PUBLIC WORKS DEPARTMENT MEMORANDUM
#12-2020

DATE: April 13, 2020

TO: Honorable Mayor Meredith Leighty and City Council Members

THROUGH: Heather Geyer, City Manager

FROM: Kent Kisselman, PE, Director of Public Works

SUBJECT: CR-72 – 2020 Residential Street Program

PURPOSE
City Council is considering CR-72, a resolution to approve a contract for the 2020 Residential Street Program.

BACKGROUND
During the January 13, 2020 City Council meeting, staff presented the results of the 2020 Pavement Condition Index (PCI) to City Council for discussion and endorsement. Memorandum #01-2020 outlined the 2020 results and is included as Attachment 2 for Council's reference.

Based on direction from City Council, staff proceeded to implement a 5-year Street and Arterials Rehabilitation Plan. The plan adds an additional $2,200,000 to the Residential Street Program and $1,500,000 for the new Arterials Rehabilitation Program.

On February 4, 2020, the City issued an Invitation for Bid (IFB 2020-003) for the 2020 Residential Street Program. A mandatory pre-bid meeting was held on February 18, 2020 in which eight prospective contractors attended. On March 5, 2020, the City received five bids. Proposals ranged from $5,262,563.59 to $7,218,462.49.

Based on the review of information submitted, it was determined that Brannan Sand and Gravel Company, LLC was the lowest responsible bidder in the amount of $5,262,563.59. Reference checks were conducted and staff determined the project is well within Brannan Sand and Gravel Company's capabilities, and its past performance meets the City's standards.

STAFF RECOMMENDATION
Staff advises that a 10% contingency be applied to this contract. Attached to this memorandum is CR-72, a resolution that, if approved, would authorize the Mayor to execute a contract between the City of Northglenn and Brannan Sand and Gravel Company, LLC for the 2020 Residential Street Program in an amount not to exceed $5,262,563.59, and authorizes the City Manager, on behalf of the City, to approve minor changes in scope of services and execute relevant change orders up to the approved expenditure limit of $5,788,819.95. Staff recommends approval of CR-72.

BUDGET/TIME IMPLICATIONS
Funds in the amount of $1,800,000.00 is budgeted in the 2020 Capital Projects Fund for the Residential Streets Program and Melody Drive Traffic Calming Improvements. An additional appropriation of $3,988,819.95 is needed to fund the remainder of the projects, and will be addressed by CB-1944 – Supplemental Appropriation and CIP Carry Over.

Appropriation – Residential Streets	$800,000.00
Appropriation – Melody Drive Traffic Calming Improvements	$1,000,000.00
Brannan Sand and Gravel Company LLC	($5,262,563.59)
Contingency (10%)	($526,256.36)
Additional Appropriation	($3,988,819.95)

The contractor has 120 calendar days to complete the work after staff issues the Notice to Proceed. Once the contract is approved, staff will coordinate with Brannan Sand and Gravel Company LLC for a project start date in April and final completion in August.

Project timeline:

Contract Approval	April 13, 2020
Notice of Award	April 2020
Notice to Proceed	April 2020
Project Completion	August 2020

STAFF REFERENCE
If Council members have any comments or questions they may contact Kent Kisselman, Director of Public Works, at 303.450.4005 or kkisselman@northglenn.org.

ATTACHMENTS
1. Bid Summary
2. Staff Memorandum #01-2020 – 2019 Pavement Condition Assessment

CR-72 – 2020 Residential Street Program
2020 Residential Street Program Contract

Northglenn

CITY OF NORTHGLENN
FORMAL BID SUMMARY

BID NUMBER: IFB 2020-003
BID NAME: 2020 Residential Streets Program
DEPARTMENT: Public Works

	Brannan Sand & Gravel Co. LLC	Martin Marietta	RME Ltd LLC dba Elite Surface Infrastructure	Asphalt Specialties Company, Inc.	Aggregate Industries - WCR Inc.
	BID RECEIVED	BID RECEIVED	BID RECEIVED	BID RECEIVED	BID RECEIVED
DATE DUE: 03/05/2020	DATE: 3/5/20	DATE: 3/5/20	DATE: 3/5/20	DATE: 3/5/20	DATE: 3/5/20
TIME: 2:00 p.m. MST	TIME: 128P	TIME: 138P	TIME: 138P	TIME: 148P	TIME: 150P
Addendum 1	Yes	Yes	Yes	Yes	Yes
TOTAL	5,262,563.59	7,218,462.49	5,541,459.01	5,269,689.40	6,799,971.80

Finance Department

City's Clerk's Office

3/5/20
Date

PUBLIC WORKS DEPARTMENT MEMORANDUM
#01-2020

DATE: January 13, 2020

TO: Honorable Mayor Meredith Leighty and City Council Members

THROUGH: Heather Geyer, City Manager

FROM: Kent Kisselman, PE – Director of Public Works

SUBJECT: 2019 Pavement Condition Assessment

PURPOSE
Present information obtained from the 2019 Pavement Condition Assessment to include current total street network conditions and recommendations for future roadway asset management.

BACKGROUND
The City of Northglenn is responsible for the pavement condition assessment of its roadway network every three years and to maintain an average pavement condition index (PCI) rating of 70 or better throughout its entire roadway network pursuant to Resolution No. 06-92, Series 2006. The City is responsible for approximately 106 center line miles of roadway. The roadway network is classified into arterial, collector, and local roadways. The percent breakdown can be found in Attachment 1 – Functional Classification Distribution by Area.

The City has adopted the PCI as a measure of pavement condition for asset management purposes. The PCI was first developed by the Army Corp of Engineers and then further standardized by the American Society for Testing and Materials (ASTM International). ASTM D6433 Standard Practice for Roads and Parking Lots Pavement Condition Index Survey describes a method for the determination of road and parking lot pavement conditions through visual surveys using the PCI method of quantifying pavement condition.

In 2016, the City contracted with IMS Infrastructure Maintenance Services, LLC to complete the survey and provide recommendations for roadway asset management. In order to keep a consistent rating, the City contracted IMS again in 2019. IMS Infrastructure completes field inspections through the use of laser technology. The laser technology is used to accurately identify distresses within the pavement area based on the ASTM Standard. For local roadways the assessment is completed over the main driving surface. For arterial and collectors the data is collected over the main travel lane. This provides an unbiased, consistent and accurate measure of the roadway pavement condition.

IMS Infrastructure completed its field survey and data analysis, see Attachment 2 – Final Report. Highlights from the final report are discussed below:

The City of Northglenn average PCI is a 60 with a backlog of 6.9% for collectors and locals, and 62 with a backlog of 9.8% for arterials. The City's average PCI falls within the "Good" ranking. Backlog is defined as the percentage of streets at or below a PCI of 40 (poor and very poor).

a. The majority of the streets within the city fall within the fair and marginal category. The breakdown in PCI based on percentage is shown in Attachment 3 – As Surveyed Pavement Condition Rating Using Descriptive Terms.

b. A backlog below 15% is recommended to be maintained as those streets that fall below this threshold will require very expensive treatments to repair.

With the information available the next step is to find ways to select and prioritize roadway projects. To achieve this goal staff is working on the implementation of a pavement management program. Streetlogix is a highly customizable, web-based asset management software that enables municipalities to optimize their road budget within a GIS environment. The system provides information on the state of their infrastructure and makes maintenance and repair recommendations, including prioritizing roadway and sidewalk projects.

STAFF RECOMMENDATION

A. Staff recommends a one-time increase to the residential street program of $2,200,000 in 2020.
B. In addition to the one-time need above. Staff recommends that the annual budget be increased for the residential street program from the current $800,000/year to $1,250,000/year (an increase of $450,000 annually) in order to achieve an average PCI of 64 from 2021-2024.
C. Staff recommends implementation of the proposed 5 year Arterials Rehabilitation Plan shown on page 3 of this memo.
D. Amend current Council policy of a PCI rating of 70 to use the PCI Good condition range of 60 to 70 moving forward.

BUDGET/TIME IMPLICATIONS

The current and future PCI average of the roadway network is directly correlated to the City budget allocation within the Residential Street Program. Currently, the program is funded from the Adams County Transportation Tax (ADCOT) accounted for in the Capital Projects Fund. Below is a table showing funding per year projecting PCI after 5 years of maintenance and rehabilitation strategies implemented with current and proposed budget.

Current Residential Street Program Budget

Year	Budget	Projected PCI*
2020	$800,000	61
2021	$800,000	61
2022	$800,000	60
2023	$800,000	60
2024	$800,000	59

Proposed Residential Street Program Budget

Year	Budget	Projected PCI*
2020	$3,000,000	64
2021	$1,250,000	64
2022	$1,250,000	64
2023	$1,250,000	64
2024	$1,250,000	64

Due to the size of arterial rehabilitation projects, staff proposes these projects be handled as individual capital improvement projects and the creation of a 5 year Arterials Rehabilitation Plan.

Proposed 5 Year Arterials Rehabilitation Plan Budget

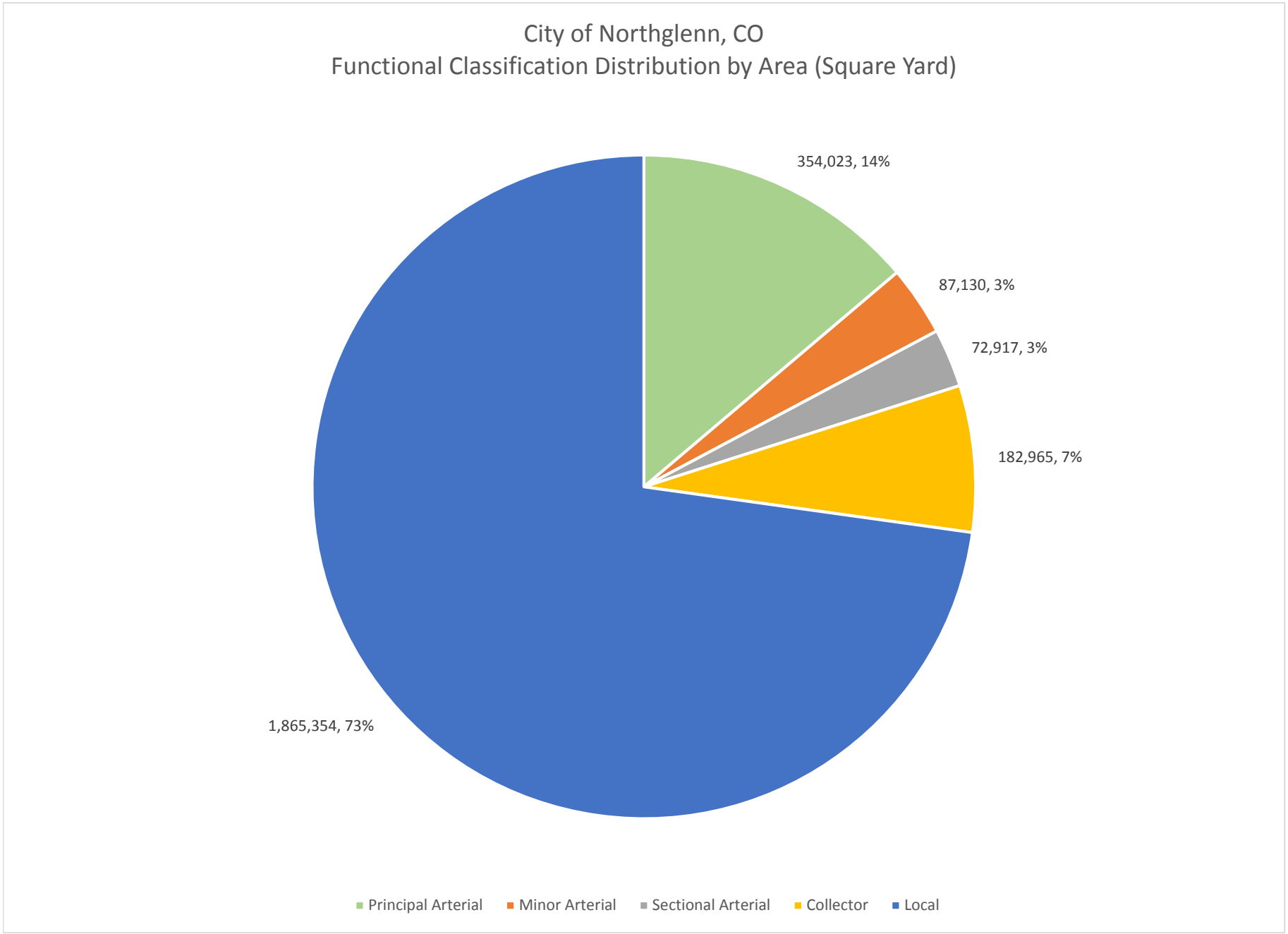
Year	Budget*	Street	From	To	PCI	Treatment
2020	$1,500,000	104th Ave	Zuni St	Huron St	47	Full Width Mill (FWM) & Overlay
2021	$1,500,000	Huron St	97th Ave	104th Ave	36	FWM & Overlay
2022	$1,200,000	Washington St	112th Ave	120th Ave	45	FWM & Overlay
2023	$1,700,000	104th Ave	Huron St	Washington St	44	FWM & Overlay
2024	$1,100,000	Washington St	104th Ave	112th Ave	62	FWM & Overlay

*Based on 2019 paving bids

Funding is available for the proposed residential street program and arterial plans by using one-time reserves from either the Capital Projects Fund or General Fund ($2,200,000 in 2020) and using ADCOT and the 4.000 Mills Property Tax restricted for road rehabilitation project. The program budgets will be evaluated through the annual budget process.

STAFF REFERENCE
If Council members have any comments or questions they may contact Kent Kisselman, Director of Public Works, at 303.450.4005 or kkisselman@northglenn.org.

ATTACHMENTS
1. Functional Classification Distribution by Area
2. Final Report
3. As Surveyed Pavement Condition Rating Using Descriptive Terms
4. Presentation


City of Northglenn, CO
Functional Classification Distribution by Area (Square Yard)
354,023, 14%
87,130, 3%
72,917, 3%
182,965, 7%
1,865,354, 73%
Principal Arterial
Minor Arterial
Sectional Arterial
Collector
Local

Northglenn, CO

Pavement Management Analysis Report

October 2019

City of Northglenn, CO
Attn.: Daniel Martinez, Civil Engineer II
11701 Community Center Drive
Northglenn, CO 80233-8061

Infrastructure Management Services

IMS Infrastructure Management Services
1820 West Drake Drive, Suite 104, Tempe, AZ 85283
Phone: (480) 839-4347, Fax: (480) 839-4348
www.imsanalysis.com

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APPENDED MAPS **Located on Thumb Drive**

Abbreviation or Acronym	Definition
$k	Dollars in thousands ($,000)
$M	Dollars in millions
%SP	Percent Spreadability - component of deflection analysis
AC	Asphalt Concrete - asphalt streets, flexible pavements, also known as ACP
ACP	Asphalt Concrete Pavement - asphalt streets, flexible pavements, also known as AC
ART	Arterial roadway functional classification
ASTM	American Society of Testing Methods
Avg	Average
BCI	Base Curvature Index - component of deflection analysis
Brk	Break
CAL	Coarse Aggregate Loss
CDV	Corrected Deduct Value - part of the ASTM D6433 PCI calculation
COL	Collector roadway functional classification
Crk	Crack
DeflCON	Deflection Condition - structural load analysis based on traffic loading and deflection
DMD	Dynamic Maximum Deflection - temperature corrected deflection
Dvdd Slab	Divided Slab
DynaCON	Dynamic Condition - structural layer analysis
ft or FT	Foot
ft2 or FT2	Square foot
FunCL	Functional Classification
FWD	Falling weight deflectometer
GCI	Gravel Condition Index
GFP	Good - Fair - Poor
GIS	Geographic Information System
GISID	GIS segment identification number
H&V	Horizontal and Vertical
IRI	International Roughness Index
Jt	Joint
L&T	Longitudinal and Transverse
LAD	Load associated distress
LOC	Local roadway functional classification - same as RES
LOG	Lip of Gutter
m	Metre or meter
M	Moderate
m2	square metre or square meter
MART	Major arterial roadway functional classification
Max	Maximum
MaxDV	Maximum Deduct Value
MCOL	Major collector roadway functional classification
mi or Mi	Mile
Min	Minimum
MnART	Minor arterial roadway functional classification
MnCOL	Minor collector roadway functional classification
MOD	Moderate
NLAD	Non-load associated distress
OCI	Overall condition index, also known as PCI
Olay	Overlay
PART	Primary arterial roadway functional classification
Pavetype	Pavement Type
PCC	Portland Cement Concrete - concrete streets
PCI	Pavement Condition Index - generic term for OCI
R&R	Remove and replace
RART	Rural arterial roadway functional classification
PWF	Priority Weighting Factor
Recon	Reconstruction
Rehab	Rehabilitation
RES	Local roadway functional classification - same as LOC
RI or RCI	Roughness Index
S	Strong
SART	Secondary arterial roadway functional classification
SCI	Surface Curvature Index - componenent of deflection analysis
SDI	Surface Distress Index
SI	Structural Index
STA	Station or chainage
Surf Trtmt	Surface Treatment
TDV	Total Deduct Value
W	Weak

1.0 EXECUTIVE SUMMARY & RECOMMENDATIONS

PROJECT SUMMARY

In 2019 IMS Infrastructure Management Services, LLC (IMS) was contracted by the City of Northglenn to conduct a pavement condition assessment and analysis update on approximately 95 centerline miles of City maintained asphalt and concrete roadways that are considered Local / Collector. There is an additional 13 miles of roadway that is considered Arterial.

IMS mobilized their Laser Road Surface Tester (RST) to conduct an objective assessment using industry standard pavement distress protocols such as those found in ASTM D6433-11. At that time, the City's Local / Collector network average Pavement Condition Index was found to be a 60 and the City's backlog (roads below a PCI of 40) was at 5.5%. Additionally, the City's Arterial roadway network had an average PCI of 63 and backlog of 10%.

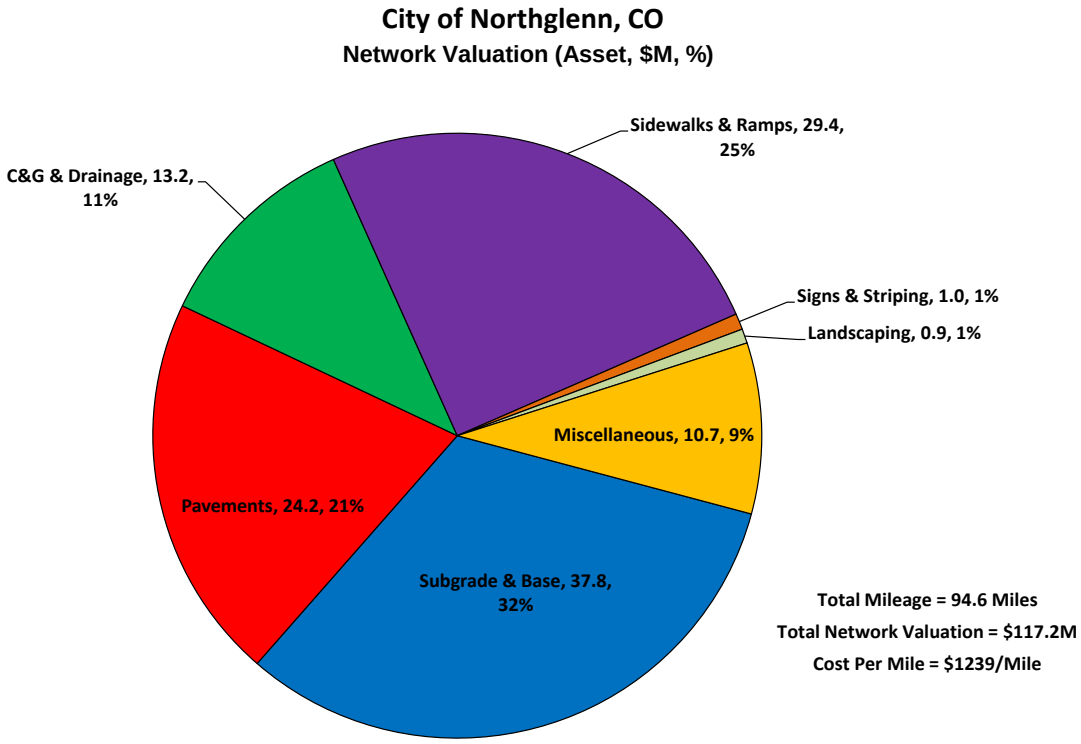


Figure 1a- Replacement Value of Roadway Network (Collector / Local)

As seen in **Figure 1a**, Northglenn has just over 95 centerline miles of roadway, encompassing over 2M square yards of pavement surfacing, which is predominantly asphalt. At an average replacement cost for a typical roadway just over $1.2M per mile, not including the value of the land, the City has over $117.2M invested in its paved roadway network.

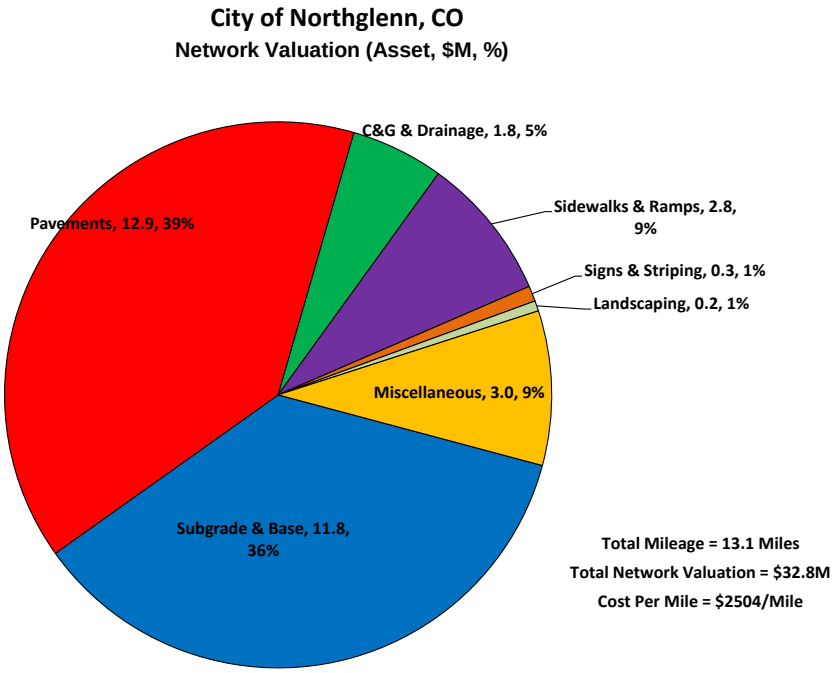


Figure 1b- Replacement Value of Roadway Network (Arterial)

As seen in **Figure 1b**, Northglenn has just over 13 centerline miles of roadway, encompassing over 514K square yards of pavement surfacing, which is predominantly asphalt. At an average replacement cost for a typical roadway just over $2.5M per mile, not including the value of the land, the City has over $32.8M invested in its paved roadway network.

SUMMARY METRICS OF HEALTH (LOCAL /COLLECTOR)

Pavement Condition Index (PCI) – The PCI score is a ranking assessment on the overall health of a pavement segment on a scale of 0 to 100. The network average PCI is a good global indicator of a network's overall health. *(Explained in section 4)*

Percent of Excellent Roads – Roads with a condition category of Excellent are those that score between a PCI of 85 to 100.

Backlog –Backlog is the Very Poor and Poor roads (between a PCI of 0 and 40) that represent a portion of the network in need of extensive rehabilitation such as full and partial reconstruction. Using sound pavement management and finance principles, a very healthy network will have a backlog of 10% or less.

Northglenn's Local / Collector's met two of three of the metrics for evaluating the quality of its roadway network.

- ✓ Northglenn's network average pavement condition score is within the national average currently seen by IMS of 60 to 65, with the City's average scoring a 60.
- The number of streets rated Excellent is below the minimum recommended target of 15% at 6.9%
- ✓ The backlog amount is below the average value of 12% at 5.5%.

Northglenn's Arterial network met three out of three of the metrics for evaluating the quality of its roadway network.

- ✓ Northglenn's network average pavement condition score is within the national average currently seen by IMS of 60 to 65, with the City's average scoring a 63.
- ✓ The number of streets rated Excellent is above the minimum recommended target of 15% at 16.5%
- ✓ The backlog amount is below the average value of 12% at 9.8%.

BUDGET SCENARIOS

The current annual budget for Northglenn Local / Collector network is $750K per year dedicated to pavement preservation and rehabilitation. This will inflate the backlog to 24% while reducing the average PCI to a 55 over 5 years. Please note this number is an annual budget average across all 5 years of the analysis horizon.

The Recommended budget for Arterial and Collector roads is $3.68M per year and will elevate the network average PCI to a 70 while maintaining a backlog of 10%. This is a "Backlog Control Budget"

Northglenn does not have a set budget for Arterials but spends an average of $1M per year. This budget will increase the average PCI of Arterial roadways to 71 while also increasing the backlog to 17%.

The recommended budget of $1.25M for arterial roadways will arrest the growth of backlog at 8% while increasing the average PCI to 76.

EXECUTIVE SUMMARY CONCLUSION

The Northglenn network has divided their pavement analysis into two sections, as seen above. An average PCI of 59 and a backlog of 5.5%, can be seen along the Local / Collector network, while the Arterial network has an average PCI of 62 with a backlog of 9.8%. With the City's existing budget, the network conditions within the Arterial network will continue to improve into the 70s PCI range, but the backlog will also sharply increase to 17%.

Within the Collector / Local network the City's existing budget of $750K will result in unhealthy deterioration of the level of service within the community. This will ultimately result in a PCI of 55 and a backlog of 24% within this network. Pavement managers should be aware that a large percentage of local/collector roads currently exist in the "Marginal" 40-50 PCI range. This represents a large collection of streets that will soon fall into the "backlog" category and require costly rehabilitation efforts to restore to full service. These streets should be monitored closely over the next 5 years.

2.0 PRINCIPLES OF PAVEMENT MANAGEMENT

2.1 PAVEMENT PRESERVATION

Preservation of existing roads and street systems has become a major activity for all levels of government. Because municipalities must consistently optimize the spending of their budgets, funds that have been designated for pavement must be used as effectively as possible. The best method to obtain the maximum value of available funds is through the use of a pavement management system.

Pavement management is the process of planning, budgeting, designing, evaluating, and rehabilitating a pavement network to provide maximum benefit with available funds.

A pavement management system is a set of tools or methods that assist decision makers in finding optimal strategies for providing and maintaining pavements in a serviceable condition over a given time period. The intent is to identify the optimum level of long-term funding to sustain the network at a predetermined level of service while incorporating local conditions and constraints.

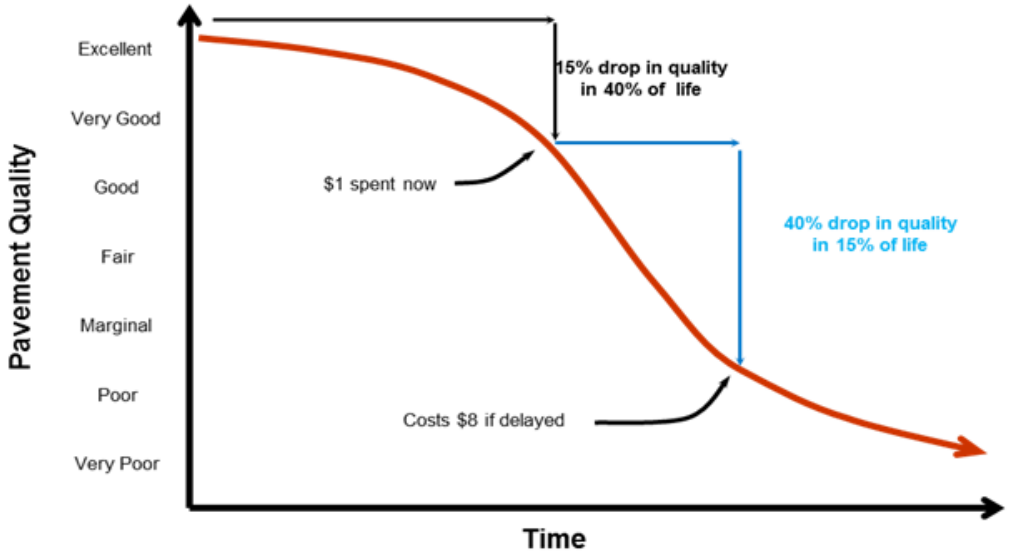


Figure 2 – Pavement Deterioration and Life Cycle Costs

As shown as **Figure 2**, the streets that are repaired while in good condition will cost less over their lifetime than those left to deteriorate to a poor condition. Without an adequate routine pavement maintenance program, streets require more frequent reconstruction, thereby costing millions of extra dollars.

The key to a successful pavement management program is to develop a reasonably accurate performance model of the roadway, and then identify the optimal timing and rehabilitation strategy. The resultant benefit of this exercise is realized by the long term cost savings and increase in pavement quality over time. As illustrated in **Figure 2,** pavements typically deteriorate rapidly once they hit a specific threshold. A $1 investment after 40% lifespan is much more effective than deferring maintenance until heavier overlays or possibly reconstruction are required just a few years later.

Once implemented, an effective pavement information management system can assist agencies in developing long-term rehabilitation programs and budgets. The key is to develop policies and practices that delay the inevitable total reconstruction for as long as practical yet still remain within the target zone for cost effective rehabilitation. That is, as each roadway approaches the steepest part of its deterioration curve, apply a remedy that extends the pavement life, at a minimum cost, thereby avoiding costly heavy overlays and reconstruction. **Figure 3** illustrates the concept of extending pavement life through the application of timely rehabilitations.

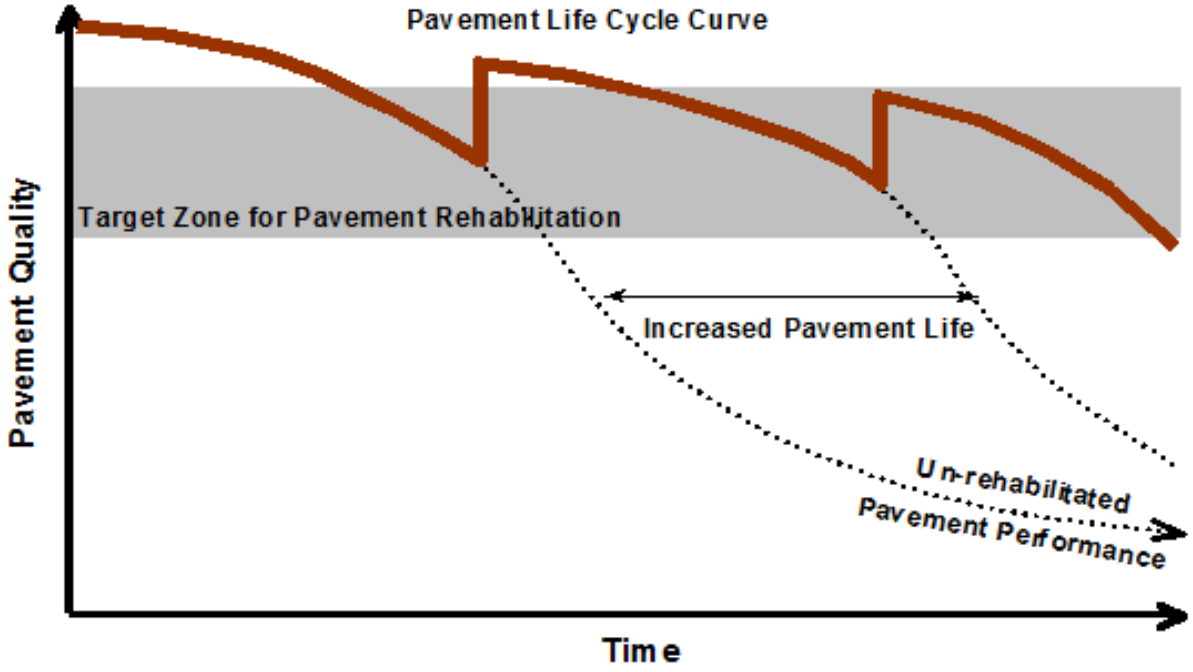


Figure 3 – Pavement Life Cycle Curve

Ideally, the lower limit of the target zone shown in **Figure 3** would have a minimum PCI value in the 60 to 70 range to keep as many streets as possible requiring a thin overlay or less. The upper limit would tend to fall close to the higher end of the Very Good category – that is a pavement condition score approaching 85. Other functions of a pavement management system include assessing the effectiveness of maintenance activities, new technologies, and storing historical data and images.

For Northglenn, a prioritization methodology based on pavement condition, pavement materials, functional class, and strength rating was used to analyze the network condition and develop the proposed 5 year rehabilitation plan.

The analysis methodologies and data collection technologies were based on *ASTM D6433 Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys* (hereinafter ASTM D6433) for assessment of pavement surface condition and the International Roughness Index (IRI) for quantification of pavement roughness on all City streets. These measurements of pavement quality are combined to form an overall 0 to 100 Pavement Condition Index (PCI), with 100 being the best.

2.2 ECONOMIC IMPACTS OF MAINTENANCE & REHABILITATION

The role of the street network as a factor in the City's well-being cannot be overstated. In the simplest of terms, roadways form the economic backbone of a community. They provide the means for goods to be exchanged, commerce to flourish, and commercial enterprises to generate revenue. As such, they are an investment to be maintained.

The overall condition of an agency's infrastructure and transportation network is a key indicator of economic prosperity. Roadway networks, in general, are one of the most important and dynamic sectors in the global economy. They have a strong influence on not only the economic well-being of a community, but a strong impact on quality of life. Well-maintained road networks experience multiple socioeconomic benefits through greater labor market opportunities and decreasing income gap.

As a crucial link between producers and their markets, quality road networks ensure straightforward access to goods and drive global and local economies. Likewise, higher network quality has a strong correlation to improvements in household consumption and income. Roads also act as a key element to social cohesion by acting as a median for integration of bordering regions. This social integration promotes a decreased gap in income along with diversity and a greater sense of community that can play a large role in decreasing rates of poverty.

Conversely, deterioration of roads can have adverse effects on a community and may bring about important and unanticipated welfare effects that the governments should be aware of when cutting transportation budgets. Poor road conditions increase fuel and tire consumption while shortening intervals between vehicle repair and maintenance. In turn, these roads result in delayed or more expensive deliveries for businesses and consumers. Economic effects of poor road networks, such as time consuming and costly rehabilitation, can be reduced if a proactive maintenance approach is successfully implemented. To accomplish this, a pavement assessment and analysis should be completed every few years in an effort update the budget models and rehabilitation plans. As shown below, the IMS Laser Road Surface Tester (featured in **Figure 4**) was mobilized to Northglenn to conduct an objective survey.

