



**City of North St. Paul
City Council
Workshop Meeting Agenda**

**July 16, 2024
5:15 PM**

The City Council Workshop Meeting will be conducted on **July 16, 2024** at 5:15 p.m. in the Council Chambers at City Hall, located at 2400 Margaret St., North St. Paul.

You can also watch the meeting on our YouTube channel here: [**tinyurl.com/NSPYouTube**](https://www.youtube.com/NSPYouTube).

I. Call to Order

II. Roll Call

Council Member Cole
Council Member Schweer
Council Member Wong
Council Member Nordby
Mayor Monge

III. Adopt Agenda

IV. Topic(s)

A. Facility Assessment and Pavement Management Discussions

V. Other Business

VI. Adjournment

The next regularly scheduled City Council Workshop meeting is August 20, 2024



To	Date
Honorable Mayor Monge and City Council	July 16, 2024

Agenda Placement # IV.A

Topic(s)

Subject

Facility Assessment and Pavement Management Discussions

Background/Facts

1. Facility Assessment Discussion by Jonathan Loose, Partner, Wold Architects and Engineers
2. Pavement Management Discussion by Morgan Dawley, Senior Director, WSB

No attachments.

Recommended Action

Attachments

1. NSP - Draft Facility Assessment Report updated
2. 2023 North Saint Paul Pavement Management Report PDF 8.17.2023
3. NSP New 2024 PM Scenario ideas

Respectfully submitted,



City of North Saint Paul

Facility Analysis and Master Planning

Draft Report

North St. Paul, MN

July 2024



Prioritization Categories

Priority 1 (0 - 2 years)

Life Safety Issue	As noted by Fire Marshal/Life Safety Officials
Deterioration Item	Further deterioration will create higher future repair costs or will damage other areas in the building
Health Issue	Rooms with no ventilation or items that do not meet state health code.
Accessibility Issue	Must be completed to provide access into the building, to the curriculum within the building, or to access a restroom or obtain a drink of water
Hazardous Materials	Item posing a significant impact on building occupants

Priority 2 (2 - 5 years)

Energy Issue	Item or system upgrade that results in a payback in 10 years or less
Deterioration Item	Material or system that currently functions but will require replacement or maintenance within 5 years
Health Issue	Inadequate exhaust and ventilation in lab environments and other areas lacking adequate ventilation
Accessibility Issue	Modification required to meet state code guidelines
Hazardous Materials	Removal of items affected by other changes occurring in priority 2.
Modernization	Modification required to support future modernizations

Priority 3 (6 - 10 years)

Energy Issue	Item or system upgrade that results in a payback in more than 10 years
Deterioration Item	Material or system that currently functions but will require replacement or maintenance within 6 to 10 years
Health Issue	Non-tagged items that do not meet state health code requirements
Hazardous Materials	Removal of items affected by other changes occurring in priority 3.

Priority 4 (would like to do within 10 years)

Aesthetic	Item which impacts the visual environment
Hazardous Materials	Removal of items affected by other changes occurring in priority 4.



Facility Analysis
Summary by Building

City of Aurora
Facility Assessment
232150
7/16/2024

	Sum of 2024 Cost
Public Works	
Accessibility	\$4,700.00
Exterior	\$364,400.00
Interior	\$281,500.00
Mechanical Systems	\$813,500.00
Site	\$243,500.00
Public Works Total	\$1,707,600.00
City Hall, Fire, and Police	
Accessibility	\$5,800.00
Exterior	\$115,300.00
Interior	\$590,700.00
Mechanical Systems	\$850,800.00
Site	\$251,300.00
City Hall, Fire, and Police Total	\$1,813,900.00
City Hall Trash Building	
Exterior	\$2,900.00
City Hall Trash Building Total	\$2,900.00
Casey Park Booya Building	
Exterior	\$2,900.00
Interior	\$3,200.00
Mechanical Systems	\$0.00
Casey Park Booya Building Total	\$6,100.00
Casey Park Event Building	
Interior	\$14,400.00
Casey Park Event Building Total	\$14,400.00
Casey Park Open Air Shelter	
Exterior	\$700.00
Casey Park Open Air Shelter Total	\$700.00
Hause Park Building	
Accessibility	\$1,600.00
Mechanical Systems	\$13,700.00
Hause Park Building Total	\$15,300.00
Hause Open Air Shelter	
Exterior	\$1,900.00
Hause Open Air Shelter Total	\$1,900.00
Northwood Park Building	
Exterior	\$16,800.00
Interior	\$52,600.00
Mechanical Systems	\$55,500.00
Site	\$2,100.00
Northwood Park Building Total	\$127,000.00
Northwood Park Open Air Shelter	
Exterior	\$4,700.00
Northwood Park Open Air Shelter Total	\$4,700.00
McKnight Concession Stand Building	
Accessibility	\$101,900.00
Exterior	\$83,500.00
Interior	\$21,000.00
Site	\$80,000.00
McKnight Concession Stand Building Total	\$286,400.00
McKnight Baseball Pressbox	
Accessibility	\$100,000.00
Exterior	\$39,100.00
Site	\$60,600.00
McKnight Baseball Pressbox Total	\$199,700.00
Batting Cage Building	
Exterior	\$13,100.00
Batting Cage Building Total	\$13,100.00
McKnight Garage	
Exterior	\$45,400.00
McKnight Garage Total	\$45,400.00
Well #1 Building	
Electrical Systems	\$10,500.00
Exterior	\$14,200.00
Interior	\$4,400.00
Mechanical Systems	\$23,600.00
Well #1 Building Total	\$52,700.00
Well #2 Building	
Electrical Systems	\$8,000.00
Exterior	\$8,400.00
Interior	\$2,200.00
Mechanical Systems	\$24,300.00
Site	\$300.00
Well #2 Building Total	\$43,200.00
Well #3 Building	
Electrical Systems	\$4,000.00
Exterior	\$20,100.00
Interior	\$3,000.00
Mechanical Systems	\$6,800.00
Well #3 Building Total	\$33,900.00
Well #3 Building	
Electrical Systems	\$100.00
Well #3 Building Total	\$100.00
Well #4 Building	
Electrical Systems	\$2,400.00
Exterior	\$34,600.00
Interior	\$2,600.00
Mechanical Systems	\$17,000.00
Well #4 Building Total	\$56,600.00
Well #5 Building	
Electrical Systems	\$500.00
Exterior	\$8,700.00
Interior	\$5,600.00
Mechanical Systems	\$24,000.00



Facility Analysis
Summary by Building

City of Aurora
Facility Assessment
232150
7/16/2024

	Sum of 2024 Cost
Site	\$7,200.00
Well #5 Building Total	\$46,000.00
Well Generator #2 Building	
Mechanical Systems	\$1,000.00
Well Generator #2 Building Total	\$1,000.00
Well Generator #5 Building	
Mechanical Systems	\$5,000.00
Well Generator #5 Building Total	\$5,000.00
Mcknight Field Concessions	
Mechanical Systems	\$40,000.00
Mcknight Field Concessions Total	\$40,000.00
Mcknight Pressbox	
Mechanical Systems	\$25,000.00
Mcknight Pressbox Total	\$25,000.00
Casey Park Building	
Mechanical Systems	\$0.00
Casey Park Building Total	\$0.00
Silver Lake Park Building	
Mechanical Systems	\$8,900.00
Silver Lake Park Building Total	\$8,900.00
Seppala Boulevard Trash Building	
Exterior	\$87,500.00
Site	\$100.00
Seppala Boulevard Trash Building Total	\$87,600.00
Silver Lake Building	
Accessibility	\$800.00
Silver Lake Building Total	\$800.00
Silver Lake Open Air Shelter	
Exterior	\$1,100.00
Silver Lake Open Air Shelter Total	\$1,100.00
Well #2 Generator Building	
Exterior	\$43,300.00
Site	\$1,900.00
Well #2 Generator Building Total	\$45,200.00
Well #5 Generator Building	
Exterior	\$2,800.00
Interior	\$1,300.00
Well #5 Generator Building Total	\$4,100.00
Grand Total	\$4,691,800.00



Facility Analysis
Summary by Building

City of Aurora
Facility Assessment
232150
7/16/2024

	Sum of 2024 Cost	Priority
Public Works		
Accessibility		
Remove and replace sinks with ADA height sinks and countertops.	\$4,700.00	4
Accessibility Total	\$4,700.00	4
Exterior		
Acid wash masonry around building to remove salt discoloration.	\$12,000.00	3
Remove and replace flashing to repair water leak issues.	\$700.00	1
Repair holes from equipment screen roof penetrations.	\$3,600.00	2
Remove and replace Bifold and OH garage doors.	\$45,000.00	2
Remove portion of caulking at precast wall and recaulk.	\$100.00	1
Remove dirt bay masonry units and replace with cast in place concrete bay.	\$301,600.00	4
Remove and replace salt shed metal fascia/ coping.	\$1,400.00	4
Exterior Total	\$364,400.00	17
Interior		
Paint all interior walls.	\$99,600.00	3
Remove and replace upper and lower casework and countertops.	\$11,900.00	3
Remove and replace ACT ceiling including all hangers and grid.	\$22,800.00	3
Paint all steel bollards.	\$1,500.00	4
Remove and replace all vinyl base in the office area.	\$1,500.00	2
Remove and replace hydraulic lift in shop to meet 15000 lb capacity	\$100,000.00	2
Repair precast panel joints at areas of water/ moisture leaking.	\$200.00	3
Repair minor cracks in the mezzanine concrete floor.	\$12,000.00	4
Remove blinds in the offices with roller blinds.	\$6,000.00	3
Replace windows that have drafts.	\$26,000.00	3
Interior Total	\$281,500.00	30
Mechanical Systems		
Clean ductwork and grilles	\$70,000.00	1
Replace pumps	\$18,000.00	3
Replace water heater	\$25,000.00	3
Replace aging infrared heaters	\$60,000.00	3
Replace air handlers and VAV boxes	\$98,000.00	3
Replace make-up air units and exhaust fans	\$487,500.00	3
Replace aging boilers	\$40,000.00	3
Replace aging condensing units	\$15,000.00	2
Mechanical Systems Total	\$813,500.00	21
Site		
Remove and replace existing concrete walk.	\$4,800.00	3
Remove brick on retaining wall and replace.	\$2,300.00	3
Remove precast retaining wall cap and replace.	\$7,500.00	3
Remove and replace asphalt in parking lot, and repaint striping lines.	\$228,900.00	3
Site Total	\$243,500.00	12
Public Works Total	\$1,707,600.00	84
(blank)		
(bblank)		
(bblank)	\$1,500.00	
(blank) Total	\$1,500.00	
(blank) Total	\$1,500.00	
City Hall, Fire, and Police		
Accessibility		
Remove and replace sinks with ADA height sinks and countertops.	\$3,200.00	4
Add grab bars to create ambulatory toilet stalls.	\$1,600.00	4
Add ADA shower benches to locker room showers.	\$1,000.00	4
Install handicap actuators on council chambers doors to meet ADA.	\$0.00	4
Accessibility Total	\$5,800.00	16
Exterior		
Remove and replace hollow metal doors and frames.	\$22,400.00	4
Acid wash masonry around building to remove salt discoloration.	\$0.00	3
Remove and replace OH Doors.	\$90,000.00	3
Remove and replace flashing to repair water leak issues.	\$900.00	1
Remove and replace damaged masonry units on east side of Fire station.	\$1,500.00	4
Paint steel lintel above OH door that has been scraped.	\$100.00	4
Remove and replace OH Door seals.	\$400.00	4
Exterior Total	\$115,300.00	23
Interior		
Paint all interior walls.	\$137,100.00	4
Remove and replace carpet including all adhesives and tack strips.	\$212,500.00	4
Remove and replace epoxy garage floor finish.	\$77,000.00	3
Remove and replace vinyl wall covering up to 4' AFF.	\$700.00	4
Remove and replace ballistic rated glass.	\$4,800.00	4
Remove and replace upper and lower casework and countertops.	\$45,500.00	2
Patch and paint wall scuffs.	\$200.00	3
Remove and replace room signage tags.	\$1,000.00	4
Remove and replace ACT ceiling including all hangers and grid.	\$78,200.00	4
Remove and replace Fire floor water access doors.	\$3,000.00	2
Remove and replace fire shower ceramic tile.	\$2,300.00	3
Remove and replace council chambers acoustic wall panels.	\$17,600.00	4
Remove and replace VCT flooring.	\$8,700.00	4
Paint scuffed HM frame.	\$2,100.00	4
Interior Total	\$590,700.00	49
Mechanical Systems		
Replace aging air handlers and VAV boxes	\$427,500.00	2
Replace aging make-up air units and exhaust fans	\$191,300.00	2
Clean ductwork and grilles	\$41,300.00	2
Replace aging CRAC units	\$30,000.00	1
Replace two aging boilers	\$40,000.00	2
Replace pumps	\$4,500.00	2



