THE MUNICIPALITY OF WEST GREY

NORMANBY STRUCTURE RATING AND RATIONALE REPORT

DECEMBER 11, 2019

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THE MUNICIPALITY OF WEST GREY

PROJECT NO.: 171-04854-00
DATE: DECEMBER 11, 2019

WSP
SUITE 101
1450, 1ST AVENUE WEST
OWEN SOUND, ON, CANADA N4K 6W2

T: +1 519 376-7612
F: +1 519 376-8008
WSP.COM

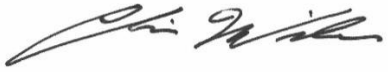
SIGNATURES

PREPARED BY

Katherine Hemstock, EIT
Designer

December 11, 2019

APPROVED BY



Chris Wilson, P.Eng.
Team Lead – Municipal Infrastructure

December 11, 2019

CONTRIBUTORS

THE MUNICIPALITY OF WEST GREY

Director of Infrastructure and Public Works	Brent Glasier, C.E.T.

WSP

Reviewer/ Approver	Chris Wilson, P. Eng.
Report Preparation	Katherine Hemstock, EIT

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1 INTRODUCTION

WSP has been retained by the Municipality of West Grey and tasked with the completion of a comprehensive evaluation of the current condition of the bridges under the Municipality's jurisdiction. The Municipality has a large number of structures under its jurisdiction, many of which are in the advanced stages of their lifecycle, and will require significant rehabilitation or replacement if they are to remain in use. It is understood that due to the available tax base for funding the maintenance and rehabilitation of its structures going forward, it is in the best interest of the Municipality to undergo strategic closures of a selection of its lowest value and importance structures, so that the remaining structures may be maintained and replaced to provide a functional, safe, and economically sustainable transportation network.

Each of the three (3) former townships of Bentinck, Glenelg, and Normanby within the Municipality of West Grey have their own specific and important histories and overall networks for transportation. Based on the unique attributes of each, it is recommended that each be analyzed and considered individually, as well as considered as part of the overall municipal transportation network. This report will focus on the evaluation and reporting related to the structure assets within the former Township of Normanby.

The evaluations and reporting are based on all available information regarding the Municipality's roadway network and structure inventory. The condition and current and future needs of each structure are assessed on an ongoing basis during the biennial Ontario Structure Inspection Manual (OSIM) inspections.

It is the objective of this report to summarize the findings of the evaluation and assign an individual rating to each structure based on a number of criteria which will consider the condition, viability, and importance of each, identify those structures which are best suited for closure, and provide overall recommendations for the Municipality's consideration in moving forward with their structure asset management.

2 BACKGROUND INFORMATION

2.1 MUNICIPALITY OF WEST GREY STRUCTURES

The assets to be reviewed within this report include bridges and culverts greater than three (3) meters in span, as per the criteria for a structure defined by the Ontario Structure Inspection Manual (OSIM). The OSIM defines a bridge as; *"A structure which provides a roadway or walkway for the passage of vehicles, pedestrians or cyclists across an obstruction, gap or facility and is greater than or equal to 3 m in span."*

The feasibility of maintaining each structure asset meeting the aforementioned criteria is assessed based on various criteria which consider the scale, value, condition, economy, importance in the community, and historical significance of each.

The Municipality of West Grey has a considerably large number of structure assets. There are a total of one-hundred and six (106) structures, including the Neustadt and Ayton Dams, as well as the Durham and Neustadt pedestrian bridges. ***Figure 1*** shows a location map of each structure, and can be found in **Appendix A**. The typical lifespan of a structure is between 75 and 100 years, depending on various factors. Many of the bridges within the Municipality were constructed prior to 1950, with thirty-six (36) of those structures at or approaching the end of their useful life span. The below chart depicts the age distribution of the structure (bridge and culvert) assets within the municipality.

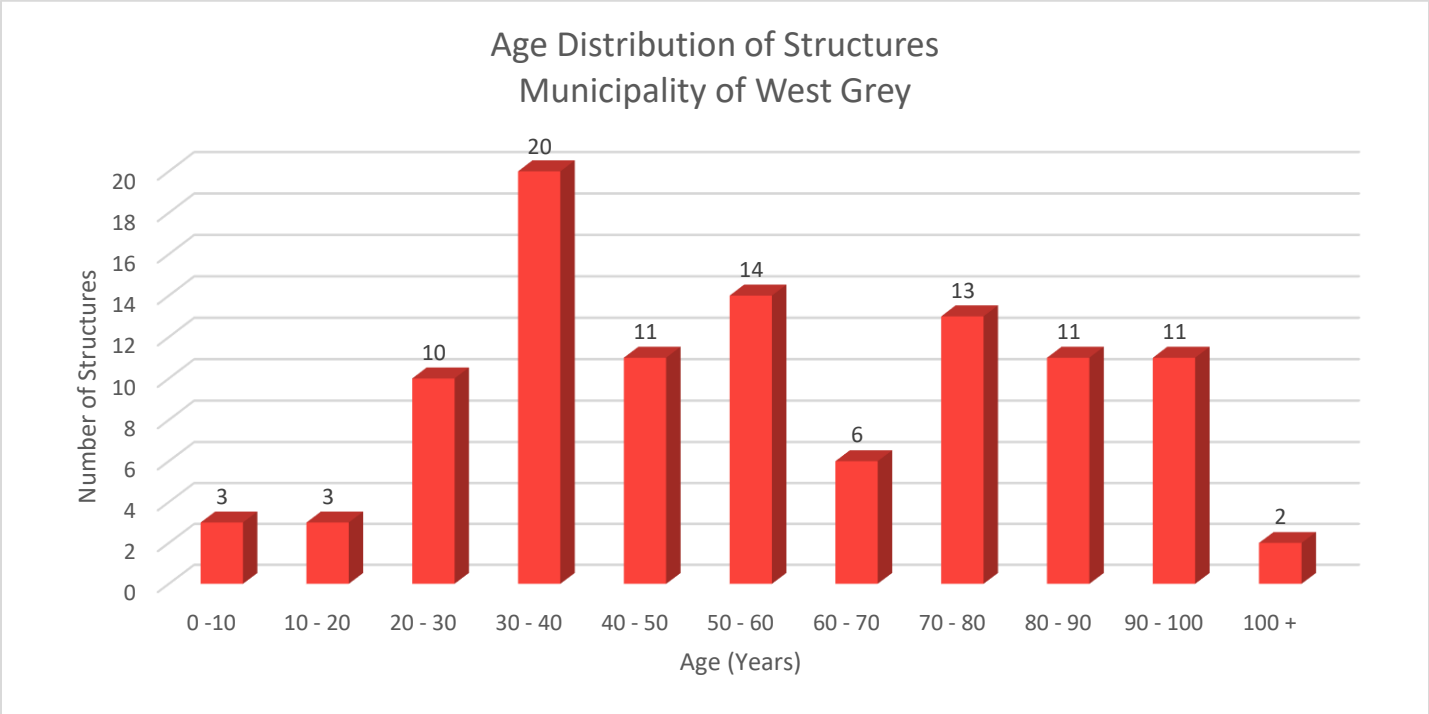


Chart 1 - Age Distribution of Structures - Municipality of West Grey

The current construction cost to replace a structure which has reached the end of its life spans and is no longer a viable candidate for rehabilitation ranges from $300,000 (smaller structures and culverts) to $1,750,000 (larger span structures). Given the current tax base and funding available to the Municipality, it is recommended that a strategic plan be developed going forward identifying which structures are best suited for closure. The development of a strategic plan for closures will assist the Municipality in allocating funding and scheduling projects such that it can maximize its investment in a sustainable transportation network which best suits the needs of its residents.

2.2 NORMANBY AREA STRUCTURES

The former Township of Normanby has thirty-eight (38) structure assets; twenty-three (23) bridges, fourteen (14) culverts, and one (1) dam. ***Figure 2*** shows a location map of each structure, and can be found in **Appendix A**. The structures range in age from five (5) to ninety-eight (98) years. The age distribution of the former Township of Normanby's bridges and culverts is displayed in ***Chart 2*** below. The distribution highlights eleven (11) structures which are approaching the end of their useful life span, which without replacement or significant rehabilitation, will face necessary closure in the near future.

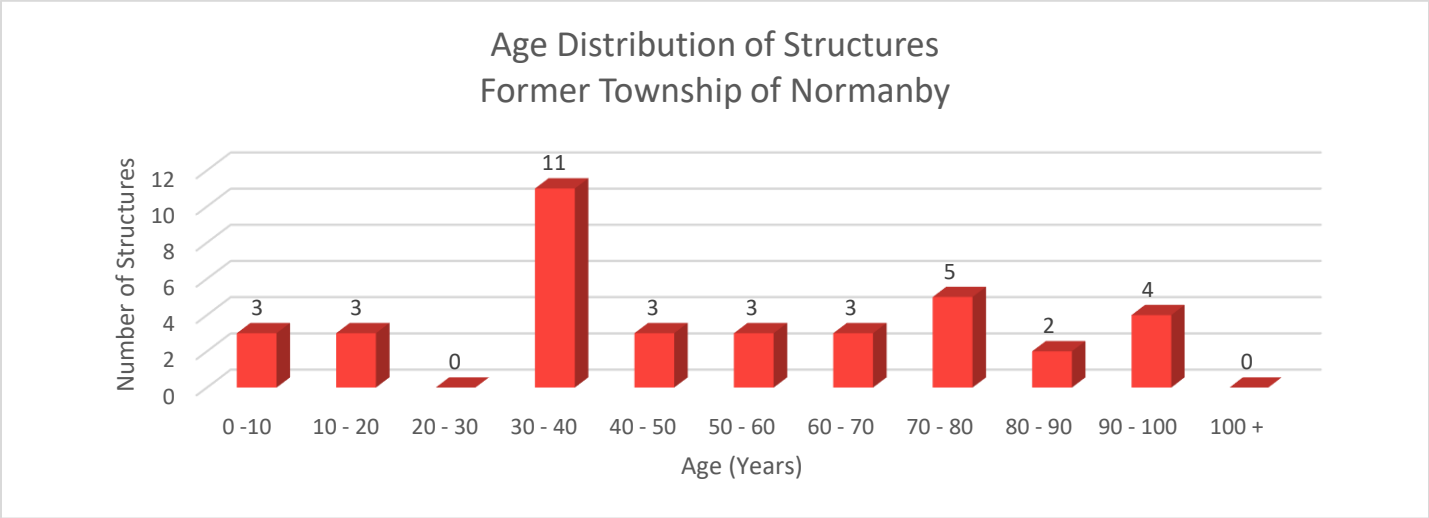


Chart 2 - Age Distribution of Structures - Township of Normanby

2.2.1 BRIDGE CONDITION INDEX (BCI)

A mandatory biennial inspection and report based on the Ontario Structure Inspection Manual (OSIM) is undertaken for each structure (as defined within the OSIM) within the province of Ontario. One component generated during these inspections and reporting is the Bridge Condition Index (BCI), which weights the condition of each of the various elements of a structure and provides a numeric rating of its overall condition. This value is often one of the measures used in determining allocation of provincial funding. The BCI value ranges from 0 (poor condition) to 100 (excellent condition). As a general rule, structures with a BCI of less than 40 should be considered for immediate repair, rehabilitation, replacement, or closure. It is also recommended that planning for future rehabilitation and repairs be initiated for structures with a BCI between 40 and 60. ***Chart 3*** below illustrates the BCI distribution of the structures in the former Township of Normanby.

