

Street Pavement Assessment FOR City of Florence, Colorado

July 19, 2024

Revised August 15, 2024

FINAL



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3 Rocks Engineering & Surveying

Background

The City of Florence hired 3 Rocks Engineering and Surveying to provide an assessment of the condition of the asphalt pavement on all streets within the City boundary and under the jurisdiction of the City. The project limits were defined as those streets that lie within the boundary shown on the City Ward Boundaries map provided by the City Clerk. A more detailed map of the City limits is shown below as Figure 1.

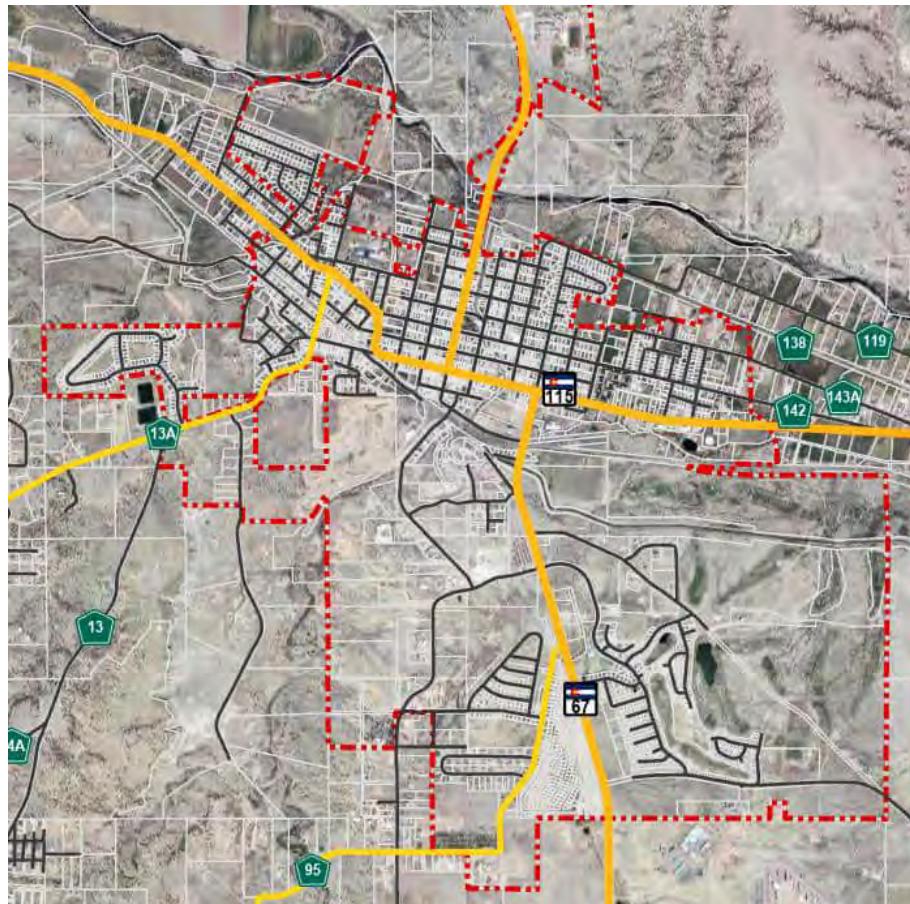


Figure 1

Project Description

Goal of project:

The goal of this project is to have a complete inventory of current street conditions for all city streets (county roads and state highways excluded) so that each street can be assigned an improvement priority (high, medium, low) which can be used by the City to create a long-term implementation plan.



Existing conditions- General:

Pavement conditions were observed on June 4-5, June 20, July 8, and July 15. Below is a general summary of conditions encountered which is the basis of the tabulations of each specific street segment.



1 Road damage at Tanner Ave and 3rd St



2 Unpaved Road- Florence Ave at 3rd St

Most streets in the city core are asphalt paved and in varying condition. Although no one street stood out as needing immediate rehabilitation, there were sections of road that were showing severe distress.



3 3rd St- example of typical city pavement condition



4 4th St- localized severe pavement damage.



City streets varied in width and shoulder treatments. Most have curbs but some have shoulders used for off-street parking. The condition of curbs and associated sidewalks is outside of the project scope.



