Town of Lyons 2022 Streets Pavement Memo

Date: May 11, 2022

Project: 19-2529

To: Dave Cosgrove, Town of Lyons Director of Parks & Public Works
Aaron Caplan, Town of Lyons Director of Utilities & Engineering

From: Chris Jain, PE, CFM
Murraysmith, Town Engineer

Re: Street Maintenance and Paving Summary and Recommendations Memo

Overview

The purpose of this memo is to summarize the completed pavement projects within the last five years (2017 to 2021) and to identify and prioritize streets that will require pavement preservation or pavement rehabilitation over the next three years (2022 to 2024). In November 2019, Capital Asset & Pavement Services, Inc. (CAPS) performed a visual inspection of all paved streets maintained by the Town of Lyons, Colorado (Town). US 36 (Main Street and Broadway) and 5th Avenue / Highway 7 are not included as the pavement for these streets is maintained by CDOT.

The subsequent Pavement Management Budget Options Report, submitted to the Town in March 2020, provided a Pavement Condition Index (PCI) of all inspected streets to assist the Town with identifying street preservation and rehabilitation priorities. The PCI is a measurement of pavement condition that ranges from 0 to 100, where a newly constructed street would have a PCI of 100, while a failed street needing to be reconstructed would have a PCI of under 25.

In general, a street that has a PCI of over 70 is in "Good" condition and can remain in "Good" condition for a longer period if relatively inexpensive preventative maintenance treatments (crack, chip, and slurry sealing) are used. However, if the PCI falls below 70, more expensive rehabilitation treatments such as a mill and overlay are required, and if the PCI falls below 40, increasingly expensive treatments such as full-depth reclamation or complete reconstruction are required. Thus, it becomes imperative for a pavement management system to follow a "best-first" approach to extend the life cycle of a street and delay the requirement for expensive rehabilitation projects by performing preventive maintenance and pavement preservation treatments.

The original report prepared by CAPS was produced in March 2020, and most of the recommendations from 2020 and 2021 have been completed. Street sections from those years that have not been completed are included on the proposed pavement preservation and

rehabilitation projects lists. Additionally, all recommendations will be reevaluated in the field prior to construction, as pavement deterioration may have occurred at a slower or faster rate than anticipated since the time of initial assessment in 2019 and documentation in 2020.

Completed Projects

Annual pavement preservation projects have been on-going for several years. The recent pavement rehabilitation or reconstruction projects were part of the Town's disaster recovery efforts following the 2013 flood as stand-alone projects or in conjunction with utility replacement projects. The table below includes a summary of all completed pavement programs and their costs since 2017 in the Town of Lyons. For a comprehensive list of all pavement projects by location and treatment type, see **Appendix A**.

Approximate Costs of Completed Pavement Programs	
Program	**Approximate Cost**
2017/2018 – Pavement Preservation	$55,000
2019 – Pavement Preservation	$48,000
2019 – Apple Valley Waterline Relocation[1]	$275,000
2020 – Pavement Preservation	$38,500
2020 – Roadway Repairs for Flood Recovery (FEMA Grant)	$525,000
2021 – Pavement Preservation	$44,600
2021 – 2nd Avenue Bridge Replacement (Flood Recovery FEMA Grant) [2]	$130,000
2022 – Longs Peak Drive Utility Replacement and Street Reconstruction[1]	$360,000
Total Cost of All Pavement Treatment Programs from 201 7 to 2022	**$1,476,100**

[1]These projects were constructed for utility purposes but involved full-depth pavement reclamation. The costs provided were approximated using the construction costs of the pavement-associated items.

[2]This project was primarily a bridge replacement project, but also included roadway reconstruction of the approaches to the bridge, approximately 250 feet south and 350 feet north of the new 2nd Avenue Bridge. The costs provided were approximated using the construction costs of the pavement-associated items.

