Inventory and Assessment of Municipal Street Light Assets

Assessment Report

FINAL

Prepared for:
Municipality of Middlesex Centre

RVA 236832

December 15, 2023

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RVA 236832

December 15, 2023

Middlesex Centre
10227 Ilderton Road, RR#2
Ilderton, ON, N0M 2A0

Attention: Andrew Giesen, C.E.T, PMP, CMM III
Transportation Manager

Dear Mr. Giesen:

Re: Inventory and Assessment of Municipal Street Light Assets
Condition Assessment Report

After a review of the data collected, it is recommended that the following corrections be made before further improvements or upgrades to the existing systems.

1. Immediate maintenance for missing and damaged Municipal pole handholes, and replacement of missing arm attachment bolts, combined 78 locations.
2. Maintenance and potential replacement of pole, arm, and luminaires in poor conditions at approximately 125 locations.
    a) From the data, most updates are required at Komoka Kilworth (i.e., 55), followed by Delaware (i.e., 32), and Ilderton (i.e., 27), totalling 116 of the 125 noted locations.
3. With no further immediate maintenance concerns found in this review, a phased proactive maintenance approach can be completed for the remaining locations to upgrade all areas to an LED system to match the new developments in the same areas.
    a) Bryanston had no recorded luminaires and maintenance is not required.
    b) Arva, Denfield, Birr, Ballymote, and Lobo has a combined 51 recorded luminaires, where upgrades can be completed in a short span.
    c) For Melrose, with the exception of a few luminaires at the Vanneck Road and Egremont Drive intersection, all other pole assemblies were recently upgraded in Summer 2023. These may also be combined with the Arva et al Settlement Areas.

All other data can be referenced in the GIS package circulated in November 2023.

Yours very truly,

R.V. Anderson Associates Limited

Mario A. Watson, P.Eng.
Associate, Project Manager

INVENTORY AND ASSESSMENT OF MUNICIPAL STREET LIGHT ASSETS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 Project Background

There were an assumed 1,876 street light assets within the Municipality that required a more recent assessment. This would comprise of 1,021 streetlights on Municipal poles and 855 streetlights on Hydro poles. The following settlement areas were identified for this assessment:

- Schedule A-1 – Ilderton
- Schedule A-2 – Komoka-Kilworth
- Schedule A-3 – Arva
- Schedule A-4 – Delaware
- Schedule A-5 – Ballymote
- Schedule A-6 – Birr
- Schedule A-7 – Bryanston
- Schedule A-8 – Poplar Hill / Coldstream
- Schedule A-9 – Denfield
- Schedule A-10 – Lobo
- Schedule A-11 – Melrose

Assessment requirement was inclusive of the following:

- GPS location in a shape file for addition to the municipal GIS database.
- Height of pole.
- Type of pole.
- Luminaire Type.
- Luminaire Wattage.
- Arm Type.
- Arm Length.
- Pole Condition (visual inspection from the ground).
- Arm Condition (visual inspection from the ground).
- Luminaire condition (visual inspection from the ground).
- Pole ownership (municipal, hydro authority, or other).

The Municipality requires this Inventory and Assessment to aid in identifying priorities for repair or replacement based on pole, luminaire, and / or arm conditions. This is inclusive of identifying any maintenance concerns such as missing covers or loose bolts.

2.0 GIS Package Setup

RVA utilized ArcGIS' Survey 123 feature for the field reconnaissance. The Survey 123 template used for this assessment was modified on an as-needed basis to suit the ongoing field reviews. The ultimate template included the following Survey 123 field requests:

1. Date and Time of Assessment.
2. Settlement Area.
3. Image of the Pole.
4. Location of the Pole.
5. Type of Pole.
6. Pole ID.
7. Height of the Pole (m).
8. Pole Condition.
9. Type of Pole Base.
10. Notes for Pole Condition.
11. Type of Arm.
12. Length of Arm (m).
13. Arm Condition.
14. Notes for Arm Condition.
15. Arm Attachment Bolts.
16. Notes for Arm Attachment Bolt(s) Condition.
17. Type of Luminaire.
18. Type of Luminaire Attachment.
19. Luminaire Condition.
20. Wattage of Luminaire (W).
21. Notes for Luminaire Condition.
22. Owner of the Pole.
23. Pole Handhole Cover Condition.
24. Photocell Visible.
25. Banners Attached.
26. Plant Hangers Attached.

Where possible, pre-determined drop-down lists or single select radio options were used to prepare a more uniform dataset. Items originally in the data collection request were set as mandatory, where an option for "N/A" was set for pole assemblies that did not have this feature.

The following sub-sections elaborate on the individual field selections.

2.1 Date and Time of Assessment

This feature was automatically added once the field reviewer opened a new form to collect data on a new survey point.

2.2 Settlement Area

This selection was a mandatory requirement. A pre-selected drop-down list was available for the eleven (11) settlement areas.

2.3 Image of the Pole

This selection was a mandatory requirement. To allow for future review during the QA period of this assignment, a photo was required for the side profile, luminaire, and base of the pole. Where deficiencies were found or a wattage sticker was available, a photo specific to that item was collected.

2.4 Location of the Pole

This selection was a mandatory requirement. Using the built-in GPS capability of the tablet used for this assignment, the field reviewer positioned the tablet against the pole to collect the exact location. The tablet used for this assignment was the Samsung Galaxy Active 4, 5G. From the specifications of the device, each data point was collected within 3.57 m horizontal distance of the pole location.

2.5 Type of Pole

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- Wood.
- Aluminum.
- Galvanized Steel.
- Concrete Standard Round.
- Concrete Decorative Round.
- Concrete Decorative Octagonal.
- Traffic Signal.

2.6 Pole ID

This selection was a non-mandatory requirement and added where available.

2.7 Height of the Pole

This selection was a non-mandatory requirement. The label option was used for this data input, set to a number value. In the cases where the luminaire and arm attachment were on a utility pole, this input was left blank. When a number was added, the field requirement was set to only accept values between 2m and 20m.

The measuring tool used for this assignment was the Bosch Blaze GLM400C, Outdoor 400ft Connected Laser Measure with Camera Viewfinder. The built-in inclinometer allows for indirect measurements which allowed for the field reviewer to obtain the indirect height of the pole directly from the screen.

From the specifications of the device, each data shot is shown within a 1.5 mm accuracy. As there is opportunity for human error based on the exact point shot and angle to the top of the pole, a uniform height was used for each pole encountered. Where available, the nameplate on the pole was also used for confirmation.

2.8 Pole Condition

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included Good, Fair, Poor.

The approach used for this selection was to reserve the Good Option for New or Like New, Fair to indicate no visible deficiencies, and Poor to indicate a visible deficiency. When Poor was used, a photo of the identified deficiency was taken with notes added to the Notes section.

2.9 Type of Pole Base

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- Direct Buried.
- Base Mounted.

2.10 Notes for Pole Condition

This selection was a non-mandatory requirement and added only for cases where the condition was set to Poor.

2.11 Type of Arm

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- N/A (If Post Top).
- Tenon Side Mounted.
- Tapered Elliptical Bracket.
- Tapered Elliptical Bracket – Double.
- Davit Arm.
- Truss Arm.
- Scroll Arm.
- Pipe Arm.

2.12 Length of Arm

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- Nil if Post Top.
- 1.2m (4ft Arm).
- 1.8m (6ft Arm).
- 2.4m (8ft Arm).
- 3.0m (10ft Arm).
- 3.6m (12ft Arm).

The measuring tool used for this assignment was the Bosch Blaze GLM400C, Outdoor 400ft Connected Laser Measure with Camera Viewfinder. The built-in inclinometer allows for indirect measurements which allowed for the field reviewer to obtain the indirect length of the arm directly from the screen.

From the specifications of the device, each data shot is shown within a 1.5 mm accuracy. As there is opportunity for human error based on the exact point shot and angle to the end of the arm, the length was chosen based on the closest arm in the pre-determined list.

2.13 Arm Condition

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included Good, Fair, Poor.

The approach used for this selection was to reserve the Good Option for New or Like New, Fair to indicate no visible deficiencies, and Poor to indicate a visible deficiency. When Poor was used, a photo of the identified deficiency was taken with notes added to the Notes section.

2.14 Notes for Arm Condition

This selection was a non-mandatory requirement and added only for cases where the condition was set to Poor.

2.15 Arm Attachment Bolts

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- All Bolts Present (Fair).
- All Bolts Present (Poor)
- Bolt(s) missing.

2.16 Notes for Arm Attachment Bolt(s) Condition

This selection was a non-mandatory requirement and added only for cases where the condition was set to Poor or Missing.