Figure 4 – Laser Road Surface Tester (RST)

3.0 THE PAVEMENT MANAGEMENT PROCESS

3.1 FUNCTIONAL CLASS REVIEW

As part of the scope of this assignment, the functional classification designations currently used in the Northglenn pavement management program were adopted for their use in the pavement analysis.

Although there is no uniform standard for classifying pavement into functional classes, The Federal Highway Administration (FHWA), American Public Works Association (APWA) and Institute of Transportation Engineers (ITE) offer some broad guidelines on how to assign classifications that were followed in this study.

The City's functional classification definitions used in the assessment are as follows:

1. **Principal Arterial (PART)** – all cross City corridors consisting of 2 to 4 or more lanes, generally spaced at 1 mile intervals with daily traffic counts generally exceeding 20,000 vehicles per day. Major cross City corridors with a landscaped median were also assigned to Principal Arterials.
2. **Section Line Arterial (SART) –** All cross City arterials located along the major section lines.
3. **Minor Arterial (MnART)** – Continuous and discontinuous cross city and inter-district corridors that are 2 to 4 lanes across and generally have a centerline stripe or a designated bus route. The ADT generally falls in the 10,000 to 20,000 vehicle per day range. They are typically spaced on the ½ or ¼ mile section line and on occasion, may have a short non-landscaped median.
4. **Collector (COL)** – Continuous and discontinuous cross City and inter-district corridors that are 2 to 4 lanes across and generally have a centerline stripe or a designated bus route. The ADT generally falls in the 1,000 to 10,000 vehicle per day range. They are typically spaced on the ½ or ¼ mile section line and on occasion, may have a short non-landscaped median. Major collectors are also assigned to streets segments leading to, or adjacent to, a major traffic generator site such as a regional shopping complex. Collectors form the entrance to communities and may have a decorative landscaped median of short duration.
5. **Local (LOC)** – These are the majority of the street segments consisting of all residential roads not defined above or as industrial/commercial.

The paved roadway network consists of 5 functional classes, covering approximately 110 miles of pavement. The average pavement condition index (PCI) of the roadway network is a 60.5 and the network's primary pavement type is asphalt. The following table and **Figure 5** summarize the functional classification splits within the system.

Local/Collector

City of Northglenn, CO
Network Summary by Functional Class

	Pavetype	Network	Collector	Local
Segment (Block) Count	All Streets	994	37	957
	Asphalt	990	35	955
	Concrete	4	2	2
Network Length (ft):	All Streets	499,633	28,808	470,825
	Asphalt	495,864	26,206	469,658
	Concrete	3,769	2,602	1,167
Network Length (mi):	All Streets	94.6	5.5	89.2
	Asphalt	93.9	5.0	89.0
	Concrete	0.7	0.5	0.2
Average Width (ft):	All Streets	36.9	57.2	35.7
	Asphalt	36.7	56.4	35.7
	Concrete	56.8	65.1	38.2
Network Area (yd2):	All Streets	2,048,319	182,965	1,865,354
	Asphalt	2,024,540	164,139	1,860,401
	Concrete	23,779	18,826	4,953
Current Pavement Condition	All Streets	59	50	60
Index (CPCI)	Asphalt	59	47	60
8/1/19	Concrete	74	72	81
Pavement Condition Index	All Streets	60	50	61
(Surveyed PCI)	Asphalt	60	48	61
	Concrete	74	72	81
Current Backlog (%)	All Streets	7		
Current Network Index	All Streets	55		
Surface Distress Index (SDI)	All Streets	56	42	58
8/1/19	Asphalt	56	39	58
	Concrete	79	76	90
Roughness Index (RI)	All Streets	65	65	65
8/1/19	Asphalt	65	65	65
	Concrete	65	65	64

City of Northglenn, CO
Network Summary by Functional Class

	Pavetype	Network	Principal Arterial	Minor Arterial	Section Line Arterial
Segment (Block) Count	All Streets	94	56	25	13
	Asphalt	83	45	25	13
	Concrete	11	11	0	0
Network Length (ft):	All Streets	69,172	42,963	15,670	10,539
	Asphalt	59,620	33,411	15,670	10,539
	Concrete	9,552	9,552	0	0
Network Length (mi):	All Streets	13.1	8.1	3.0	2.0
	Asphalt	11.3	6.3	3.0	2.0
	Concrete	1.8	1.8	0.0	0.0
Average Width (ft):	All Streets	66.9	74.2	50.0	62.3
	Asphalt	67.4	77.1	50.0	62.3
	Concrete	63.7	63.7	0.0	0.0
Network Area (yd2):	All Streets	514,070	354,023	87,130	72,917
	Asphalt	446,449	286,402	87,130	72,917
	Concrete	67,621	67,621	0	0
Current Pavement Condition	All Streets	62	63	70	48
Index (CPCI)	Asphalt	59	59	70	48
8/1/19	Concrete	82	82	0	0
Pavement Condition Index	All Streets	63	63	71	49
(Surveyed PCI)	Asphalt	60	59	71	49
	Concrete	82	82	0	0
Current Backlog (%)	All Streets	10	Percentage of Network with a PCI < 4		
Current Network Index	All Streets	56	Minimum Acceptable Network Index		
Surface Distress Index (SDI)	All Streets	57	58	68	37
8/1/19	Asphalt	53	52	68	37
	Concrete	82	82	0	0
Roughness Index (RI)	All Streets	73	73	74	71
8/1/19	Asphalt	72	72	74	71
	Concrete	81	81	0	0

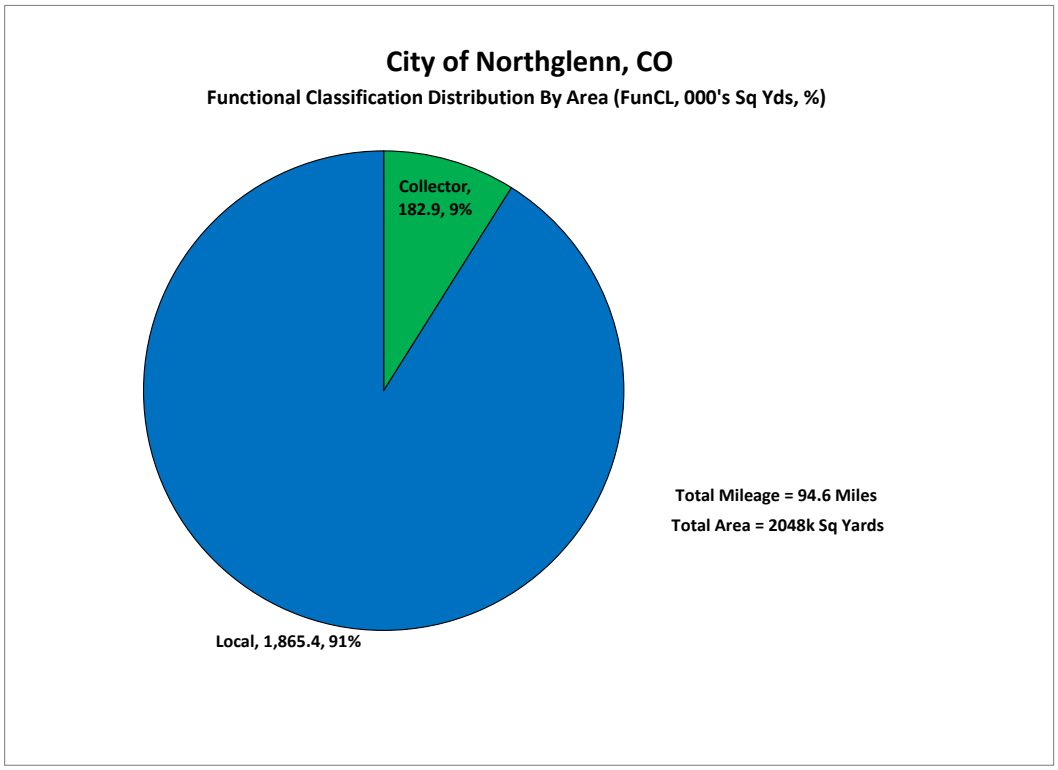


Figure 5a – Functional Class Distribution by Milage

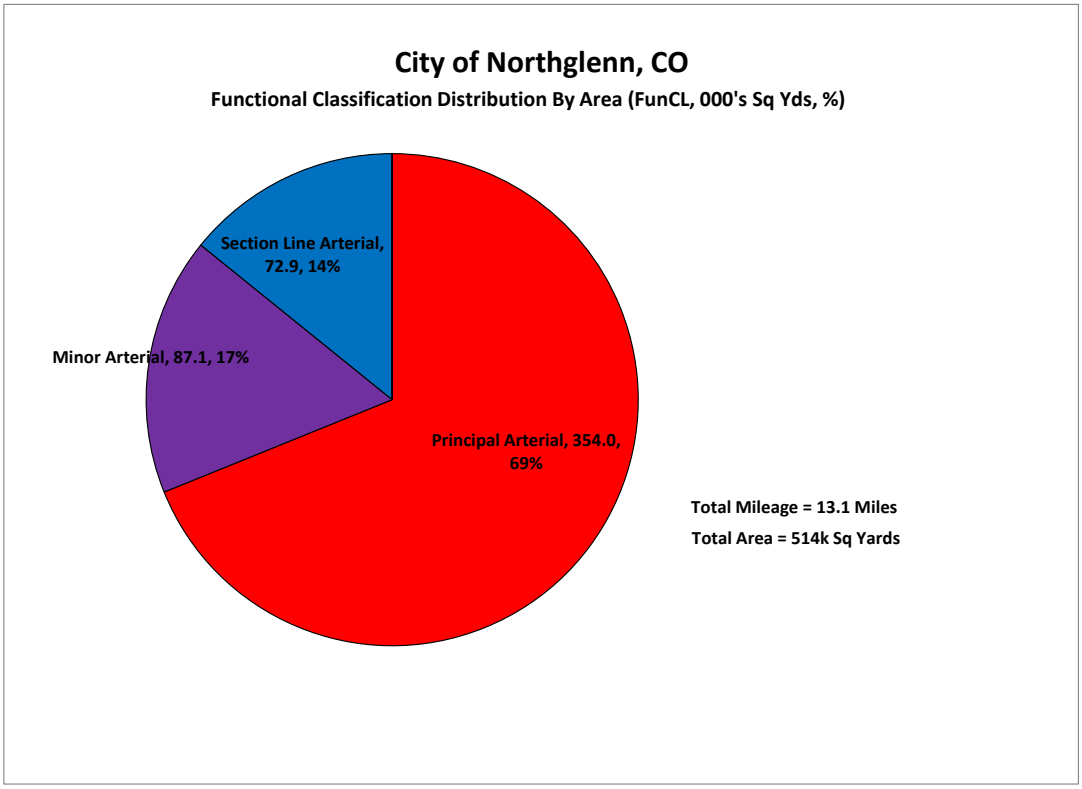


Figure 5b – Functional Class Distribution by Milage

The following figure (**Figure 6**) highlights the functional classifications used for the Northglenn roadway network. An electronic version of this map is appended to this report.

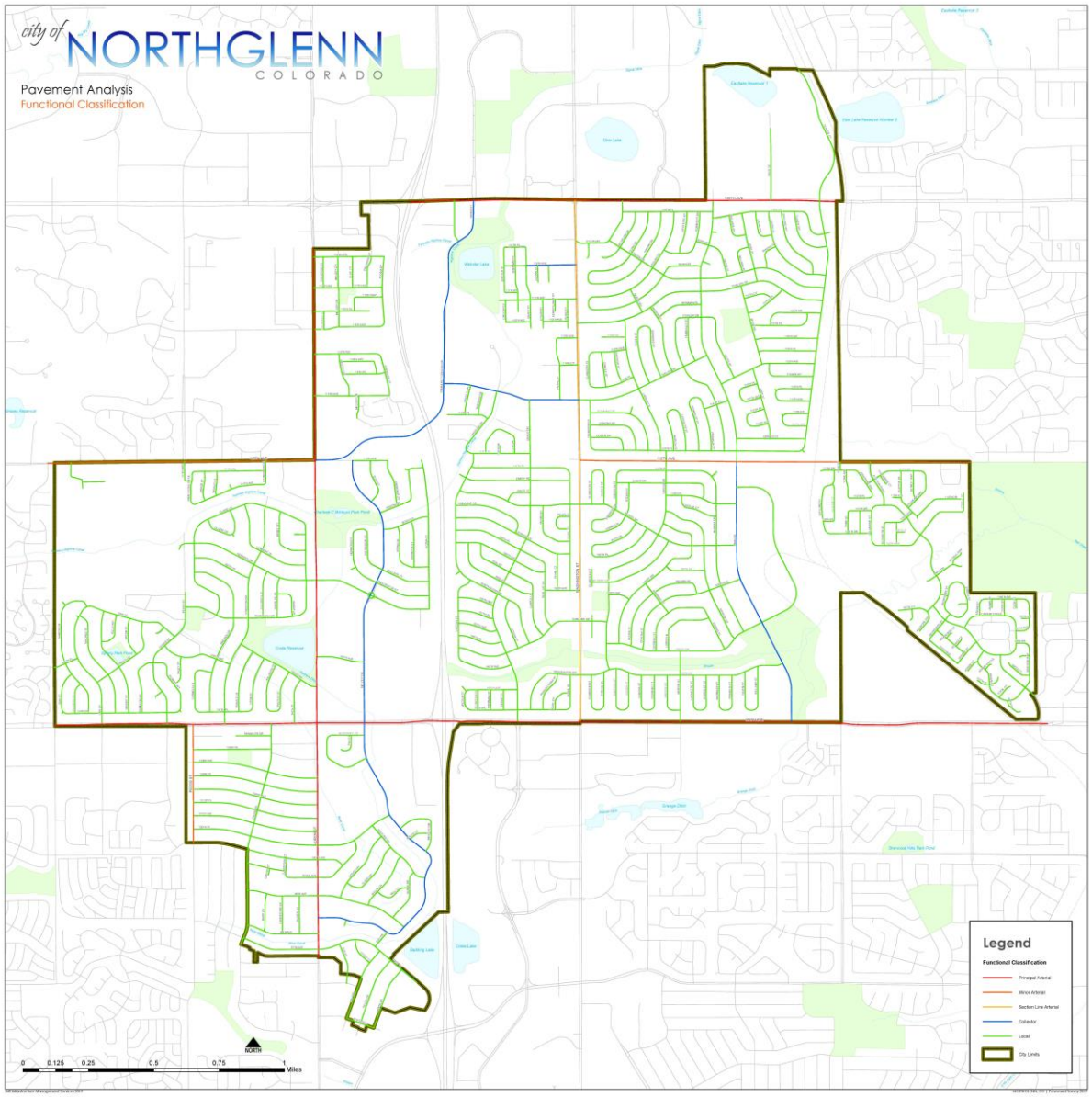


Figure 6 – Northglenn Functional Classification Designation

3.2 ASSEMBLY OF DATA INTO PROJECTS

Northglenn's Geographic Information System (GIS) was used as the basis for segmenting the roadway network on a block-by-block basis. Each segment was assigned a unique identifier referred to as a GISID, establishing a one-to-one relationship between the GIS and the street inventory. The segments form the basic building block of the pavement management system and are where all attribute and condition data are stored.

The centerline segments were aggregated together within the pavement management system to form logical projects that the analysis and rehabilitation program are developed against.

- Arterial projects run from major intersection to major intersection up to 1 mile in length.
- Similar to arterials, collector streets within a neighborhood were aggregated together to form a single project where practical.
- Local streets along a homogenous route were aggregated together along with adjacent side streets to form a small neighborhood based approach.

Segments were joined only when the pavement condition and functional classification were homogeneous in nature such that when joined they have a relatively uniform condition that may be rehabilitated using a single strategy.

The following figure (**Figure 7**) highlights the projects, used for the analysis. An electronic version of this map is appended to this report.

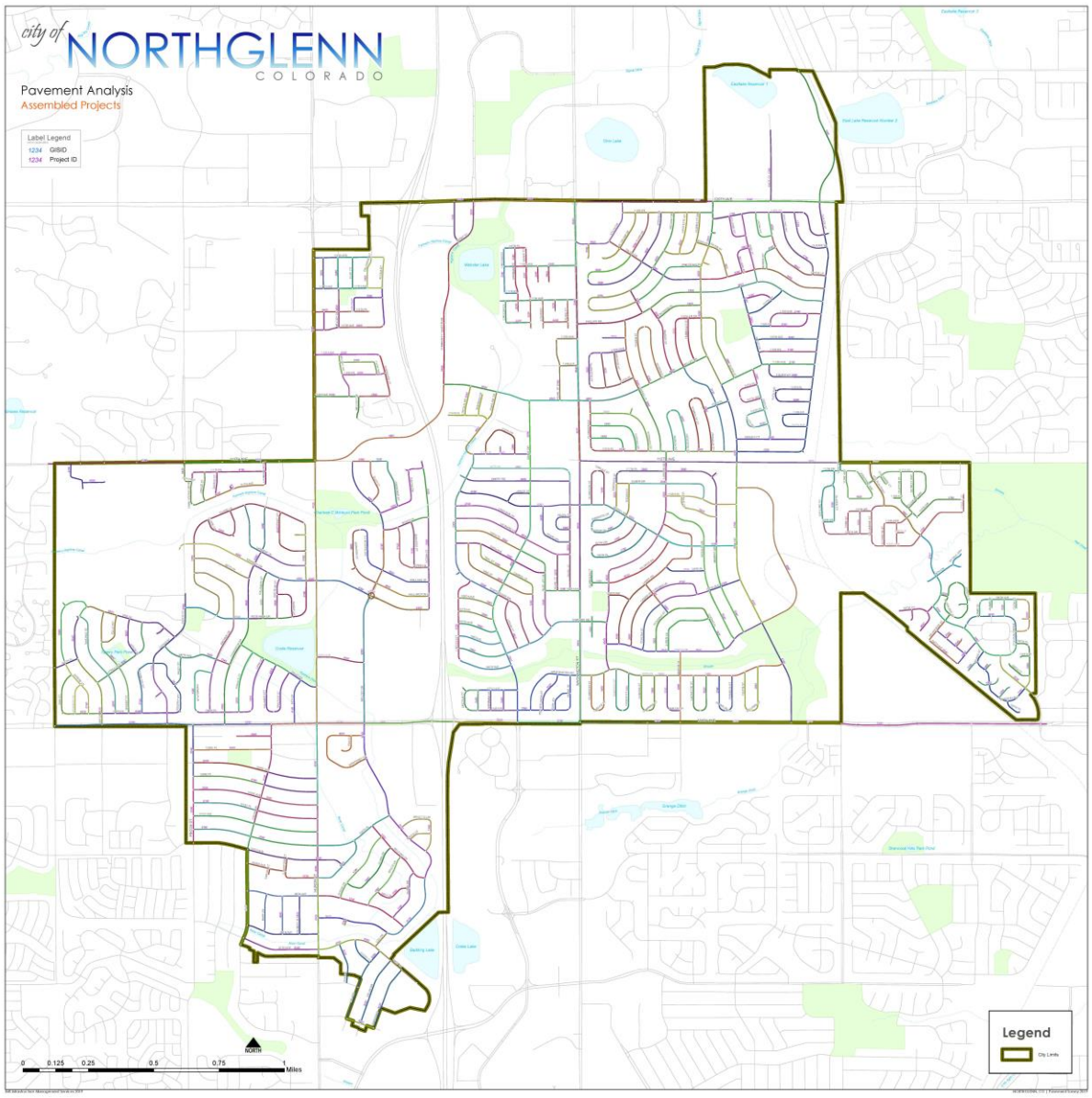


Figure 7 – Northglenn Assembled Projects

3.3 FIELD SURVEY METHODOLOGY

Following a set of predefined assessment protocols matching the pavement management software (ASTM D6433), a specialized piece of survey equipment – referred to as a Laser Road Surface Tester (Laser RST, pictured on page 5) – is used to collect observations on the condition of the pavement surface, as well as collect high definition digital imagery and spatial coordinate information. The Laser RST surveys each local street from end to end in a single pass, while all other roadway classifications are completed in two passes.

Key pavement condition data elements collected by the Laser RST include:

Surface Distress Index – The Laser RST collects surface distress observations based on the extent and severity of distresses encountered along the length of the roadway following ASTM D6433 protocols for asphalt and concrete pavements. The surface distress condition (cracking, potholes, raveling, and the like) is considered by the traveling public to be the most important aspect in assessing the overall pavement condition.

Presented on a 0 to 100 scale, the Surface Distress Index (SDI) is an aggregation of the observed pavement defects. Within the SDI, not all distresses are weighted equally. Certain load associated distresses (caused by traffic loading), such as rutting or alligator cracking on asphalt streets, or divided slab on concrete streets, have a much higher impact on the surface distress index than non-load associated distresses such as raveling or patching. Even at low extents and moderate severity – less than 10% of the total area – load associated distresses can drop the SDI considerably. ASTM D6433 also has algorithms within it to correct for multiple or overlapping distresses within a segment.

For this project, extent and severity observations were collected, processed, and loaded into the pavement management software. Within the software, the following distresses, listed in order from greatest to lowest impact, are presented as a 0 to 10 rating for review and reporting:

- Alligator Cracking – Alligator cracking is quantified by the severity of the failure and number of square feet. Even at low extents, this can have a large impact on the condition score as this distress represents a failure of the underlying base materials.
- Wheel Path Rutting – Starting at a minimum depth of ¼ inch, wheel path ruts are quantified by their depth and the number of square feet encountered. Like alligator cracking, low densities of rutting can have a large impact on the final condition score.
- Longitudinal, Transverse, Block (Map), and Edge Cracks – These are quantified by their length and width. Longitudinal cracks that intertwine are the start of alligator cracking.
- Patching – Patching is quantified by the extent and quality of patches. When the majority of a roadway surface is covered by a patch, such as a large utility replacement, the rating of the patch is minimized. All potholes are rated as patches.
- Distortions – All uneven pavement surfaces, such as depressions, bumps, sags, swells, heaves, and corrugations, are included as distortions and are quantified by the severity and extent of the affected area.
- Raveling – Raveling is the loss of fine aggregate materials on the pavement surface and is measured by the severity and number of square feet affected.

- Bleeding – Bleeding is the presence of free asphalt on the roadway surface caused by too much asphalt in the pavement or insufficient voids in the matrix. The result is a pavement surface with low skid resistance and is measured by the amount and severity of the area.
- Similar distresses were collected for concrete streets including divided slab, corner breaks, joint spalling, faulting, polished aggregate, and scaling.

Roughness Index – Roughness is recorded following the industry standard "International Roughness Index" (IRI), a measure of the change in elevation over a distance expressed as a slope and reported in millimeters/meter. The IRI value is converted to a 0 to 100 score and reported as the Roughness Index (RI) as follows:

$$\mathbf{RI} = (11 - 3.5 \times \ln(IRI)) \times 10$$

ln(IRI) is the natural logarithm of IRI.

In common terms, a newer street would generally have a Roughness Index above 85, while one due for an overlay would be in the range 40 to 70. Failed streets typically have roughness values below 40.

Structural Index – The network of streets was not tested for structural adequacy, instead, the relationship between the final pavement condition score and amount of load associated distresses was analyzed and each pavement section assigned a Weak, Moderate or Strong strength rating. The assigned structural index (30, 60 or 80 for weak, moderate and strong respectively) was not used in determining the overall pavement condition score, but simply to classify the pavement strength and aid in selecting appropriate rehabilitation strategies.

Pavement Condition Index (PCI) – Following our field surveys, the condition data is assembled to create a single score representing the overall condition of the pavement. The Pavement Condition Index (PCI) is calculated as follows:

$$\mathbf{PCI} = 33\% \text{ Roughness Index} + 67\% \text{ Surface Distress Index}$$

Development of the pavement management plan and budgets were completed using Northglenn - specific rehabilitation strategies, unit rates, priorities, and pavement performance curves. The process was iterative in its attempt to obtain the greatest efficiency and cost benefit.

4.0 NORTHGLENN SURVEY PAVEMENT CONDITION

4.1 UNDERSTANDING THE PAVEMENT CONDITION INDEX

The following compares the Pavement Condition Index (PCI) to commonly used descriptive terms. Divisions between the terms are not fixed, but are meant to reflect common perceptions of condition.

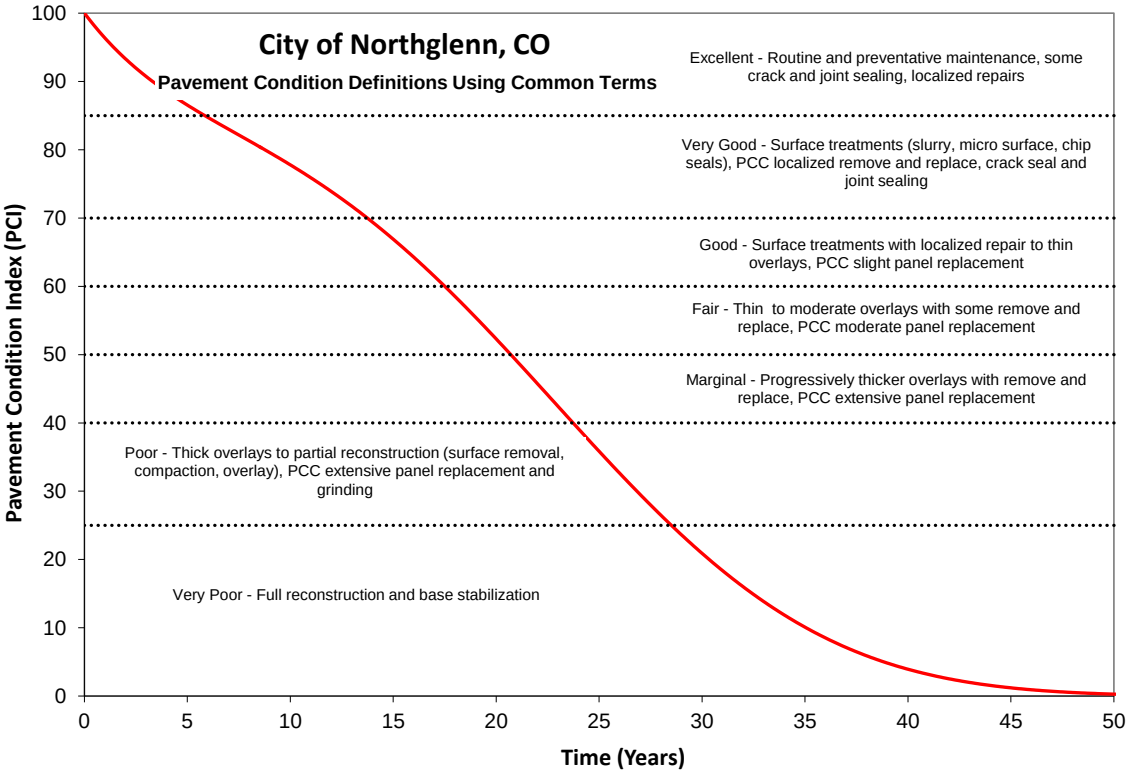


Figure 1 – Understanding the Pavement Condition Index (PCI) Score

The following table details a general description for each of these condition levels with respect to remaining life and typical rehabilitation actions:

PCI Range	Description	Relative Remaining Life	Definition
85 – 100	Excellent	15 to 25 Years	Like new condition – little to no maintenance required when new; routine maintenance such as crack and joint sealing.
70 – 85	Very Good	12 to 20 Years	Routine maintenance such as patching and crack sealing with surface treatments such as seal coats or slurries.
60 – 70	Good	10 to 15 Years	Heavier surface treatments, chip seals and thin overlays. Localized panel replacements for concrete.
40 – 60	Marginal to Fair	7 to 12 Years	Heavy surface-based inlays or overlays with localized repairs. Moderate to extensive panel replacements.
25 – 40	Poor	5 to 10 Years	Sections will require very thick overlays, surface replacement, base reconstruction, and possible subgrade stabilization.
0 – 25	Very Poor	0 to 5 Years	High percentage of full reconstruction.

The images presented below provide a sampling of the Northglenn streets that fall into the various condition categories with a discussion of potential rehabilitation strategies.

Very Poor (PCI = 0 to 25) – Complete Reconstruction (Not a Northglenn street)

Northglenn has no streets that fall within the Very Poor category - the above image is for illustrative purposes only.

Celedonia Street from Front Street to Main Street (GISID 1485, PCI = 23) – Rated as Very Poor, this street displays spreading base failure as evidenced by the severe alligator cracking and patching. It is also worth noting that the patching along the left hand side of the street has severely deteriorated as evident by the amount of weeds growing between the seams. A mill and overlay on this street would not be suitable as the base has failed and would not meet an extended service life of at least 15 years. This street requires a full reconstruction and should be carefully monitored.

Deferral of reconstruction of streets rated as Very Poor will not cause a substantial decrease in pavement quality as the streets have passed the opportunity for overlay-based strategies. Due to the high cost of reconstruction, Very Poor streets are often deferred until full funding is available in favor of completing more streets that can be rehabilitated at lower costs, resulting in a greater net benefit to the City. This strategy however must be sensitive to citizen complaints forcing the street to be selected earlier. In addition, this type of street can pose a safety hazard for motorists, since severe potholes and distortions may develop. It is important to consistently monitor these streets and check for potholes or other structural deficiencies until the street is eventually rebuilt.

Poor (PCI = 25 to 40) – Last Opportunity for Surface Base Rehabilitation

Huron Street from West 103rd Avenue to 104th Avenue (GISID 11489, PCI = 31) – Rated as Poor, this segment still has some remaining life before it becomes a critical reconstruction need. As evident in the imagery, some of the cracks have been sealed or patched, however the patches are now beginning to deteriorate. On this street, the base is showing signs of failure in areas exhibiting alligator/fatigue cracking. The severely cracked areas are isolated and do not persist throughout the entire segment length. These areas should be dug out and structurally patche. If left untreated, within a short period of time, a full reconstruction would be required.

On arterial roadways, Poor streets often require partial to full reconstruction – that is removal of the pavement surface and base down to the subgrade and rebuilding from there. On local roadways, they require removal of the pavement surface through grinding or excavation, base repairs, restoration of the curb line and drainage, and then placement of a new surface.

In general, the service life of Poor streets is such that if deferred for too long, it would require a more costly reconstruction. Streets rated as Poor are typically selected first for rehabilitation as they provide the greatest cost/benefit to the City – that is the greatest increase in life per rehabilitation dollar spent.

Marginal (PCI = 40 to 50) – Progressively Thicker Overlays

104th Avenue from Melody Drive to 104th I-25 (GISID 3621, PCI = 43) – Marginal streets have distresses that tend to be localized and moderate in nature – that is they do not extend the full length of the segment and can be readily dug out and repaired. On this street segment the failed area does not quite extend the full length or width of the roadway and is still serviceable. Placing an overlay on this street without repairing the base would not achieve a full 15 year life as the failure would continue to occur over time. Structural patching of the failed areas along localized rehabs would permit a full width grind and inlay on this street segment and return it to full service. The curb lines are straight and drainage is functioning well.

Similar to streets rated as Very Poor, Marginal streets that display high amounts of load associated distresses are selected as a priority for rehabilitation as they provide the greatest cost/benefit to the City. If left untreated, Marginal streets with high amounts of load associated distresses would deteriorate to become partial reconstruction candidates. Marginal streets that are failing due to materials issues or non-load associated failures may become suitable candidates for thick overlays if deferred, without a significant cost increase.

Fair (PCI = 50 to 60) – Thin to Moderate Overlays

104th Avenue from Irma Drive to Brendon Way (GISID 8350, PCI = 58) – Rated in the Fair category, these streets require thin to moderate overlays for asphalt when they enter their need year (generally within 2-3 points of the lower PCI in the defined range). Several distresses are present, but tend to be more localized and moderate in severity, and non-load related (primarily longitudinal and transverse cracking and raveling). On this segment of road, most of the cracked areas have been sealed.

Asphalt streets rated as Fair tend to receive a lower priority when developing a rehabilitation program. The reason for this is the cost to complete an overlay now would be on the order of $14.00 to $17.00/yd2. If deferred, the rehabilitation cost would only increase by about $3 to $5/yd2, again depending on the functional classification, in about 5 to 10 years. This delay represents a 20% difference over the time stated. Thus, the cost of deferral is low when compared to deferring a thick overlay to a reconstruction with a two to threefold increase in cost.

Good (PCI = 60 to 70) – Surface Treatments to Thin Overlays

112th Avenue from Raritan Street to West 111th Way (GISID 3639, PCI = 69) – Rated as Good with the primary cause of deterioration the transverse and longitudinal cracking, as well as patching. It also displays small amounts of load associated distresses that can easily be removed to restore the visual appearance of the roadway. The existing cracks should be sealed and the pavement surface restored, with a heavier surface treatment such as microsurfacing or double slurry to fully waterproof the pavement and cover the crack sealant. The occasional dig out and replacement may be required to correct localized deficiencies. Alternatively, depending on the extent of the distressed areas, base strength and drainage, a thin overlay may be applied.

Asphalt streets rated as Good are ideal candidates for thinner surface-based rehabilitations and local repairs. Depending on the amount of localized failures, a thin edge mill and overlay, or possibly a surface treatment, would be a suitable rehabilitation strategy for streets rated as Good. Streets that fall in the high 60 - low 70 PCI range provide the greatest opportunity for extending pavement life at the lowest possible cost, thus applying the principles of the perpetual life cycle approach to pavement maintenance. The adjacent photo is a great example of a street segment (not a Northglenn Road) that displayed low load associated distresses and thus, high structural characteristics, and once the distressed areas were replaced, a slurry seal was applied. The patching accounted for less than 5 to 10% of the total area and resulted in a good looking, watertight final surface at a much lower cost than an overlay with less disruption to the neighborhood and curb line. The patches were paver laid and roller compacted.

Very Good (PCI = 70 to 85) – Surface Treatments and Localized Rehabilitation

Huron Street from West 116th Place to West 117th Avenue (GISID 3712, PCI = 82) – Rated as Very Good, this road displays minor amounts of transverse cracking. The surface is non-weathered, and the base is still strong. This street is an example of a candidate for preventative maintenance and light weight surface treatments to extend the life of a roadway.

Asphalt streets rated as Very Good generally need lightweight surface-based treatments such as surface seals, slurries, chip seals or microsurfacing. Routine maintenance such as crack sealing and localized repairs often precede surface treatments. The concept is to keep the cracks as waterproof as possible through crack sealing and the application of a surface treatment. By keeping water out of the base layers, the pavement life is extended without the need for thicker rehabilitations such as overlays or reconstruction. Surface treatments also tend to increase surface friction and visual appearance of the pavement surface but do not add structure or increase smoothness.