Pavement Preservation Priorities

It is recommended that the pavement preservation projects continue to be completed on a yearly basis, to continue a "best-first" approach by preserving and extending the life of the streets that are currently still in good condition. Pavement preservation projects include crack sealing, slurry seals, and chip seals that extend the life of the pavement and protect the aggregate base by sealing out destructive water infiltration. Continuing these yearly preservation projects will supplement the pavement rehabilitation projects, which are designed to repair or replace severely deteriorated or failing streets. An example of this is to inspect recently paved streets for any developing cracks, and then apply a crack seal to them in a timely matter to preserve the recent investment.

Appendix B includes a list of pavement preservation projects for the next three years (2022 to 2024), as identified in the Pavement Management Budget Options Report. Each pavement preservation project has a recommended treatment option to fulfill the goal of extending the pavement life cycle and preventing the need for a more costly rehabilitation project in the near future. In addition, although not specifically listed in **Appendix B**, striping will also likely be performed in conjunction with preservation projects as needed.

Pavement Rehabilitation and Reconstruction Priorities

While a "best-first" approach to the Town's pavement management system is proposed in this memo, several streets were identified in the CAPS report as having already deteriorated to the point of failure, and thus requiring a rehabilitation with mill and overlay or reconstruction with full-depth reclamation. A list of these streets can be found in **Appendix C**, with each project ranked in order of the current PCI. In addition, several streets will not be able to be fully rehabilitated through a mill and overlay and will instead require a full-depth reclamation.

Some of these streets with the worst PCI's include 5th Avenue from High Street to Steamboat Valley Road, 2nd Avenue from Main Street/US 36 to the cul-de-sac on Mountain View Drive, and McConnell Drive from 2nd Avenue to Bohn Court and from Cater Drive back out to McConnell Drive. Spending money on these streets outside of patching potholes or repairing areas that pose a risk to vehicles, bikes, or pedestrians, is not advised as they have deteriorated past the point of saving. These streets will continue to function short-term but maybe a rough ride for vehicles and will need to be addressed at some point.

Although PCI is integral in prioritizing streets with the greatest need for rehabilitation and reclamation, other factors must be considered when developing a proposed timeline for this work. These factors include necessary underground utility work, stormwater drainage problems, ongoing construction projects, and street classification.

As the installation, repair, or replacement of an underground utility often requires trench excavation in the roadway pavement, it will be imperative for all planned utility projects near or underneath existing roadways to be coordinated with pavement rehabilitation or reclamation projects. Likewise, the conditions of the underground utilities should be evaluated or confirmed prior to any rehabilitation or reconstruction projects to prevent having to cut a trench in the newly placed pavement for utility repairs or replacements. The Town Engineer (Murraysmith), Town Director of Utilities & Engineering and Town Director of Parks & Public Works continue to discuss the needs and any identified future utility or street projects to ensure utility work and street paving are coordinated.

Stormwater runoff can rapidly deteriorate both the asphalt pavement and the underlying base course and subgrade, contributing to a wide variety of roadway problems including stripping, bleeding, potholing, cracking, and heaving. Therefore, known drainage issues should be addressed prior to, or in conjunction with, street rehabilitation and reconstruction projects to extend the pavement life cycle and delay the need for the reoccurrence of these costly projects.

For example, while 2nd Avenue from Main Street/US 36 to the cul-de-sac on Mountain View Drive has a current PCI in the 20s and is therefore slated for a full-depth reclamation, there are known drainage problems in this area that must be addressed first.

Similar to the problems caused by improper drainage, regular use of a roadway by heavy vehicles can accelerate deterioration. This problem is often observed in areas that are adjacent to construction activities or commercial facilities and become temporary or permanent haul routes for trucks transporting heavy materials or equipment. Over the next two years, construction activities related to the new Summit Lyons Valley Townhomes will result in sustained heavy load traffic on the McConnell Drive loop, and therefore this roadway should not receive rehabilitation or reconstruction until after the adjacent construction project is complete. On the contrary, 5th Avenue previously experienced regular commercial vehicle traffic related to the operation of a quarry and commercial construction businesses north of the Town, contributing to the low PCI (approximately 25) observed on this street north of Highway 36. Now that these commercial facilities are no longer in operation, a complete street reconstruction project to upgrade the road would be appropriate.