2.17 Type of Luminaire

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. For uniformity of data collected, options included:

- Cobra Head HPS.
- Cobra Head LED Type 1.
- Cobra Head LED Type 2.
- Cobra Head LED Type 3.
- Decorative Post Top Type 1.
- Decorative Post Top Type 2.
- Decorative Post Top Type 3.
- Decorative Post Top Type 4.
- Decorative Post Top Type 5.
- Decorative Post Top Type 6.
- Decorative Post Top Type 7.

- Decorative Post Top Type 8.
- Decorative Post Top Type 9.
- Decorative Side Mount Type 1.
- Decorative Side Mount Type 2.

Refer to Appendix 1 for photographs of the respective Types of Luminaires.

2.18 Type of Luminaire Attachment

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- Post Top.
- Side Mounted.

2.19 Luminaire Condition

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included Good, Fair, Poor.

The approach used for this selection was to reserve the Good Option for New or Like New, Fair to indicate no visible deficiencies, and Poor to indicate a visible deficiency. When Poor was used, a photo of the identified deficiency was taken with notes added to the Notes section.

2.20 Wattage of Luminaire (W)

This selection was a non-mandatory requirement and added only for cases where the wattage sticker was visible.

2.21 Notes for Luminaire Condition

This selection was a non-mandatory requirement and added only for cases where the condition was set to Poor.

2.22 Owner of the Pole

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- Municipal.
- Hydro.

- Traffic Signal.
- Other.
- Unknown.

2.23 Pole Handhole Cover Condition

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- N/A.
- Present – Good.
- Missing.
- Damaged.

When Missing or Damaged were used, a photo of the identified deficiency was taken.

2.24 Photocell Visible

This selection was a mandatory requirement. The single-select radio option feature was used for this data input. Options included:

- N/A.
- Yes.
- No.

2.25 Banners and Plant Hangers Attached

This selection was a non-mandatory requirement. The single-select radio option feature was used for this data input. Options included Yes or No.

3.0 High-Level Data Summary

After completing the field reconnaissance, a desktop review of all the data points was completed with adjustments made on an as needed basis to maintain uniformity across the data set.

Table summaries based on pole type, ownership, and luminaire type is shown in the below sub-sections.

3.1 Number of Reviews

There was a total of 1,453 reviews completed across the eleven (11) settlement areas. Breakdown per settlement area broken down below, sorted from highest to lowest.

Table 1: Data Review by Settlement Area

Settlement Area	Number of Reviews	Percentage of Total
Komoka-Kilworth	673	46.32%
Ilderton	440	30.28%
Delaware	180	12.39%
Poplar Hill / Coldstream	56	3.85%
Melrose	53	3.65%
Arva	17	1.17%
Denfield	16	1.1%
Birr	14	0.96%
Ballymote	2	0.14%
Lobo	2	0.14%
Bryanston	0	0%

3.2 Breakdown by Type and Ownership of Pole

A summarized breakdown per ownership is below.

Table 2: Data Review by Pole Ownership

Pole Ownership	Count	Percentage of Total
Municipal	1,159	79.7%
Hydro	281	19.34%
Traffic Signal	13	0.89%

Breakdown per Type of Pole reviewed is broken down below, sorted from highest to lowest.

Table 3: Data Review by Pole Type

Type of Pole	Count	Percentage of Total
Aluminium	1,151	79.22%
Wood	274	18.86%
Concrete Decorative Octagonal	8	0.55%
Traffic Signal	8	0.55%
Galvanized Steel	6	0.41%
Concrete Standard Round	4	0.28%

3.3 Breakdown by Type of Luminaire

Breakdown per Type of Luminaire reviewed is broken down below.

Table 4: Data Review by Luminaire Type

Type of Pole	Count	Percentage of Total
Cobra Head HPS	3	0.21%
Cobra Head LED Type 1	1,143	78.66%
Cobra Head LED Type 2	14	0.96%
Cobra Head LED Type 3	5	0.34%
Decorative Post Top Type 1	8	0.55%
Decorative Post Top Type 2	8	0.55%
Decorative Post Top Type 3	13	0.89%
Decorative Post Top Type 4	160	11.01%
Decorative Post Top Type 5	11	0.76%
Decorative Post Top Type 6	1	0.07%
Decorative Post Top Type 7	8	0.55%
Decorative Post Top Type 8	13	0.89%
Decorative Post Top Type 9	15	1.03%
Decorative Side Mount Type 1	20	1.38%
Decorative Side Mount Type 2	31	2.13%

4.0 Condition Level Summary

4.1 Immediate Maintenance

4.1.1 Pole Handhole Maintenance

From a safety assessment, an immediate maintenance requirement would be the replacement of damaged or missing pole handhole covers.

Table 5: Data Review by Pole HH Condition

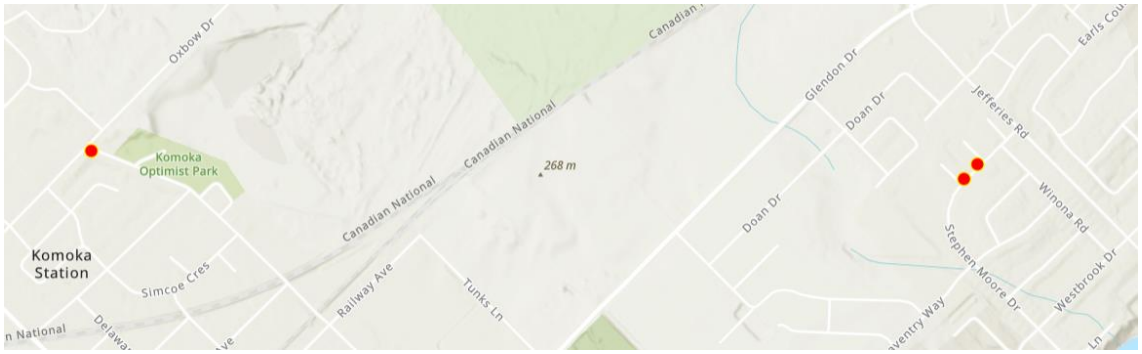
Pole Handhole Cover Condition	Count	Percentage of Total
Present - Good	1,089	74.95%
N/A	286	19.68%
Damaged	64	4.40%
Missing	14	0.96%

N/A for this assessment is in relation to utility poles.

Of the 14 missing pole handholes, 11 are in Ilderton, and 3 are in Komoka-Kilworth. Snippets may be found below for reference to the noted locations. More detailed locations can be found in the GIS package circulated to the Municipality.

Figure 1: Pole Handhole Cover Missing - Ilderton

Figure 2: Pole Handhole Cover Missing – Komoka-Kilworth



Of the 64 damaged pole handholes:

- 1 is in Birr.
- 10 is in Delaware.
- 37 is in Ilderton.
- 16 is in Komoka-Kilworth.

Snippets may be found below for reference to the noted locations. More detailed locations can be found in the GIS package circulated to the Municipality.