Surface treatments may include:

- *Double or single application of slurry seals (slurries are a sand and asphalt cement mix).*
- *Microsurfacing – asphalt cement and up to 3/8 sand aggregate.*
- *Chip seals and cape seals (Chip seal followed by a slurry).*

Additional cost benefits of early intervention include:

- *Less use of non-renewable resources through thinner rehabilitation strategies.*
- *Less intrusive rehabilitation and easier to maintain access during construction.*
- *Easier to maintain existing drainage patterns.*

Excellent (PCI = 85 to 100)

104th Avenue from Fox Run Parkway to East 104th Avenue (GISID 8975, PCI = 97) – Rated as Excellent, displaying little to no surface distresses. The ride is smooth and the surface is non-weathered and the base is strong. In a couple of years, this street segment would be an ideal candidate for routine maintenance activities such as crack sealant rehabilitation.

In terms of pavement management efficiency, a program based on worst-first, that is starting at the lowest rated street and working up towards the highest, does not achieve optimal expenditure of money. Generally, under this scenario, agencies can not sufficiently fund pavement rehabilitation and lose ground despite injecting large amounts of capital into the network.

The preferred basis of rehabilitation candidate selection is to examine the cost of deferral of a street, against increased life expectancy.

4.2 EVALUATING THE PAVEMENT QUALITY AND BACKLOG

The concept of the Pavement Condition Index (PCI) score, backlog percentage and number of streets rated as Excellent must be fully understood in order to understand and develop an effective pavement management program. These three metrics should fall into certain ranges in order to measure the quality and long term viability of a network.

The PCI score indicates the overall pavement condition and represents the amount of equity in the system; it is the value most commonly considered when gauging the overall quality of a roadway network. It may also be used to define a desired level of service: that is, an agency may wish to develop a pavement management program such that in five years the overall network score meets a set minimum value. Obviously, the higher the PCI score the better off the overall network condition is. Agencies with an average PCI score above 80 (when considering surface distress, roughness and possibly strength) are rare and found only in a few select communities. Less than 1 in 20 communities surveyed by IMS have that high of a condition average. Averages between 65 and 80 are indicative of either newer networks, or ones that have an ongoing pavement rehabilitation program and tend to be fully funded. Scores between 60 and 65 are common and represent a reasonable average providing a satisfactory balance between levels of service and funding, and when taken with the other two metrics may represent a well-managed and funded network. A minimum score of 60 means that overall the network falls at the lower end of the range where light weight surface treatments and thin overlays are the standard rehabilitation practice. Below a 60 means an agency has to rely on more costly rehabilitations and reconstructions to address condition issues.

At the upper end of the condition scale, a minimum of 15% of the network should be rated as Excellent. Generally, at or above 15%, means that a noticeable percentage of the roadway network is in like new condition, requiring only routine maintenance. While higher percentages of streets rated as Excellent are certainly desirable, the annual cost to maintain rates at higher multiples is often cost prohibitive. Below 15% means the agency is struggling to effectively rehabilitate their network on an annual basis. The 15% marker represents a cost effective balance between annual investment and satisfactory level of service.

Backlog roadways are those that have dropped sufficiently in quality to the point where surface based rehabilitation efforts would no longer prove to be cost effective. These roadways are rated Poor or Very Poor and will require either partial or total reconstruction. Backlog is expressed as the percentage of roads requiring reconstruction as compared to the network totals.

It is the backlog, however, that defines the amount of legacy work an agency is facing and is willing to accept in the future. It is the combination of the three metrics that presents the true picture of the condition of a roadway network, and conversely defines improvement goals.

Generally, a backlog of 10% to 15% of the overall network is considered manageable from a funding point of view with 12% being a realistic target. Fifteen percent (15%) is used as a control limit to indicate the maximum amount of backlog that can be readily managed. Backlog rates below 10%, again are certainly desirable, but financially unachievable for a large percentage of agencies. Backlogs approaching 20% or more tend to become unmanageable, unless aggressively checked through larger rehabilitation programs, and will grow at an alarming rate. At 20% a tipping point has been met and the backlog tends to increase faster than an agency's ability to reconstruct their streets.

4.3 NORTHGLENN NETWORK CONDITION DISTRIBUTION

Figure 9 presented below shows the distribution of pavement condition for the roadway network in Northglenn. The average PCI for the network Local/Collector is 59. While direct comparisons to other agencies are difficult due to variances in ratings systems, Northglenn is slightly below average when compared to other agencies recently surveyed by IMS, which typically fall in the 60 to 65 range.

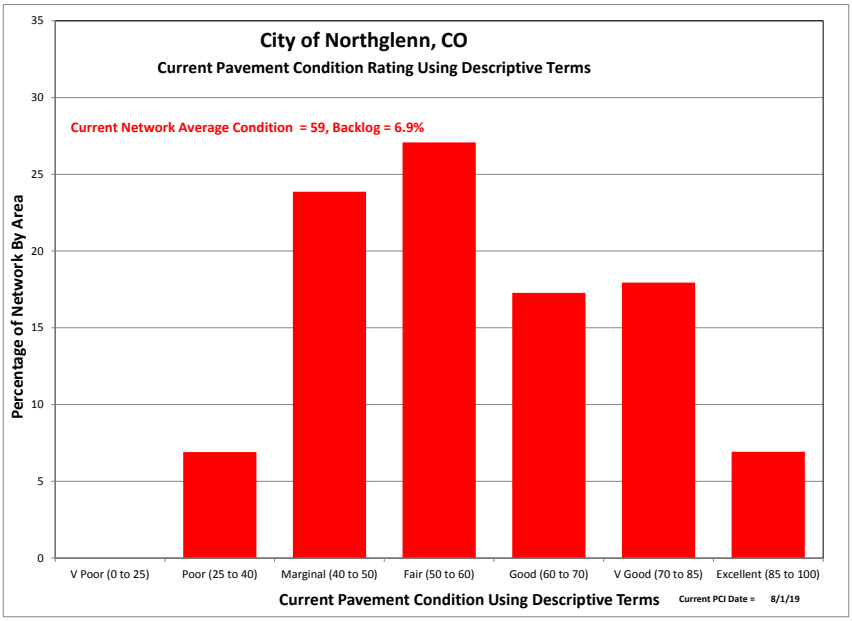


Figure 9a – Roadway Network Present Status (Local/Collector)

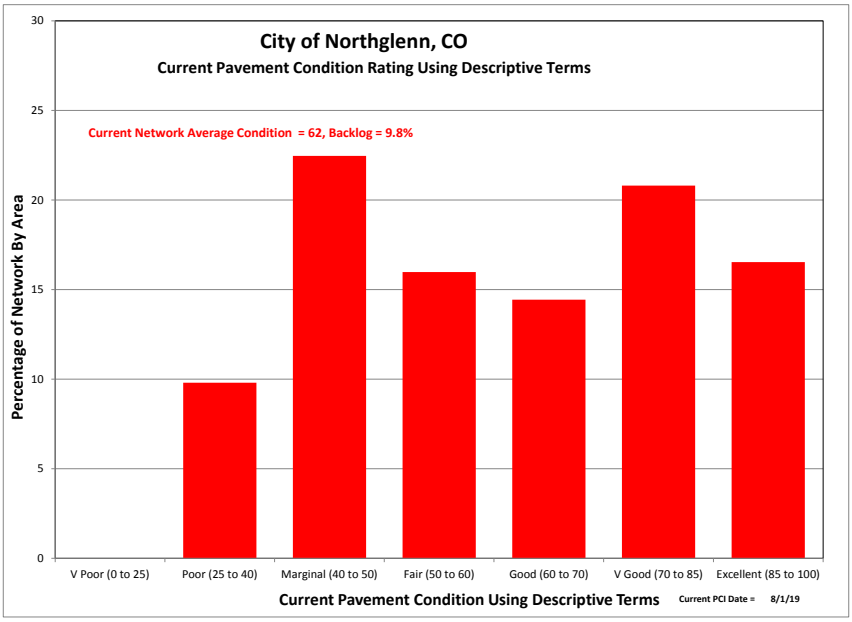


Figure 9b – Roadway Network Present Status (Arterials)

The following graph **(Figure 10)** plots the same pavement condition information of the Local/Collector network, but instead of using the actual Pavement Condition Index (PCI) value, descriptive terms are used to classify the roadways.

- Seven percent (6.9%) of the network can be considered in Excellent condition and require only routine maintenance. The target value for Excellent streets should be 15%, so the Northglenn network just barely fails to meet this condition.
- Eighteen percent (17.9%) of the network falls into the Very Good classification. These are roads that benefit most from preventative maintenance techniques such as microsurfacing, slurry seals and localized panel repairs.
- Seventeen percent (17.3%) of the streets are rated as Good and are candidates for lighter surface-based rehabilitations such as thin overlays or slight panel replacements.
- Fifty-one percent (51%) of network can be considered Fair to Marginal condition representing candidates for progressively thicker overlay-based rehabilitation or panel replacements. If left untreated, they will decline rapidly into reconstruction candidates.
- The remaining Seven percent (6.9%) of the network is rated as Poor or Very Poor, meaning these roadways have failed or are past their optimal due point for overlay or surface-based rehabilitation and may require progressively heavier or thicker forms of rehabilitation (such as extensive panel replacement, surface reconstruction or deep patch and paving) or total reconstruction.

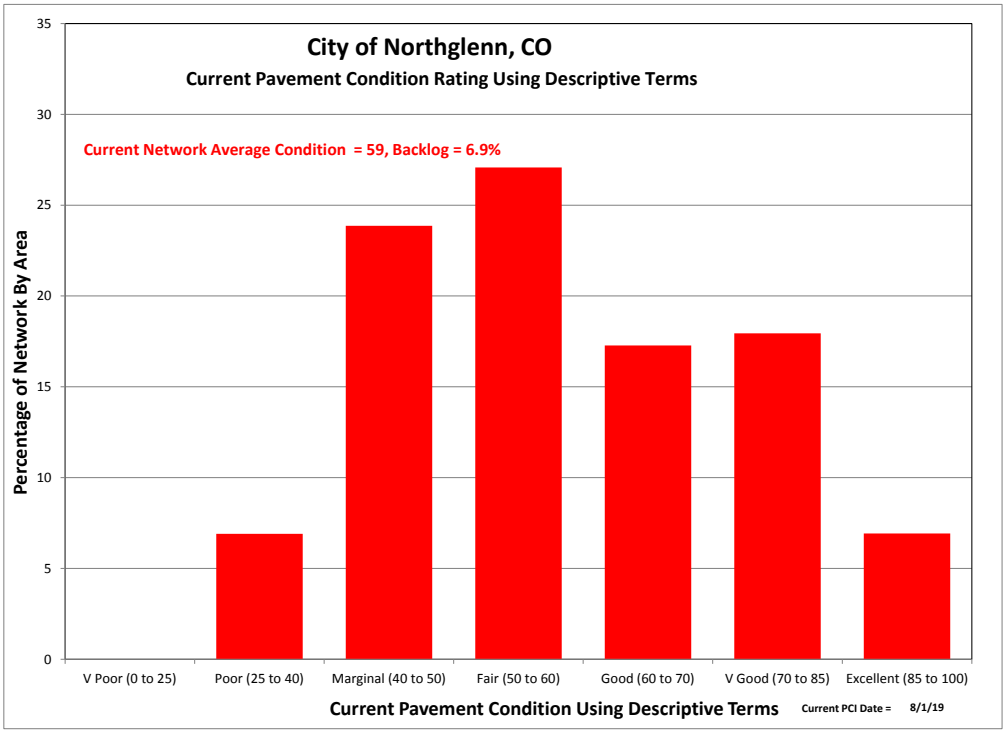


Figure 10 – Roadway Network Present Status Using Descriptive Terms

Figures 11 and 12 present the surveyed condition of the streets using PCI and Good-Fair-Poor descriptive terms, respectively. Electronic versions of these maps are appended to this report.

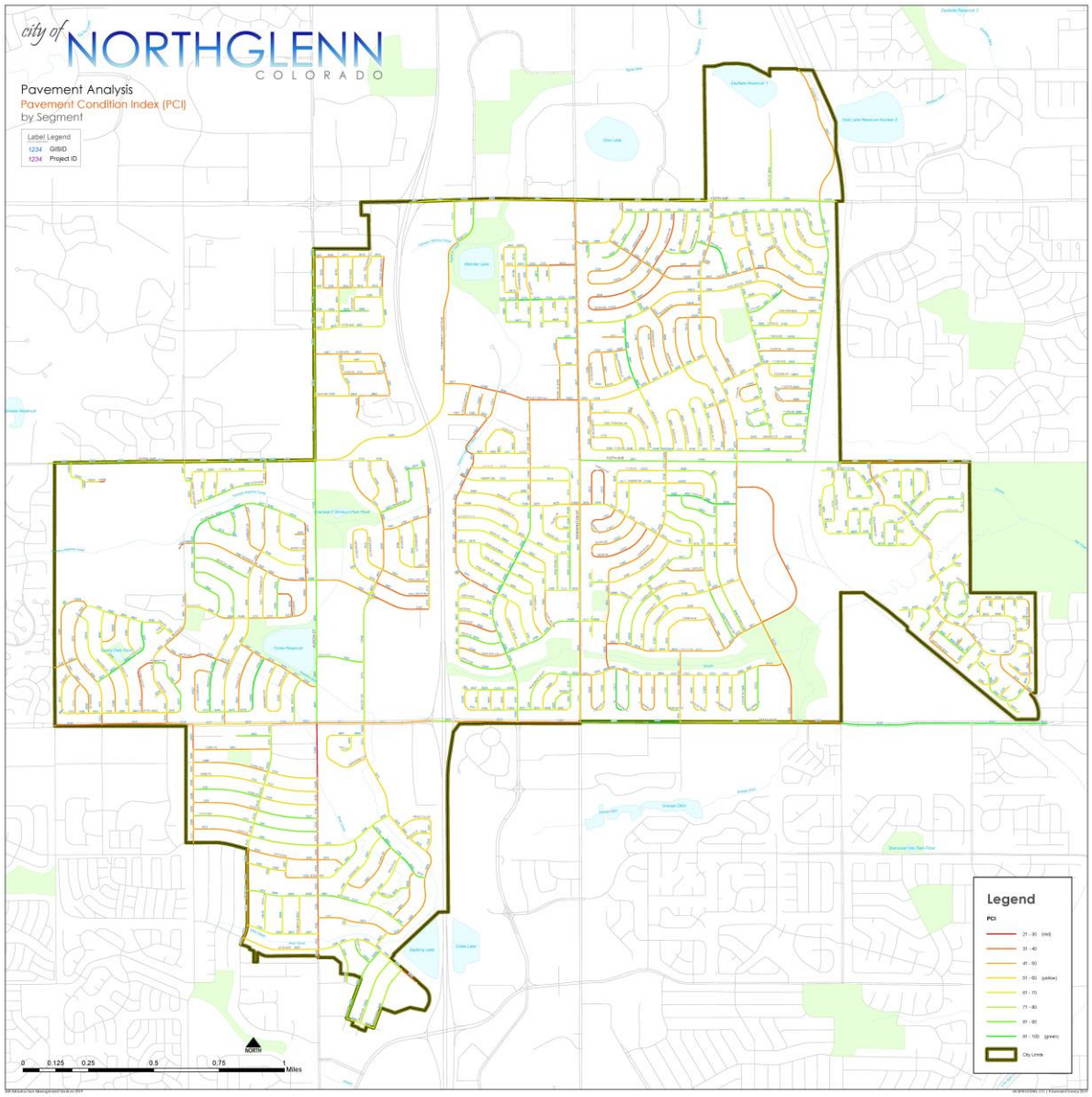


Figure 11 – Northglenn by Segment Using Pavement Condition Index (PCI)

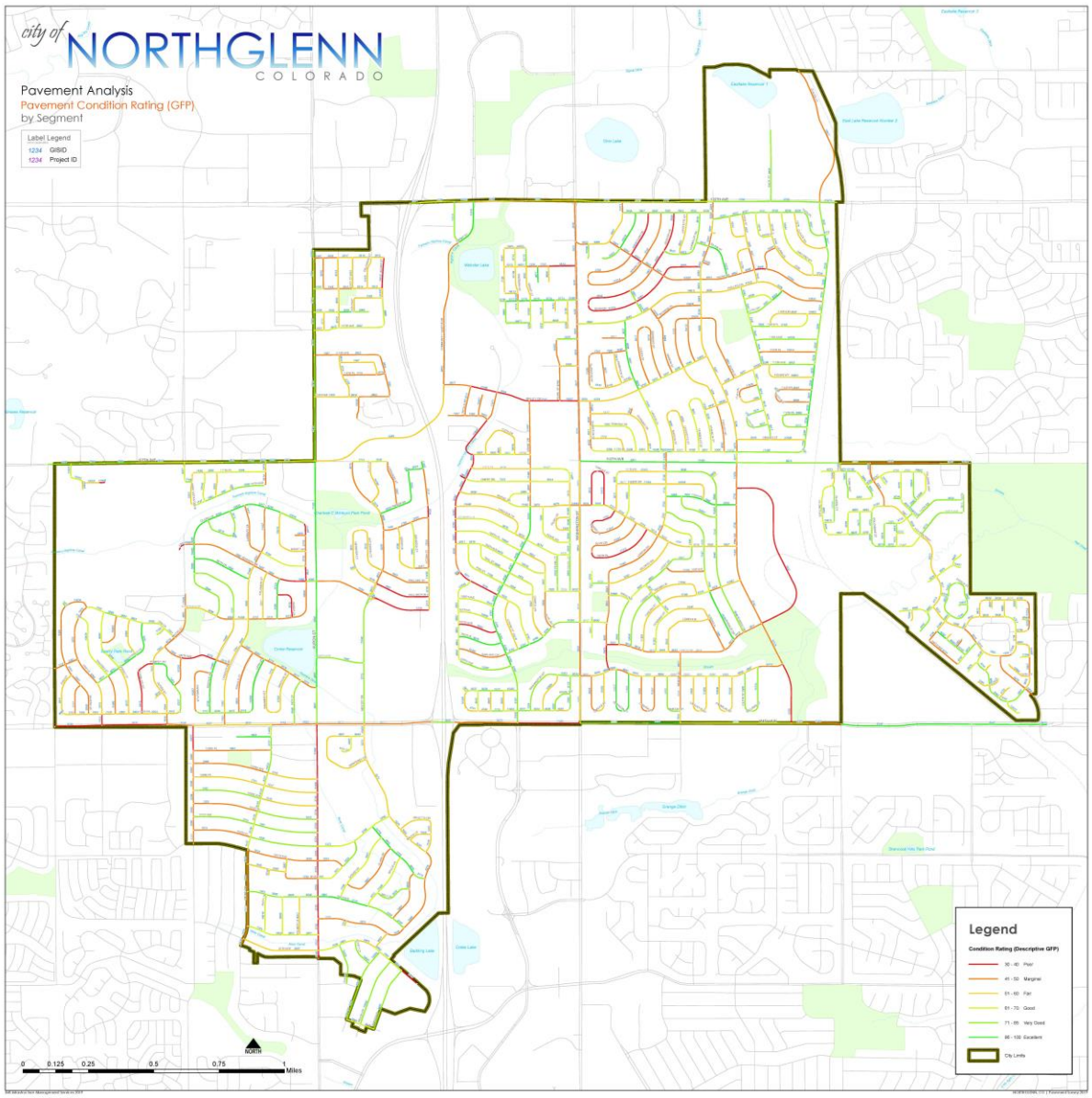


Figure 12 – Northglenn Pavement Condition by Segment Using Descriptive Terms

4.4 STRUCTURAL AND LOAD ASSOCIATED DISTRESS ANALYSIS

Structural testing and analysis was not performed for the City of Northglenn. Instead, analysis of the cause of pavement failure for these street segments was completed by examining the types of distresses that have caused the PCI score to drop.

Surface distresses may be categorized into two classifications – load associated distresses (LADD) and non-load associated distresses (NLAD). Load associated distresses are those that are directly related to traffic loading and structural capacity. Non-load associated distresses are those that result from materials or environmental issues including shrinkage (transverse) cracking, bleeding and raveling. Generally, load associated distresses affect the overall condition score more than non-load associated distresses – as is the case in Northglenn. For asphalt streets, roadways were classified as Weak, Moderate, or Strong.

The purpose of the structural analysis is twofold:

- The structural analysis provides input into which performance curve each segment is to use – performance curves are used to predict pavement deterioration over time.
- Structural analysis assists in rehabilitation selection by constraining inadequate pavement sections from receiving too light of a rehabilitation and conversely, identifying segments suitable for lighter weight treatment.

Figure 14 plots the relationship of the load associated distresses (shown in red) against pavement condition. As can be seen from the plot, at higher PCI scores, most pavements fall into the moderate strength classification as the distresses have not yet begun to manifest themselves into severe failures. As the PCI score drops, the load associated distresses typically affect the PCI score to a higher degree with more segments being classified as weak. Conversely, segments that have a declining PCI score and low LADD, are classified as strong as they display few load associated failures. High PCI score (above 60) rehab selections should focus on pavement preservation activities such as surface treatments or thin overlays, possibly with some localized pavement repairs and crack sealing.

The sum of the Load-Associated Distress deducts (LADD) is also used to qualify the appropriate rehabilitation strategy selection in addition to the overall pavement condition score. For example, a street that has a good PCI score (that is between 60 and 70) and is displaying relatively low load associated distress deducts would be a suitable candidate for a surface treatment in place of a thin overlay in that the PCI score is more influenced by materials issues such as transverse cracking or raveling.

Overall, the low amounts of streets exhibiting weak performance can generally be attributed to poor subgrade conditions, insufficient pavement thickness and increased traffic loading – in particular heavy, side-loading garbage and recycling trucks (an unintended consequence of green initiatives) along with school buses and delivery vehicles. The average weight of these vehicles coupled with tire pressure and configuration today compared to those from a few decades ago has increased drastically.

- The upper black diagonal line identifies segments that have a high ratio of load associated distresses compared to their PCI score. These segments are classified as weak.
- The lower black diagonal line identifies segments that have a low ratio of load associated distresses compared to their PCI score and are classified as strong.
- Segments that fall between the two lines are assigned a moderate pavement strength.

The sum of the Load-Associated Distress deducts (LADD) is also used to qualify the appropriate rehabilitation strategy selection in addition to the overall pavement condition score.

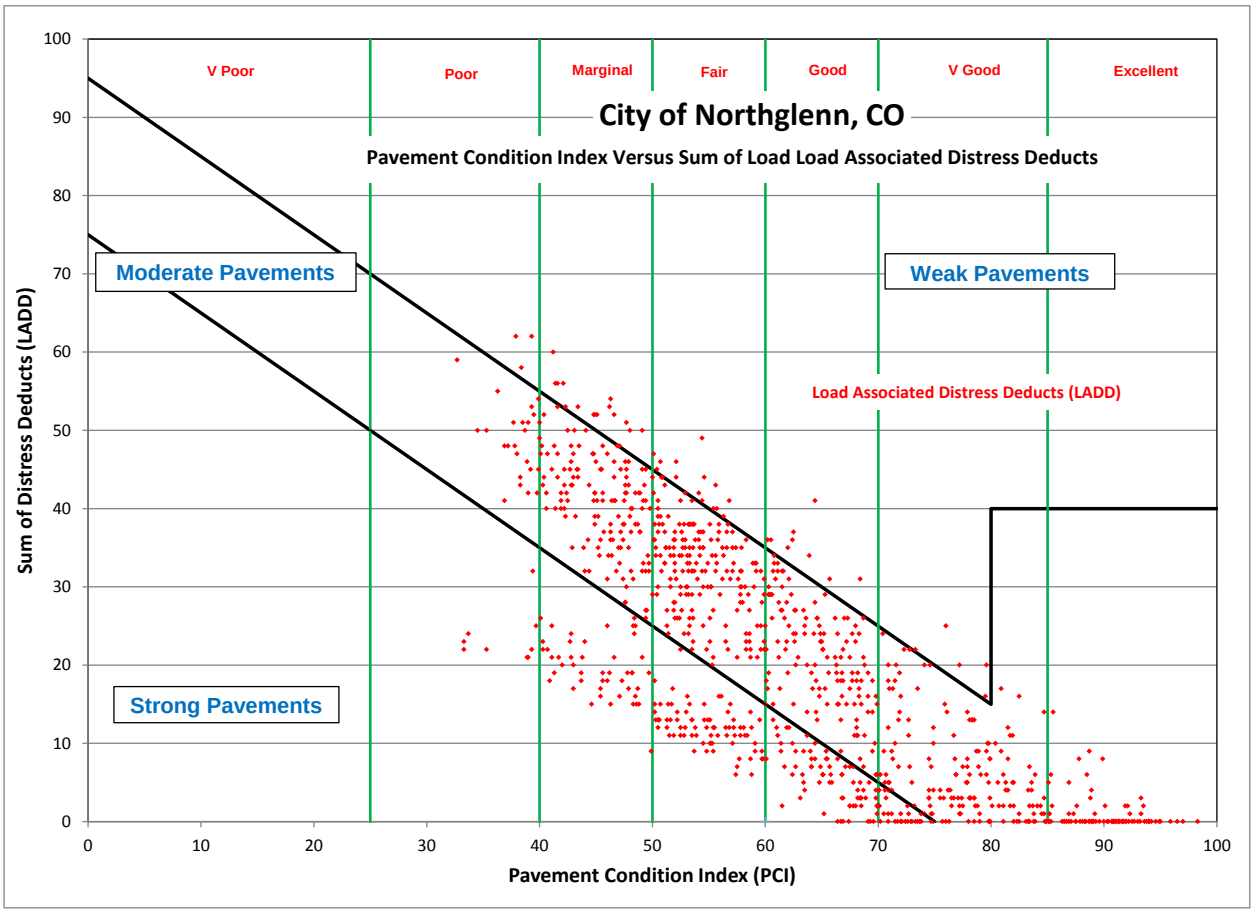


Figure 14 – Pavement Condition Index versus Sum of Distress Deducts

5.0 REHABILITATION PLAN AND BUDGET DEVELOPMENT

5.1 KEY ANALYSIS SET POINTS AND PAVEMENT PERFORMANCE CURVES

Pavement management analysis requires user inputs in order to complete its condition forecasting and prioritization. A series of operating parameters were developed in order to create an efficient program that is tailored to the City's needs.

Some of the highlights include:

- The pavement performance curves that are used to predict future pavement condition. Asphalt streets are classified as weak, moderate, or strong, and then assigned the appropriate pavement performance curve based on their functional classification to use in the analysis. The concept of load associated distresses does not apply to concrete streets.
- The shape of performance curves reflect the concept of deferred maintenance and salvage life. Instead of dropping to an absolute PCI value of 0 after 40 years of service, the curves are designed to become asymptotic to the age axis and have a whole life of approximately 50 to 60 years depending on pavement type. This indicates the notion that once a street deteriorates past a specific threshold – about a PCI of 20, age becomes less important in rehab selection.
- Priority ranking analysis uses prioritization for rehabilitation candidate selection. It is designed to capture as many segments in their need year based on the incremental cost of deferral. The higher the functional classification of a street, the higher priority a segment is given.

Rehabilitation Strategies and Unit Rates

The rehab strategies and unit rates used in the pavement analysis can be found on the following page. Some important parameters include:

- **Rehab Code and Activity** – The assigned identifier and name to each rehabilitation strategy. The term "RR" refers to "Remove and Replace", otherwise known as Structural Patching. When this term is present, additional funds have been assigned to the strategy to allow for an increased amount of preparation work and patching. The relative terms of thin, moderate and thick are used to describe the overlay thickness. This is to facilitate consistency in the naming convention, but does not imply the same material thickness has to be used for each functional classification.

  The recommended rehab activities for any given PCI range may vary due to pavement strength and functional classification. For example, an arterial between a PCI of 50 to 60 may receive a thin to moderate overlay, while a local access road may only receive a chip seal or thin overlay.

- **Unit Rates** – The rehab costs are presented on a per square yard basis for each pavement type, functional class, and rehabilitation activity combination. The rates were developed using typical national averages for similar activities and adjusted for Northglenn's location and unique conditions. An additional burden to all costs was also added to cover City overheads, design and engineering and inspection. Costs for peripheral concrete rehab (valley gutters, inlets, approaches, etc.) have not been included in the analysis.

The unit rates are reflected in the network value, final budgets, and average cost/mile for doing work in Northglenn.

City of Northglenn, CO
Rehabilitation Strategies and Unit Rates

			Rehab Group 1			Rehab Group 2			Rehab Group 3									
Pavetype	Rehab Code	Rehab Activity	Min PCI	Critical PCI (Need Year)	Max PCI	Min PCI	Critical PCI (Need Year)	Max PCI	Min PCI	Critical PCI (Need Year)	Max PCI	Base Unit Rate ($/yd2)	Collector Unit Rate ($/yd2)	Local Unit Rate ($/yd2)	Construction Activities Burden Included in Unit Rates (%)	Agency Overheads Included in Unit Rates (%)	Reset PCI	Steady State Life Cycle (Yrs)	CBA Rehab Priority (Info Only)
All	5	Routine Maintenance	85	100	100	80	82	100	80	82	100	0.00	0.00	0.00	0	0		1	
Asphalt	10	Slurry Seal / Seal Coat	80	82	85	70	73	80	70	73	80	3.70	3.70	3.70	10	15	85	3	15
Asphalt	20	MicroSurface / Chip Seal	70	73	80				60	63	70	4.90	4.90	4.90	10	15	88	14	7
Asphalt	23	MicroSurface / Chip Seal + Strctrl Ptch	70	73	80								5.70	5.70	10	15	88	14	8
Asphalt	26	MicroSurface / Chip Seal + Strctrl Ptch	70	73	80	60	63	70	50	54	60		6.40	6.40	10	15	88	14	6
Asphalt	30	Edge Mill + Thin Overlay (1.5 - 2.0)	60	63	70				50	54	60	16.50	16.50	16.50	10	15	92	24	13
Asphalt	33	Edge Mill + Thin Overlay (1.5 - 2.0) + Strctrl Ptch	60	63	70	50	54	60	50	54	60		18.25	18.25	10	15	92	24	14
Asphalt	36	Edge Mill + Thin Overlay (1.5 - 2.0) + Strctrl Ptch	50	54	60	50	54	60	40	44	50		20.00	20.00	10	15	92	24	5
Asphalt	40	EM/FWM + Moderate Overlay (2.0 - 3.0)	50	54	60	50	54	60	40	44	50	18.50	18.50	18.50	10	15	94	30	10
Asphalt	43	EM/FWM + Moderate Overlay (2.0 - 3.0) + Strctrl Ptch	50	54	60	40	44	50	40	44	50		20.25	20.25	10	15	94	30	4
Asphalt	46	EM/FWM + Moderate Overlay (2.0 - 3.0) + Strctrl Ptch	40	44	50	40	44	50	25	30	40		22.00	22.00	10	15	94	30	11
Asphalt	50	FWM + Thick Overlay (> 2.0 - 3.0)	40	44	50							22.00	22.00	22.00	10	15	96	37	9
Asphalt	53	FWM + Thick Overlay (> 2.0 - 3.0) + Strctrl Ptch	40	44	50	25	30	40					24.00	24.00	10	15	96	37	12
Asphalt	56	FWM + Thick Overlay (> 2.0 - 3.0) + Strctrl Ptch	25	30	40								26.00	26.00	10	15	96	37	1
Asphalt	60	Surf Recon + Base Rehab / FWM + Strctrl Ptch + Olay	25	30	40	25	30	40	0	15	25	47.50	47.50	47.50	10	15	98	45	2
Asphalt	70	ACP Full Depth Reconstruction	0	15	25	0	15	25	0	15	25	69.00	69.00	69.00	10	15	100	56	3
Concrete	510	PCC Jnt Rehab & Crk Seal	80	82	100	80	82	100	80	82	100	0.56	0.55	0.55	10	15	83	2	11
Concrete	520	PCC Localized Rehab	70	73	80	70	73	80	70	73	80	3.47	3.50	3.50	10	15	85	16	10
Concrete	523	PCC Localized Rehab + Grind	70	73	80	70	73	80	70	73	80		3.50	3.50	10	15	85	16	3
Concrete	530	PCC Slight Pnl Rplcmnt (<10%)	60	63	70	60	63	70	60	63	70	14.84	14.75	14.75	10	15	88	31	8
Concrete	533	PCC Slight Pnl Rplcmnt (<10%) + Grind	60	63	70	60	63	70	60	63	70		14.75	14.75	10	15	88	31	8
Concrete	540	PCC Moderate Pnl Rplcmnt (< 20%)	50	54	60	50	54	60	50	54	60	28.00	28.00	28.00	10	15	90	41	6
Concrete	543	PCC Moderate Pnl Rplcmnt (< 20%) + Grind	50	54	60	50	54	60	50	54	60		28.00	28.00	10	15	90	41	6
Concrete	550	PCC Extensive Pnl Rplcmnt (<33%)	40	44	50	40	44	50	40	44	50	40.88	41.00	41.00	10	15	94	54	4
Concrete	553	PCC Extensive Pnl Rplcmnt (<33%) + Grind	40	44	50	40	44	50	40	44	50		41.00	41.00	10	15	94	54	4
Concrete	560	PCC Partial Reconstruction	25	30	40	25	30	40	25	30	40	81.76	82.00	82.00	10	15	96	66	1
Concrete	570	PCC Full Depth Reconstruction	0	15	25	0	15	25	0	15	25	124.32	124.00	124.00	10	15	100	84	2

**Unit rates vary slightly between functional classes*

City of Northglenn, CO
Rehabilitation Strategies and Unit Rates

			Rehab Group 1			Rehab Group 2			Rehab Group 3										
Pavetype	Rehab Code	Rehab Activity	Min PCI	Critical PCI (Need Year)	Max PCI	Min PCI	Critical PCI (Need Year)	Max PCI	Min PCI	Critical PCI (Need Year)	Max PCI	Base Unit Rate ($/yd2)	Principal Arterial Unit Rate ($/yd2)	Minor Arterial Unit Rate ($/yd2)	Section Line Arterial Unit Rate ($/yd2)	Construction Activities Burden Included in Unit Rates (%)	Agency Overheads Included in Unit Rates (%)	Reset PCI	Steady State Life Cycle (Yrs)	CBA Rehab Priority (Info Only)
All	5	Routine Maintenance	85	100	100	80	82	100	80	82	100	0.00	0.00	0.00	0.00	0	0		1	
Asphalt	10	Slurry Seal / Seal Coat	80	82	85	70	73	80	70	73	80	3.70	4.10	4.00	3.90	10	15	85	2	15
Asphalt	20	MicroSurface / Chip Seal	70	73	80				60	63	70	4.90	5.40	5.30	5.10	10	15	88	10	7
Asphalt	23	MicroSurface / Chip Seal + Strctrl Ptch	70	73	80								6.20	6.10	5.90	10	15	88	10	8
Asphalt	26	MicroSurface / Chip Seal + Strctrl Ptch	70	73	80	60	63	70	50	54	60		7.00	6.90	6.70	10	15	88	10	6
Asphalt	30	Edge Mill + Thin Overlay (1.5 - 2.0)	60	63	70				50	54	60	16.50	18.25	17.75	17.25	10	15	92	18	12
Asphalt	33	Edge Mill + Thin Overlay (1.5 - 2.0) + Strctrl Ptch	60	63	70	50	54	60	50	54	60		20.00	19.50	19.25	10	15	92	18	14
Asphalt	36	Edge Mill + Thin Overlay (1.5 - 2.0) + Strctrl Ptch	50	54	60	50	54	60	40	44	50		22.00	21.50	21.00	10	15	92	18	5
Asphalt	40	EM/FWM + Moderate Overlay (2.0 - 3.0)	50	54	60	50	54	60	40	44	50	18.50	21.25	20.50	20.00	10	15	94	23	9
Asphalt	43	EM/FWM + Moderate Overlay (2.0 - 3.0) + Strctrl Ptch	50	54	60	40	44	50	40	44	50		23.25	22.50	21.75	10	15	94	23	4
Asphalt	46	EM/FWM + Moderate Overlay (2.0 - 3.0) + Strctrl Ptch	40	44	50	40	44	50	25	30	40		25.50	24.50	23.75	10	15	94	23	11
Asphalt	50	FWM + Thick Overlay (> 2.0 - 3.0)	40	44	50							22.00	26.50	25.50	24.25	10	15	96	28	10
Asphalt	53	FWM + Thick Overlay (> 2.0 - 3.0) + Strctrl Ptch	40	44	50	25	30	40					29.00	27.75	26.50	10	15	96	28	13
Asphalt	56	FWM + Thick Overlay (> 2.0 - 3.0) + Strctrl Ptch	25	30	40								31.50	30.00	28.75	10	15	96	28	1
Asphalt	60	Surf Recon + Base Rehab / FWM + Strctrl Ptch + Olay	25	30	40	25	30	40	0	15	25	47.50	57.50	55.00	52.50	10	15	98	34	2
Asphalt	70	ACP Full Depth Reconstruction	0	15	25	0	15	25	0	15	25	69.00	76.00	74.00	72.50	10	15	100	42	3
Concrete	510	PCC Jnt Rehab & Crk Seal	80	82	100	80	82	100	80	82	100	0.56	0.60	0.60	0.60	10	15	83	2	11
Concrete	520	PCC Localized Rehab	70	73	80	70	73	80	70	73	80	3.47	4.00	3.90	3.70	10	15	85	16	10
Concrete	523	PCC Localized Rehab + Grind	70	73	80	70	73	80	70	73	80		4.00	3.90	3.70	10	15	85	16	3
Concrete	530	PCC Slight Pnl Rplcmnt (<10%)	60	63	70	60	63	70	60	63	70	14.84	18.00	17.25	16.25	10	15	88	31	8
Concrete	533	PCC Slight Pnl Rplcmnt (<10%) + Grind	60	63	70	60	63	70	60	63	70		18.00	17.25	16.25	10	15	88	31	8
Concrete	540	PCC Moderate Pnl Rplcmnt (< 20%)	50	54	60	50	54	60	50	54	60	28.00	35.50	33.50	31.50	10	15	90	41	6
Concrete	543	PCC Moderate Pnl Rplcmnt (< 20%) + Grind	50	54	60	50	54	60	50	54	60		35.50	33.50	31.50	10	15	90	41	6
Concrete	550	PCC Extensive Pnl Rplcmnt (<33%)	40	44	50	40	44	50	40	44	50	40.88	54.50	51.00	47.50	10	15	94	54	4
Concrete	553	PCC Extensive Pnl Rplcmnt (<33%) + Grind	40	44	50	40	44	50	40	44	50		54.50	51.00	47.50	10	15	94	54	4
Concrete	560	PCC Partial Reconstruction	25	30	40	25	30	40	25	30	40	81.76	104.00	98.00	92.50	10	15	96	66	1
Concrete	570	PCC Full Depth Reconstruction	0	15	25	0	15	25	0	15	25	124.32	165.00	154.00	144.00	10	15	100	84	2

Min PCI, Critical PCI, and Max PCI – These define the Pavement Condition Index (PCI) range applicable to the rehab selection. The Critical PCI defines when a segment is in its need year and is deemed to be critical, otherwise if deferred, the street declines in PCI past the point which the rehabilitation is no longer appropriate. Generally the Critical PCI falls 2 to 4 points higher than the minimum PCI applicable for each rehab activity.