Finally, street classification should be considered in the project prioritization as well. Streets classified as a "collector" or "arterial" are the backbone of a street network, relied upon by more users, typically resulting in higher volumes and speeds. Streets that are identified as "residential/local" will experience a lower volume of traffic with lower travel speeds and typically much less heavy/truck traffic. Most of the Town's street network consists of residential/local streets, with McConnell Drive, most of Stone Canyon Drive, most of 2nd Avenue, and short sections of 3rd Avenue and 4th Avenue are classified as collectors. A section of Stone Canyon Drive is classified as an arterial.

Conclusion

Below is a list of the top priorities to be considered for rehabilitation or reconstruction this year and include only street sections that have no known underground utility repair or replacement needs, no known significant stormwater drainage system needs, and that are not expected to be impacted by heavy traffic related to commercial facilities or planned construction activities in the near future. In addition, geographic proximity was considered to decrease the cost of mobilization and expedite construction. The following will be field inspected prior to seeking construction bids to verify the recommendations and project limits and adjust according to the available budget.

Pavement Rehabilitation Recommendations – Mill and Overlay		
Location	**Current PCI**	**Estimated Cost**
Eagle Canyon Circle (Entire Length)	44	$118,000
Eagle Canyon Drive (Highway 36 to Eagle Canyon Circle)	46	$16,000
Welch Court (Welch Drive to End of Cul-De-Sac)	46	$32,000
Welch Drive (McConnell Drive to 2nd Avenue)	48	$114,000

Total Estimated Cost of Mill/Overlay Projects	**$280,000**

Pavement Reconstruction Recommendations – Full-Depth Reclamation		
Location	**Current PCI**	**Estimated Cost**
5th Avenue (High Street to Steamboat Valley Road)	25	$300,000

By providing a "best-first" approach that focuses on pavement preservation treatments in combination with rehabilitation and reconstruction projects for streets that require more extensive repair, the overall condition of the Town's street network can be improved and maintained at an optimal PCI level in the low 80's.

Appendix A – Recently Completed Projects

2017/2018 – Pavement Preservation	
Location	**Treatment Type**
2nd Avenue	Patching
3rd Avenue (Railroad Avenue to Evans Street)	Infrared Patching
4th Avenue and Evans Street (Curve Only)	Repair
High Street (Adjacent to 211 High Street Only)	Patching
Apple Valley Road	Patching
Longs Peak Drive (Entire Length)	Infrared Patching
Old Shop/Sheriff's Building	ADA Parking and Paving
Railroad Avenue and 4th Avenue (Intersection Only)	Patching
Town Hall	Repair
Approximate 2017/2018 Total Cost	**$55,000**

2019 – Pavement Preservation	
Location	**Treatment Type**
2nd Avenue (Railroad Avenue to 2nd Avenue Bridge)	Patching
4th Avenue (Broadway to Main Street)	Patching
4th Avenue and High Street (Intersection Only)	Patching
Lyons Valley Park Subdivision Area (McConnell Dr, Raymond Ct, Goranson Ct, Bohn Ct, Noland Ct, Estes Ct)	Crack Sealing
Steamboat Valley Road Area	Crack Sealing
Vasquez Road Area	Crack Sealing
Horizon Road Area	Crack Sealing
Stone Canyon Area	Crack Sealing
Approximate 2019 Total Cost	**$48,000**

2019 – Apple Valley Waterline Relocation	
Location	**Treatment Type**
Apple Valley Road (Boulder County Limits to US 36)	Overlay
Approximate Cost for Pavement Section Only	**$275,000**

2020 – Pavement Preservation	
Location	**Treatment Type**
3rd Avenue (High Street to Stickney Avenue)	Patching and Crack Sealing
4th Avenue (High Street to Stickney Avenue)	Patching and Crack Sealing
5th Avenue (High Street to Steamboat Valley Road)	Patching and Crack Sealing
Bloomfield Alley (Entire Length)	Patching and Crack Sealing
Ewald Avenue (Entire Length)	Patching and Crack Sealing
McCall Alley (Entire Length)	Patching and Crack Sealing
Meily Street (Entire Length)	Patching and Crack Sealing
Old Main Street (2nd Avenue to 3rd Avenue)	Patching and Crack Sealing
Prospect Street (Entire Length)	Patching and Crack Sealing
Railroad Avenue (2nd Avenue to 5th Avenue)	Patching and Crack Sealing
Stickney Avenue (3rd Avenue to 5th Avenue)	Patching and Crack Sealing
Approximate 2020 Total Cost	**$38,500**

