Municipality of Machin

Condition Data Collection Specifications

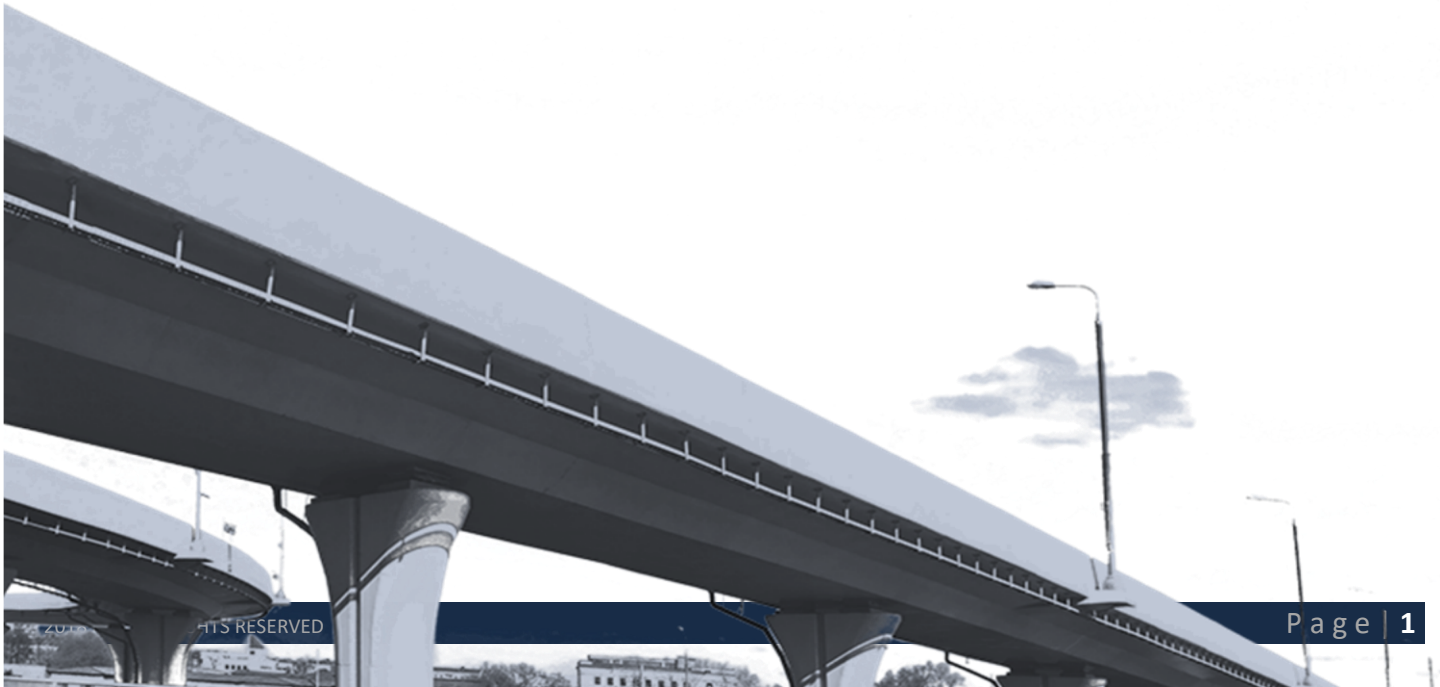
The Municipality of Machin is a picturesque municipality within the Kenora District, west of Dryden. The Municipality of Machin consists of rural communities, with a population of 971 residents. Machin consists of three main communities: Eagle River, Minnitaki, and Vermillion Bay.

Machin located in Northwestern Ontario along the Trans Canada Highway, making it a perfect visitor stop for those on the cross Canadian journey. Surrounded by Eagle Lake and tremendous scenic views, outdoor recreational activities such fishing, hunting, water sports, off road vehicle use, and many more activities are located conveniently in the community's backyard.

Condition data collection specifications will provide the tools and guidance necessary to capture current and accurate inventory and condition assessments of the Municipality's infrastructure and assets.

Condition assessments will provide the Municipality with:

- A detailed inventory of the Municipality's assets.



- A standardized and integrated approach to asset inventory management.
- Condition descriptions and ratings of assets.
- The ability to create Machin's current and future capital budgets.
- The ability to forecast capital renewal costs of Municipality's assets over the next 25 years.
- Overall current Replacement Value estimates of each asset.

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LEGAL NOTICE

1.0 CONDITION ASSESSMENT OVERVIEW

The foundation of good asset management practice is based on having comprehensive and reliable information on the current condition of the infrastructure. Municipalities need to have a clear understanding regarding performance and condition of their assets, as all management decisions regarding future expenditures and field activities should be based on this knowledge. An incomplete understanding about an asset may lead to its premature failure or premature replacement.

Some benefits of holistic condition assessment programs within the overall asset management process are listed below:

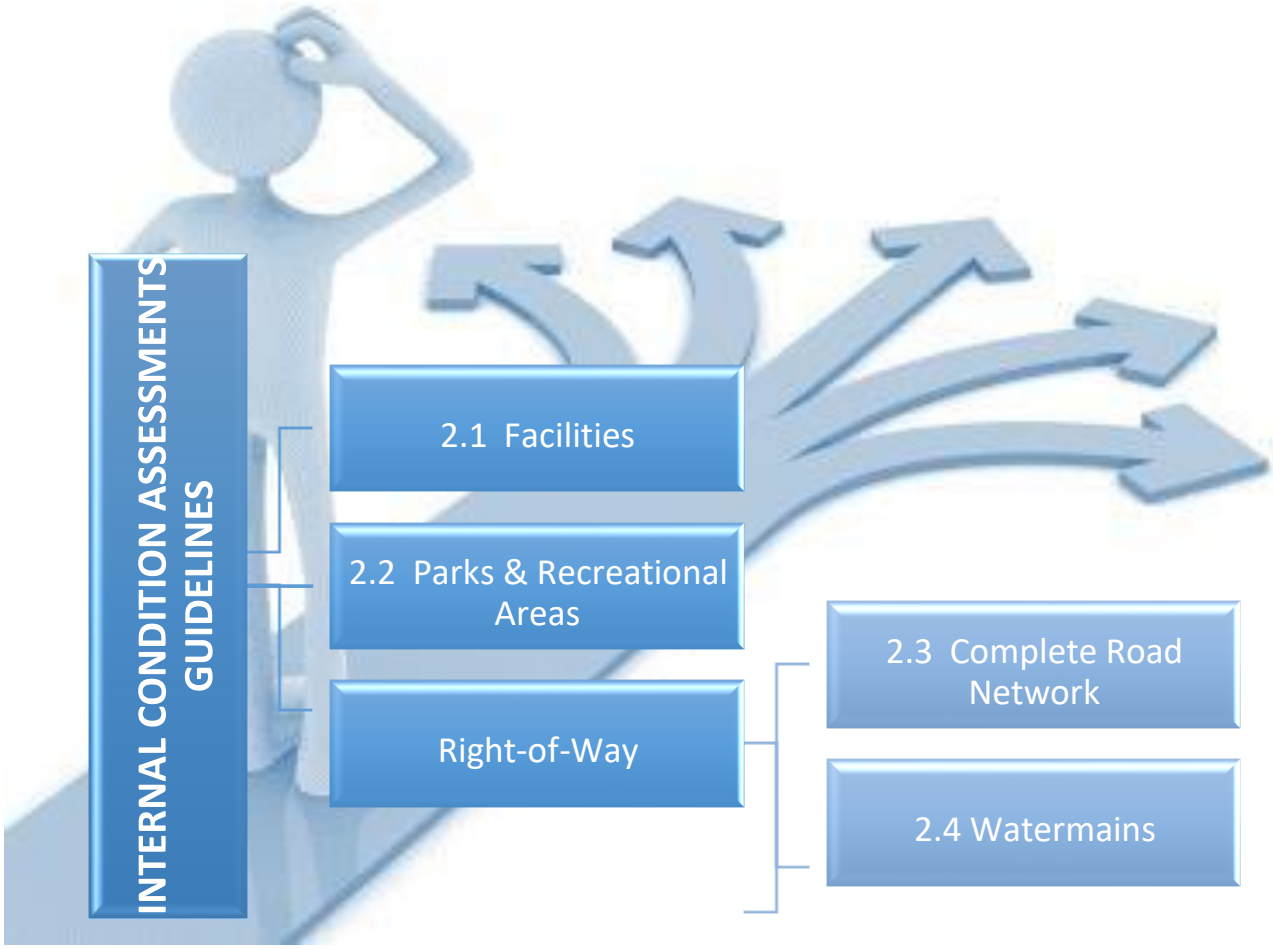
- Understanding of overall network condition leads to better management practices
- Allows for the establishment of rehabilitation programs
- Prevents future failures and provides liability protection
- Potential reduction in operation / maintenance costs
- Accurate current asset valuation
- Allows for the establishment of more robust risk assessment programs
- Establishes proactive repair schedules and preventive maintenance programs