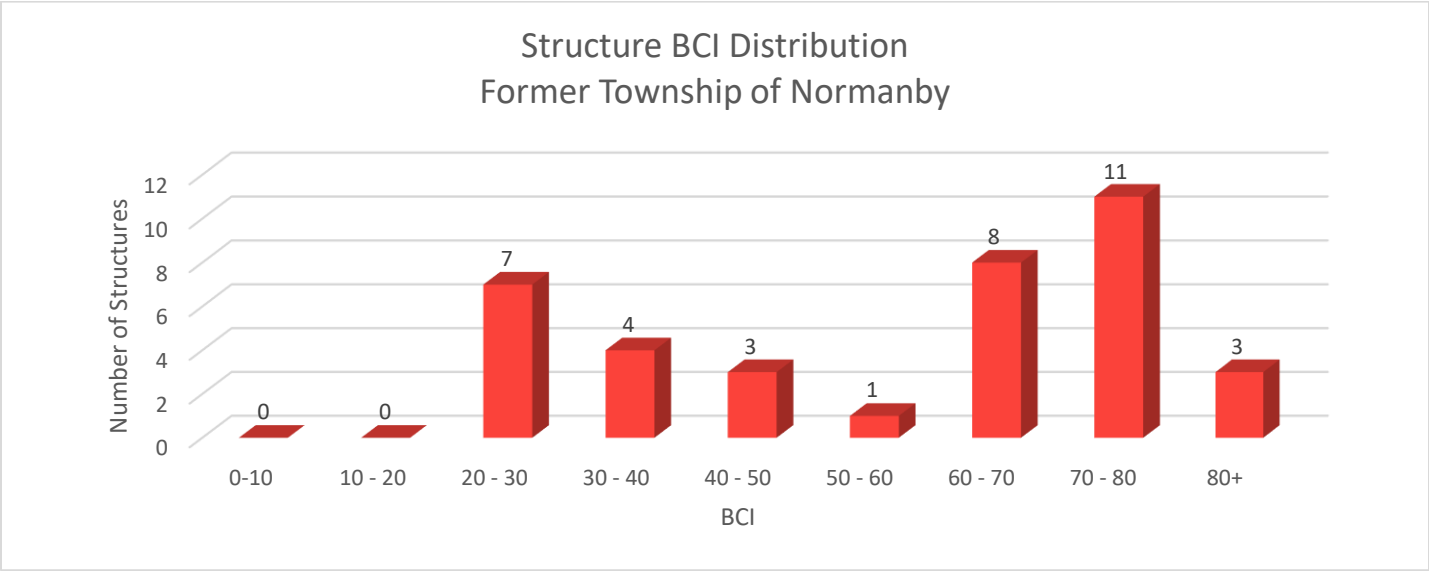


Chart 3 - Structure BCI Distribution - Township of Normanby

In analyzing this distribution, it is noted that eleven (11) structures in Normanby have BCI values lower than 40, indicating that rehabilitation or replacement of the structure should be scheduled immediately if they are to remain in safe and useful operating condition. This distribution also highlights that five (5) structures fall within the BCI range of 40 to 60, and future planning for rehabilitation should be initiated.

2.2.2 STRUCTURE ASSET SUMMARY

The condition criteria of the structures within the former Township of Normanby area have been analyzed to provide a baseline for the overall rating of the structures. To better understand the needs of each structure moving forward, the timing, type and an approximate value of rehabilitation or replacement works have been established. Rehabilitation costs are provided for all structures where the structural condition is such that rehabilitation can restore the structure to a safe and useful condition. Replacement has been specified only where rehabilitation is no longer a structurally viable or economic option for a structure. Rehabilitation is not considered to be an economically viable option where the cost to rehabilitate equals or exceeds the cost of replacement. The approximate replacement value of each structure has also been provided to give an overall indication of the value of the asset.

These established values and information for each structure, along with the age and Bridge Condition Index (BCI), have been summarized in ***Table 1*** in **Appendix A**.

3 EVALUATION OF STRUCTURES

3.1 METHODOLOGY

In order to achieve a rating system which would clearly demonstrate the condition and value (as an asset to the Municipality) of each individual structure, as well as provide a platform for comparing the structures to one another in future decision-making processes, a universal procedure was developed and applied to each of the structures within the former Township of Normanby. The procedure considers several criteria, each yielding its own numeric value ranging from 1 to 10 (1 being poor and 10 being excellent). Due to the varying overall impact of each criteria, each has then been classified as primary, secondary, or tertiary, and weighted accordingly in the development of each Overall Structure Rating. The overall structure rating is provided on a scale of 1 to 100, with 1 being poor and 100 being excellent.

Table 2 below summarizes the considered criterion, and indicates their classification and weight within the Overall Structure Rating matrix.

Table 2 – Structure Rating Criteria

RATING CRITERIA	CLASSIFICATION	RATING RANGE	OVERALL RATING WEIGHT
Bridge Condition index (BCI)	Primary	1 to 10	20
Asset Value	Primary	1 to 10	20
Emergency Services – EMS and Fire	Primary	1 to 10	20
Traffic	Secondary	1 to 10	10
Transportation Network	Secondary	1 to 10	10
Municipal Services – School Board and Waste Management	Secondary	1 to 10	10
Historical Significance	Tertiary	1 to 10	5
Detour Impact	Tertiary	1 to 10	5
		TOTAL	100

3.2 PRIMARY CRITERIA

3.2.1 BRIDGE CONDITION INDEX (BCI)

To develop the rating for the Bridge Condition Index (BCI) criteria, the BCI determined in the 2018 OSIM inspection was directly converted to a 1 to 10 scale (1 being poor and 10 being excellent structural condition). The weight of this primary criterion within the Overall Structure Rating matrix is 20 out of 100 points. ***Table 3*** below defines each structures rating for this criterion.

Table 3 Structure BCI Ratings

STRUCTURE ID	BCI VALUE	BCI RATING (1-10)	OVERALL RATING (MAX. 20 POINTS)	STRUCTURE ID	BCI VALUE	BCI RATING (1-10)	OVERALL RATING (MAX. 20 POINTS)
N-050	60.46	6.5	13	**N-070**	34.87	3.5	7
N-051	25.52	2.6	5	**N-071**	89.05	8.9	18
N-052	68.11	6.8	14	**N-072**	74.11	7.4	15
N-054	55.27	5.5	11	**N-163**	64.91	6.5	13
N-055	49.88	5.0	10	**N-165**	62.14	6.2	12
N-056	46.76	4.7	9	**N-171**	99.83	10	20
N-057	72.28	7.2	14	**N-172**	67.62	6.8	14
N-058	26.74	2.7	5	**N-178**	96.98	9.7	19
N-059	28.59	2.9	6	**N-179**	74.48	7.5	15
N-060	34.89	3.5	7	**N-183**	71.44	7.1	14
N-061	35.93	3.6	7	**N-184**	28.69	2.9	6
N-062	71.57	7.2	14	**N-185**	35.47	3.5	7
N-063	71.38	7.1	14	**N-187**	73.12	7.3	15
N-064	74.55	7.4	15	**N-188**	25.27	2.5	5
N-065	65.39	6.5	13	**N-189**	24.09	2.4	5
N-066	67.39	6.7	13	**N-190**	73.60	7.4	15
N-067	29.84	3.0	6	**N-199**	75.00	7.5	15
N-068	60.00	6.0	12	**P-102**	45.00	4.5	9
N-069	73.25	7.3	15				

3.2.2 ASSET VALUE

The asset value is assessed as a rating ranging from 1 (low overall value as an asset to the Municipality) to 10 (high overall value as an asset to the Municipality). The rating of this criterion is made up of two considerations, the replacement value of the structure, and its current stage within its estimated life cycle. A structure which has a high replacement value would be a large span or multi-span bridge, an intermediate replacement value would be a bridge or ridge frame concrete culvert with an average span, and low replacement value a small rigid frame or pipe culvert. This criterions rating is intended to measure the structures value (in its current condition) as either an asset to or burden on the Municipality's asset management. The following table illustrates the rating scale for the Asset Value rating:

		Replacement Value		
		High	**Intermediate**	**Low**
Lifecycle Stage (Years)	**75 +**	Poorest (1/10)	Poor (2/10)	Poor (3/10)
	50 to 75	Poor (2/10)	Poor (3/10)	Fair (4/10)
	25 to 50	Good (7/10)	Good (6/10)	Fair (5/10)
	0 to 25	Best (10/10)	Excellent (9/10)	Excellent (8/10)

Each Asset Value Rating is then weighted as 20 out of 100 points within the Overall Structure Rating matrix. ***Table 4*** below defines each structures rating for this criterion.

