- In-lays are also used to smooth out rutted roads caused by heavy traffic.

Figure 4 represents the preferred asphalt maintenance strategy with attention to best practices relating to properly timed treatments and ideal service life thresholds.

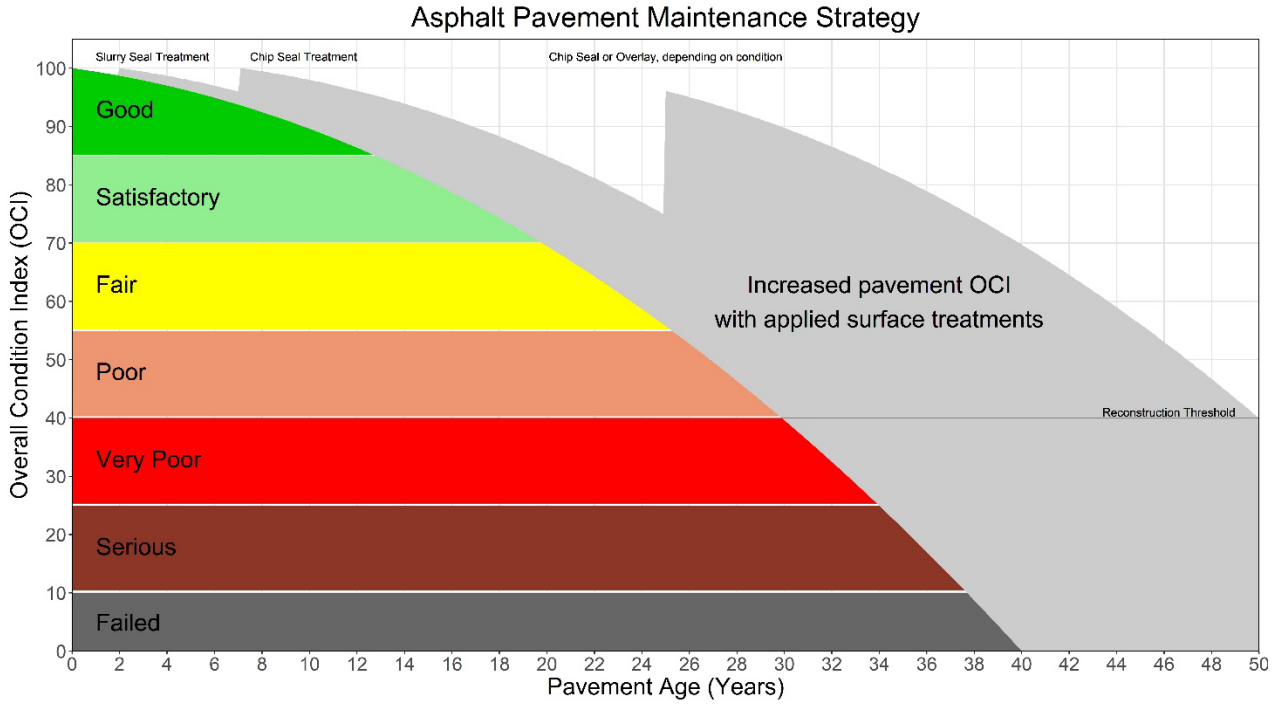


Figure 4 – Preferred Asphalt Pavement Maintenance Strategy

Rehabilitation and Reconstruction

The Engineering Division partnered with the Streets Division, Transportation Division, Public Utilities Department, and the Redevelopment Agency to produce a sound project prioritization plan. While primarily a pavement plan focused on street reconstruction needs, Engineering seeks input from many other affected groups to achieve more inclusive project prioritization results. Maintenance is a critical aspect of ensuring pavement longevity, therefore, this plan also includes recommendations for maintenance activities.

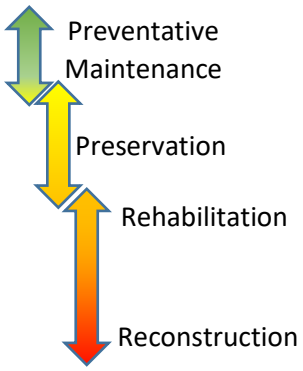
This plan helps collaborate efforts with Public Utilities and other private utility companies as they determine their utility needs. With a moratorium of 7 years on excavation within newly constructed streets, and 3 years on repaved (overlaid) streets, it is critical that projects are planned and prioritized with consideration of planned future utility improvements.

Engineering's goal is to improve overall condition of the roadway network to a Fair condition (minimum average OCI of 55 or greater).