5 Existing inlet



6 Alligator cracking at Robinson and 4th St.

A few street sections showed moderate to severe alligator cracking indicating a potential subgrade issue. These sections are potentially the most critical for rehabilitation because they have lost their structural integrity, and the cracking will rapidly propagate into the rest of the street.



7 Transition between 2 pavement conditions



8 Poor pavement condition near the park

Project Scope and Approach:

The determination of improvement priorities (high, medium, low) is based on 2 factors: current condition of the pavement surface and amount of traffic using the street. The highest priority for improvement will be given to high traffic streets in poor condition with the lowest priority given to low traffic volume streets in good condition. All city streets will fall within these two extremes. Assessment of the street surface will be by a visual inspection with some measurements taken to denote the presence of cracking, rutting, potholing, raveling or other signs of distress. These types of distress are commonly caused by too much traffic for the pavement section, poor subgrade, or inadequate drainage of the pavement surface or adjacent ground.

3 Rocks used the following approach to complete the pavement assessment:

- Drive all roads within the project limits and document the existing condition. Photo document problem areas and take measurements as needed for potential improvement quantities.



- Assign each street a condition designation – Good, Fair or Poor.
- The City provided information on which streets are considered high volume traffic- this listing is included in the appendix of this report
- Assign each street a priority designation – High, medium, or low.
- Create a Street Pavement Assessment Report which documents the existing conditions, identified problems, and prioritizes the rehabilitation of each street.
- Create exhibits from Google earth aerial maps (no files were provided by the city) to show specific problem areas.

Deliverables

- Street Pavement Assessment Report with exhibits

Exclusions

- County roads and state highways are not included in this assessment. Only streets within the city limits are in the scope of work.
- Surveying and ROW services
- Geotechnical investigations
- Drainage inventory, analysis, and report
- Sidewalk and ramp assessments
- Design plans
- Traffic counts
- Cost estimates
- Structural design
- Agency coordination other than City staff
- Public involvement
- Anything not specifically listed in this proposal

Priority Determination Table

Condition	Traffic Volume	Improvement Priority
Poor	High	High
Poor	Low	High
Fair	High	Medium
Fair	Low	Medium
Good	High	Low
Good	Low	Low



Condition Definitions

Poor- the presence of alligator cracking which covers a large section of road or runs the entire width, usually with multiple potholes and missing asphalt chunks where the structural integrity of the pavement is compromised and beyond mill and overlay rehabilitation.

Fair- distresses noted beyond block cracking including longitudinal, transverse and alligator cracking, depressions, patching, edge cracking, potholes, or other types of more serious distresses. Asphalt looks weathered and not a consistent finish. The noted distresses have not propagated along the entire length or width of the road segment, still only localized. The Fair category was further broken into two conditions- *Fair-Good (F/G)* and *Fair-Poor (F/P)* to help further prioritize roads in Fair condition. While still meeting the criteria for the FAIR designation, Fair-Good is roads in better condition than Fair-Poor. Note that the aerial exhibits were NOT updated to have all the Fair designation labels changed to F/G or F/P- refer to the table for the condition breakdown.

Good- no cracking or block cracking only, no patching, consistent look and texture

Recommendations and next Steps

Based on the Condition Summary table and the aerial exhibits, top priority project areas can be determined by the City. Pavement sections that are in poor condition are probably beyond the point of being able to do a mill and overlay and most likely require full reconstruction. Pavement segments in Fair condition can have overlay or mill and overlay rehabilitation, and pavement in Good condition should receive crack sealing and spray seals as needed.

Other factors that can be evaluated in the future that are not part of this project scope that can help in prioritizing the rehabilitation of the streets are:

- Speed limit assessment – document speed limit sign locations, look for inconsistencies and check road geometrics to determine if limits need to be adjusted.
- Accident History- get accident records from county sheriff and local police departments. Look for trends in the accident data to determine if roadway alignment or condition was a factor.
- Proper Signage – Inventory all signs and locations and determine if adjustments or additions are needed. Consult the MUTCD to determine if current signs meet standard convention.
- Drainage – curbs and inlets need to be checked to see if they are adequate. Discuss problem areas with city staff and residents and road users to determine areas of concern.
- Sidewalk location and condition- determine where sidewalk needs to be added or where existing sidewalk needs to be replaced because of poor condition or substandard (non-ADA compliant) design.
- Pedestrian crossings – check sight distances, markings, and signage
- Identify high risk areas- look for areas of potential danger and get input from residents and road users about these locations.