Table 4 Asset Value Ratings

STRUCTURE ID	ASSET VALUE RATING (1-10)	OVERALL RATING (MAX. 20 POINTS)	STRUCTURE ID	ASSET VALUE RATING (1-10)	OVERALL RATING (MAX. 20 POINTS)
N-050	3	6	**N-070**	1	2
N-051	2	4	**N-071**	5	10
N-052	6	12	**N-072**	5	10
N-054	1	2	**N-163**	5	10
N-055	2	4	**N-165**	5	10
N-056	2	4	**N-171**	8	16
N-057	7	14	**N-172**	5	10
N-058	2	4	**N-178**	8	16
N-059	2	4	**N-179**	5	10
N-060	3	6	**N-183**	5	10
N-061	2	4	**N-184**	4	8
N-062	6	12	**N-185**	4	8
N-063	3	6	**N-187**	8	16
N-064	6	12	**N-188**	4	8
N-065	7	14	**N-189**	4	8
N-066	2	4	**N-190**	8	16
N-067	9	18	**N-199**	8	16
N-068	3	6	**P-102**	3	6
N-069	7	14			

3.2.3 EMERGENCY SERVICES – EMS AND FIRE

One of the critical considerations when assessing the importance of a structure within the context of the Municipality's transportation network is its use as a response route for emergency services. To measure this importance and provide a numeric rating (from 1 to 10) for each structure, a number of factors are taken into consideration. If a structure is part of a primary route used by the Fire Service and EMS, it is given the highest rating of 10 points. If the closure of a structure would result in an significant increase in the length of an emergency route or response time, it is assessed at a high rating of 8 to 10, depending on the scale of the increase. A structure which is not considered to be used as a primary route for emergency services, but is on a paved (asphalt or surface treatment) road is given a rating of 6 to 8 as it would be prioritized for use as a response route ahead of an unpaved road whenever possible. Structures which receive the lowest rating in each aforementioned category are rated from 1 to 5 for importance as a part of the overall municipal emergency service routes.

Table 5 below displays each structures rating from 1 to 10 (10 being of high and 1 being low) as a measure of its importance with regards to emergency services routes.

Table 5 Emergency Service Ratings

STRUCTURE ID	RATING (1-10)	OVERALL RATING (MAX. 20 POINTS)	STRUCTURE ID	RATING (1-10)	OVERALL RATING (MAX. 20 POINTS)
N-050	6	12	**N-070**	3	6
N-051	9	18	**N-071**	8	16
N-052	8	16	**N-072**	8	16
N-054	9	18	**N-163**	8	16
N-055	9	18	**N-165**	5	10
N-056	9	18	**N-171**	8	16
N-057	10	20	**N-172**	6	12
N-058	10	20	**N-178**	6	12
N-059	10	20	**N-179**	6	12
N-060	10	20	**N-183**	6	12
N-061	6	12	**N-184**	7	14
N-062	6	12	**N-185**	7	14
N-063	5	10	**N-187**	6	12
N-064	6	12	**N-188**	4	8
N-065	4	8	**N-189**	4	8
N-066	3	6	**N-190**	9	18
N-067	5	10	**N-199**	10	20
N-068	8	16	**P-102**	1	1
N-069	8	16			

3.3 SECONDARY CRITERIA

3.3.1 TRAFFIC

The measured traffic volumes for a section of road can provide insight into many aspects of the decision-making process for the operation of a transportation network. They establish the number of users with respect to adjoining and adjacent road sections, give an overview of the traffic flow within a given area, and are a key indicator of the significance of a specific section of road within the overall network.

During the month of September 2016, the Municipality of West Grey's Public Works Department conducted traffic volumes counts for each roadway within the Municipality. The traffic volumes obtained are a key component utilized in ranking (from 1 to 10) the importance of each structure with regards to traffic within the Municipality.

Figure 3 illustrates the traffic volume data collected in the Normanby area by the Public Works Department, and can be found in **Appendix A**. Each section of road has been colour coded and categorized by volume, and given a rating range which can be applied to each structure as follows:

Colour	Average Daily Traffic	Rating Range
	>1,000	8-10
	200 - 999	6-8
	100-199	4-6
	50 -99	2-4
	0 - 49	0-2

When rating each individual structure within the Normanby area, the structure is bound by the rating range of its road (above), and is assessed within that range based on its proximity to higher ranked road sections, potential for seasonal volume fluctuation, and proximity to points of significant trip generation. It should be noted that as the Durham pedestrian structure does not convey vehicle traffic, it has been given a lower importance value of 2 with respect to traffic pattern importance. The individual rating of each structure (from 1 to 10) as a measure of its importance with regards to traffic considerations is defined below in ***Table 6***.

Table 6 Traffic Ratings

STRUCTURE ID	RATING RANGE	OVERALL RATING (MAX. 10 POINTS)	STRUCTURE ID	RATING RANGE	OVERALL RATING (MAX. 10 POINTS)
N-050	6 – 8	7	**N-070**	0 - 2	2
N-051	8 – 10	9	**N-071**	6 – 8	8
N-052	6 – 8	6	**N-072**	6 – 8	8
N-054	6 – 8	8	**N-163**	6 – 8	7
N-055	4 - 6	5	**N-165**	6 – 8	7
N-056	4 - 6	6	**N-171**	6 - 8	7
N-057	6 – 8	8	**N-172**	4 - 6	6
N-058	8 – 10	9	**N-178**	6 - 8	7
N-059	8 – 10	9	**N-179**	4 - 6	6

STRUCTURE ID	RATING RANGE	OVERALL RATING (MAX. 10 POINTS)	STRUCTURE ID	RATING RANGE	OVERALL RATING (MAX. 10 POINTS)
N-060	8 – 10	9	**N-183**	2 - 4	4
N-061	4 – 6	5	**N-184**	2 - 4	3
N-062	4 - 6	5	**N-185**	2 - 4	3
N-063	4 - 6	5	**N-187**	4 - 6	5
N-064	0 - 2	2	**N-188**	0 - 2	1
N-065	2 - 4	4	**N-189**	0 - 2	2
N-066	2 - 4	2	**N-190**	8 - 10	9
N-067	4 - 6	4	**N-199**	8 - 10	9
N-068	2 - 4	4	**P-102**	N/A*	1
N-069	6 – 8	8			

3.3.2 TRANSPORTATION NETWORK

Within any transportation network, there are primary, secondary, and tertiary roadways, which provide varying levels of service to road users. The level of service of an individual section depends on the traffic volumes and quality of the roadway. The assessment of the quality of roadway should consider road and corridor width, the surface type (gravel, surface treatment, asphalt, concrete), condition, potential for congestion, and design and posted speeds. Based on these factors, each structure within the former Normanby Township area has been assigned a level of service category of 'A' (primary road), 'B' (secondary road), or 'C' (tertiary road), and subsequently rated from 1 to 10 based on its overall importance within the overall transportation networks of the former Normanby Township and the Municipality of West Grey. The level of service and individual rating of each structure (from 1 to 10) as a measure of its importance with regards to overall transportation network is defined below in ***Table 7***.

Table 7 Transportation Network Ratings

STRUCTURE ID	LEVEL OF SERVICE	OVERALL RATING (MAX. 10 POINTS)	STRUCTURE ID	LEVEL OF SERVICE	OVERALL RATING (MAX. 10 POINTS)
N-050	A	8	**N-070**	C	1
N-051	B	7	**N-071**	A	8
N-052	A	8	**N-072**	A	8
N-054	A	8	**N-163**	A	8
N-055	B	5	**N-165**	B	6
N-056	B	5	**N-171**	B	6
N-057	A	8	**N-172**	B	5
N-058	A	9	**N-178**	B	6
N-059	A	9	**N-179**	B	5
N-060	A	9	**N-183**	B	4

STRUCTURE ID	LEVEL OF SERVICE	OVERALL RATING (MAX. 10 POINTS)	STRUCTURE ID	LEVEL OF SERVICE	OVERALL RATING (MAX. 10 POINTS)
N-061	C	3	**N-184**	B	4
N-062	C	3	**N-185**	B	4
N-063	B	5	**N-187**	B	5
N-064	B	4	**N-188**	C	1
N-065	A	7	**N-189**	C	1
N-066	B	5	**N-190**	A	9
N-067	C	3	**N-199**	A	10
N-068	B	5	**P-102**	C	1
N-069	A	8			

3.3.3 MUNICIPAL SERVICES – SCHOOL BOARD AND WASTE MANAGEMENT

This criterion is intended to assess and measure the importance of each individual structure for facilitating the municipal services such as school bus routes and waste pick up. Each structure has been individually assessed as to the impact its closure on the provision of these services. Each structure is rated from 1 to 10 (10 being a great impact on the provision of municipal services, and 1 being a very low impact) and that rating is then applied within the Overall Structure Rating matrix. When rating each structure, consideration was given to whether a structure's closure would impede the provision of services for any resident, if a detour route is available, the additional distance and time of the ideal detour route, as well as to any site-specific concerns received from the School Board following their review.

Table 8 below displays each structure's rating as a measure of its importance with regards to the provision of municipal services to the residents of West Grey.

