

Open Source Asset Management for Small Municipalities



Introduction to the AIMNet Solution
October 17, 2020

Who We Are

- A not-for-profit Community of Practice
- A network of individuals committed to asset management planning for long-term sustainability of services
- Our mandate: To guide and support infrastructure management planning for municipalities in Atlantic Canada by facilitating opportunities for knowledgesharing, collaboration and resource development

What is Open Source?

- Open-source-software supports the use of <u>open-source licenses</u> for some or all software, a part of the broader notion of <u>open collaboration</u>;
- A software for which the original source code is made freely available and may be redistributed and modified according to the requirement of the user;
- Governed by an open source license that defines acceptable use, reuse, modifications, attribution and commercialization







Contributors















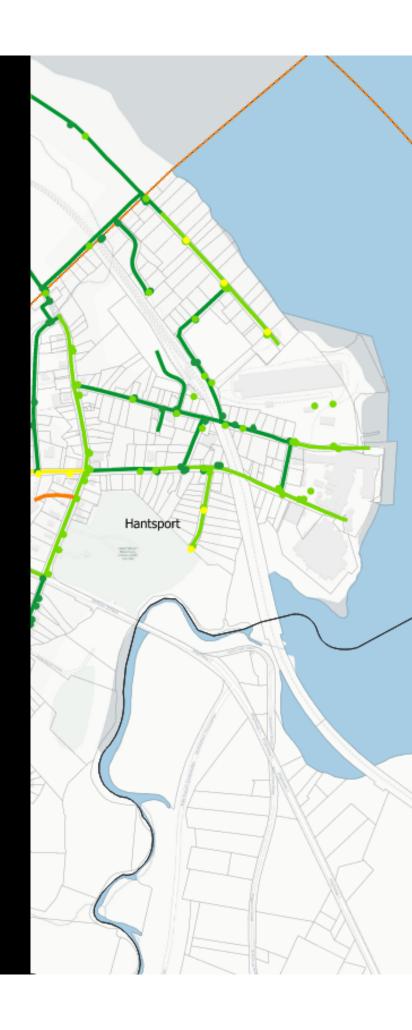
Open Source Toolkit

- Asset Management Policy Template
- Committee Terms of Reference Template
- Asset Management Planning Self Assessment
- Capacity Building Roadmap Template
- QGIS Layer Templates
- Inventory Data and Reporting Spreadsheet
- User Guide for the Inventory Tool
- Project Planning and Budgeting Spreadsheet
- Capital Program Template
- Asset Management Program Template



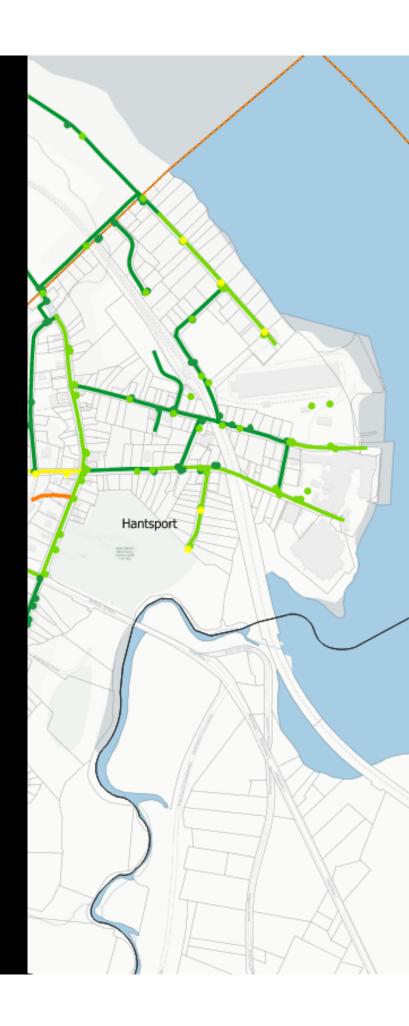
How Does it Work?

- Develop Policy
- Assemble Asset Management Committee
- Collect Inventory
- Define Level of Service
- Assess Risk
- Assign Priority
- Generate Reports
- Assign Projects
- Define Budgets