- Avoids unnecessary expenditures
- Extends asset service life therefore improving level of service
- Improves financial transparency and accountability
- Enables accurate asset reporting which, in turn, enables better decision making

Condition assessment can involve different forms of analysis such as subjective opinion, mathematical models, or variations thereof, and can be completed through a very detailed or very cursory approach.

When establishing the condition assessment of an entire asset class, the cursory approach (metrics such as Very Good, Good, Fair, Poor, Very Poor) is used. This will be a less expensive approach when applied to thousands of assets, yet will still provide up to date information, and will allow for detailed assessment or follow up inspections on those assets captured as Poor or Very Poor condition later.

2.0 INTERNAL CONDITION ASSESSMENT GUIDELINES



2.1 INTERNAL FACILITY ASSESSMENTS

DATA COLLECTION SPECIFICATIONS

OVERVIEW

The Municipality owns and maintains approximately **10** municipal facilities (buildings).
The services required include data collection for facility components attributes, defects and overall condition. This field data is then to be uploaded to the Municipality's current CityWide Asset

Management System provided by Public Sector Digest. As such, all data collected during this assignment must be compatible with the upload requirements of this system.

PURPOSE

The condition assessments required will provide the Municipality with:

- A detailed inventory of facilities and their components.
- Condition descriptions and ratings of facilities and their components
- The ability to create the Municipality's current and future capital budgets.
- The ability to forecast capital renewal costs of its assets over the next 25 years.
- Overall current Replacement Value estimates of each asset. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Assessments are for renewal of like for like components however staff can also enter data for upgraded components where there is the opportunity for energy savings or more efficient operation of the components.

SCOPE:

The following Facilities are included for assessment:

Asset Name	Address	City
Eagle River Fire Hall	717 Highway 594	Eagle River
Eagle River Garage	711 Highway 594	Eagle River
Eagle River Rec Centre	31 Friendship Drive	Eagle River
Eagle River Rink	22 Cascade Road	Eagle River
Medical Clinic	87 Spruce Street	Vermilion Bay
Municipal Office	75 Spruce Street	Vermilion Bay
Vermillion Bay Fire Hall	65 Armstrong Street	Vermilion Bay
Vermillion Bay Garage	65 Armstrong Avenue	Vermilion Bay
Woodland Arena	#1 Arena Lane	Vermilion Bay
Senior Centre	19 Main Street	Vermilion Bay

DATA CAPTURE REQUIREMENTS

Data collection and entry are divided primarily into six Levels: Asset, Identifier & Location, Component Classification, Details, Assessment Data, Financial Data, and Intervention Data.

- The term Asset relates to the entire structure and site as a whole.
- Components are individual physical items which make up an Asset (foundation, windows, HVAV, etc.).
- Interventions are work, and resources recommended by the assessor for renewal and/or upgrade of components.

ASSET LEVEL (FACILITY) DATA REQUIRED

Facility Name
Facility Type
Two Cover photos

COMPONENT LEVEL INFORMATION & DATA REQUIRED

Provide an inventory of all components at each facility. All components will at a minimum require the following data regardless of its condition or whether the year of renewal is less than or greater than the 25-year outlook required;

Identifiers & Location

CityWide Asset ID
Unique ID or Import ID

Location
General description in regard to where in the facility the component is located.

Classification

Component Major Group - Level 1
Assessor to select component Level 1 – Major Group classification as per UNIFORMAT II standard.

Component Secondary Group - Level 2
Assessor to select component Level 2 – Secondary Group classification as per UNIFORMAT II standard.

Component Identification - Level 3

Assessor to select component Level 3 – Component identification as per UNIFORMAT II standard.

Details

Component Description;
The component description should be utilized to provide a brief description of the component. **Example:** Rheem Gas Fired Hot Water Boiler, 1,500,000 BTU, mid-efficiency 85%

Manufacturer
Model #
Serial #
Warranty Effective Date
Warranty Term

Quantities, and Units of Measure (required for linear and area components)
Quantitative measurements and or calculations of all linear and/or area components are required. For example: flooring or wall coverings – provide square footage.

Assessment Data

Accurate In Service Date

Commentary;
Utilize the commentary field to detail any additional information relating to the component's condition and any other life expectation observations.
Example: The boiler is past expected life but does appear to be functional and there have been no reported issues from site staff. Given the normal life of a boiler system replacement can be anticipated within the next 1-5 years.

Condition
Very Good = performing very well, no noticeable defects.
Good = Component is performing adequately; no work is foreseen in next **10** years
Fair = Component is operational, but replacement is required in **5-10** years
Poor = Component requires replacement in next **1-5 years**
Very Poor = Component is beyond useful life (or not functioning) – replace in current year.

Photos – photos of the components to support the assessments - in general one photo for components that are in good condition, and two or three photos for components in critical, poor or fair conditions. (Photos should be named as per Facility name, then component name, then 1,2,3, etc)
Financial Data

Current Replacement Value

This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Replacement Cost Date
The date when the replacement cost was acquired.

Intervention Data Required

Only components which require current and forecasted renewal needs within the next 25 years will require the following data:

Intervention Type
(replace, repair, remediate, remove / demolish, study)

Intervention Details Narrative
Describe what needs to be done and include cost calculations.

Intervention Year year of renewal based on condition and lifecycle.

Cost
Cost resulting from costing calculations above. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Project Prioritization Questions

- Energy Savings (high, medium, low)
- Accessibility Issue (yes, no)
- Consequences of Failure (very high, high, moderate, low, very low)
- Legislation (yes, no)
- Health and Safety (yes, no)
- Grants Availability (yes, no)
- Part of Strategic Plan (yes, no)

GENERAL NOTES

Remediate Intervention - When assessing materials which are hazardous, and remediation is recommended, a "Remediate" intervention will be selected. Remediate events will be chosen only for removing hazardous or dangerous materials. It is understood the remediation of asbestos material or any other hazardous material will be associated with substantially higher costs compared with nonhazardous materials.
Study Intervention - "Study" interventions will include a description of suspected deficiencies in the "Element Commentary Narrative".

Replace Intervention - Costs per unit of measure will also be adjusted to include all costs as applicable to the nature of the work, including soft costs, removal & disposal, labor, materials, project fees, and engineering fees where required.