Table 8 Municipal Services Rating

STRUCTURE ID	OVERALL RATING (MAX. 10 POINTS)	STRUCTURE ID	OVERALL RATING (MAX. 10 POINTS)
N-050	5	**N-070**	4
N-051	9	**N-071**	8
N-052	7	**N-072**	6
N-054	9	**N-163**	6
N-055	8	**N-165**	5
N-056	9	**N-171**	8
N-057	10	**N-172**	6
N-058	10	**N-178**	5

STRUCTURE ID	OVERALL RATING (MAX. 10 POINTS)	STRUCTURE ID	OVERALL RATING (MAX. 10 POINTS)
N-059	10	**N-179**	6
N-060	10	**N-183**	5
N-061	7	**N-184**	6
N-062	7	**N-185**	6
N-063	5	**N-187**	5
N-064	6	**N-188**	4
N-065	5	**N-189**	4
N-066	4	**N-190**	8
N-067	5	**N-199**	8
N-068	8	**P-102**	1
N-069	8		

3.4 TERTIARY CRITERIA

3.4.1 HISTORIC SIGNIFICANCE

The Ontario Heritage Act, introduced in 1975, is intended to give municipalities and provincial government agencies the power to preserve elements of their jurisdictions with established historic significance. Subsequently, the Ontario Heritage Bridge Guidelines (OHBG) were developed and published by the Ministry of Transportation (MTO) to provide direction regarding the conservation of bridges considered historically significant, or, "Heritage" bridges. Bridges are identified, evaluated, and, if they are determined to have "heritage value", are listed on the Ontario Heritage Bridge List (OHBL). For the purpose of determining a numeric rating within the Overall Structure Rating matrix, each structure was assessed based on the following guideline:

Criteria	Rating
Listed on OHBL with significance of 8 or higher	5
Listed on OHBL with significance of 5 to 7	4
Listed on OHBL with significance of less than 5	3
Structure is more than 40 years old and has unique characteristics	2
Structure is more than 40 years old but has no unique characteristics	1
Structure is less than 40 years old	0

The historic significance rating of each structure (from 0 to 5) are shown below in ***Table 9.***

Table 9 Historic Significance Ratings

STRUCTURE ID	OVERALL RATING (MAX. 5 POINTS)	STRUCTURE ID	OVERALL RATING (MAX. 5 POINTS)
N-050	1	**N-070**	4
N-051	4	**N-071**	1
N-052	0	**N-072**	1
N-054	1	**N-163**	0
N-055	2	**N-165**	0
N-056	4	**N-171**	0
N-057	0	**N-172**	0
N-058	1	**N-178**	0
N-059	1	**N-179**	0
N-060	1	**N-183**	0
N-061	4	**N-184**	1
N-062	0	**N-185**	1
N-063	2	**N-187**	0
N-064	0	**N-188**	1
N-065	0	**N-189**	1
N-066	1	**N-190**	0
N-067	1	**N-199**	0
N-068	2	**P-102**	2
N-069	1		

3.4.2 DETOUR IMPACT

The final criterion to be considered is the availability of a detour route at each structure, were it to be closed and decommissioned, and a temporary closure of a neighbouring structure be required. Each structure is considered individually and given a rating from 1 to 10 (1 being minimal detour impact, 10 being high detour impact), taking into account the availability of a detour route, suitability of the proposed detour to accept the re-routed traffic, and the additional distance and time required to travel the available route.

Table 10 below defines the individual rating of each structure (from 1 to 10) and weight within the Overall Structure Rating matrix.

Table 10 Detour Impact Ratings

STRUCTURE ID	RATING (1-10)	OVERALL RATING (MAX. 5 POINTS)	STRUCTURE ID	RATING (1-10)	OVERALL RATING (MAX. 5 POINTS)
N-050	4	2	**N-070**	4	2
N-051	8	4	**N-071**	8	4

STRUCTURE ID	RATING (1-10)	OVERALL RATING (MAX. 5 POINTS)	STRUCTURE ID	RATING (1-10)	OVERALL RATING (MAX. 5 POINTS)
N-052	6	3	**N-072**	4	2
N-054	8	4	**N-163**	4	2
N-055	6	3	**N-165**	4	2
N-056	8	4	**N-171**	8	4
N-057	10	5	**N-172**	6	3
N-058	9	5	**N-178**	4	2
N-059	9	5	**N-179**	6	3
N-060	9	5	**N-183**	4	2
N-061	7	4	**N-184**	4	2
N-062	7	4	**N-185**	4	2
N-063	6	3	**N-187**	4	2
N-064	6	3	**N-188**	4	2
N-065	6	3	**N-189**	4	2
N-066	4	2	**N-190**	6	3
N-067	6	3	**N-199**	6	3
N-068	8	4	**P-102**	2	1
N-069	7	4			

3.5 OVERALL STRUCTURE RATING MATRIX

To establish an Overall Structure Rating for each structure within the Normanby Township area, each of the primary, secondary, and tertiary rating criteria have been given weight based on importance within the overall rating matrix. The results of the application of the Overall Structure Rating matrix for each structure are presented in ***Table 11*** below.

Table 11 Overall Structure Ratings

STRUCTURE ID	BCI (MAX 20)	ASSET VALUE (MAX 20)	EMS (MAX 20)	TRAFFIC (MAX 10)	TRANS-PORTATION NETWORK (MAX 10)	MUNICIPAL SERVICES (MAX 10)	HISTORIC SIG. (MAX 5)	DETOUR IMPACT (MAX 5)	**OVERALL STRUCTURE RATING (MAX 100)**
N-050	13	6	12	7	8	5	1	2	**54**
N-051	5	4	18	9	7	9	4	4	**60**
N-052	14	12	16	6	8	7	0	3	**66**
N-054	11	2	18	8	8	9	1	4	**61**
N-055	10	4	18	5	5	8	2	3	**55**

STRUCTURE ID	BCI (MAX 20)	ASSET VALUE (MAX 20)	EMS (MAX 20)	TRAFFIC (MAX 10)	TRANS-PORTATION NETWORK (MAX 10)	MUNICIPAL SERVICES (MAX 10)	HISTORIC SIG. (MAX 5)	DETOUR IMPACT (MAX 5)	**OVERALL STRUCTURE RATING (MAX 100)**
N-056	9	4	18	6	5	9	4	4	**59**
N-057	14	14	20	8	8	10	0	5	**79**
N-058	5	4	20	9	9	10	1	5	**63**
N-059	6	4	20	9	9	10	1	5	**64**
N-060	7	6	20	9	9	10	1	5	**67**
N-061	7	4	12	5	3	7	4	4	**46**
N-062	14	12	12	5	3	7	0	4	**57**
N-063	14	6	8	5	5	5	2	3	**50**
N-064	15	12	12	2	4	6	0	3	**54**
N-065	13	14	8	4	7	5	0	3	**54**
N-066	13	4	6	2	5	4	1	2	**37**
N-067	6	18	10	4	3	5	1	3	**50**
N-068	12	6	16	4	5	8	2	4	**57**
N-069	15	14	16	8	8	8	1	4	**74**
N-070	7	2	6	2	1	4	4	2	**28**
N-071	18	10	16	8	8	8	1	4	**73**
N-072	15	10	16	8	8	6	1	2	**66**
N-163	13	10	16	7	8	6	0	2	**62**
N-165	12	10	10	7	6	5	0	2	**52**
N-171	20	16	16	7	6	8	0	4	**77**
N-172	14	10	12	6	5	6	0	3	**56**
N-178	19	16	12	7	6	5	0	2	**67**
N-179	15	10	12	6	5	6	0	3	**57**
N-183	14	10	12	4	4	5	0	2	**51**
N-184	6	8	14	3	4	6	1	2	**44**
N-185	7	8	14	3	4	6	1	2	**45**
N-187	15	16	12	5	5	5	0	2	**60**
N-188	5	8	8	1	1	4	1	2	**30**
N-189	5	8	8	2	1	4	1	2	**31**
N-190	15	16	18	9	9	8	0	3	**78**
N-199	15	16	20	9	10	8	0	3	**81**
P-102	9	6	2	1	1	1	2	1	**23**

As highlighted in Table 11 above, there are eight (8) structures, including six (6) bridges and two (2) culverts, with a rating below 50 out of a possible 100 points. Each of these seven (7) structures are considered viable candidates for closure based on their low overall value to the municipality and a minimal impact of closure and are reviewed and presented in depth in the following section, *Individual Structure Assessment and Rational.*

4 INDIVIDUAL STRUCTURE ASSESSMENT AND RATIONAL

4.1 STRUCTURE REVIEW

Each structure within the Normanby area has been given an numeric rating to indicate its overall significance as an asset within the Municipality of West Grey. The below noted structures fall into the lowest rating class (less than 50 of a possible 100-point rating) have been identified as potential candidate for closure.

Structure	Bridge/Culvert	Rating
N-061	Bridge	46
N-066	Bridge	37
N-070	Bridge	28
N-184	Culvert	44
N-185	Culvert	45
N-188	Culvert	30
N-189	Culvert	31
P-102	Bridge	23

Within this section, the site specific current conditions and future potential of each of the above noted structures will be summarized.

4.1.1 STRUCTURE N-061

Structure N-061 is located on Concession 14 between Sideroad 25 and Baseline Road in the central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). The structure received an overall rating of 46 out of a possible 100 points, primarily attributable to its current fair to poor condition, high cost of replacement, and low level of service. The

structure was originally constructed in 1920, having some minor rehabilitation work and maintenance completed since. The structure spans approximately fifteen (15) metres and is a steel pony truss structure with concrete abutments and a timber deck overlain by an asphalt wearing surface. A view of the structure from the east approaching and north elevation perspectives are shown in ***Images 1 and 2*** respectively below.

Image 1 – N-061 View from East Approach

Image 2 – N-061 View of North Structure Elevation

Structure N-061 servs a moderate number of road users with respect to other structures in the Municipality, and is located on Concession 14, which has a varying moderate-to-low level of service throughout its length. The west portion of Concession 14 carries significantly higher traffic volumes, and is an importation east-west traffic route through the Municipality. If the road corridore and structure were improved, the location has the potential for increased future traffic volumes in the future. The structure is in fair to poor overall condition and due to its age and type, is a costly candidate for rehabilitation. Recent inspections have noted the overall poor condition of the north abutment and portions of the steel superstructure, and indicate the need for additional indepth investigations to determine the safe load carrying capacity and material conditions. If further investigation determines the substructure has adequate load carrying capacity, it will require significant rehabilitation including the replacement of the majority of the superstructure in the near future. Should detailed investigations indicate the substructure does not have adequate load carrying capacity, the structure will require full replacement or face eventual closure in the interest of public safety. In addition to the structural concerns, steel bridges constructed during this era were typically designed for a load of 15 imperial tons, which is the equivilant of 13.6 metric tonnes, and therefore, a full rehabilitation of the structure would still require an imposed load limit posting of 13 tonnes. The current estimated replacement value of this structure is $850,000.