Selection and Prioritization of Rehab Candidates

The City's pavement management program incorporates a series of user defined values to prioritize and select the street segments for rehabilitation. The rehab selection order is not worst first, but rather designed to capture as many segments in their need year based on the incremental cost of rehab deferral. A Street is considered to be in its need year when it has reached its maximum service life and any further deferral would require a heavier and more costly rehabilitation. The rehab program has been designed to maximize the increased service life for each rehabilitation dollar spent on a segment.

Other factors included in the prioritization process focus on:

- **Need Year** – streets are only selected when they have expended their service life and are optimal for rehab selection.
- **Functional Classification** – generally priority is given to higher functional classifications as they provide greater benefits to a larger group of users
- **Pavement Strength** – weaker streets are prioritized higher than stronger ones as they deteriorate faster.
- **Area** – a very slight increase in priority is given to larger projects over smaller ones.

The net result is a program that favors thick overlays, followed by partial reconstruction projects then full reconstruction projects (more for safety reasons than cost-benefit). These are then followed by surface treatments and lastly by moderate to thin overlays.

The programmed deterioration curves illustrated in **Figure 16** are designed to integrate the pavement condition distribution performance curves for the network, with the applied rehabilitation strategies and their expected life cycle. Different color performance curves are meant to represent the full suite of curves assigned to segments based upon their functional class, pavement type, and strength.

It is important to recognize that even though all streets fall into specific rating categories and their respective rehabilitation strategies, it is not until a street falls to within a few points of the lower end of the range that it will become a critical need selected for rehabilitation.

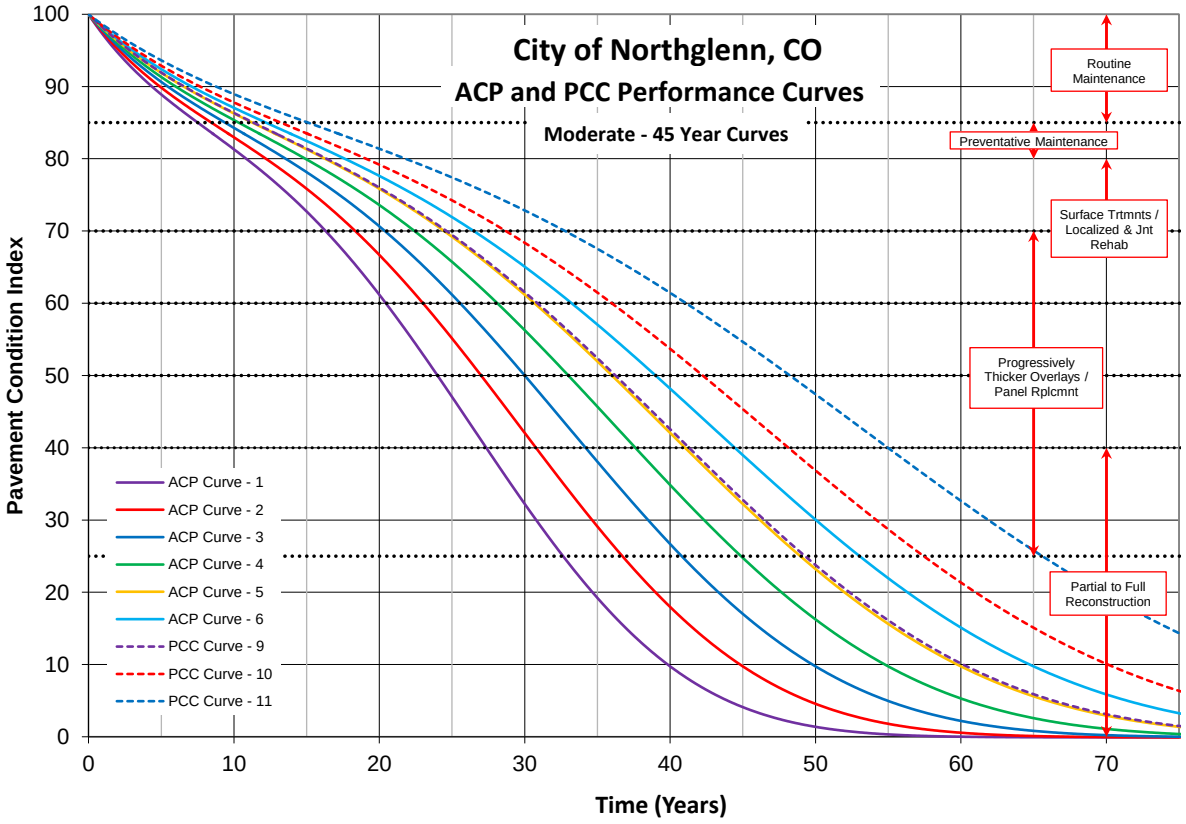


Figure 16 - Performance Curves

5.2 NETWORK BUDGET ANALYSIS MODELS

An analysis containing a total of 10 profile budget runs plus a Do Nothing options was prepared for Northglenn.

The analysis results for Collectors and Locals are summarized below:

- **Do Nothing** (illustrated in Figure 20) – This option identifies the effect of spending no capital for 5 years. After 5 years, this scenario results in a network average PCI drop from a 59 to a 51 and a dramatic increase in backlog to 30%.
- **Client Budget** (Green Line) – this represents the City's current annual budget of $750K annually dedicated to pavement preservation and rehabilitation. This level of funding will result in a network average PCI score of 55 and a backlog increase to 24%.
- **Steady State PCI** – this is simply the funds required to maintain the current network average PCI at a 59. The annual budget required to do so is on the order of $1.63M annually, however backlog (Very Poor & Poor roadways) continues to climb to 17%.
- **Backlog Control Budget** – A budget designed to arrest the growth of backlog to 10%. This budget is also the IMS recommended budget.

The results of the analysis are summarized in **Figure 17** below. The X-axis highlights the annual budget, while the Y-axis plots the 5 Year Post Rehab Network Average PCI value. The diagonal blue line is the results of the pavement analysis (the Northglenn model profile).

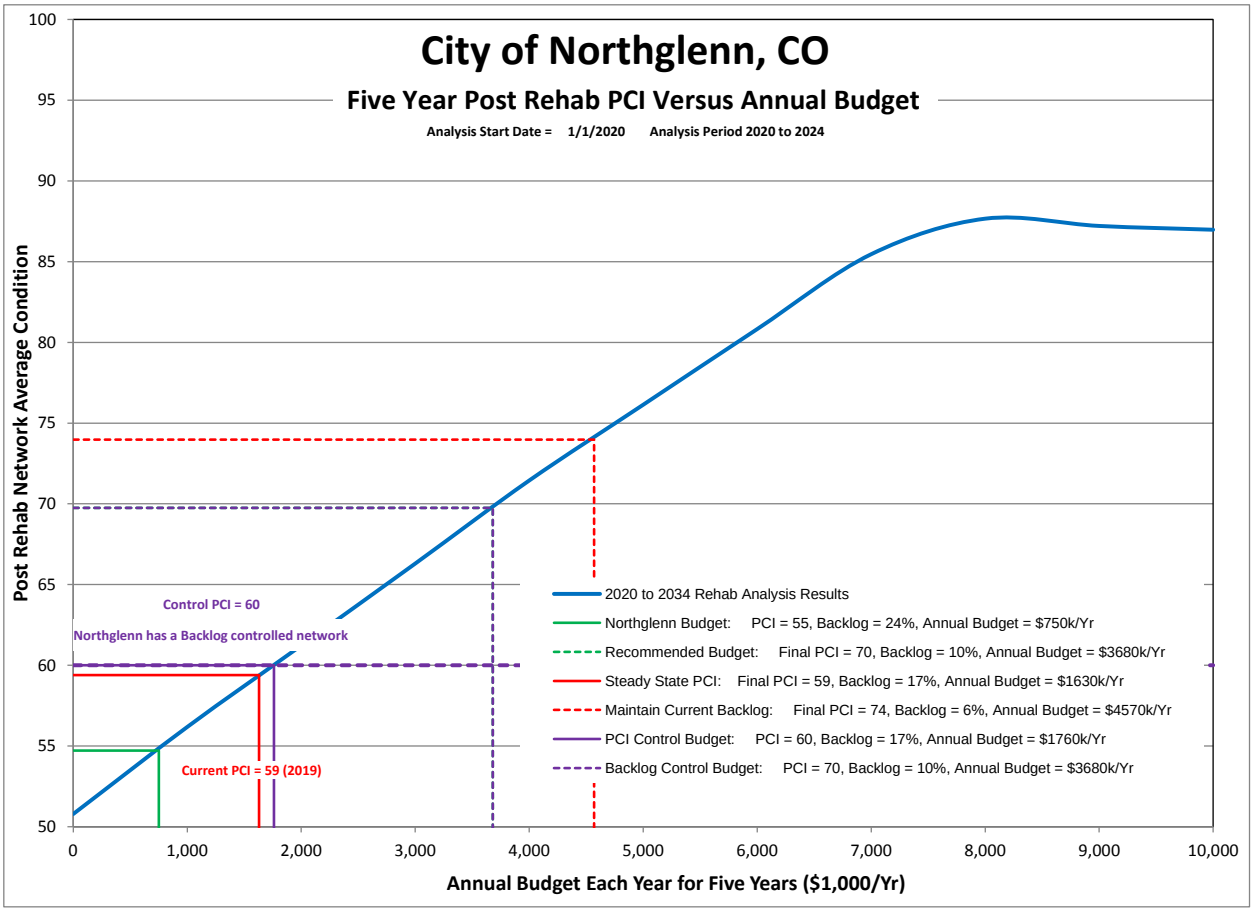


Figure 17 – 5 Year Post Rehab Network PCI Analysis Results

Figure 18 presents the resultant network backlog against annual budget. Similar to Figure 17, but instead of plotting the average PCI score, the blue diagonal line represents the total backlog after 5 years.

The lower the backlog the better, with a maximum of 12% recommended

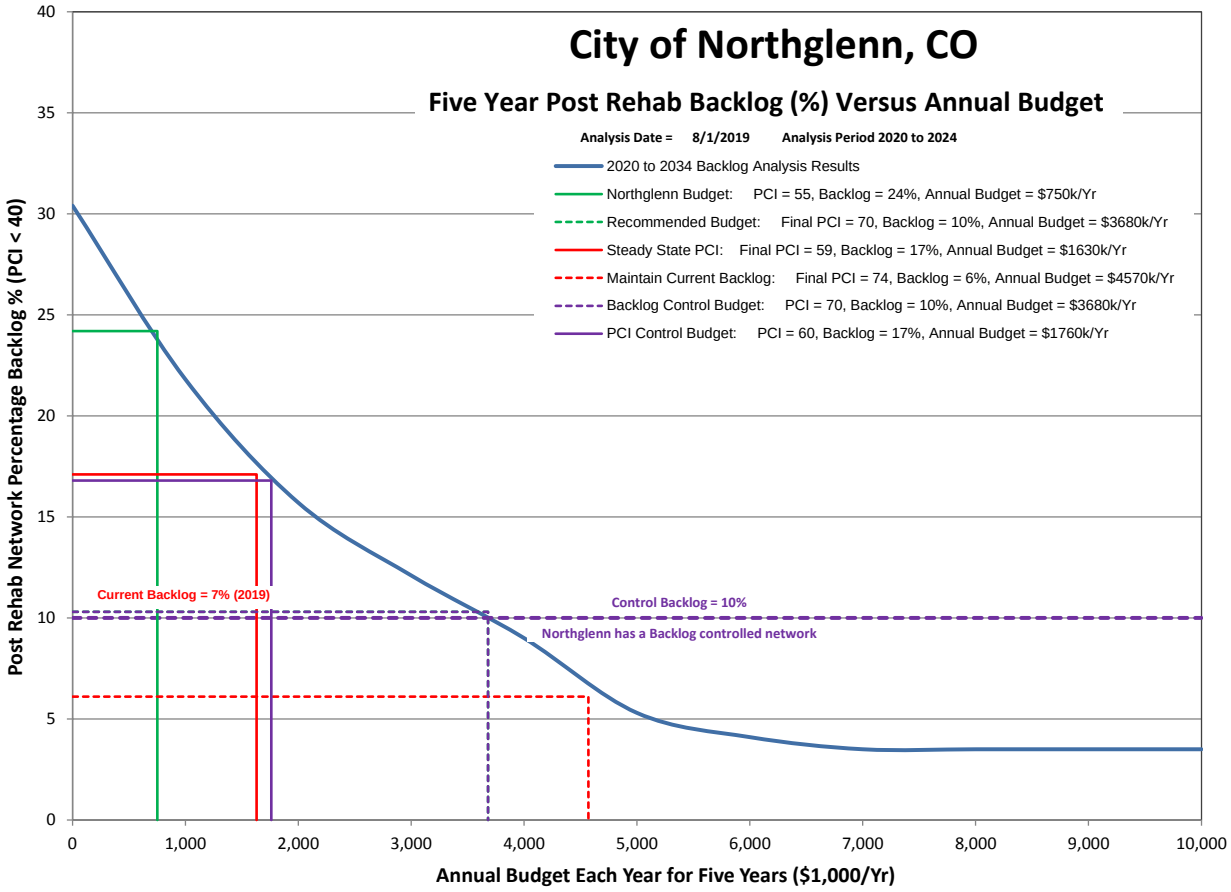


Figure 18 – 5 Year Post Rehab Network Backlog Results

Figure 19 presents the analysis results on an annual basis. This shows that if the budget falls below $1.63M/year (Steady State Budget), over time the overall condition of the roads will deteriorate as backlog continues to grow.

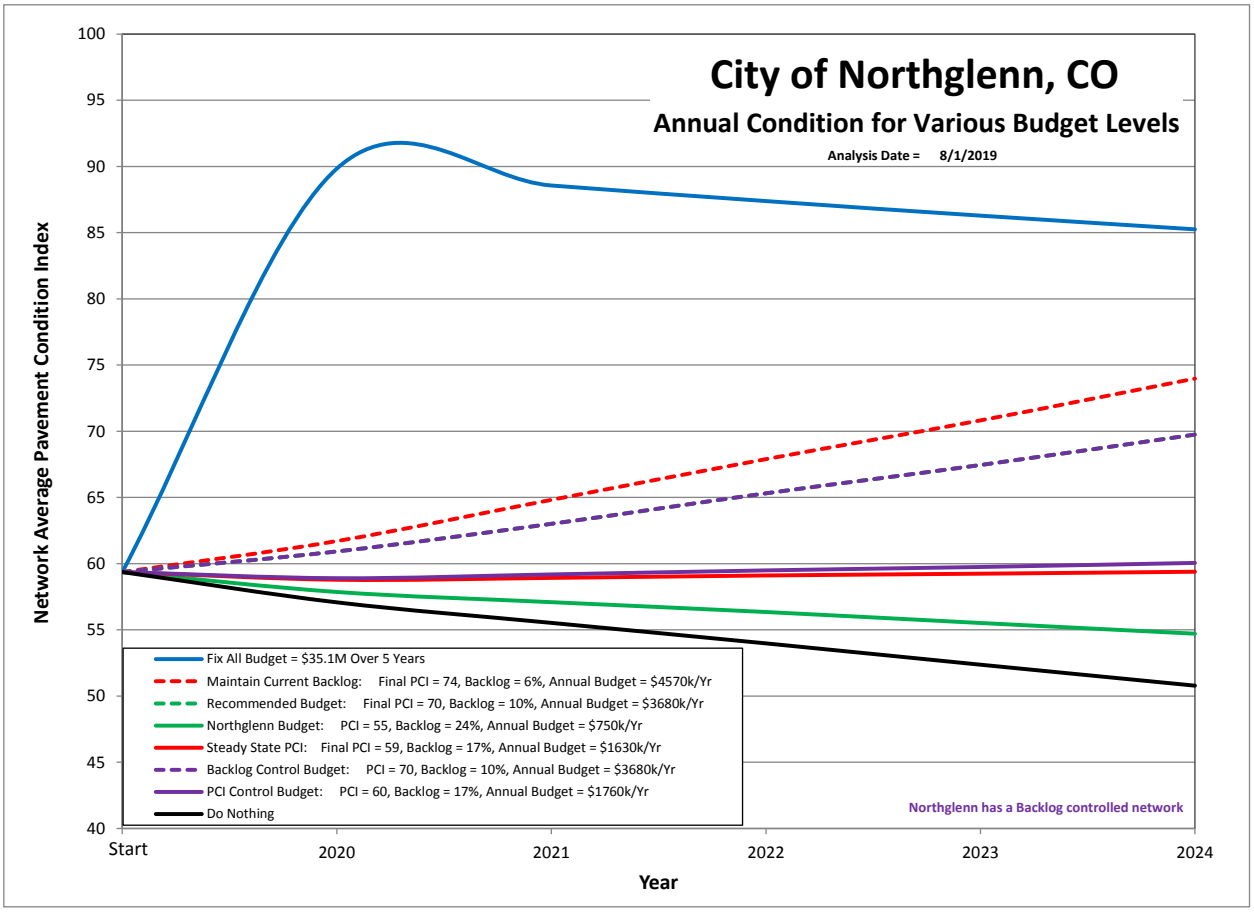


Figure 19– 5 Year Annual PCI

5.3 POST REHABILITATION CONDITION

The following figure (**Figure 20**) compares the current network condition distribution (red) against what the 5-year post rehabilitation distribution would be at with a budget of $750K/year (blue). As can be seen in the plot, the Northglenn budget will reduce the overall network's PCI average and increase the amount of roads in the backlog category.

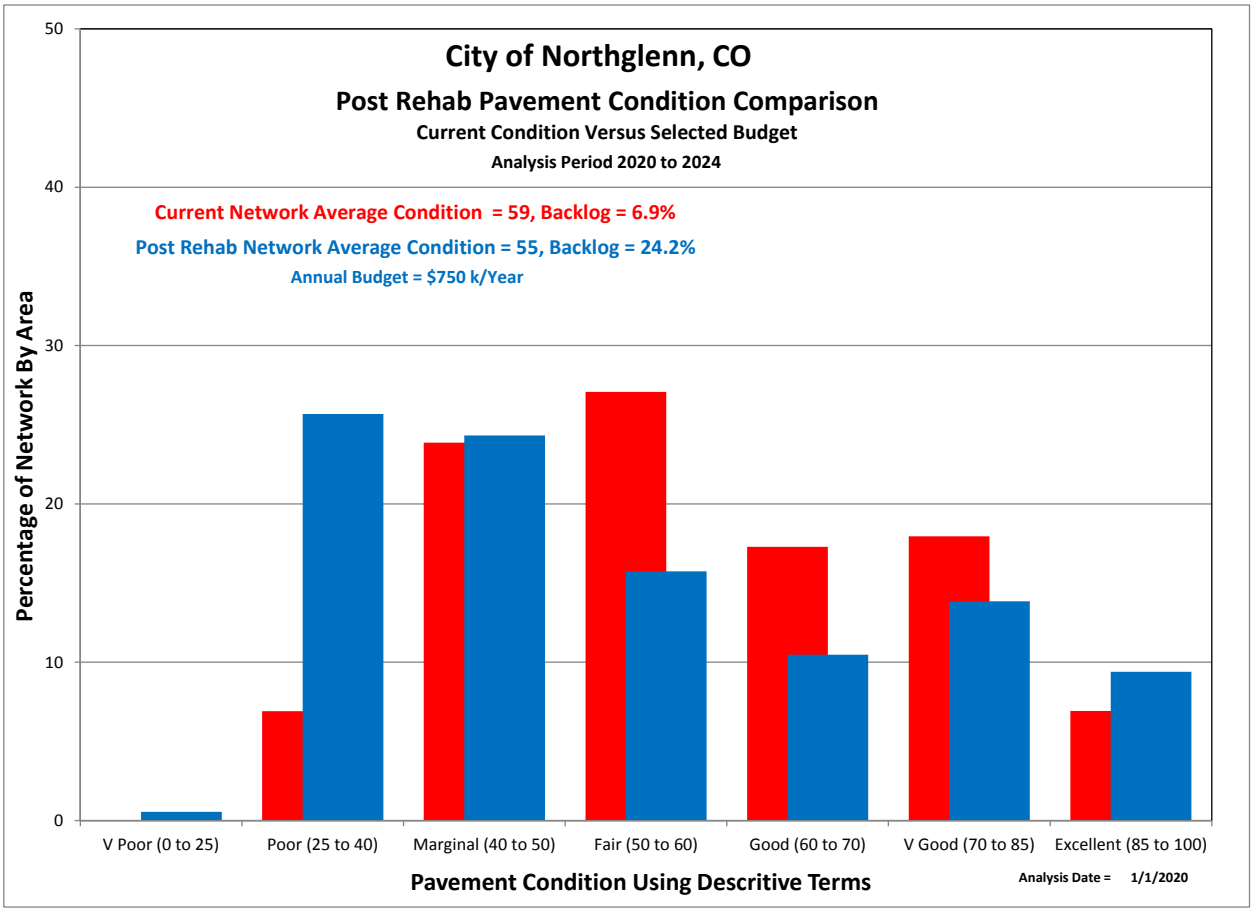


Figure 20 – Five-Year Post Rehabilitation Condition Distribution

Three metrics are used to evaluate the quality of a roadway network, they are:

Average Condition – should be between 60 and 65 at a minimum
Percentage of Backlog – target 12%, should be less than 15%, must be less than 20%
Percentage of Streets Rated as Excellent – should be greater than 15%

Figures 21 and 22 present the current Northglenn recommended budget network rehabilitation plan by year and activity. Electronic versions of these maps are appended to this report.

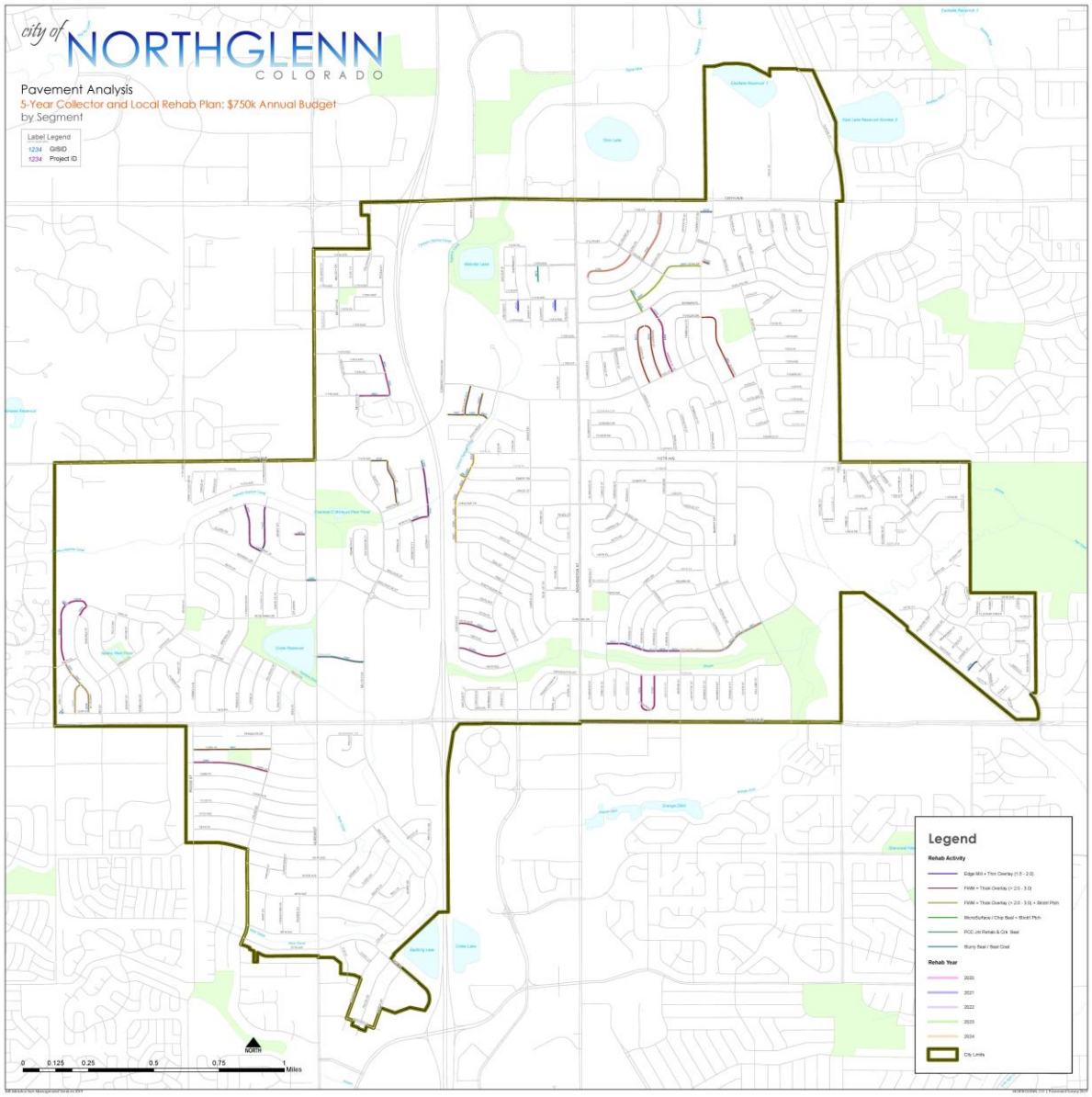


Figure 21 – $750K/Year Rehabilitation Plan by Segment – Collector/Local

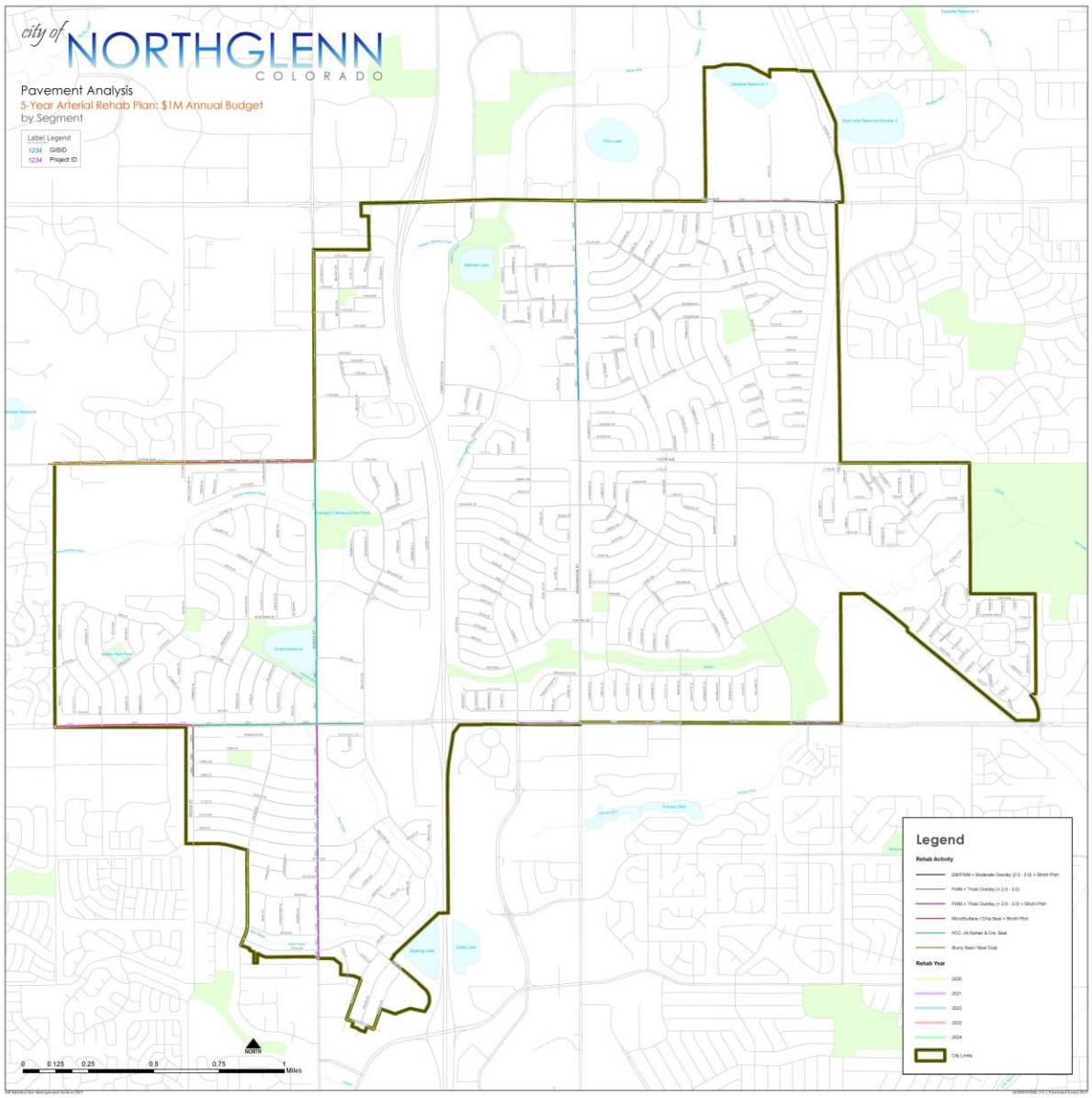


Figure 22 – $1M/Year Rehabilitation Plan by Segment – Arterial

5.5 True Cost of Underfunding of a Roadway Network (Locals/ Collectors)

Funding of roadway rehabilitation is an exercise in identifying the balance between available funding and the desired level of service that is right for each agency. There are no hard rules for what is the definitive level of funding as this is a decision for local elected officials, based on their priorities and practices.

However, the true costs of over and underfunding must be presented in order to provide decision makers with all the information available to base the decisions upon. Northglenn has a considerable investment in their paved roadway network with a combined replacement value (just for the streets, not right of way) exceeding $117M. Spreading this cost over a 50 to 100 year period (the expected ultimate life of a roadway) means that an annual investment on the order of $1.63M per year would be required – not including the cost of maintenance, deterioration ,repair curbing, drainage, tree roots, sidewalks or ADA ramps.

Government Accounting Standards Board Statement 34 requires that agencies who collect taxes (local, business, property or gas taxes) for the purpose of maintaining long term infrastructure assets (such as roads) be good stewards of those assets by either accounting for them financially on the City's balance sheet, or implement a methodology to manage and fund them to a locally defined level of service.

The condition of a roadway network may be equated to equity in a depreciating asset. Regular payments to that asset must be made in order to maintain the equity at a constant level. Should those payments fall short, the equity must eventually be replaced through a large influx of capital in order to make the investment whole again. Roadway networks are no different. Long term underfunding of rehabilitation and maintenance is the direct equivalent of removing equity from an asset – eventually it must be repaid through total reconstruction. The following table compares the real cost of the various budgets against the Do Nothing and Steady State options.