Facility Analysis
Summary by Building

City of Aurora
Facility Assessment
232150
7/16/2024

	Sum of 2024 Cost	Priority
Replace water heater	\$12,500.00	2
Replace aging infrared heaters	\$50,000.00	3
Replace rusty cabinet unit heater in front entry	\$2,500.00	2
Replace rusted floor water boxes in the apparatus bay	\$20,000.00	2
Replace aging flammable waste traps	\$30,000.00	2
Replace leaking soap pipe near police garage	\$1,200.00	1
Mechanical Systems Total	\$850,800.00	23
Site		
Remove and replace retaining wall mortar and caulking joints.	\$300.00	3
Remove and replace asphalt in parking lot, and repaint striping lines.	\$98,000.00	3
Remove and replace concrete aprons and curbs.	\$153,000.00	3
Site Total	\$251,300.00	9
City Hall, Fire, and Police Total	\$1,813,900.00	120
City Hall Trash Building		
Exterior		
Remove precast wall cap and replace.	\$2,900.00	3
Exterior Total	\$2,900.00	3
City Hall Trash Building Total	\$2,900.00	3
Casey Park Booya Building		
Exterior		
Reseal the underside of the wood ceiling soffit.	\$2,300.00	3
Patch hardie board holes in siding.	\$400.00	3
Remove and replace portion of metal downspout that has been damaged.	\$0.00	4
Patch damaged concrete block as base of building.	\$200.00	3
Exterior Total	\$2,900.00	13
Interior		
Paint all interior walls.	\$3,200.00	4
Interior Total	\$3,200.00	4
Mechanical Systems		
(blank)	\$0.00	
Mechanical Systems Total	\$0.00	
Casey Park Booya Building Total	\$6,100.00	17
Casey Park Event Building		
Interior		
Paint all interior walls.	\$3,900.00	4
Reseal the underside of the wood ceiling soffit.	\$10,500.00	3
Remove and replace vinyl wall covering.	\$0.00	4
Interior Total	\$14,400.00	11
Casey Park Event Building Total	\$14,400.00	11
Casey Park Open Air Shelter		
Exterior		
Prep and paint entire shelter.	\$700.00	4
Exterior Total	\$700.00	4
Casey Park Open Air Shelter Total	\$700.00	4
Hause Park Building		
Accessibility		
Remove and replace kitchen sink to meet ADA height for sink.	\$1,600.00	4
Accessibility Total	\$1,600.00	4
Mechanical Systems		
Replace water heater	\$5,000.00	2
Provide lav trap wrap	\$600.00	1
Provide a return grille	\$300.00	2
Provide sealant at gas pipe	\$300.00	1
Provide ventilation air to the main room by adding air exchanger	\$7,500.00	1
Mechanical Systems Total	\$13,700.00	7
Hause Park Building Total	\$15,300.00	11
Hause Open Air Shelter		
Exterior		
Prep and paint entire shelter.	\$1,900.00	4
Exterior Total	\$1,900.00	4
Hause Open Air Shelter Total	\$1,900.00	4
Northwood Park Building		
Exterior		
Remove and replace roof shingles and metal coping.	\$16,800.00	4
Exterior Total	\$16,800.00	4
Interior		
Paint all interior walls.	\$1,400.00	4
Remove and replace windows.	\$4,200.00	3
Remove and replace HM door and frames.	\$34,200.00	3
Remove and replace rubber floor mats.	\$12,800.00	3
Interior Total	\$52,600.00	13
Mechanical Systems		
Replace water heater	\$3,500.00	2
Provide ventilation air to the main room	\$25,000.00	1
Provide toilet room exhaust	\$7,000.00	1
Replace plumbing fixtures	\$15,000.00	1
Repair underground water pipe to drinking fountain	\$5,000.00	2
Mechanical Systems Total	\$55,500.00	7
Site		
Remove and replace concrete walkway.	\$2,100.00	4
Site Total	\$2,100.00	4



Facility Analysis
Summary by Building

City of Aurora
Facility Assessment
232150
7/16/2024

	Sum of 2024 Cost	Priority
Northwood Park Building Total	\$127,000.00	28
Northwood Park Open Air Shelter		
Exterior		
Prep and paint entire shelter.	\$4,700.00	4
Exterior Total	\$4,700.00	4
Northwood Park Open Air Shelter Total	\$4,700.00	4
McKnight Concession Stand Building		
Accessibility		
Add grab bars to create ambulatory toilet stalls.	\$1,600.00	4
Add concrete ramps to allow for accessible access to public restrooms.	\$300.00	4
Add elevator to allow for accessible access to upper level.	\$100,000.00	4
Accessibility Total	\$101,900.00	12
Exterior		
Acid wash masonry around building to remove salt discoloration.	\$100.00	4
Remove and replace roof shingles and metal coping.	\$36,400.00	4
Remove and replace windows.	\$18,800.00	3
Remove and replace HM door and frames.	\$16,800.00	3
Remove and replace coiling doors including all tracks, etc.	\$11,400.00	3
Exterior Total	\$83,500.00	17
Interior		
Remove and replace carpet including all adhesives and tack strips.	\$500.00	3
Remove and replace upper and lower casework and countertops.	\$8,000.00	3
Remove and replace countertops.	\$9,800.00	3
Remove and replace ceiling mounted light fixtures.	\$2,700.00	3
Interior Total	\$21,000.00	12
Site		
Remove and replace asphalt in park.	\$80,000.00	4
Site Total	\$80,000.00	4
McKnight Concession Stand Building Total	\$286,400.00	45
McKnight Baseball Pressbox		
Accessibility		
Add elevator to allow for accessible access to upper level.	\$100,000.00	4
Accessibility Total	\$100,000.00	4
Exterior		
Remove and replace windows.	\$2,000.00	3
Remove and replace coiling doors including all tracks, etc.	\$17,100.00	3
Remove and replace wood stairs with composite decking stairs.	\$20,000.00	3
Exterior Total	\$39,100.00	9
Site		
Remove and replace asphalt.	\$60,000.00	4
Remove and replace concrete apron.	\$600.00	4
Site Total	\$60,600.00	8
McKnight Baseball Pressbox Total	\$199,700.00	21
Batting Cage Building		
Exterior		
Remove and replace windows.	\$4,700.00	4
Remove and replace HM door and frames.	\$8,400.00	4
Exterior Total	\$13,100.00	8
Batting Cage Building Total	\$13,100.00	8
McKnight Garage		
Exterior		
Remove and replace roof shingles and metal coping.	\$20,800.00	3
Replace exterior walls and wood studs.	\$9,600.00	3
Remove and replace OH Door including all tracks, etc.	\$15,000.00	3
Exterior Total	\$45,400.00	9
McKnight Garage Total	\$45,400.00	9
Well #1 Building		
Electrical Systems		
Replace aging service entrance panelboard	\$2,500.00	3
Replace aging receptacles	\$2,400.00	3
Replace fluoride room lighting	\$300.00	4
Replace exterior lighting	\$5,000.00	4
Add vacancy sensors to interior rooms	\$300.00	3
Electrical Systems Total	\$10,500.00	17
Exterior		
Acid wash masonry around building to remove salt discoloration.	\$1,400.00	2
Remove and replace damaged brick on exterior.	\$1,500.00	2
Paint HM doors, louvers, and frames.	\$11,300.00	4
Remove and replace metal downspout that has been damaged.	\$0.00	3
Exterior Total	\$14,200.00	11
Interior		
Paint all interior walls.	\$2,700.00	3
Remove and replace epoxy floor finish.	\$1,700.00	3
Interior Total	\$4,400.00	6
Mechanical Systems		
Replace exhaust fans	\$7,000.00	2
Provide new electric heater	\$1,000.00	2
Replace floor drain grate	\$300.00	2
Provide caulk around gas meter pipe	\$300.00	1
Provide VFD on well pump	\$15,000.00	2
Mechanical Systems Total	\$23,600.00	9



Facility Analysis
Summary by Building

City of Aurora
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232150
7/16/2024

	Sum of 2024 Cost	Priority
Well #1 Building Total	\$52,700.00	43
Well #2 Building		
Electrical Systems		
Replace aging service entrance panelboard	\$2,500.00	3
Replace aging receptacles	\$2,400.00	3
Replace fluoride room lighting	\$300.00	4
Replace exterior lighting	\$2,500.00	4
Add vacancy sensors to interior rooms	\$300.00	3
Electrical Systems Total	\$8,000.00	17
Exterior		
Remove and replace HM door and frames.	\$8,400.00	3
Remove and replace metal downspout that has been damaged.	\$0.00	4
Exterior Total	\$8,400.00	7
Interior		
Remove and replace epoxy floor finish.	\$2,200.00	3
Interior Total	\$2,200.00	3
Mechanical Systems		
Replace exhaust fans	\$7,000.00	2
Provide new electric heater	\$2,000.00	2
Replace floor drain grate	\$300.00	2
Provide VFD on well pump	\$15,000.00	2
Mechanical Systems Total	\$24,300.00	8
Site		
Patch cracks in concrete steps.	\$300.00	3
Site Total	\$300.00	3
Well #2 Building Total	\$43,200.00	38
Well #3 Building		
Electrical Systems		
Replace aging service entrance panelboard	\$100.00	3
Replace fluoride room lighting	\$100.00	4
Replace exterior lighting	\$3,600.00	4
Add vacancy sensors to interior rooms	\$200.00	3
Electrical Systems Total	\$4,000.00	14
Exterior		
Acid wash masonry around building to remove salt discoloration.	\$1,800.00	2
Remove and replace HM door and frames.	\$8,400.00	3
Remove and replace wood trim around windows.	\$300.00	3
Infill windows with masonry units.	\$6,000.00	3
Remove and replace damaged concrete block.	\$3,600.00	3
Exterior Total	\$20,100.00	14
Interior		
Remove and replace epoxy floor finish.	\$3,000.00	3
Interior Total	\$3,000.00	3
Mechanical Systems		
Replace exhaust fans	\$3,500.00	2
Provide new electric heater	\$1,000.00	2
Replace floor drain grate	\$300.00	2
Replace motorized dampers and actuators	\$2,000.00	2
Mechanical Systems Total	\$6,800.00	8
Well #3 Building Total	\$33,900.00	39
Well #3Building		
Electrical Systems		
Replace aging receptacles	\$100.00	3
Electrical Systems Total	\$100.00	3
Well #3Building Total	\$100.00	3
Well #4 Building		
Electrical Systems		
Replace aging service entrance panelboard	\$100.00	3
Replace aging receptacles	\$500.00	3
Replace fluoride room lighting	\$100.00	4
Replace exterior lighting	\$1,600.00	4
Add vacancy sensors to interior rooms	\$100.00	3
Electrical Systems Total	\$2,400.00	17
Exterior		
Remove and replace HM door and frames.	\$5,600.00	3
Remove and replace damaged brick on exterior.	\$1,800.00	2
Remove and replace asphalt shingles and metal coping.	\$27,100.00	2
Prep and paint exterior columns.	\$100.00	2
Exterior Total	\$34,600.00	9
Interior		
Remove and replace epoxy floor finish.	\$2,600.00	3
Interior Total	\$2,600.00	3
Mechanical Systems		
Provide VFD on well pump	\$15,000.00	2
Repair motorized damper and actuator	\$1,000.00	1
Reroute fluoride vent	\$1,000.00	2
Mechanical Systems Total	\$17,000.00	5
Well #4 Building Total	\$56,600.00	34
Well #5 Building		
Electrical Systems		



Facility Analysis
Summary by Building

City of Aurora
Facility Assessment
232150
7/16/2024

	Sum of 2024 Cost	Priority
Replace aging service entrance panelboard	\$100.00	3
Replace aging receptacles	\$100.00	3
Replace fluoride room lighting	\$100.00	4
Replace exterior lighting	\$100.00	4
Add vacancy sensors to interior rooms	\$100.00	3
Electrical Systems Total	\$500.00	17
Exterior		
Remove and replace HM door and frames.	\$8,400.00	4
Paint louver frame.	\$300.00	3
Exterior Total	\$8,700.00	7
Interior		
Paint all interior walls.	\$2,500.00	4
Remove and replace epoxy floor finish.	\$3,100.00	4
Interior Total	\$5,600.00	8
Mechanical Systems		
Replace exhaust fans	\$7,000.00	2
Provide VFD on well pump	\$15,000.00	2
Remove gas unit heater and gas meter	\$2,000.00	2
Mechanical Systems Total	\$24,000.00	6
Site		
Remove and replace asphalt drive.	\$7,200.00	4
Site Total	\$7,200.00	4
Well #5 Building Total	\$46,000.00	42
Well Generator #2 Building		
Mechanical Systems		
Reattach sound attenuator	\$1,000.00	2
Mechanical Systems Total	\$1,000.00	2
Well Generator #2 Building Total	\$1,000.00	2
Well Generator #5 Building		
Mechanical Systems		
Replace exhaust fan	\$3,500.00	2
Paint the exterior diesel storage tank	\$1,500.00	2
Mechanical Systems Total	\$5,000.00	4
Well Generator #5 Building Total	\$5,000.00	4
Mcknight Field Concessions		
Mechanical Systems		
Replace kitchen hood and exhaust fan	\$15,000.00	1
Provide ventilation air to the upstairs room	\$25,000.00	1
Mechanical Systems Total	\$40,000.00	2
Mcknight Field Concessions Total	\$40,000.00	2
Mcknight Pressbox		
Mechanical Systems		
Provide ventilation	\$25,000.00	1
Mechanical Systems Total	\$25,000.00	1
Mcknight Pressbox Total	\$25,000.00	1
Casey Park Building		
Mechanical Systems		
(blank)	\$0.00	
Mechanical Systems Total	\$0.00	
Casey Park Building Total	\$0.00	
Silver Lake Park Building		
Mechanical Systems		
Provide lav trap wrap	\$600.00	1
Provide ceiling fans routed to the building exterior	\$7,000.00	1
Clean EWC drain	\$300.00	1
Provide caulking around plumbing fixtures	\$1,000.00	2
Mechanical Systems Total	\$8,900.00	5
Silver Lake Park Building Total	\$8,900.00	5
Seppala Boulevard Trash Building		
Exterior		
Remove and replace masonry walls.	\$71,900.00	3
Remove and replace asphalt shingle roof including wood structure.	\$15,600.00	3
Exterior Total	\$87,500.00	6
Site		
Prep and paint metal bollards.	\$100.00	4
Site Total	\$100.00	4
Seppala Boulevard Trash Building Total	\$87,600.00	10
Silver Lake Building		
Accessibility		
Add grab bars to create ambulatory toilet stalls.	\$800.00	4
Accessibility Total	\$800.00	4
Silver Lake Building Total	\$800.00	4
Silver Lake Open Air Shelter		
Exterior		
Prep and paint entire shelter.	\$1,100.00	4
Exterior Total	\$1,100.00	4
Silver Lake Open Air Shelter Total	\$1,100.00	4
Well #2 Generator Building		
Exterior		
Remove and replace damaged brick on exterior.	\$400.00	4