In addition to the decision tree noted above, Engineering uses the general OCI guidelines and observes threshold timing in the service life to help provide a simple framework to help guide rehabilitation and reconstruction activities.

Table 2 – OCI Maintenance Method Framework

Overall Condition Index (OCI) Range	Condition Description	Method	Legend
86 - 100	Good	Do Nothing or Slurry Seal in First Two Years	
75 - 85	Satisfactory	Patch or Crack Seal	
56 - 74	Fair	Slurry or Chip Seal	
40- 55	Poor	Rehabilitate (Overlay)	
26 - 39	Very Poor	Reconstruct	
11 - 25	Serious	Reconstruct	
0 - 10	Failed	Reconstruct	



Visual examples of pavement conditions are included in Appendix A.

Review - Asphalt Pavement Management and Maintenance Strategies

A brief review of pavement management strategies is presented below as guidance of techniques employed by the City's Divisions. Pavement maintenance strategies are accomplished through the Streets Division. Asphalt overlay and reconstruction projects are funded by the City's Capital Improvement Program and administered by the Engineering Division.

Pothole Filling

This is an emergency type repair to fill holes in existing deteriorated roadways. Quality construction, timely maintenance activities, and proper utility cut restorations, are all components that significantly reduce the frequency of pothole repairs.

Patching and Crack Sealing

These maintenance strategies address specific distresses in the roadway surface. Localized patching addresses significant defects in the pavement surface. Crack sealing places specialized materials into asphalt pavement cracks to prevent infiltration of water. These repair types are generally followed by a roadway surface treatment within two years to provide a cost-effective program of roadway preservation.

Slurry Seal and Chip Seal Surface Treatments

Slurry seals and chip seals are thin surface treatments applied to the entire pavement surface of a roadway section to prevent oxidation and moisture intrusion. Slurry seals are applied to streets that are in good condition, and chip seals are applied to streets that have deteriorated to a satisfactory condition rating. Both treatments extend the pavement life and improve long-term performance.

Asphalt Pavement Mill and Overlay

Asphalt mill and overlay projects remove the top 1" to 3" of the existing pavement and replace it with a new asphalt overlay, which adds structural strength to the existing pavement. This pavement maintenance strategy is generally applied to roadways that have a poor condition rating. In accordance with City's commitment to the elimination of pedestrian barriers in the public way, ADA accessibility ramps are installed in conjunction with all overlay projects. Curb and gutter are also evaluated, and appropriate repairs are included in the overlay project to enhance safety and alleviate drainage problems. Per the State Code, overlays of 2" or less in thickness are considered a maintenance activity while overlays over 2" are considered a construction project. A 3" mill and overlay is advised for road which have deteriorated to a range of an OCI of 40-55. This is typically the bottom limit of refurbishment and per the State Code, is not considered a maintenance activity. The Streets Division coordinates with the Engineering Division when segments have deteriorated to this level. Spot activities can occur to preserve a segment or area along these routes, but overlays are required to rebuild substructures to prevent further degradation.

Pavement Reconstruction

Roadway pavements that have exceeded their functional life are designated for reconstruction through the City's Capital Improvement Program. Pavement reconstruction projects involve removal of the deteriorated roadway section and replacement with a new roadway structural system using new or recycled materials. Reconstruction projects address all necessary street repairs, including roadway base materials, asphalt or concrete pavement, curb and gutter, sidewalks, accessibility ramps, and drainage improvements.

To maximize our investment in road reconstruction, maintenance should be funded at a level that prevents further degradation, increase remaining service life, and delays the need for reconstruction. The most efficient maintenance strategy is to keep good roads in good condition. With proper and timely application of surface treatments on new roads, it is feasible that the pavement can be kept in good condition for a very long time – 25 to 35 years or longer. The current range of pavement conditions requires careful planning to select the best pavement treatment options.

As a comparison, for the cost of every lane mile that is reconstructed, roughly 50 miles can receive a surface treatment. Street maintenance is closely coordinated between the Engineering and Streets divisions utilizing the Cartegraph asset management system.

Project Plan and Budget Methodology

From the data collected, Engineering developed a six-year project list. This plan provides a framework for planning and budgeting purposes with the goal of improving pavement condition to a fair condition network wide. The plan, discussed in detail below, identifies and prioritizes the following:

- Selecting roadway reconstruction candidates
- Selecting roadway rehabilitation candidates
- Ranking candidates according to needs as identified by other City divisions
- Specifying roadway treatments to be performed by the Streets Division
- Developing an annual budget framework for decision-makers and stakeholders

Engineering created a proposed project list, as a first step in the planning process. The list utilized OCI data to identify the worst local/residential 200 roadway segments in the City. Engineering developed an in-house geospatial application to curate the list of 200 local/residential street segments. This application allowed other divisions and departments to rank, by degree of importance, these street segments. This refined list was combined with some of the worst arterial/collector roadway segments previously identified in a combined effort between Engineering, Streets, Public Utilities, and Transportation Divisions. The arterial/collector list includes some roadway segments that do not meet the "worst" criteria as determined by OCI. Instead, these segments met other critical needs as identified by other departments.

