Maintenance Appendix

B

July 2016

Trail Name: _____

Trail Segment: _____

Inspection Date: _____

Inspector Name: _____

PAVED TRAIL INSPECTION TEMPLATE

Follow-up Performed By: _____

Follow-up Date: _____

	Inspection Items:	✔ if "Yes"	Inspection Comment/Location	✔ if Maintenance is Complete	Follow Up Comments	Photos Taken During Inspection: Y/N
1	Pavement condition					
	a. Are there cracks, surface pitting, potholes, heaves or other					
	deficiencies in the trail surface condition?					
2	Pavement markings					
	a. Are pavement markings fading or chipping?					
3	Overhead tree/brush trimming					
	a. Is there less than 10-feet of vertical clearance					
	across the trail and clear zones?					
	b. Do the trail clear zones need to be cleared of woody vegetation?					
4	Intersection sight lines (road, driveway, other trail, sidewalk)					
	a. Does vegetation within the trail corridor need to be cleared					
	to maintain sightlines from/to trail?					
5	Rain gardens					
	a. Is there standing water more than 48 hours after a rain event?					
	b. Are there weeds/volunteer plants growing in the rain garden?					
	c. Is sediment accumulating anywhere in the rain garden?					
	d. Do any rain garden plants need to be replaced?					
	e. Is more mulch needed?					
	f. Is there erosion or gullying?					
	g. Is there trash or debris in the rain garden?					
6	Erosion evidence/damage					
	a. Is there any erosion damage to the trail or shoulders?					
7	Drainage structures & culverts					
	a. Are any culverts clogged with debris?					
	b. Are any catch basins clogged or blocked? (trailhead parking lots)					
	c. Is there any erosion near culverts?					
8	Ditch clearing					
	a. Is there debris in the ditches? (trash, branches, sediment, etc.)					
	b. Is there standing water in the ditches?					
	c. Do ditches need mowing?					

	Inspection Items:	✔ if "Yes"	Inspection Comment/Location	✔ if Maintenance is Complete	Follow Up Comments	Photos Taken During Inspection: Y/N
9	Bridge/tunnel/boardwalk (Non-structural inspection)					
	a. Is there any graffiti that needs to be cleaned?					
	b. Are the railings bent, broken or in disrepair?					
	c. Is the decking in disrepair? (nail heads sticking up, cracks, etc.)					
	d. Is the paint or surface treatment chipping or cracking?					
	e. Is there any spalling?					
	f. Is there sediment accumulation on the trail?					
	g. Are the light fixtures in good shape?					
	h. Is there any visual sign of damage to the substructure?					
10	Railroad crossings (Non-structural inspection)					
	a. Is the crossing in disrepair? (not flush with trail, large gaps, etc)					
	b. Is trail signage at the railroad crossing blocked by					
	vegetation or other obstructions?					
11	Trail amenities					
	a. Are any bike racks, trash receptacles, kiosks, picnic tables or					
	benches broken or in disrepair?					
	b. Is there any sign of vandalism?					
	c. Do the concrete pads around amenities need repair?					
12	Pet stations					
	a. Do the pet station bags need to be re-filled?					
13	Restrooms (portable toilets)					
	a. Does the toilet need to be serviced?					
	b. Has the toilet been vandalized or is it in disrepair?					
	c. Is the concrete pad significantly cracked and does it require repair?					
14	Signage					
	a. Are any trail signs blocked by vegetation for other obstructions?					
	b. Is there any physical damage to trail signs?					
	c. Are connecting bolts and anchorages intact?					
15	Fences (chain link, wood)					
	a. Are there any holes or gaps in the fence fabric?					
	b. Are there any loose, bent or broken fence posts?					
	c. Are there any loose connections between the fence and posts?					
16	Sediment/debris on trail					
	a. Is there any sediment on the trail?					
	b. Is there any debris on the trail (storm, trash, etc.)					
17	Lighting					
	a. Does the fixture need to be replaced or repaired?					
	b. Does the light hardware need to be repaired? (pole, mast, etc.)					