Facility Analysis
Summary by Building

City of Aurora
Facility Assessment
232150
7/16/2024

	Sum of 2024 Cost	Priority
Remove and replace built up roof and metal coping.	\$42,000.00	4
Remove intake louver and reanchor into brick and caulk around it.	\$800.00	3
Acid wash masonry around building to remove discoloration.	\$100.00	3
Exterior Total	\$43,300.00	14
Site		
Remove and replace concrete aprons.	\$1,900.00	3
Site Total	\$1,900.00	3
Well #2 Generator Building Total	\$45,200.00	17
Well #5 Generator Building		
Exterior		
Remove and replace HM door and frames.	\$2,800.00	4
Exterior Total	\$2,800.00	4
Interior		
Paint all interior walls.	\$1,300.00	4
Interior Total	\$1,300.00	4
Well #5 Generator Building Total	\$4,100.00	8
Grand Total	\$4,691,800.00	625

August 17, 2023

2023 PAVEMENT MANAGEMENT REPORT

North Saint Paul, MN



**NORTH
ST. PAUL**

PREPARED FOR:

CITY OF NORTH SAINT PAUL

2400 MARGARET STREET

NORTH SAINT PAUL, MN 55109

WSB PROJECT NUMBER: 022578-000



Table of Contents

I. Executive Summary	2
II. Introduction	5
III. Pavement Condition Report Update	6
Pavement Lifecycle	6
Existing Pavement Conditions	7
IV. Pavement Maintenance and Rehabilitation Techniques	8
Minimal Maintenance	8
Routine Maintenance	8
Repair	8
Reconstruction	9
Recent Maintenance Examples	10
Pavement Forensics	12
V. Pavement Management Scenarios	13
Scenario 1: No Maintenance	13
Scenario 2: Projects Completed in 2025 and 2027	14
Scenario 3: Projects in 2023-2028	15
Spending and Maintenance Recommendations	16
Appendices	20
Appendix A: PCI Condition Category Maps	21
Appendix B: PCI Values by Segment	22
Appendix C: PCI Examples Pictures	36

I. Executive Summary

This report summarizes the findings of the pavement inspection of the road segments in North Saint Paul performed by WSB & Associates and completed in June 2023. The report gives an overview of the condition of roads in the city but is not intended to be a final document on public policy or city planning and is subjected to change upon review by City Council. Additionally, pavement analysis was performed using the PAVER program to project the future condition of the City's pavement and make maintenance recommendations. Several scenarios were provided by the City and tested to help guide future maintenance planning.

A summary of the pavement condition report is listed below:

- In 2023, approximately 16 of the 48 miles of paved roads in North Saint Paul were inspected. WSB is currently working to evaluate every road in North Saint Paul over a 3-year period with the last third to be inspected in 2024. A similar inspection was conducted in 2017 through 2019.
- The current weighted average Pavement Condition Index (PCI) for all roads in North Saint Paul is 56.6. PCI is based on a 0 to 100 scale, with higher PCI values corresponding to better road conditions. This weighted average is calculated from the PCI values generated on each segment of roadway. A road's PCI is based on the quantity and severity of pavement distresses identified in the field. Any type of road maintenance (i.e. patching or crack sealing) done prior to inspections is accounted for in the PCI value.
- To provide accurate PCI values for segments not evaluate in 2023, a standard pavement degradation curve was used to extrapolate a road's condition from its most recent inspection.

In addition to system wide average PCI, WSB tracks the average condition of several categories of pavement in North Saint Paul. Figure 1. shows the weighted average PCI for collector, local, bituminous, concrete, and alleyway segments. Additionally, data going back to the previous time this section of the City was inspected is shown to track condition trends.

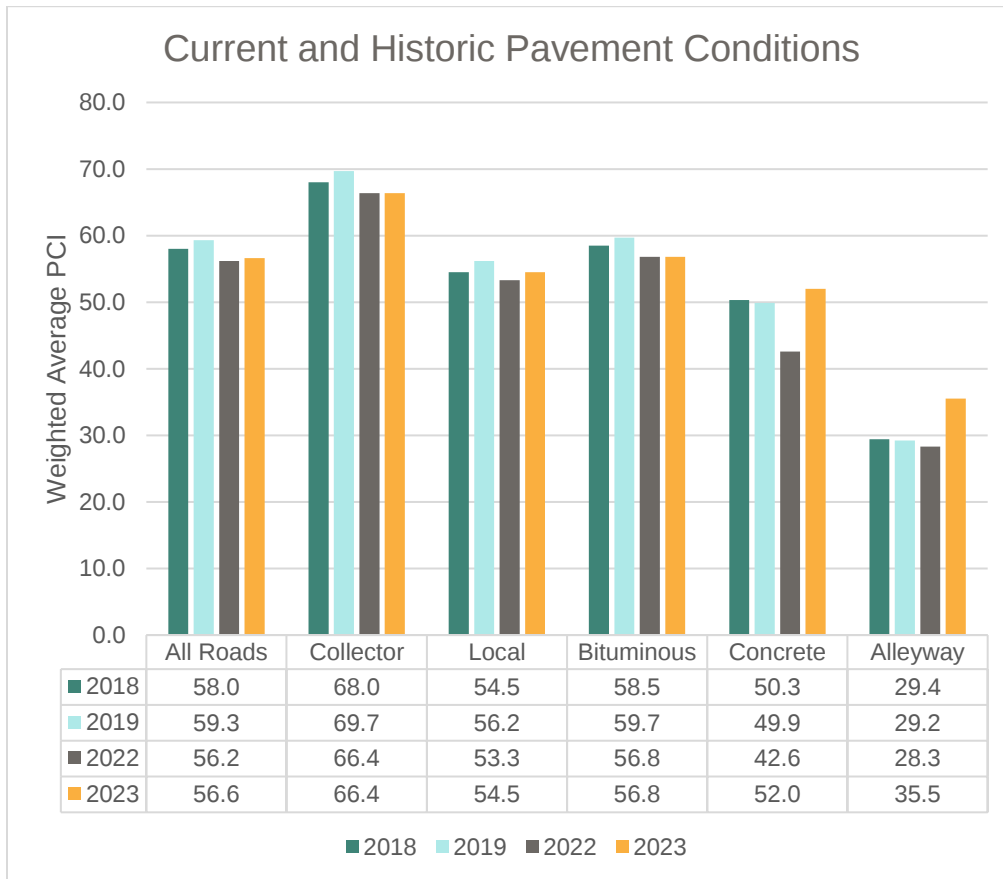


Figure I.1. PCI Values for Each Category of Pavement.

The data shows the City's pavement has continued to remain in relatively steady condition over the past several years. Compared to last year, most categories saw a marginal increase in condition with the biggest jumps coming from the Concrete and Alleyway categories. A few of the concrete segments were reconstructed in 2023 which caused a significant increase since there are comparatively few concrete segments in North Sain Paul's network. This year, our pavement inspector encountered many alleys that had appeared to have been patched which can provide a short-term increase in pavement condition. Outside of these increases, no significant trends were detected across the categories.

The analysis included aims to help the City determine the best path to meet their pavement condition goals. Three different scenarios were tested to show potential impacts to Average PCI. Each version of the model examined different budgets or goals that could possibly get implemented over the next six years. A summary of the results is displayed in Table I.1.

Table I.1. 5-Year CIP Scenario Comparison

Scenario	2029 Average PCI
1: No Maintenance	41.4
2: 2025 & 2027 Project	43.6
3: 2023-2028 Projects	52.4

The City has shown the ability to maintain the current condition of their pavement network. Good decision making will be crucial moving forward since the test scenarios results show implementing the work tested will not be enough to maintain the current average PCI. However, the results show how investing in major rehabilitation projects each year can significantly influence average PCI.

II. Introduction

A pavement management program includes a systematic method of conducting a detailed distress survey to evaluate the condition of roads in a network, followed by performing a cost-effective analysis of various maintenance and rehabilitation strategies. This assists decision makers in making the best decision on the use of available resources. The pavement management ideology, if successfully implemented, can result in improvement of the life cycle costs, performance, and service life of roads. The main objectives of a pavement management program are to maintain a high-level network, evaluate the effectiveness of different alternatives, and optimize timing of maintenance and rehabilitation activities. These objectives can be met by routinely conducting inspections and determining the condition of a system of roads. The data is typically managed within a pavement management software which can manage, sort, and store the collected information. Through this software, various models can be generated that allows the user to customize maintenance protocols, run different budget scenarios, and evaluate the outcomes of each scenario.

By conducting a pavement management analysis, the City is showing their willingness to continue looking for ways to improve their network of roads and extend the life of their pavement. On top of that, the benefits of a pavement management program extend beyond helping a City improve the average condition of its pavement. Better pavement results in less wear and damage to vehicles that travel the roads. Extending the life of a road reduces the frequency of major reconstruction projects that require lengthy detours and delays to travelers. Safety is improved by giving drivers a surface that allows them to stop quickly and predictably. Achieving the maximum service life of a road is also more sustainable for the environment by reducing the amount of material and fuel that is needed when pavement needs to be completely replaced.

Overall, a pavement management plan should improve the safety for a road network's users and the sustainability of its pavement maintenance while minimizing the costs to taxpayers. This document is designed to act as a guide to help the City manage its pavement. However, it is not the only source of information decision makers should use. It is important to also consult with maintenance staff and review other factors that cannot be accurately included a model. Circumstances unique to a specific City are hard to capture in a scientific analysis and may take precedent over the recommendations provided.

III. Pavement Condition Report Update

Pavement Lifecycle

Pavement is constructed to meet the demands of traffic and the environment for a certain design period. The Pavement Condition Index (PCI) of the roadway declines as traffic and time slowly take their toll on newly constructed pavement. Figure III.1. shows the typical life expectancy of pavement based on data obtained from the Army Corps of Engineers.

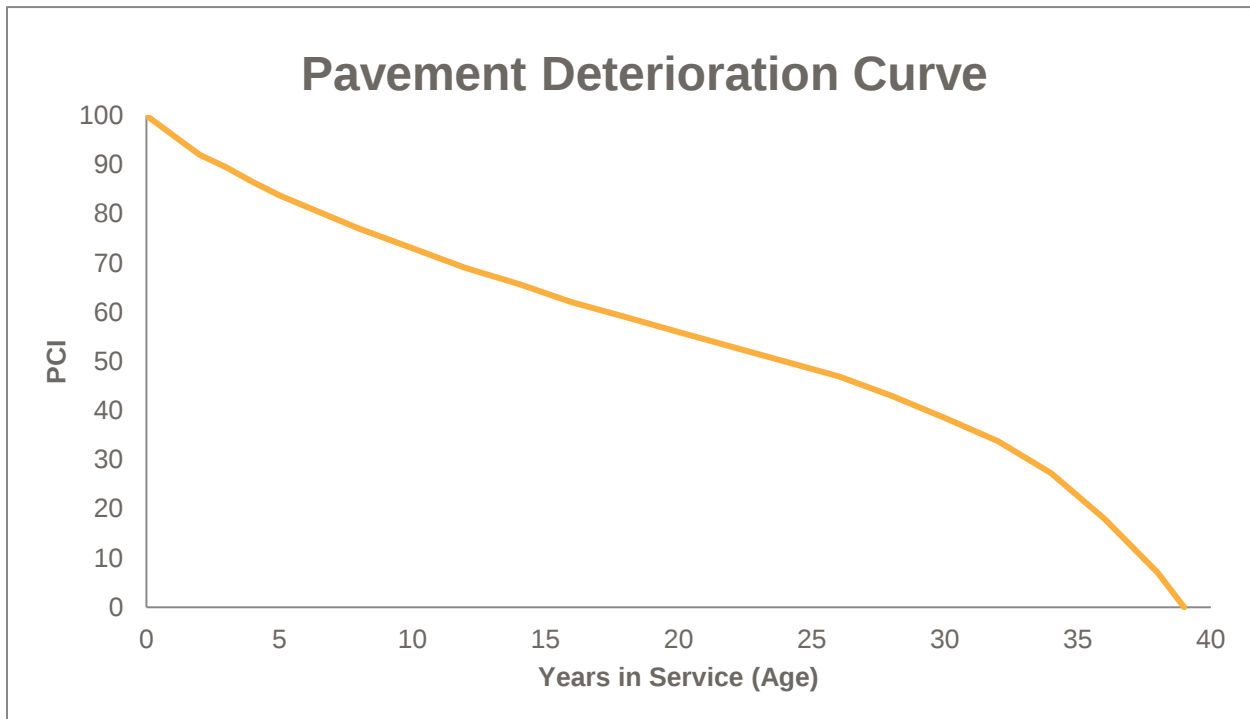


Figure III.1. Typical Pavement Deterioration Curve

This curve exhibits standard behavior when no maintenance is implemented. Each repair or preservation technique applied increases the PCI of a segment and increases its expected life by delaying degradation. The PCI values used in this report are based on a surface inspection of the City's streets. Surface inspections provide a good indication of the pavement and what riders experience when driving the road. However, they do not capture the sub-surface of a pavement structure. Pavement forensics such as pavement coring are required to analyze the entire depth of the road. Some repairs such as patching often improve the PCI of a road but fail to address underlying issues that will continue to cause deterioration. The recommendations in this report seek to keep PCI values high but also maintain the underlying layers of pavement for each segment.

Existing Pavement Conditions

PCI values are used to evaluate pavement condition on a scale from 0 to 100 with 100 being a perfect roadway that exhibits no distress. Table III.1. displays the PCI categories that North Saint Paul has historically used to describe the condition of roadways along with the maintenance strategy typically implemented on roads in that condition. WSB can offer analysis on these categories and additional recommendations on the types of repairs that can be implemented if needed.