In addition, a subset of roadway candidates falling into a middle classification having an OCI of 50 to 51 was selected. This group comprises a list of roadways qualified to receive a mill/overlay rehabilitation.

Budget Strategy

Engineering in consultation and agreement with Transportation recommends that the funding sources for street reconstruction and overlays be distributed 80% for arterials/collectors and 20% for local streets. For the purposes of planning, the Engineering Division adopted this hierarchy as an approach to budgeting for future pavement construction. Salt Lake City Council agreed with this recommendation and supported the expenditure of street Bond funds in this way. Support for prioritizing arterials and collectors in this hierarchy follows:

- These are the primary emergency response routes to hospitals and snow removal routes and should be maintained at the highest level possible.
- Greatest value for the $/mile – though the average cost to reconstruct an arterial/collector street is higher than a local street, a much larger segment of the community will benefit from the upgraded arterial/collector street. Most everyone in the community uses the arterial/collector streets on a daily basis whereas each local street serves a smaller segment of the community.
- Local roads have much less Average Annual Daily Trips (AADT of less than 2,000) versus arterial/collector streets (AADT of 5,000 – 15,000). The slower posted speeds and shorter travel distances makes it much easier for drivers on local streets to tolerate pavement distresses such as potholes.

- Inclusion of the Transit Master Plan priorities, such as enhanced bus corridors, occurs along arterial and collector routes such as 200 S.
- Economic activity, movement of people, goods and services rely on a well-maintained transportation network with arterials and collectors as its core that connects population hubs and council districts.

Based on the issuance of $87 million in bonds over the next six years along with $3.0 million of Class C funds received each year ($18 million over 6 years), the 80/20 breakout is shown below.