Trail Maintenance Activity Schedule

PAVED TRAIL MAINTENANCE SCHEDULE

Maintenance Activity	Optimal Frequency							Notes
	Weekly	Monthly	Quarterly	Annually	Spring/Fall	After Storm	Other	
General								
1 Safety inspection	X					X		
2 General debris and trash pickup	X					X		
3 Vandalism inspection	X							
4 Encroachments							Ongoing	
Pavement								
1 Pavement survey					X			Conduct Spring and Fall surveys
2 Crack sealing							Reactionary	
3 Patching							As needed	
4 Fog seal							As needed	Lifespan approximately 4-6 years
5 Sealcoat							As needed	Lifespan approximately 6-10 years
6 Slurry seal							As needed	Lifespan approximately 8-10 years
7 Overlay							As needed	Lifespan approximately 15 years
8 Reconstruct							As needed	
9 Inspect pavement markings				X				
10 Repaint pavement markings							As needed	
Vegetation								
1 Mowing- clear zones, trailhead areas	X	X						
2 Brush trimming/overhead trimming				X				Spring activity
3 Clear zone weed control							As needed	Noxious weed spraying/removal
4 Sight line trimming at intersections		X						Roads, other trails, driveways, etc.
5 Tree removal						X	As needed	Storm cleanup
6 Rain garden maintenance		X				X		
7 Trail sweeping/blowing					X	X	As needed	Up to weekly frequency in Fall
8 Seeding				X	X			Spring activity
9 Root cutting							As needed	Monitor root activity along trail
Drainage								
1 Erosion repair			X		X	X		After spring snowmelt, storm cleanup
2 Culvert/catch basin clearing			X			X		Storm cleanup
3 Ditch maintenance (clear of debris, trash, branches)				X		X		Spring activity
4 Standing water repair				X		X		
Structures								
1 Bridge inspection (non-structural inspection)				X				
2 Tunnel inspection (non-structural inspection)				X				
3 Boardwalk inspection				X				
4 Railroad crossing inspection				X				Notify owner (railroad) of problems
5 Retaining walls				X				

PAVED TRAIL MAINTENANCE SCHEDULE

Maintenance Activity	Optimal Frequency							Notes
	Weekly	Monthly	Quarterly	Annually	Spring/Fall	After Storm	Other	
Amenities								
1 Empty trash receptacles	X							May vary depending on trail use
2 Restroom maintenance (portable toilets)	X							May vary depending on trail use
3 Pet station re-stocking	X							May vary depending on trail use
4 Information kiosk inspection				X				
5 Update information kiosk graphics/maps							As needed	
6 Bench, bike rack, picnic table, trash receptacle inspection			X					
7 Signage inspection				X				
8 Lighting inspection			X					
9 Fence inspection				X				
10 Bollard inspection				X				
Winter								
1 Install/remove winter use signage					X			
2 Install/remove bridge protection from snowmobiles					X			Wood chips or rubber matting
3 Plow trail						X	As needed	
4 Plow trailheads and parking						X	As needed	
5 Install/remove protection at snowmobile trail crossings				X				
6 Ski trail grooming	X					X		

CITY OF BLOOMINGTON MINNESOTA

Maintenance Costs for Trails

Trail Pavement Management Program

Throughout Bloomington there is an existing right-of-way and park trail system with approximately 38 miles of bituminous trail and bituminous sidewalk, in various state of repair. The City is beginning to implement a trail maintenance program similar to the existing Pavement Management Program for roadways, that would apply the appropriate pavement maintenance applications at the correct times to maximize the condition and usable life of the bituminous pavement trails over the targeted usable life of 30 years. This program will be referred to as Trail PMP. This program will include a prioritized reconstruction plan as well as a trail maintenance plan.

RECONSTRUCTION PLAN

As part of the development of the Trail PMP, a complete inventory and pavement condition index (PCI) has been collected for all existing right-of-way bituminous asphalt trails and bituminous asphalt park trails. From that assessment, approximately 9 -10 miles of bituminous trail were identified with a PCI between 0 and 35.99, classified as poor condition, and a 10-year construction and funding plan has been developed to reconstruct those 9-10 miles of trails (2018 doesn't have construction identified, funding and time that year would be dedicated to ROW acquisition for future projects).

Figure 1. Trail Segments Identified for Reconstruction in 10 year Plan

Name	Parallel Street	Segment	Approx. Length [Miles]	Est. TPMP Year
Normandale	Normandale Blvd	9 Mile Creek to 94th Street	2.25	2016
Lindstrom	Lindstrom Drive	South Bay to Zylon	.25	2017
Collegeview	Collegeview Rd	90th Street to 3000' east	.5	2017
Penn Walkway	Penn Avenue	Ivy Ln to Maple Ave	.25	2017
France	France Ave	Poplar Bridge Rd to 9 Mile Creek	.5 +	2019
West Bush Lake	West Bush Lake Rd	Oakmere to 494	1	2020
Minnesota Bluffs	Minnesota Bluffs	114th St to Sumter Ave	.5	2020
Auto Club	Auto Club Rd	Auto Club Cir to MN Valley	.25	2020
Normandale	Normandale Blvd	94th Street to Old Shakopee Rd	1.75 +	2021-23
Old Shakopee Rd	Old Shakopee Rd	Nesbitt to Bloomington Ferry	1.25	2024