In the case of this structure, a structure condition assessment and rehabilitation, replacement (near future), or permanent closure are the feasible options. Due the moderate cost of replacement and potential for future increase in overall importance within the municipal transportation network, structure N-061 warrants consideration for rehabilitation and eventual replacement by the Municipality in its future strategic planning.

4.1.2 STRUCTURE N-066

Structure N-066 is located on Concession 6 between Grey Road 3 and Sideroad 20 in the south-central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). The structure received a rating of 37 points out of a possible 100 points, primarily attributable location, overall importance within the Municipality's transportation network and age. The structure was originally constructed in 1950, and underwent rehabilitation in July of 2018. The structure spans over thirty-seven (37) metres and is a multi-span concrete structure with concrete beams and barrier railing, and exposed concrete deck. A view of the structure in elevation and from the east approaching perspective are shown in ***Images 3 and 4*** below.

Image 3 – N-066 Elevation View

Image 4 – N-066 View from East Approach

Structure N-066 serves a relatively low number of road users with respect to other structures in the Municipality, as it is located on the Concession 6, which provides a low-to-moderate level of service and varies in condition throughout its east/west length. The structure is in fair to good overall condition, following repairs in 2018. The structure has a very high replacement value of $1,750,000. If the maintenance and repair schedule is continued, the structure could continue to serve road users for approximately 40 more years before requiring replacement. The structure has close proximity to Grey Road 3, and may have future potential for serving an increased number of road users, increasing its overall importance within the local and municipal transportation network.

As structure N-066 is in overall fair to good condition, is a viable candidate for ongoing maintenance and rehabilitation, and has the potential for future increase in importance of this asset within the Municipality of West Grey, the Municipality may consider maintaining it and continuing to schedule repairs as necessary in order for it to remain open and in a safe operating condition. In the future, when rehabilitation is no longer a viable option, the structure may warrant consideration for closure by the Municipality in its future stratigic planning.

4.1.3 STRUCTURE N-070

Structure N-070 is located on Concession 2 WGR between Road 71 and Highway 89 in the central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). The structure received the lowest rating within the former Township of Normanby of 28 out of a possible 100 points, primarily attributable to its current very poor structural condition, low level of service, and high cost of replacement. The structure was originally constructed in 1920, having some repairs completed since. The structure spans approximately thirty-seven (37) metres and is a steel beam and pony truss structure with concrete abutments, pier, and exposed timber deck. A view of the structure elevation and from the approaching perspective are shown in ***Images 5 and 6*** below.

Image 5 – N-070 Elevation View

Image 6 – N-070 View from South Approach

Structure N-070 serves a relatively low number of road users with respect to other structures in the Municipality, as it is located on the Concession 2 WGR, which provides a low level of service and is discontinuous throughout its north/south length. The structure is in poor overall condition, with recent inspections indicating that rehabilitation is no longer an economically viable option. Replacement of the structure is required if it is to remain open in a safe operating condition. The structure has an approximate replacement value of $1,500,000. The structure has close proximity to Mount Forest and Highway 89, and may have future potential for serving an increased number of road users if the roadway level-of-service is improved.

In the case of structure N-070, replacement or permanent closure are the two feasible options. Due the high cost of replacement and low overall importance within the municipal transportation network, the structure warrants consideration for closure by the Municipality in its future stratigic planning.

4.1.4 STRUCTURE N-184

Structure N-184 is located on Sideroad 25 between Grey Road 9 and the Concession 8 in the central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). The structure received a rating of 44 out of a possible 100 points, primarily attributable to the poor condition of its main structural elements, and importance within the overall

transportation network. The structure was originally constructed in 1950, having only minor repairs completed since. The structure spans approximately nine (9) metres and is a rigid frame concrete culvert, overlain by granular fill and wearing surface. A view of the structure in elevation, and from the approaching perspective are shown in ***Images 7 and 8*** below.

Image 7 – N-184 Elevation View

Image 8 – N-184 View from South Approach

Structure N-184 serves a relatively low number of road users with respect to other structures in the Municipality, as it is located on Sideroad 25, which has a moderate-to-low level of service and is dicontinuous throughout its length. The structure is in poor condition, and is approaching the end of its lifecycle, with necessary rehabilitation or replacement required in the immediate future. The current estimated replacement value of this structure is $500,000. The structure has close proximity to Grey Road 9, and may have potential for serving an increased number of road users in the future.

As structure N-184 is a viable candidate for rehabilitation and has the potential for future increase in importance of this asset within the Municipality of West Grey, the Municipality may consider maintaining it and continuing to repair it as necessary in order for it to remain open and in a safe operating condition. In the future, when rehabilitation is no longer a viable option, and if the importance of the structure has not increased, the structure may warrant consideration for closure by the Municipality in its future stratigic planning.

4.1.5 STRUCTURE N-185

Structure N-185 is located on Sideroad 25 between Grey Road 9 and the Concession 8 in the central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). The structure received a rating of 45 out of a possible 100 points, primarily attributable to the poor condition of its main structural elements, and importance within the overall transportation network. The structure was originally constructed in 1950, having only minor repairs completed since. The structure spans approximately nine (9) metres and is a rigid frame concrete culvert, overlain by granular fill and wearing surface. A view of the structure in elevation, and from the approaching perspective are shown in ***Images 9 and 10*** below.

Image 9 – N-185 Elevation View

Image 10 – N-185 South Approaching Perspective

Structure N-185 serves a relatively low number of road users with respect to other structures in the Municipality, as it is located on Sideroad 25, which has a moderate-to-low level of service and is dicontinuous throughout its length. The structure is in poor condition, and is approaching the end of its lifecycle, with necessary rehabilitation or replacement required in the immediate future. The current estimated replacement value of this structure is $500,000. The structure has close proximity to Grey Road 9, and may have potential for serving an increased number of road users in the future.

As structure N-185 is a viable candidate for rehabilitation and has the potential for future increase in importance of this asset within the Municipality of West Grey, the Municipality may consider maintaining it and continuing to repair it as necessary in order for it to remain open and in a safe operating condition. In the future, when rehabilitation is no longer a viable option, and if the importance of the structure has not increased, the structure may warrant consideration for closure by the Municipality in its future stratigic planning.

4.1.6 STRUCTURE N-188

Structure N-188 is located on Sideroad 25 between Concession 12 and Concession 14 in the central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). The structure received a rating of 30 points out of a possible 100 points, primarily attributable to its poor current condition, location, and overall importance within the West Grey transportation network. The structure was originally constructed in 1945, having only minor maintenance tasks completed since. The structure is a rigid frame concrete culvert, overlain by granular fill and wearing surface. A view of the structure elevation is shown in ***Image 11*** below.

Image 11 – N-188 Elevation View

Structure N-188 serves a very low number of road users with respect to other structures in the Municipality, as it is located on Sideroad 25, between Concessions 12 and 14. Recent inspections indicate that the structure is in very poor overall condition, and the southeast wingwall has an observed failure which resulted in the temporary closure of the structure from 2016 to 2018, when it was reopened following an interim repair. An indepth evaluation of the structures safe load limit capacity is recommended if the structure is to remain open and in a safe operating condition. The structure has an approximate replacement value of $400,000.

In the case of this structure, replacement (near future) or permanent closure are the two feasible options. Due the moderate cost of replacement and low number of road users and overall importance within the municipal transportation network, structure N-188 warrants consideration for closure by the Municipality in its future strategic planning.

4.1.7 STRUCTURE N-189

Structure N-189 is located on Sideroad 25 between Concession 12 and Concession 14 in the central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). The structure received a rating of 31 points out of a possible 100 points, primarily attributable to its poor current condition, location, and overall importance within the West Grey transportation network. The structure was originally constructed in 1945, having only minor maintenance tasks completed since. The structure is a rigid frame concrete culvert, overlain by granular fill and wearing surface. A view of the structure elevation is shown in ***Image 12*** below.

Image 12 N-189, Durham Pedestrian Bridge Elevation View

Structure N-189 serves a very low number of road users with respect to other structures in the Municipality, as it is located on Sideroad 25, between Concessions 12 and 14. Recent inspections indicate that the structure is in poor overall condition, and indicate that significant repairs will be required in the near future if the structure is to remain open and in a safe operating condition. Due to the cost of rehabilitation, replacement is likely the more economic option for this structure. The structure has an approximate replacement value of $400,000. The structure has close proximity to structure N-188, which is in slightly worse condition and serves slightly less road users, and is recommended for closure. There are several property enterances and field enterances located bewtween Structrue N-188 and N-189, which would become stranded or require relocation were both structure to be closed.

In the case of this structure, replacement (near future) or permanent closure are the two feasible options. Due the moderate cost of replacement and close proximity to structure 188, which has been recommended for closure, structure N-189 warrants consideration for replacement by the Municipality in its future strategic planning.

4.1.8 STRUCTURE P-102

Structure P-102, known as the Neustadt Pedestrian Bridge, is located in Neustadt Lions Community Park, in the west-central portion of the former Township of Normanby (see ***Figure 2 – Structure location map*** in **Appendix A**). Although the structure received a rating of 37 out of a possible 100 points, below the 50 points flagging it as warranting further investigation for closure, the structure is not currently a candidate for closure. The low overall rating for this structure is primarily attributable to its type. As a pedestrian structure, it receives low ratings in several categories including vehicle traffic, emergency and municipal service provision, and overall asset importance and value within the municipality. The structure has an important historical and recreational significance within Neustadt and the Municipality. Structure P-102 has been recently added as a monitored asset within the Municipality's structure asset management and planning database, and a detailed OSIM condition inspection is scheduled for summer 2019. In the interim, the data pertaining to this structure, including BCI value, has been estimated based on the observed general condition of the structure.

The Neustadt Pedestrian Bridge (P-102) is recommended for a detailed inspection to determine its current condition and necessary repairs so that the Municipality may continue to maintain it in a safe operating condition. At the end of the structrues lifecycle, the Municipality may consider its overall cost-benefit ratio, and consider closure or replacement of the structure.