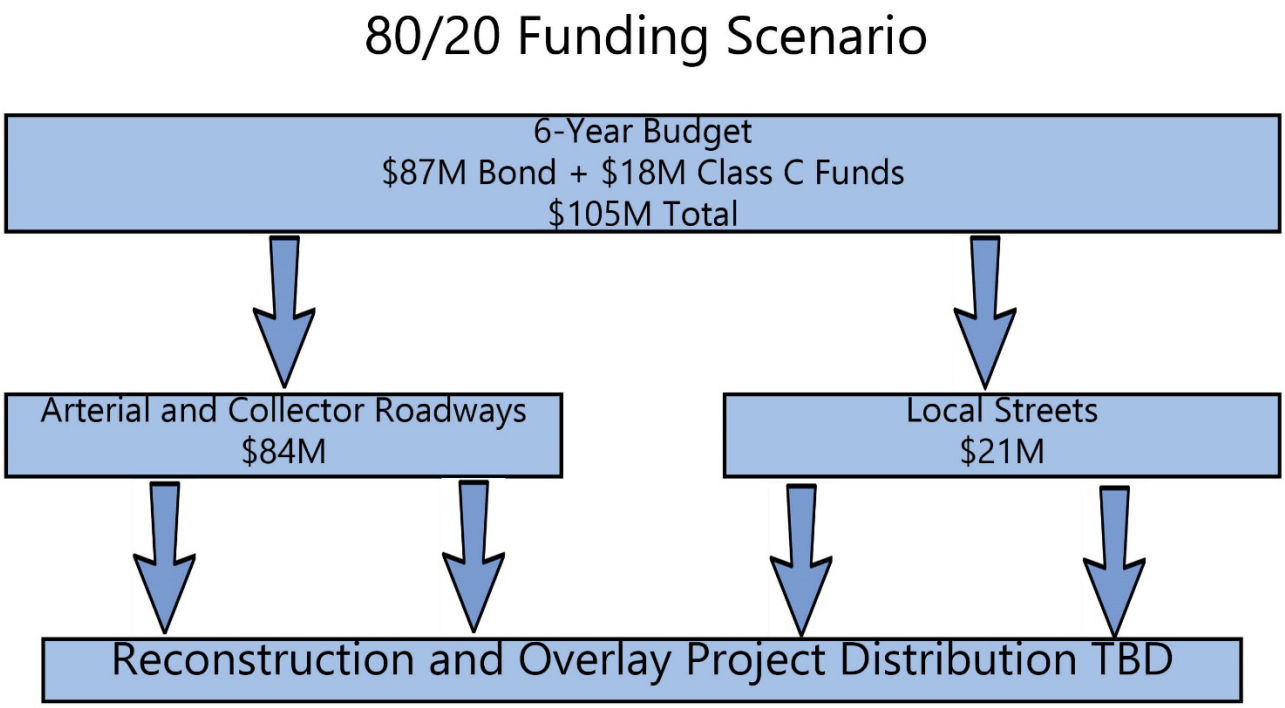


Figure 5 - Fund Distribution Scenario

The capital budget plan does not include City-wide roadway maintenance, which is funded through other programs.

Engineering also recommends continuing to fund the pavement condition survey every 5 years. A regular census of pavement condition provides detailed information from an independent source, allowing for Engineering to calibrate Cartegraph OCI estimates. The time period of five years balances the desire to regularly collect data on pavement condition with budgetary constraints. We will also reevaluate this plan annually based on funding received and new priorities.

Project Breakout

The following pages detail the planned project lists for the next six years. Items on this list include funding from the $87 million Bond issuance and $18 million Class C funds. The project priorities for these projects are listed below:

- Worst First
    - Data driven
    - Based on OCI from pavement condition survey

- Transportation Priorities
    - Safety needs
    - Multimodal and Complete Streets needs
- Public Utilities Priorities
    - Curb/Gutter/Storm Drain study
    - Impacts to Public Utility project budgets
    - East West Aqueduct alignment
- Overlap with Current Plan where Available
    - Impact fees, capital facility plans
    - 9-line plans
    - The list does not include provisions for new roads in Northwest Quadrant

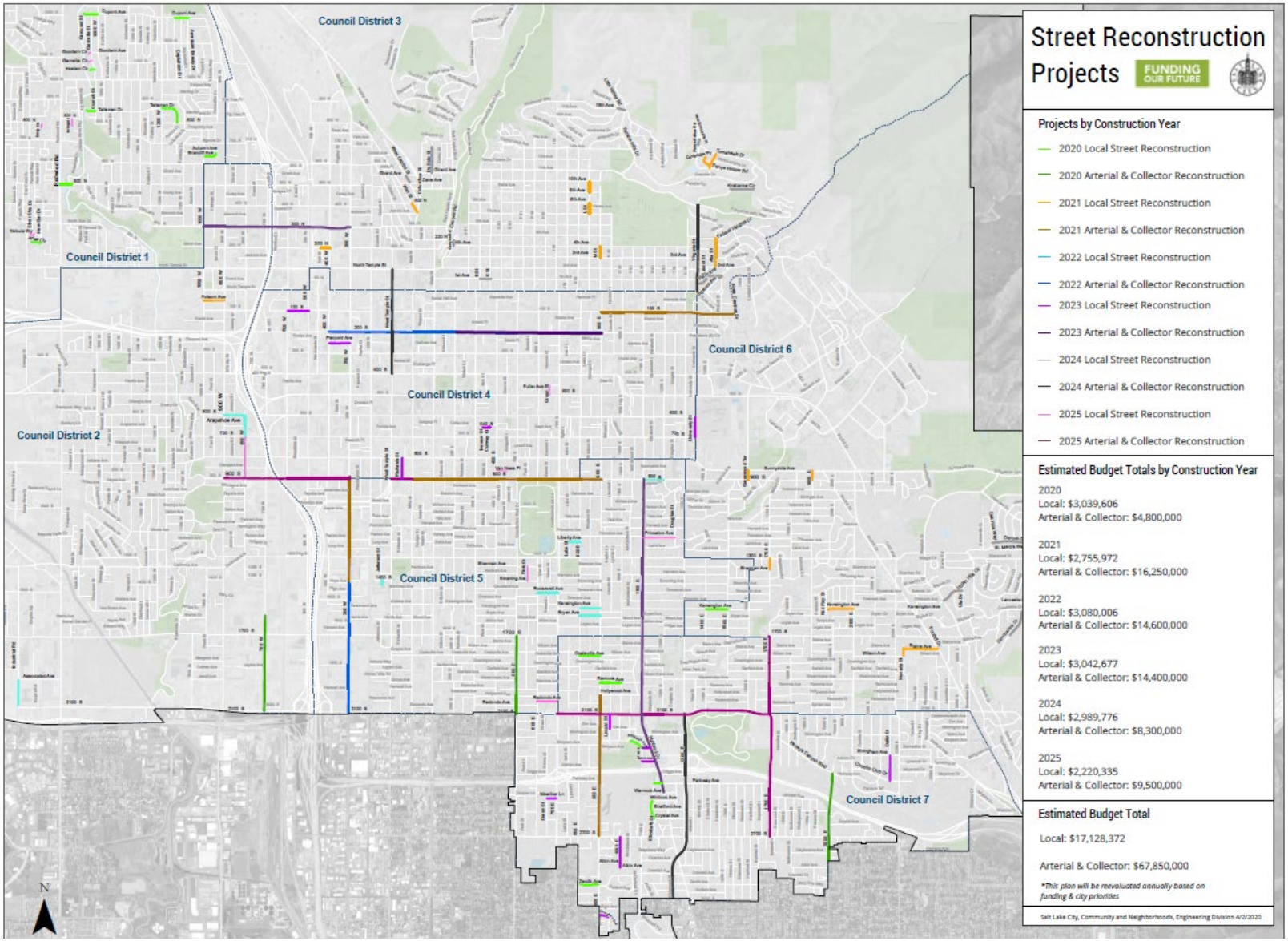
It should be noted that this list is only a current snapshot in time of the priorities at the time of the revision of this document. Roadways do not deteriorate at the same pace due to many competing factors. As mentioned, Engineering expects to revisit this list, and the priorities, annually during the Roadway Selection Committee to insure the current needs of the City are being addressed.