ENGINEERING DIVISION
1700 WEST 98TH STREET, BLOOMINGTON MN 55431-2501
PH 952-563-4870 FAX 952-563-4868 TTY 952-563-8740

This reconstruction plan is based on estimates of potential funding (including Franchise Fees and grants) as well as construction costs, ROW costs, wall costs, administrative and engineering costs. When drafted in 2015, the plan to reconstruct the approximately 9-10 miles of poor condition trail was estimated to cost on the order of $5.8 million. The Plan may also be accelerated based on funding priorities established annually in the Capital Inverstment Plan (CIP) and will be updated as additional data becomes available.

TRAIL MAINTENANCE PLAN

Another critical element of the new Trail PMP is the application of appropriate pavement maintenance techniques at optimum times to maximize the condition of the pavement over its life (Pavement Condition Maintenance) and day-to-day surface maintenance (Routine Trail Maintenance) to maintain the safe, seasonal usability of the trails.

Pavement Condition Maintenance

Pavement condition maintenance includes the routine pavement maintenance techniques that will be applied to preserve the condition and life of the pavement for an estimated 30 years pavement life. The estimated costs for pavement condition maintenance, using best practices for trail pavement maintenance, are broken out in Figure 2.

Figure 2. Costs per Mile for Pavement Condition Maintenance

Maintenance	Time Interval	Cost per Mile	Treatments in 30 years	Cost per Mile over 30 year life	Average Cost per Mile per Year
Crack Seal and Fog Coat	Every 7 years	$18,600	3	$55,800	$1,860
Paint Centerline (if needed)	Every 7 years	$1,000	3	$3,000	$100
			Total =	$58,800	$1,960

Routine Trail Maintenance

Routine maintenance of the trail surface is required to ensure access and safe usability of the bituminous trail system. This routine maintenance includes sweeping to remove debris, mowing along the trails for improved site lines and to keep it clean, snow plowing to maintain access during winter and sign maintenance. The costs for surface maintenance are broken out in Figure 3.

Figure 3. Costs per Mile for Routine Trail Maintenance

Maintenance	Time Interval	Cost per Mile	Treatments in 30 years	Cost per Mile over 30 year life	Average Cost per Mile per Year
Sweeping	5 times per season	$50*	3	$7,500	$250
Mowing	Every 2 weeks (May - Oct)	$101.50**	14	$42,630	$1,421
Snow Plowing	Each 2" snowfall	$50*	12	$18,000	$600
Signs	5-10 year lifespan			$3,800	$100
			Total =	$71,930	$2,371

*Sweeping and snow plowing cost based on estimated $100/hour for labor and equipment and estimated 2 miles per hour

**Mowing cost estimate assumes a strip on each side of and a cost of $70 per acre

Estimated Maintenance Costs per Mile

Total average cost per mile for (30 year) lifetime of trail = $130,730

Total average cost per mile per year for (30 year) lifetime of trail = $4,331

Cost to Maintain the Existing Trail System

The existing Right-of Way and Park trail system includes an estimated 38 miles of bituminous asphalt trails. The 2016 Maintenance budget for trail maintenance is $125,000. With this funding, the maintenance focus will be on pavement condition maintenance of the 28+/- miles of trails with pavement condition that is good or new (PCI of 36 and higher) and routine maintenance of all trails. The current maintenance budget provides an estimated $3,290 per mile of existing trail, which is a little below the estimated $4,331 average cost per mile per year for trail maintenance.

The Cities goal identified in the Trail PMP Plan and funding options discussed, is for that maintenance budget to increase to ultimately fully fund the maintenance plan for the 38 miles of trail, especially as the 9-10 miles of poor condition trail are reconstructed and added to the pavement condition maintenance plan.

Cost to Maintain New Trail Segments Identified in the ATP

As any new segments of bituminous trail are added to the system, the maintenance budget will need to be increased as well. Estimated annual maintenance costs for each new trail segment identified in the Prioritized List (Figure 4-5) in the ATP Plan are indicated along with the construction costs so they are known and can be planned for at the same time that new construction is being considered. If all of the new Regional Trails identified in the ATP Prioritized List are constructed, it would add an estimated $71,000 per year (in 2016 dollars) of additional trail maintenance costs (does not include the Minnesota River Trail that will be maintained by the DNR). If all of the new Community Corridors identified in the ATP Prioritized List are constructed it would add an estimated $48,000 per year (in 2016 dollars) of additional trail maintenance costs (this includes only new, off-road trail segments).

Program developed by:	Engineering and Maintenance
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Document prepared by:	Amy Marohn