Inventory Collection

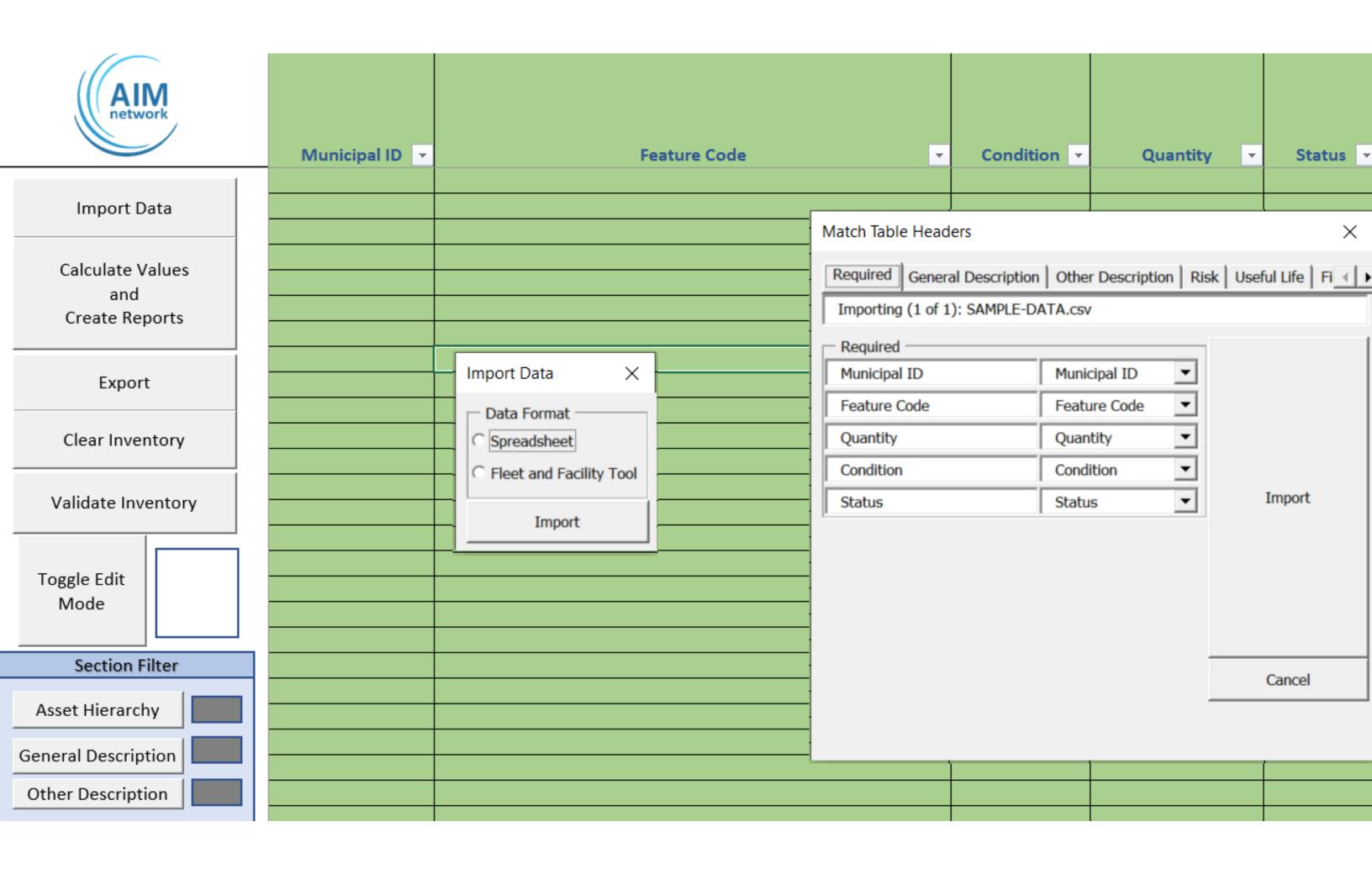
- Collect Data:
 - GIS
 - Digital (CAD)
 - PDF
 - Hard Copies
 - Field Collection
- Assess Condition
- Assess Risk
- Define Level of Service
- Assign Priority
- Generate Reports
- Assign Projects
- Define Budgets



Inventory Entry

- Direct Entry into Spreadsheet
- Import from shape file DBF
- Import from CSV exported from ESRI geodatabase
- Import from CSV of survey data
- Import from fleet and facilities collection spreadsheet