- Final Inspections are to be submitted in electronic Microsoft Excel files
- Accompanying the final digital database, the assessor shall also submit all hard copy inspection records.
- Hard copy inspection records shall be submitted contained in 100mm 3 ring binders, the reports three hole punched, and categorized/indexed by inspection date and alphabetical facility name.

2.2 INTERNAL PARKS & RECREATIONAL AREAS ASSESSMENTS

DATA COLLECTION SPECIFICATIONS

OVERVIEW

The Municipality maintains approximately **3** parks and recreational areas.

The services required include data collection for recreational areas, park assets and their components attributes and overall condition. This field data must be provided in a data format that can be uploaded to the Municipality's current CityWide Asset Management System provided by Public Sector Digest. As such, all data collected during this assignment must be compatible with the upload requirements of this system.

PURPOSE

To provide the Municipality with current and accurate inventory and condition assessments of recreational areas and the components within their parks assets which will identify components that require rehabilitation or replacement in the short term or long-term Capital Budget. In addition, some general operational and maintenance requirements will be captured which can optionally be included in the short term and long-term Capital Budget or operations and maintenance budgets.

Assessments are for renewal of like for like components however staff can also enter data for upgraded components where there is the opportunity for energy savings or more efficient operation of the components.

SCOPE

The following Parks are included for assessment:

Asset Name	Address	City
Kinsmen Beach Park	160 Bluebird Road	Vermilion Bay
Post Park	1994 Lyle Road	Eagle River
Pine Tree Park	# 7 Bay Street	Vermilion Bay

DATA CAPTURE REQUIREMENTS

Data collection and entry are divided primarily into six levels: Asset, Identifier & Location, Component Classification, Details, Assessment Data, Financial Data, and Intervention Data.

- The term Asset relates to the entire park and site as a whole.
- Components are individual physical items which make up an asset (playground structures, buildings, shelters, fences, sports fields / equipment, etc.).
- Interventions are work, and resources recommended by the assessor for renewal and/or upgrade of components.

ASSET LEVEL (PARK) DATA REQUIRED

Park Name
Park Type
Two Cover photos

COMPONENT LEVEL DATA REQUIRED

Provide an inventory of all components at each park. All components will at a minimum require the following data regardless of its condition or whether the year of renewal is less than or greater than the 25-year outlook required;

Identifiers & Location

CityWide Asset ID
Unique ID or Import ID

Location
General description in regard to where in the park the component is located.

Classification

Component Major Group - Level 1
Assessor to select component Level 1 – Major Group classification.

Component Identification - Level 2
Assessor to select component Level 2 – Component Identification.

Details

Component Description;
The component description should be utilized to provide a brief description of the component.
Example: Baseball Diamond Light Standard
Material
Manufacturer
Supplier Serial #
Model #
Warranty Effective Date
Warranty Term

Quantities, and Units of Measure (required for linear and area components)
Quantitative measurements and or calculations of all linear and/or area components are required. For example: Play structure surface – provide square footage.

Assessment Data

Accurate In-Service Date

Commentary;
Utilize the commentary field to detail any additional information relating to the component's condition and any other life expectation observations.
Example: The baseball diamond light standard is past expected life but does appear to be functional and there have been no reported issues from site staff. Given the normal life of this light standard, replacement can be anticipated within the next 1-5 years.

Condition
Very Good = performing very well, no noticeable defects.
Good = Component is performing adequately; no work is foreseen in next **10** years
Fair = Component is operational, but replacement is required in **5-10** years
Poor = Component requires replacement in next **1-5 years**
Very Poor = Component is beyond useful life (or not functioning) – replace in current year.

Photos – photos of the components to support the assessments - in general one photo for components that are in good condition, and two or three photos for components in critical, poor or fair conditions. (Photos should be named as per Facility name, then component name, then 1,2,3, etc)

Financial Data

Current Replacement Value

This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Replacement Cost Date
The date when the replacement cost was acquired.

Intervention Data Required

Only components which require current and forecasted renewal needs within the next 25 years will require the following data:

Intervention Type
(replace, repair, remediate, remove / demolish, study)

Intervention Details Narrative
Describe what needs to be done and include cost calculations.

Intervention Year year of renewal based on condition and lifecycle.

Cost
Cost resulting from costing calculations above. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Project Prioritization Questions

- Energy Savings (high, medium, low)
- Accessibility Issue (yes, no)
- Consequences of Failure (very high, high, moderate, low, very low)
- Legislation (yes, no)
- Health and Safety (yes, no)
- Grants Availability (yes, no)
- Part of Strategic Plan (yes, no)

GENERAL NOTES

Remediate Intervention - When assessing materials which are hazardous, and remediation is recommended, a "Remediate" intervention will be selected. Remediate events will be chosen only for removing hazardous or dangerous materials. It is understood the remediation of asbestos material or any other hazardous material will be associated with substantially higher costs compared with nonhazardous materials.

Study Intervention - "Study" interventions will include a description of suspected deficiencies in the "Element Commentary Narrative".

Replace Intervention costs per unit of measure will also be adjusted to include all costs as applicable to the nature of the work, including soft costs, removal & disposal, labor, materials, project fees, and engineering fees where required.

DELIVERABLES

- Final Inspections are to be submitted in electronic Microsoft Excel files
- Accompanying the final digital database, the assessor shall also submit all hard copy inspection records.
- Hard copy inspection records shall be submitted contained in 100mm 3 ring binders, the reports three hole punched, and categorized/indexed by inspection date and alphabetical park name.

2.3 INTERNAL RIGHT-OF-WAY ASSESSMENTS (ROADS)

DATA COLLECTION SPECIFICATIONS

OVERVIEW

The Municipality maintains approximately 280 centerline km of municipal roadway.
The services required include data collection for road attributes, defects and overall condition. This field data is then to be uploaded to the Municipality's current CityWide Asset Management System provided by Public Sector Digest. As such, all data collected during this assignment must be compatible with the upload requirements of this system.

PURPOSE

The assessments are to identify roads that require rehabilitation or re-construction in the short term or long-term Capital Budget. In addition, some general maintenance requirements will be captured.

SCOPE OF WORK

- Record or verify physical properties and classification data for each road segment.
- Record conditions of all roads by segment (intersection to intersection) and stating recommended repair.
- In addition to specific defects (as listed below), each road segment should be given an overall condition rating. The ratings will be one of: Very Good, Good, Fair, Poor, or Very Poor.

DATA CAPTURE REQUIREMENTS

Data collection and entry are divided primarily into seven levels: Composition, Identifier & Location, Physical Properties Data, Classification Data, Assessment Data, Financial Data, Optional Shoulder Data, and Intervention Data.