Table III.1. Pavement Condition Categories Based on PCI Values

Category	Pavement Condition Index (PCI)	Recommended Strategy
Excellent	90-100	Minimal Maintenance
Good	70-89	Routine Maintenance
Fair	35-69	Repair
Poor	0-34	Reconstruction

PAVER, an asset management software, was used to record and estimate the condition of each road segment. The software calculates PCI using deduct values that are based on the type, severity, and quantity of the visible pavement distresses on each road. Examples of asphalt pavement distresses include alligator cracking, longitudinal/transverse cracking, and potholes. Distress severity is classified as either low, moderate, or high. Depending on the type of distress, quantity is measured as the number of occurrences, length, or area.

The PCI values generated were based on a visual inspection and the corresponding recommended maintenance strategies should only be used as a guideline. In some cases, pavement forensics such as coring may be needed to supplement visual inspections and provide more information regarding roadway condition.

This report shows updated pavement conditions for all road segments in the City. Most roadways are in Fair or Good condition, but over a fourth of the roads are in the Poor category. Table III.2. shows how much of the City's pavement is in each condition category.

Table III.2. City Roads by Condition Category

Pavement Condition Index	Approximate Mileage	Percent of System by Area
Excellent Category (90 – 100)	5.1	10.7 %
Good Category (70-89)	13.1	28.7 %
Fair Category (35-69)	15.9	34.9 %
Poor Category (0-34)	13.1	25.7 %

Appendix A includes a map of all the inspected road segments in the City with their PCI condition categories. Appendix B displays the PCI values of every inspected segment.

IV. Pavement Maintenance and Rehabilitation Techniques

North Saint Paul has many options at their disposal for pavement rehabilitation and maintenance. Each of these treatments should last several years and be cost-effective if correctly implemented at the right time.

Minimal Maintenance

When roads are in Excellent condition, minimal maintenance is needed. Typically, maintenance at this stage is used to correct a road segment that is not performing as expected. This may be the result of improper construction or unforeseen conditions. This typically involves crack sealing or patching. Segments in Excellent condition should not need any major maintenance other than minor crack sealing unless the pavement behaves unpredictably.

Routine Maintenance

Routine maintenance is used on roads in Good condition to preserve them and prolong pavement life. These preventative repairs preserve and protect the pavement, while also slowing future deterioration. This type of maintenance improves the condition of the system without increasing its structural capacity.

Implementing routine preventative maintenance is cost-effective and important since maintenance costs increase with pavement age. Routine maintenance actions can be done at a much lower cost than preservation actions such as reconstructions. By applying appropriate preventative maintenance before a road deteriorates, the pavement can be kept in good condition at a much lower cost. With proper routine maintenance techniques, the life of an average paved road increases from 20 years to 60 years.

Routine maintenance is best performed on newer pavements prior to the appearance of significant and/or severe distresses. There are many maintenance applications that seek to protect pavement from deterioration. These treatments vary in effectiveness and price. Common routine maintenance techniques include crack sealing, fog sealing, chip sealing, chip sealing followed by fog sealing, rejuvenating, micro-surfacing, and slurry sealing. WSB would be happy to provide additional guidance on what types of preventative maintenance would work best for North Saint Paul if needed. Patching can also be considered preventative maintenance, but it is usually implemented on small areas of severe distress. Additionally, patching a road to increase its PCI does not provide long term structural improvement. Patching may be necessary to keep roads in serviceable condition but it should not be considered routine maintenance for every road.

Repair

For roads in the Fair category, more significant repairs are needed to restore PCI. The most common repair strategies include mill/overlays and reclamations. Concrete pavement repairs are usually concrete pavement rehabilitation projects.

An overlay involves placing a new layer of bituminous material on top of an existing asphalt surface. A mill and overlay requires grinding all or a portion of the in-place asphalt surface and

topping the ground surface with a bituminous wearing course. This rehabilitation strategy provides a structural improvement to the roadway. We recommend conducting more investigation such as pavement coring to evaluate the subsurface conditions before implementing an overlay project. Information such as depths of pavement layers, signs of debonding, and distresses that are not visible from the road surface can be obtained through pavement coring. Applying an overlay to a pavement structure with inadequate subsurface conditions will cause the new surface to fail prematurely.

The most common types of reclamation are full-depth reclamations (FDR) and stabilized full-depth reclamations (SFDR). FDR involves pulverizing the full depth of bituminous and a portion of the underlying materials. That material then gets blended together and placed as a sound base for new pavement. Typically, FDR reclaim depth is 12 inches, although it can be as deep as 18 inches. Excess FDR mixture may be removed to allow 6-inch lifts compaction. Additional rock may need to be provided if the mixture is expected to be deficient in crushing or gradation. The reclaimed mixture can be topped with different types of surface course, depending on the structural requirements and anticipated traffic level. A layer of tack coat needs to be applied prior to surface treatment to provide good bonding between the FDR mixture and surface course. SFDR involves the same process but includes mechanical, chemical, or bituminous stabilization. The typical minimum depth of stabilization is 4 inches, but it can go as deep as 6 inches. Mechanical stabilization involves the addition of new aggregate or recycled materials. Chemical stabilization includes the addition of lime, cement, fly ash, calcium chloride, or other proprietary products. The asphalt additives can be foamed asphalt or asphalt emulsion. These stabilizing agents if combined with additives, can help optimizing the FDR performance.

For concrete pavement, rehabilitation projects focus on replacing and repairing isolated problem areas. Since concrete pavement is much stronger and longer lasting than asphalt, usually only small weak areas deteriorate to the point where they need to be replaced. These weak areas are most commonly at joints and seems. Concrete pavement rehabilitation involves removing broken or distressed sections of pavement and replacing it with new, reinforced pavement. The result is a cost-effective pavement repair that keeps most of the pavement in place and repairs the bumps drivers notice. Rehabilitation projects can be followed up with a diamond grind to create a smooth and uniform surface.

Reconstruction

When roads are in Poor condition, reconstructions are usually needed to address the issues presented. Reconstruction includes the complete replacement of the road's driving surface and pavement structure. The pavement along with its base layers are then replaced with new material. Asphalt or concrete mix type, ride specification, thicknesses, and compaction requirements must be in accordance with the specified standard. Selecting the specific appropriate reconstruction plan for a road requires more detailed investigation such as pavement coring. Each road segment requires a specific pavement design that considers existing subgrade materials and traffic loading to create the most effective pavement structure. Subsurface water management is a significant component of a reconstruction project. Thus, addressing roadway drainage is included in roadway reconstruction projects. When performing a reconstruction, it is important to consider the entire pavement structure that includes the base

and subbase. A larger initial investment in thicker base and subbase layers along with edge drains provides the pavement with a stronger foundation that reduces damage from moisture under the surface. This produces pavement that is less susceptible to damage and has a longer expected life. WSB can provide specific reconstruction design recommendations if requested.

Recent Maintenance Examples

In 2023, several segments in North Saint Paul received a maintenance overlay. Figure IV.1 shows a segment of Burke/Belmont that was repaired this spring. Since this road received a completely new surface that shows no surface defects, the new PCI for this segment is 100. Before the overlay the PCI score for this segment was 43. Figure IV.2 displays a segment of Dianne that is scheduled to receive an overlay this fall and currently has a PCI of 49.



Figure IV.1. Recently Completed Maintenance Overlay



Figure IV.2. Segment That Will Soon Receive a Maintenance Overlay

Pavement Forensics

The final decision on implementing a reconstruction or reclamation project should come after a pavement forensic study. Pavement forensics studies the pavement structure and condition of the base underneath the visible layer of pavement. Important information results from this analysis. Examining pavement cores can determine the depths of pavement layers, signs of bonding or de-bonding, and distresses that might not be visible from the surface. Soil borings along the roadway can be used to identify aggregate depths and soil classifications to provide a better understanding of the roadway section. This information is crucial when determining what type of rehabilitation is needed and what it will cost. Several factors should be considered when deciding the number of cores to be taken such as the pavement condition and the variability in the pavement depth as cores are being taken. A pavement forensic study should be conducted less than two years before a major maintenance project to ensure the results of the study accurately reflect the road's condition. The findings of pavement forensic studies have been proven to lead to cost savings and more appropriate maintenance strategies. WSB can perform pavement forensics for North Saint Paul if requested.

V. Pavement Management Scenarios

To help the City plan pavement maintenance over the next 6 years, WSB created a model using the PAVER software. PAVER uses construction, inspection, and maintenance records along with a degradation curve to predict how each segment of pavement in the City's system will perform over time. This analysis utilized the Army Corps of Engineer's standard pavement degradation curve. Different scenarios and maintenance budgets can then be tested to see how they would perform and determine the best plan moving forward. Leveraging PAVER's ability to optimize the cost-effectiveness makes sure the City's resources have the biggest impact on the roadway system.

A main goal of this pavement management report is to determine how much funding is necessary to maintain the City's streets over the next several years and how that budget should be spent. To investigate this, three scenarios were tested and the associated impacts on the overall PCI rating of the City were recorded.

Scenario 1: No Maintenance

The No Maintenance scenario is a good starting point when comparing various alternatives because it shows the rate of deterioration that the City must overcome through its maintenance and rehabilitation programs. Given no pavement maintenance funding over the next 6 years, the City pavement condition would deteriorate at a rate of approximately 2-3 PCI points per year, going from a PCI of 56.6 in 2023, to 41.4 in 2029. The goal of the other scenarios tested is to find the best way to offset this natural deterioration rate. The summary of results from Scenario 1 can be found in Table V.1. and Figure V.1.

Table V.1. Summary Results for Scenario 1

Year	2024	2025	2026	2027	2028	2029
Average PCI	53.9	51.2	48.6	46.0	43.6	41.4

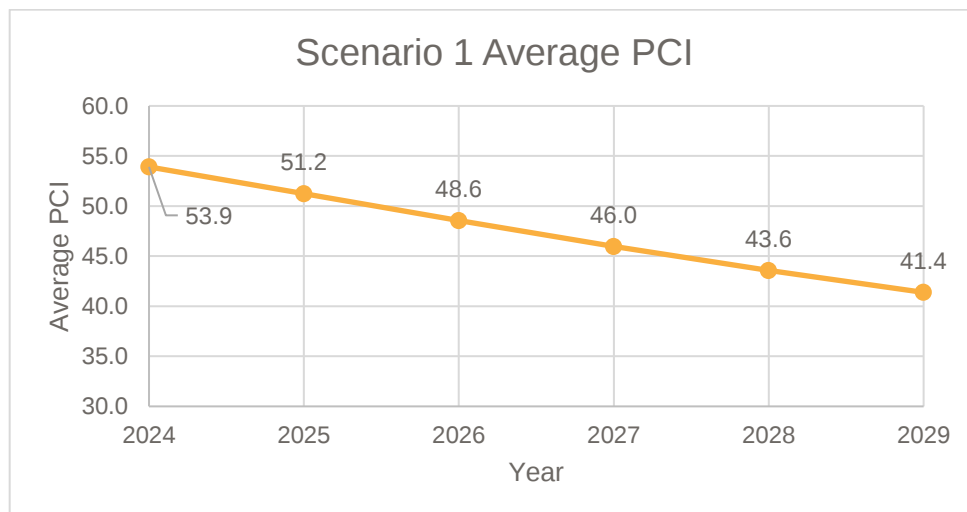


Figure V.1. Average PCI in Scenario 1

Scenario 2: Projects Completed in 2025 and 2027

The second scenario determined how implementing major projects in 2025 and 2027 would influence average PCI. The City specifically requested the 2025 project to restore Buhl Avenue, Gerald Avenue, and a section of Shawnee Drive. The 2027 project would restore Chisholm Avenue and Mesabi Avenue. A specific list this scenario's projects are shown in Table V.2. This scenario assumes that the projects listed below are all major rehabilitation that completely replace the driving surface. It is also assumed that no other preventative or minor maintenance projects are implemented over the lifetime of the analysis.

Table V.2. Scenario 2 Projects

2025		2027	
Branch	Section	Branch	Section
Buhl Ave	7.001	Chisholm Ave	15.001
Gerald Ave	22.001	Chisholm Ave	16.001
Gerald Ave	22.002	Mesabi Ave	43.001
Shawnee Dr	60.001	Mesabi Ave	43.002

While Scenario 2 implements two major projects to offset pavement degradation, the model shows it is not enough to prevent a yearly average PCI drop. In the years 2025 and 2027, the average PCI decreases by a smaller amount, but a net decrease still occurs. In this scenario, the 2029 average PCI is approximately two points higher at 43.6. The summary of results from Scenario 2 can be found in Table V.3. and Figure V.2.

Table V.3. Summary Results for Scenario 2

Year	2024	2025	2026	2027	2028	2029
Average PCI	53.9	52.2	49.7	48.3	45.8	43.6

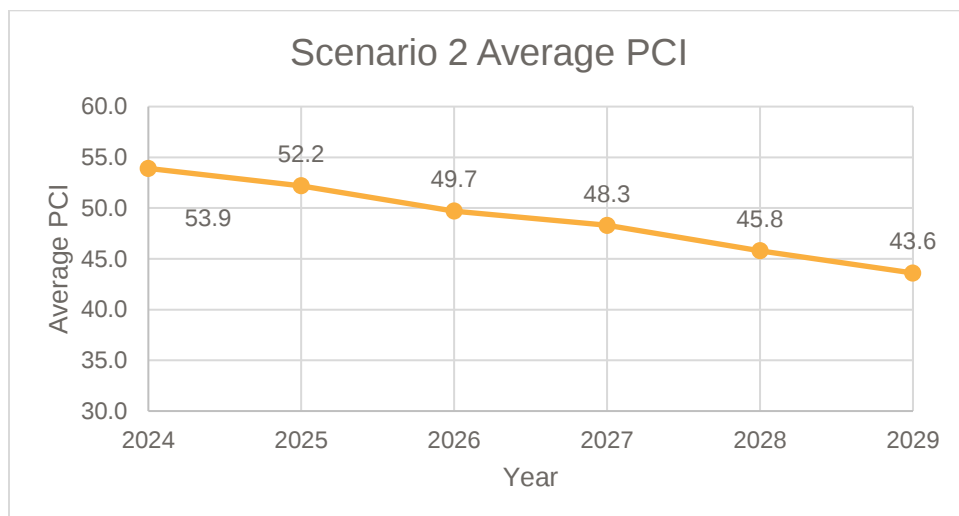


Figure V.2. Average PCI in Scenario 2

Scenario 3: Projects in 2023-2028

The third scenario tested how implementing major rehabilitation projects each year would influence the average PCI of the system. The City provided a list of specific projects to be implemented in the years 2023-2027. In 2028, the PAVER modeling software was given the freedom to select the most effective way to spend a budget of \$1,200,000. Constraints for the 2028 project selection forced the money to be spent on reclamation projects. It was assumed that in 2028, reclamation projects would cost \$7.39/sf. A list of the segments receiving work in Scenario 3 are listed in Table V.4. Like Scenario 2, the projects listed are assumed to completely replace the driving surface and that no other smaller projects such as preventative maintenance were implemented.