Figure 3: Pole Handhole Cover Damaged - Birr

Figure 4: Pole Handhole Cover Damaged - Delaware

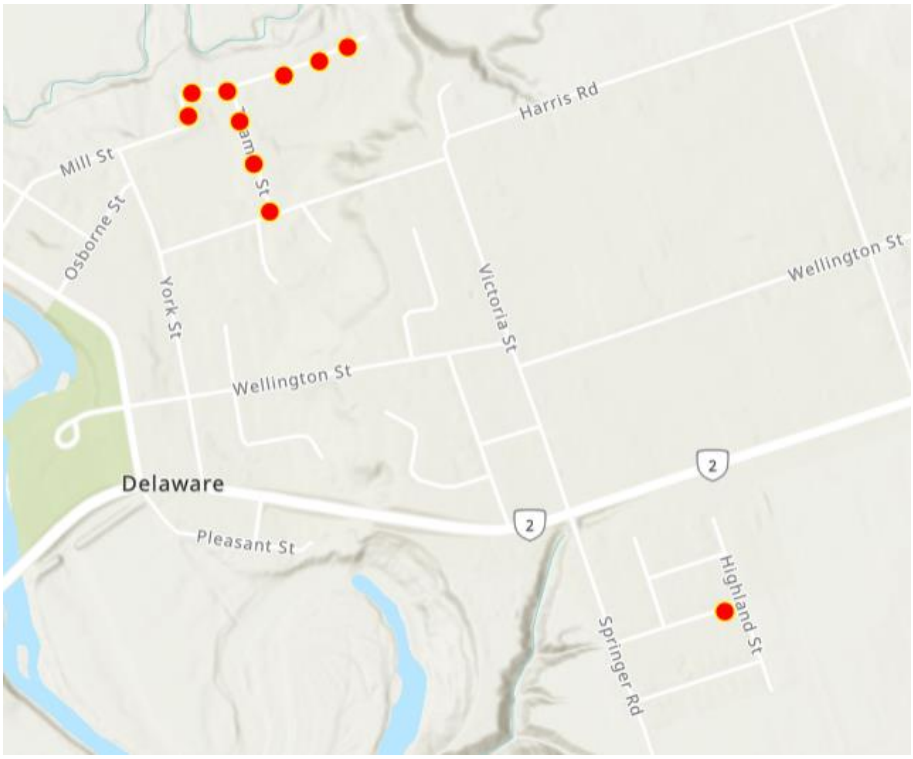


Figure 5: Pole Handhole Cover Damaged - Ilderton

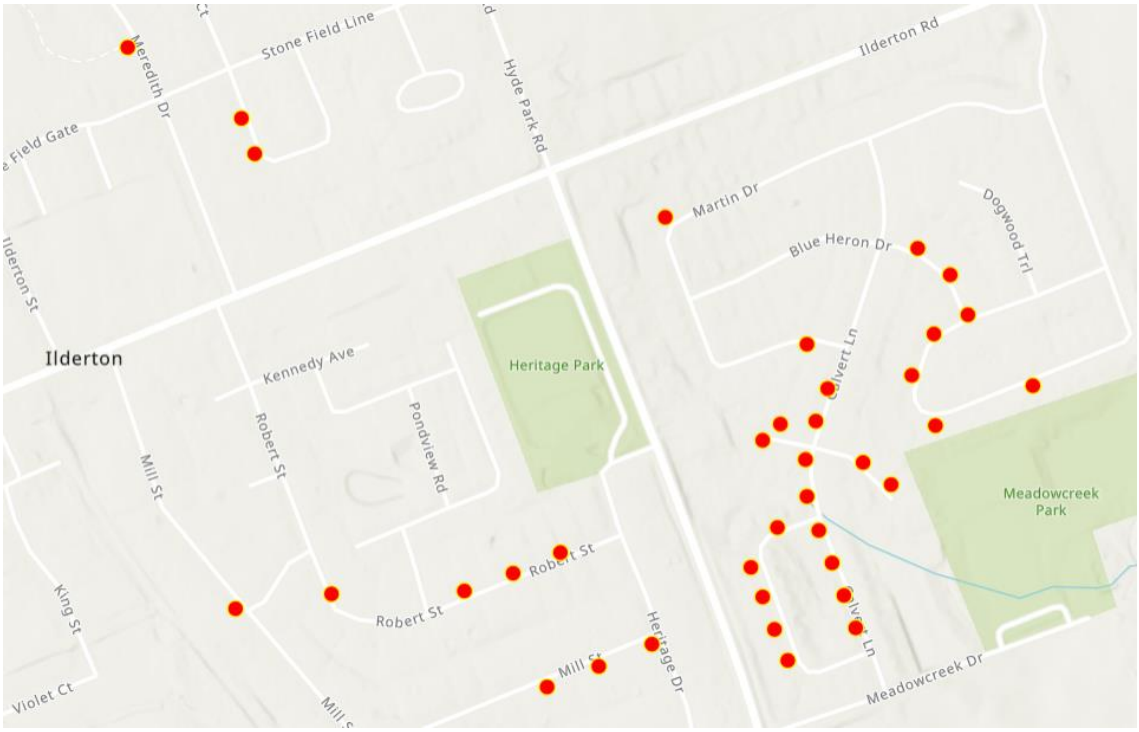
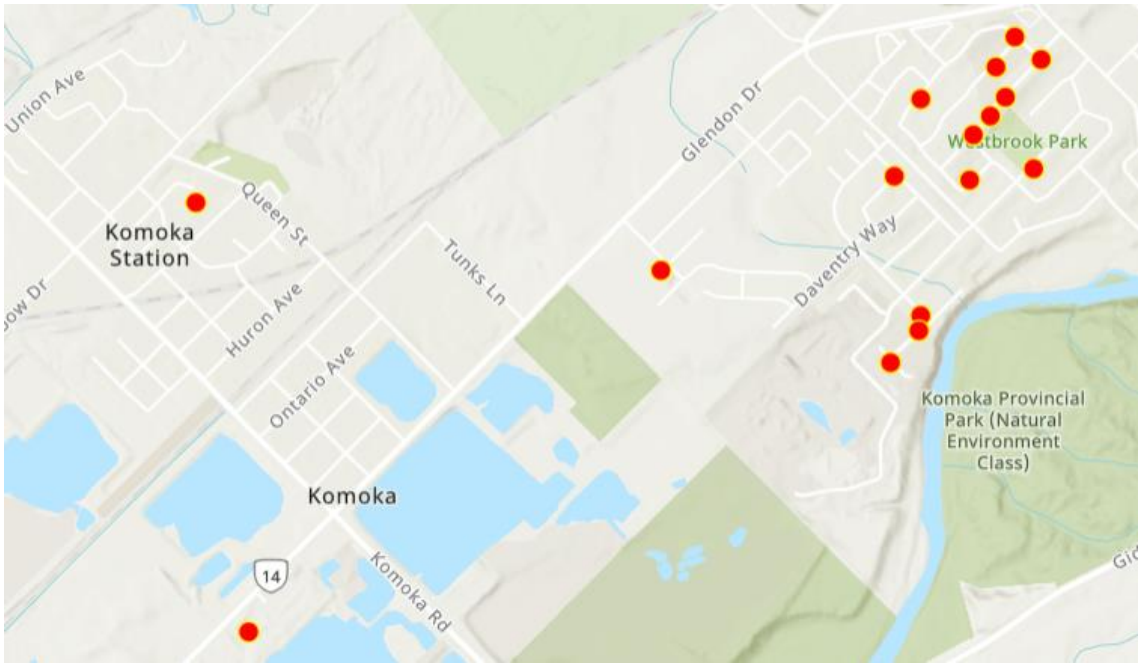


Figure 6: Pole Handhole Cover Damaged - Komoka-Kilworth



4.1.2 Arm Bolt Attachment Maintenance

From a safety assessment, another immediate maintenance requirement would be the replacement of missing arm attachment bolts.

Table 6: Data Review by Arm Bolt Attachment

Pole Handhole Cover Condition	Count	Percentage of Total
All Bolts Present (Fair)	1,255	86.37%
All Bolts Present (Poor)	168	11.56%
Bolt(s) Missing	30	2.06%

A further breakdown of missing bolts is included in the table below.

Table 7: Missing Bolts by Settlement Area

Settlement Area	Poor Count	Percentage of Total
Delaware	1	3.33%
Ilderton	26	86.67%
Komoka-Kilworth	3	10.00%