Attachments:

Ward Boundary map
High Volume Street list
Condition summary and priority table
Surface Photos
Pavement Condition Aerial exhibits



Florence Street Assessment
Pavement Condition Inventory

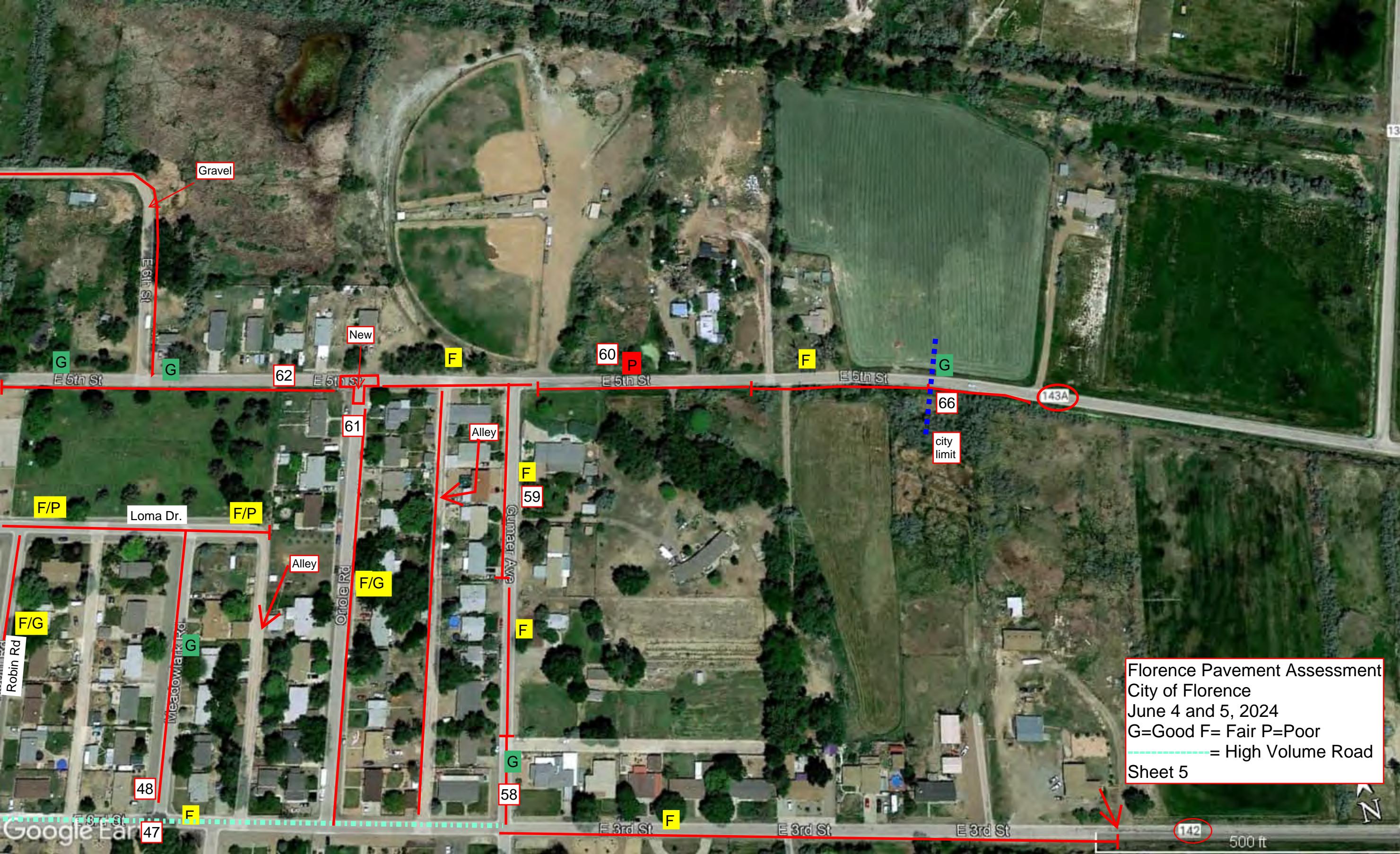
Client:	City of Florence				Date:	July 19 2024		
Project:	Pavement Assessment							
Title:	Condition Summary and Priority Table					PRIORITY		
Street	Good	Fair-Good	Fair-Poor	Poor	Very Poor	SHEET	High Volume Street	HIGH MEDIUM LOW
W 1st St			1,063	463	1,16			
W 2nd St	1,978	2,041	380	591	1,2,15			
E 2nd St- Pikes Peak to Florence	1,405	1,235		76	2,4	Y		
E 2nd St- Sunnyside St east	503				2,4			
E 2nd St- Gumaer Ave east		271			4			
W 3rd St	259	1,268			1,2	Y		
E 3rd St	959	4,641	61		2,3,4,5	Y		
E 3rd St - Alpine Village MHP	1,976				3			
W Main St	1,950				1	Y		
E 4th St - Pikes Peak to Petroleum		436			7			
E 4th St - Petroleum to Florence	494	1,597		252	7			
W 4th St - Cyanide to Oak Creek	1,998				15,16			
W 4th St - Maple to Pikes Peak	480	452			7			
E 5th St - Pikes Peak to 5th Terrace	1,200	185			7			
E 5th St - Tanner to City limit	1,096	808		478	5,6			
W 5th St-N Santa Fe to Pikes Peak	433				7,8			
W 5th St-Maple to Morgan Ave	2,150				8			
E 6th St - N Petroleum to Cul-de-sac		180		725	12			
E 6th St		Gravel			5			
W 6th St		419			12			
E 7th St				991	12			
W 7th St - Maple to N Pikes Peak	500			360	11, 12			
W 7th St- West of N Frazier				340	11			
E 8th St/CR 119		338			13			
Maple Ave	1,120	572		491	2,7,11			
Green St	379				1			
N Santa Fe Ave	803	402			7,12			
S Santa Fe Ave	280	40			2			
S Pikes Peak			328		2	Y		
N Petroleum Ave	1,415	778		545	7,12			
S Petroleum Ave			338		2			
Midland Ave	630	449		365	7,12			
N McCandless Ave	681		1,275	681	2,7,12	Y		
N Robinson Ave			2,682		3,6	Y		
Crawford Ave	51	1,220			3,6			
Florence Ave - Main St to 3rd St.		743			3	Y		
Sunnyside St			599		4			
Gumaer Ave	441	866			4,5	Y		
Circle Drive		Gravel			3			
Tanner Ave	691	50			6			
Loma Dr	597		537		5, 6			
Robin Rd - 3rd to Loma		441			4,5			
Robin Rd - Loma to 5th		236			6			
Meadowlark Rd	442				5			
Oriole Rd		710			5			
Lincoln Ave	384				8	Y		
Washington Ave		634			8	Y		
Church Ave		673			8			
Railroad St		1,803			9			
W Front St			454		2	Y		
E Front St	394	76			2			
Rose Dr	519	791			15			
Rocchio Drive	568	500			15			
Brooke Way	724	990			13			
Cyanide Ave	661	669			15			
Lobach Ave	301				15			
Teller Ave	327				16			
Wilson Ave		593			16			
N Houston Ave		750			16			
Morgan Ave	354				16			
Hawkins Ave		418			16			
N Frazier Ave	1,700			640	1,8,11	Y		
S Frazier Ave	1,080				1	Y		