Table V.4. Scenario 3 Projects

2023		2024		2025		2026		2027		2028	
Branch	Section	Branch	Section	Branch	Section	Branch	Section	Branch	Section	Branch	Section
14th Ave	79.001	1st St N	85.001	Buhl Ave	7.001	1st St N	85.021	Chisholm Ave	15.001	10th Ave	75.002
Belmont Ln	5.0001	1st St N	85.002	Gerald Ave	22.001	6th St	91.002	Chisholm Ave	16.001	12th Ave	77.006
Belmont Ln	5.005	1st St N	85.003	Gerald Ave	22.002	18th Ave	82.001	Mesabi Ave	43.001	13th Ave	78.01
Burke Ave	8.0001	1st St N	85.004	Shawnee Dr	60.001	Ariel St	3.002	Mesabi Ave	43.002	14th Ave	79.005
Dianne St	19.001	1st St N	85.005			Ariel St	3.003			15th Ave	80.002
Sean's Way	123.0001	1st St N	85.006			Ariel Ct	3.009			15th Ave	80.003
Skillman Ave	63.008	1st St N	85.007			Cowern Pl	17.008			15th Ave	80.007
		1st St N	85.008			Division S	107.001			16th Ave	81.001
		1st St N	85.009			Eldridge Ave	20.001			16th Ave	81.002
		6th St	91.007			Eldridge Ave	20.002				
		18th Ave	82.004			Hilltop Ct	28.001				
		Charles St	11.013			Hilltop Ct	28.002				
		Charles St	11.014			Jennifer Ln	33.001				
		Charles St	11.015			Jennifer Ct	32.001				
		Charles St	11.016			Laurie Rd	35.001				
		Cowern Pl	17.001			Margaret St	38.007				
		Margaret St	38.001			Shawnee Dr	60.005				
		Margaret St	38.002			Shawnee Dr	60.006				
		Margaret St	38.0025								
		Margaret St	38.003								
		Margaret St	38.004								
		Margaret St	38.005								
		Reardon Pl	55.001								

As expected, implementing more major projects results in a much higher average PCI than Scenario 1 or Scenario 2. The years with more projects such as 2024 and 2026 result in PCI increases. However, the years with fewer projects still result in PCI reductions. Overall, the model shows this scenario is also not enough to outpace pavement deterioration. The summary of results from Scenario 3 can be found in Table V.5. and Figure V.3.

Table V.5. Summary Results for Scenario 3

Year	2024	2025	2026	2027	2028	2029
Average PCI	56.4	54.7	56.7	55.3	54.9	52.4

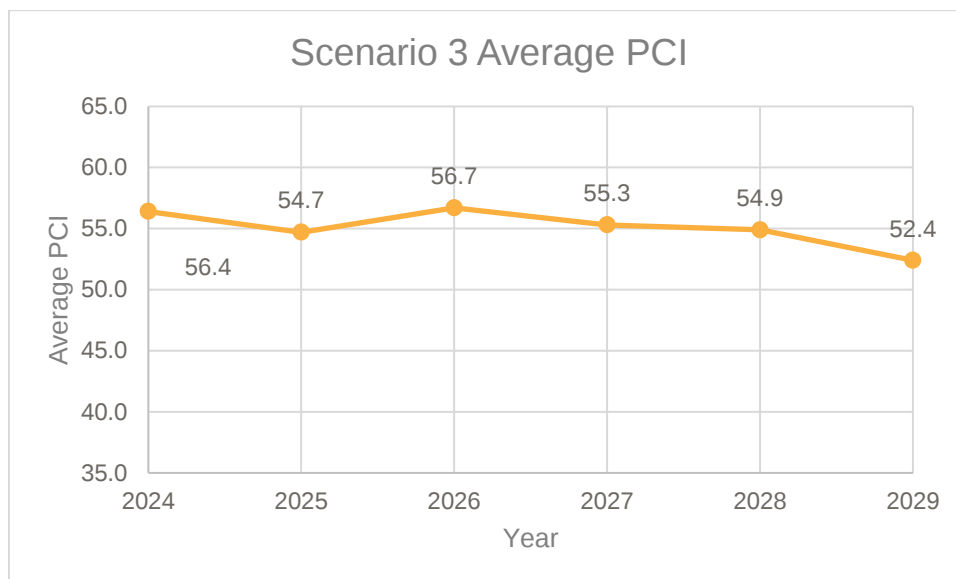


Figure V.3. Average PCI in Scenario 3

Spending and Maintenance Recommendations

Figure V.4. compares the three scenarios tested in PAVER. The results were used to notice trends and develop recommendations for the City. Examples of recently inspected roads in this PCI range are shown in Appendix C. These pictures can provide a rough depiction of the difference in road conditions achieved in these scenarios.

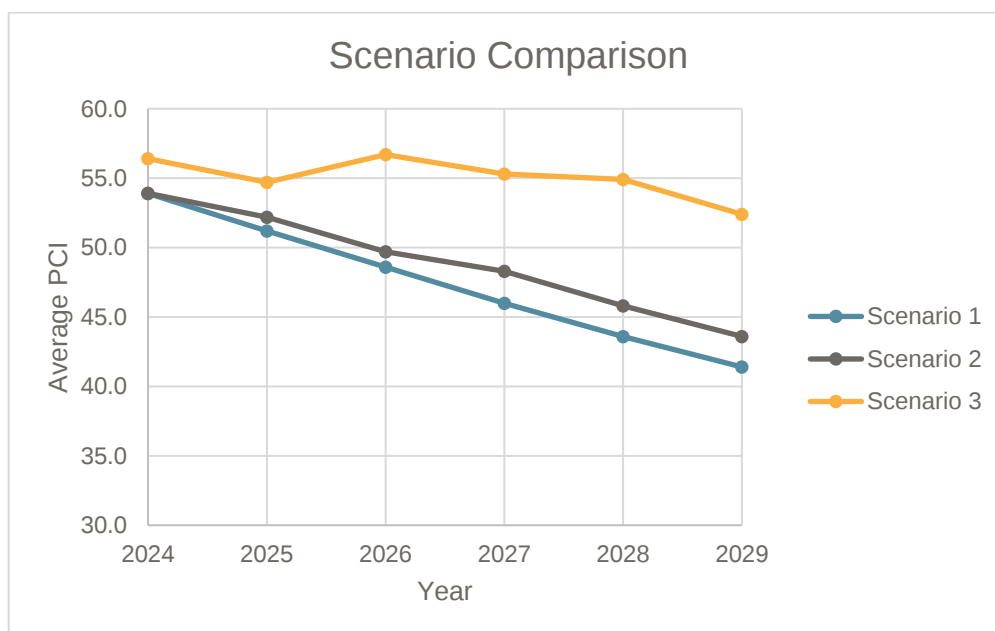


Figure V.4. Scenario Summary Comparison

Maintenance and Budget Recommendations

It should be noted that in all three scenarios, the result is the average PCI in 2029. However, none of the scenarios implemented any maintenance in 2029. In all three scenarios, the City's PCI drops by approximately 2.5 points throughout that final year of analysis. If the final PCI of the analysis was the network's condition just after completing maintenance in the summer of 2028, the end conditions would all be roughly 2.5 points higher. Additionally, none of the scenarios implemented any projects other than major repairs and reconstruction/reclamations. While these projects are the most costly and important to plan, preventative maintenance and smaller projects can also produce significant PCI increases for very little cost. If crack sealing, seal coating, or even patching projects were included in these scenarios, the average PCI would be considerably higher. WSB recommends including budget for these more cost-effective treatments in any pavement maintenance plan.

While the maintenance repair recommended for a segment typically aligns with its PCI score and the corresponding condition category noted above, there are a few other factors to consider when deciding which roads should receive a specific treatment. Anytime a major rehabilitation projects is needed (PCI less than 75), it is wise to do more investigation before moving ahead with a project. Spending resources investigating the pavement and base condition adds value by making sure the most cost-effective solution is applied. This is especially true when deciding between a reclamation or a reconstruction. The cost difference between these alternatives is substantial enough that pavement coring should always be implemented before moving forward with a project that has a PCI score lower than approximately 58.

As mentioned earlier, the actual performance of the roads in the City's system will depend on how cost-effective its maintenance is. There are several strategies that can be used to protect the roads in good condition and to stretch the impact of the City's resources. To maximize the effectiveness of the available funding, we recommend prioritizing preventative maintenance. While it seems counterintuitive to focus on roads in the best condition, their preventative maintenance is relatively cheap and retaining segments with high PCI values is necessary to avoid high maintenance costs in the future. While roads will inevitably need more expensive repairs at some point, delaying those expenses and keeping roads in good condition is a best practice. Figure V.5. illustrates this point.

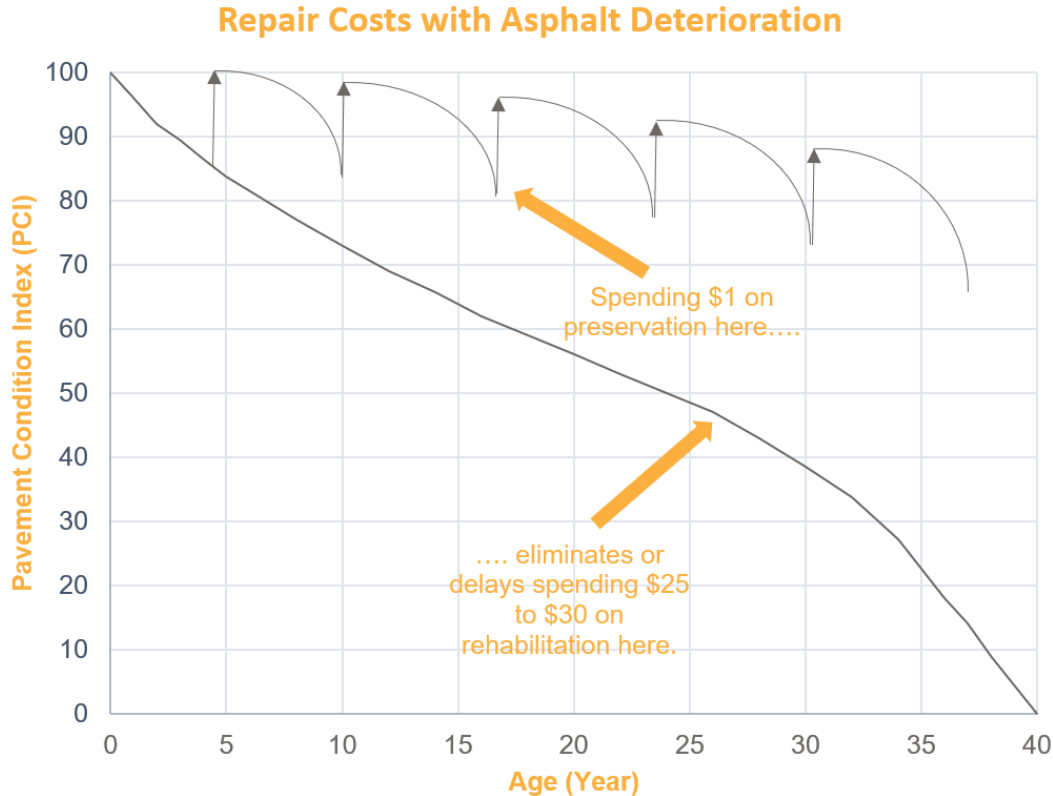


Figure V.5. Cost-Effectiveness of Preventative Maintenance Example

Similarly, taking advantage of the lower cost of mill and overlay projects compared to other major rehabilitation projects allows the budget to improve more road segments in the city. When reconstruction cannot be avoided, we recommend investing in base and subbase layers with adequate thickness. Paying extra to make sure the new road is built on a sturdy and dry foundation will extend the life of the pavement and reduce the amount of resources needed for maintenance. When constructed properly, aggregate bases and subbases should not need to be replaced, even when the pavement fails.

Another important methodology to adopt is to not implement a less expensive repair on a road that requires a more expensive fix. It is tempting to try and apply cheaper fixes when facing expensive cost estimates. However, this will result in wasting precious funds. For example, applying a chip seal as preventative maintenance on a road that is in Fair or Poor condition is not effective. Instead of providing years of protection as intended, it will deteriorate quickly and not result in long-term results.

With all these factors in mind, a recommended maintenance schedule was created. This schedule is meant to serve as a guide for typical segments and will not apply to every road in the system. However, it does implement many best practices that cost-effectively keep the pavement in good condition. Table V.6. shows this recommendation.