Figure 7: Bolt Missing - Delaware

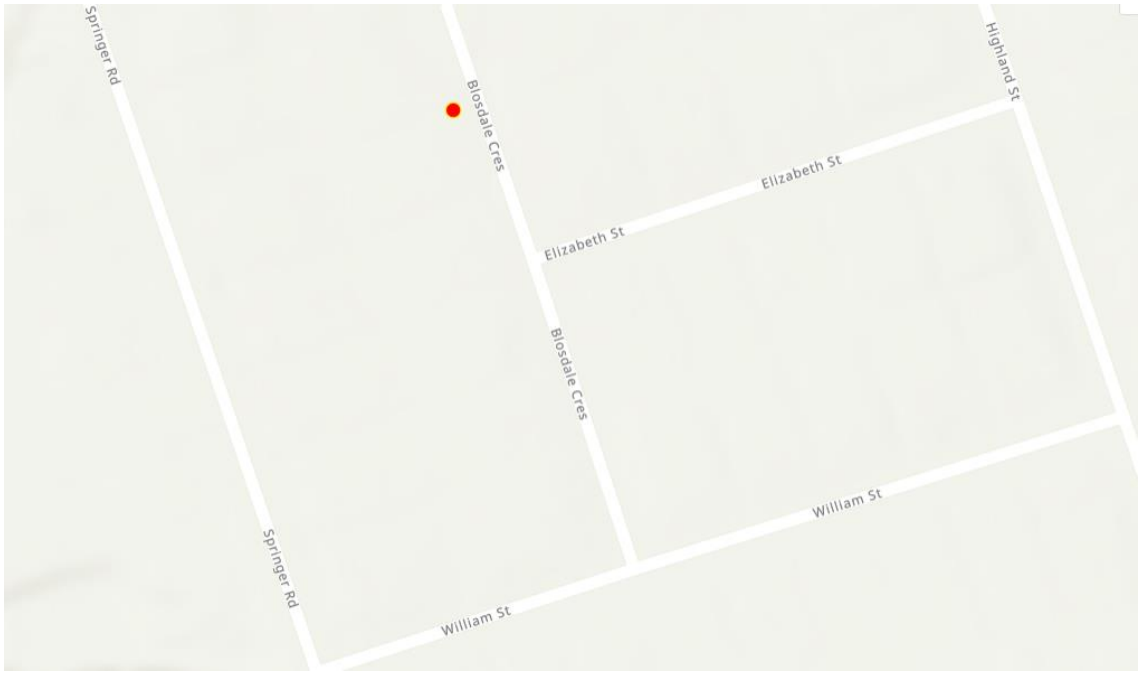


Figure 8: Bolt Missing - Ilderton

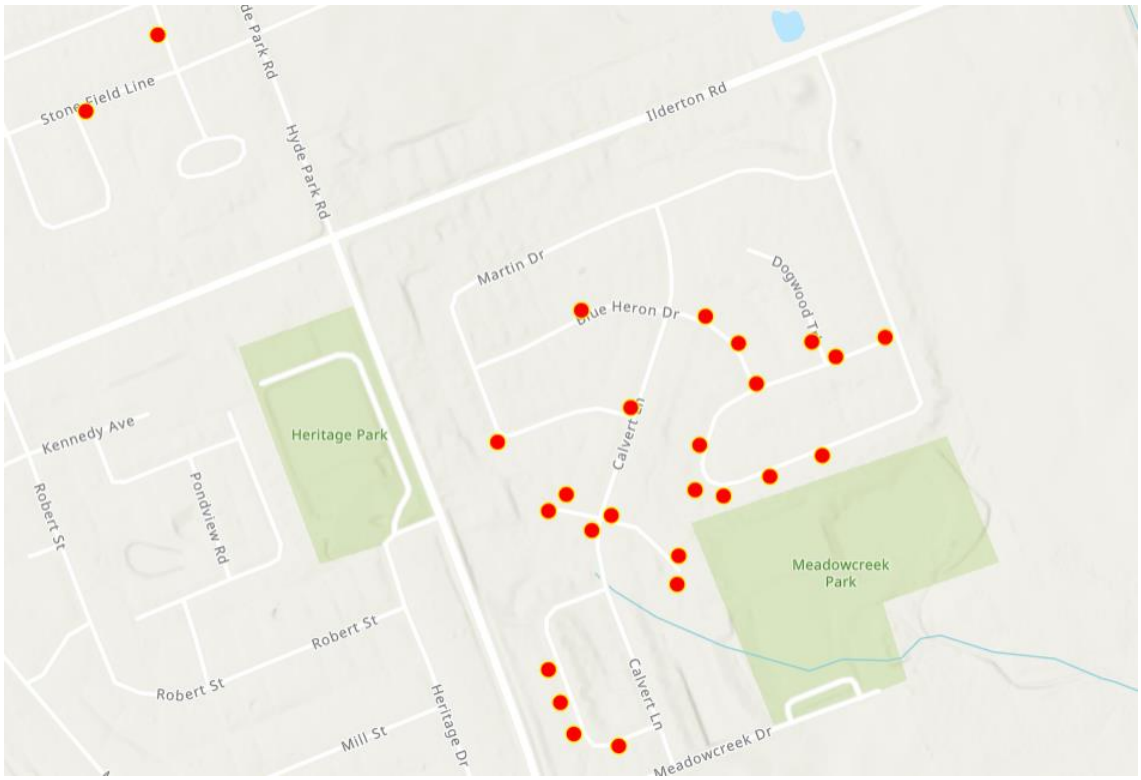


Figure 9: Bolt Missing - Komoka-Kilworth

4.2 Pole Condition

A summary of pole conditions for the overall data set can be found below. The last column notes how many of the poles reviewed were joint-use utility poles.

Table 8: Pole Condition High-Level Summary

Pole Condition	Count	Percentage of Total	Utility Pole Subset
Good	610	41.98%	20
Fair	801	54.85%	253
Poor	42	2.89%	8

In the pole review, an indication of poor was noted for scenarios where the pole was not plumb, was rusted, had cracks, or had a visual damage.

Some locations may have been surrounded by trees but was identified as either Good or Fair for this review. However, any potential impacts to the lighting levels were identified as poor under the luminaire condition section.

With the exclusion of the utility poles, a further breakdown of poles with a poor condition is included in the table below.

Table 9: Poor Pole Condition by Settlement Area

Settlement Area	Poor Count	Percentage of Total
Birr	3	8.82%
Delaware	2	5.88%
Ilderton	19	55.88%
Komoka-Kilworth	6	17.65%
Poplar Hill / Coldstream	4	11.76%