City of Northglenn, CO
Equity Removal Summary

Starting PCI:	59		
Five Year Post Rehab Fix All PCI:	85		
Fix All PCI Increase:	26		
Five Year Fix All Total Cost ($):	35,091,000		
Cost Per PCI Point (Total Cost / PCI Increase, $/pt)	1,356,000		
Equity Removal Based On PCI Restoration			**For PCI Controlled Agencies**
Model:	**Do Nothing**	**$1000k Annual**	**Steady State**
Annual Budget ($k/Year):	0	1000	1630
Starting PCI	59	59	59
Final PCI	51	56	59
PCI Drop:	9	3	0
Cost to Replace Equity (PCI Drop X $/Pt, $):	11,636,000	4,325,000	0
5 Year Budget Expenditure ($):	0	5,000,000	8,150,000
Total 5 Year Cost ($):	11,636,000	9,325,000	8,150,000
Cost Over Steady State Budget ($):	3,486,000	1,175,000	0
Additional Annual Cost Over Steady State ($/year):	**697,200**	**235,000**	**0**

5.6 NETWORK RECOMMENDATIONS AND COMMENTS

The following recommendations are presented to Northglenn as an output from the pavement analysis, and must be read in conjunction with the attached reports.

1. Northglenn should adopt a policy statement to maintain PCI at or above a 70 while keeping backlog below 10%.

   An annual budget of $750K for Collectors and Locals (dedicated to pavement rehabilitation) will achieve a network average PCI of 55 and backlog will be increased to 24%.

   An annual budget of $3.68M for Collectors and Locals will achieve a network average PCI of 70 with the backlog halting at 10%

   An annual budget of $1M for Arterials will achieve a network average PCI of 71 with a backlog growth to 17%

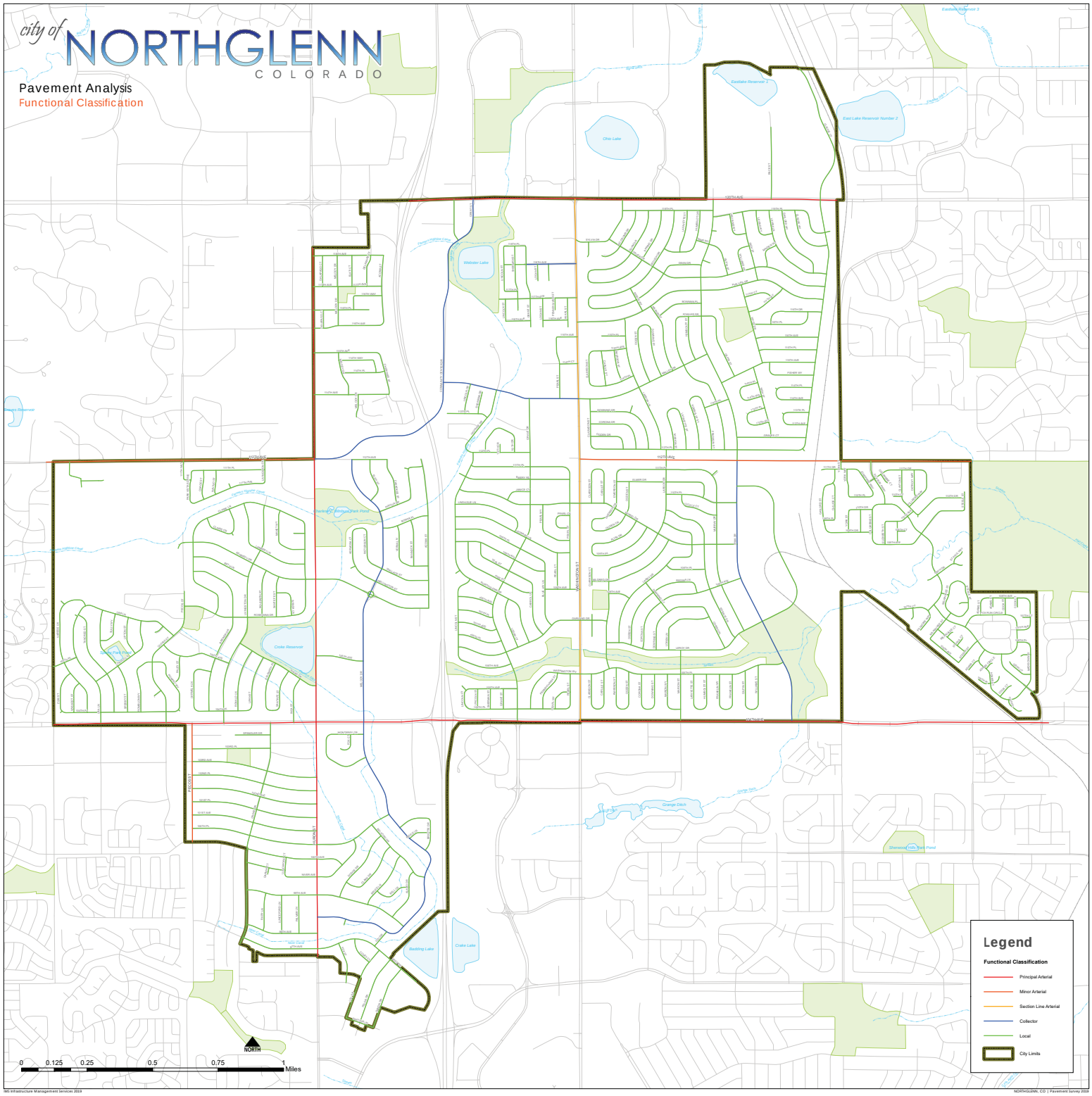
   An annual budget of $1.25M for Arterials will achieve a network average PCI of 76 with a backlog reduction to 8%

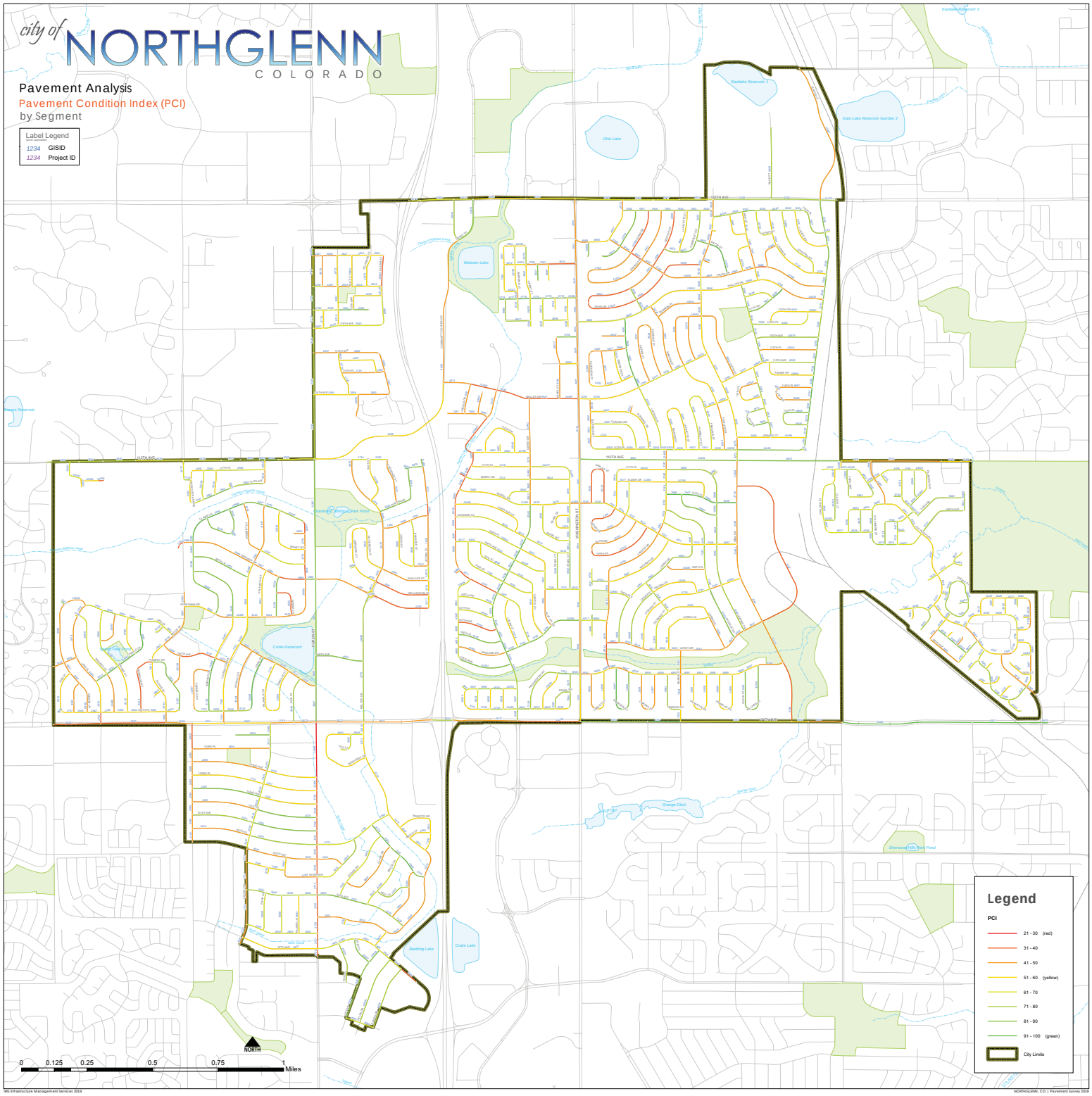
2. The full suite of proposed rehabilitation strategies and unit rates should be reviewed annually as these can have considerable effects on the final program.

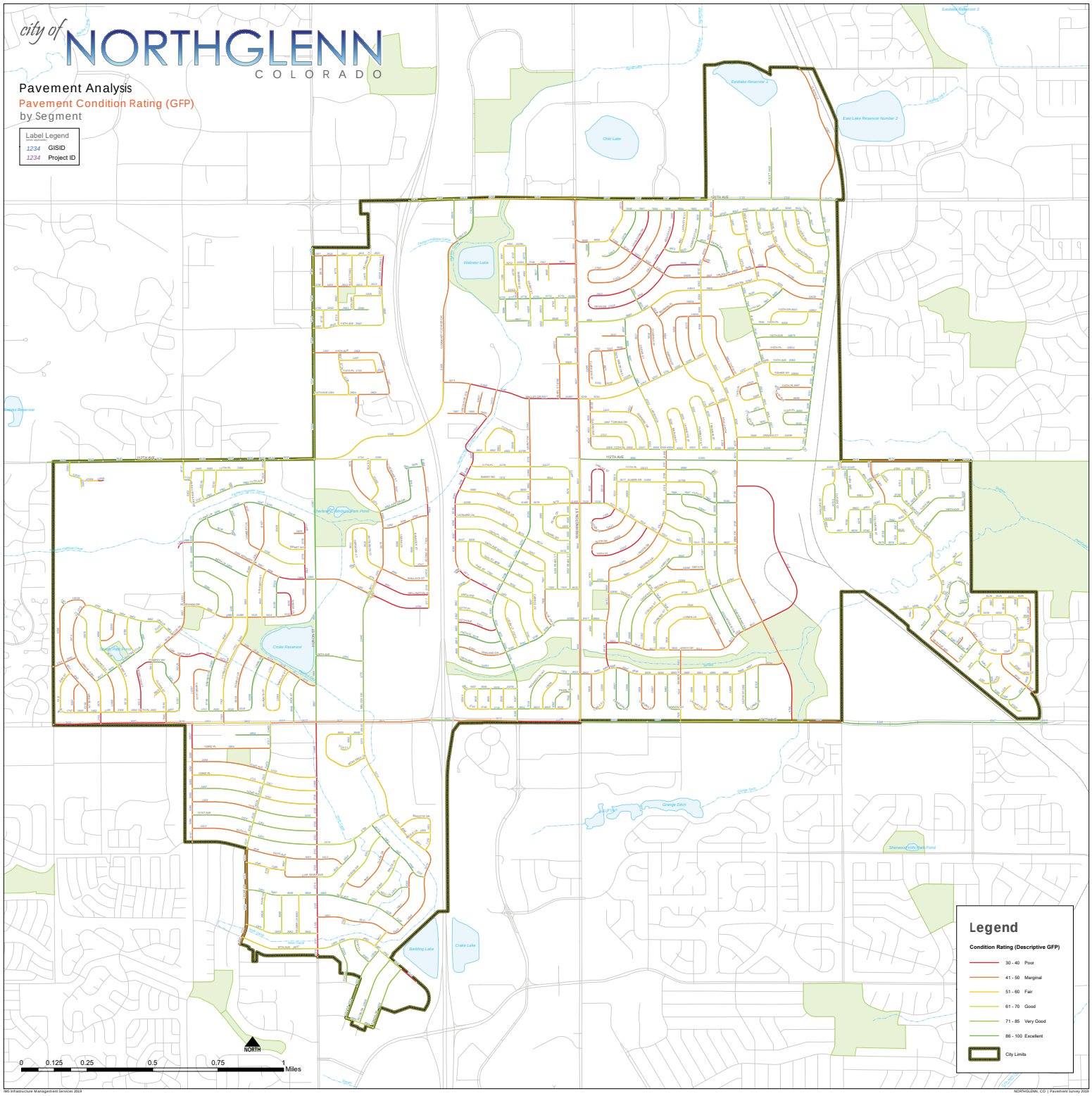
3. No allowance has been made for network growth. As the City expands or increases the amount of paved roads, increased budgets will be required.

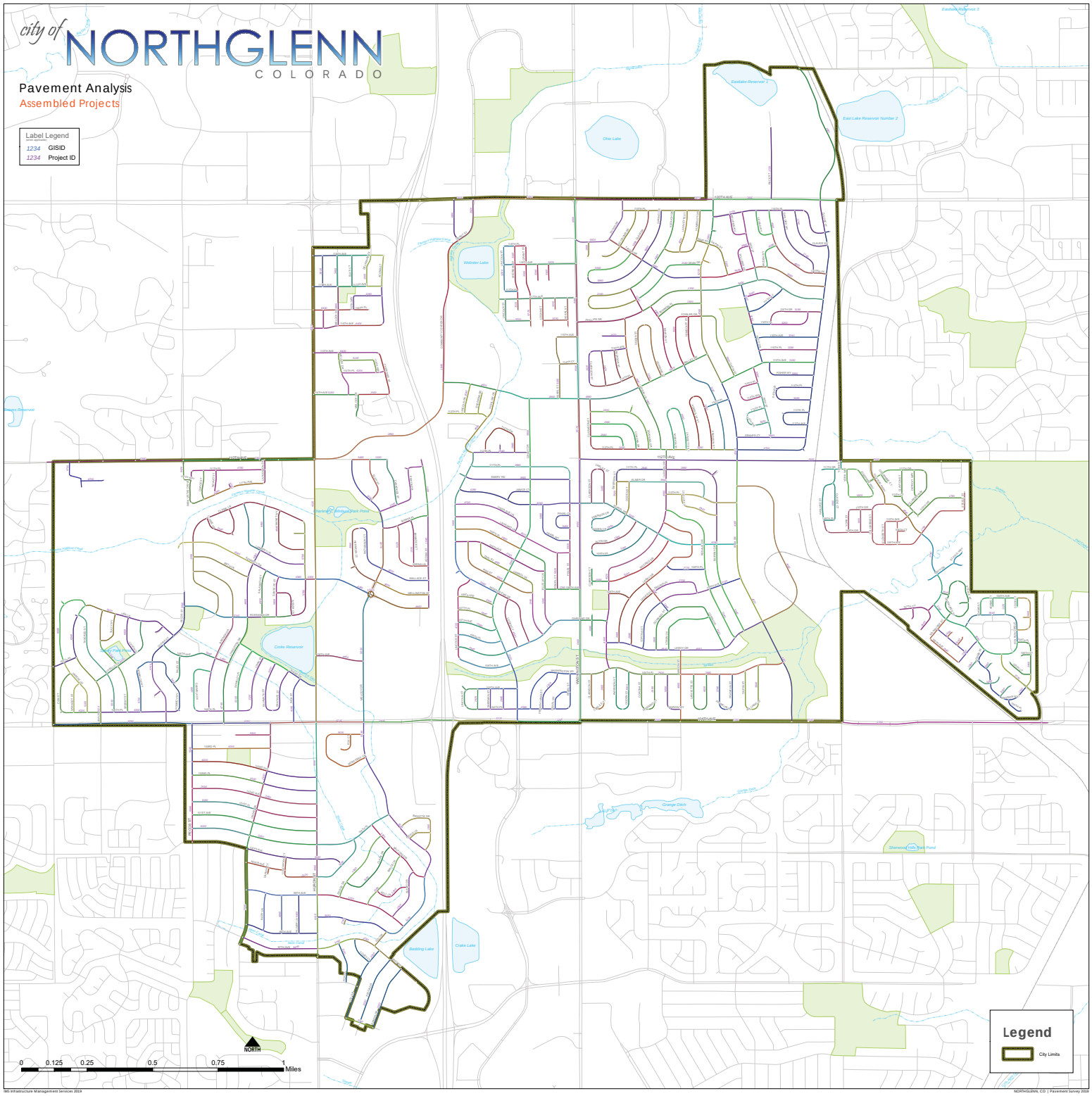
4. No allowance has been made for routine maintenance activities such as asphalt crack sealing, pothole filling, sweeping, striping or patching within the budget runs and analysis. These costs are assumed to be outside the pavement management costs.

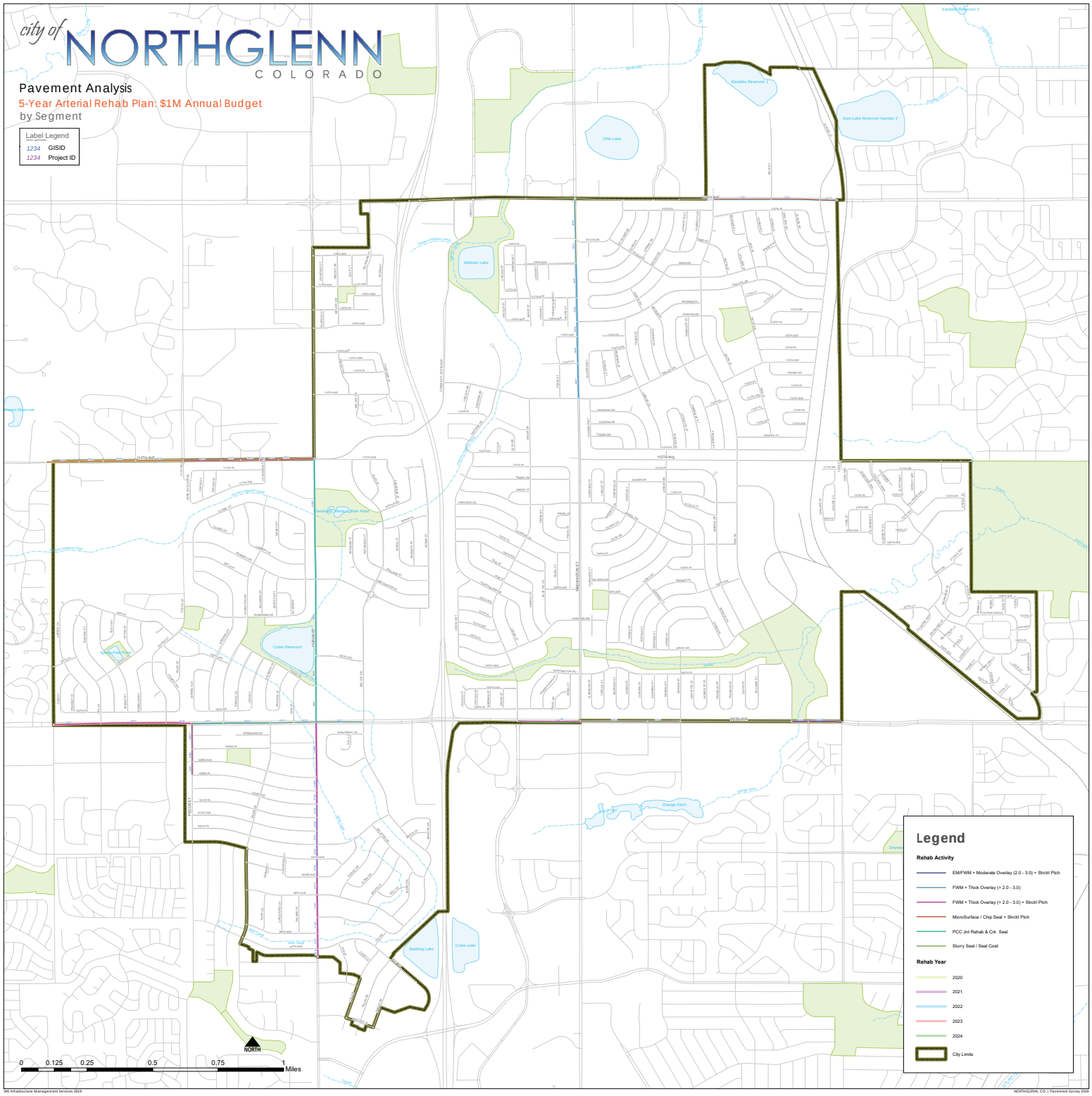
5. The City should resurvey their streets every few years to update the condition data and rehabilitation program.

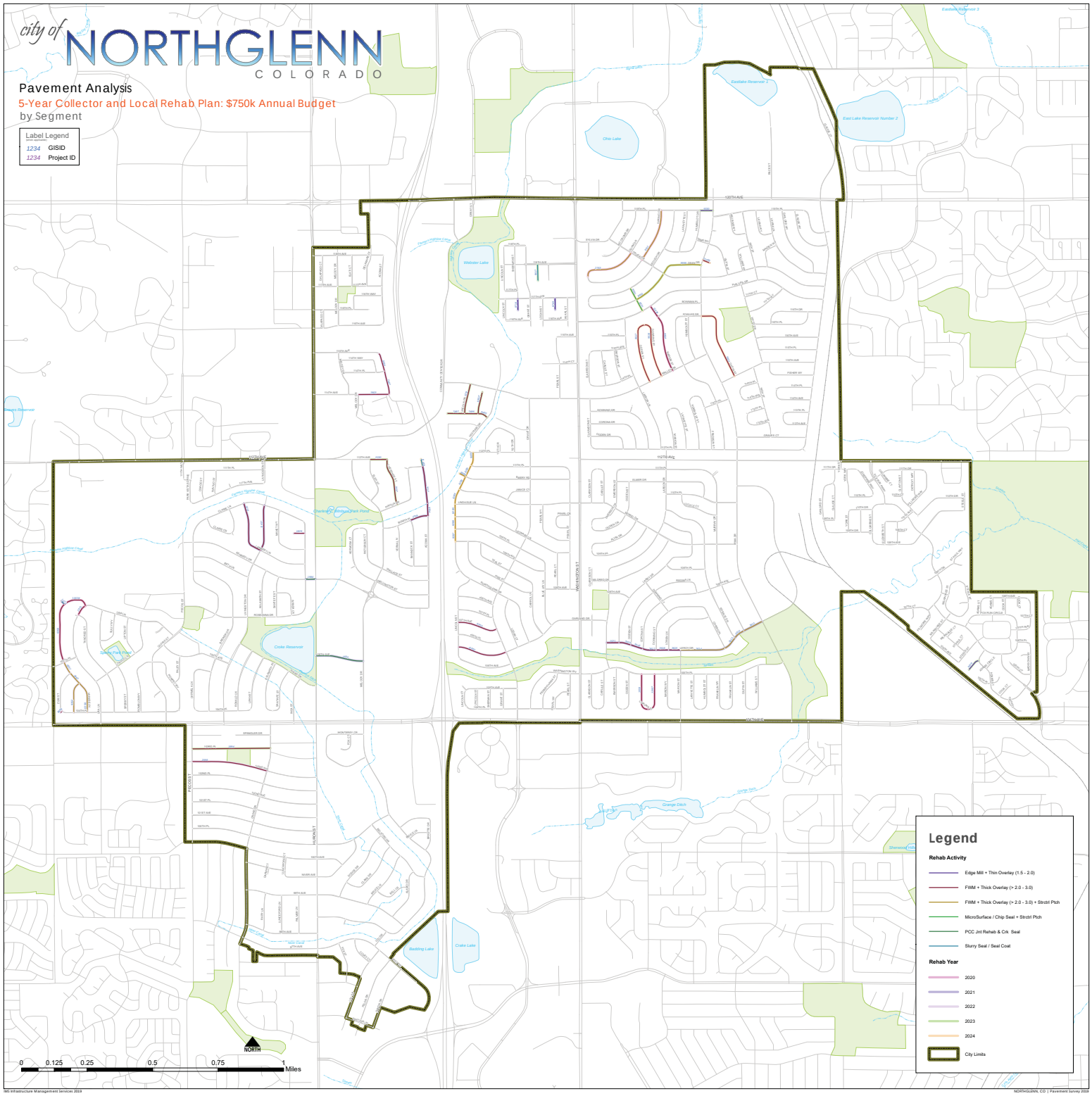

city of NORTHGLENN
COLORADO
Pavement Analysis
Functional Classification
Legend
Functional Classification
Principal Arterial
Minor Arterial
Section Line Arterial
Collector
Local
City Limits
NORTH
0
0.125
0.25
0.5
0.75
1
Miles

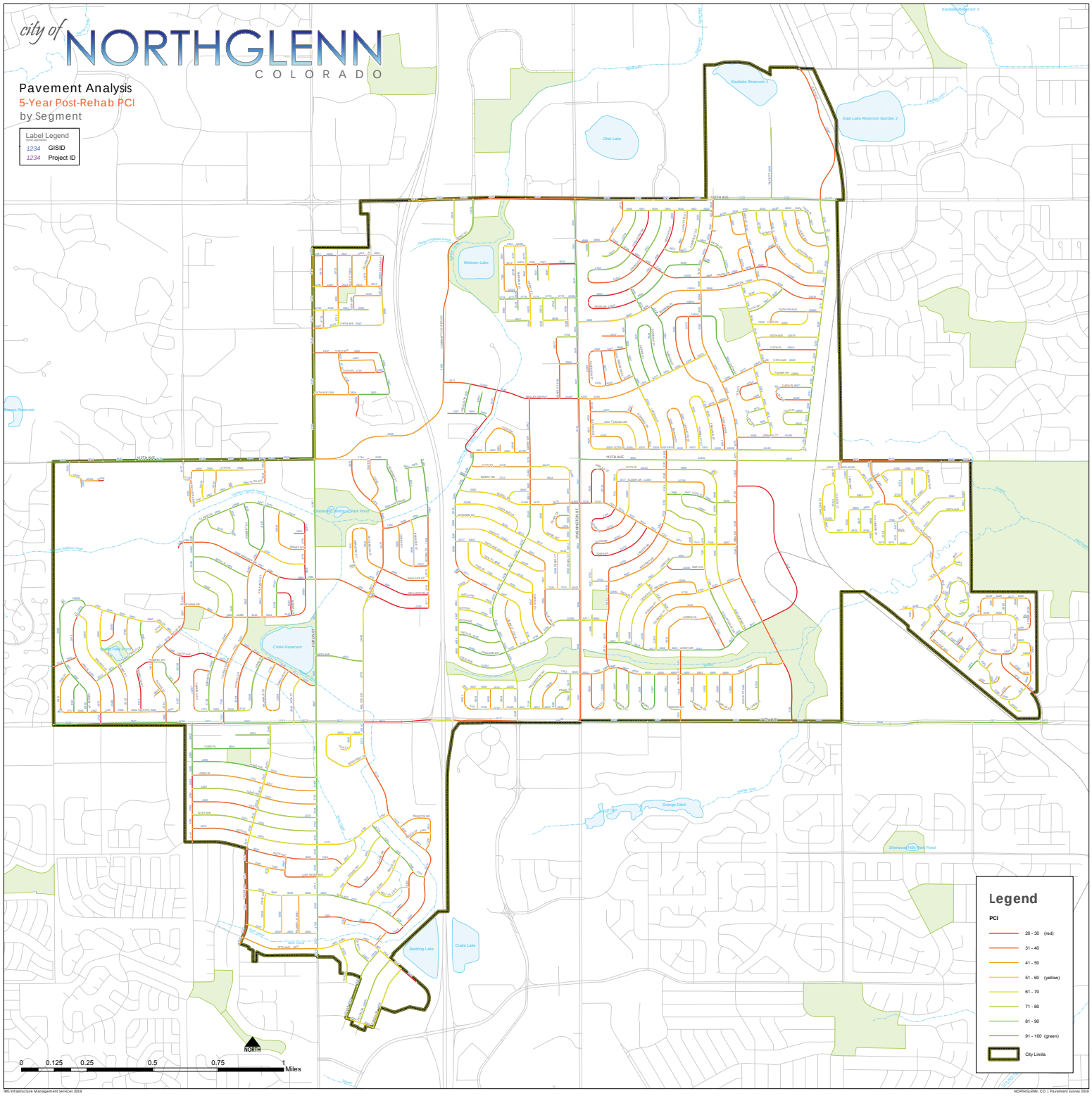

city of NORTHGLENN
COLORADO
Pavement Analysis
Pavement Condition Index (PCI)
by Segment
Label Legend
1234 GISID
1234 Project ID
Legend
PCI
21 - 30 (red)
31 - 40
41 - 50
51 - 60 (yellow)
61 - 70
71 - 80
81 - 90
91 - 100 (green)
City Limits
NORTH
0 0.125 0.25 0.5 0.75 1 Miles

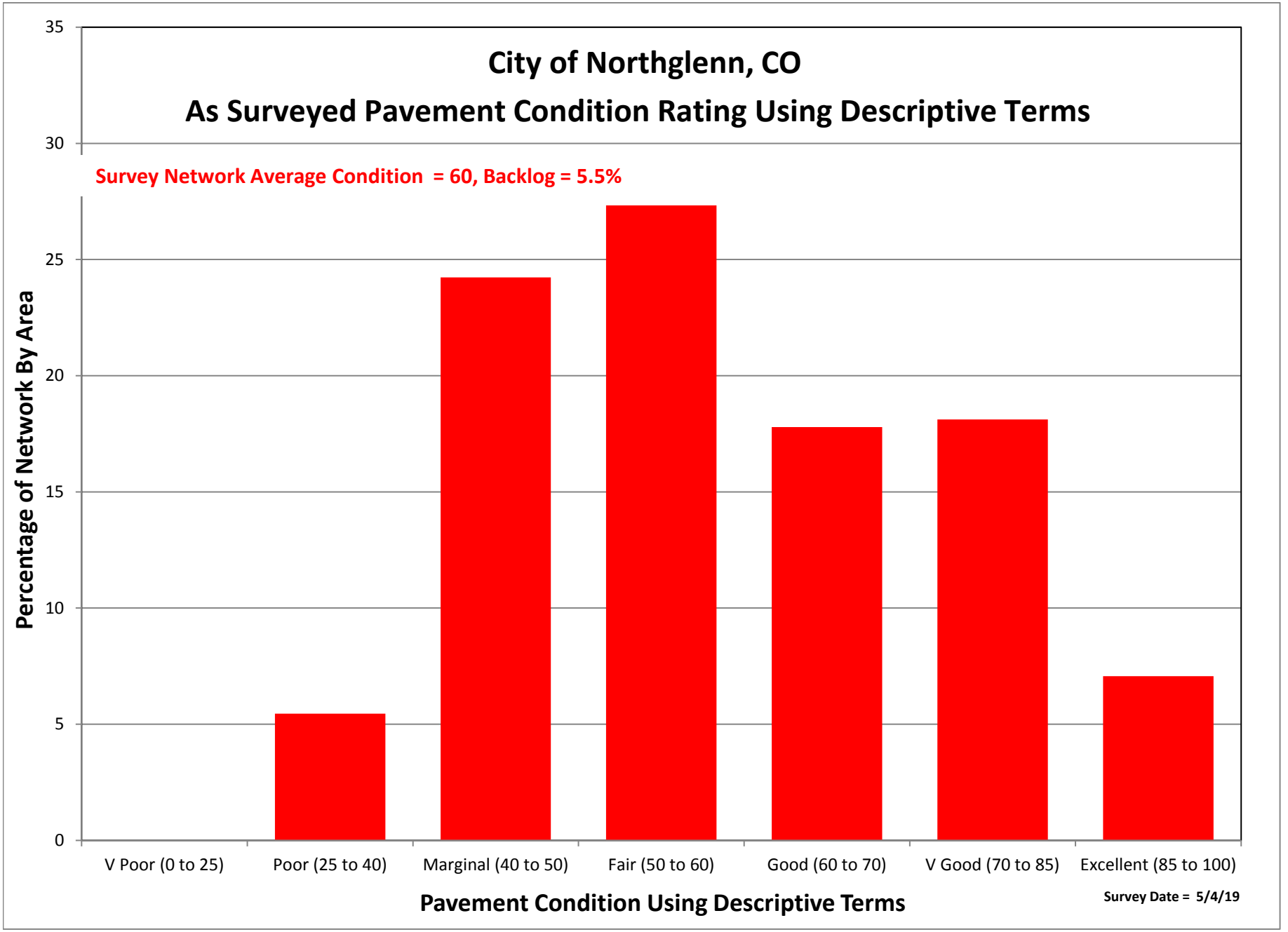

city of NORTHGLENN
COLORADO
Pavement Analysis
Pavement Condition Rating (GFP)
by Segment
Label Legend
1234 GISID
1234 Project ID
Legend
Condition Rating (Descriptive GFP)
30 - 40 Poor
41 - 50 Marginal
51 - 60 Fair
61 - 70 Good
71 - 85 Very Good
86 - 100 Excellent
City Limits
NORTH
0 0.125 0.25 0.5 0.75 1 Miles


city of NORTHGLENN
COLORADO
Pavement Analysis
Assembled Projects
Label Legend
1234 GISID
1234 Project ID
Legend
City Limits
NORTH
0 0.125 0.25 0.5 0.75 1 Miles


city of NORTHGLENN
COLORADO
Pavement Analysis
5-Year Arterial Rehab Plan: $1M Annual Budget
by Segment
Label Legend
1234 GISID
1234 Project ID
Legend
Rehab Activity
EMI/FWM + Moderate Overlay (2.0 - 3.0) + Strctrl Ptch
FWM + Thick Overlay (> 2.0 - 3.0)
FWM + Thick Overlay (> 2.0 - 3.0) + Strctrl Ptch
MicroSurface / Chip Seal + Strctrl Ptch
PCC Jnt Rehab & Crk Seal
Slurry Seal / Seal Coat
Rehab Year
2020
2021
2022
2023
2024
City Limits
NORTH
0 0.125 0.25 0.5 0.75 1 Miles


city of NORTHGLENN
COLORADO
Pavement Analysis
5-Year Collector and Local Rehab Plan: $750k Annual Budget
by Segment
Label Legend
1234 GISID
1234 Project ID
Legend
Rehab Activity
Edge Mill + Thin Overlay (1.5 - 2.0)
FWM + Thick Overlay (> 2.0 - 3.0)
FWM + Thick Overlay (> 2.0 - 3.0) + Strctrl Ptch
MicroSurface / Chip Seal + Strctrl Ptch
PCC Jnt Rehab & Crk Seal
Slurry Seal / Seal Coat
Rehab Year
2020
2021
2022
2023
2024
City Limits
NORTH
0 0.125 0.25 0.5 0.75 1 Miles


city of NORTHGLENN
COLORADO
Pavement Analysis
5-Year Post-Rehab PCI
by Segment
Label Legend
1234 GISID
1234 Project ID
Legend
PCI
20 - 30 (red)
31 - 40
41 - 50
51 - 60 (yellow)
61 - 70
71 - 80
81 - 90
91 - 100 (green)
City Limits
NORTH
0 0.125 0.25 0.5 0.75 1 Miles


City of Northglenn, CO
As Surveyed Pavement Condition Rating Using Descriptive Terms
Survey Network Average Condition = 60, Backlog = 5.5%
Percentage of Network By Area
35
30
25
20
15
10
5
0
V Poor (0 to 25)
Poor (25 to 40)
Marginal (40 to 50)
Fair (50 to 60)
Good (60 to 70)
V Good (70 to 85)
Excellent (85 to 100)
Pavement Condition Using Descriptive Terms
Survey Date = 5/4/19

CITY OF Northglenn

2019 Pavement Condition Index (PCI)

Background

- The City is responsible to maintain an average PCI of 70 (Resolution No. 06-92, Series 2006).
- PCI methodology adopted by the City – ASTM D6433.
- PCI is conducted every 3 years ($45k).
- IMS Infrastructure completed 2016 and 2019 PCI using laser technology.
- 2016 PCI ranking was 59.
- Next PCI scheduled for 2022.