2020 – Roadway Repairs for Flood Recovery (FEMA Grant)	
Location	**Treatment Type**
4th Avenue (Broadway to Evans Street)	Full-Depth Reclamation
4th Avenue (Broadway to Main Street)	Full-Depth Reclamation
Evans Street (4th Avenue to 332 Evans Street)	Full-Depth Reclamation
Evans Street (326 Evans Street to 3rd Avenue)	Mill and Overlay
Evans Street and 3rd Avenue (Intersection Only)	Full-Depth Reclamation
Evans Street (3rd Avenue to 2nd Avenue)	Patching and Mill and Overlay
3rd Avenue (Evans Street to Broadway)	Full-Depth Reclamation
2nd Avenue (Park Street to Evans Street)	Mill and Overlay
2nd Avenue (McConnell Drive to WWTP/Recycling Center Driveway)	Full-Depth Reclamation
3rd Avenue (Broadway to Main Street)	Mill and Overlay
McConnell Drive (2nd Avenue north to McConnell Drive intersection)	Mill and Overlay
Approximate Cost for Pavement Section Only	**$525,000**

2021 – Pavement Preservation	
Location	**Treatment Type**
1st Avenue (Entire Length)	Patching and Crack Sealing
2nd Avenue (Main Street to 1st Avenue)	Patching and Crack Sealing
3rd Avenue (Stickney Avenue to Seward Avenue)	Patching and Crack Sealing
4th Avenue (North of Stickney Avenue)	Patching and Crack Sealing
Mountain View Drive (Entire Length)	Patching and Crack Sealing
Reese Street (Entire Length)	Patching and Crack Sealing
Seward Avenue (3rd Avenue to 5th Avenue)	Patching and Crack Sealing
Stickney Avenue (East of 3rd Avenue)	Patching and Crack Sealing
Approximate 2021 Total Cost	**$44,600**

2021 – 2nd Avenue Bridge Replacement (Flood Recovery FEMA Grant)	
Location	**Treatment Type**
2nd Avenue (WWTP/Recycling Center Driveway to 2nd Avenue Bridge, 2nd Avenue Bridge to Park Street)	Full-Depth Reconstruction
2nd Avenue and Park Street Intersection (Intersection)	Full-Depth Reconstruction
Approximate Cost for Pavement Section Only	**$130,000**

2022 – Longs Peak Drive Utility Replacement and Street Reconstruction	
Location	**Treatment Type**
Longs Peak Drive (3rd Avenue to End)	Full-Depth Reconstruction
Approximate Cost for Pavement Section Only	**$360,000**

Appendix B – Pavement Preservation Recommendations

2022 – Pavement Preservation Recommendations	
Location	**Treatment Type**
2nd Avenue (McConnell Drive to 2nd Avenue Bridge, 2nd Avenue Bridge to Evans Street)	Seal Cracks, Slurry or Chip Seal
Nolan Road (Stone Canyon Road to end)	Slurry or Chip Seal
Peregrine Lane (Eagle Valley Drive to cul-de-sac)	Slurry or Chip Seal
Vasquez Drive (Vasquez Court to Horizon Drive)	Slurry or Chip Seal
Railroad Avenue (5th Avenue to 3rd Avenue)	Slurry and Crack Seal
Steamboat Valley Road (5th Avenue to Vasquez Drive)	Slurry and Crack Seal
4th Avenue (Prospect Street to Evans Street)	Seal Cracks
Evans Street (West cul-de-sac to 5th Avenue)	Seal Cracks
Evans Street (5th Avenue to 4th Avenue)	Seal Cracks
Park Street (5th Avenue to cul-de-sac)	Seal Cracks
Prospect Street (5th Avenue to 4th Avenue)	Seal Cracks
Approximate Cost Estimate	**$85,000**