Figure 10: Pole Condition Poor - Birr

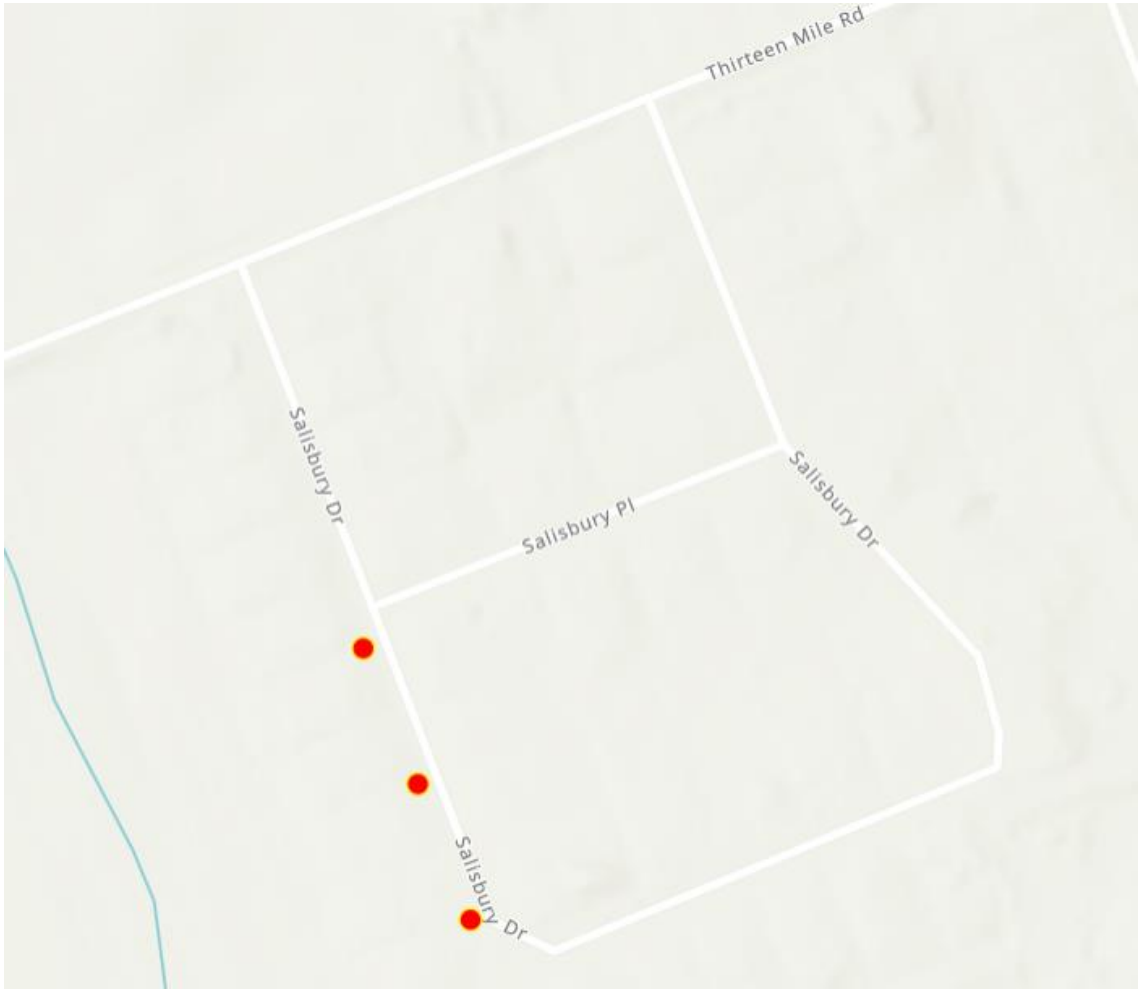


Figure 11: Pole Condition Poor - Delaware

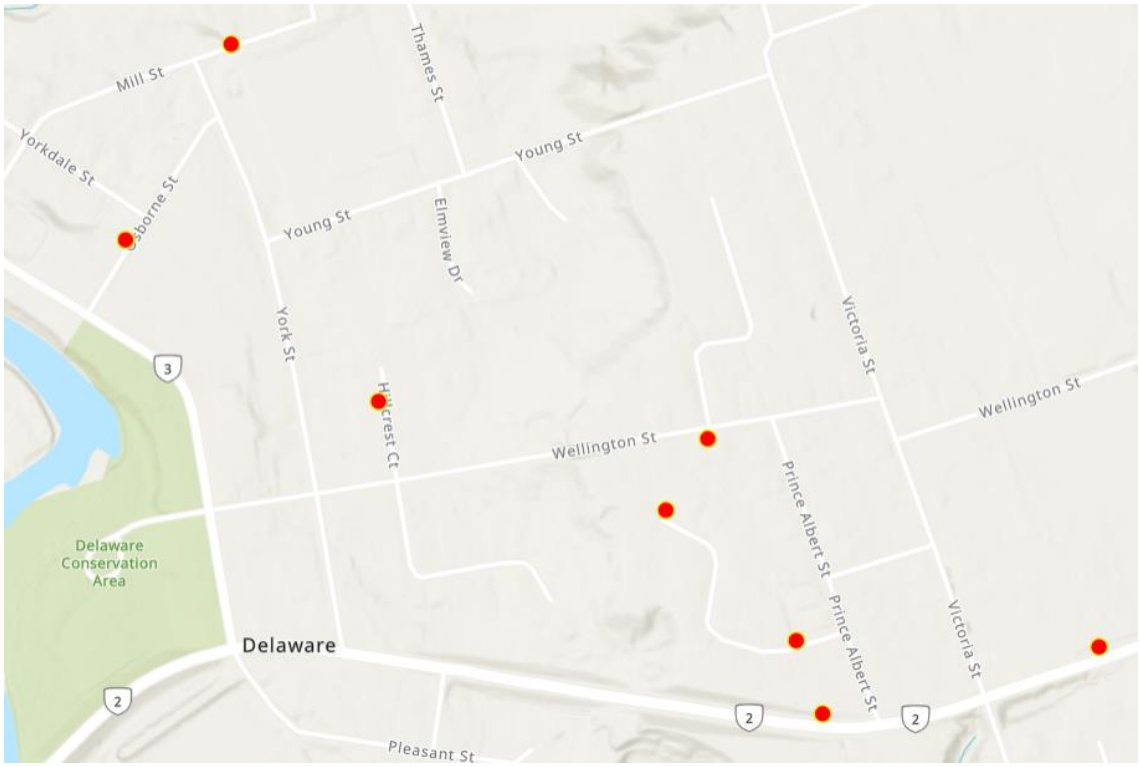


Figure 12: Pole Condition Poor - Ilderton

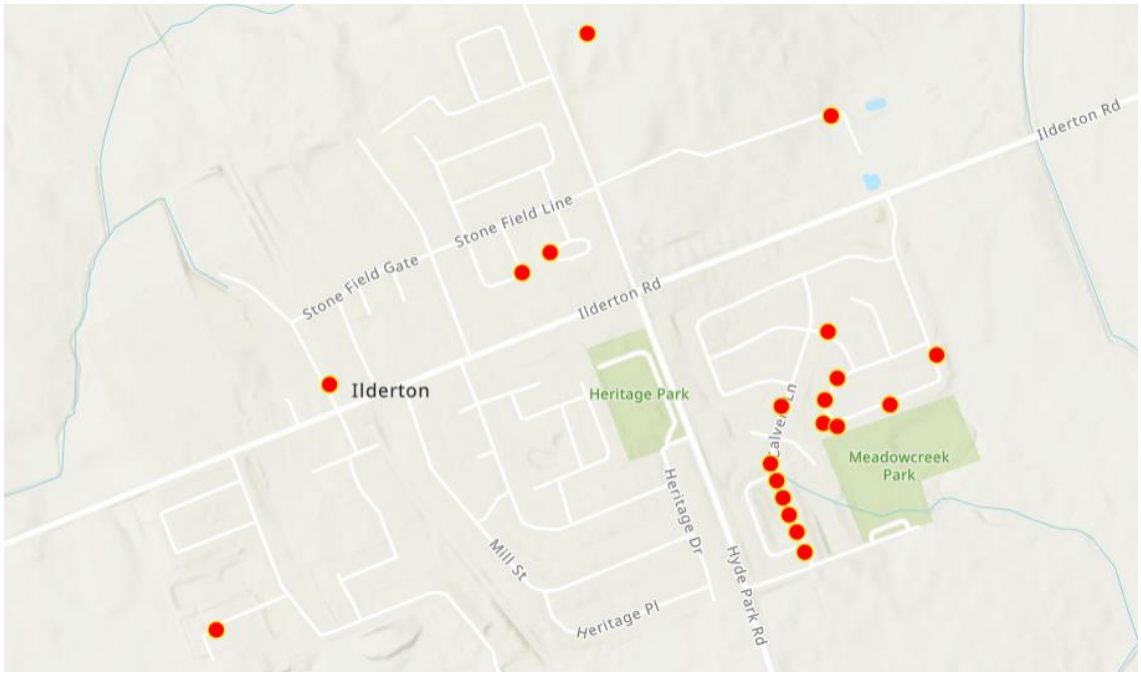


Figure 13: Pole Condition Poor - Komoka-Kilworth

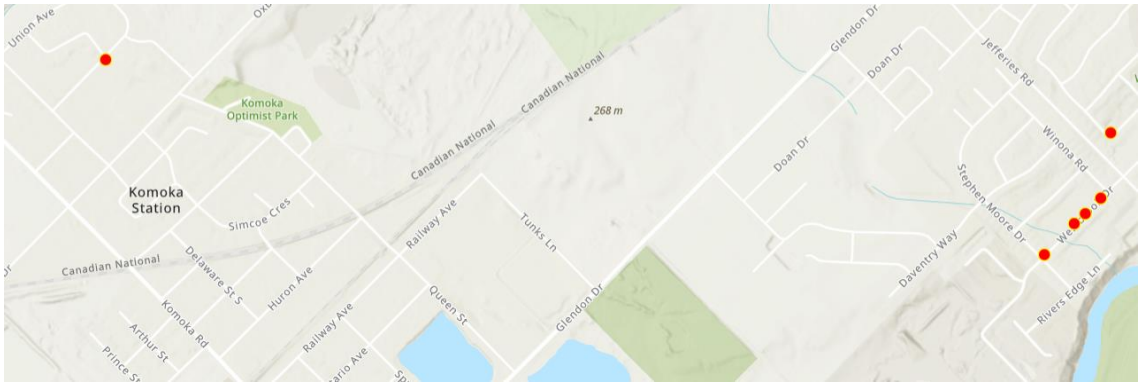
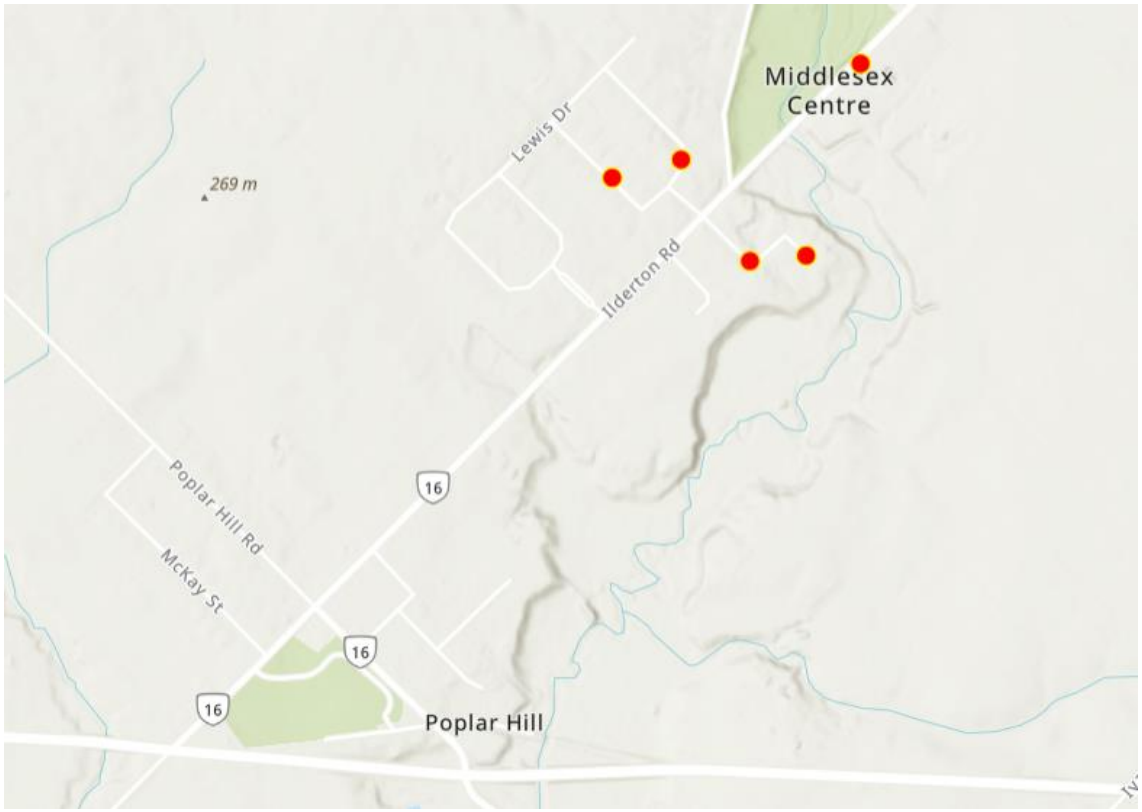


Figure 14: Pole Condition Poor - Poplar Hill / Coldstream



4.3 Arm Condition

A summary of arm conditions for the overall data set can be found below.