5 RECOMMENDATIONS

Through the development of the Overall Structure Rating matrix, a universal classification and rating system, WSP has completed an in-depth review and evaluation of each of the Municipality of West Grey's structures within the former Township of Normanby area. This review has identified eight (8) structures within the municipality which are of the lowest value and importance within the context of the overall transportation network. Each of these eight (8) structures were evaluated individually for their suitability for potential future closure, with considerations and general recommendations outlined hitherto.

It is understood that considering the available tax base for funding the maintenance and rehabilitation of its structures going forward, it is in the best interest of the Municipality to undergo strategic closures of a selection of the poorest condition structures, so that the remaining structures may be maintained and replaced to provide an adequate, safe, and economically sustainable road network. To that end, it is the recommended that the Municipality consider the below action at each of the eight (8) structures:

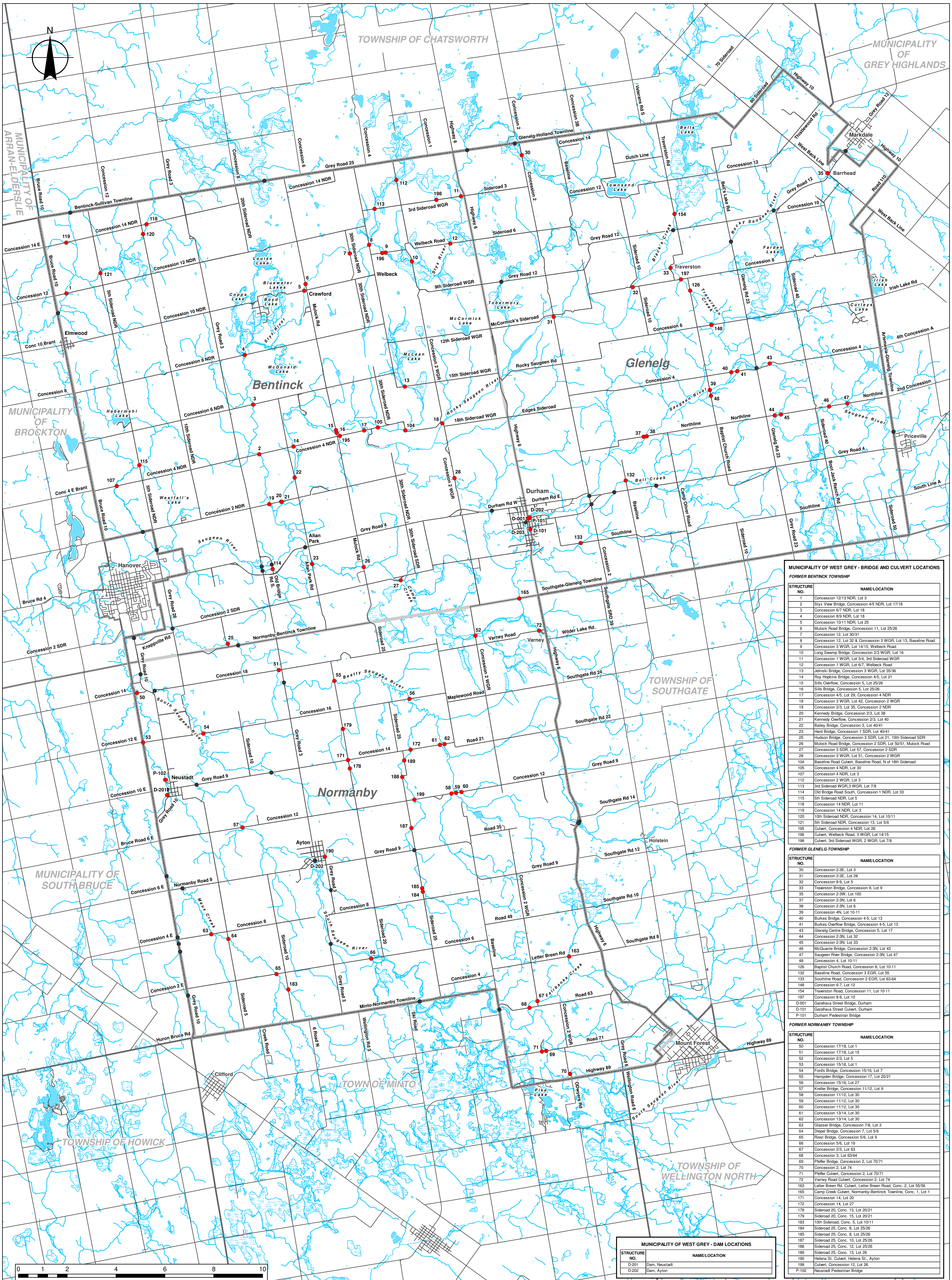
Structure	**Recommended Action**
N-061	Completion of Rehabilitation Work, Potential Closure at end of Lifecycle
N-066	Completion of Structure Condition Assessment, Rehabilitation Work, and Replacement at end of Lifecycle
N-070	Permanent Closure
N-184	Replacement of Structure
N-185	Replacement of Structure
N-188	Permanent Closure
N-189	Replacement of Structure
P-102	Completion of Detailed Inspection and Required Rehabilitation Work, Potential Closure at end of Lifecycle

The rating, assessments, and recommendations within are based on all available information regarding the Municipality's roadway network and structure inventory, and are intended to assist in the development of a strategic structure asset management plan to support and promote a functional, safe, and economically sustainable transportation network in the Municipality of West Grey.

A TABLES AND FIGURES

TABLE 1
Structure Rating and Rational Report
Former Township of Normanby
The Municipality of West Grey

Structure	Location	Bridge or Culvert	Year Built	Year Replaced	Age (2018)	BCI Value	Work Required in Immediate Future	Work Required in Near Future	Ideal Candidate for Rehabilitation	Estimated Cost of Rehabilitation	Estimated Cost of Replacement	Asset Replacement Value (Present Day)
N-050	Concession 17 & 18, Lot 1	Bridge	1960	-	58	60.46	No	Yes	Yes	$ 40,000.00		$ 850,000.00
N-051	Little's Bridge Concession 17 & 18, Lot 15	Bridge	1930	-	88	25.52	Yes		No		$ 900,000.00	$ 900,000.00
N-052	Concession 2 & 3, Lot 5	Bridge	1980	-	38	68.11	No	Yes	Yes	$ 50,000.00		$ 625,000.00
N-054	Ford's Bridge, Concession 16, Lot 7	Bridge	1940	-	78	55.27	No	Yes	Yes	$ 70,000.00		$ 1,500,000.00
N-055	Hampden Bridge, Concession 17, Lot 20 & 21	Bridge	1930	-	88	49.88	No	Yes	Yes	$ 145,000.00		$ 875,000.00
N-056	Yandt's Bridge, Concession 15 & 16, Lot 27	Bridge	1920	-	98	46.76	No	Yes	Yes	$ 125,000.00		$ 900,000.00
N-057	Kreller Bridge, Concession 11 & 12, Lot 9	Bridge	1979	-	39	72.28	Yes		Yes	$ 15,000.00		$ 1,500,000.00
N-058	Concession 11 & 12, Lot 30	Bridge	1940	-	78	26.74	Yes		No		$ 650,000.00	$ 650,000.00
N-059	Concession 11 & 12, Lot 30	Bridge	1940	-	78	28.59	Yes		No		$ 650,000.00	$ 650,000.00
N-060	Concession 11 & 12, Lot 31	Bridge	1940	-	78	34.89	Yes		Yes	$ 95,000.00		$ 600,000.00
N-061	Wettlaufer's Bridge, Concession 14, Lot 30	Bridge	1920	-	98	35.93	Yes		No		$ 850,000.00	$ 850,000.00
N-062	Concession 13 & 14, Lot 30	Bridge	1980	-	38	71.57	Yes		Yes	$ 40,000.00		$ 650,000.00
N-063	Glasser Bridge, Concession 7 & 8, Lot 3	Bridge	1966	-	52	71.38	Yes		Yes	$ 55,000.00		$ 875,000.00
N-064	Diepel Bridge, Concession 5 & 6, Lot 9	Bridge	1980	-	38	74.55	No	Yes	Yes	$ 2,500.00		$ 625,000.00
N-065	Riest Bridge, Concession 5 & 6, Lot 9	Bridge	1980	-	38	65.39	No	Yes	Yes	$ 25,000.00		$ 1,000,000.00
N-066	Concession 5 & 6, Lot 19	Bridge	1950	-	68	51.29	No	Yes	Yes	$ 20,000.00		$ 1,750,000.00
N-067	Gleneden White Bridge, Concession 2 & 3, Lot 63	Bridge	2013	-	5	29.84	Yes		Yes	$ 110,000.00		$ 625,000.00
N-068	Concession 3, Lot 63 & 64	Bridge	1965	-	53	60.00	Yes		Yes	$ 35,000.00		$ 650,000.00
N-069	Pfeffer Bridge, Concession 2, Lot 70	Bridge	1977	-	41	73.25	Yes		Yes	$ 45,000.00		$ 1,750,000.00
N-070	Shein's Bridge, Concession 2, Lot 74	Bridge	1920	-	98	34.87	Yes		Yes	$ 200,000.00		$ 1,500,000.00
N-071	Pfeffer Culvert, Road 71	Bridge	1977	-	41	89.05	No	Yes	Yes	$ 10,000.00		$ 375,000.00
N-072	Varney Rd. Culvert, Concession 2, Lot 74	Culvert	1977	-	41	74.11	Yes		Yes	$ 40,000.00		$ 400,000.00
N-163	Letter Breen Culvert (Concession 2, Lot 55/56)	Culvert	1985	-	33	64.91	Yes		Yes	$ 40,000.00		$ 400,000.00
N-165	Camp Creek Culvert (Concession 1 WGR, Lot 1)	Culvert	1985	-	33	62.14	No	Yes	Yes	$ 35,000.00		$ 450,000.00
N-171	Concession 14, Lot 20	Culvert	2012	-	6	99.83	No	Yes	Yes	$ 5,000.00		$ 400,000.00
N-172	Concession 14, Lot 27	Culvert	1979	-	39	67.62	Yes		Yes	$ 30,000.00		$ 350,000.00
N-178	Sideroad 20 (Concession 13, Lot 20/21)	Culvert	2012	-	6	96.98	No	Yes	Yes	$ 5,000.00		$ 400,000.00
N-179	Sideraod 20, Concession 15, Lot 20/21	Culvert	1985	-	33	74.48	No	Yes	Yes	$ 30,000.00		$ 375,000.00
N-183	Sideroad 10, Conc. 5, Lot 10/11	Culvert	1980	-	38	71.44	Yes		Yes	$ 35,000.00		$ 350,000.00
N-184	Sideroad 25, Concession 8 (South) Lot 25/26	Culvert	1950	-	68	28.69	Yes		Yes	$ 100,000.00		$ 400,000.00
N-185	Sideroad 25, Concession 8 (North)	Culvert	1950	-	68	35.47	Yes		Yes	$ 60,000.00		$ 500,000.00
N-187	Sideroad 25, Concession 10	Culvert	2005	-	13	73.12	No	Yes	Yes	$ 30,000.00		$ 500,000.00
N-188	Sideroad 25, Concession 12	Culvert	1945	-	73	25.27	Yes		No		$ 400,000.00	$ 400,000.00
N-189	Sideroad 25, Concession 13	Culvert	1945	-	73	24.09	Yes		No		$ 400,000.00	$ 400,000.00
N-190	Helena St. Culvert	Culvert	2004	-	14	73.60	Yes		Yes	$ 50,000.00		$ 450,000.00
N-199	Concession 12, Lot 26	Culvert	2000	-	18	75.00	No	Yes	Yes	$ 30,000.00		$ 450,000.00
									TOTALS =	**$ 1,572,500.00**	**$ 3,850,000.00**	**$ 25,925,000.00**