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Data Entry Table

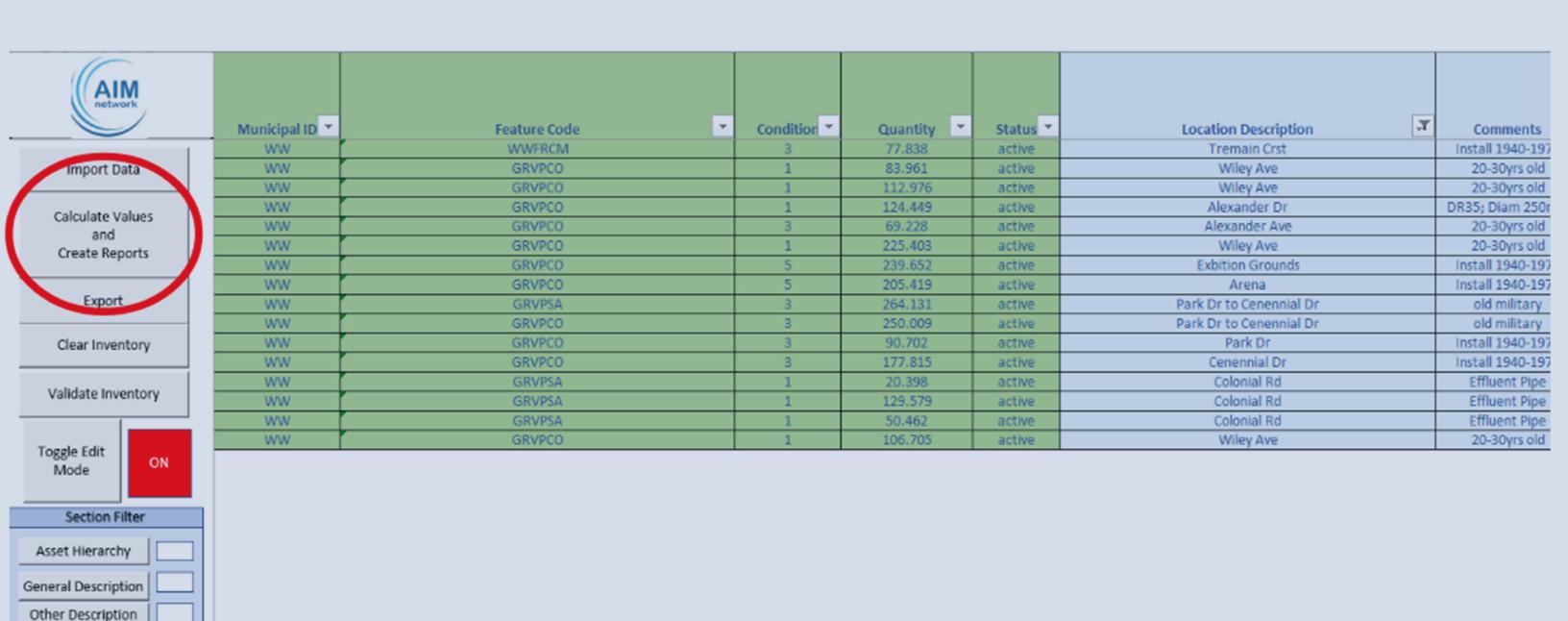
FACILITIES SPREADSHEET

Level 2 Group Elements	Туре	Description	Lookup	Quantity	Unit	Rate	Replacement Cost	Life Expectancy (Yrs.)
Foundations								
Standard Foundations	Standard		Standard Foundations_Standard	3,840	SF	\$ 20.00	\$ 76,800	100
Special Foundations	Standard	NA	Special Foundations_Standard		SF	\$ 8.50	\$ -	100
Slab on Grade	Standard	NA	Slab on Grade_Standard		SF	\$ 9.00	\$ -	100
Basement Construction								
Basement Excavation	Standard	NA - 2 story built up from ground	Basement Excavation_Standard		CF	\$ 7.00	\$ -	100
Basement Walls	Standard	NA	Basement Walls_Standard		SF	\$ 50.00	\$ -	80
Superstructure								
Floor Construction	Standard	NA	Floor Construction _Standard		SF	\$ 17.00	\$ -	50
Roof Construction	Standard	NA	Roof Construction_Standard		SF	\$ 20.00	\$ -	50
Exterior Closure								
Exterior Walls	Standard	Vinyl Siding	Exterior Walls_Standard	6960	SF	\$ 65.00	\$ 452,400	50
Exterior Windows	Standard	5	Exterior Windows_Standard	80	SF	\$ 40.00	\$ 3,200	20
Exterior Doors	Standard	9 mandoors, 6 overhead doors	Exterior Doors_Standard	460	SF	\$ 7.00	\$ 3,220	20
Roofing								
Roof Coverings	Standard	Aluminum roof	Roof Coverings_Standard	3840	SF	\$ 15.00	\$ 57,600	20
Roof Openings	Standard	1 ventillation for washrooms	Roof Openings_Standard	1	SF	\$ 25.00	\$ 25	25
Interior Construction								
Partitions	Standard		Partitions_Standard	6960	SF	\$ 30.00	\$ 208,800	50
Interior Doors	Standard	4 upstairs, 3 downstairs, 1 in boat garage	Interior Doors_Standard	160	SF	\$ 7.00	\$ 1,120	50
Specialities	Standard	NA	Specialities_Standard		SF	\$ 25.00	\$ -	50

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Data Entry Table

							Consequence of
Component Name	Description	Rer	placement Cost	Life Expectancy (Yrs.)	Annual Maintenance Cost	Condition	Failure
3 Utility Vehicle (Jeep Compass), VIN: 3C4NJDBB9JT30	Year: 2018, Fuel: Gas, Plate: R28342, MVI Expiry: April-21-2020, Reg. Expiry: May-20-2020	\$	26,700	10	1500	1	1
11-15 Utility Vehicle (Ford Escape)	Year: 2015, Fuel: Gas, Plate: R28115, MVI Expiry: August-20-2020, Reg. Expiry: August-21-2020	\$	28,500	10	1500	3	1
20-17 Work Truck (Dodge 1500)	Year: 2017, Fuel: Gas, Plate: R27023, MVI Expiry: June-20-2020, Reg. Expiry: October-01-2020	\$	60,160	10	1500	2	1
21-15 Work Truck (F-150)	Year: 2015, Fuel: Gas, Plate: R27067, MVI Expiry: October-20-2020, Reg. Expiry: November-21-20	\$	60,160	10	1500	3	1
22-09 Work Truck (Dodge 1500)	Year: 2009, Fuel: Gas, Plate: R22526, MVI Expiry: July-20-2020, Reg. Expiry: October-20-2020	\$	60,160	10	1500	5	1
23-13 Work Truck (F-150)	Year: 2013, Fuel: Gas, Plate: R21105, MVI Expiry: June-20-2020, Reg. Expiry: December-20-2020	\$	60,160	10	1500	4	1
24-10 Work Truck (Dodge 1500)	Year: 2010, Fuel: Gas, Plate: R20025, MVI Expiry: August-20-2020, Reg. Expiry: October-20-2020	\$	60,160	10	1500	5	1
25-17 Work Truck (Dodge 1500)	Year: 2017, Fuel: Gas, Plate: R28298, MVI Expiry: July-20-2020, Reg. Expiry: September-21-2020	\$	60,160	10	1500	2	1
26-13 Work Truck (F-150)	Year: 2013, Fuel: Gas, Plate: FTY727, MVI Expiry: August-20-2020, Reg. Expiry: August-21-2020	\$	60,160	10	1500	4	1
27-06 Work Truck (Dodge 1500)	Year: 2006, Fuel: Gas, Plate: R25572, MVI Expiry: February-22-2020, Reg. Expiry: October-20-2020	\$	60,160	10	1500	5	1
28-15 Work Truck (Dodge 1500)	Year: 2015, Fuel: Gas, Plate: FRS164, MVI Expiry: August-20-2020, Reg. Expiry: September-21-202	\$	60,160	10	1500	3	1
29-18 Work Truck (Dodge 1500)	Year: 2018, Fuel: Gas, Plate: R23396, MVI Expiry: June-21-2020, Reg. Expiry: October-20-2020	\$	60,160	10	1500	2	1
20-14 Work Truck (Dodge 2500)	Voors 2014 Fuels Gas Diates P24726 MVI Evning November-20-2020 Reg Evning Eebruang-20-2	Ċ	70.000	10	1500	2	1



Generate Preliminary State of Infrastructure Reports

Risk

Useful Life

Financial

Beginner

Intermediate

View Mode

Preliminary
State of
Infrastructure
Report

What do we own?

What condition is it in?

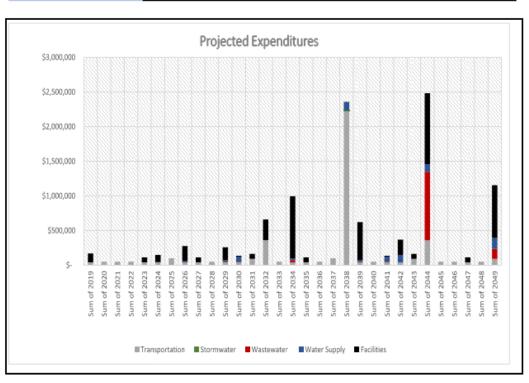
When will it reach end of service life?