Table 10: Arm Condition High-Level Summary

Arm Condition	Count	Percentage of Total
Good	594	40.88%
Fair	851	58.57%
Poor	8	0.55%

In the arm review, an indication of poor was noted for scenarios where the arm was rusted, or bolts were damaged.

A further breakdown of arms with a poor condition is included in the table below.

Table 11: Poor Arm Condition by Settlement Area

Settlement Area	Poor Count	Percentage of Total
Poplar Hill / Coldstream	1	12.50%
Delaware	1	12.50%
Ilderton	4	50.00%
Komoka-Kilworth	2	25.00%

Figure 15: Arm Condition Poor - Poplar Hill / Coldstream

Figure 16: Arm Condition Poor - Delaware

Figure 17: Arm Condition Poor - Ilderton

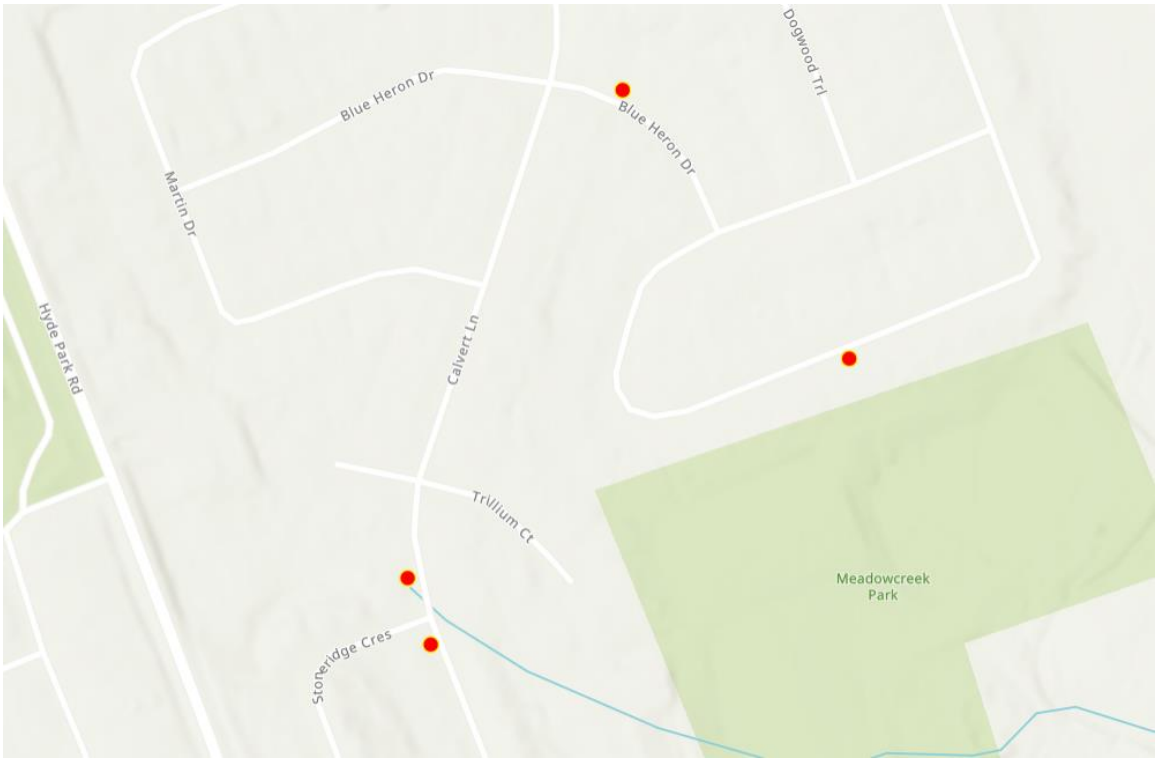
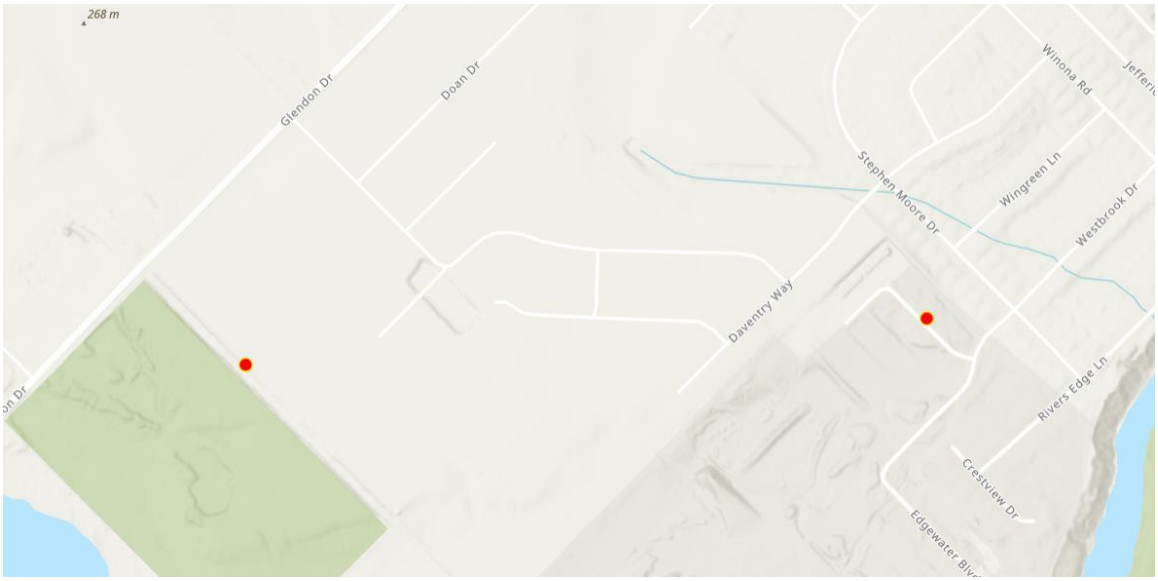


Figure 18: Arm Condition Poor - Komoka-Kilworth



4.4 Luminaire Condition

A summary of luminaire conditions for the overall data set can be found below.

Table 12: Luminaire Condition High-Level Summary

Luminaire Condition	Count	Percentage of Total
Good	327	22.51%
Fair	1,043	71.78%
Poor	83	5.71%

In the luminaire review, an indication of poor was noted for scenarios where the luminaire was rusted, covered by a treeline, LEDs covered in dirt, or has a loose attachment on the arm.

A further breakdown of luminaire with a poor condition is included in the table below.

Table 13: Poor Luminaire Condition by Settlement Area

Settlement Area	Poor Count	Percentage of Total
Birr	2	2.41%
Delaware	29	34.94%
Ilderton	4	4.82%
Komoka-Kilworth	47	56.63%
Poplar Hill / Coldstream	1	1.20%