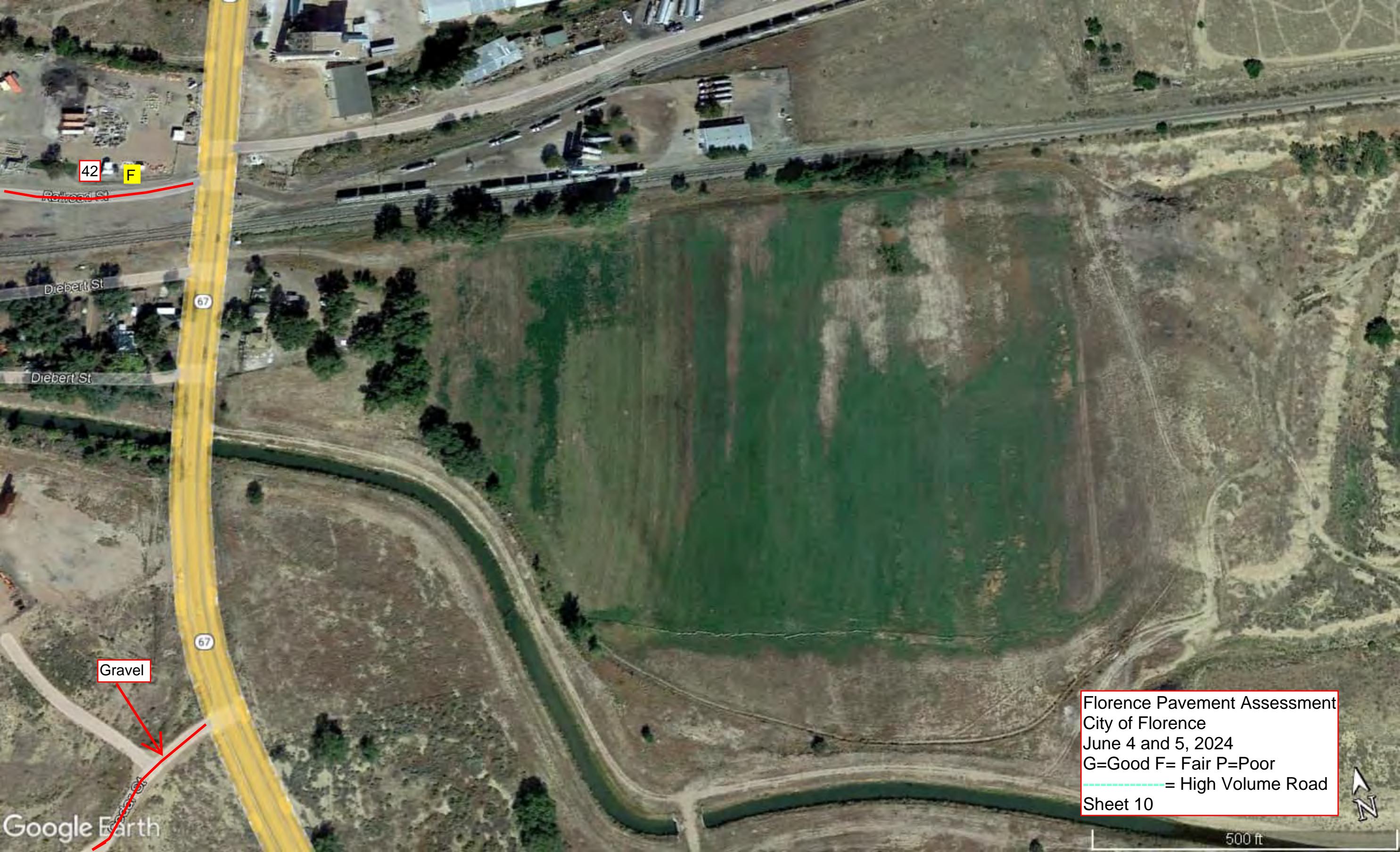
Florence Pavement Assessment
City of Florence
June 4 and 5, 2024
G=Good F= Fair P=Poor
----- = High Volume Road
Sheet 6