How much is my infrastructure worth?

Preliminary State of Infrastructure Report

The following table shows estimated value and annual reserves required for different water network asset groups.

	Cost (\$)	Value (%)	Annual Reserve (\$)	Annual Reserve (%)
Hydrants	\$423,150	6%	\$5,289	5%
Pipes	\$4,301,653	59%	\$57,355	54%
Pumping Station		0%		0%
Valves	\$1,843,725	25%	\$23,582	22%
Water Treatment	\$692,866	10%	\$20,320	19%
Other	\$3,255	0%	\$41	0%
Grand Total	\$7,264,649	100%	\$106,588	100%



These tables summarize the average condition of different water network asset groups. For more detail, please refer to the condition maps.

	Weighted Average Condition
Hydrants	2.0
Pipes	2.7
Pumping Station	
Valves	2.3
Water Treatment	2.0
Other	2.0

Condition							
Rating	Description						
1	Very Good						
2	Good						
3	Fair						
4	Poor						
5	Very Poor						

1. SUMMARY OF ALL ASSET CLASSES

a) Estimated Replacement Costs and Annual Reserve

This table shows the total estimated replacement costs and annual reserves required of your asset classes. These cost and reserve values are obtained by summing individual replacement cost and reserve values for each captured asset within their respective asset class.

	Cost (\$)	Cost (%)	Annual Reserve (\$)	Annual Reserve (%)
Transportation	\$2,594,405	13%	\$143,970	31%
Barriers and Fences		0%		0%
Bridges		0%		0%
Lights		0%		0%
Roads	\$2,594,405	13%	\$143,970	31%
Sidewalks and Trails		0%		0%
Signs and Signals		0%		0%
Other		0%		0%
Stormwater	\$1,430,511	7%	\$18,965	4%
Catch Basins	\$37,200	0%	\$465	0%
Manholes	\$93,000	0%	\$1,163	0%
Pipes	\$1,300,311	6%	\$17,337	4%
Pumping Station		0%		0%
Other		0%		0%
Wastewater	\$5,070,183	25%	\$76,909	16%
Manholes	\$688,200	3%	\$8,603	2%
Pipes	\$2,805,629	14%	\$37,547	8%
Pumping Station	\$930,000	5%	\$18,600	4%
Valves	\$4,650	0%	\$93	0%
Wastewater Treatment	\$641,704	3%	\$12,066	3%
Other		0%		0%
Water Supply	\$7,264,649	36%	\$106,588	23%
Hydrants	\$423,150	2%	\$5,289	1%
Pipes	\$4,301,653	21%	\$57,355	12%
Pumping Station		0%		0%
Valves	\$1,843,725	9%	\$23,582	5%
Water Treatment	\$692,866	3%	\$20,320	4%
Other	\$3,255	0%	\$41	0%
Facilities	\$3,809,993	19%	\$124,429	26%
Outdoor Parks and Rec	\$229,500	1%	\$12,667	3%
Indoor Parks and Rec		0%		0%
Municipal Offices		0%		0%
Public Works		0%		0%
Firehall	\$1,877,284	9%	\$62,364	13%
Other	\$1,703,209	8%	\$49,399	10%
Grand Total	\$20,169,742	100%	\$470,861	100%

1. SUMMARY OF ALL ASSET CLASSES

b) Projected Expenditures - Table

This table shows projected expenditures based on replacement cost, life expectancy, condition and maintenance costs for the next 30 years. These projected expenditures are not intended to be used as a long-term financial plan, instead to give an idea of the magnitude of projected costs if all assets were maintained and replacement at their expected end-of-life date.