Figure 19: Luminaire Condition Poor - Birr

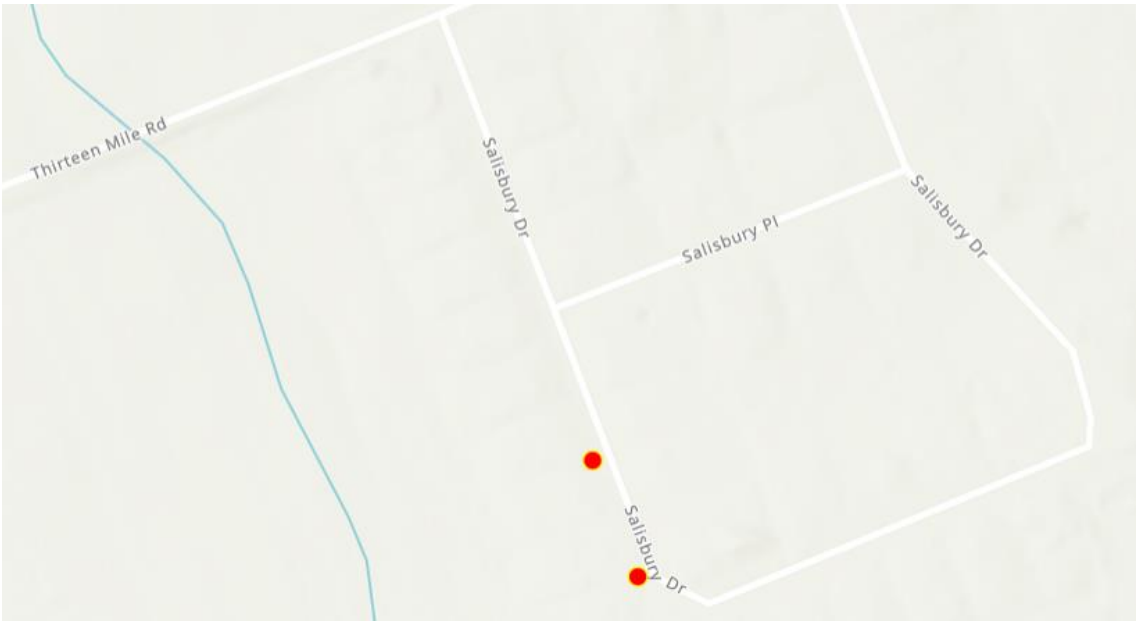


Figure 20: Luminaire Condition Poor - Delaware

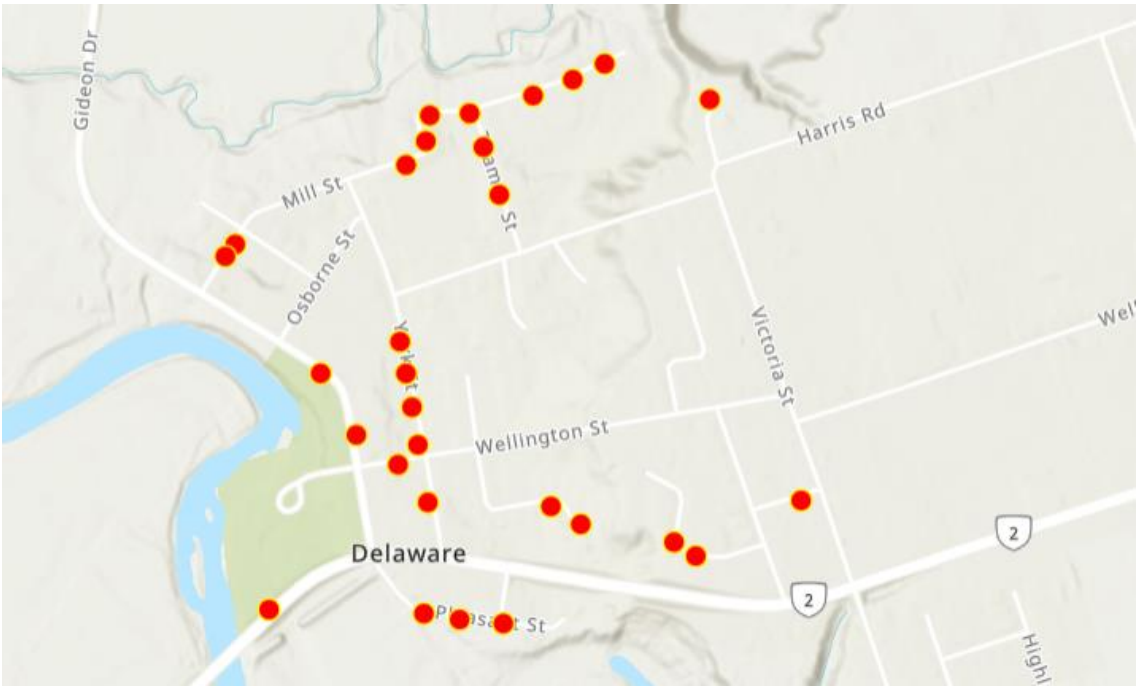


Figure 21: Luminaire Condition Poor - Ilderton

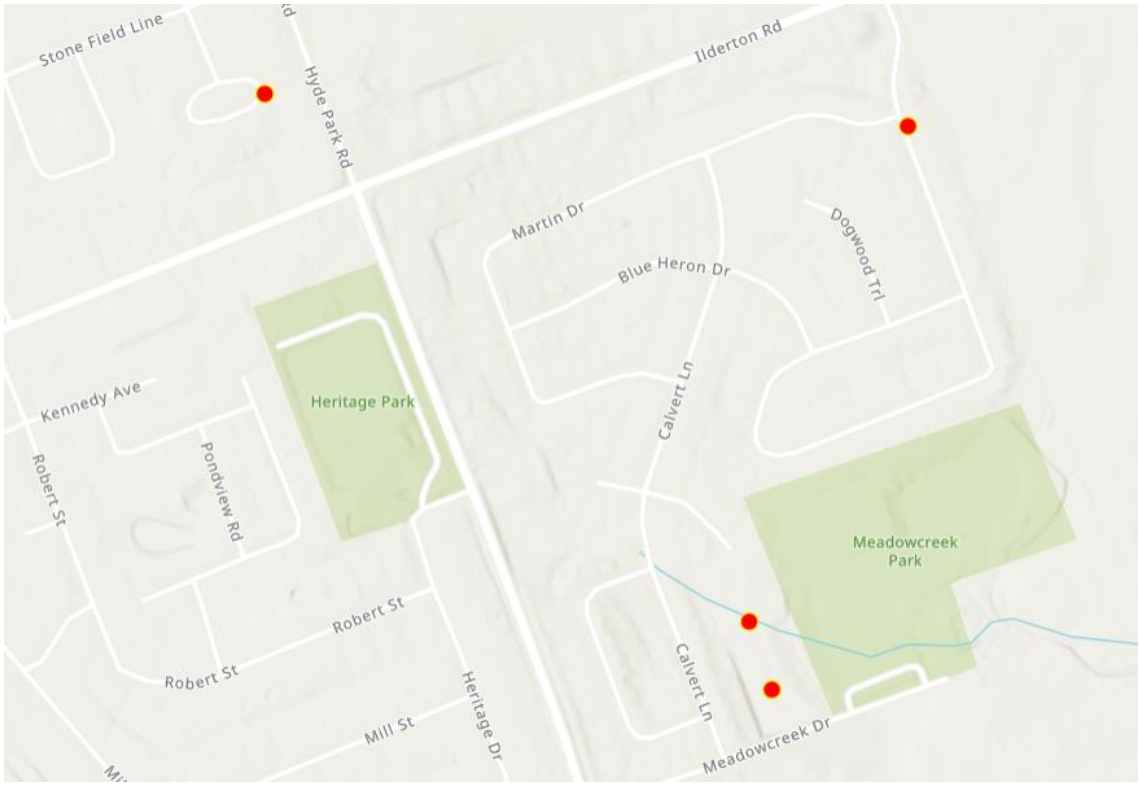


Figure 22: Luminaire Condition Poor - Komoka-Kilworth

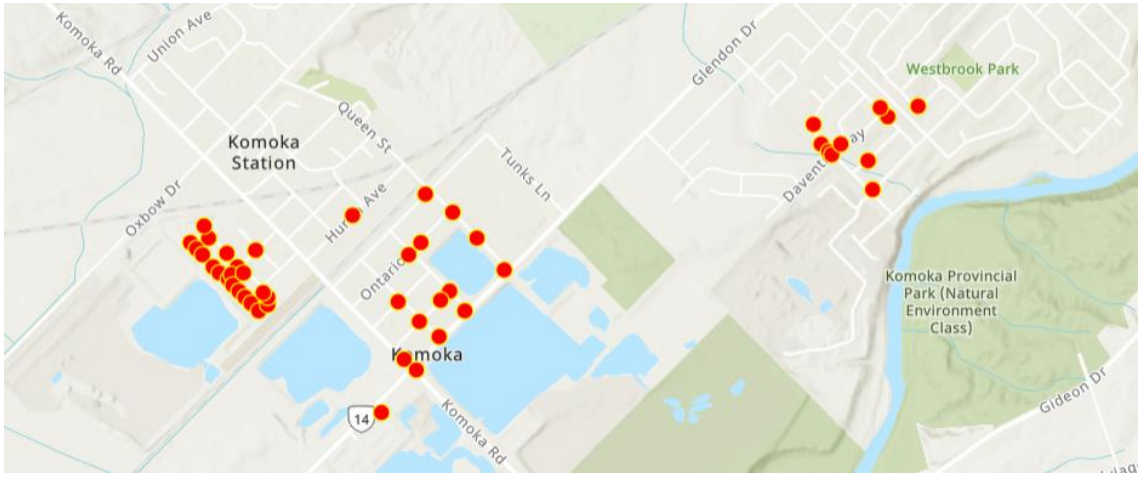


Figure 23: Luminaire Condition Poor - Poplar Hill / Coldstream

5.0 Recommendations

After a review of the data collected, it is recommended that the following corrections be made before further improvements or upgrades to the existing systems.

1. Immediate maintenance for missing and damaged Municipal pole handholes, and replacement of missing arm attachment bolts, combined 78 locations.
2. Maintenance and potential replacement of pole, arm, and luminaires with poor conditions at approximately 125 locations.
    a) From the data, most updates are required at Komoka Kilworth (i.e., 55), followed by Delaware (i.e., 32), and Ilderton (i.e., 27), totalling 116 of the 125 noted locations.
3. With no further immediate maintenance concerns found in this review, a phased proactive maintenance approach can be completed for the remaining locations to upgrade all areas to an LED system to match the new developments in the same areas.
    a) Bryanston had no recorded luminaires and maintenance is not required.
    b) Arva, Denfield, Birr, Ballymote, and Lobo has a combined 51 recorded luminaires, where upgrades can be completed in a short time frame.
    c) For Melrose, with the exception of a few luminaires at the Vanneck Road and Egremont Drive intersection, all other pole assemblies were recently upgraded in Summer 2023. These may also be combined with the Arva et al Settlement Areas.