Plan Implementation

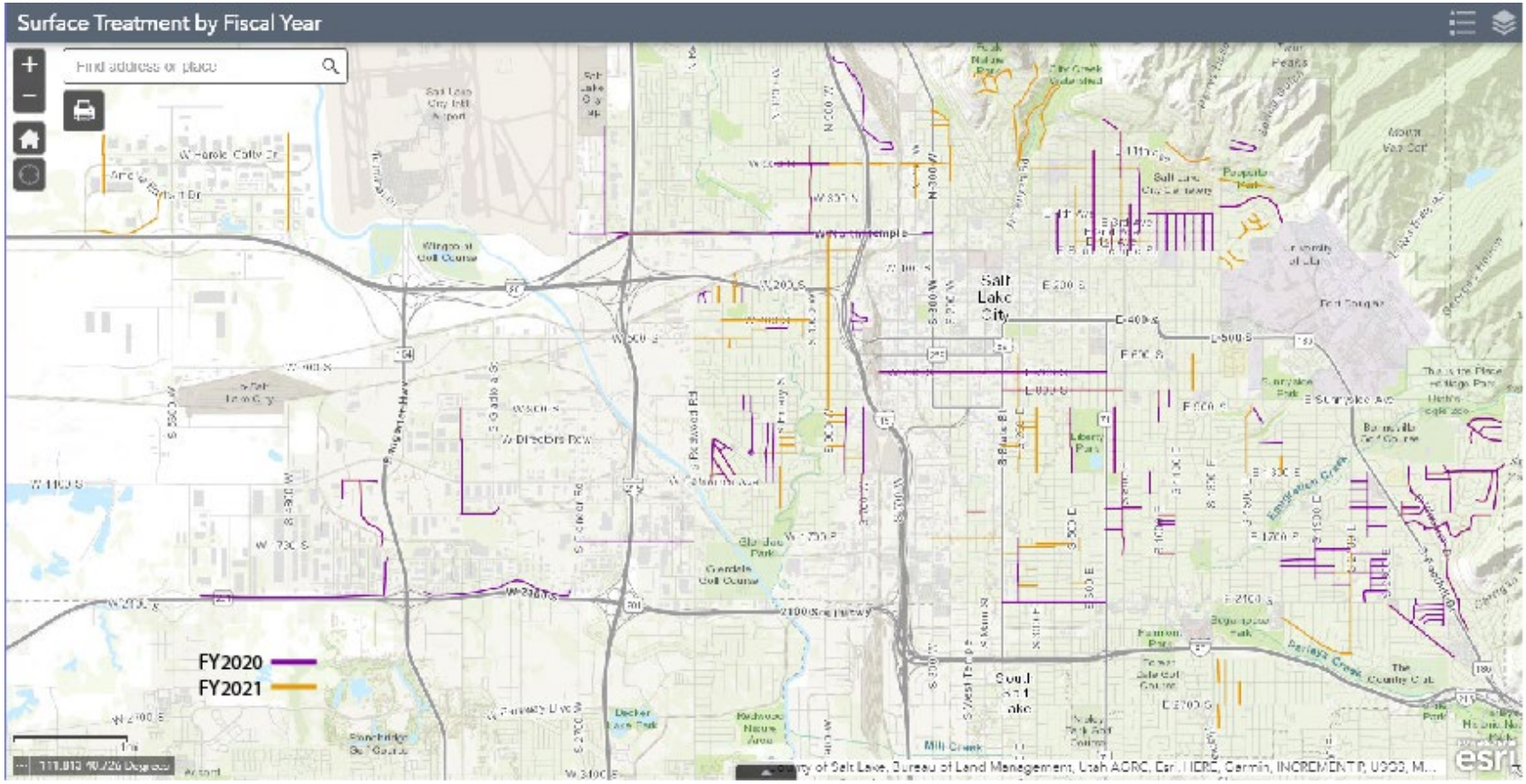
As the plan is executed, Engineering acknowledges that there are variables affecting the actual cost of projects. The following will help staff manage the expected differences between the actual project costs versus staff's estimated costs:

- Every fall, staff will revisit the plan with the Roadway Selection Committee. Based on the past summers actual cost of construction, adjustments to the plan will be made adding or deleting projects as necessary. In addition, another year of projects will be added to the plan, so it remains a 6 year look ahead.
- The current plan shows an estimated $100 million to be spent. The Bond and Class C funds total $109 million. The $9 million contingency will be managed as follows:
    - If staff finds that final project costs exceed the estimated budgets, the contingency funds will be used to cover the overruns;
    - Once the contingency funds are spent, projects will need to be truncated or removed from the plan;
    - If final project costs are coming in lower than the estimated budget, staff will add projects to the list;
    - At the end of the six-years, all $87 million plus earned interest of the bond funds will be spent.

Reconstruction Plan Map- [link to map here]



Current Proposed Streets Maintenance Plan [link to map here]



Proposed Street Listing by Year and Reconstruction Type

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Arterial & Collector Reconstruction Candidates

Year	Street	From	To	Cost Estimates at Bond Inception	Council District	Impact Fee	Total for Year
2020	500 East	1700 South	2100 South	$1,500,000	5	$124,500	$4,800,000
	2000 East	Parley's Way	City Limit	$1,300,000	7	$107,900	
	700 West	1600 South	2100 South	$2,000,000	2	$150,600	
2021	300 West - Phase 1	900 South	1300 South	$8,650,000	5	$651,345	$14,250,000
	900 East	Hollywood Ave	2700 South	$2,600,000	7	$172,640	
	900 South - RDA Phase	900 West	Lincoln St	No bond $ spent	2		
	100 South	University St	900 East	$3,000,000	4	$282,000	
2022	300 West - Phase 2	1300 South	2100 South	$8,600,000	5	$651,345	$15,850,000
	200 South - Phase 1	400 West	900 East	$6,000,000	2,4	$406,550	
	900 South - Phase 1 and 2	900 West	Lincoln St	$1,250,000	2,5	$144,000	
2023	200 South - Phase 2	400 West	900 East	$6,000,000	2,4	$406,550	$14,050,000
	900 South - Phase 1 and 2	900 West	Lincoln St	$1,250,000	2,4,5	See 2022	
	1100 East / Highland Dr	Ramona Ave	Warnock Ave	$2,900,000	7	$192,560	
	1100 East	900 South	Ramona Ave	$3,900,000	7	$232,400	
2024	Virginia St	South Temple St	11th Ave	$1,300,000	3	$122,200	$9,900,000
	300 North	300 West	1000 West	$1,600,000	1,3	$133,480	
	1300 East**	2100 South	City Limit	$3,000,000	7	$722,166	
	West Temple	North Temple	400 South	$4,000,000	3,4	$283,600	
2025	1700 East	1700 South	2700 South	$2,000,000	7	$132,800	$9,500,000
	2100 South	700 East	1700 East	$7,500,000	5,7	$622,500	
	End of GoBond Funding						
2026	900 West***	North Temple	600 North	$2,800,000	2		$2,800,000
2027	700 North (with WFRC/FED $)	Redwood Road	2200 West	$4,700,000	1		$4,700,000
						Total	**$75,850,000**

This plan will be revaluated annually based on funding and City priorities.