Table V.6. Recommended Asphalt Pavement Typical Maintenance Schedule

Typical Maintenance Schedule				
Cumulative Pavement Age (Years)	Time Between Maintenance	Maintenance	Predicted PCI	
			Initial	Improved
0	0	New Construction	100	
2	2 Years After New Construction	Initial Crack Seal	92	100
4	2 Years After Crack Seal	Crack Seal	92	100
5	1 Year After Crack Seal	Chip & Fog Seal	96	100
8-11	Every 3 to 6 Years	Crack Seal	85-90	98
12	1 Year After Final Crack Seal	Chip & Fog Seal	85	98
18-22	6-10 Years After Chip & Fog Seal	Mill and Overlay	60	95
20-24	2 Years After Overlay	Initial Crack Seal	86	93
21-25	1 Year After Crack Seal	Chip & Fog Seal	83	95
24-34	Every 3 to 6 Years	Crack Seal & Patch	80	92
27-35	1 Year After Final Crack Seal	Chip & Fog Seal	78	95
33-45	6-10 Years After Chip & Fog Seal	Mill and Overlay	59	90
35-47	2 Years After Overlay	Initial Crack Seal	86	90
36-48	1 Year After Crack Seal	Chip & Fog Seal	84	90
39-56	Every 3 to 6 Years	Crack Seal & Patch	85	90
42-57	1 Year After Final Crack Seal	Chip & Fog Seal	76	88
52-75	10-20 Years After Chip & Fog Seal	Reclamation	50	100

Finally, we recommend keeping a detailed log of all street maintenance implemented in the City. Recording information such as the type of maintenance activity, when it was implemented, how much it cost, the materials used, the age of the road during implementation, and any other testing results on that segment can prove helpful in the future. Maintenance logs can help determine what is working well for a City and what is not. Similarly, if a recommended maintenance strategy is not working well, reviewing details of the activity can help reveal why. This detailed information can also be used to improve the assumptions used by the PAVER model. This will ensure future recommendations will be based on accurate scenarios.

Appendices

Path: K:\022578-000\GIS\Maps\2023 NSP Pavement Management.aprx

Appendix B: PCI Values by Segment

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
1st St/12t	104.001	Alleyway	651	10	6,512	AC	18
2nd St/11t	105.001	Alleyway	655	10	6,546	AC	16
2nd St/1st	111.001	Alleyway	499	16	7,990	AAC	89
6th St/Eld	115.001	Alleyway	647	10	6,471	AC	45
6th St/Ski	116.001	Alleyway	651	10	6,514	AC	47
Charles St	94.001	Alleyway	686	10	6,858	AC	76
Charles St	101.001	Alleyway	448	10	4,481	AC	27
Charles St	114.001	Alleyway	684	10	6,844	AC	0
Division S	93.001	Alleyway	362	10	3,618	AAC	83
Division S	107.001	Alleyway	613	10	6,130	AC	5
Division S	112.001	Alleyway	618	10	6,182	AC	0
Division S	113.001	Alleyway	619	10	6,189	AC	17
Helen St/1	97.001	Alleyway	654	10	6,545	AC	14
Helen St/1	99.001	Alleyway	655	10	6,549	AC	4
Helen St/1	103.001	Alleyway	654	10	6,544	AC	0
Helen St/4	110.001	Alleyway	828	16	13,240	AAC	89
Henry St/6	108.001	Alleyway	641	10	6,413	AC	18
Henry St/8	106.001	Alleyway	639	10	6,393	AC	80
Margaret S	95.001	Alleyway	673	10	6,730	AC	43
Margaret S	96.001	Alleyway	673	10	6,726	AC	39
Margaret S	98.001	Alleyway	667	10	6,667	AC	32
Margaret S	100.001	Alleyway	666	10	6,663	AC	4
Margaret S	102.001	Alleyway	667	10	6,667	AC	45
Margaret S	109.001	Alleyway	816	16	13,059	AC	0
Margaret/3	125.0002	Alleyway	336	10	3,362	AC	60
UNKNOWN	69.006	Alleyway	323	10	3,232	AC	56
UNKNOWN	69.007	Alleyway	682	10	6,819	AC	72
UNKNOWN	79.009	Alleyway	682	10	6,817	AC	21
10TH AVE	75.001	Urban Local	655	30	19,649	AC	97
10TH AVE	75.002	Urban Local	614	27	16,569	AC	20
11TH AVE	76.0002	Urban Collector	663	42	27,531	AC	85
11TH AVE	76.0003	Urban Collector	654	42	27,158	AC	87
11TH AVE	76.0004	Urban Collector	651	42	27,024	AC	89
11TH AVE	76.001	Urban Collector	982	48	47,150	AAC	89
11TH AVE	76.002	Urban Collector	989	48	47,476	AAC	87

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
11TH AVE	76.003	Urban Collector	645	48	30,970	AAC	89
12TH AVE E	77.001	Urban Local	660	27	17,814	AC	51
12TH AVE E	77.002	Urban Local	655	27	17,672	AC	54
12TH AVE E	77.003	Urban Local	651	27	17,587	AC	70
12TH AVE E	77.004	Urban Local	667	40	26,693	AC	82
12TH AVE E	77.005	Urban Local	333	30	9,980	AC	67
12TH AVE E	77.006	Urban Local	617	27	16,648	AC	1
13TH AVE	78.001	Urban Local	1311	23	30,142	AC	97
13TH AVE	78.002	Urban Local	328	31	10,167	AC	97
13TH AVE	78.003	Urban Local	984	31	30,501	AC	97
13TH AVE	78.004	Urban Local	653	27	17,628	AC	33
13TH AVE	78.005	Urban Local	654	26	16,997	AC	36
13TH AVE	78.006	Urban Local	653	27	17,636	AC	36
13TH AVE	78.007	Urban Local	653	33	21,563	AC	55
13TH AVE	78.008	Urban Local	666	33	21,980	AC	61
13TH AVE	78.009	Urban Local	682	33	22,506	AC	72
13TH AVE	78.01	Urban Local	616	41	25,252	AC	5
14TH AVE	79.001	Urban Local	248	27	6,698	AC	17
14TH AVE	79.002	Urban Local	915	27	24,707	AC	97
14TH AVE	79.003	Urban Local	652	27	17,610	AC	39
14TH AVE	79.004	Urban Local	654	27	17,664	AC	32
14TH AVE	79.005	Urban Local	650	27	17,552	AC	24
14TH AVE	79.006	Urban Local	656	33	21,659	AC	69
14TH AVE	79.007	Urban Local	667	30	20,001	AC	73
14TH AVE	79.008	Urban Local	682	30	20,448	AC	37
15TH AVE	80.002	Urban Local	652	30	19,551	AC	22
15TH AVE	80.003	Urban Local	654	30	19,635	AC	17
15TH AVE	80.004	Urban Local	651	30	19,522	AAC	83
15TH AVE	80.005	Urban Local	655	31	20,318	AC	84
15TH AVE	80.006	Urban Local	667	31	20,668	AC	79
15TH AVE	80.007	Urban Local	682	32	21,817	AC	23
15TH AVE	80.008	Urban Local	646	30	19,387	AC	40
15TH AVE	80.009	Urban Local	248	30	7,426	AC	31
15TH AVE N	80.001	Urban Local	1373	27	37,072	AAC	92
16TH AVE E	81.001	Urban Local	653	29	18,931	AC	18
16TH AVE E	81.002	Urban Local	653	27	17,637	AC	23
16TH AVE E	81.003	Urban Local	654	27	17,645	AC	46
16TH AVE E	81.004	Urban Local	667	29	19,344	AC	48
16TH AVE E	81.006	Urban Local	646	27	17,429	AC	52

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
16TH AVE E	81.007	Urban Local	615	27	16,615	AC	43
18TH AVE	82.001	Urban Local	673	39	26,238	AC	14
18TH AVE	82.002	Urban Local	685	38	26,029	AC	45
18TH AVE	82.003	Urban Local	643	30	19,287	AC	48
18TH AVE	82.004	Urban Local	612	30	18,355	AC	50
19TH AVE	83.001	Urban Local	353	31	10,929	AC	83
19TH AVE	83.002	Urban Local	327	31	10,143	AC	81
19TH AVE	83.003	Urban Local	298	32	9,534	AC	82
19TH AVE	83.0035	Urban Local	518	32	16,571	AC	85
19TH AVE	83.004	Urban Local	486	33	16,050	AC	93
19TH AVE	83.005	Urban Local	187	33	6,164	AC	94
19TH AVE	83.006	Urban Local	813	33	26,835	AC	93
19TH AVE	83.007	Urban Local	611	33	20,151	AC	94
19TH AVE	83.008	Urban Local	613	33	20,236	AC	87
1ST AVE N	67.001	Urban Local	660	27	17,822	AC	24
1ST AVE N	67.002	Urban Local	653	27	17,625	AC	52
1ST AVE N	67.003	Urban Local	664	27	17,934	AC	5
1ST AVE N	67.004	Urban Local	685	27	18,501	AC	36
1ST AVE N	67.005	Urban Local	640	27	17,267	AC	30
1ST AVE N	67.006	Urban Local	620	27	16,728	AC	8
1ST ST N	85.001	Urban Collector	403	40	16,123	AC	46
1ST ST N	85.002	Urban Collector	348	40	13,937	AC	46
1ST ST N	85.003	Urban Collector	335	40	13,413	AC	48
1ST ST N	85.004	Urban Collector	336	40	13,446	AC	39
1ST ST N	85.005	Urban Collector	328	40	13,113	AC	49
1ST ST N	85.006	Urban Collector	647	32	20,690	AC	46
1ST ST N	85.007	Urban Collector	333	32	10,662	AC	29
1ST ST N	85.008	Urban Collector	349	34	11,866	AC	32
1ST ST N	85.009	Urban Collector	325	33	10,732	AC	29
1ST ST N	85.01	Urban Collector	270	33	8,913	AAC	89
1ST ST N	85.014	Urban Local	334	33	11,019	AC	22
1ST ST N	85.015	Urban Local	332	33	10,945	AC	58
1ST ST N	85.016	Urban Local	332	33	10,963	AC	33
1ST ST N	85.017	Urban Local	333	33	10,994	AC	32

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
1ST ST N	85.018	Urban Local	331	33	10,913	AAC	88
1ST ST N	85.019	Urban Local	321	33	10,584	AAC	81
1ST ST N	85.02	Urban Collector	732	30	21,955	AC	79
1ST ST N	85.021	Urban Local	755	28	21,139	AC	34
1ST ST N	137	Urban Collector	95	33	3,123	AAC	89
20TH AVE	84.001	Urban Local	364	25	9,091	AC	94
2ND AVE	68.001	Urban Local	651	27	17,579	AC	40
2ND AVE	68.002	Urban Local	665	27	17,968	AC	29
2ND AVE	68.003	Urban Local	684	27	18,459	AC	27
2ND AVE	68.004	Urban Local	641	30	19,226	AC	16
2ND AVE	68.005	Urban Local	618	27	16,693	AC	29
2ND ST	86.001	Urban Local	592	27	15,994	AC	98
2ND ST	86.002	Urban Local	333	27	8,997	AC	59
2ND ST	86.003	Urban Local	534	27	14,424	AAC	89
2ND ST	86.004	Urban Local	804	40	32,168	AAC	89
2ND ST	86.005	Urban Local	401	40	16,039	AAC	89
2ND ST	86.006	Urban Local	381	40	15,240	AAC	89
2ND ST	86.008	Urban Local	333	27	8,978	AAC	100
2ND ST	86.009	Urban Local	325	27	8,766	AC	46
2ND ST	86.01	Urban Local	333	27	8,985	AC	49
2ND ST	86.011	Urban Local	331	27	8,936	AC	34
2ND ST	86.012	Urban Local	330	27	8,908	AC	35
2ND ST	86.013	Urban Local	324	27	8,741	AC	96
2ND ST E	87.001	Urban Local	330	27	8,913	AC	39
2ND ST NW	86.014	Urban Local	732	30	21,949	AC	83
2ND ST NW	86.015	Urban Local	545	30	16,343	AC	52
2ND ST NW	86.016	Urban Local	376	30	11,281	AC	37
2ND ST NW	86.017	Urban Local	323	30	9,692	AC	39
2ND ST W	88.001	Urban Local	331	27	8,929	AC	40
3RD AVE	69.001	Urban Local	403	27	10,886	AAC	89
3RD AVE	69.002	Urban Local	669	27	18,061	AC	47
3RD AVE	69.003	Urban Local	680	27	18,366	AC	21
3RD AVE	69.004	Urban Local	641	26	16,653	AC	24
3RD AVE	69.005	Urban Local	618	27	16,695	AC	18
3RD ST	89.001	Urban Local	978	27	26,419	AC	58
3RD ST	89.002	Urban Local	214	27	5,791	AC	58
3RD ST	89.003	Urban Local	264	40	10,564	AC	29
3RD ST	89.004	Urban Local	1641	40	65,659	AC	48

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
3RD ST	89.005	Urban Local	332	30	9,954	AC	97
3RD ST	89.006	Urban Local	329	27	8,879	AC	35
3RD ST	89.007	Urban Local	330	27	8,913	AC	33
3RD ST	89.008	Urban Local	331	27	8,942	AC	25
3RD ST	89.009	Urban Local	332	27	8,966	AC	23
3RD ST	89.01	Urban Local	332	29	9,627	AC	23
3RD ST	89.011	Urban Local	323	30	9,696	AC	41
4TH AVE	70.001	Urban Local	681	34	23,148	AAC	89
4TH AVE	70.002	Urban Local	668	28	18,698	AC	24
4TH AVE	70.003	Urban Local	681	28	19,074	AC	27
4TH AVE	70.004	Urban Local	643	27	17,370	AC	46
4TH AVE	70.005	Urban Local	616	27	16,622	AC	46
5TH AVE	71.002	Urban Local	685	34	23,298	AC	83
5TH AVE	71.003	Urban Local	643	27	17,367	AC	50
5TH AVE	71.004	Urban Local	613	27	16,556	AC	46
5TH ST	90.001	Urban Local	331	27	8,946	AC	56
5TH ST	90.002	Urban Local	288	27	7,768	AC	23
5TH ST	90.003	Urban Local	328	27	8,864	AC	24
5TH ST	90.004	Urban Local	330	27	8,901	AC	25
6TH AVE	72.001	Urban Local	183	27	4,931	AC	96
6TH AVE	72.002	Urban Local	639	27	17,264	AC	33
6TH AVE	72.003	Urban Local	613	27	16,553	AC	30
6TH ST	91.002	Urban Local	737	27	19,894	AC	19
6TH ST	91.003	Urban Local	245	27	6,627	AC	42
6TH ST	91.004	Urban Local	329	27	8,880	AC	49
6TH ST	91.005	Urban Local	325	27	8,783	AC	23
6TH ST	91.006	Urban Local	328	27	8,864	AC	39
6TH ST	91.007	Urban Local	1968	27	53,131	AC	19
7TH AVE	122.0001	Urban Collector	840	24	20,168	PCC	100
7TH AVE	122.0002	Urban Collector	838	32	26,812	PCC	100
7TH AVE	122.0003	Urban Collector	885	32	28,331	PCC	19
7TH AVE	122.0004	Urban Collector	816	24	19,595	PCC	73
7TH AVE	122.0005	Urban Collector	542	44	23,848	PCC	44
7TH AVE	122.0006	Urban Collector	830	48	39,842	AC	33
7TH AVE	122.0007	Urban Collector	852	36	30,675	AAC	89