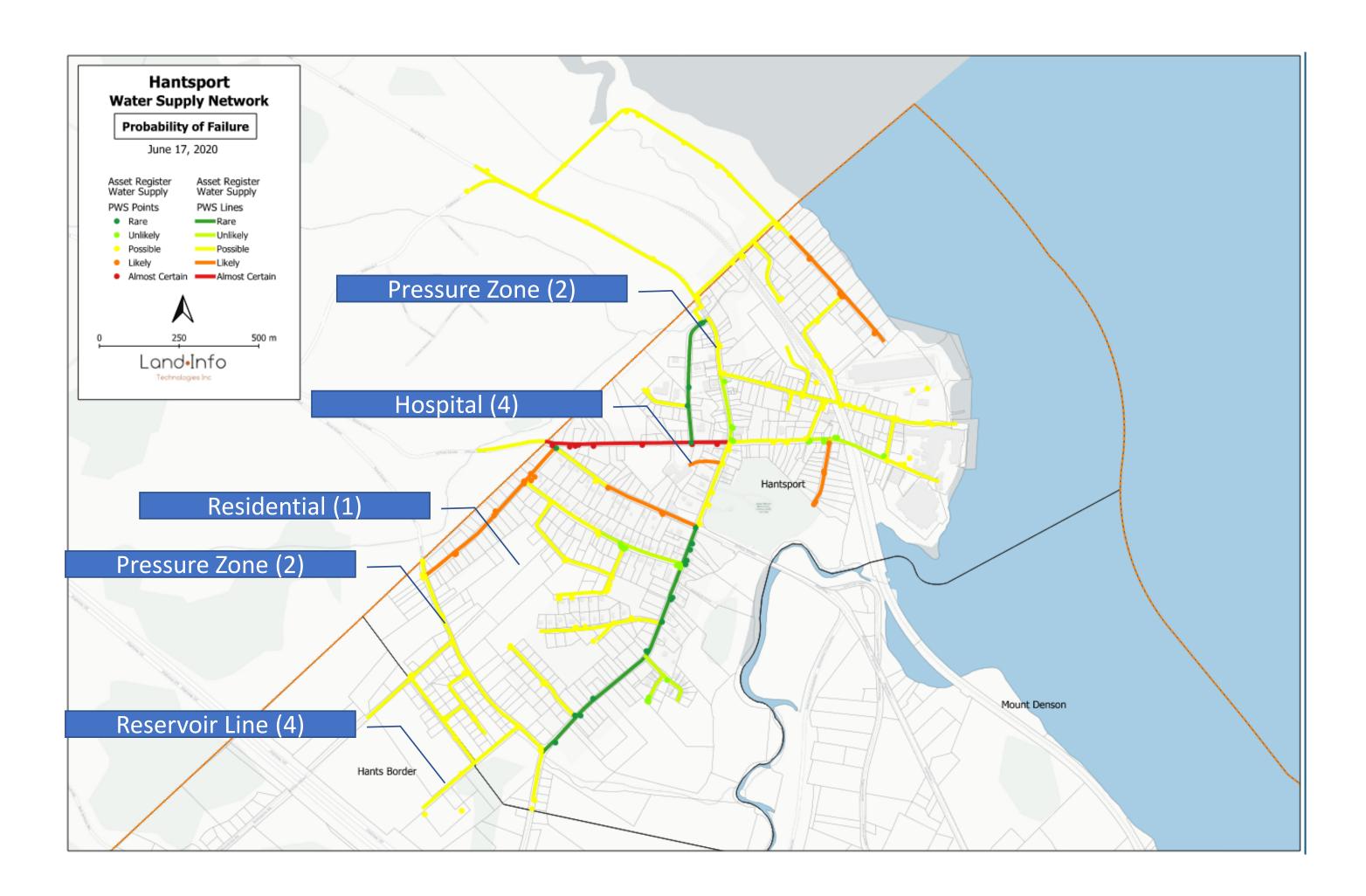
	Transportation	Stormwater	Wastewater	Water Supply	Facilities	Grand Total
2019		\$ -	\$ -	\$ -	\$ 129,200	\$ 169,394
2020	*	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2021	,	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2022		\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2023		\$ -	\$ -	\$ -	\$ 70,960	\$ 111,154
2024	\$ 40,194	\$ -	\$ -	\$ 1,600	\$ 106,809	\$ 148,603
2025	\$ 92,787	\$ -	\$ -	\$ -	\$ 2,000	\$ 94,787
2026	\$ 40,194	\$ -	\$ 1,248	\$ 18,750	\$ 217,722	\$ 277,914
2027	\$ 40,194	\$ -	\$ -	\$ -	\$ 70,960	\$ 111,154
2028	\$ 40,194	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2029	\$ 40,194	\$ -	\$ 9,696	\$ 21,541	\$ 187,431	\$ 258,862
2030	\$ 40,194	\$ -	\$ 9,360	\$ 74,750	\$ 13,120	\$ 137,424
2031	\$ 92,787	\$ -	\$ -	\$ -	\$ 70,960	\$ 163,747
2032	\$ 358,603	\$ -	\$ -	\$ 3,200	\$ 298,664	\$ 660,467
2033	\$ 40,194	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2034	\$ 40,194	\$ -	\$ 33,120	\$ 20,350	\$ 898,531	\$ 992,195
2035	\$ 40,194	\$ -	\$ -	\$ -	\$ 70,960	\$ 111,154
2036	\$ 40,194	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2037	\$ 92,787	\$ -	\$ -	\$ -	\$ 2,000	\$ 94,787
2038	+ -,,	\$ 12,306	\$ -	\$ 120,000	\$ 2,000	\$ 2,357,708
2039		\$ -	\$ 9,696	\$ 21,541	\$ 551,035	\$ 622,466
2040		\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2041	+	\$ -	\$ 9,360	\$ 74,750	\$ 13,120	\$ 137,424
2042	\$ 40,194	\$ -	\$ 1,248	\$ 108,750	\$ 218,722	\$ 368,914
2043	\$ 92,787	\$ -	\$ -	\$ -	\$ 70,960	\$ 163,747
2044	, ,,,,,,,,	\$ -	\$ 987,690	\$ 108,450	\$ 1,027,887	\$ 2,482,630
2045	+,	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2046	+,	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2047	,	\$ -	\$ -	\$ -	\$ 70,960	\$ 111,154
2048	4,	\$ -	\$ -	\$ -	\$ 2,000	\$ 42,194
2049	\$ 92,787	\$ -	\$ 142,568	\$ 156,666	\$ 763,431	\$ 1,155,452