These standards will be used to distinguish noted attributes and defects:

Identifiers & Location

CityWide Asset ID
Road Segment ID
Unique ID or Import ID
Street Name
Street From
Street To

Physical Properties

Surface Material
Asphalt
Concrete
Gravel
Other
Tar & Chip

No. of Lanes

Lane Structure
One Way
Two Way
Two Way + Turn Lane

Length (m)
(Travel Lanes) Surface Width (m)

Classification Data

Roadside Environment
Rural
Semi-Urban
Urban

MMS Service Class
1 – 6

Design Class
100 (Rural <50 AADT)
200 (Rural 50 - 199 AADT)
300 (Rural 200 – 399 AADT)
400 (Rural 400 - 999 AADT)
500 (Rural 1000 – 1999 AADT)
LR (Local Residential)
CR (Collector Residential)
LCI (Local Commercial Industrial)
CCI (Collector Commercial Industrial)
ART (Arterial)

Sub-Class

Freeway
Expressway
Major Arterial
Minor Arterial

Primary Collector
Secondary Collector
Local Road
Local Street
Alley
Cul-de-sac
Lane
Ramp

AADT Range
0 - 49
50 - 199
200 - 399
400 - 999
1,000 - 1,999
2,000 - 2,999
3,000 - 3,999
4,000 - 6,999
7,000 -9,999
10,000 and over
Or Actual AADT

AADT Year

Road Speed Range
>=100 km
90 - 99 km
80 - 89 km
70 - 79 km
60 - 69 km
50 - 59 km
< 50 km

Assessment Data

In-Service Date

Road Surface Defects

- Raveling (Segregation) - Progressive loss of surface materials. (course or fine aggregates or both).
- Flushing - Asphalt binder migrating to the pavement surface.
- Rippling and Shoving - The presence of closely spaced depressions or ridges (washboard effect) located transversely or longitudinally on the pavement surface.
- Wheel Track Rutting - Longitudinal depressions, which can appear as single rut or double ruts resulting from repeated load application from wheel tracks.

- Distortion - Any deviation (other than described for rippling, shoving, and rutting) of the pavement surface from its original shape.
- Longitudinal Wheel-Track Cracking - Longitudinal cracks parallel to the road center line and situated at or near the center of the wheel tracks.
- Longitudinal Meander and Mid-Lane Crack - A single, usually long wandering crack from edge to edge of pavement, or a crack straight and parallel to the center line usually occurring near the middle of the lane.
- Centre Line Crack - Crack(s) occurring along or near the center line of the road.
- Pothole - Depression or hollow in a road surface caused by wear or subsidence.
- Pavement Edge Crack - Crack(s) parallel to and within 30cm of the pavement edge, these cracks can vary from a relatively straight, continuous crack to crescent shaped cracks in a wave formation.
- Transverse Crack - Crack that forms perpendicular to the pavement center line and tend to be regularly spaced along the length of the road.
- Map Crack - A combination of interconnected transverse and longitudinal cracks that form a series of large polygons resembling a map.
- Alligator Crack - Cracks which form a network of polygon blocks which can vary in size from a few millimeters to about a meter. This formation of cracks resembles the skin of an alligator.
- Miscellaneous Crack - Uncommon crack formations. These cracks are usually restricted to a local area or geographic location which is a result of unique conditions at that particular location. Give a description of the crack, its geographic location and a unique name that best describes the defect.

Overall Severity of Defects

Estimated severity of all noted defects per road segment. 0 – 100 Scale (0 = lowest, 100 = highest)

Density of Defects

Estimated percentage of the road segment surface affected by defects.

Ride Comfort Rating
Estimated ride comfort rating. 0 – 100 Scale (0 = lowest, 100 = highest)

Internal Condition Rating
A subjective rating based on assessor's best judgement. (See examples below)

Assessor's Name

Date Assessed

Very Good: Pavement is in excellent condition with few visible defects.
Ride ability is excellent with few areas of very slight distortion.

Good: Pavement is in good condition with accumulating slight defects.
Ride ability is good with intermittent slightly rough and uneven sections.


Main St W

Fair: Pavement is in fair condition with intermittent patterns of slight to moderate defects. Ride ability is fair, and surface is slightly rough and uneven.

Poor: Pavement is in poor condition with frequent patterns of moderate defects. Ride ability is poor, and surface is rough and uneven.


Mitchell st

Very Poor: Pavement is in very poor condition with extensive severe defects. Ride ability is very poor, and surface is very rough and uneven.

Photos – photos of the defects to support the assessments - in general one photo for each segment with defects, and two or three photos for segments with severe structural damage or severe defects that require immediate maintenance or replacement.

Optional Segment Shoulder Data

Shoulder Surface Material
Asphalt
Concrete
Gravel
Other
Tar & Chip

Shoulder Surface Defects
Shoulder Cracking
Shoulder, Edge (or Curb) Separation
Shoulder Breakup
Shoulder Distortion
Shoulder Erosion (Potential Embankment Failure)

Shoulder Surface Width (m)

Financial Data

Current Replacement Value
This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Replacement Cost Date
The date when the replacement cost was acquired.

Intervention Data Required

Only components which require current and forecasted renewal needs within the next 25 years will require the following data:

Intervention Type
(replace, repair, remediate, remove / demolish, study)

Intervention Details Narrative
Describe what needs to be done and include cost calculations.

Intervention Year year of renewal based on condition and lifecycle.

Cost
Cost resulting from costing calculations above. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Project Prioritization Questions

- Energy Savings (high, medium, low)
- Accessibility Issue (yes, no) • Legislation (yes, no)
- Health and Safety (yes, no)
- Grants Availability (yes, no)
- Part of Strategic Plan (yes, no)

DATABASE REQUIREMENTS

The data should be delivered in Excel format and should include:

- Asset ID as provided from the Municipality's CityWide database
- Road Seg ID
- Unique ID / Import ID
- Street Name, Street To, and Street From
- Surface Material
- No. of Lanes

- Lane Structure
- Segment Length (m)
- Segment Surface Width (m)
- Roadside Environment
- MMS Class
- Design Class • Sub Class
- AADT Range
- AADT Year
- Road Speed Range
- In Service Date
- Road surface defects
- Internal Condition Rating
- Inspectors Name
- Date of Inspection
- Remarks/Notes for any inspector comments

DELIVERABLES

- Final Inspections are to be submitted in electronic Microsoft Excel files
- Accompanying the final digital database, the assessor shall also submit all hard copy inspection records.
- Hard copy inspection records shall be submitted contained in 100mm 3 ring binders, the reports three hole punched, and categorized/indexed by inspection date and alphabetical road segments.

2.4 INTERNAL RIGHT-OF-WAY ASSESSMENTS (WATERMAINS)

DATA COLLECTION SPECIFICATIONS

OVERVIEW

The Municipality maintains approximately ____ Kilometers of water main infrastructure.
The services required include data collection of water mains environmental factors, physical properties, operational factors and overall condition. This field data is then to be uploaded to the Municipality's

current CityWide Asset Management System provided by Public Sector Digest. As such, all data collected during this assignment must be compatible with the upload requirements of this system.

PURPOSE

To provide the Municipality with current and accurate inventory and condition assessments for the Municipality's entire water transmission network which will identify water mains that require rehabilitation or replacement in the short term or long-term Capital Budget.

SCOPE OF WORK

- For each water main segment, the assessor shall note the street name, street from, and street to.
- Record all the environmental, physical and operational factors by segment ID and street location.
- In addition to the specific environmental, physical and operational attributes of each water main segment (as listed below), each water main segment should be given an overall condition rating. The ratings will be one of: Very Good, Good, Fair, Poor, or Very Poor.
- Noted deficiencies or defects must be recorded by length (m) and location by property address (where applicable), or an approximate location description.
- A final electronic (digital) Excel report is also to be submitted, upon completion of assessment of all water main segments.
- All segments are to be assessed and lengths recorded regardless of the presence of defects.
- Photos will be provided for water mains with evidence of severe defects and/or adjacent infrastructure failure that may contribute to a water main damage or failure.

DATA CAPTURE REQUIREMENTS

Provide an inventory of all water main segments. All segments will at a minimum require the following data regardless of its condition or whether the year of renewal is less than or greater than the 25-year outlook required;

Data collection and entry are divided primarily into six levels: Identifiers & Location, Physical Properties, Environment Data, Operational Data, Financial Data, and Intervention Data.