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
7TH AVE	122.0008	Urban Collector	747	36	26,905	AAC	89
7TH AVE	122.0009	Urban Collector	236	44	10,376	AC	54
7TH AVE	136	Urban Collector	83	36	2,996	PCC	100
7TH AVE	122.0002A	Urban Local	838	32	26,812	APCC	89
7TH AVE	122.0003A	Urban Local	885	32	28,331	PCC	57
7TH ST	92.001	Urban Local	201	27	5,438	AC	32
7TH ST	92.002	Urban Local	450	27	12,139	AC	41
7TH ST	92.003	Urban Local	330	27	8,906	AC	45
7TH ST	92.004	Urban Local	327	27	8,830	AC	42
7TH ST	92.005	Urban Local	329	27	8,870	AC	42
7TH ST	92.006	Urban Local	326	27	8,790	AC	33
7TH ST	92.007	Urban Local	333	27	8,984	AC	24
7TH ST	92.008	Urban Local	476	31	14,767	AC	53
7TH ST	92.009	Urban Local	1474	31	45,709	AC	45
7TH ST	92.01	Urban Local	461	32	14,763	AC	12
8TH AVE	73.001	Urban Local	639	27	17,263	AC	40
8TH AVE	73.002	Urban Local	613	27	16,550	AC	49
97TH AVE	74.001	Urban Local	745	32	23,843	AC	79
9TH AVE	74.002	Urban Local	216	27	5,823	AC	0
9TH AVE	74.003	Urban Local	615	27	16,603	AC	12
AMY CIR	1.001	Urban Local	296	27	7,998	AC	98
ANCHOR DRI	148	Urban Collector	726	42	30,473	AC	92
APACHE RD	2.001	Urban Local	1146	27	30,932	AC	80
ARIEL CT	3.009	Urban Local	163	27	4,406	AC	30
ARIEL ST	3.001	Urban Local	305	27	8,228	AC	35
ARIEL ST	3.002	Urban Local	795	27	21,474	AC	19
ARIEL ST	3.003	Urban Local	527	27	14,234	AC	55
ARIEL ST	3.004	Urban Local	544	32	17,413	AC	97
ARIEL ST	3.005	Urban Local	615	32	19,679	AC	97
ARIEL ST	3.006	Urban Local	481	33	15,865	AC	97
ARIEL ST	3.007	Urban Local	201	19	3,812	AC	97
ARIEL ST	3.008	Urban Local	1330	32	42,557	AC	97
ARIEL ST	3.01	Urban Local	329	27	8,896	AC	26
BEAM AVE	4.001	Urban Collector	303	34	10,315	AC	77
BEAM AVE	4.002	Urban Collector	854	34	29,032	AC	77

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
BEAM AVE	4.003	Urban Collector	312	33	10,302	AC	80
BEAM AVE	4.004	Urban Collector	1145	33	37,797	AC	69
BELLAIRE A	26.018	Urban Collector	1318	24	31,625	AC	79
BELMONT LN	5.0001	Urban Local	160	27	4,316	AC	55
BELMONT LN	5.001	Urban Local	658	27	17,770	AC	21
BELMONT LN	5.002	Urban Local	647	27	17,465	AC	21
BELMONT LN	5.003	Urban Local	711	27	19,203	AC	57
BELMONT LN	5.004	Urban Local	219	27	5,922	AC	1
BELMONT LN	5.005	Urban Local	966	27	26,090	AC	43
BELMONT LN	5.006	Urban Local	656	27	17,722	AC	86
BELMONT LN	5.007	Urban Local	210	27	5,671	AC	87
BELMONT LN	5.008	Urban Local	414	27	11,183	AC	84
BETTY JANE	6.001	Urban Local	486	27	13,109	AC	87
BUHL AVE	7.001	Urban Local	1366	27	36,886	AC	44
BURKE AVE	8.0001	Urban Local	470	27	12,691	AC	54
BURKE AVE	8.001	Urban Local	628	27	16,949	AC	33
BURKE AVE	8.002	Urban Local	653	27	17,633	AC	23
BURKE AVE	8.003	Urban Local	652	27	17,596	AC	24
BURKE AVE	8.004	Urban Local	397	27	10,709	AC	50
BURKE AVE	8.005	Urban Local	656	27	17,708	AC	47
BURKE AVE	8.006	Urban Local	660	27	17,812	AC	40
BURKE AVE	8.007	Urban Local	668	27	18,041	AC	82
BURKE AVE	8.008	Urban Local	143	27	3,873	AC	82
CASTLE AV	147	Urban Local	70	56	3,905	AC	91
CASTLE AVE	76.0001	Urban Collector	771	40	30,826	AC	91
CEMETERY R	53.001	Urban Local	413	27	11,157	AC	91
CENTENNIAL	11.019	Urban Local	935	33	30,846	AC	79
CHARLES ST	11.001	Urban Local	327	27	8,834	AAC	82
CHARLES ST	11.002	Urban Local	329	27	8,877	AAC	86
CHARLES ST	11.003	Urban Local	326	27	8,805	AC	84
CHARLES ST	11.004	Urban Local	343	27	9,253	AC	18
CHARLES ST	11.005	Urban Local	326	27	8,809	AC	26
CHARLES ST	11.006	Urban Local	330	27	8,922	AC	30
CHARLES ST	11.007	Urban Local	328	36	11,797	AAC	96
CHARLES ST	11.008	Urban Local	330	37	12,212	AAC	96
CHARLES ST	11.009	Urban Local	328	37	12,133	AAC	96
CHARLES ST	11.01	Urban Local	163	35	5,706	AAC	96

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
CHARLES ST	11.011	Urban Local	159	33	5,262	AC	79
CHARLES ST	11.013	Urban Local	331	38	12,583	AC	54
CHARLES ST	11.014	Urban Local	330	40	13,183	AC	64
CHARLES ST	11.015	Urban Local	331	39	12,921	AC	53
CHARLES ST	11.016	Urban Local	324	37	11,988	AC	59
CHARLES ST	11.017	Urban Local	366	32	11,697	AC	71
CHARLES ST	11.018	Urban Local	400	28	11,211	AC	75
CHARLES ST	12.001	Urban Local	338	27	9,122	AC	26
CHARLES ST	13.001	Urban Local	337	27	9,107	AC	30
CHARLES ST	142	Urban Local	106	35	3,708	APCC	96
CHARLES ST	143	Urban Local	73	33	2,411	PCC	68
CHIPPEWA A	14.001	Urban Local	699	27	18,885	AC	82
CHIPPEWA A	14.002	Urban Local	602	27	16,251	AC	80
CHIPPEWA A	14.003	Urban Local	608	27	16,406	AC	81
CHIPPEWA A	14.004	Urban Local	691	27	18,667	AC	77
CHISHOLM A	15.001	Urban Local	307	27	8,298	AC	35
CHISHOLM A	16.001	Urban Local	1432	27	38,659	AC	27
COWERN PL	17.001	Urban Local	648	27	17,497	AC	26
COWERN PL	17.002	Urban Local	435	27	11,747	AC	52
COWERN PL	17.003	Urban Local	651	27	17,590	AC	50
COWERN PL	17.004	Urban Local	328	27	8,863	AC	50
COWERN PL	17.005	Urban Local	323	27	8,714	AC	45
COWERN PL	17.006	Urban Local	772	27	20,849	AC	48
COWERN PL	17.007	Urban Local	481	27	12,977	AC	50
COWERN PL	17.008	Urban Local	1399	28	39,177	AC	40
DELAWARE A	18.001	Urban Local	265	27	7,151	AC	79
DELAWARE A	18.002	Urban Local	842	27	22,733	AC	81
DELAWARE A	18.003	Urban Local	264	27	7,128	AC	72
DIANNE ST	19.001	Urban Local	1004	27	27,117	AC	49
ELDRIDGE A	20.001	Urban Local	121	27	3,261	AC	6
ELDRIDGE A	20.002	Urban Local	658	27	17,754	AC	21
ELDRIDGE A	20.003	Urban Local	647	33	21,365	AC	39
ELDRIDGE A	20.004	Urban Local	653	33	21,536	AC	21
ELDRIDGE A	20.005	Urban Local	364	33	11,998	AC	23
ELDRIDGE A	20.006	Urban Local	438	27	11,817	AC	98
ELDRIDGE A	20.007	Urban Local	485	27	13,107	AC	98
ELDRIDGE A	20.008	Urban Local	331	27	8,932	AC	83
ELDRIDGE A	20.009	Urban Local	624	27	16,836	AC	84
ELDRIDGE A	20.01	Urban Local	323	27	8,714	AC	82

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
FLANDERS R	21.001	Urban Local	1048	21	22,012	AC	97
GERALD AVE	22.001	Urban Local	1066	27	28,769	AC	13
GERALD AVE	22.002	Urban Local	653	27	17,625	AC	20
HELEN CT	23.001	Urban Local	207	30	6,222	AC	92
HELEN LN	24.001	Urban Local	327	27	8,818	AAC	84
HELEN ST	26.0001	Urban Collector	331	31	10,264	AC	81
HELEN ST	26.001	Urban Local	350	27	9,446	AC	26
HELEN ST	26.002	Urban Local	326	27	8,789	AC	21
HELEN ST	26.003	Urban Local	335	27	9,057	AC	18
HELEN ST	26.004	Urban Local	441	27	11,898	AC	27
HELEN ST	26.005	Urban Local	156	27	4,215	AC	21
HELEN ST	26.006	Urban Local	610	44	26,844	AC	82
HELEN ST	26.007	Urban Collector	331	36	11,899	AC	84
HELEN ST	26.008	Urban Collector	332	36	11,939	AC	83
HELEN ST	26.009	Urban Collector	330	36	11,896	AC	82
HELEN ST	26.01	Urban Collector	323	38	12,290	AC	82
HELEN ST	26.011	Urban Collector	364	32	11,645	AC	81
HELEN ST	26.012	Urban Collector	368	32	11,789	AC	81
HELEN ST	26.013	Urban Collector	296	31	9,164	AC	80
HELEN ST	26.014	Urban Collector	297	32	9,499	AC	87
HELEN ST	26.015	Urban Collector	289	32	9,244	AC	87
HELEN ST	26.016	Urban Collector	561	32	17,960	AC	89
HELEN ST	26.017	Urban Collector	451	32	14,446	AC	87
HELEN ST	138	Urban Local	99	27	2,682	PCC	68
HELEN ST	139	Urban Local	85	27	2,299	PCC	36
HENRY ST	27.001	Urban Local	896	27	24,188	AC	83
HENRY ST	27.002	Urban Local	325	27	8,786	AC	83
HENRY ST	27.003	Urban Local	336	27	9,063	AC	16
HENRY ST	27.004	Urban Local	328	27	8,856	AC	11
HENRY ST	27.005	Urban Local	331	27	8,925	AC	24
HENRY ST	27.006	Urban Local	330	27	8,903	AC	24
HENRY ST	27.007	Urban Local	335	27	9,040	AC	24

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
HENRY ST	27.008	Urban Local	331	27	8,949	AC	12
HENRY ST	27.009	Urban Local	329	27	8,883	AC	30
HENRY ST	27.01	Urban Local	329	27	8,873	AC	27
HENRY ST	27.011	Urban Local	330	27	8,899	AC	27
HENRY ST	27.012	Urban Local	488	35	17,072	AC	85
HENRY ST	27.013	Urban Local	325	35	11,362	AC	86
HENRY ST	27.014	Urban Local	331	30	9,945	AC	33
HENRY ST	27.015	Urban Local	323	27	8,728	AC	44
HENRY ST	27.016	Urban Local	366	30	10,982	AC	48
HENRY ST	27.017	Urban Local	367	30	11,022	AC	61
HENRY ST	144	Urban Local	97	27	2,624	PCC	54
HENRY ST	145	Urban Local	77	35	2,680	PCC	69
HILLTOP CT	28.001	Urban Local	538	29	15,601	AC	18
HILLTOP CT	28.002	Urban Local	343	27	9,265	AC	11
HOLLOWAY A	29.001	Urban Collector	555	38	21,092	AC	75
HOLLOWAY A	29.002	Urban Collector	659	32	21,098	AC	76
HOLLOWAY A	29.003	Urban Collector	648	27	17,485	AC	78
HOLLOWAY A	29.004	Urban Collector	651	30	19,538	AC	81
HOLLOWAY A	29.005	Urban Collector	1303	38	49,513	AC	62
HOLLOWAY A	29.006	Urban Collector	544	41	22,291	AC	62
HOLLOWAY A	29.007	Urban Collector	285	42	11,983	AC	64
HOLLOWAY A	29.008	Urban Collector	485	42	20,361	AC	62
HOLLOWAY A	29.009	Urban Collector	673	42	28,252	AC	62
HOLLOWAY A	29.01	Urban Collector	379	42	15,901	AC	64
HOLLOWAY A	29.011	Urban Collector	1126	42	47,296	AC	65
HOLLOWAY A	29.012	Urban Collector	452	42	19,005	AC	66
HOLLOWAY A	91.001	Urban Local	331	27	8,941	AC	45
HWY 36 E	91.008	Urban Local	661	27	17,835	AC	76
HWY 36 E	91.009	Urban Local	641	27	17,306	AC	76
HWY 36 E	91.01	Urban Local	2220	27	59,929	AC	73
INDIAN WAY	30.001	Urban Local	1123	27	30,331	AC	42
INDIAN WAY	30.002	Urban Local	798	30	23,953	AC	20