2019 PCI Results

- The City's road network is divided in two groups.
  - Collectors and Locals
  - Arterials

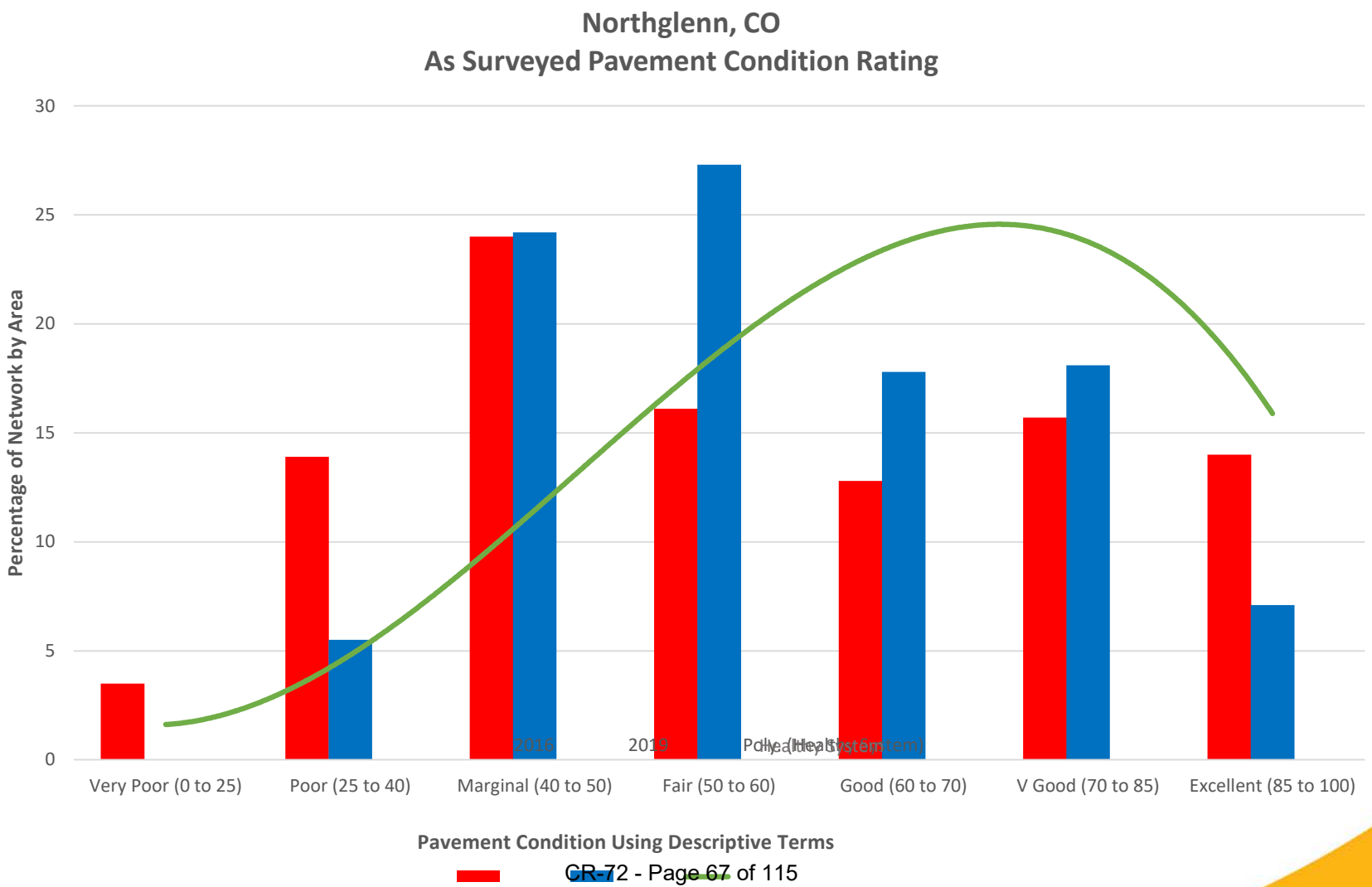
Northglenn Network	PCI (Average 60 to 65)	Percent of Excellent (min. 15%)	Backlog (less than 10%)
Collectors and Locals	60	7%	5.5
Arterials	63	17%	9.5

- Backlog is defined as the percentage of streets with a PCI of 40 or less.
- Percent of Excellent under 15% indicates agency may be struggling to properly fund road network maintenance.
- Generally a very healthy agency will have less than 10% backlog. If backlog reaches 20%, work could become extremely costly.

Condition Rating

Condition	Range	Miles Collectors and Locals (94.6 Total)	Miles Arterials (13.1 Total)	Recommended Treatment
Excellent	85 to 100	6.7	2.4	Crack Sealing
Very Good	70 to 85	17.5	2.7	MicroSurface / Chip Seal
Good	60 to 70	17	1.6	Edge Mill + Thin Overlay or Chip Seal
Fair	50 to 60	25.7	2.2	Edge Mill + Thin Overlay (1.5 -2.0 in)
Marginal	40 to 50	21.5	2.7	Full Width Mill (FWM) + Thick Overlay + Minimal or No Patching
Poor	25 to 40	6.2	1.5	FWM + Thick Overlay (2.0 – 3.0 in) + Possibly Extensive Patching
Very Poor	0 to 25	0	0	Reconstruction

2016 PCI vs. 2019 PCI



Rehab Plan and Investment Impact

- Collectors and Locals (Residential Street Program)
  - Staff proposes the following rehabilitation plan to work towards achieving a 65 PCI rating over the next 5 years.

Year	Budget	Additional Appropriation	Miles	Projected PCI*
2020	$800,000	$2,200,000	7.7	64
2021	$1,250,000**		2.8	64
2022	$1,250,000**		2.6	64
2023	$1,250,000**		2.7	64
2024	$1,250,000**		2.8	64

*Results based on the City's 2019 paving bids, not on IMS estimates

** Future Appropriation

Rehab Plan and Investment Impact

- Arterials
  - Staff proposes the following rehabilitation plan for Arterials.
  - The City is matching $3.8 Million for the 120th Avenue Improvements.

Year	Budget*	Street	From	To	PCI	Treatment
2020	$1,500,000	104th Ave	Zuni St	Huron St	47	FWM + Overlay
2020	$600,000	Huron St	104th Ave	99th Ave		Waterline Replacement
2020	$200,000	Huron St				Stormwater Improvements
2021	$700,000	Huron St	97th Ave	104th Ave	36	FWM + Overlay
2022	$1,200,000	Washington St	112th Ave	120th Ave	45	FWM + Overlay
2023	$1,500,000	104th Ave	Huron St	Washington St	44	FWM + Overlay
2024	$1,100,000	Washington St	104th Ave	112th Ave	62	FWM + Overlay

* Budget numbers based on the City's 2019 paving bids, not on IMS estimates

New Pavement Management Program

Streetlogix is a highly customizable, web-based asset management software that enables municipalities to optimize their road budget within a GIS environment.

- Provides state of infrastructure.
- Makes maintenance and repair recommendations.
- Prioritizes roadway projects.

Pavement Management Program

- Software

https://login.streetlogix.com/

- Story Board

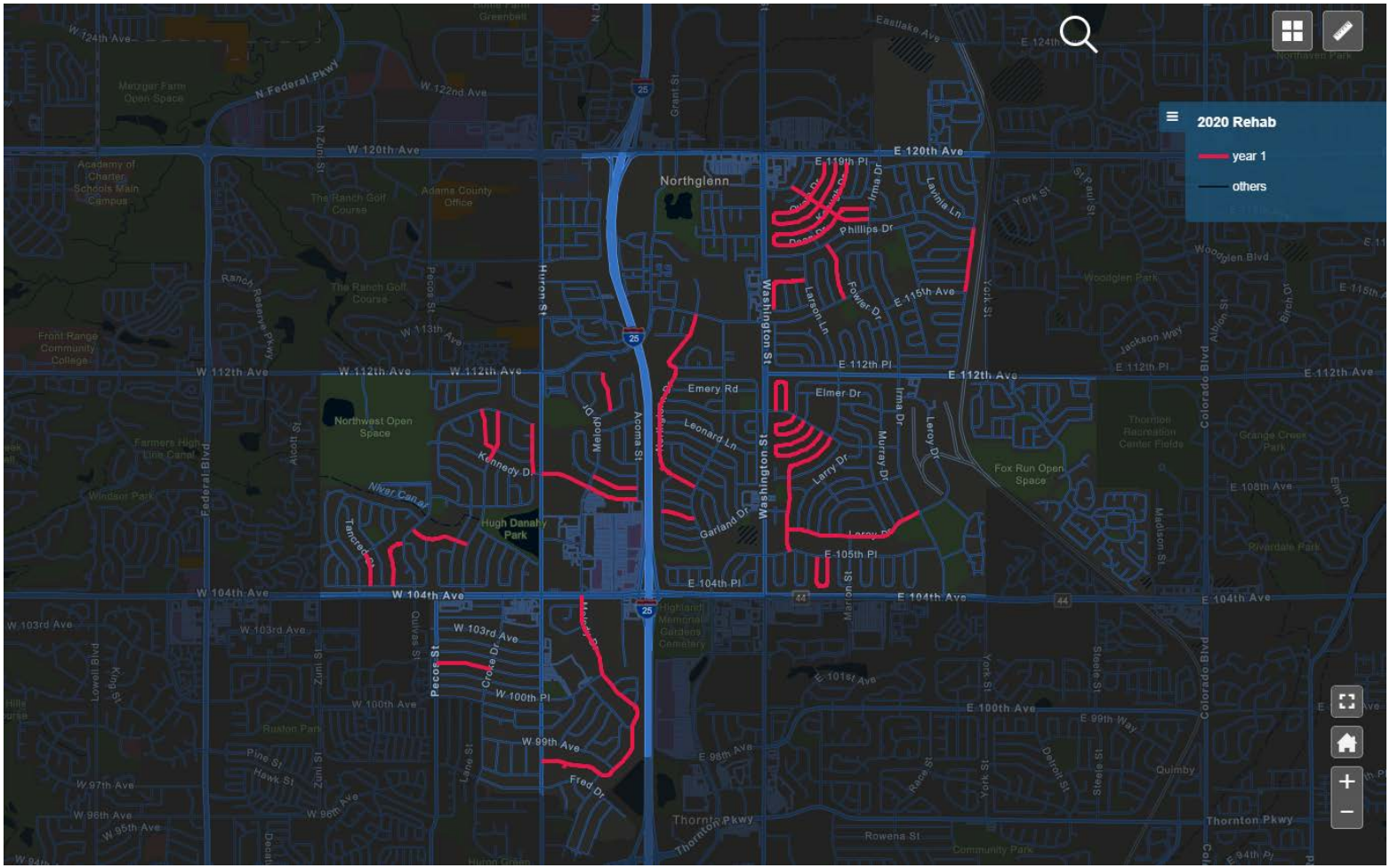
http://t.ly/xNXz5

2020 Rehabilitation Plan

FWM + Thick Overlay			
STREET	FROM	TO	PCI
ALVIN DR	E 109TH PL	MURIEL DR	47
CARLILE ST	MURIEL DR	CLARKSON ST	41
CHEROKEE ST	PINYON DR	112TH AVE	42
CLARKSON ST	E 114TH PL	E 115TH AVE	44
CLARKSON ST	MURIEL DR	CARLILE ST	40
CLAUDE CT	E 115T AVE	TRUDA DR	81
CORONA ST	DOWNING ST	E 105TH PL	43
DEAN DR	KEOUGH DR	IRMA DR	34
DOWNING ST	CORONA ST	E 105TH PL	42
E 107TH AVE	LINCOLN ST	GRANT DR	39
E 109TH PL	ALVIN DR	MURIEL DR	40
E 115TH AVE	CLARKSON ST	LARSON LN	43
EMERSON CR	OGDEN CR	MURIEL DR	37
HIGHLINE DR	E 112TH PL	MALLEY DR	40
KENNEDY DR	HURON ST	ACOMA ST	47
KEOUGH DR	DEAN DR	E 119TH PL	40
LAMBERT LN	LIVINGSTON DR	CLAIRE LN	42

FWM + Thick Overlay			
STREET	FROM	TO	PCI
LARSON DR	E 105TH PL	MURIEL DR	41
LEROY DR	LARSON DR	IRMA DR	40
LIVINGSTON DR	KENNEDY DR	CLAIRE LN	45
MARION ST	PHILLIPS DR	MALLEY DR	42
MELODY DR	HURON ST	104TH AVE	54
NORTHGLEN N DR	E 112TH PL	GRANT DR	39
OGDEN CR	EMERSON CR	MURIEL DR	44
QUAM DR	SPRING DR	E 119TH PL	38
ROMBLON WY	W 104TH PL	QUIVAS ST	39
ROSEANNA DR	KENNEDY DR	CLAIRE LN	38
SPRING DR	QUAM DR	E 119TH PL	42
TANCRED ST	W 104TH PL	UTRILLO LN	45
TRUDA DR	SYLVIA DR	IRMA DR	42
W 101ST PL	PECOS ST	CROKE DR	45
W 106TH AVE	QUIVAS ST	LIVINGSTON DR	41
WELLINGTO N ST	MELODY DR	ACOMA ST	40

2020 Rehabilitation Plan



Cost Analysis

Collector and Local		
Year	Budget	Projected PCI*
2020	$3,000,000	64
2021	$1,250,000	64
2022	$1,250,000	64
2023	$1,250,000	64
2024	$1,250,000	64

Collector, Local and Arterial		
Year	Budget	Projected PCI*
2020	$9,600,000*	64
2021	$1,950,000	64
2022	$2,450,000	65
2023	$2,750,000	66
2024	$2,350,000	66

*Includes 120th Avenue Improvements Match

Current Policy (PCI = 70) Collector and Local		
Year	Budget	Projected PCI*
2020	$5,000,000	67
2021	$1,750,000	68
2022	$1,750,000	68
2023	$1,750,000	69
2024	$1,750,000	70

Current Policy (PCI = 70) Collector and Local		
Year	Budget	Projected PCI*
2020	$7,500,000	70
2021	$1,250,000	70
2022	$1,250,000	70
2023	$1,250,000	70
2024	$1,250,000	70

Staff Recommendations

- Staff recommends a one-time budget increase to $3,000,000 in 2020 to raise the PCI to an estimated 64 ranking for local and collector.
- Staff recommends that the annual budget be increased for the residential street program from the current $800,000/year to $1,250,000/year in order to maintain an average PCI of 64 in 5 years.
- Staff recommends implementation of the Arterials Rehabilitation Plan.
- Staff recommends realigning the PCI policy to a range of Good (PCI 60 to 70).

SPONSORED BY: MAYOR LEIGHTY

COUNCILMAN'S RESOLUTION

RESOLUTION NO.

No. CR-72
Series of 2020

Series of 2020

A RESOLUTION APPROVING AN AGREEMENT BETWEEN THE CITY OF NORTHGLENN AND BRANNAN SAND AND GRAVEL COMPANY, LLC FOR THE 2020 RESIDENTIAL STREET PROGRAM

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF NORTHGLENN, COLORADO THAT:

Section 1. The Agreement between the City of Northglenn and Brannan Sand and Gravel Company, LLC, attached hereto, in an amount of $5,262,563.59 with a ten percent (10%) contingency of $526,256.36 for a total amount not to exceed $5,788,819.95 for the 2020 Residential Street Program is hereby approved and the Mayor is authorized to execute same on behalf of the City of Northglenn.

DATED, at Northglenn, Colorado, this _____day of _____, 2020.

MEREDITH LEIGHTY
Mayor

ATTEST:

JOHANNA SMALL, CMC
City Clerk

APPROVED AS TO FORM:

COREY Y. HOFFMANN
City Attorney

TRADE CONTRACTOR AGREEMENT

TABLE OF CONTENTS

TRADE CONTRACTOR AGREEMENT

THIS AGREEMENT is made and entered into this _____ day of _____,20_____, by and between the City of Northglenn, State of Colorado, a Colorado home rule municipal corporation, hereinafter referred to as the "City" or "Owner" and Brannan Sand and Gravel Company, LLC, hereinafter referred to as the "Trade Contractor".

ARTICLE 1 - GENERAL PROVISIONS AND SERVICES

A. The Trade Contractor will commence and fully complete the construction of the 2020 Residential Streets Program Project, which is described in **Exhibit A**, which is attached hereto and made a part hereof ("Project").

B. The Trade Contractor will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the project described herein.

C. The Trade Contractor will commence the work required by the contract documents within ten (10) calendar days after the date of the notification to proceed and will complete the same within one hundred and twenty calendar (120) day, unless the period for completion is extended otherwise by the contract documents. The Trade Contractor agrees to pay as liquidated damages, and not as a penalty, the sum of five hundred dollars ($500.00) for each consecutive calendar day's delay in completing this Contract after the completion dated specified herein, excluding any approved extensions of time because of unavoidable delay.

D. The Trade Contractor agrees to perform all of the work described in the contract documents and to comply with the terms therein for an amount not to exceed five million two hundred sixty two thousand five hundred sixty three dollars and fifty nine cents ($5,262,563.59) as described in Article 5 of this Agreement.

ARTICLE 2 - DEFINITIONS

A. Wherever used in the contract documents, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1. Addenda - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the contract documents, drawings and specifications, by additions, deletions, clarifications or corrections.

2. Architect - The Architect shall be N/A

3. Bid - The offer or proposal of the bidder submitted in the prescribed form setting forth the prices for the work to be performed.

4. Bidder - Any person, firm or corporation submitting a bid for the work.

5. Bonds - Bid, performance and payment bonds and other instruments of security, furnished by the Trade Contractor and his surety in accordance with the contract documents.

6. Change Order - A written order to the Trade Contractor authorizing an addition, deletion or revision in the work within the general scope of the contract documents, or authorizing an adjustment in the contract price and/or contract time.

7. Contract Documents - The contract, including advertisement for bids, information for bidders, bid, bid bond agreement, bid schedule, labor and material, payment bond, performance bond, notice of award, notice to proceed, change order, general conditions, special conditions, general specifications, special specifications, scopes of work, addenda, drawings, schedules and any and all other documents or papers included or referred to in the foregoing documents are part of the Contract Documents

8. Contract Price - The total monies payable to the Trade Contractor under the terms and conditions of the contract documents.

9. Contract Time - The number of calendar days stated in the contract documents for the completion of the work.

10. Date of Award - Date of award of contract shall mean the date formal notice of such award, approved by the Owner, has been delivered to the intended awardee, or mailed to him at the main business address shown in his proposal by the Owner or it's authorized representative.

11. Day or Days - Unless herein otherwise expressly defined, "day" shall mean calendar day or days.

12. Drawings, Plans or Contract Documents - The part of the contract documents which shows the characteristics and scope of the work to be performed and which has been prepared or approved by the Engineer and/or Architect.

13. Engineer shall be as determined by the Public Works Director

14. Field Order - A written order effecting a change in the work not involving an adjustment in the contract price or an extension of the contract time, issued by the Engineer or the Owner to the Trade Contractor during construction.

15. Major Equipment or Major Equipment Items - Installation of major equipment to be furnished and placed under the contract awarded to the Trade Contractor and/or installations of major equipment to be furnished by the Owner and received, unloaded, stored, and placed under the contract awarded to the Trade Contractor.

16. Notice of Award - The written notice of the acceptance of the bid from the Owner to the successful bidder.

17. Notice to Proceed - Written communication issued by the Owner to the Trade Contractor authorizing him to proceed with the work and establishing the date of commencement of the work.

18. Owner or City - The City of Northglenn, Colorado, a home rule municipality. The Public Works Director of the Owner, or his designee, is the Owner's representative.

19. Project - Construction of the project described in **Exhibit A.**

20. Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by the Trade Contractor, a subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

21. Site - The lands and other places on, under, in, or through which the work is to be executed or carried out and any other lands or places provided by the Owner for the purposes of the contract together with such other places as may be specifically designed in the contract documents as forming part of the site.

22. Special Conditions - Supplemental conditions that apply to specific aspects of the project or modifications to the general conditions that are to be adhered to in the project.

23. Subcontractor - An individual, firm or corporation having a direct contract with the Trade Contractor or with any other subcontractor for the performance of a part of the work at the site.

24. Substantial Completion - That date as certified by the Owner when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the contract documents, so that the project or specified part can be utilized for the purposes for which it is intended.

25. Suppliers - Any person, supplier, or organization who supplies materials or equipment for the work, including that fabricated to a special design, but who does not perform labor at the site. A supplier is not a subcontractor who purchases an item of equipment from a manufacturer.

26. Trade Contractor - The person, firm or corporation with whom the City of Northglenn has executed this Agreement.

27. Work - All labor necessary to produce the construction required by the contract documents, and all materials and equipment incorporated or to be incorporated in the project. The work and the project are used interchangeably to mean the same thing.

28. Written Notice - Any notice to any party of the Agreement relative to any part of the Agreement in writing and considered delivered and the service thereof completed when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the work.

ARTICLE 3 - DESCRIPTION OF WORK AND SERVICES

Section 1. Drawings and Specifications.

A. The intent of the drawings and specifications is that the Trade Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the work in accordance with the contract documents and all incidental work necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the Owner.

B. Up to three (3) copies of the drawings and specifications will be furnished to the Trade Contractor without charge upon request, and any additional copies which the Trade Contractor may request will be furnished at the cost of reproduction. The drawings and specifications are to be used only in connection with the work specified herein and, with the exception of the signed contract set and As-Built drawings, are to be returned at the completion of the contract.

C. In case of conflict between the drawings and specifications, the drawings will govern. In case of conflict between the special specifications and the general specifications, the special specifications shall govern. Figure dimension on drawings will govern over scale dimensions, and detailed drawings will govern over general drawings. Notwithstanding the above, a document which is more restrictive or requires greater responsibility or increased compliance by the Trade Contractor shall govern.

D. Any discrepancies found between the drawings and specifications and site conditions or any inconsistencies or ambiguities in the drawings or specifications shall be immediately reported to the Owner, in writing, who will promptly resolve such inconsistencies or ambiguities in writing. Work done on unreported discrepancies, inconsistencies or ambiguities by the Trade Contractor shall be done at the Trade Contractor's risk.

E. The Trade Contractor may be furnished additional instructions and detail drawings, by the Owner, as necessary to carry out the work required by the contract documents. All additional instructions and detail drawings shall be issued to the Trade Contractor by the Owner.

F. The additional drawings and instructions thus supplied will become a part of the contract documents. The Trade Contractor shall carry out the work in accordance with the additional detail drawings and instructions.

Section 2. Materials, Services and Facilities.

A. It is understood that, except as otherwise specifically stated in the contract documents, the Trade Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the work within the specified time.

B. In addition to the requirements for major equipment items previously given, within fourteen (14) days after execution of the Contract, the Trade Contractor shall submit to the Owner and Engineer a complete listing of the manufacturers of each item of equipment or assembly fabricated off the site which he proposed to furnish for the project, together with sufficient information, including shop assembly and detail drawings, manufacturers' specifications and performance data, to demonstrate clearly that the materials and equipment to be furnished comply with the provisions and intent of the contract documents. If the information shows any deviation from the Contract requirements, the Trade Contractor shall advise the Engineer and Owner of the deviation and state the reason for it in writing.

C. Only first class materials and materials which conform to the requirements of the specifications shall be incorporated in the work. All materials shall be new unless specified to be otherwise.

D. When requested by the Owner, the Trade Contractor shall furnish a written statement of the origin, composition, and manufacturer of any or all materials (manufactured, produced or grown) that are to be used in the work. The sources of supply of each material used will be approved by the Owner before delivery is started. If, at any time, sources previously approved, fail to produce materials acceptable to the Owner, the Trade Contractor shall furnish materials from other sources.

E. Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the work shall be located so as to facilitate prompt inspection.

F. Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

G. Materials, supplies, and equipment shall be in accordance with samples submitted by the Trade Contractor and approved by the Engineer or Architect.

H. Materials, supplies or equipment to be incorporated into the work shall not be purchased by the Trade Contractor or the subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

I. The Trade Contractor shall retain, for the benefit of the Owner, all materials and supplies that are purchased for the project but are not used as a part of the project. The Owner may take any of the materials and supplies that are used in the project for any City purpose. Any materials and supplies not taken by the Owner shall be removed from the project site by the Trade Contractor.

Section 3. Shop Drawings.

A. The Trade Contractor shall submit shop drawings, samples and O&M manuals as may be necessary for the prosecution of the work as required by the contract documents on a timely basis so that the project schedule is not affected. The Engineer will promptly review all shop drawings. All such drawings will be approved and signed by the Engineer, and will be null and void unless authorized by such signature. The Engineer's approval of any shop drawing will not release the Trade Contractor from responsibility for deviations from the contract documents. The approval of any shop drawings which substantially deviates from the requirements of the contract documents shall be evidenced by a change order.

B. All drawings and details on items of major equipment will be reviewed by the Engineer only after the complete set of drawings and details covering the entire equipment package to be furnished under a particular major equipment item are submitted. Drawings submitted on a piecemeal basis covering only parts of the equipment package will be held for checking until the entire set of drawings are received.

C. The Trade Contractor shall also submit to the Engineer shop drawings showing all necessary detail for the proper installation of materials into the completed work, as provided by this Agreement.

D. The Trade Contractor shall make any indicated corrections on the drawings returned and shall resubmit corrected drawings until final approval is obtained.

E. The Trade Contractor shall have no claims for damages or extension of time on account of any delay in the work resulting from the rejection of material or from review, revision and resubmittal of drawings when the review, revision and resubmittal is due to changes to the original design documents, and other data for approval by the Engineer.

F. Each shop drawing shall be dated and shall be identified with the name of the project, the division, if any, the Contract item number, and the name of the Trade Contractor.

G. When submitted for the Engineer's review, shop drawings shall bear the Trade Contractor's certification that he has reviewed, checked and approved the shop drawings and that they are in conformance with the requirements of the contract documents.

H. The Trade Contractor shall submit the shop drawings in accordance with the general requirements.

I. Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Engineer. A copy of each approved sample shall be kept in good order by the Trade Contractor at the site and shall be available to the Engineer.

J. By approving and submitting shop drawings and samples, the Trade Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each shop drawing and sample with the requirements of the work and of the contract documents.

Section 4. Records, Accounts and Audits.

A. The Trade Contractor agrees to keep one complete set of records and books of account on a recognized cost accounting basis (satisfactory to the Engineer), showing all expenditures, of whatever nature, made pursuant to the provisions of this Contract.

B. The Trade Contractor shall furnish the Engineer and Owner with such records, information and data as may be reasonable. The Engineer and Owner shall at all reasonable times be afforded the opportunity to inspect and/or audit the above-specified books and records of said Trade Contractor.

Section 5. Inspection and Testing.

A. All materials and equipment used in the construction of the project will be subject to adequate inspection and testing in accordance with generally accepted standards.

B. The Trade Contractor shall give sufficient advance notice of placing orders to permit tests to be completed before materials are incorporated in the work.

C. The Owner will provide all inspection and testing services required by the Contract Documents, unless specifically noted in the contract specifications for special inspection and testing services, such as, by way of example, welding inspections on off-site assembly.

D. Neither observations by the Engineer, and Owner, tests nor approvals by persons other than the Engineer and Owner will relieve the Trade Contractor from his obligations to perform the work in accordance with the requirements of the contract documents.

E. The Engineer, the Owner, and their representatives will at all times have access to the work and to locations where materials or equipment are being manufactured, stored, or prepared for use under these contract documents, and they shall have full facilities for unrestricted inspection of such materials, equipment, and work including full access to purchasing and engineering information, but not including prices, to the extent of uncovering, testing, or removing portions of the finished work. The Engineer and Owner shall be furnished with such information as may be required regarding materials used and the process of manufacture for the various items of equipment. Inspections by the Engineer and Owner of equipment or materials during its manufacture will be performed by or for the Owner solely in an effort to detect discrepancies and defects as early as possible, when they can be most readily corrected, and the work thereby expedited. No acceptance of equipment or materials will be construed to result from such shop inspections by the Engineer and Owner Any inspections or tests or waivers thereof will not relieve the Trade Contractor of responsibility for meeting all requirements of these contract documents.

F. In addition, authorized representatives and agents of any participating federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Trade Contractor shall provide proper facilities for such access and observation of the work and also for any inspection or testing thereof.

G. In case of disputes between the Trade Contractor and the Engineer as to materials furnished or manner of performing the work, the Owner will have authority to reject materials or suspend the work until the question at issue can be decided by the Owner. The Owner is authorized to revoke, alter, enlarge, relax or release any requirements of these specifications, and to approve or accept any portion of the work, and to issue instructions contrary to the drawings and specifications.

Section 6. Construction Review

A. The Engineer will periodically observe the construction of all work covered by this Contract. The Engineer, on behalf of the Owner, shall be authorized to determine the amount or quantities of the several items of work which are to be paid for under this Contract; to order field changes within the scope of the Contract and to render decisions on any questions which may arise relative to the execution of the work covered by this Contract. The Engineer does not have authority to suspend work on the project. The Trade Contractor shall not suspend any portion of the work nor resume suspended work without the written authority of the Owner.

B. Neither Engineer's authority to act under the Contract nor any decision made by Engineer in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the Engineer to the Trade Contractor, any subcontractor, any supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

C. Whenever in the drawings, plans or Contract Documents the terms "as ordered", "as directed", or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of Engineer as to the work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the work for compliance with the contract documents. The use of any such

term or adjective shall not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility for the project. Neither the Owner nor the Engineer will be responsible for the acts or omissions of Contractor or any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

D. Periodic observation of the work in progress by the Engineer will be done whenever the Contractor is performing work that requires review as determined by the Engineer. The normal working time shall be during a regular 5-day, 40-hour work week, Monday through Friday. If the Trade Contractor elects to work more than 40 hours per week and observation is required during this overtime work as determined by the Engineer, the Engineer shall be paid by the Trade Contractor at the rate as specified herein for all review time required over the normal 5-day, 40-hour week. If the Engineer or his authorized representative is called to the job site to address problems created by the Trade Contractor, he will be paid by the Trade Contractor at the same rate as for overtime review as stated above. This payment shall be made by a credit to the Owner, and then the Engineer shall bill the Owner for the same.

E. If any work has been covered which the Engineer has not been specifically requested to observe prior to its being covered, or if the Engineer considers it necessary or advisable that covered work be inspected or tested by others, the Trade Contractor at the Engineer's request shall uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the work in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such work is defective, the Trade Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective, the Trade Contractor will be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate change order will be issued.

Section 7. Surveys, Permits and Regulations.

A. The Owner will furnish any existing land surveys in the Owner's possession. Provided however, the Trade Contractor shall perform all necessary land surveys to complete the work required by this Agreement. The Trade Contractor shall provide detailed construction staking.

B. At the beginning of the construction or as the work progresses, the Trade Contractor shall be responsible for the installation of property corners and the setting of bench marks.

C. Bench marks and survey stakes shall be preserved by the Trade Contractor and in case of their destruction, or removal by him, his employees, or others, they shall be replaced at the Trade Contractor's expense and his Sureties shall be liable therefor.

D. The Trade Contractor shall be responsible for elevations used in computing his bid.

E. The Trade Contractor shall secure and pay for all necessary permits, fees and licenses in connection with the performance of its work and shall pay all municipal and other governmental fees in connection therewith except those expressly provided by the specifications as being the responsibility of the Owner, and shall furnish at its expense any and all bonds and

cash or other deposits required by law or required by any lawful body having the right to make demand therefor.

F. The Owner will provide rights-of-way and permanent and temporary easements as shown on the plans for construction purposes. Any additional land actually needed by the Trade Contractor for the performance of the work, proper location of his plant and equipment, or the storage of materials and supplies for the work, shall be furnished by the Trade Contractor.

Section 8. Protection of Work, Property and Persons.

A. The Trade Contractor shall be responsible for initiating and maintaining all safety precautions and programs in connection with the work. Neither the Owner nor the Engineer will be responsible for Trade Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto. The Trade Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all employees on the work who may be affected thereby, all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

B. The Trade Contractor shall at all times consult with and obtain the approval of the Owner for the storage of material, operation of equipment, placing of temporary structures or dispositions of any surplus or waste materials upon property of the Owner anywhere outside the limits of construction. The Trade Contractor shall comply with all state, federal and local laws related to the storage or placement of any supplies, equipment, structures, or any other materials.

C. The Trade Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall notify owners of adjacent utilities when prosecution of the work may affect them. The Trade Contractor shall remedy at his expense all damage, injury, or loss to any property or person caused, directly or indirectly, in whole or in part, by the Trade Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except damage or loss attributable to the fault of the contract documents or to the acts or omissions of the Owner or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Trade Contractor. Notwithstanding the provisions of C.R.S. § 13-20-802.5(2), for purposes of this Contract, the measure of damages shall never be deemed to be the fair market value of the real property without an alleged construction defect.

D. The Trade Contractor shall observe all rules and regulations of the health department having jurisdiction and shall take precautions to avoid creating unsanitary conditions.

E. In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, the Trade Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss.