Identifiers & Location

CityWide Asset ID
Road Segment ID
Unique ID or Import ID
Street Name
Node From
Node To

Physical Properties

Pipe Material
AC - Asbestos Cement
CI - Cast Iron
CU - Copper
DI - Ductile Iron
GLV - Galvanized
HDPE - High Density Polyethylene
PVC - Polyvinylchloride
STL – Steel

Diameter (mm)
Length (m)

Type
Trunk
Distribution
Service

In-Service Date

Environment Data

Soil Type
Bury Depth
AADT

Road Class
Art
CCI
CR

LCI
LR

Service Area
Institutional / EMS
Business District
Industrial Commercial
Residential
Rural

Operational Data

Breaks per Segment
Operational Pressure
Loss of Wall Thickness (%)
Cathodic Protection

Condition
Very Good = Newly / recently installed or like new with no signs of corrosion or deterioration. Reassess in 15 years.
Good = Coatings, linings still intact. No more than 10% loss in wall thickness of original. Re-assess in 10 years. Cathodic Protection required within the next 5-10 years.
Fair = Signs of damage to coatings and/or linings, up 25 % loss in wall thickness of original. Re-assess in 3-5 years. Lining and rehabilitation required within the next 5-10 years.
Poor = Significant signs of internal and/or external corrosion. No lining or coatings. Leaks evident. Collapse inevitable. 25 to 50% loss of wall thickness of original. Rehabilitation or replacement required within the next 3-5 years.
Very Poor = Critical condition with extensive internal and/or external corrosion. Evidence of collapse and/or large cracks/holes. More than 50% loss of wall thickness of original. Significant rate of breakage. (>8 breaks in a single segment) Repair or replacement required immediately

Financial Data

Current Replacement Value
This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Replacement Cost Date
The date when the replacement cost was acquired.

Intervention Data Required

Only components which require current and forecasted renewal needs within the next 25 years will require the following data:

Intervention Type

(replace, repair, remediate, remove / demolish, study)

Intervention Details Narrative
Describe what needs to be done and include cost calculations.

Intervention Year
Year of renewal based on condition and lifecycle.

Cost
Cost resulting from costing calculations above. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Project Prioritization Questions

- Energy Savings (high, medium, low)
- Accessibility Issue (yes, no)
- Consequences of Failure (very high, high, moderate, low, very low)
- Legislation (yes, no)
- Health and Safety (yes, no)
- Grants Availability (yes, no)
- Part of Strategic Plan (yes, no)

DELIVERABLES

- Final Assessments are to be submitted in electronic Microsoft Excel files.
- Accompanying the final digital database, the assessor shall also submit all hard copy assessment records.
- Hard copy assessment records shall be submitted contained in 100mm 3 ring binders, the reports three hole punched, and categorized/indexed by assessment date and alphabetical road segments.

3.0 RFP CONDITION ASSESSMENT GUIDELINES

3.1 RFP FACILITY ASSESSMENTS

TERMS OF THE CONDTRACT AND DATA COLLECTION SPECIFICATIONS

SCHEDULE OF CONTRACT PRICES

(HST should be excluded)

CONTRACT SCHEDULE

The Successful Bidder agrees to begin work within ___ working days from the award of contract. The total inspection should be completed within ___ working days. This includes writing the reports and submitting the completed data.

Schedule of Prices

Schedule of prices and quantities will be determined by the contractor and itemized in the bid.

See suggested guideline below.

DESCRIPTION	Unit of measure	Price per m^2	Total Price
Inspection of facilities and their components ___ Facilities)	m^2 / Lump Sum		
Compiling of data base {to include submission of hard copy}	 Lump Sum		
Total Price 2018:			

OVERVIEW

The Municipality owns and maintains approximately ___ municipal facilities (buildings).
The services required include data collection for facility components attributes, defects and overall condition. This field data is then to be uploaded to the Municipality's current CityWide Asset Management System provided by Public Sector Digest. As such, all data collected during this assignment must be compatible with the upload requirements of this system.

PURPOSE

The condition assessments required will provide the Municipality with:

- A detailed inventory of facilities and their components.
- Condition descriptions and ratings of facilities and their components
- The ability to create the Municipality's current and future capital budgets.
- The ability to forecast capital renewal costs of its assets over the next 25 years.
- Overall current Replacement Value estimates of each asset. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Assessments are for renewal of like for like components however staff can also enter data for upgraded components where there is the opportunity for energy savings or more efficient operation of the components.

SCOPE:

The following Facilities are included for assessment:

Asset Name	Address	City
Eagle River Fire Hall	717 Highway 594	Eagle River
Eagle River Garage	711 Highway 594	Eagle River
Eagle River Rec Centre	31 Friendship Drive	Eagle River
Eagle River Rink	22 Cascade Road	Eagle River
Medical Clinic	87 Spruce Street	Vermilion Bay
Municipal Office	75 Spruce Street	Vermilion Bay
Vermillion Bay Fire Hall	65 Armstrong Street	Vermilion Bay
Vermillion Bay Garage	65 Armstrong Avenue	Vermilion Bay
Woodland Arena	#1 Arena Lane	Vermilion Bay
Senior Centre	19 Main Street	Vermilion Bay

DATA CAPTURE REQUIREMENTS

Data collection and entry are divided primarily into six Levels: Asset, Identifier & Location, Component Classification, Details, Assessment Data, Financial Data, and Intervention Data.

- The term Asset relates to the entire structure and site as a whole.
- Components are individual physical items which make up an Asset (foundation, windows, HVAV, etc.).
- Interventions are work, and resources recommended by the assessor for renewal and/or upgrade of components.

ASSET LEVEL (FACILITY) DATA REQUIRED

Facility Name
Facility Type
Two Cover photos

COMPONENT LEVEL INFORMATION & DATA REQUIRED

Provide an inventory of all components at each facility. All components will at a minimum require the following data regardless of its condition or whether the year of renewal is less than or greater than the 25-year outlook required;

Identifiers & Location

CityWide Asset ID
Unique ID or Import ID

Location
General description in regard to where in the facility the component is located.

Classification

Component Major Group - Level 1
Assessor to select component Level 1 – Major Group classification as per UNIFORMAT II standard.

Component Secondary Group - Level 2
Assessor to select component Level 2 – Secondary Group classification as per UNIFORMAT II standard.

Component Identification - Level 3
Assessor to select component Level 3 – Component identification as per UNIFORMAT II standard.

Details

Component Description;
The component description should be utilized to provide a brief description of the component. **Example:** Rheem Gas Fired Hot Water Boiler, 1,500,000 BTU, mid-efficiency 85%

Manufacturer
Model #
Serial #
Warranty Effective Date
Warranty Term

Quantities, and Units of Measure (required for linear and area components)
Quantitative measurements and or calculations of all linear and/or area components are required. For example: flooring or wall coverings – provide square footage.

Assessment Data

Accurate In Service Date

Commentary;
Utilize the commentary field to detail any additional information relating to the component's condition and any other life expectation observations.
Example: The boiler is past expected life but does appear to be functional and there have been no reported issues from site staff. Given the normal life of a boiler system replacement can be anticipated within the next 1-5 years.

Condition
Very Good = performing very well, no noticeable defects.
Good = Component is performing adequately; no work is foreseen in next **10** years
Fair = Component is operational, but replacement is required in **5-10** years
Poor = Component requires replacement in next **1-5 years**
Very Poor = Component is beyond useful life (or not functioning) – replace in current year.

Photos – photos of the components to support the assessments - in general one photo for components that are in good condition, and two or three photos for components in critical, poor or fair conditions. (Photos should be named as per Facility name, then component name, then 1,2,3, etc)

Financial Data

Current Replacement Value
This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Replacement Cost Date
The date when the replacement cost was acquired.