**1300 East (2100 South to City Limit) is receiving federal funding.

***Dependent on funding and City priorities

Local Street Reconstruction Candidates

Year	Street	From	To	Council District	Cost Estimates at Bond Inception	Total for Year
2020	500 N	JORDAN RIVER	REDWOOD RD	1	$186,274	**$2,794,181**
	ARIES CIR	CULDESAC END	NEW STAR DR	1	$193,975	
	BRIARCLIFF AVE	AMERICAN BEAUTY DR	AUTUMN AV	1	$147,286	
	COATSVILLE AVE	800 E	900 E	7	$251,049	
	DUPONT AVE	CAPISTRANO DR	AMERICAN BEAUTY DR	1	$209,736	
	DUPONT AVE	CAROUSEL ST	1500 W	1	$229,937	
	ELIZABETH ST	CRYSTAL AV	STRATFORD AV	7	$122,209	
	ELIZABETH ST	STRATFORD AV	WHITLOCK AV	7	$132,387	
	HASLAM CIR	CULDESAC END	GARNETTE ST	1	$75,267	
	KENSINGTON AVE	1400 E	1500 E	6	$223,691	
	PARKWAY AVE	ELIZABETH ST	HIGHLAND DR	7	$121,678	
	RAMONA AVE	900 E	LINCOLN ST	7	$86,240	
	RAMONA AVE	LINCOLN ST	1000 E	7	$133,535	
	TALISMAN DR	800 N	1200 W	1	$288,113	
	TALISMAN DR	CULDESAC END	CORNELL ST	1	$139,477	
	ZENITH AVE	800 E	900 E	7	$253,329	

Local Street Reconstruction Candidates

Year	Street	From	To	Council District	Cost Estimates at Bond Inception	Total for Year
2021	1900 E	SUNNYSIDE AV	900 S	6	$140,801	**$3,269,305**
	200 N	400 W	W TERMINUS END	3	$180,606	
	ALTA ST	2ND AV	3RD AV	3	$108,932	
	ALTA ST	3RD AV	FEDERAL HEIGHTS DR	3	$212,668	
	BLAINE AVE	NEVADA ST	FOOTHILL DR	6	$514,874	
	CAMBRIDGE WAY	CHANDLER DRIVE	TOMAHAWK DR	3	$420,559	
	GREENWOOD TER	900 S	SUNNYSIDE AV	6	$105,601	
	FOLSOM AVE	900 W	1000 W	2	$513,333	
	KENSINGTON AVE	KEN REY ST	2100 E	6	$385,770	
	L ST	7TH AV	8TH AV	3	$155,347	
	L ST	9TH AV	10TH AV	3	$149,095	
	M ST	3RD AV	4TH AV	3	$163,352	
	NEVADA ST	WILSON AV	BLAINE AV	6	$111,276	
	WALL ST	COLUMBUS ST	400 N	3	$107,091	

Local Street Reconstruction Candidates

Year	Street	From	To	Council District	Cost Estimates at Bond Inception	Total for Year
2022	800 W	ARAPAHOE AV	600 S	2	$191,476	**$2,573,571**
	800 W	ARAPAHOE AV	700 S	2	$218,109	
	800 W	700 S	800 S	2	$423,512	
	800 W	800 S	900 S	2	$399,162	
	BRYAN AVE	800 E	900 E	5	$310,153	
	INDUSTRIAL RD	2100 S	ASSOCIATED AVE	2	$401,643	
	KENSINGTON AVE	800 E	900 E	5	$308,933	
	LIBERTY AVE	LAKE ST	800 E	5	$81,454	
	ROOSEVELT AVE	600 E	700 E	5	$239,128	
2023	100 S	600 W	500 W	2	$696,337	**$2,775,817**
	1000 E	ATKIN AV	2700 S	7	$327,363	
	1700 E	1300 S	SHERMAN AVE	6	$176,000	
	BENCHMARK CR AND DR	LAKELINE DR	TERMINUS	6	TBD	
	DALLIN ST	COUNTRY CLUB DR	STRINGHAM AV	7	$371,763	
	GREGSON AVE	900 E	LINCOLN ST	7	$127,494	
	LINCOLN ST	ELM AV	2100 S	7	$244,435	
	MEADOW LN	GREEN ST	700 E	7	$61,644	
	PIERPONT AVE	400 W	300 W	4	$182,269	
	RICHARDS ST	900 S	800 S	5	$405,280	
	UNIVERSITY ST	600 S	700 S	4,6	$183,231	