MUNICIPALITY OF WEST GREY - BRIDGE AND CULVERT LOCATIONS

FORMER BENTINCK TOWNSHIP

STRUCTURE NO.	NAME/LOCATION
1	Concession 12/13 NDR, Lot 3
2	Styx View Bridge, Concession 4/5 NDR, Lot 17/18
3	Concession 6/7 NDR, Lot 18
4	Concession 8/9 NDR, Lot 18
5	Concession 10/11 NDR, Lot 25
6	Mulock Road Bridge, Concession 11, Lot 25/26
7	Concession 12, Lot 30/31
8	Concession 12, Lot 32 & Concession 3 WGR, Lot 13, Baseline Road
9	Concession 3 WGR, Lot 14/15, Welbeck Road
10	Long Swamp Bridge, Concession 2/3 WGR, Lot 16
11	Concession 1 WGR, Lot 3/4, 3rd Sideroad WGR
12	Concession 1 WGR, Lot 6/7, Welbeck Road
13	Jelinski Bridge, Concession 3 WGR, Lot 35/36
14	Roy Hopkins Bridge, Concession 4/5, Lot 21
15	Sills Overflow, Concession 5, Lot 25/26
16	Sills Bridge, Concession 5, Lot 25/26
17	Concession 4/5, Lot 29, Concession 4 NDR
18	Concession 3 WGR, Lot 42, Concession 2 WGR
19	Concession 2/3, Lot 35, Concession 2 NDR
20	Kennedy Bridge, Concession 2/3, Lot 38
21	Kennedy Overflow, Concession 2/3, Lot 40
22	Bailey Bridge, Concession 3, Lot 40/41
23	Herd Bridge, Concession 1 SDR, Lot 40/41
25	Hudson Bridge, Concession 3 SDR, Lot 21, 10th Sideroad SDR
26	Mulock Road Bridge, Concession 2 SDR, Lot 50/51, Mulock Road
27	Concession 3 SDR, Lot 57, Concession 2 SDR
28	Concession 3 WGR, Lot 51, Concession 2 WGR
104	Baseline Road Culvert, Baseline Road, N of 18th Sideroad
105	Concession 4 NDR, Lot 30
107	Concession 4 NDR, Lot 3
112	Concession 2 WGR, Lot 3
113	3rd Sideroad WGR,3 WGR, Lot 7/8
114	Old Bridge Road South, Concession 1 NDR, Lot 33
115	5th Sideroad NDR, Lot 5
118	Concession 14 NDR, Lot 11
119	Concession 14 NDR, Lot 3
120	10th Sideroad NDR, Concession 14, Lot 10/11
121	5th Sideroad NDR, Concession 13, Lot 5/6
195	Culvert, Concession 4 NDR, Lot 26
196	Culvert, Welbeck Road, 3 WGR, Lot 14/15
198	Culvert, 3rd Sideroad WGR, 2 WGR, Lot 7/8

FORMER GLENELG TOWNSHIP

STRUCTURE NO.	NAME/LOCATION
30	Concession 2-3E, Lot 3
31	Concession 2-3E, Lot 28
32	Concession 8-9, Lot 5
33	Traverston Bridge, Concession 9, Lot 9
35	Concession 2-3W, Lot 100
37	Concession 2-3N, Lot 6
38	Concession 2-3N, Lot 6
39	Concession 4N, Lot 10-11
40	Burkes Bridge, Concession 4-5, Lot 13
41	Burkes Overflow Bridge, Concession 4-5, Lot 13
43	Glenelg Centre Bridge, Concession 5, Lot 17
44	Concession 2-3N, Lot 32
45	Concession 2-3N, Lot 33
46	McQuarrie Bridge, Concession 2-3N, Lot 43
47	Saugeen River Bridge, Concession 2-3N, Lot 47
48	Concession 4, Lot 10-11
126	Baptist Church Road, Concession 8, Lot 10-11
132	Baseline Road, Concession 3 EGR, Lot 55
133	Southline Road, Concession 2 EGR, Lot 63-64
148	Concession 6-7, Lot 12
154	Traverston Road, Concession 11, Lot 10-11
197	Concession 8-9, Lot 10
D-001	Garafraxa Street Bridge, Durham
D-101	Garafraxa Street Culvert, Durham
P-101	Durham Pedestrian Bridge

FORMER NORMANBY TOWNSHIP

STRUCTURE NO.	NAME/LOCATION
50	Concession 17/18, Lot 1
51	Concession 17/18, Lot 15
52	Concession 2/3, Lot 5
53	Concession 15/16, Lot 1
54	Ford's Bridge, Concession 15/16, Lot 7
55	Hampden Bridge, Concession 17, Lot 20/21
56	Concession 15/16, Lot 27
57	Kreller Bridge, Concession 11/12, Lot 9
58	Concession 11/12, Lot 30
59	Concession 11/12, Lot 30
60	Concession 11/12, Lot 30
61	Concession 13/14, Lot 30
62	Concession 13/14, Lot 30
63	Glasser Bridge, Concession 7/8, Lot 3
64	Diepel Bridge, Concession 7, Lot 5/6
65	Riest Bridge, Concession 5/6, Lot 9
66	Concession 5/6, Lot 19
67	Concession 2/3, Lot 63
68	Concession 3, Lot 63/64
69	Pfeffer Bridge, Concession 2, Lot 70/71
70	Concession 2, Lot 74
71	Pfeffer Culvert, Concession 2, Lot 70/71
72	Varney Road Culvert, Concession 2, Lot 74
163	Letter Breen Rd. Culvert, Letter Breen Road, Conc. 2, Lot 55/56
165	Camp Creek Culvert, Normanby-Bentinck Townline, Conc. 1, Lot 1
171	Concession 14, Lot 20
172	Concession 14, Lot 27
178	Sideroad 20, Conc. 13, Lot 20/21
179	Sideroad 20, Conc. 15, Lot 20/21
183	10th Sideroad, Conc. 5, Lot 10/11
184	Sideroad 25, Conc. 8, Lot 25/26
185	Sideroad 25, Conc. 8, Lot 25/26
187	Sideroad 25, Conc. 10, Lot 25/26
188	Sideroad 25, Conc. 12, Lot 25/26
189	Sideroad 25, Conc. 13, Lot 26
190	Helena St. Culvert, Helena St., Ayton
199	Culvert, Concession 12, Lot 26
P-102	Neustadt Pedestrian Bridge

MUNICIPALITY OF WEST GREY - DAM LOCATIONS

STRUCTURE NO.	NAME/LOCATION
D-201	Dam, Neustadt
D-202	Dam, Ayton

LEGEND

- WEST GREY MUNICIPAL BOUNDARY
- MUNICIPAL BOUNDARY
- WEST GREY BRIDGE/CULVERT/DAM ASSET
- GREY COUNTY BRIDGE/CULVERT ASSET
- WATERBODY
- WETLAND - EVALUATED
- STREAM

BASE MAP DATA PROVIDED BY THE COUNTY OF GREY AND THE MINISTRY OF NATURAL RESOURCES AND FORESTRY, LAND INFORMATION ONTARIO, © QUEEN'S PRINTER FOR ONTARIO (2019).