Florence Pavement Assessment
City of Florence
June 4 and 5, 2024
G=Good F= Fair P=Poor
= High Volume Road
Sheet 10





Florence Pavement
Assessment
City of Florence
June 20, 2024

G=Good F=Fair P=Poor

= High Volume Road

SHEET 12





Florence Pavement Assessment
City of Florence
June 20, 2024
G=Good F= Fair P=Poor
--- = High Volume Road
SHEET 13



Florence Pavement Assessment
City of Florence
June 4 and 5, 2024
G=Good F= Fair P=Poor
--- = High Volume Road
SHEET 14





Florence Pavement Assessment
City of Florence
June 4 and 5, 2024
G=Good F= Fair P=Poor
— = High Volume Road
Sheet 16

800 ft

Florence Street Assessment

Arrowhead, Highland, Indian Hills





Florence Street Assessment

Moore Road



Florence Pavement Assessment
City of Florence
July 8, 2024
G=Good F= Fair P=Poor VP=Very Poor
— = High Volume Road
SHEET 19





CITY OF FLORENCE

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HIGH VOLUME STREET LIST

As Follows:

W. 3rd St. 100-300 Block

E. 3rd St. from Pikes Peak to Gumaer Ave.

W. 2nd St. 100-300 Block

E. 2nd St. from Pikes Peak to Florence Ave.

Gumaer Ave. 100-200 Block

N. Robinson Ave. from Highway 115 to E. 8th St.

Florence Ave. 100-200 Block

McCandless Ave. from Highway 115 to E. 8th St.