2023 – Pavement Preservation Recommendations	
Location	**Treatment Type**
1st Avenue (Overlook Drive to cul-de-sac)	Slurry or Chip Seal
Bloomfield Alley (5th Avenue to 4th Avenue)	Slurry or Chip Seal
Carter Drive (McConnell Drive to new pavement – Summit Town Homes)	Slurry or Chip Seal
High Street (80 ft east of 4th Avenue to 3rd Avenue)	Slurry or Chip Seal
McConnell Drive (Carter Drive to house #325)	Slurry or Chip Seal
McConnell Ct (McConnel Drive to cul-de-sac)	Slurry or Chip Seal
Stickney Avenue (250 feet east of 3rd Avenue to Seward Street)	Slurry or Chip Seal
Stickney Avenue (3rd Avenue to 250 feet east of 3rd Avenue)	Slurry and Crack Seal
Eagle Valley Drive (Stone Canyon Drive to cul-de-sac)	Slurry and Crack Seal
Falcon Lane (Eagle Valley Drive to cul-de-sac)	Slurry or Chip Seal
Apple Valley Road (Town Limits to US 36)	Seal Cracks
McConnell Drive (US 36 to McConnell Drive intersection)	Seal Cracks
McConnell Drive (School Driveway to Raymond Court)	Seal Cracks
Approximate Cost Estimate	**$85,000**

2024 – Pavement Preservation Recommendations	
Location	**Treatment Type**
McConnell Drive (US 36 to McConnell Drive intersection)	Slurry or Chip Seal
McConnell Drive (100 feet S of Goranson Court to Carter Drive)	Slurry or Chip Seal
Old Main Street (3rd Avenue to 2nd Avenue)	Slurry or Chip Seal
Raymond Court (McConnell Drive to cul-de-sac)	Slurry or Chip Seal
Stone Canyon Drive (US 36 to Eagle Valley Drive)	Slurry or Chip Seal
Stickney Avenue (4th Avenue to 3rd Avenue)	Slurry and Crack Seal
2nd Avenue (WWTP/Recycling Center Driveway to 2nd Avenue Bridge, 2nd Avenue Bridge to Park Street)	Seal Cracks
3rd Avenue (Park Street to Main Street)	Seal Cracks
4th Avenue (Evans Street to Main Street)	Seal Cracks
Evans Street (4th Avenue to 2nd Avenue)	Seal Cracks
Longs Peak Drive (3rd Avenue to End)	Seal Cracks
Stone Canyon Drive (Eagle Valley Drive to Town Limits/Pavement End)	Seal Cracks
Approximate Cost Estimate	**$85,000**

Appendix C – Pavement Rehabilitation Recommendations

Pavement Rehabilitation Recommendations – Mill and Overlay	
Location	**Current PCI**
Eagle Canyon Circle (Entire Length)[1]	44
McCall Alley (5th Avenue to the Dead-End East of 4th Avenue)	45
Eagle Canyon Drive (Highway 36 to Eagle Canyon Circle)[1]	46
Welch Court (Welch Drive to End of Cul-De-Sac)[1]	46
3rd Avenue (Stickney Avenue to Cemetery)	47
Cobblestone Court (2nd Avenue to End of Cul-De-Sac)	47
Kelling Drive (2nd Avenue to the Dead End)	47
2nd Avenue (Highway 36 to Main Street)	48
High Street (3rd Avenue to 2nd Avenue)	48
Welch Drive (McConnell Drive to 2nd Avenue)[1]	48
2nd Court (2nd Avenue to End of Cul-De-Sac)	49
Estes Court (McConnell Drive to End of Cul-De-Sac)	49
Meily Road (Ewald Avenue to 5th Avenue)	49
Noland Court (McConnell Drive to End of Cul-De-Sac)	49
4th Avenue (Main Street to High Street)	63
5th Avenue Access Road (5th Avenue/Steward Intersection to 5th Avenue)	66

[1]These projects have been proposed to be completed in 2022.