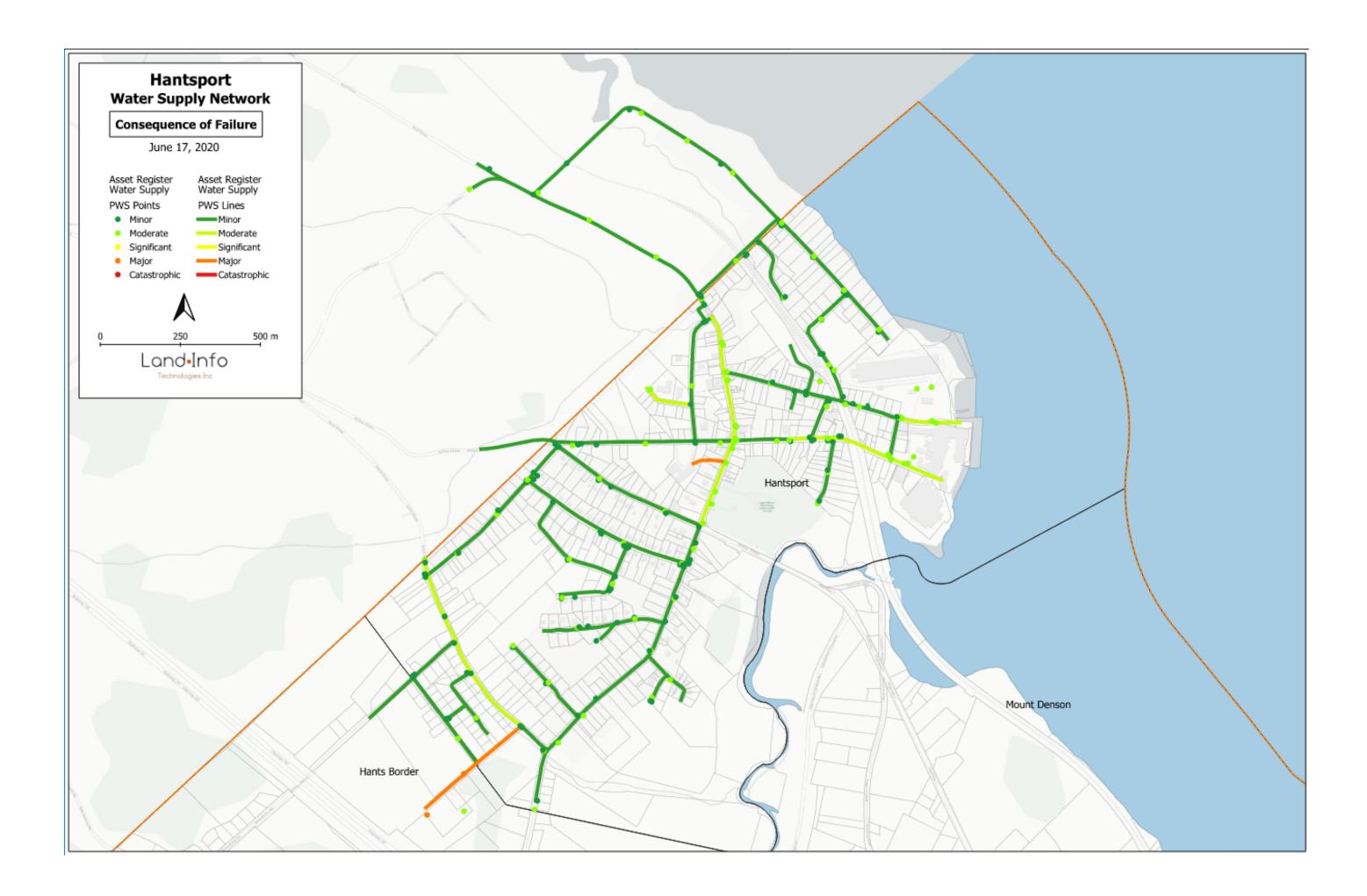
RISKAND LEVEL OF SERVICE

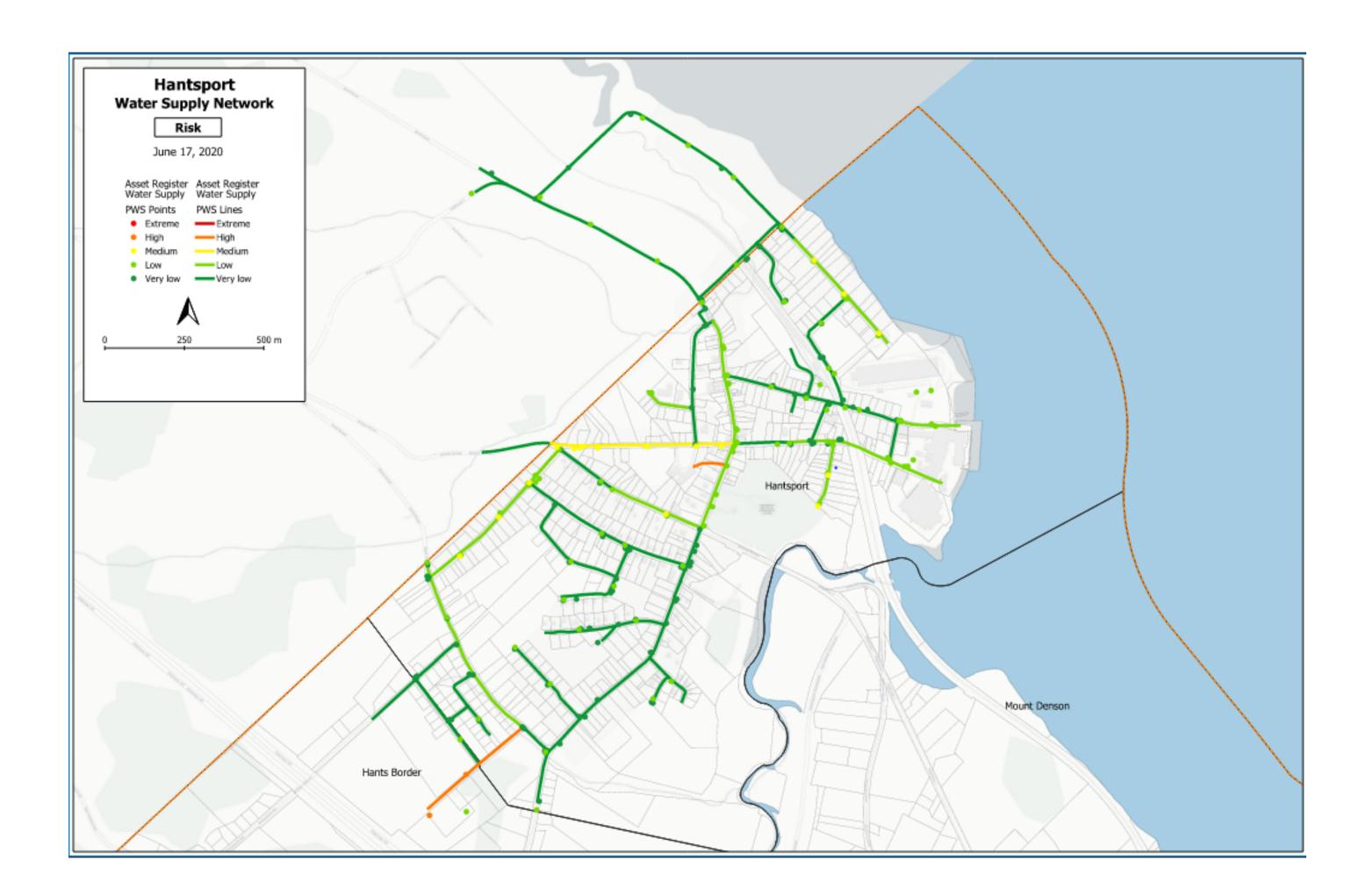
	Risk Tolerance							
Risk Class	Low	₩.	High ▼	-				
Lowest	1		9					
Low	10	12						
Medium	13		17					
High	18	21						
Extreme	22		25					