S. Pikes Peak 100-200 Block

W. Main St. 400-500 Block

S. Frazier Ave. from W. Main St. to City Limits

N. Frazier Ave. from W. Main St. to Elementary School

Lincoln Ave. only during school

Washington Ave. only during school

4/2/24 email from Marca Martinez:

I sent you a list earlier from Sam in regards to the high Volume Streets. I did not know he added three more after I sent you the list. They are as follows:

W. 7th St 100-200 Block

Arrowhead Dr.

Moore Dr.

City Review comments received 8/13/24

3 Rocks Engineering comment responses in *italics* 8/15/24

General observations:

- “Fair Good” and “Fair Poor” are labeled very hit and miss on the aerials. Not a huge issue, but there is inconsistency. In the chart everything is labeled “Fair Good” or “Fair Poor”, but almost nothing is labeled this way on the aerials. What is the rationale in labeling some of the aerials this way? *We added the Fair Good and Fair Poor on request from the city to help prioritize the improvements. The table is the main place to look for the priority level so that is also the location for the Fair condition breakdown. When we did make edits, we did show F/G or F/P on the aerials but that was only for revisions. Going back and changing all the Fair labels on the aerials was not part of the original scope of work.*
- Several streets have the associated aerials listed out of numerical order. For example Maple is listed as “2, 11, 7”; N Santa Fe is listed as “12, 7”, etc. Please place aerial numbers in numerical order for easier review for all streets. *Will do*
- Aerial 14 does not include any street information *left it in for information only and so no one thinks it is missing*

E 3rd St: A decent sized section of E Third is on aerial 2 (Pikes Peak to east of McCandless), but the chart only shows aerials 3,4, and 5. Does the footage listed in the chart include the portion of E Third shown on aerial 2? *Yes, the length is correct and the table has been updated to show sheet 2*

W Main: This is listed as being on aerial 2. However, the portion on aerial 2 is part of 115. I assume this is a clerical error and was supposed to be sheet 1? *Yes, the table has been updated to show sheet 1*

W 4th St – Cyanide to Oak Creek: This is listed as being on aerials 6, 7, and 15. This area of W 4th is shown on aerials 15 and 16. *Yes, the table has been updated to show sheet 15 and 16*

W 4th St – Maple to Pikes Peak: This is listed as being on aerials 6, 7, and 15. This area of W 4th is shown on aerial 7 only. *Yes, the table has been updated to show sheet 7*

E 5th St – Pikes Peak to Cul-de-sac: This is listed as being on aerials 5, 6, and 7. This area of E 5th is shown on aerials 6 and 7 only. It should be noted that only the cul-de-sac portion is shown on sheet 7, and it is unlabeled and shows no condition designation, despite being listed on the chart and this portion not being shown on another aerial. *The cul-de-sac has been labelled and condition designated on sheet 7, and the table has been updated for the conditions for this entire stretch of E. 5th.*

E 5th St – Tanner to City Limits: This is listed as being on aerials 5, 6, and 7. This area of E 5th is shown on aerials 5 and 6 only. *Yes, the table has been updated to show sheet 5 and 6*

E 5th St – N Santa Fe to Pikes Peak: This is W 5th Street. Pikes Peak is the dividing line for E/W street designations. *Table has been fixed*

W 5th St – Maple to Morgan: This area does not have an associated aerial listed. It is aerial 8. Additionally, the areas from just east of Church Street to Maple and just east of Wilson Street to Morgan do not have a condition designation on the aerial. Are they included in the footage listed on the chart? *Yes, this section is on aerial 8 only, and the condition designations have been extended to the end of the segments and the table distance has been updated*

E 6th St: There is a blank row for E 6th that appears to be a duplicate with no information. This area is listed as being on aerial 5 only. A small portion also appears on aerial 6, but with no designation. I assume this is also gravel. *E 6th from Petroleum to the cul-de-sac has been added to the table and is shown on sheet 12*

W 7th St: All of W 7th is listed as being in “Good” condition on the chart. However, on aerial 12, the area of W 7th between N Pikes Peak and N Santa Fe is shown as “Poor”. The chart and the aerial need to match. *Added a line to the table for W 7th West of Frazier and revised the condition lengths*