Intervention Data Required

Only components which require current and forecasted renewal needs within the next 25 years will require the following data:

Intervention Type
(replace, repair, remediate, remove / demolish, study)

Intervention Details Narrative
Describe what needs to be done and include cost calculations.

Intervention Year year of renewal based on condition and lifecycle.

Cost
Cost resulting from costing calculations above. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Project Prioritization Questions

- Energy Savings (high, medium, low)
- Accessibility Issue (yes, no)
- Consequences of Failure (very high, high, moderate, low, very low)
- Legislation (yes, no)
- Health and Safety (yes, no)
- Grants Availability (yes, no)
- Part of Strategic Plan (yes, no)

GENERAL REQUIREMENTS

Deliverables - Paper reports are **Not** required. Data should be delivered in the specified format.

Remediate Intervention - When assessing materials which are hazardous, and remediation is recommended, a "Remediate" intervention will be selected. Remediate events will be chosen only for removing hazardous or dangerous materials. It is understood the remediation of asbestos material or any other hazardous material will be associated with substantially higher costs compared with nonhazardous materials.

Study Intervention - "Study" interventions will include a description of suspected deficiencies in the "Element Commentary Narrative".

Sources for Estimating Intervention Costs – Where possible Action cost values shall be obtained using RS Means costing data by subscribing to RS Means cost-works for the current year. In cases where cost

values are unavailable through the RS Means costing source the consultant may use previous costing research and experience.

Replace Intervention costs per unit of measure will also be adjusted to include all costs as applicable to the nature of the work, including soft costs, removal & disposal, labor, materials, project fees, and engineering fees where required.

Inventory, Quantities, and Measurements - The assessment process requires that an inventory of components be obtained. Quantitative measurements and or calculations of all visible components are required to fulfill the inventory requirement. Drawings or floor plans, where available, may be used as an aid in obtaining inventories only when it is evident that the quantities and components actually exist as indicated in the drawings and floor plans. Where components are not visible, and their quantities cannot be obtained from drawings or floor plans, then quantity survey calculations are required by estimations based on the size and type of structure. All measurements and calculations will strive to achieve accurate (within 10%) component inventory quantities.

All components which physically exist at each asset location are required to be assessed by the consultant.

The consultant is responsible for travel to and from sites. It is understood by the general undertaking of the work provided, that access to the facilities is required and should not be unduly limited in any way as to hinder the site assessment. All expenses incurred by the consultant to meet the requirements of this Contract must be included in the consultant's Total Contract Price.

Site Visits are mandatory and will include a scheduled meeting with the facility supervisor. It will be determined at this site meeting whether or not special equipment will be needed to gain access to the interior or roof for inspections. Safety attire is required which includes safety helmets, safety shoes, safety vests, and safety glasses if it is a construction site or hazardous site.

Project Team Requirements - A Professional Engineer is Not required to conduct the non-invasive assessments described in this contract, but is required to oversee, review, approve, and assume responsibility for assessments covered in the scope of this contract and for any special testing described under the scope section where an engineer is required by law.

Depending on the volume of assessments and the timelines agreed upon, the consultant is required to adjust the number of assessors to meet the demand of assessments in this contract, regardless of weather or any other deterring factor.

The consultant will indicate in their quote assessors who will be assigned to this project and their qualifications. The assessors will be qualified and specialize in the building disciplines indicated in the scope summary with a minimum of 10 years related work experience

Historical Buildings The consultant is required to factor into event cost calculations the inherent premium costs required to preserve the historical integrity and appearance of any built cultural assets listed in the scope. Designated Heritage Buildings typically require the use of traditional replacement materials that either match the existing or original finishes and/or the conservation of existing heritage fabric. The use

of modern or inappropriate materials and methods is generally not acceptable or permitted under the Ontario Heritage Act or by the Ontario Heritage Trust.

The Consultant is required to name in this contract a Project Manager and an Assistant Project Manager. The Project Manager will act as a single point of contact for the Municipality to ensure efficient and accurate communication between the two parties. In the event that the Consultant's Project Manager is unavailable, a designated Assistant Project Manager will act on behalf of consultants Project Manager.

Quality Review and Approvals - The consultant will implement a quality assurance procedure check of all data contained in the assessments prior to submitting data to the Municipality for approval.

Assessment data submitted by the consultant who the Municipality finds to be inaccurate or incomplete will be returned to the consultant for correction which may require that the consultant's assessors revisit the assets (at no additional cost to the Municipality) for the necessary corrections to be made. Incorrect data and or omissions are required to be corrected within 5 business days from the time of notification. At any given time, on-site spot checks may be conducted by the Municipality to verify accuracy and completeness of data.

PROJECT SCHEDULE AND COMPLETION DEADLINE

The deadline for this project is _____

The schedule will recognize the time required to mobilize and travel to each asset to complete the site visit. Similarly, a reasonable time will be allotted to report on each asset including an allowance for Quality Control and Assurance procedures.

All work shall be limited to week days only from the hours of _____AM to _____PM. This Project will be coordinated by the consultant's project manager who will establish an overall Project Schedule satisfactory to the Municipality's project manager.

ACCESS TO PROPERTY AND SAFETY

The consultant's assessors will carry company ID and make themselves known to Municipal staff upon arrival to Municipal sites. Prior to going on site, the Consultant shall make arrangements with Municipal staff at the locations to be visited no later than 48 business hours in advance.

It is the Consultants responsibility to acquire the method and means to safely gain access to rooftops of structures for the inspection and assessments of roofs and rooftop HVAC equipment, and any other safety requirements necessary for work carried out in this contract. Multiple ladders may be required to gain access to multi-level rooftops of facilities. Depending on the site being assessed proper protective safety attire may be required which includes safety helmets, safety shoes, safety vests, and safety glasses. Confined space procedures are required when entering these areas for assessment data collection.

3.2 RFP PARKS & RECREATIONAL AREAS ASSESSMENTS

TERMS OF THE CONTRACT AND DATA COLLECTION SPECIFICATIONS

SCHEDULE OF CONTRACT PRICES

(HST should be excluded)

CONTRACT SCHEDULE

The Successful Bidder agrees to begin work within ____ working days from the award of contract. The total inspection should be completed within ____ (enter amount) working days. This includes typing the reports and submitting the completed data.

SCHEDULE OF PRICES

Schedule of prices and quantities will be determined by the contractor and itemized in the bid. See suggested guideline below.

DESCRIPTION	Unit of measure	Price per m^2	Total Price
Inspection of parks, park components and recreational areas (___ sites)	m^2 / Lump Sum		
Compiling of data base {to include submission of hard copy}	Lump Sum		
Total Price 2018:			

OVERVIEW

The Municipality maintains approximately __ parks and recreational areas.

The services required include data collection for recreational areas, park assets and their components attributes and overall condition. This field data must be provided in a data format that can be uploaded to the Municipality's current CityWide Asset Management System provided by Public Sector Digest. As such, all data collected during this assignment must be compatible with the upload requirements of this system.

PURPOSE

To provide the Municipality with current and accurate inventory and condition assessments of recreational areas and the components within their parks assets which will identify components that require rehabilitation or replacement in the short term or long-term Capital Budget. In addition, some general operational and maintenance requirements will be captured which can optionally be included in the short term and long-term Capital Budget or operations and maintenance budgets.

Assessments are for renewal of like for like components however staff can also enter data for upgraded components where there is the opportunity for energy savings or more efficient operation of the components.