	Consequence									
Probability 🔻	1	₩	2 🔻	_	•	4 *	5 🔻			
1	1		3	6		10	15			
2	2		5	9		14	19			
3	4		8	13		18	22			
4	7		12	17		21	24			
5	11		16	20		23	25			

		Consequence											
Probability 🔻	1	*	2	₩.	3	₩	4	*	5	₩			
1	Lowest		Lowest		Lowest		Low		Medium				
2	Lowest		Lowest		Lowest		Medium		High				
3	Lowest		Lowest		Medium		High		Extreme				
4	Lowest		Low		Medium		High		Extreme				
5	Low		Medium		High		Extreme		Extreme				







AIM							
network	Municipal ID *	Feature Code	Condition *	Quantity -	Status *	Location Description	Comments
	WW	WWFRCM	3	77.838	active	Tremain Crst	Install 1940-197
Import Data	WW	GRVPCO	1	83.961	active	Wiley Ave	20-30yrs old
	WW	GRVPCO	1	112.976	active	Wiley Ave	20-30yrs old
Calculate Values	WW	GRVPCO	1	124.449	active	Alexander Dr	DR35; Diam 250r
and	WW	GRVPCO	3	69.228	active	Alexander Ave	20-30yrs old
Create Reports	WW	GRVPCO	1	225.403	active	Wiley Ave	20-30yrs old
create neports	WW	GRVPCO	5	239.652	active	Exbition Grounds	Install 1940-197
	WW	GRVPCO	5	205.419	active	Arena	Install 1940-197
Export	WW	GRVPSA	3	264.131	active	Park Dr to Cenennial Dr	old military
	WW	GRVPCO	3	250.009	active	Park Dr to Cenennial Dr	old military
Clear Inventory	WW	GRVPCO	3	90.702	active	Park Dr	Install 1940-197
	WW	GRVPCO	3	177.815	active	Cenennial Dr	Install 1940-197
and the desired of the second	WW	GRVPSA	1	20.398	active	Colonial Rd	Effluent Pipe
Validate Inventory	WW	GRVPSA	1	129.579	active	Colonial Rd	Effluent Pipe
	WW	GRVPSA	1	50.462	active	Colonial Rd	Effluent Pipe
T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	WW	GRVPCO	1	106.705	active	Wiley Ave	20-30yrs old
Toggle Edit Mode							
Section Filter							
Asset Hierarchy							

Generate Refined State of Infrastructure Reports Calculate Replacement Priority

General Description

Other Description

Risk

Useful Life

Financial

Beginner

Intermediate

View Mode

Refined State of Infrastructure Report

What is most critical?

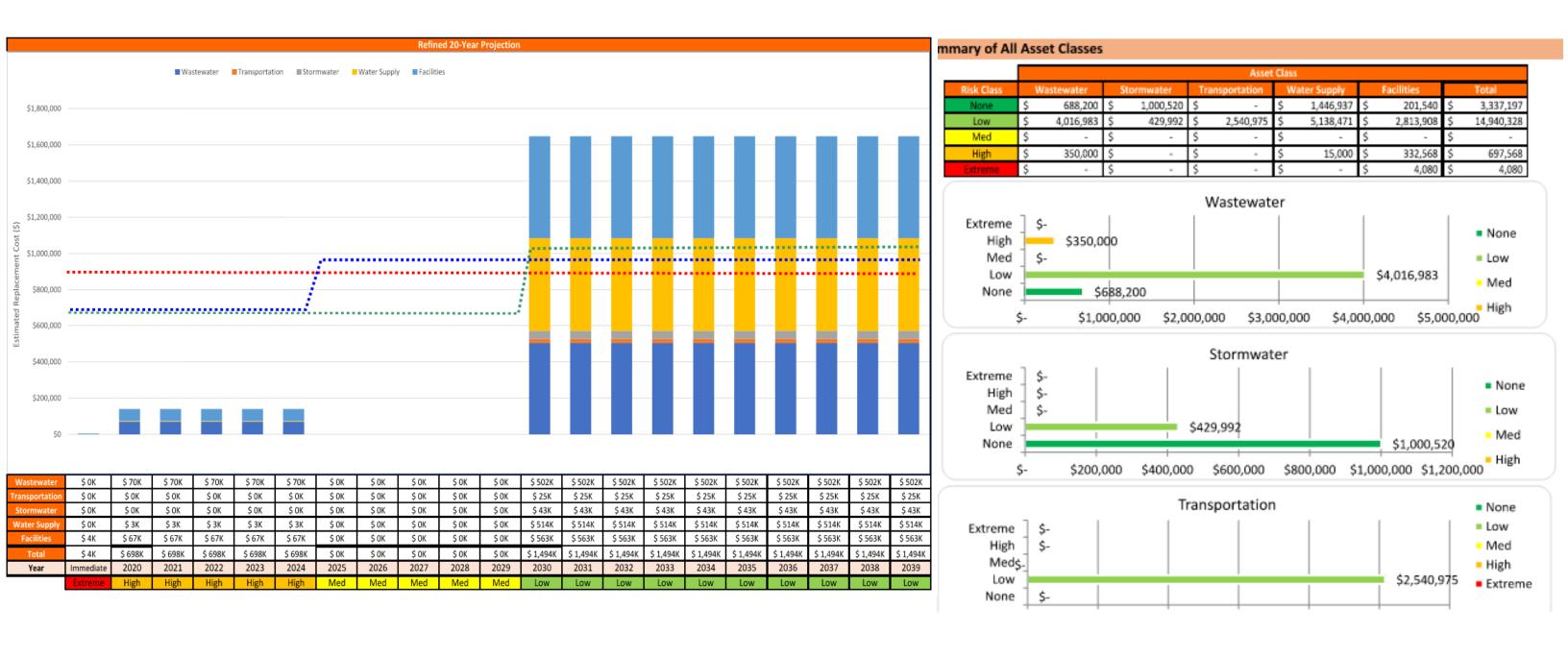
How much reserve funding do I need?