F. The Trade Contractor shall at all times conduct and work in such a manner as to

cause the least inconvenience and greatest protection to the general public. The Trade Contractor shall furnish and maintain barricades, warning signs, red flags, lights, and temporary passageways as may be necessary to protect the work and to safeguard the public. The cost of furnishing and maintaining the above facilities shall be incidental to the contract and no extra compensation for it will be allowed.

G. Throughout the performance of the work or in connection with this Contract, the Trade Contractor shall construct and adequately maintain suitable and safe crossings over trenches and such detours as are necessary to care for public and private traffic. The material excavated from trenches shall be compactly deposited along the sides of the trench or elsewhere in such a manner as shall give as little inconvenience as possible to the traveling public, to adjoining property owners, to other trade contractors, or to the City.

H. In performing the work, the Trade Contractor shall take the necessary action, including making arrangements with the owners or operators of existing power, cable and telephone lines, fiber-optic and telemetry lines, gas, water, sewer and other utilities or installations that may be encountered, whether privately or publicly owned, to prevent interference with the conditions, operations and maintenance of the respective utilities in a manner satisfactory to the owners, or operators of the respective utilities. Relocation or repair of utilities encountered even though not shown on the plans, shall be the responsibility of the Trade Contractor. The cost of the above measures, including maintaining of guards, watchmen, signals, barricades and temporary structures, making any necessary repairs and other cooperative or corrective work shall be borne by the Trade Contractor and shall be included in the prices bid in the Proposal for the related items of work. Neither the Owner nor the Engineer shall be responsible to the Contractor for the existence of utilities not shown on the plans or drawings and the Trade Contractor remains obligated under this paragraph for all hidden utilities.

I. The Trade Contractor shall be responsible for the preservation of all private or public property along and adjacent to the work and shall take all necessary precautions to prevent damage or injury thereto. Such preservation and protection shall include but not be limited to, trees, stone walls, fences, mail boxes, monuments, irrigation ditches, driveways, road access culverts, underground pipelines and structures. Such preservation and protection shall apply to all underground pipelines and utilities whether public, private or individually owned that are in or adjacent to the right-of-way. When direct or indirect damage is done to public or private property on account of the act, omission, neglect or misconduct in the prosecution or non-prosecution of the work on the part of the Trade Contractor, such property shall be restored by the Trade Contractor at the Trade Contractor's expense to a condition similar or equivalent to that which existed before such damage or injury was done, and brought up to current codes if applicable. The Trade Contractor shall be responsible for making all arrangements at his own expense for moving and operating equipment at temporary crossings of telephone and transmission lines, railroad tracks, irrigation ditches and pipelines.

Section 9. Communication with the Owner.

The Trade Contractor shall designate a responsible member of its organization at the site, whose duty shall be designated as the contact person for all communication between the Owner and the Trade Contractor. Said designated representative shall also be responsible to attend such meetings, as may be required to insure coordination and adequate performance of the work.

Section 10. Scope of Work.

The scope of work is described in the contract documents which are appended hereto and incorporated herein by this reference.

Section 11. Trade Contractor's Responsibility.

A. The Trade Contractor shall be responsible for all the work under this Contract until completion and final acceptance by the Owner.

B. The Trade Contractor shall supervise and direct the work. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction.

C. The Trade Contractor shall employ on the work only such persons who are competent and skilled in their assignments. Any employee who obstructs the progress of the work through incompetence or other means or conducts himself improperly shall be discharged or removed from the work when so requested by the Owner. This section shall not create a duty for the Owner to evaluate or assess the competence or skills of the Trade Contractors employees.

D. The Trade Contractor warrants that all materials and equipment furnished and incorporated by him in the project shall be new, unless otherwise specified, and that all work under this Trade Contract shall be of good quality, free from fault and defects and in conformity with the contract documents. All work not conforming to these standards shall be considered defective. The warranty provided herein shall be in addition to and not in limitation of any other warranty or remedy required by law or by the contract documents.

E. The Trade Contractor agrees that if he should fail or neglect to prosecute the work diligently and properly, or fail to perform any provisions of this Trade Contract, that the Owner, after three (3) days written notice to said Trade Contractor may, without prejudice to any other remedy, make good such deficiencies and may deduct the cost thereof from the payments then or thereafter due to the Trade Contractor pursuant to this Contract.

F. Tools furnished with any equipment may be used when approved by the Owner and shall be turned over to the Owner after completion of the work in a condition acceptable to the Owner. In case of rejection by the Owner, the Trade Contractor shall replace the tool or tools at no extra cost to the Owner.

G. Upon completion and before final acceptance of the work, the Trade Contractor shall remove from the site of the work and property of the Owner, all machinery, equipment, surplus materials, rubbish, barricades, signs and temporary structures and shall leave the premises in a condition which is satisfactory to the Owner.

H. The Trade Contractor shall keep one record set of the contract documents annotated to show all changes made during construction.

I. The Trade Contractor shall be responsible for the acts and omissions of all his employees and all subcontractors, their agents and employees and all other persons performing any of the work under a contract with the Trade Contractor.

J. Upon completion of the work, the Trade Contractor shall, at his or its expense, remove from the vicinity of the work, all plant, buildings, rubbish, unused materials, concrete forms

and other like material, belonging to him or used under his direction during construction, and in the event of his failure to do so, the same may be removed by the Owner and the Trade Contractor, his Surety or Sureties, shall be liable for the cost thereof. Also during the construction of the work, the site, partially finished structures, and material stockpiles shall be kept in a reasonable state of order and cleanliness.

Section 12. Changes in the Work.

A. CHANGES. Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, only by Change Order, Construction Change Directive, or Order for a Minor Change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

1. A Change Order shall be based upon agreement among the Owner, Contractor, and Engineer; a Construction Change Directive requires agreement by the Owner and Engineer and may or may not be agreed to by the Contractor; an Order for a Minor Change in the Work may be issued by the Engineer alone.

2. Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive, or Order for a Minor Change in the Work.

3. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to the quantities of work proposed will cause substantial inequity to the Owner or the Contractor, the applicable unit prices shall be equitably adjusted; provided however, that Owner may increase the number of units without change in the unit price if reasonable.

B. CHANGE ORDERS. The Contract Sum and the Contract Time may be changed only by Change Order. Methods used in determining adjustments to the Contract Sum may include those listed in Subsection C below. A Change Order is a written order to the Contractor, signed by the Contractor, the Owner and the Engineer, stating their agreement upon all of the following:

1. A change in the Work;

2. The amount of the adjustment in the Contract Sum, if any; and

3. The extent of the adjustment in the Contract Time, if any.

C. CONSTRUCTION CHANGE DIRECTIVES. A Construction Change Directive is a written order directed to the Contractor and signed by the Owner and Engineer, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

1. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

2. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

a. By mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

b. By unit prices stated in the Contract Documents or subsequently agreed upon;

c. By cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

d. By the method provided in Subparagraph (C)(3)(5).

3. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the work involved and advise the Engineer and Owner of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

4. A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

5. If the Contractor does not respond promptly to the Construction Change Directive or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Engineer on the basis of reasonable expenditures and savings of those performing the work attributable to the change, including, in case of an increase in the Contract Sum, a percentage fee for overhead and profit not to exceed five percent (5%) of such work's actual cost for Contractor and ten percent (10%) of such work's actual cost to be apportioned between any and all subcontractors and sub-subcontractors. For work performed by Contractor's own forces, Contractor's mark-up shall be limited to actual cost plus a percentage fee for overhead and profit not to exceed ten percent (10%). In such case, the Contractor shall keep and present, in such form as the Engineer may prescribe, an itemized accounting of actual costs together with appropriate supporting data. For the purposes of this Subparagraph, actual costs shall be defined as and limited to the following:

a. Costs of labor, including Social Security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

b. Costs of materials, supplies, and equipment, including costs of transportation, whether incorporated or consumed;

c. Reasonable rental costs of machinery and equipment, exclusive of hand tools, obtained and used specifically for such work, whether rented from the Contractor or others; and

d. Costs of premiums for all bonds (if any), permit fees, and sales, use or similar taxes directly attributable to such work. Actual cost does not include any item which could be deemed to be a general conditions cost or overhead, such as but not limited to, the cost of Contractor and Subcontractor supervisory personnel assigned to the Work, and field office and related expenses.

6. Pending final determination of actual cost to the Owner, amounts not in dispute may be included in applications for payment. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Engineer. When both additions and credits covering related work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

7. If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be determined in accordance with Article 5 hereof.

8. When the adjustments in the Contract Sum and Contract Time are determined as provided herein, such determination shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

D. MINOR CHANGES IN THE WORK

1. The Engineer will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

2. The Owner may at any time as the need arises, order changes within the scope of work without invalidating the Agreement. If such changes increase or decrease the amount due under the contract documents or in the time required for performance of the work, and equitable adjustment will be authorized by change order.

3. The Owner also may, at any time, by issuing a field order, make changes in the details of the work. The Trade Contractor shall proceed with the performance of any changes in the work so ordered by the Owner unless the Trade Contractor believes that such field order entitles him to a change in contract price or time, or both, in which event he shall give the Owner written notice thereof within ten (10) days after the receipt of the ordered change, and the Trade Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the Owner.

Section 14. Contract Documents.

In case of conflict between this Contract, the general conditions of the contract for construction, and the supplementary conditions, this Contract will govern.

ARTICLE 4 – TRADE CONTRACTOR'S CONSTRUCTION SCHEDULE

Section 1. Preconstruction Conference.

A preconstruction conference shall be scheduled at the time the Notice of Award is issued. The Trade Contractor, at the preconstruction conference, shall prepare and submit for the Owner's and the Engineer's review and approval a Trade Contractor's construction schedule for the Work, in such and form and detail as the Owner may require. The schedule shall not exceed time limits under the Contract Documents, shall be revised as required herein and at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire project to the extent required by the Contract Documents, and shall provide for the expeditious and practicable execution of the Work. The schedule shall indicate the proposed starting and completion dates for the various subdivisions of the Work as well as the totality of the Work. The schedule shall be updated every fourteen (14) days for submitted to Engineer with Trade Contractor's applications for payment. Each schedule shall contain a comparison of actual progress with the estimated progress for such time stated in the original schedule. If any schedule submitted sets forth a date for Substantial Completion for the Work or any phase of the Work beyond the date(s) of Substantial Completion established in the Contract (as the same may be extended as provided in the Contract Documents), the Trade Contractor shall submit to Engineer and Owner for their review and approval, a narrative description of the means and methods which Trade Contractor intends to employ to expedite the progress of the Work to ensure timely completion of the various phases of the Work as well as the totality of the Work. To ensure such timely completion, Trade Contractor shall take all necessary action including, without limitation, increasing the number of personnel and labor on the Project and implementing overtime and double shifts. In that event, Trade Contractor shall not be entitled to an adjustment in the Contract Sum or the Schedule.

Section 2. Schedule of Submittals.

The Contractor shall prepare and keep current, for the Engineer's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Engineer reasonable time to review submittals.

Section 3. Conformance to Schedule.

The Contractor shall conform to the most recent schedules.

ARTICLE 5 - TIME FOR COMPLETION AND LIQUIDATED DAMAGES

A. The date of beginning and the time for completion of the work are essential conditions of the contract documents and the work embraced shall be commenced on a date specified in the notice to proceed.

B. The Trade Contractor shall proceed with the work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed, by and between the Trade Contractor and the Owner, that the contract time for the completion of the work described herein is a reasonable time, If Trade Contractor is delayed in the progress of the Work by fire, unusual delay in transportation, unanticipated adverse weather conditions, or other unavoidable casualties beyond Trade Contractor's control other than unanticipated adverse weather conditions, the Contract Time shall be extended for a reasonable period of time. "Weather" means precipitation, temperature, or wind, and an "adverse weather condition" means

weather that on any calendar day varies from the average weather conditions for that day by more one hundred percent (100%) as measured by the National Oceanic and Atmospheric Administration. The term "unanticipated adverse weather conditions" means the number of days in excess of the anticipated adverse weather days per month as set forth below:

MONTHLY ANTICIPATED ADVERSE WEATHER DAYS

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7	4	4	4	6	3	4	2	3	3	2	5

By reason of example only, if in March there are two (2) days when the snowfall exceeds the average snowfall for that day by one hundred percent (100%), those two (2) days will have experienced an adverse weather condition. However, there will have been no unanticipated adverse weather condition in March, because there are four (4) anticipated adverse weather days in March, which should be accounted for in the schedule. If, however, there are five (5) days in which the snowfall exceeds the average snowfall by one hundred percent (100%), an unanticipated adverse weather condition will have occurred, and Trade Contractor shall be entitled to request an extension of time.

C. If the Trade Contractor shall fail to complete the work within the Contract Time, or extension of time granted by the Owner, then the Trade Contractor shall pay to the Owner the amount of liquidated damages and not as penalty the sum of five hundred dollars ($500.00) for each calendar day that the Trade Contractor shall be in default after the time stipulated in the contract documents.

D. The Owner will charge the Trade Contractor, and may deduct from the partial and final payment for the work, all architectural, engineering and construction management expenses incurred by the Owner in connection with any work accomplished after the specified completion date.

E. The Trade Contractor will not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following, and the Trade Contractor has promptly given written notice of such delay to the Owner.

1. To any preference, priority or allocation order duly issued by the Owner.

2. To unforeseeable causes beyond the control and without the fault or negligence of the Trade Contractor, including, but not restricted to, unforeseen conditions, acts of God, or of the public enemy, acts of the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

3. To any delays of subcontractors occasioned by any of the causes specified in subparagraphs 1 and 2 of this paragraph E.

F. The Trade Contractor waives any right of recovery or reimbursement or by whatever name, as against the Owner or the Engineer, as a result of any delay or increase on overhead cost incurred by the Trade Contractor's association with any action or inaction on the part of any other trade contractor or supplier.

G. Any request for extension of the Contract Time shall be made in writing to the

Project Manager not more than seven (7) days after commencement of the delay; otherwise it shall be waived. Any such request shall contain an estimate of the probable effect of such delay on the progress of the Work.

H. In strict accordance with C.R.S. § 24-91-103.5, the City shall not amend the Contract Price to provide for additional compensation for any delays in performance which are not the result of acts or omissions of the City or persons acting on behalf of the City.

ARTICLE 6 - CONTRACT SUM

Section 1. Monthly or Progress Payments.

A. The City Council of the City of Northglenn has appropriated the money necessary to fund this project. The Owner shall pay the Trade Contractor in current funds for the performance of the work, subject to any additions and deletions, by written change order, the total sum not to exceed five million two hundred sixty two thousand five hundred sixty three dollars and fifty nine cents ($5,262,563.59) (the "Original Contract Amount"). Notwithstanding anything to the contrary contained in this Agreement, no change order or other form of directive by the Owner requiring additional compensable work to be performed, which causes the aggregate amount payable under this Agreement, to exceed the amount appropriated for the Original Contract Amount, unless the Trade Contractor is given written assurance by the City of Northglenn that lawful appropriations have been made by the City Council of the City of Northglenn to cover the cost of the additional work.

B. The Engineer has, by separate agreement with the Owner, agreed to include in its monthly work estimate to the Owner, a review of the Trade Contractor's estimates of the value of all work, labor, and materials of the Trade Contractor incorporated into the Project. The Trade Contractor hereby agrees that estimates provided to the Engineer for review for the Owner shall be for work actually performed upon the project and that all such work, including labor and materials, have been paid. The determination of the amount of work completed on each application for payment by the Trade Contractor shall be made by the Engineer and shall thereafter be subject to approval by the Owner. Such determination, however, by the Engineer or approval by the Owner shall not be construed as acceptance of the work.

1. Before the first application for payment, the Trade Contractor shall submit to the Engineer and Owner a schedule of values to be allocated to the various portions of the Work, which in the aggregate equals the total Contract Sum, divided so as to facilitate payments to subcontractors, supported by such evidence of correctness as the Engineer may direct. This schedule, when approved by the Engineer, shall be used to monitor the progress of the Work and as a basis for making progress payments hereunder. Application for monthly progress payments shall be made in writing in accordance with this Contract and shall be submitted on approved forms provided by the Owner and shall be submitted to the Owner on or before the twentieth (20th) day of each month. Applications received on time will be paid on the twentieth (20th) day of the following month, providing that the Owner approves such recommendations of the Engineer. Applications received after the twentieth (20th) day of each month shall paid after the Owner's next pay period.

2. Pursuant to Colo. Rev. Stat. § 24-91-103, as may be amended, where the Original Contract Amount exceeds one hundred fifty thousand dollars ($150,000.00), the

Owner may retain up to five percent (5%) of the calculated value of completed work from each progress payment up until the contract is completed satisfactorily and finally accepted by the Owner. If the Owner finds satisfactory progress is being made in any phase of the contract, the Trade Contractor may make written request of the Owner for final payment of the withheld percentage. The Owner may agree to final payment of the withheld percentage if the Owner finds satisfactory and substantial reasons exist for the payment. The Trade Contractor must provide written approval to the Owner from any surety furnishing bonds for the contract work in order to receive said payment of the withheld percentage.

3. Upon receipt of written notice from the Trade Contractor that his work is ready for final inspection and acceptance by the Owner and upon receipt of final application for payment, the Owner will promptly make such final field review subject to the final payment requirements contained in Colo. Rev. Stat. § 38-26-107, as amended. If the Owner finds that the work is acceptable under the contract documents, he will recommend to the Owner that a final certificate of payment be issued. Neither final payment nor the remaining retention shall become due until the Trade Contractor submits to the Engineer an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work, have been paid or otherwise satisfied. Likewise, final payment shall not be made until the consent of the surety to final payment has been obtained, and if required by the Owner, such other data establishing payment or satisfaction of all obligations, including releases, final lien waivers, and receipts and warranties, if any, have been provided to the Engineer for the use and benefit of the Owner. Should any subcontractor of the Trade Contractor or supplier of said Trade Contractor refuse to furnish any warranty and/or release or waiver, the Owner in its sole discretion, may refuse to certify final payment. The Trade Contractor may then furnish sufficient bonds satisfactory to the Owner to indemnify the Owner against any such liens.

4. Notwithstanding anything else to the contrary contained herein, such final payment by the Owner shall not be construed as a waiver of any claims affecting or arising from:

a. Unsettled liens;

b. Faulty or defective work appearing after substantial completion;

c. Failure of the work to comply with the requirements of the contract documents;

d. Terms of any special warranties required by the contract documents.

5. The acceptance by the Trade Contractor of final payment shall be and shall operate as a release to the Owner from all claims and all liability to the Trade Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of the work other than claims in stated amounts as may be specifically expected by the Trade Contractor with the consent of the Owner. Any payment, however, final or otherwise, will not release the Trade Contractor or his sureties from any obligations under the contract documents or the performance bond and labor and material payment bond.

ARTICLE 7 - CORRECTION OF WORK

A. During the life of the Contract and for a period of two (2) years after final acceptance, the Trade Contractor shall promptly remove from the premises all work rejected by the Owner for failure to comply with the contract documents, whether incorporated in the construction or not, and the Trade Contractor shall promptly replace and re-execute the work in accordance with the contract documents and without expense to the Owner and shall bear the expense of making good all work of other trade contractors destroyed or damaged by such removal or replacement. The Owner, however, may at its discretion elect to accept an equitable reduction in price or a refund instead of correction of the condemned work.

B. All removal and replacement work shall be done at the Trade Contractor's expense. If the Trade Contractor does not take action to remove such rejected work within ten (10) days after receipt of written notice, the Owner may remove such work and store the materials all at the expense of the Trade Contractor.

ARTICLE 8 - TEMPORARY FACILITIES AND SERVICES

Unless otherwise provided in this Contract, the Trade Contractor shall furnish and make available, at no cost, all temporary facilities, including all power needed for heating and protection of facilities and work. It is the expressed intent of the parties that the Trade Contractor shall be responsible for and at its sole cost all heating and protection of facilities and work.

ARTICLE 9 - INDEMNIFICATION AND INSURANCE

Section 1. Indemnification.

The Contractor, to the fullest extent permitted by law, shall defend, indemnify and hold harmless the City, its officers, employees, agents and their insurers, from and against all liability, claims and demands on account of injury, loss or damage, including without limitation, claims arising from bodily injury, personal injury, sickness, disease, death, property loss or damage or any other loss of any kind whatsoever, which arises out of or is in any manner connected with this Contract, to the extent that such injury, loss or damage is attributable to the act, omission, error, professional error, mistake, negligence or other fault of the Contractor, the Contractor's employees, subcontractors or anyone else employed directly or indirectly by the Contractor, Contractor's employees or subcontractor.

The Contractor, to the fullest extent permitted by law, shall defend, investigate, handle, respond and provide defense for and defend against any such liability, claims or demands at the sole expense of the Contractor, or at the option of the City, Contractor agrees to pay the City or reimburse the City for defense costs incurred by the City in connection with any such liability, claims, or demands. The Contractor, to the fullest extent permitted by law, shall defend and bear all other costs and expenses related thereto, including court costs and attorney fees, whether or not such liability, claims or demands alleged are groundless, false or fraudulent.

This indemnification provision is intended to comply with C.R.S. § 13-21-111.5(6), as amended, and shall be read as broadly as permitted to satisfy that intent.

Section 2. Insurance.

A. The Contractor agrees to obtain and maintain during the life of this Contract, a policy or policies of insurance against all liability, claims, demands and other obligations assumed by the Contractor pursuant to Section 1 above. Such insurance shall be in addition to any other insurance requirements imposed by this Contract or by law. The Contractor shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to Section 1 above, by reason of its failure to obtain and maintain during the life of this Contract insurance in sufficient amounts, durations, or types.

B. Contractor shall obtain and maintain during the life of this Contract, and shall cause any subcontractor to obtain and maintain during the life of this Contract, the minimum insurance coverages listed below. Such coverages shall be obtained and maintained with forms and insurers acceptable to the City. All coverages shall be continuously maintained to cover all liability, claims, demands and other obligations assumed by the Contractor pursuant to Section 1 above. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage.

1. Worker's Compensation Insurance to cover obligations imposed by applicable law for any employee engaged in the performance of the work under this Contract, and Employers Liability Insurance with minimum limits of five hundred thousand dollars ($500,000) each incident, five hundred thousand dollars ($500,000) disease—policy limit, and five hundred thousand dollars ($500,000) disease—each employee.

2. General Public Liability Insurance to be written with a limit of liability of not less than one million dollars ($1,000,000) for all damages arising out of bodily injury, personal injury (including coverage for employee and contractual acts), including death, at any time resulting therefrom, sustained by any one person and not less than two million dollars ($2,000,000) for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by two or more persons in any one accident. This policy shall also include coverage for blanket contractual and independent contractor risks. The limits of General Public Liability Insurance for broad form property damage (including products and completed operations) shall be not less than one million dollars ($1,000,000) for all damages arising out of injury to or destruction of property in any one (1) accident and not less than two million dollars ($2,000,000) for all damages arising out of injury to, or destruction of property, including the City's property, during the policy period. The General Public Liability Insurance policy shall include coverage for explosion, collapse and underground hazards. The policy shall contain a severability of interests provision.

3. Protective Liability and Property Damage insurance covering the liability of the Owner, including any employee, officer or agent of the Owner with respect to all operations under the Contract by the Trade Contractor or his sub-contractors shall be obtained and maintained during the life of the contract. The limits of the Owner's Protective Liability Policy, to be provided by the Trade Contractor, as described in this Section 2, shall be increased to the same limits as described above for the Trade Contractor's General Public Liability Insurance.

4. Comprehensive Automobile Liability Insurance with minimum combined single limits for bodily injury and property damage of not less than one million dollars

($1,000,000) each occurrence and one million dollars ($1,000,000) aggregate with respect to each of the Trade Contractor's owned, hired, and non-owned vehicles assigned to or used in performance of the services. The policy shall contain a severability of interests provision. If the Trade Contractor has no owned automobiles, the requirements of this paragraph shall be met by each employee of the Trade Contractor providing services to the Owner under this contract.

C. To the extent that liability results from the acts or omissions of the Trade Contractor, all Insurance Policies and Certificates of Insurance issued for this project shall name as additional insured(s), the Owner, whether private or governmental, the Owner's officers and employees, and the Engineer and its agents and employees, and any other person(s), company(ies), or entity(ies) deemed necessary by the Owner. The Trade Contractor shall be solely responsible for any deductible losses under any policy required herein.

D. The insurance provided by the Trade Contractor shall be primary to insurance carried by the Owner, the Engineer, and all other additional insureds, and the principal defense of any claims resulting from the Trade Contractor's obligations under the Contract shall rest with the Trade Contractor's Insurer.

Section 3. Certificates of Insurance.

A. The certificate of insurance provided by the Trade Contractor shall be completed by the Trade Contractor's insurance agent as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect, and shall be reviewed and approved by the Owner prior to commencement of the contract. No other form of certificate shall be used. The certificate shall identify this Contract and shall provide that the coverages afforded under the policies shall not be cancelled, terminated or materially changed until at least thirty (30) days prior written notice has been given to the Owner. The completed certificate of insurance shall be sent to:

Director of Public Works
City of Northglenn
11701 Community Center Drive
Northglenn, Colorado 80233-8061

B. Failure on the part of the Trade Contractor to procure or maintain policies providing the required coverages, conditions, and minimum limits shall constitute a material breach of contract upon which the Owner may immediately terminate this contract, or at its discretion the Owner may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by the Owner shall be repaid by the Trade Contractor to the Owner upon demand, or the Owner may offset the cost of the premiums against any monies due to the Trade Contractor from the Owner.

C. The Owner reserves the right to request and receive a certified copy of any policy and any endorsement thereto.

D. The parties hereto understand and agree that the Owner is relying on, and does not waive or intend to waive by any provision of this contract, the monetary limitations (presently three hundred fifty thousand dollars ($350,000) per person and nine hundred ninety thousand dollars ($990,000) per occurrence) or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, 24-10-114 et seq., C.R.S., as from time to time

amended, or otherwise available to the Owner, its officers or employees.

ARTICLE 10 - PERFORMANCE, LABOR AND MATERIAL PAYMENT BONDS

The Trade Contractor shall within ten (10) days after the receipt of a notice of award, furnish the Owner with a performance bond and a payment bond in penal sums equal to the amount of the contract price, conditioned upon the performance by the Trade Contractor of all undertakings, covenants, terms, conditions and agreements of the contract documents, and upon the prompt payment by the Trade Contractor to all persons supplying labor and materials in the prosecution of the work provided by the contract documents. Such bonds shall be executed by the Trade Contractor and a corporate bonding company licensed to transact such business in the state in which the work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these bonds shall be borne by the Trade Contractor. If at any time a surety on any such bond is declared a bankrupt or loses its right to do business in the state in which the work is to be performed or is removed from the list of Surety Companies accepted on Federal Bonds, the Trade Contractor shall within ten (10) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Trade Contractor. No further payments will be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond to the Owner.

ARTICLE 11 – CLAIMS AND DISPUTES

A. Definition. A claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment of contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract. The term "claim" also includes other disputes between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate claims shall rest with the party making the claim.

B. Decision of Engineer or Architect. Claims may, upon request of both the Contractor and the Owner, be referred initially to the Engineer or Architect for action as provided in Article 3, Section 12.

C. Time limits on Claims. Claims by either party must be made within twenty one (21) days after occurrence of the event giving rise to such claim or within twenty one (21) days after the claimant first recognizes, or reasonably should have recognized, the condition giving rise to the claim, whichever is later. An additional claim made after the initial claim has been implemented by change order will not be considered unless submitted in a timely manner.

D. Continuing Contract Performance. Pending final resolution of a claim, including litigation, unless otherwise directed by Owner in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

E. Waiver of Claims: Final Payment. The making of Final Payment shall constitute a waiver of claims by the Owner except those arising from:

1. Liens, claims, security interests, or encumbrances arising out of the Contract and unsettled;

2. Failure of the Work to comply with the requirements of the Contract Documents;

3. Terms of special warranties required by the Contract Documents; or

4. Faulty or defective work appearing after Substantial Completion.

F. Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than seven (7) days after first observance of the conditions. Site conditions which an experienced and prudent contractor could have anticipated by visiting the site, familiarizing himself with the local conditions under which the Work is to be performed and correlating his observations with the requirements of the Contract Documents shall not be considered as claims for concealed or unknown conditions, nor shall the locations of utilities which differ from locations provided by the utility companies. The Engineer or Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or the required time for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Engineer or Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Engineer or Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within twenty-one (21) days after the Engineer or Architect has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Engineer or Architect for initial determination, subject to further proceeding pursuant to these Contract Documents.

G. Claims for Additional Cost. If the Contractor wishes to make claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the work. Said notice shall itemize all claims and shall contain sufficient detail and substantiating data to permit evaluation of same by Owner and Engineer or Architect. No such claim shall be valid unless so made. Prior notice is not required for claims relating to an emergency endangering life or property. If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Engineer or Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Engineer or Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension, or (7) other reasonable grounds, claim shall be filed in accordance with the procedure established herein Any change in the Contract Sum resulting from such claim shall be authorized by change order or construction change directive.

H. Claims for additional time. If the Contractor wishes to make claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one claim is necessary.

I. Injury or damage to person or property. Subject to the Parties' obligations and responsibilities under the Contract Documents in general and Article 8 hereof in particular, if either party to the Contract suffers injury or damage to person or property because of an act or omission

of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding ten (10) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a claim for additional cost or time related to this claim is to be asserted, it shall be filed as provided in Article 3, Section 12.

ARTICLE 12 - RESOLUTION OF CLAIMS AND DISPUTES

A. The Engineer (if the matter is referred to the Engineer for initial decision) will review claims and take one or more of the following preliminary actions within ten (10) days of receipt of a claim: (1) request additional supporting data from the claimant; (2) submit a schedule to the parties indicating when the Engineer expects to take action; (3) reject the claim in whole or in part, stating the reasons for rejection; (4) recommend approval of the claim by the other party; or (5) suggest a compromise. The Engineer may also, but is not obligated to, notify the surety, if any, of the nature and amount of the claim.

B. If a claim has been resolved, the Engineer (or at the Owner's option, Owner), will prepare or obtain appropriate documentation.

C. If a claim has not been resolved, the party making the claim shall within ten (10) days after the Engineer's preliminary response, take one or more of the following actions: (1) submit additional supporting data requested by the Engineer; (2) modify the initial claim; or (3) notify the Engineer that the initial claim stands.

D. If a claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Engineer, the Engineer will notify the parties in writing that the Engineer's decision will be made within seven (7) days, which decision will be considered advisory only and not binding on the parties in the event of litigation in respect of the claim. Upon expiration of such time period, the Engineer will render to the parties the Engineer's written decision relative to the claim, including any change in the Contract Sum or Contract Time or both. If there is a surety and there appears to be a possibility of a Trade Contractor's default, the Engineer may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

E. The dispute clause does not preclude the considerations of questions of fact or law in connection with decisions provided for in Paragraph A above. Nothing in this Agreement, however, shall be construed as making final a decision of an administrative official, representative or City Council on a question of fact or law.

F. As between the parties of this Agreement, as to all acts or failure to act by either party of this Agreement, any applicable statute of limitation shall commence to run from the date of the agreed party's discovery of such act or failure to act.

G. The Trade Contractor shall give written notice to the Owner within ten (10) days of any dispute/claim arising under this Contract upon which the Trade Contractor seeks compensation or change of contract documents, otherwise the Trade Contractor's dispute/claim shall be deemed waived. Said ten (10) days written notice shall not be deemed to run from the date of discovery in this instance but from the date the dispute/claim has arisen.

ARTICLE 13- TERMINATION

A. This Agreement may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this Agreement through no fault of the terminating party; provided that no such termination may be effected unless the other party is given (1) not less than ten (10) days written notice (delivered by certified mail, return receipt requested) of intent to terminate; and (2) an opportunity for consultation with the terminating party prior to termination.

B. This Agreement may be suspended or terminated in whole or in part, in writing, by the Owner for its convenience; provided that no such termination may be effected unless the Trade Contractor is given (1) not less than ten (10) days written notice (delivered by certified mail, return receipt requested) of intent to suspend or terminate; and (2) an opportunity for consultation with the Owner prior to suspension or termination.

C. Suspension for Convenience: The Owner, for its own convenience, may suspend the contract in whole or in part at any time by written notice to the Trade Contractor. Such notice shall state the extent and the effective date of such suspension, and on the effective date thereof the Trade Contractor shall promptly suspend such work to the extent specified, and during the period of such suspension shall properly care for and protect all work and materials, housing and equipment on hand for construction under the contract. The Trade Contractor also shall promptly supply the Owner with copies of all outstanding orders for materials, equipment and services, and shall take such action relative to such orders as may be directed by the Owner. If the performance of the work is thus suspended, the Trade Contractor shall be entitled to be reimbursed for all additional expense incurred by reason of such suspension as agreed upon by the Trade Contractor and the Owner.

D. Termination for Convenience:

1. The Owner may for its own convenience terminate work under the contract in whole or in part at any time by written notice to the Trade Contractor. Such notice shall state the extent and effective date of such termination and on the effective date thereof, the Trade Contractor will, and as to the extent directed, stop work under the contract and the placement of further orders of subcontracts under the contract, terminate work under order and subcontracts under the contract, and take any necessary action to protect property in the Trade Contractor's possession in which the Owner has or may acquire an interest.

2. In the event of such termination, the Owner shall pay to the Trade Contractor: (1) its direct costs (excluding overhead) for all work done in conformity with the Contract to the effective date of such termination and (2) other costs pertaining to the work which the Trade Contractor may incur as a result of such termination, all as approved by the Owner plus ten percent (10%) of such costs (excluding costs under (2) above) for overhead and profit, provided, however, that in no event shall the total amount to be paid under this Article 11, Section D.(2) plus payments previously made, exceed the lesser of (a) the total aggregate contract price specified in the Trade Contract; or (b) that proportion of the aggregate total contract price specified in the date of termination bears to the entire work to be performed hereunder. Any payment under this Article 11, Section D.(2) shall be made upon the expiration of the period within which liens may be filed under the laws of the state of Colorado, subject, however, to withholding by the Owner for the reasons and in the manner provided in those provisions pertaining to withholding of payments for

liens.

E. Termination for Default:

1. The Owner shall have the right to terminate the employment of the Trade Contractor after giving ten (10) days written notice of the termination to the Trade Contractor in the event of any default by the Trade Contractor. In the event of such termination, the Owner may take possession of the work and of all materials, tools and equipment thereon and may finish the work by whatever method and means he may select. It shall be considered a default by the Trade Contractor whenever he shall:

a. Disregard or violate important provisions of the contract documents or the Owner's instructions, or fail to prosecute the work according to the agreement schedule of completion, including extensions thereof;

b. Fail to provide a qualified representative, competent workmen or subcontractors, or proper materials, or fail to make prompt payment therefor; and

c. Fail to submit a completion schedule within fourteen (14) days after award of contract.