Local Street Reconstruction Candidates

Year	Street	From	To	Council District	Cost Estimates at Bond Inception	Total for Year
2024	18TH AVE	LITTLE VALLEY RD	TERRACE HILLS DR	3	$156,924	**$3,194,638**
	BONNEVIEW DR	1500 E	MICHIGAN AVE	6	$305,250	
	COUNTRY CLUB CIR	PARLEYS CANYON BLVD	TERMINUS	7	$133,833	
	DE SOTO ST	GIRARD AV	N TERMINUS END	3	$317,145	
	DEVONSHIRE DR	SUNSET OAKS DR	LANCASTER DR	6	$623,231	
	KENSINGTON AVE	WASATCH DR	INDIAN HILLS CIR	6	$274,482	
	KRISTIANNA CIR	VIRGINIA ST	E CULD AC END	6	$292,344	
	OQUIRRH DR	OAK HILLS WY	ST MARYS WY	6	$581,727	
	PERRY AVE	TRAFFIC -Y-	SIGSBEE TRAF CIR	3	$116,446	
	PERRY AVE	VIRGINIA ST	LAUREL ST	3	$144,856	
	PERRYS HOLLOW RD	TOMAHAWK DR	NEW BONNEVILLE PL (PVT)	3	$75,171	
	SIGSBEE AVE	SIGSBEE TRAF CIR	SIGSBEE TRAF CIR INCLUSIVE	3	$112,534	
	WEST CAPITOL ST	ZANE AV	GIRARD AV	3	$60,695	
2025	600 S	900 W	800 W	2	$746,984	**$2,260,130**
	EMILY CIR	S TERMINUS END	800 N	1	$48,876	
	GARNETTE CIR	W CULDESAC END	GARNETTE ST	1	$65,516	
	GOODWIN CIR	W CULDESAC END	GARNETTE ST	1	$54,420	
	IRVING ST	S CULDESAC END	800 N	1	$96,787	
	NEBULA WAY	W TERMINUS END	SILVER STAR DR	1	$70,430	
	PARK ST	BROWNING AV	SHERMAN AV	5	$222,546	
	PARAMOUNT AVE	300 W	TERMINUS	5	$262,167	
	PRINCETON AVE	1100 E	DOUGLAS ST	5	$389,756	
	REDONDO AVE	600 E	700 E	5	$210,658	
	VAN NESS PL	400 E	E TERMINUS END	5	$91,990	
	End of GoBond Funding					
2026	1100 W	HAYES AVE	AMERICAN AVE	2	$200,000	**$200,000**
2027	SMALL STREETS/CUL-DE-SACS			Throughout	$1,500,000	**$1,500,000**
					Total	**$18,567,643**

This plan will be revaluated annually based on funding and City priorities.

Summary

	Arterial & Collector Reconstruction	Arterial & Collector Overlay	Local Street Reconstruction	Local Street Overlay	Yearly Totals
2020	$4,800,000	$526,560	$2,794,181	$1,790,680	**$9,911,421**
2021	$14,250,000	$2,693,160	$3,269,305	$1,120,320	**$21,332,785**
2022	$15,850,000	$1,491,040	$2,573,571	$1,694,360	**$21,608,971**
2023	$14,050,000	$1,645,240	$2,775,817	$1,580,880	**$20,051,937**
2024	$9,900,000	$1,259,960	$3,194,638	$1,093,480	**$15,448,078**
2025	$9,500,000		$2,260,130		**$11,760,130**
2026	$2,800,000		$200,000		**$3,000,000**
2027	$4,700,000		$1,500,000		**$6,200,000**
Method Totals	**$75,850,000**	**$7,615,960**	**$18,567,643**	**$7,279,720**	**$109,313,323**

This plan will be revaluated annually based on funding and City priorities.

Appendix A: Descriptions and Photos of Pavement Condition Classifications

Overall Pavement Condition (OCI) Ratings Examples

The following pages present examples of roadway maintenance strategies that would be recommended based on the stated roadway pavement condition.

Pavement Condition: Good

Recommended Maintenance Strategy: Pavement requires only minor or no maintenance activities over the next five years

Pavement Condition: Satisfactory (Minor cracking and oxidation)
Recommended Maintenance Strategy: Slurry Seal

Pavement Condition: Fair (Significant cracking and oxidation)
Recommended Maintenance Strategy: Chip Seal

Pavement Condition: Poor (Major cracking, rutting, and oxidation)
Recommended Maintenance Strategy: Rehabilitation (Overlay)

Pavement Condition: Very Poor (Major cracking, patches, and sunken pavement)
Recommended Maintenance Strategy: Reconstruction

Pavement Condition: Serious and Failed (Pavement has failed – ongoing repairs needed to maintain the roadway in a safe passable condition)

Recommended Maintenance Strategy: Reconstruction

Crack Sealing

Hot rubberized sealant to pre-vent water intrusion.

Slurry Sealing

Mixture of small rock, asphalt, cement and water.

Chip Sealing

Fine gravel, evenly spread, covered by liquid asphalt.

Asphalt Overlay

Removal of top layer and replaced with new asphalt.

Reconstruction

Rebuild of entire road structure.