Do I have enough funding?

Where should I focus further investigation?

What risks do I need to mitigate?

Refined State of Infrastructure Report



Project List

Expenditure Type	Location *	Department 💌	Project Name	Scope of Work	Budgeted Cost	Delivery Year	Funding Sources
CapEx	Region	Facilities	Hantsport Food Bank - Stair Rehabilitation		\$2,280	2020-2021	
	Hantsport		Office Renovations	Replace front doors, painting and furniture			
CapEx		Facilities		upgrades	\$2,500	2020-2021	Building Reserve
CapEx	Region	Facilities	Stephenson Building - Stair Refinishing		\$3,650	2020-2021	
CapEx	Hantsport	Facilities	Garage Upgrades	Miscellaneous Maintenance	\$5,000	2020-2021	Building Reserve
CapEx	Region	Facilities	Hants Aqautic Centre - Main Circulation Pump and sewage pump		\$6,300	2020-2021	
				Asset assessment indicates replacments required	L		
CapEx	Region	Facilities	Brooklyn Fire Station - Assess Electrical System Condition (Generator,	for 181,000. Detailed assessment may indicate			
			alarms, Co2, entry keys, kitchen equipment, computers, tables and chairs)	asset life can be extended.	\$10,000	2020-2021	
CapEx	Region	Facilities	Hantsport Fire Station - Assess fire protecion and emergenecy lights		\$10,000	2020-2021	
CapEx	Region	Facilities	Library - Monitors and Printers Upgrade		\$11,450	2020-2021	
CapEx	Region	Facilities	Coach House Roof		\$48,500	2020-2021	
CapEx	Windsor	Facilities	Cemetery Columbarium		\$95,950	2020-2021	Capital Reserve
CapEx	Windsor	Fire	Fire equipment replacement program-Firefighter breathing apparatus		\$44,280	2020-2021	Capital Reserve
	Windsor			Replace 2001 Holder sidewalk plow with multi-			
CapEx		Fleet	Sidewalk Plow	purpose compact articulated wheel loader	\$19,500	2020-2021	Capital Reserve
CapEx	Windsor	Fleet	Mini-Excavator	Replace Backhoe with Mini-Excavator	\$24,500	2020-2021	Capital Reserve
CapEx	Windsor	Fleet	Replacement of 2010 Woods Zero Turn Mower		\$25,070	2020-2021	Borrowing
CapEx	Windsor	Fleet	Truck 33 replacement		\$60,160	2020-2021	Borrowing
	Hantsport		Assess Main Street and Willow Street storm pipe rehabilitation options.				
CapEx		Stormwater	CCTV by Region forces		\$7,500	2020-2021	
	Region						
CapEx		Stormwater	Catch Basin Maintenance	Rehabilitate 20 CBs per year based on mapping	\$10,000	2020-2021	Operations
	Hantsport		Signage	Upgrade and replace signage throughout			
CapEx		Transportation		Hantsport	\$2,500	2020-2021	Transition
CapEx	West Hants	Transportation	Irven Drive	Annual maintenance to municipal owned streets	\$50,000	2020-2021	Capital Reserve
- LPLN				Tames manifestance to manierpar owned streets	φ50,000	LJEU LULI	Jupital Hobel Vo

Pro Forma Budget

5-YEAR CAPITAL BUDGET PLAN PROJECT SUMMARY INFORMATION

Sum of Budgeted Cost		Column Labels	₩								
Row Labels	_ †	2020-2021		2021-2022		2022-2023		2023-2024		2024-2025	
⊞ Facilities		\$ 235,630.	00	\$	506,830.00	\$	347,500.00	\$	708,500.00	\$	47,500.00
⊕ Fire		\$ 44,280.	00	\$	1,002,650.00	\$	187,990.00				
⊕ Fleet		\$ 729,230.	00	\$	481,990.00	\$	626,120.00	\$	282,720.00	\$	1,800,000.00
• Stormwater		\$ 17,500.	00	\$	10,000.00	\$	10,000.00	\$	10,000.00	\$	10,000.00
⊕ Transportation		\$ 1,105,700.	00	\$	2,675,730.00	\$	6,469,260.00	\$	7,001,000.00	\$	3,961,522.00
Wastewater		\$ 1,431,440.	00	\$	1,796,302.00	\$	1,112,110.00	\$	974,000.00	\$	900,000.00
⊕ Water		\$ 3,773,590.	00	\$	5,467,120.00	\$	1,993,560.00	\$	3,651,203.02	\$	2,320,800.00
5-YR Total		\$ 7,337,370.	00	\$	11,940,622.00	\$	10,746,540.00	\$	12,627,423.02	\$	9,039,822.00



- Policy
- Revenue Structures / Rate Setting Basis
- Regulatory Requirements and Reporting
- Risk and Level of Service Basis
- Risk Mitigation Strategies
- Deferral Strategies
- Pro-Form Budget

QUESTIONS?