SCOPE

The following Parks are included for assessment:

Asset Name	Address	City
Kinsmen Beach Park	160 Bluebird Road	Vermilion Bay
Post Park	1994 Lyle Road	Eagle River
Pine Tree Park	# 7 Bay Street	Vermilion Bay

DATA CAPTURE REQUIREMENTS

Data collection and entry are divided primarily into six levels: Asset, Identifier & Location, Component Classification, Details, Assessment Data, Financial Data, and Intervention Data.

- The term Asset relates to the entire park and site as a whole.
- Components are individual physical items which make up an asset (playground structures, buildings, shelters, fences, sports fields / equipment, etc.).
- Interventions are work, and resources recommended by the assessor for renewal and/or upgrade of components.

ASSET LEVEL (PARK) DATA REQUIRED

Park Name
Park Type
Two Cover photos

COMPONENT LEVEL DATA REQUIRED

Provide an inventory of all components at each park. All components will at a minimum require the following data regardless of its condition or whether the year of renewal is less than or greater than the 25-year outlook required;

Identifiers & Location

CityWide Asset ID
Unique ID or Import ID

Location
General description in regard to where in the park the component is located.

Classification

Component Major Group - Level 1
Assessor to select component Level 1 – Major Group classification.

Component Identification - Level 2
Assessor to select component Level 2 – Component Identification.

Details

Component Description;
The component description should be utilized to provide a brief description of the component. **Example:** Baseball Diamond Light Standard

Material
Manufacturer
Supplier Serial #
Model #
Warranty Effective Date
Warranty Term

Quantities, and Units of Measure (required for linear and area components)
Quantitative measurements and or calculations of all linear and/or area components are required. For example: Play structure surface – provide square footage.

Assessment Data

Accurate In-Service Date

Commentary;
Utilize the commentary field to detail any additional information relating to the component's condition and any other life expectation observations.
Example: The baseball diamond light standard is past expected life but does appear to be functional and there have been no reported issues from site staff. Given the normal life of this light standard, replacement can be anticipated within the next 1-5 years.

Condition
Very Good = performing very well, no noticeable defects.
Good = Component is performing adequately; no work is foreseen in next **10** years
Fair = Component is operational, but replacement is required in **5-10** years
Poor = Component requires replacement in next **1-5 years**
Very Poor = Component is beyond useful life (or not functioning) – replace in current year.

Photos – photos of the components to support the assessments - in general one photo for components that are in good condition, and two or three photos for components in critical, poor or fair conditions. (Photos should be named as per Facility name, then component name, then 1,2,3, etc)

Financial Data

Current Replacement Value
This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Replacement Cost Date
The date when the replacement cost was acquired.

Intervention Data Required

Only components which require current and forecasted renewal needs within the next 25 years will require the following data:

Intervention Type
(replace, repair, remediate, remove / demolish, study)

Intervention Details Narrative
Describe what needs to be done and include cost calculations.

Intervention Year year of renewal based on condition and lifecycle.

Cost
Cost resulting from costing calculations above. This value is the cost to rebuild the equivalent asset and includes material, labor, and design costs. This estimate shall not include taxes.

Project Prioritization Questions

- Energy Savings (high, medium, low)
- Accessibility Issue (yes, no)
- Consequences of Failure (very high, high, moderate, low, very low)
- Legislation (yes, no)
- Health and Safety (yes, no)
- Grants Availability (yes, no)
- Part of Strategic Plan (yes, no)

GENERAL NOTES

Prior to Start of the Contract - The contractor shall train all staff in all applicable health and safety legislations, best management practices and submit a copy of their inspector training manual and all training records to the Municipality.

Remediate Intervention - When assessing materials which are hazardous, and remediation is recommended, a "Remediate" intervention will be selected. Remediate events will be chosen only for removing hazardous or dangerous materials. It is understood the remediation of asbestos material or any other hazardous material will be associated with substantially higher costs compared with nonhazardous materials.

Study Intervention - "Study" interventions will include a description of suspected deficiencies in the

"Element Commentary Narrative".

Replace Intervention costs per unit of measure will also be adjusted to include all costs as applicable to the nature of the work, including soft costs, removal & disposal, labor, materials, project fees, and engineering fees where required.

DELIVERABLES

- Final Inspections are to be submitted in electronic Microsoft Excel files
- Accompanying the final digital database, the assessor shall also submit all hard copy inspection records.
- Hard copy inspection records shall be submitted contained in 100mm 3 ring binders, the reports three hole punched, and categorized/indexed by inspection date and alphabetical park name.

3.3 RFP RIGHT-OF-WAY ASSESSMENTS (ROADS)

DATA COLLECTION SPECIFICATIONS

OVERVIEW

The Municipality maintains approximately ___ centerline kilometers of municipal roadway.

The services required include data collection for Ride Comfort Index (RCI), Surface Distress Index (SDI) for the Municipality's entire paved road network. This field data is then to be uploaded to the Municipality's current CityWide Asset Management System provided by Public Sector Digest. As such, all data collected during this assignment must be compatible with the upload requirements of this system.

Survey Year	Survey Area Description	CL-km (approx)
2018	Road Surface	____

Actual CL-km and survey-km quantities may differ from those shown; final survey requirements will be determined at the start of each annual data collection start-up, to account for any increases (e.g. newly assumed roads) or decreases (e.g. roads scheduled to be or currently under construction), as identified

and approved by Municipal staff. Changes to the actual survey-km totals will result in adjustments to the deliverable and billable quantities, at the supplier's proposed unit rates for data collection activities.

CONTRACT TERM

The work shall commence on the issuance of the purchase order and shall be completed on or before _____.

DELIVERABLES

Data Collection

- Data collection must be completed by _____. Before commencing the survey, a pre-survey ("start-up") meeting with the Municipality is required.
- The Supplier is responsible for processing, validating, and providing the detailed survey data in a format suitable for uploading into the Municipality's CityWide program in an error free format by _____ of the survey year.
- Distances shall be measured using a calibrated DMI (Distance Measuring Instrument) device. All road section lengths shall be verified by the supplier.
- The respondent shall obtain surface distress data for all streets using a Line scan/Laser Road Imaging System (LRIS) automated vehicle. The survey vehicle must also be capable of collecting and recording reliable and accurate Global Positioning (GPS) data for the surface condition and digital image data streams, using Inertial aided GPS. Systems must be rated to +/- 1-meter horizontal accuracy, with the ability to post-process GPS data in order to improve results to sub-meter accuracies.

Surface Distress and Roughness

- Surface distress data will be collected in one direction (single pass) on roads with two (2) lanes or less.
- Data will be collected in both directions on roads having three (3) or more lanes in the outer (curb) through lane in each direction; divided roads will also be surveyed in both directions.
- Roughness data will be collected simultaneously with the surface distress survey using a Class 1 profilometer. Roughness data will be measured in both wheel paths of the traveled lane in conjunction with the surface distress survey.
- Downward perspective images of the pavement surface shall be collected to produce a minimum 3.5 meters width view of the pavement surface for visual and post-processed pavement distress condition evaluation. These images shall be collected from downward pointing camera(s), which are orthogonal to the pavement surface. The downward perspective image shall be collected with a uniform and consistent form of illumination applied to the pavement surface. The illumination shall be regulated to provide sufficient contrast and crack-shadows for the clear discernment of cracking and patching. Pavement condition will be evaluated based on the type, severity and extent, and amount of pavement defects or distresses. Each surface distress is to be evaluated on the basis of two components:

- Severity is defined as 'How bad is the defect?' and is expressed in terms of the width or degree of deterioration associated with a particular pavement distress. An example of a severity measurement includes the average width of a crack.
- Extent is defined as 'How much is there?' and is expressed in terms of the quantity of the surface that a particular defect/distress covers. Examples of measures used for extent would include the number and length of transverse cracks, length of longitudinal cracking, or the pavement area affected by an alligator or pattern cracking.