S Santa Fe Ave: This area is listed on aerials 1 and 2 but is only on aerial 1. Additionally, the very end of S Santa Fe just N of the intersection appears to be in “Fair” condition based on the designation on the aerial. However, the chart lists S Santa Fe as “Good” condition only. *The portion of S Santa Fe near Front Street is Fair, the rest of it is in Good condition, the table and aerial have been revised*

N McCandless Ave: This is a high volume street and the majority is listed as “Fair Poor” or “Poor” for condition. Why is this designated as medium priority? *This has been changed to high priority*

Florence Ave: This area is listed on aerials 3 and 5, but is on aerials 3 and 6. Additionally, the non-gravel portion on aerial 6 does not have a condition designation labeled. *Florence Ave is gravel north of 3rd St so the paved portion is only on sheet 3 and labelled fair. Sheet 6 revised to show Florence Ave as gravel.*

Loma Dr: It appears that the text box covers the condition designation for the lower portion of the street. Alternatively, the aerial only shows “Good” as a condition designation for this street while the chart shows both “Good” and “Fair Poor” *Text box moved on sheet 6. Aerial updated to show Fair/Poor portion*

Robin Rd – 3rd to Loma: This area is listed on aerials 4 and 5 but is on aerials 5 and 6. Most of the road has been covered up by the text box on aerial 5, and goes off the page on aerial 6, making it difficult to review. Additionally, the part that has a condition designation on aerial 5 is listed as “Good”, while the chart lists it as “Fair Good”. There is no visible condition designation on aerial 6. *Robin Rd between 3rd and Loma is on aerial 4 and 5 and has been designate Fair/Good on both sheets*

Robin Rd – Loma to 5th: This area is listed on aerials 4 and 5 but is only on aerial 6. Additionally, the condition designation on aerial 6 is listed as “Good”, while the chart lists it as “Fair Good”. *Table has been updated and condition has been designated as Fair Good on the aerial*

Oriole Rd: The condition designation on aerial 5 is listed as “Fair”, while the chart lists it as “Good”. *Condition for Oriole has been changed to Fair Good*

Rose Ave: The northern segment of the street does not have a condition designation. The street is listed as “Rose St” on aerial 15. *North segment of Rose Drive is gravel- labels added to aerial 15 and table changed to say Rose DRIVE*

N Frazier Ave: The condition designation on portions of the street aerial 11 shows “Poor”, however, “Poor” is not listed on the chart. *Chart is updated to show poor segment length*

Grand St: This is a gravel street but was given a priority level. No other fully gravel streets were given a priority level. There should be consistency across all instances of this street type. *Priority level removed*

Graphite St: The entirety of this street is listed as poor condition. Why is the street designated as medium priority? *Will make a high priority*

Mica St: The condition designation is missing on aerial 20. *Fair Good condition added*

Bear Paw Rd (southbound and northbound): Why is this street divided into northbound and southbound when both directions are in the same condition? This is inconsistent with how other streets on the document were categorized. *Bear Paw has been revised to be one line item for both directions*

Butte Rd (Cul de Sac Gravel): It appears this is a gravel portion of the street but was given a priority level. If gravel portions of streets are not prioritized in other instances this one should not be either. There should be consistency across all instances of this street type. *This cul-de-sac is gravel but has significant grading and erosion issues so it should be surfaced at the same time as Butte Rd- no reason to leave the cul-de-sac gravel if Butte gets resurfaced*

Sumo Ave: It is difficult to tell if the entirety of Sumo has a condition designation, as the red line is missing from a portion of the street on aerial 18. *Red line has been extended and is all fair condition*

N Joseph St: On the chart, 185 ft of the street is designated as “Poor”, while 1,677 feet (aprx 11%) is designated as “Fair Good”. On aerial 18, between 25% - 33% of the street has a “Poor” condition designation. While this is not expected to be completely to scale, the discrepancy in this instance is very obvious. *The lengths and line designations have been adjusted*

Arrowhead Dr: None of Arrowhead is listed as “Poor” on the chart. However, much of the street has a condition designation of “Poor” (this statement accounts for the “Very Poor” designation near the cemetery, which is consistent with the chart). *The chart has been updated to reflect the conditions shown on sheet 17*