2. Upon termination of the contract by the Owner for default by the Trade Contractor, no further payments shall be due to the Trade Contractor until the work is completed. If the unpaid balance of the contract amount shall exceed the cost of completing the work including all overhead costs, the excess shall be paid to the Trade Contractor. If the cost of completing the work shall exceed the unpaid balance, the Trade Contractor shall pay the difference to the Owner. The amount of the cost incurred by the Owner in implementing the work, and the damage incurred through the Trade Contractor's default, shall be approved by the Owner.

3. The provisions of this Article 11, Section D.(2) shall not apply in the event of default of the Trade Contractor; provided, however, that the provisions of Article 11, Section D.(2) shall apply in the event of substantial failure by the Owner to fulfill its obligations under this Agreement.

ARTICLE 14 - SIMULTANEOUS WORK BY OTHERS

A. The Owner reserves the right to let other contracts in connection with this project. The Trade Contractor shall afford other trade contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

B. If the proper execution or results of any part of the Trade Contractor's work depends upon the work of any other trade contractor, the Trade Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. Failure of the Trade Contractor to so inspect and report defects shall constitute an acceptance of the other trade contractors' work as fit and proper for the addition of his work thereto, except as to defects which may develop in the other trade contractors' work after the execution of his work.

C. The Trade Contractor shall coordinate his operations with those of other trade contractors. Cooperation will be required in the arrangement for the storage of materials and in

the detailed execution of the work.

D. The Trade Contractor, including his subcontractors, shall keep informed of the progress and the detail work of other trade contractors and shall notify the Engineer immediately of lack of progress, defective workmanship, or lack of coordination on the part of other trade contractors. Failure of the Trade Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress, defective workmanship, or lack of coordination by others shall be construed as acceptance by him of the work and the status of work as being satisfactory for proper execution of his own work.

E. All materials and labor shall be furnished at such times as shall be for the best interest of all trade contractors concerned, to the end that the combined work of all may be properly and fully completed on contract time.

F. Nothing herein shall be construed in any way as giving the Trade Contractor a claim as against the Owner and the Engineer resulting in any revised schedule based upon delay caused by any other trade contractor or supplier.

ARTICLE 15 - SUBCONTRACTING

A. The Trade Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

B. Before execution of the contract, the Trade Contractor shall submit the names of all subcontractors, including contact persons, phone numbers, and addresses to the Engineer or Architect and Owner. The Trade Contractor shall also promptly notify all parties of any changes in subcontractors or subcontractor contact information.

C. The Trade Contractor shall be fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

D. The Trade Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Trade Contractor by the terms of the contract documents insofar as applicable to the work of subcontractors and to give the Trade Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Trade Contractor under any provision of the contract documents.

E. Nothing contained in this Contract will create any contractual relation between any subcontractor and the Owner.

ARTICLE 16 - GUARANTY

A. The Trade Contractor shall guarantee all materials and equipment furnished and work performed for a period of two (2) years from the date of final acceptance of the contract by the Owner that the work is free from all defects due to faulty materials or workmanship and that the Trade Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Trade Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the Owner may do so and charge the Trade Contractor the cost thereby incurred. The performance bond shall remain in full force and effect through the guarantee period.

B. Whenever in the specifications a guarantee or maintenance bond is required to be furnished for any item of equipment, material or portion of the work, such guarantee shall be submitted to the Owner and a written approval will be issued to the Trade Contractor before any such equipment, material or construction is ordered and incorporated in work by the Trade Contractor.

ARTICLE 17 - SALES TAX

The Trade Contractor and all of his subcontractors must make application to the Colorado State Department of Revenue for a certificate of exemption to permit the purchase of building materials for the construction of this project without payment of the sales tax. Prior to the start of construction, the Trade Contractor shall furnish copies of such certificates to the Owner. Applications and certificates must be on forms provided by the Department of Revenue.

ARTICLE 18 - MISCELLANEOUS PROVISIONS

A. This Agreement is made and entered into subject and conformable to the laws of the State of Colorado and the Home Rule Charter of the City of Northglenn. To the extent any provision hereof is inconsistent with said laws and Charter, said laws and Charter shall control.

B. The Trade Contractor shall comply with all federal and state laws and local ordinances and regulations which affect those engaged or employed in the work or which affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same, and shall at all times observe and comply with all such existing laws, ordinances, regulations and decrees, and shall protect and indemnify the Owner and the Engineer against any claim or liabilities arising solely from or based solely on the violations of such law, ordinance, regulation, order or decree, whether by itself, its subconsultants, agents, or employees.

C. The Trade Contractor will take affirmative action to not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex or handicap, if otherwise qualified.

D. In the event any provision of this Agreement is held invalid and unenforceable, the remaining provisions shall be valid and binding upon the parties.

E. One or more waivers by either party of any provision, term, condition or covenant

shall not be construed by the other party as a waiver of a subsequent breach of the same by the other party.

F. The Owner and the Trade Contractor each binds itself and its partners, successors, executors, administrators, and assigns to this Agreement. Neither the Owner nor the Trade Contractor will assign, sublet, or transfer its interest in this Agreement without the written consent of the other.

G. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of any public body which may be a party hereto, nor shall it be construed as giving any rights or benefits hereunder to anyone other than the Owner and the Trade Contractor.

H. Illegal Aliens.

1. Certification. By entering into this Agreement, Contractor hereby certifies that, at the time of this certification, it does not knowingly employ or contract with an illegal alien who will perform work under the Agreement and that Contractor will participate in either the E-Verify Program administered by the United States Department of Homeland Security and Social Security Administration or the Department Program administered by the Colorado Department of Labor and Employment in order to confirm the employment eligibility of all employees who are newly hired for employment to perform work under the Agreement.

2. Prohibited Acts. Contractor shall not:

a. Knowingly employ or contract with an illegal alien to perform work under this Agreement; or

b. Enter into a contract with a subcontractor that fails to certify to Contractor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this Agreement.

3. Verification.

a. Contractor has confirmed the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement through participation in either the E-Verify Program or the Department Program.

b. Contractor shall not use the E-Verify Program or the Department Program procedures to undertake pre-employment screening of job applicants while this Agreement is being performed.

c. If Contractor obtains actual knowledge that a subcontractor performing work under this Agreement knowingly employs or contracts with an illegal alien who is performing work under the Agreement, Contractor shall:

i. Notify the subcontractor and the City within three (3) days that Contractor has actual knowledge that the subcontractor is employing or contracting with an illegal alien who is performing work under the Agreement; and

ii. Terminate the subcontract with the subcontractor if within three (3) days of receiving the notice required pursuant to subparagraph (a) hereof, the subcontractor does not stop employing or contracting with the illegal alien who is performing work under the Agreement; except that Contractor shall not terminate the contract with the subcontractor if during such three (3) days the subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with an illegal alien who is performing work under the Agreement.

4. Duty to Comply with Investigations. Contractor shall comply with any reasonable request by the Colorado Department of Labor and Employment made in the course of an investigation conducted pursuant to C.R.S. § 8-17.5-102(5)(a) to ensure that Contractor is complying with the terms of this Agreement.

5. If Contractor does not currently employ any employees, Contractor shall sign the No Employee Affidavit attached hereto.

6. If Contractor wishes to verify the lawful presence of newly hired employees who perform work under the Agreement via the Department Program, Contractor shall sign the Department Program Affidavit attached hereto.

l. Keep Jobs in Colorado Act: Pursuant to the Keep Jobs in Colorado Act, C.R.S. 8-17-101 *et seq.* (the "Act") and the rules adopted by the Division of Labor of the Colorado Department of Labor and Employment implementing the Act (the "Rules"), the Contractor shall employ Colorado labor to perform at least eighty percent (80%) of the work and shall obtain and maintain the records required by the Act and the Rules. For purposes of this Section "Colorado labor" means any person who is a resident of the state of Colorado at the time of this Project, without discrimination as to race, color, creed, sex, sexual orientation, marital status, national origin, ancestry, age, or religion except when sex or age is a bona fide qualification. A resident of the state is a person who can provide a valid Colorado driver's license, a valid Colorado state-issued photo identification, or documentation that he or she has resided in Colorado for the last thirty (30) days. Contractor represents that it is familiar with the requirements of the Act and the Rules and will fully comply with same. This Section shall not apply to any project for which appropriation or expenditure of moneys may be reasonably expected not to exceed five hundred thousand dollars ($500,000) in the aggregate for any fiscal year.

ARTICLE 19 - ATTACHMENTS, SCHEDULES AND SIGNATURES

It is further mutually agreed that this Agreement and the contract documents constitute the entire Agreement between the Owner and the Trade Contractor and supersede all prior or oral understandings. This Agreement may only be amended, supplemented, modified, or cancelled by a duly executed written amendment.

IN WITNESS WHEREOF the parties hereto each herewith subscribe the same in triplicate.

CITY OF NORTHGLENN, COLORADO

By: _____

Name: Meredith Leighty

Title: Mayor

ATTEST:

_____
Johanna Small, CMC, City Clerk

APPROVED AS TO FORM:

_____
Corey Y. Hoffmann, City Attorney

TRADE CONTRACTOR

By: _____

Name: **J. C. Marvel, Jr.**

Title: **Member/Manager**

STATE OF COLORADO)
) ss.
COUNTY OF **Adams**)

The foregoing instrument was acknowledged before me this **2nd** day of **April**, 20**20** by **J. C. Marvel, Jr.**, as **Member/Manager** of **Brannan Sand and Gravel Company, LLC**.

My commission expires: 12-10-2022

Witness my hand and official seal.

_____
Notary Public

CHERYL CHENEY
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19984033878
MY COMMISSION EXPIRES 12/10/2022

Bid Summary

Vendor: **Brannan Sand and Gravel Company, LLC**

Hereby submits to the City of Northglenn, Colorado the following bid items complete and in place as specified for the: 2020 Residential Streets Program - IFB 2020-003

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
	Claude Ct - Truda Dr to 115th Ave				
1	Mobilization & Demobilization	1	LS	$ 1,500.00	$ 1,500.00
2	Third Party Materials Testing	1	LS	$ 1,250.00	$ 1,250.00
3	Traffic Control	1	LS	$ 3,750.00	$ 3,750.00
4	1.5" Milling	7176	SY	$ 1.75	$ 12,558.00
5	2" Asphalt	807	TON	$ 65.50	$ 52,858.50
6	Concrete Combination SW/C&G	250	LF	$ 70.00	$ 17,500.00
7	ADA Ramp	2	EA	$ 2,615.00	$ 5,230.00
8	Cross Pan (High Early)	38	SY	$ 250.00	$ 9,500.00
	Total Claude Ct - Truda Dr to 115th Ave				$ 104,146.50
	Quam Dr/Spring Dr - E 119th Pl to E 119th Pl				
9	Mobilization & Demobilization	1	LS	$ 1,500.00	$ 1,500.00
10	Third Party Materials Testing	1	LS	$ 3,250.00	$ 3,250.00
11	Traffic Control	1	LS	$ 8,500.00	$ 8,500.00
12	1.5" Milling	17788	SY	$ 1.75	$ 31,129.00
13	2" Asphalt	1976	TON	$ 76.11	$ 150,393.36
14	Concrete Combination SW/C&G	400	LF	$ 59.00	$ 23,600.00
	Total Quam Dr/Spring Dr - E 119th Pl to E 119th Pl				$ 218,372.36
	Dean Dr/Keough Dr - E 119th Ave to Irma Dr				
15	Mobilization & Demobilization	1	LS	$ 1,750.00	$ 1,750.00
16	Third Party Materials Testing	1	LS	$ 3,250.00	$ 3,250.00
17	Traffic Control	1	LS	$ 8,800.00	$ 8,800.00
18	1.5" Milling	22044	SY	$ 1.60	$ 35,270.40
19	2" Asphalt	2449	TON	$ 76.15	$ 186,491.35
20	Concrete Combination SW/C&G	500	LF	$ 59.00	$ 29,500.00
21	ADA Ramp	7	EA	$ 2,615.00	$ 18,305.00
22	Cross Pan (High Early)	160	SY	$ 255.00	$ 40,800.00
	Total Dean Dr/Keough Dr - E 119th Ave to Irma Dr				$ 324,166.75
	Truda Dr - Irma Dr to Sylvia				
23	Mobilization & Demobilization	1	LS	$ 1,500.00	$ 1,500.00
24	Third Party Materials Testing	1	LS	$ 1,500.00	$ 1,500.00
25	Traffic Control	1	LS	$ 4,500.00	$ 4,500.00
26	1.5" Milling	8272	SY	$ 1.60	$ 13,235.20
27	2" Asphalt	919	TON	$ 78.00	$ 71,682.00
28	Concrete Combination SW/C&G	250	LF	$ 59.00	$ 14,750.00
29	ADA Ramp	7	EA	$ 2,615.00	$ 18,305.00
30	Cross Pan (High Early)	200	SY	$ 240.00	$ 48,000.00
	Total Truda Dr - Irma Dr to Sylvia				$ 173,472.20
	Marion St - Phillips Dr to Malley Dr				
31	Mobilization & Demobilization	1	LS	$ 1,500.00	$ 1,500.00
32	Third Party Materials Testing	1	LS	$ 1,000.00	$ 1,000.00
33	Traffic Control	1	LS	$ 2,500.00	$ 2,500.00
34	1.5" Milling	5628	SY	$ 1.60	$ 9,004.80
35	2" Asphalt	633	TON	$ 76.85	$ 48,646.05
36	Concrete Combination SW/C&G	120	LF	$ 59.00	$ 7,080.00
37	ADA Ramp	2	EA	$ 2,615.00	$ 5,230.00
38	Cross Pan (High Early)	23	SY	$ 255.00	$ 5,865.00
	Total Marion Dr - Phillips Dr to Malley Dr				$ 80,825.85
	Clarkson St - Larson Ln to E 114th Pl				
39	Mobilization & Demobilization	1	LS	$ 1,500.00	$ 1,500.00
40	Third Party Materials Testing	1	LS	$ 1,031.91	$ 1,031.91
41	Traffic Control	1	LS	$ 3,750.00	$ 3,750.00
42	1.5" Milling	6344	SY	$ 1.60	$ 10,150.40
43	2" Asphalt	705	TON	$ 76.99	$ 54,277.95
44	Concrete Combination SW/C&G	260	LF	$ 59.00	$ 15,340.00
45	ADA Ramp	3	EA	$ 2,614.44	$ 7,843.32
46	Cross Pan (High Early)	23	SY	$ 255.00	$ 5,865.00
	Total Clarkson St - Larson Ln to E 114th Pl				$ 99,758.58

	Clarkson St/Charlie St - Muriel Dr to Muriel Dr				
47	Mobilization & Demobilization	1	LS	$ 1,500.00	$ 1,500.00
48	Third Party Materials Testing	1	LS	$ 1,000.00	$ 1,000.00
49	Traffic Control	1	LS	$ 3,750.00	$ 3,750.00
50	1.5" Milling	6160	SY	$ 1.60	$ 9,856.00
51	2" Asphalt	684	TON	$ 77.00	$ 52,668.00
52	Concrete Combination SW/C&G	380	LF	$ 59.00	$ 22,420.00
53	ADA Ramp	2	EA	$ 2,615.00	$ 5,230.00
	Total Clarkson St/Charlie St - Muriel Dr to Muriel Dr				$ 96,424.00
	Ogden Cr/Emerson Cr - Muriel Dr to Muriel Dr				
54	Mobilization & Demobilization	1	LS	$ 1,500.00	$ 1,500.00
55	Third Party Materials Testing	1	LS	$ 1,250.00	$ 1,250.00
56	Traffic Control	1	LS	$ 3,750.00	$ 3,750.00
57	1.5" Milling	6156	SY	$ 1.60	$ 9,849.60
58	2" Asphalt	684	TON	$ 77.75	$ 53,181.00
59	Concrete Combination SW/C&G	430	LF	$ 59.00	$ 25,370.00
60	ADA Ramp	4	EA	$ 2,615.00	$ 10,460.00
61	Preformed Thermoplastic Pavement Marking (X-Walk)	108	SF	$ 11.00	$ 1,188.00
	Total Ogden Cr/Emerson Cr - Muriel Dr to Muriel Dr				$ 106,548.60
	Alvin Dr/109th Pl - Muriel Dr to Muriel Dr				
62	Mobilization & Demobilization	1	LS	$ 1,750.00	$ 1,750.00
63	Third Party Materials Testing	1	LS	$ 1,500.00	$ 1,500.00
64	Traffic Control	1	LS	$ 5,000.00	$ 5,000.00
65	1.5" Milling	10316	SY	$ 1.60	$ 16,505.60
66	2" Asphalt	1146	TON	$ 75.80	$ 86,866.80
67	Concrete Combination SW/C&G	870	LF	$ 59.00	$ 51,330.00
68	ADA Ramp	4	EA	$ 2,615.00	$ 10,460.00
69	Preformed Thermoplastic Pavement Marking (X-Walk)	108	SF	$ 11.00	$ 1,188.00
	Total Alvin Dr/109th Pl - Muriel Dr to Muriel Dr				$ 174,600.40
	Larson Dr - Muriel Dr to E 105th Pl				
70	Mobilization & Demobilization	1	LS	$ 2,500.00	$ 2,500.00
71	Third Party Materials Testing	1	LS	$ 2,000.00	$ 2,000.00
72	Traffic Control	1	LS	$ 6,250.00	$ 6,250.00
73	1.5" Milling	13100	SY	$ 1.60	$ 20,960.00
74	2" Asphalt	1474	TON	$ 76.00	$ 112,024.00
75	Concrete Combination SW/C&G	300	LF	$ 59.00	$ 17,700.00
76	ADA Ramp	11	EA	$ 2,615.00	$ 28,765.00
77	Cross Pan (High Early)	67	SY	$ 255.00	$ 17,085.00
78	Preformed Thermoplastic Pavement Marking (Stopline)	306	SF	$ 11.00	$ 3,366.00
79	Preformed Thermoplastic Pavement Marking (X-Walk)	306	SF	$ 11.00	$ 3,366.00
80	Epoxy Pavement Marking (4")	500	LF	$ 3.00	$ 1,500.00
	Total Larson Dr - Muriel Dr to E 105th Pl				$ 215,516.00
	Leroy Dr - Larson Dr to Irma Dr				
81	Mobilization & Demobilization	1	LS	$ 2,000.00	$ 2,000.00
82	Third Party Materials Testing	1	LS	$ 2,000.00	$ 2,000.00
83	Traffic Control	1	LS	$ 8,500.00	$ 8,500.00
84	1.5" Milling	13420	SY	$ 1.60	$ 21,472.00
85	2" Asphalt	1491	TON	$ 76.25	$ 113,688.75
86	Concrete Combination SW/C&G	750	LF	$ 59.00	$ 44,250.00
87	ADA Ramp	22	EA	$ 2,615.00	$ 57,530.00
88	Cross Pan (High Early)	156	SY	$ 245.00	$ 38,220.00
89	Preformed Thermoplastic Pavement Marking (X-Walk)	648	SF	$ 11.00	$ 7,128.00
	Total Leroy Dr - Larson Dr to Irma Dr				$ 294,788.75
	Downing St/Corona St - E 105th Pl to E 105th Pl				
90	Mobilization & Demobilization	1	LS	$ 1,250.00	$ 1,250.00
91	Third Party Materials Testing	1	LS	$ 1,000.00	$ 1,000.00
92	Traffic Control	1	LS	$ 3,750.00	$ 3,750.00
93	1.5" Milling	6296	SY	$ 1.60	$ 10,073.60
94	2" Asphalt	700	TON	$ 77.15	$ 54,005.00
95	Concrete Combination SW/C&G	250	LF	$ 59.00	$ 14,750.00
96	Cross Pan (High Early)	30	SY	$ 255.00	$ 7,650.00
	Total Downing St/Corona St - E 105th Pl to E 105th Pl				$ 92,478.60

	E 107th Ave - Grant Dr to Lincoln St				
97	Mobilization & Demobilization	1	LS	$ 1,000.00	$ 1,000.00
98	Third Party Materials Testing	1	LS	$ 525.00	$ 525.00
99	Traffic Control	1	LS	$ 2,550.00	$ 2,550.00
100	1.5" Milling	3220	SY	$ 1.60	$ 5,152.00
101	2" Asphalt	358	TON	$ 80.50	$ 28,819.00
102	Concrete Combination SW/C&G	120	LF	$ 59.00	$ 7,080.00
103	ADA Ramp	4	EA	$ 2,615.00	$ 10,460.00
104	Cross Pan (High Early)	23	SY	$ 255.00	$ 5,865.00
	Total E 107th Ave - Grant Dr to Lincoln St				$ 61,451.00
	Northglenn Dr/Highline Dr - Grant Dr to Malley Dr				
105	Mobilization & Demobilization	1	LS	$ 3,250.00	$ 3,250.00
106	Third Party Materials Testing	1	LS	$ 3,000.00	$ 3,000.00
107	Traffic Control	1	LS	$ 11,000.00	$ 11,000.00
108	1.5" Milling	19911	SY	$ 1.60	$ 31,857.60
109	2" Asphalt	2212	TON	$ 76.50	$ 169,218.00
110	Concrete Combination SW/C&G	600	LF	$ 59.00	$ 35,400.00
111	ADA Ramp	13	EA	$ 2,615.00	$ 33,995.00
112	Cross Pan (High Early)	156	SY	$ 255.00	$ 39,780.00
113	Preformed Thermoplastic Pavement Marking (Stopline)	36	SF	$ 11.00	$ 396.00
114	Preformed Thermoplastic Pavement Marking (X-Walk)	180	SF	$ 11.00	$ 1,980.00
115	Epoxy Pavement Marking (4")	410	LF	$ 3.00	$ 1,230.00
	Total Northglenn Dr/Highline Dr - Grant Dr to Malley Dr				$ 331,106.60
	Cherokee St - W 112th Ave - Pinyon Dr				
116	Mobilization & Demobilization	1	LS	$ 1,000.00	$ 1,000.00
117	Third Party Materials Testing	1	LS	$ 525.00	$ 525.00
118	Traffic Control	1	LS	$ 2,550.00	$ 2,550.00
119	1.5" Milling	3800	SY	$ 1.60	$ 6,080.00
120	2" Asphalt	422	TON	$ 79.55	$ 33,570.10
121	Concrete Combination SW/C&G	100	LF	$ 59.00	$ 5,900.00
122	ADA Ramp	2	EA	$ 2,615.00	$ 5,230.00
	Total Cherokee St - W 112th Ave - Pinyon Dr				$ 54,855.10
	Wellington St - Melody Dr to Acoma St				
123	Mobilization & Demobilization	1	LS	$ 1,250.00	$ 1,250.00
124	Third Party Materials Testing	1	LS	$ 800.00	$ 800.00
125	Traffic Control	1	LS	$ 2,850.00	$ 2,850.00
126	1.5" Milling	4492	SY	$ 1.65	$ 7,411.80
127	2" Asphalt	499	TON	$ 79.10	$ 39,470.90
128	Concrete Combination SW/C&G	120	LF	$ 59.00	$ 7,080.00
129	ADA Ramp	4	EA	$ 2,615.00	$ 10,460.00
130	Preformed Thermoplastic Pavement Marking (X-Walk)	108	SF	$ 11.00	$ 1,188.00
	Total Wellington St - Melody Dr to Acoma St				$ 70,510.70
	Kennedy Dr - Huron St to Acoma St				
131	Mobilization & Demobilization	1	LS	$ 5,750.00	$ 5,750.00
132	Third Party Materials Testing	1	LS	$ 1,550.00	$ 1,550.00
133	Traffic Control	1	LS	$ 6,500.00	$ 6,500.00
134	1.5" Milling	9596	SY	$ 1.65	$ 15,833.40
135	2" Asphalt	1066	TON	$ 75.20	$ 80,163.20
136	Concrete Combination SW/C&G	800	LF	$ 59.00	$ 47,200.00
137	ADA Ramp	6	EA	$ 2,615.00	$ 15,690.00
138	Cross Pan (High Early)	45	SY	$ 255.00	$ 11,475.00
139	Preformed Thermoplastic Pavement Marking (Stopline)	36	SF	$ 11.00	$ 396.00
140	Preformed Thermoplastic Pavement Marking (X-Walk)	360	SF	$ 11.00	$ 3,960.00
141	Preformed Thermoplastic Pavement Marking (Yeild)	24	SF	$ 15.50	$ 372.00
142	Preformed Thermoplastic Pavement Marking (Delineator)	48	SF	$ 15.50	$ 744.00
143	Preformed Thermoplastic Pavement Marking (Multi Movement)	40	SF	$ 15.50	$ 620.00
144	Preformed Thermoplastic Pavement Marking (ONLY)	15	SF	$ 15.50	$ 232.50
145	Preformed Thermoplastic Pavement Marking (Turn Arrow)	30	SF	$ 15.50	$ 465.00
146	Chase Drain	1	EA	$ 5,000.00	$ 5,000.00
147	Epoxy Pavement Marking (4")	295	LF	$ 3.00	$ 885.00
	Total Kennedy Dr - Huron St to Acoma St				$ 196,836.10
	Lambert Ln - Claire Ln to Livingston Dr				
148	Mobilization & Demobilization	1	LS	$ 750.00	$ 750.00
149	Third Party Materials Testing	1	LS	$ 750.00	$ 750.00
150	Traffic Control	1	LS	$ 3,250.00	$ 3,250.00
151	1.5" Milling	5020	SY	$ 1.65	$ 8,283.00
152	2" Asphalt	558	TON	$ 77.10	$ 43,021.80
153	Concrete Combination SW/C&G	200	LF	$ 59.00	$ 11,800.00
154	ADA Ramp	4	EA	$ 2,615.00	$ 10,460.00
	Total Lambert Ln - Claire Ln to Livingston Dr				$ 78,314.80

	Livingston Dr - Claire Ln to Lambert Ln				
155	Mobilization & Demobilization	1	LS	$ 750.00	$ 750.00
156	Third Party Materials Testing	1	LS	$ 550.00	$ 550.00
157	Traffic Control	1	LS	$ 2,850.00	$ 2,850.00
158	1.5" Milling	3012	SY	$ 1.65	$ 4,969.80
159	2" Asphalt	335	TON	$ 75.20	$ 25,192.00
160	Concrete Combination SW/C&G	200	LF	$ 59.00	$ 11,800.00
161	ADA Ramp	4	EA	$ 2,615.00	$ 10,460.00
	Total Livingston Dr - Claire Ln to Lambert Ln				$ 56,571.80
	Roseanna Dr - Claire Ln to Kennedy Dr				
161	Mobilization & Demobilization	1	LS	$ 2,000.00	$ 2,000.00
162	Third Party Materials Testing	1	LS	$ 1,250.00	$ 1,250.00
163	Traffic Control	1	LS	$ 3,750.00	$ 3,750.00
164	1.5" Milling	8340	SY	$ 1.65	$ 13,761.00
165	2" Asphalt	927	TON	$ 74.50	$ 69,061.50
166	Concrete Combination SW/C&G	100	LF	$ 59.00	$ 5,900.00
167	ADA Ramp	4	EA	$ 2,615.00	$ 10,460.00
168	Cross Pan (High Early)	45	SY	$ 255.00	$ 11,475.00
169	Epoxy Pavement Marking (4")	475	LF	$ 3.50	$ 1,662.50
	Total Roseanna Dr - Claire Ln to Kennedy Dr				$ 119,320.00
	W 106th Ave - Livingston Dr to Quivas St				
170	Mobilization & Demobilization	1	LS	$ 750.00	$ 750.00
171	Third Party Materials Testing	1	LS	$ 750.00	$ 750.00
172	Traffic Control	1	LS	$ 3,000.00	$ 3,000.00
173	1.5" Milling	5764	SY	$ 1.65	$ 9,510.60
174	2" Asphalt	640	TON	$ 75.00	$ 48,000.00
175	Concrete Combination SW/C&G	230	LF	$ 59.00	$ 13,570.00
176	ADA Ramp	2	EA	$ 2,615.00	$ 5,230.00
177	Cross Pan (High Early)	23	SY	$ 255.00	$ 5,865.00
	Total W 106th Ave - Livingston Dr to Quivas St				$ 86,675.60
	Romblon Way - Quivas St to W 104th Pl				
178	Mobilization & Demobilization	1	LS	$ 750.00	$ 750.00
179	Third Party Materials Testing	1	LS	$ 750.00	$ 750.00
180	Traffic Control	1	LS	$ 3,150.00	$ 3,150.00
181	1.5" Milling	4884	SY	$ 1.65	$ 8,058.60
182	2" Asphalt	543	TON	$ 75.65	$ 41,077.95
183	Concrete Combination SW/C&G	280	LF	$ 59.00	$ 16,520.00
	Total Romblon Way - Quivas St to W 104th Pl				$ 70,306.55
	Tancred St - W 104th Pl to Utrillo Ln				
184	Mobilization & Demobilization	1	LS	$ 750.00	$ 750.00
185	Third Party Materials Testing	1	LS	$ 525.00	$ 525.00
186	Traffic Control	1	LS	$ 2,550.00	$ 2,550.00
187	1.5" Milling	3200	SY	$ 1.65	$ 5,280.00
188	2" Asphalt	356	TON	$ 76.50	$ 27,234.00
189	Concrete Combination SW/C&G	100	LF	$ 59.00	$ 5,900.00
190	ADA Ramp	2	EA	$ 2,615.00	$ 5,230.00
191	Cross Pan (High Early)	23	SY	$ 255.00	$ 5,865.00
	Total Tancred St - W 104th Pl to Utrillo Ln				$ 53,334.00
	Melody Dr - W 104th Ave to Huron St				
191	Mobilization & Demobilization	1	LS	$ 15,000.00	$ 15,000.00
192	Third Party Materials Testing	1	LS	$ 5,000.00	$ 5,000.00
193	Traffic Control	1	LS	$ 30,000.00	$ 30,000.00
194	1.5" Milling	50827	SY	$ 1.50	$ 76,240.50
195	2" Asphalt	5647	TON	$ 71.50	$ 403,760.50
196	Concrete Combination SW/C&G	1600	LF	$ 59.00	$ 94,400.00
197	ADA Ramp	16	EA	$ 2,615.00	$ 41,840.00
198	Cross Pan (High Early)	167	SY	$ 255.00	$ 42,585.00
	Total Melody Dr - W 104th Ave to Huron St				$ 708,826.00

	W 101 St Pl - N Pecos St to Croke Dr				
199	Mobilization & Demobilization	1	LS	$ 750.00	$ 750.00
200	Third Party Materials Testing	1	LS	$ 750.00	$ 750.00
201	Traffic Control	1	LS	$ 3,150.00	$ 3,150.00
202	1.5" Milling	5252	SY	$ 1.65	$ 8,665.80
203	2" Asphalt	584	TON	$ 76.35	$ 44,588.40
204	Concrete Combination SW/C&G	400	LF	$ 59.00	$ 23,600.00
205	ADA Ramp	2	EA	$ 2,615.00	$ 5,230.00
206	Cross Pan (High Early)	23	SY	$ 255.00	$ 5,865.00
	Total W 101 St Pl - N Pecos St to Croke Dr				$ 92,599.20
	104th Ave - Zuni St to I-25				
207	Mobilization & Demobilization	1	LS	$ 75,000.00	$ 75,000.00
208	Third Party Materials Testing	1	LS	$ 12,500.00	$ 12,500.00
209	Traffic Control	1	LS	$ 52,250.00	$ 52,250.00
210	1.5" Milling	73066	SY	$ 1.60	$ 116,905.60
211	2" Asphalt	8118	TON	$ 84.00	$ 681,912.00
212	Concrete Combination SW/C&G	600	LF	$ 59.00	$ 35,400.00
213	ADA Ramp	26	EA	$ 2,615.00	$ 67,990.00
214	Cross Pan (High Early)	550	SY	$ 220.00	$ 121,000.00
215	Curb and Gutter	1000	LF	$ 50.00	$ 50,000.00
216	Preformed Thermoplastic Pavement Marking (Stopline)	1642	SF	$ 11.00	$ 18,062.00
217	Preformed Thermoplastic Pavement Marking (X-Walk)	3690	SF	$ 11.00	$ 40,590.00
218	Preformed Thermoplastic Pavement Marking (ONLY)	60	SF	$ 15.50	$ 930.00
219	Preformed Thermoplastic Pavement Marking (Turn Arrow)	660	SF	$ 15.50	$ 10,230.00
220	Epoxy Pavement Marking (4")	14202	LF	$ 0.85	$ 12,071.70
221	Epoxy Pavement Marking (8")	4733	LF	$ 1.25	$ 5,916.25
	Total 104th Ave - Zuni St to I-25				$ 1,300,757.55
				Total	$ 5,262,563.59
	TOTAL IN WORDS: Five Million Two Hundred Sixty-Two Thousand Five Hundred Sixty-Three Dollars and Fifty-Nine Cents				

DEPARTMENT PROGRAM AFFIDAVIT

(To be completed if Contractor participates in the Department of Labor Lawful Presence Verification Program)

I, J. C. Marvel, Jr.; Member/Manager of Brannan Sand and Gravel Company, LLC, as a public contractor under contract with the City of Northglenn (the "City"), hereby affirm that:

1. I have examined or will examine the legal work status of all employees who are newly hired for employment to perform work under this public contract for services ("Contract") with the City within twenty (20) days after such hiring date;

2. I have retained or will retain file copies of all documents required by 8 U.S.C. § 1324a, which verify the employment eligibility and identity of newly hired employees who perform work under this Contract; and

3. I have not and will not alter or falsify the identification documents for my newly hired employees who perform work under this Contract.

Contractor Signature — April 2, 2020 Date

J. C. Marvel, Jr.; Member/Manager

STATE OF COLORADO)
) ss.
COUNTY OF Adams)

The foregoing instrument was subscribed, sworn to and acknowledged before me this 2nd day of April, 2020, by J. C. Marvel, Jr. as Member/Manager of Brannan Sand and Gravel Company, LLC.

My commission expires: 12-10-2022

(S E A L)

Notary Public

CHERYL CHENEY
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19984033878
MY COMMISSION EXPIRES 12/10/2022

PROSPECTIVE CONTRACTOR'S CERTIFICATE REGARDING EMPLOYING OR CONTRACTING WITH AN ILLEGAL ALIEN

FROM: **Brannan Sand and Gravel Company, LLC**
(Prospective *Contractor*)

TO: City of Northglenn
11701 Community Center Drive
Northglenn, Colorado 80233-8061

Project Name **2020 Residential Streets Program**

Bid Number _____ Project No. _____

As a prospective Contractor for the above-identified bid, I (we) do hereby certify that, as of the date of this certification, I (we) do not knowingly employ or contract with an illegal alien who will perform work under the Agreement and that I (we) will confirm the employment eligibility of all employees who are newly hired for employment to perform work under the Agreement through participation in either the E-Verify Program administered by the United States Department of Homeland Security and Social Security Administration or the Department Program administered by the Colorado Department of Labor and Employment.

Executed this **2nd** day of **April**, 20**20**.

Prospective Contractor **Brannan Sand and Gravel Company, LLc**

By: _____

Title: **J. C. Marvel, Jr.; Member/Manager**