The assessment of the surface condition will be based on a modified version of ASTM D 6433-11 "Standard Practice for Roads and Parking Lots Pavement Conditions Index Surveys". The Surface Distress
Index (SDI) ratings must account for the following surface distresses; all SDI data shall be summarized in 30-meter intervals and reported in equivalent distress key pair values as per the severity and extent definitions below:

	Severity Rating			
Distress Description	***Criterion***	***Slight***	***Moderate***	***Severe***
		0	***1***	***2***
Patching/Utility Cuts	Condition	Good	Deteriorating	Failed
Rippling/Shoving	Roughness	Noticeable	Distinct	Excessive
Raveling/Streaking	Appearance	Noticeable	Distinct	Excessive
Flushing/Bleeding	Appearance	Noticeable	Distinct	Excessive
Distortion	Profile Deviation (mm)	< 50	50 - 100	> 100
Excessive Crown	Elevation (%)	>= 3 and < 4	>= 4 and < 6	>= 6
Progressive Edge Cracking	Width (m)	< 0.3	0.3 – 0.6	> 0.6
Alligator Cracking	Condition	Noticeable	Distinct	Excessive
Potholes	Width (mm)	< 75	75 – 300	> 300
Map Cracking	Crack Width (mm)	< 13	13 - 25	> 25
Longitudinal Cracking	Crack Width (mm)	< 13	13 - 25	> 25
Transverse Cracks	Crack Width (mm)	< 13	13 - 25	> 25
Wheel Track Rutting	Rut Depth (mm)	< 13	13 - 25	> 25

Distress Description	Criterion	Extent Rating				
		Few	Intermittent	Frequent	Extensive	Throughout
		1	2	3	4	5
Patching/Utility Cuts	Area %	0 - 10	10 - 20	20 - 40	40 - 60	60 - 100
Rippling/Shoving	Area %	0 - 10	10 - 20	20 - 40	40 - 60	60 - 100
Raveling/Streaking	Area %	0 - 10	10 - 20	20 - 40	40 - 60	60 - 100
Flushing/Bleeding	Area %	0 - 10	10 - 20	20 - 40	40 - 60	60 - 100
Distortion	Area %	0 - 10	10 - 20	20 - 40	40 - 60	60 - 100
Excessive Crown	Area %	0 - 10	10 - 20	20 - 40	40 - 60	60 - 100
Progressive Edge Cracking	Length %	0 - 4	4 - 10	10 - 30	30 - 60	60 - 100
Alligator Cracking	Area %	0 - 4	4 - 10	10 - 30	30 - 60	60 - 100
Potholes	Count	1	2	3	4	□ □
Map Cracking	Area %	0 - 4	4 - 10	10 - 30	30 - 60	60 - 100
Longitudinal Cracking	Crack Length (m)	< 30	30 - 60	60 - 90	90 - 120	> 120
Transverse Cracks	Crack Spacing (m)	> 25	15 - 25	10 - 15	5 - 10	< 5
Wheel Track Rutting	Area %	0 - 10	10 - 20	20 - 40	40 - 60	60 - 100

Longitudinal Profile (Roughness)

- All roadway profile data should be simultaneously collected with the other data attributes for this project.
- The longitudinal profile or roughness data is to be collected using a fully automated and certified Class I profiler as per ASTM E950.
- Roughness data shall be measured using the International Roughness Index (IRI) for eventual conversion to an RCI number for each road section. The supplier prior to commencement shall provide an outline of the IRI measurement process. The survey data shall also be summarized in 30 meters intervals and an average for the entire roadway section shall be provided. Where road length and/or geometry prohibit the direct measurement of IRI, the consultant will provide an estimated IRI value for the section and indicate that the value is an estimated measurement.

Transverse Profile / Rutting Data Collection

- The supplier shall collect transverse or cross-sectional profile and rut depths, calculations of rut depth should simulate the straight edge method made in accordance with ASTM E 1703E/1703M-95 "Standard Test Method for Measuring Rut Depth of Pavement Surface Using a Straightedge".

Road Sections

- The Municipality will be responsible in supplying the supplier with detailed road sections and their respective identification (ID) numbers in digital form (Excel or GIS file). These (ID) numbers must be used to collect and summarize the field data. This process will facilitate the electronic transfer of data into the Road Matrix software.
- All roads in the Municipality's network have been sectioned on a block-to-block basis, frequently resulting in street names being listed more than once; however, the individual road sections can be identified using the street name along with the "from" and "to" identifiers. If, for routing purposes, any road sections are tested in the opposite direction, the resulting reversal of the "from" and "to" identifiers must be reflected in the data.

Quality Control

- Every effort has been made to ensure the accuracy of the road section listing. If, for any reason there are errors in the list, all data must reflect the "as-tested" conditions. All road section lengths shall be verified by the supplier and must submit a quality control (QC) plan that ensures consistency and repeatability in the data. The supplier shall provide an "exceptions list" when there is no data collected for a road section (all stations) and provide a reason for why the data could not be collected.

Deflection Testing (Optional)

- The supplier shall provide an assessment of pavement strength that is to be evaluated based on deflection testing, utilizing a fully automatic, non-destructive Falling Weight Deflectometer (FWD). The supplier will assist Municipal staff in the selection of a candidate deflection survey road sections, based on whether roads have previous data, road conditions and age.
- Deflection measurements are derived using a series of nine (9) sensors and transmitted directly to the truck's recording unit. The results of these tests are used in conjunction with the subsurface and traffic data to determine if the pavement is structurally adequate to support the anticipated loads over a given time period.
- FWD deflection tests shall be carried out at approximately every 100 meters, with a minimum of three (3) tests per section. The sensor readings must be temperature corrected prior to submission of the data, and data must be formatted for upload into the CityWide asset management system. Final results will provide the Municipality with data for the following pavement engineering applications, including:
  - Calculation of Structural Adequacy Index (SAI) scores for tested sections.
  - Determination of Remaining Roadway Service Life.

- Evaluation of Existing Structural Capacity of supporting subgrade and existing pavement which can be used for Capital Improvement Projects, such as to determine if a pavement is a candidate for a structural overlay or reconstruction.

Row Digital Image Inventory

- For cost-effectiveness, GPS and digital imagery is to be collected in conjunction with the pavement condition survey, to provide a source of data capture for pavement attributes or other right of way (ROW) asset inventories.
- ROW imagery is to be collected while performing the pavement roughness and distress survey, using a camera configuration comprised of a minimum two forward facing, high-resolution cameras minimum 2448 x 2048 dots per inch (dpi) that collect continuous digital images of the right shoulder travel lane, at approximately 5-meter intervals, and stores the images in real time, with accurate corresponding geo-referenced data (GPS) locational data, to a portable hard drive system.
- The resulting image data set is to contain industry standard JPEG's, organized in a folder and file naming structure matching that of historical data sets. Additional attribute data will also be "watermark" stamped on each JPEG file. The Municipality will provide a sample of the stamping information to the supplier. Each image shall be tagged with a GPS coordinate to facilitate easy linkage to the Municipality's GIS; geo-referenced information will be delivered as an ESRI Geodatabase and the images are to be delivered on a USB3 hard drive.
- Collected digital images must be calibrated for possible photogrammetric feature extraction. The Municipality may require the supplier, by utilizing known calibration data, including the position of the camera relative to the GPS unit, to obtain x, y, and z coordinates for assets within the image frame. Data extraction forms will be defined for each of the assets for which data is required.

The data extracted from the image must be stored in a geodatabase, along with the image associated to the asset.

The preparation of this project was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.