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
INDIAN WAY	30.003	Urban Local	347	30	10,416	AC	24
IVY ST	31.001	Urban Local	982	27	26,522	AC	55
JENNIFER C	32.001	Urban Local	473	31	14,659	AC	12
JENNIFER L	33.001	Urban Local	513	27	13,854	AC	55
LAKE BLVD	34.001	Urban Local	758	27	20,463	AC	92
LAKE BLVD	34.002	Urban Local	664	27	17,930	AC	92
LAKE BLVD	34.003	Urban Local	1697	27	45,828	AC	91
LAURIE RD	35.001	Urban Local	320	27	8,633	AC	61
LONGVIEW D	36.001	Urban Local	1061	30	31,817	AC	81
MARGARET S	38.0001	Urban Collector	345	44	15,165	PCC	28
MARGARET S	38.0002	Urban Collector	334	44	14,681	PCC	37
MARGARET S	38.0003	Urban Collector	328	44	14,432	PCC	23
MARGARET S	38.0004	Urban Collector	333	44	14,639	PCC	19
MARGARET S	38.0005	Urban Collector	326	44	14,364	PCC	36
MARGARET S	38.0006	Urban Collector	210	44	9,227	AC	77
MARGARET S	38.0007	Urban Collector	331	44	14,578	AC	61
MARGARET S	38.0008	Urban Collector	333	44	14,657	PCC	42
MARGARET S	38.0009	Urban Collector	330	44	14,501	PCC	52
MARGARET S	38.001	Urban Collector	339	38	12,877	AC	45
MARGARET S	38.0011	Urban Collector	323	44	14,221	PCC	57
MARGARET S	38.0012	Urban Collector	331	44	14,544	PCC	55
MARGARET S	38.002	Urban Collector	333	37	12,307	AC	47
MARGARET S	38.0025	Urban Collector	307	37	11,363	AC	51
MARGARET S	38.003	Urban Collector	986	37	36,466	AC	58
MARGARET S	38.004	Urban Collector	325	37	12,032	AC	50
MARGARET S	38.005	Urban Collector	324	37	12,000	AC	59
MARGARET S	38.006	Urban Collector	294	36	10,594	AAC	89
MARGARET S	38.007	Urban Collector	995	40	39,791	AC	48

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
MARGARET S	38.008	Urban Local	365	37	13,490	AC	22
MARGARET S	38.009	Urban Local	368	37	13,627	AC	39
MARGARET S	140	Urban Collector	85	36	3,057	AAC	89
MARGARET S	141	Urban Collector	100	40	3,983	PCC	11
MARYJOE LN	39.001	Urban Local	390	27	10,518	AC	51
MARYJOE LN	39.002	Urban Local	364	27	9,834	AC	63
MARYJOE LN	39.003	Urban Local	392	27	10,576	AC	32
MEADOW DR	40.001	Urban Local	490	27	13,240	AC	36
MEMORY CT	41.001	Urban Local	142	27	3,842	AC	30
MEMORY LN	42.001	Urban Local	1028	27	27,753	AC	20
MESABI AVE	43.001	Urban Local	285	27	7,689	AC	11
MESABI AVE	43.002	Urban Local	1544	27	41,681	AC	20
MOHAWK RD	44.001	Urban Local	424	29	12,291	AC	61
MOHAWK RD	44.002	Urban Local	870	27	23,486	AC	57
MOHAWK RD	44.003	Urban Local	305	27	8,228	AC	57
MOHAWK RD	44.004	Urban Local	638	27	17,236	AC	73
NAVAJO RD	45.001	Urban Local	1169	27	31,554	AC	42
NAVAJO RD	45.002	Urban Local	825	28	23,093	AC	69
NORTH ST.	85.012	Urban Collector	301	30	9,034	AC	75
NORTH ST.	85.02	Urban Local	1543	33	50,908	AC	84
NORTH ST.	85.022	Urban Collector	337	37	12,463	AC	81
NORTHWOOD	46.001	Urban Local	639	27	17,265	AC	14
NORTHWOOD	46.002	Urban Local	645	27	17,428	AC	29
NORTHWOOD	46.003	Urban Local	268	27	7,242	AC	18
OAKHILL PL	47.001	Urban Local	452	22	9,941	AAC	92
PARK ROW	48.001	Urban Local	1308	27	35,316	AC	84
PARK ROW	48.002	Urban Local	658	27	17,766	AC	83
PARK ROW	48.003	Urban Local	363	26	9,438	AC	92
PARK ROW	146	Urban Local	134	26	3,474	AC	83
PARKWAY DR	49.001	Urban Local	717	27	19,365	AC	84
PARKWAY DR	49.002	Urban Local	1417	27	38,260	AC	84
PENN PL	70.006	Urban Local	523	24	12,550	AC	53
POLARIS CT	51.001	Urban Local	183	27	4,951	AC	51
POLARIS PL	50.001	Urban Local	370	27	10,003	AC	47
POLARIS PL	50.002	Urban Local	949	27	25,610	AC	49
PONDVIEW C	52.001	Urban Local	82	24	1,964	AC	37
POPLAR AVE	53.002	Urban Local	941	18	16,933	AC	87

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
RADATZ AVE	54.001	Urban Local	755	29	21,900	AC	66
RADATZ AVE	54.002	Urban Local	1631	28	45,654	AC	73
RADATZ AVE	54.003	Urban Local	280	28	7,835	AC	72
REARDON PL	55.001	Urban Local	368	30	11,041	AC	48
RIPLEY AVE	56.001	Urban Local	528	27	14,245	AC	33
RYAN AVE	57.001	Urban Local	534	27	14,420	AAC	82
RYAN AVE	57.002	Urban Local	386	27	10,430	AAC	81
RYAN CT	58.001	Urban Local	503	27	13,579	AC	22
SEANS WAY	123.0001	Urban Local	828	26	21,532	AC	44
SEPPALA BL	59.001	Urban Local	790	25	19,742	AC	35
SEPPALA BL	59.002	Urban Local	843	30	25,291	AC	43
SEPPALA BL	59.003	Urban Local	872	31	27,027	AC	24
SEPPALA BL	59.004	Urban Local	281	36	10,131	AC	0
SHAWNEE DR	60.001	Urban Local	590	27	15,932	AC	19
SHAWNEE DR	60.002	Urban Local	454	27	12,258	AC	80
SHAWNEE DR	60.003	Urban Local	368	27	9,934	AC	83
SHAWNEE DR	60.004	Urban Local	360	27	9,726	AC	82
SHAWNEE DR	60.005	Urban Local	332	27	8,959	AC	40
SHAWNEE DR	60.006	Urban Local	321	27	8,679	AC	31
SHOSHONE R	61.001	Urban Local	1169	27	31,550	AC	52
SHOSHONE R	61.002	Urban Local	312	27	8,413	AC	59
SHRYER AVE	62.001	Urban Local	549	27	14,824	AC	39
SHRYER AVE	62.002	Urban Local	488	27	13,168	AC	98
SHRYER AVE	62.003	Urban Local	605	27	16,331	AAC	82
SHRYER AVE	62.004	Urban Local	690	27	18,628	AAC	84
SHRYER CT	149.001	Urban Local	209	24	5,019	AC	71
SKILLMAN A	63.001	Urban Local	648	27	17,491	AC	37
SKILLMAN A	63.002	Urban Local	712	33	23,492	AC	40
SKILLMAN A	63.003	Urban Collector	330	33	10,880	AC	48
SKILLMAN A	63.004	Urban Collector	324	33	10,692	AC	40
SKILLMAN A	63.005	Urban Collector	781	33	25,770	AC	63
SKILLMAN A	63.006	Urban Collector	490	27	13,240	AC	14
SKILLMAN A	63.007	Urban Collector	269	27	7,267	AC	45
SKILLMAN A	63.008	Urban Local	787	27	21,255	AC	43
SPIRIT DR	64.001	Urban Local	765	27	20,668	AAC	91
SPIRIT HIL	37.001	Urban Local	339	27	9,162	AC	97
STERLING S	25.001	Urban Local	399	23	9,179	AC	81

Branch ID	Section ID	Classification	Length (ft)	Width (ft)	Area (sqft)	Surface Type	2023 PCI
STERLING S	25.002	Urban Local	374	25	9,349	AC	84
STERLING S	25.003	Urban Local	489	26	12,704	AC	85
SWAN AVE	65.001	Urban Local	788	18	14,183	AC	91
TIERNEY AV	66.001	Urban Local	483	27	13,029	AC	22

Appendix C: PCI Examples Pictures

While it can be difficult to capture the condition of an entire segment in a single picture, they can serve as a general representation of the present conditions. WSB pavement inspectors take photographs of each segment they inspect. As requested by the City, below are some of the segments inspected with PCI scores ranging from the mid 50's to the low 40's.

Shoshone Road 61.002, PCI = 59



Mohawk Road 44.002, PCI = 57



Charles Street 11.013, PCI = 54



Shoshone Road 61.001, PCI = 52



Reardon Place 55.001, PCI = 48



Henry Street 27.015, PCI = 44



Buhl Avenue 7.001, PCI = 44



Indian Way 30.001, PCI = 42



Navajo Road 45.001, PCI = 42



	Fund	Category	2018	2019	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	TOTALS
Scenario 1 - Do Nothing			58.5	59.7	56.8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	41.4						\$ -
Scenario 2 2025 and 2027 Reconstruct Only	022 Bonding Streets	Pavement Reconstruction				\$ -	\$ -	\$ 2,670,700	\$ -	\$ 3,255,200	45.8	43.6						\$ 5,925,900
Scenario 3 Maintenance Overlays \$350k and Pvmt Rehab \$1.1M 2025 and 2027 Reconstruct Only	011 Street Maintenance Fund	Maintenance Overlays				\$ 350,000	\$ 384,400	\$ 394,010	\$ 403,860	\$ 413,957	\$ 424,306							\$ 2,370,533
	011 Street Maintenance Fund	Pavement Preservation					\$ 1,100,000		\$ 1,150,000		\$ 1,208,219							\$ 3,458,219
	022 Bonding Streets	Pavement Reconstruction						\$ 2,670,700		\$ 3,255,200								\$ 5,925,900
		TOTAL OVERALL RATING				\$ 350,000	\$ 1,484,400 56.4	\$ 3,064,710 54.7	\$ 1,553,860 56.7	\$ 3,669,157 55.3	\$ 1,632,525 54.9	52.4						\$ 11,754,652
NEW Scenario 4 - Extend to 2033 Maintenance Overlays \$350k and Pvmt Rehab \$1.1M Pavement Rehabilitation Every Year Start 2030 2025, 2027, 2029 Reconstruct - Stop After 2029	011 Street Maintenance Fund	Maintenance Overlays				\$ 350,000	\$ 384,400	\$ 394,010	\$ 403,860	\$ 413,957	\$ 424,306	\$ 434,913	\$ 445,786	\$ 456,931	\$ 468,354	\$ 480,063		\$ 4,656,580
	011 Street Maintenance Fund	Pavement Preservation					\$ 1,100,000		\$ 1,150,000		\$ 1,208,219		\$ 1,269,385	\$ 1,301,119	\$ 1,333,647	\$ 1,366,647		\$ 8,729,017
	022 Bonding Streets	Pavement Reconstruction						\$ 2,670,700		\$ 3,255,200		\$ 3,000,000						\$ 8,925,900
		TOTAL OVERALL RATING				\$ 350,000	\$ 1,484,400 56.4	\$ 3,064,710 54.7	\$ 1,553,860 56.7	\$ 3,669,157 55.3	\$ 1,632,525 54.9	\$ 3,434,913 55.2	\$ 1,715,171 57.2	\$ 1,758,050 56.9	\$ 1,802,001 56.7	\$ 1,846,710 56.5	56.3	\$ 22,311,497
NEW Scenario 5 - Extend to 2033 Maintenance Overlays \$350k and Pvmt Rehab \$2.0M Pavement Rehabilitation Every Year Start 2030 2025, 2027, 2029 Reconstruct - Stop After 2029	011 Street Maintenance Fund	Maintenance Overlays				\$ 350,000	\$ 384,400	\$ 394,010	\$ 403,860	\$ 413,957	\$ 424,306	\$ 434,913	\$ 445,786	\$ 456,931	\$ 468,354	\$ 480,063		\$ 4,656,580
	011 Street Maintenance Fund	Pavement Preservation					\$ 1,100,000		\$ 2,000,000		\$ 2,050,000		\$ 2,100,000	\$ 2,150,000	\$ 2,175,000	\$ 2,200,000		\$ 13,775,000
	022 Bonding Streets	Pavement Reconstruction						\$ 2,670,700		\$ 3,255,200		\$ 3,000,000						\$ 8,925,900
		TOTAL OVERALL RATING				\$ 350,000	\$ 1,484,400 56.4	\$ 3,064,710 54.7	\$ 2,403,860 56.7	\$ 3,669,157 56.8	\$ 2,474,306 57.8	\$ 3,434,913 58.1	\$ 2,545,786 60.1	\$ 2,606,931 60.2	\$ 2,643,354 60.4	\$ 2,680,063 60.6	60.8	\$ 27,357,480