This concludes the review of this assignment. All other data can be referenced in the GIS package circulated in November 2023 to the Municipality.

APPENDIX 1

Photo Catalogue – Type of Luminaire

Photo 1: Cobra Head LED Type 1

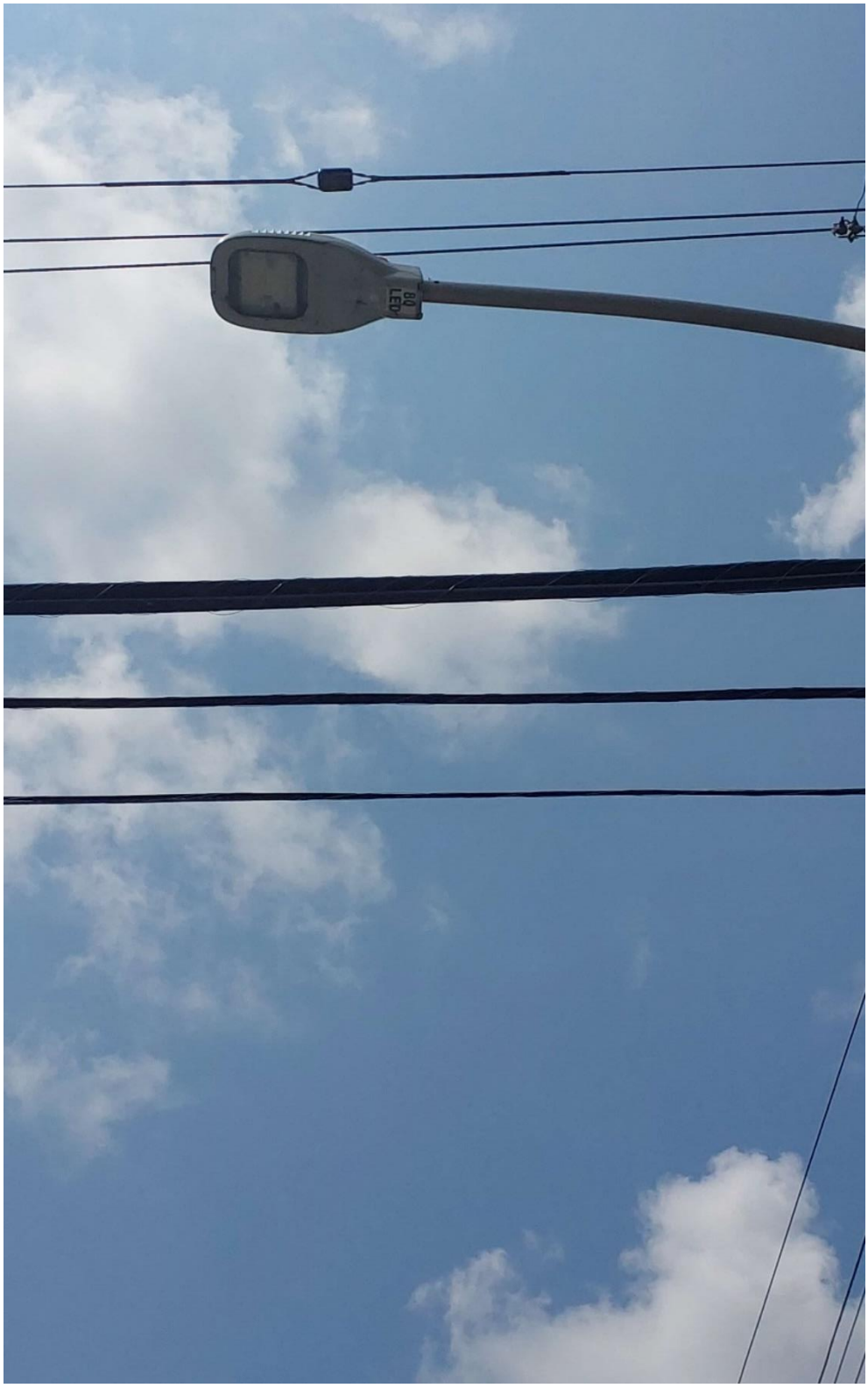


Photo 2: Cobra Head LED Type 2

Photo 3: Cobra Head LED Type 3

Photo 4: Decorative Post Top Type 1

Photo 5: Decorative Post Top Type 2

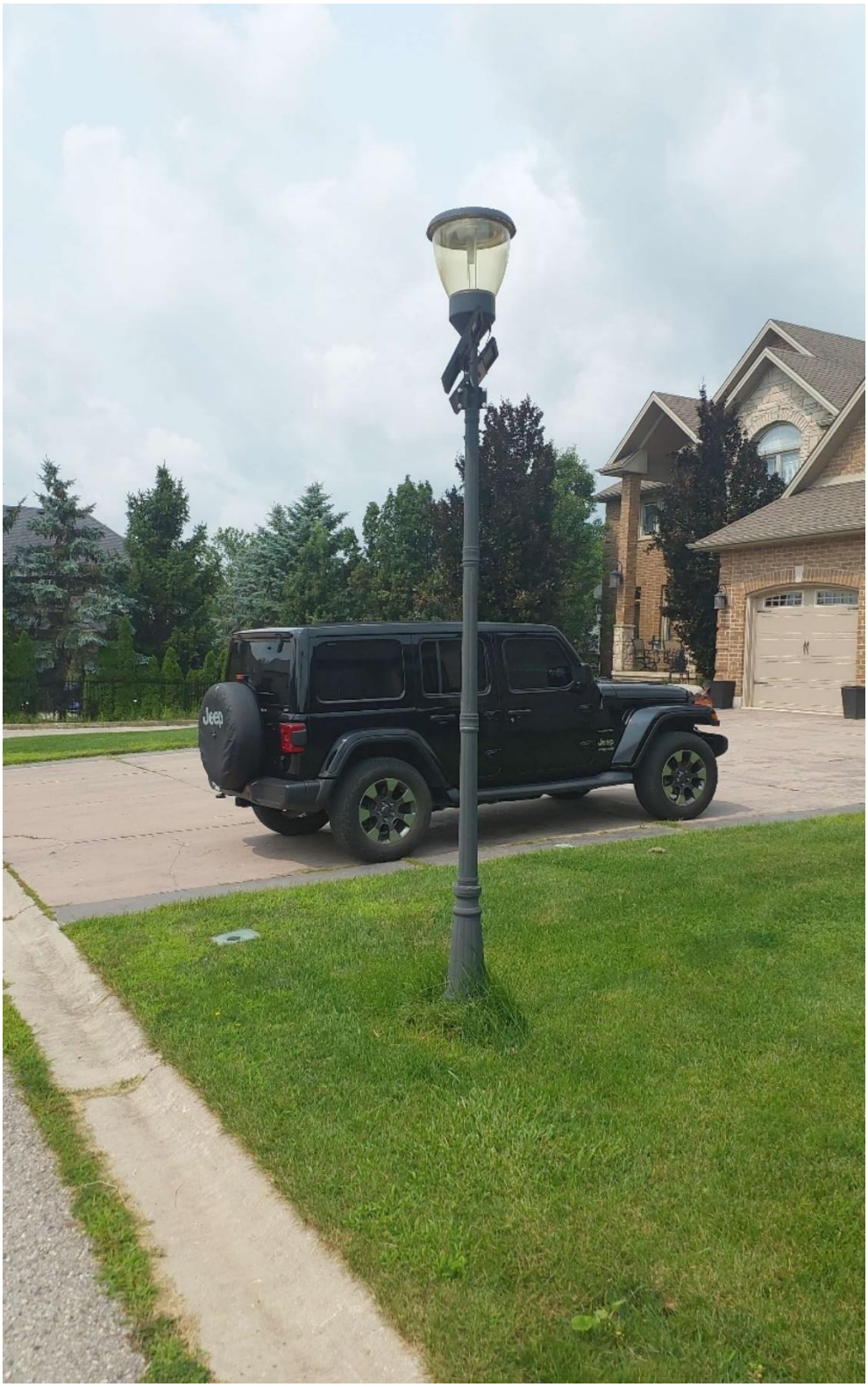


Photo 6: Decorative Post Top Type 3

Photo 7: Decorative Post Top Type 4

Photo 8: Decorative Post Top Type 5

Photo 9: Decorative Post Top Type 6

Photo 10: Decorative Post Top Type 7

Photo 11: Decorative Post Top Type 8

Photo 12: Decorative Post Top Type 9

Photo 13: Decorative Side Mount Type 1

Photo 14: Decorative Side Mount Type 2