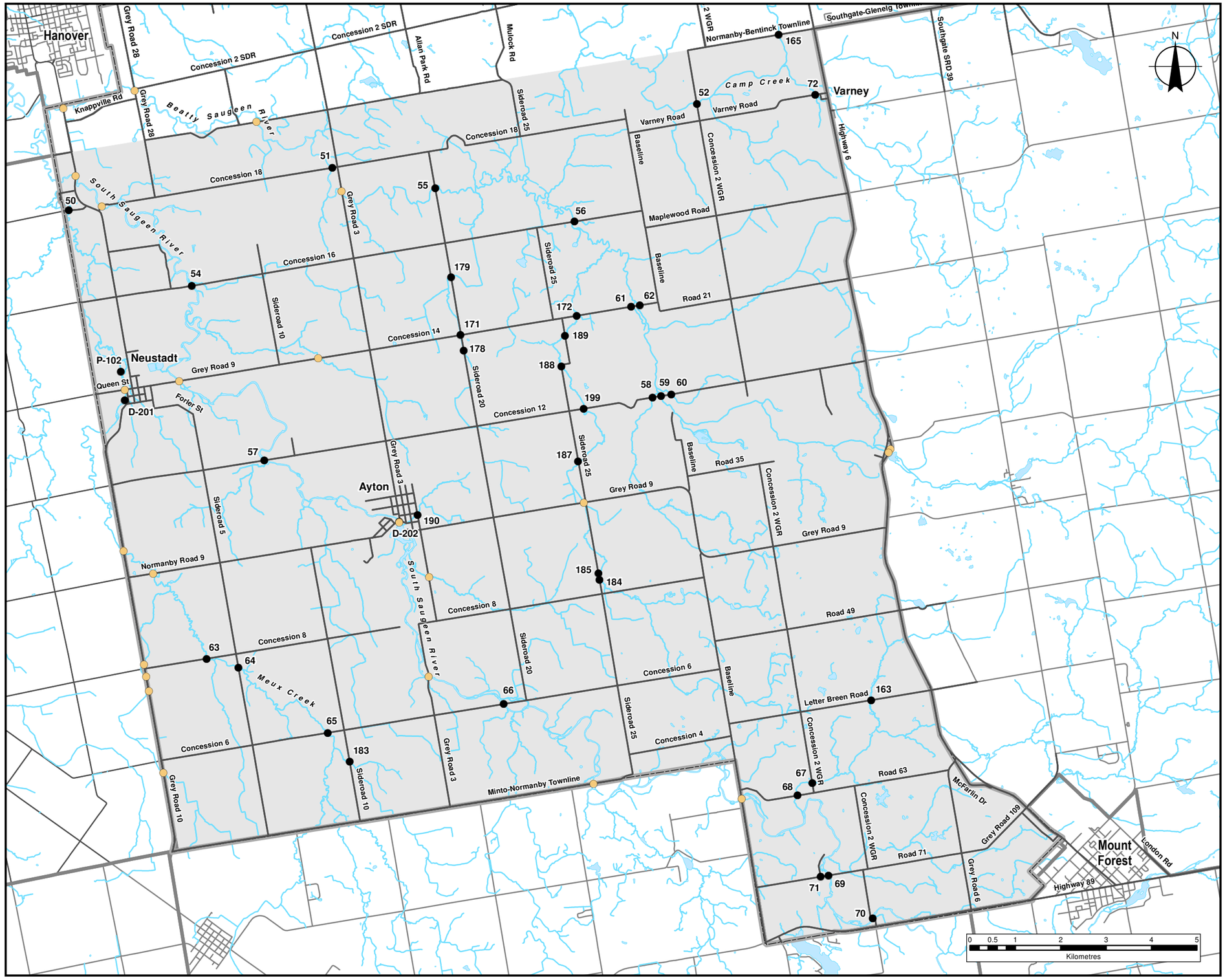
BRIDGE, CULVERT & DAM LOCATIONS MUNICIPALITY OF WEST GREY

PROJECT:	171-04854-00	DATE:	MAY 2019
DRAWN/APPROVED:	JET/CW/KH	SCALE:	SEE SCALE BAR

FIGURE: 1

1450 1st AVENUE WEST, SUITE 101
OWEN SOUND, ONTARIO CANADA N4K 6W2
PHONE: 519 376-7612 - FAX 519 376-8008 - WWW.WSP.COM

Document Path: G:\2017\171-04854 Mun of West Grey 2017 Bridge Inspections\8.0 GIS\WestGrey_Bridges_24x36Vert_RevMay2019.mxd



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59	Concession 11/12, Lot 30
60	Concession 11/12, Lot 30
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62	Concession 13/14, Lot 30
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64	Diepel Bridge, Concession 7, Lot 5/6
65	Riest Bridge, Concession 5/6, Lot 9
66	Concession 5/6, Lot 19
67	Concession 2/3, Lot 63
68	Concession 3, Lot 63/64
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188	Sideroad 25, Conc. 12, Lot 25/26
189	Sideroad 25, Conc. 13, Lot 26
190	Helena St. Culvert, Helena St., Ayton
199	Culvert, Concession 12, Lot 26
D-202	Dam, Ayton
P-102	Neustadt Pedestrian Bridge

LEGEND

- WEST GREY MUNICIPAL BOUNDARY
- FORMER NORMANBY TOWNSHIP
- WATERBODY
- RIVER/STREAM
- ROAD MAINTAINED IN WINTER
- 50 WEST GREY BRIDGE/CULVERT/DAM ASSET
- GREY COUNTY BRIDGE/CULVERT ASSET

BASE MAP DATA PROVIDED BY THE COUNTY OF GREY AND THE MINISTRY OF NATURAL RESOURCES AND FORESTRY, LAND INFORMATION ONTARIO, RETRIEVED FROM https://www.javacoeapp.lrc.gov.on.ca

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STRUCTURE LOCATION MAP
STRUCTURE RATING AND RATIONAL REPORT
FORMER NORMANBY TOWNSHIP
MUNICIPALITY OF WEST GREY

SCALE:	1:85,000	DATE:	MAY 2019
DRAWN:	JET	PROJECT:	171-04854-00
APPROVED:	KH/CW	FIGURE:	2

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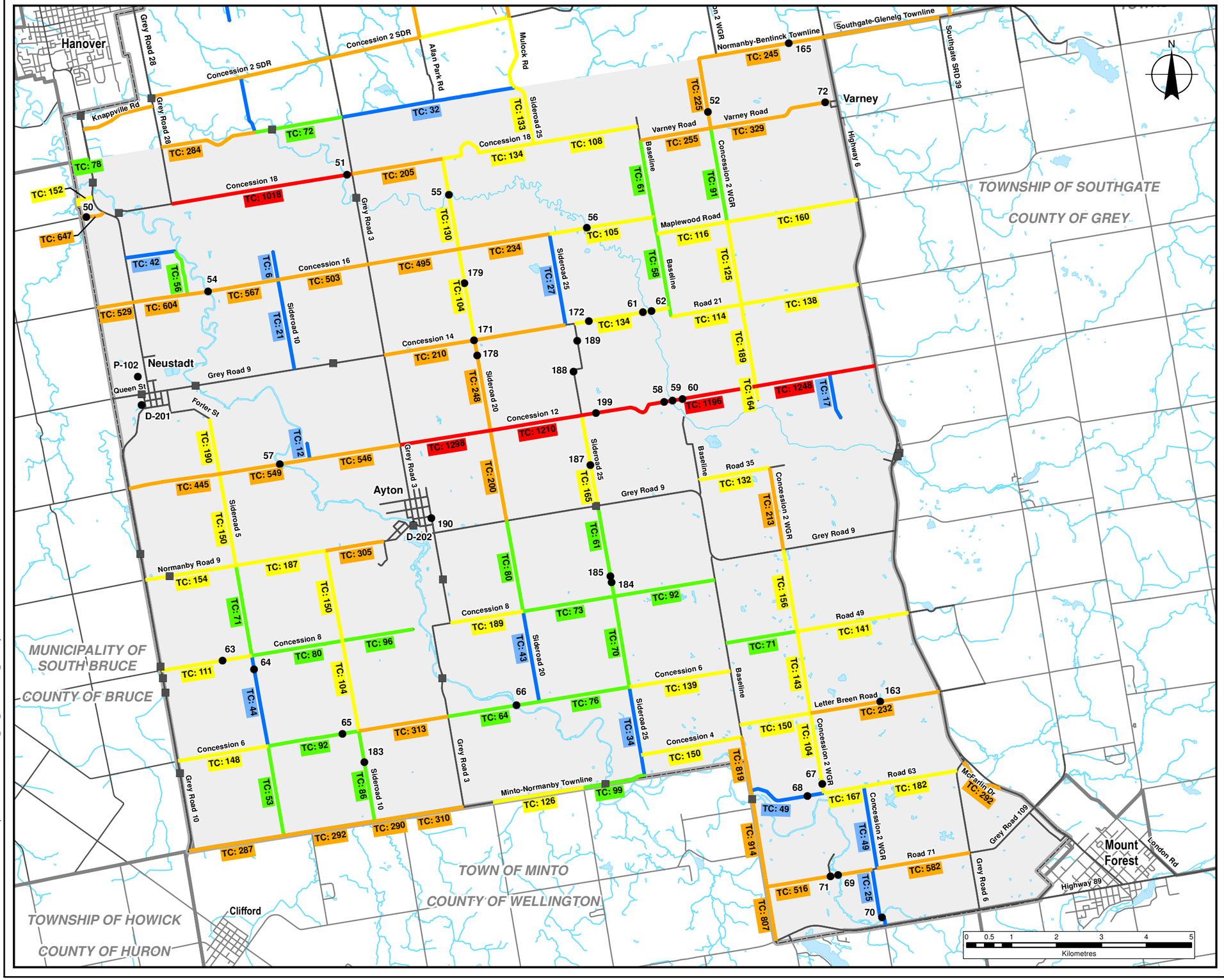

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189	Sideroad 25, Conc. 13, Lot 26
190	Helena St. Culvert, Helena St., Ayton
199	Culvert, Concession 12, Lot 26
D-202	Dam, Ayton
P-102	Neustadt Pedestrian Bridge

LEGEND

- WEST GREY MUNICIPAL BOUNDARY
- 50 WEST GREY STRUCTURE - BRIDGE/CULVERT/DAM
- GREY COUNTY BRIDGE/CULVERT ASSET

WEST GREY ROADS - AVERAGE DAILY TRAFFIC (ADT)

- 1,000 AND OVER ADT (2016 TRAFFIC COUNT)
- 200 - 999 ADT (2016 TRAFFIC COUNT)
- 100 - 199 ADT (2016 TRAFFIC COUNT)
- 50 - 99 ADT (2016 TRAFFIC COUNT)
- 0 - 49 ADT (2016 TRAFFIC COUNT)

BASE MAP DATA PROVIDED BY THE COUNTY OF GREY AND THE MINISTRY OF NATURAL RESOURCES AND FORESTRY, LAND INFORMATION ONTARIO, RETRIEVED FROM https://www.javacoeapp.lrc.gov.on.ca

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TRAFFIC COUNT DATA
STRUCTURE RATING AND RATIONAL REPORT
FORMER NORMANBY TOWNSHIP
MUNICIPALITY OF WEST GREY

SCALE:	1:85,000	DATE:	DEC 2019
DRAWN:	JET	PROJECT:	191-10409-00
APPROVED:	KH/CW	FIGURE:	3

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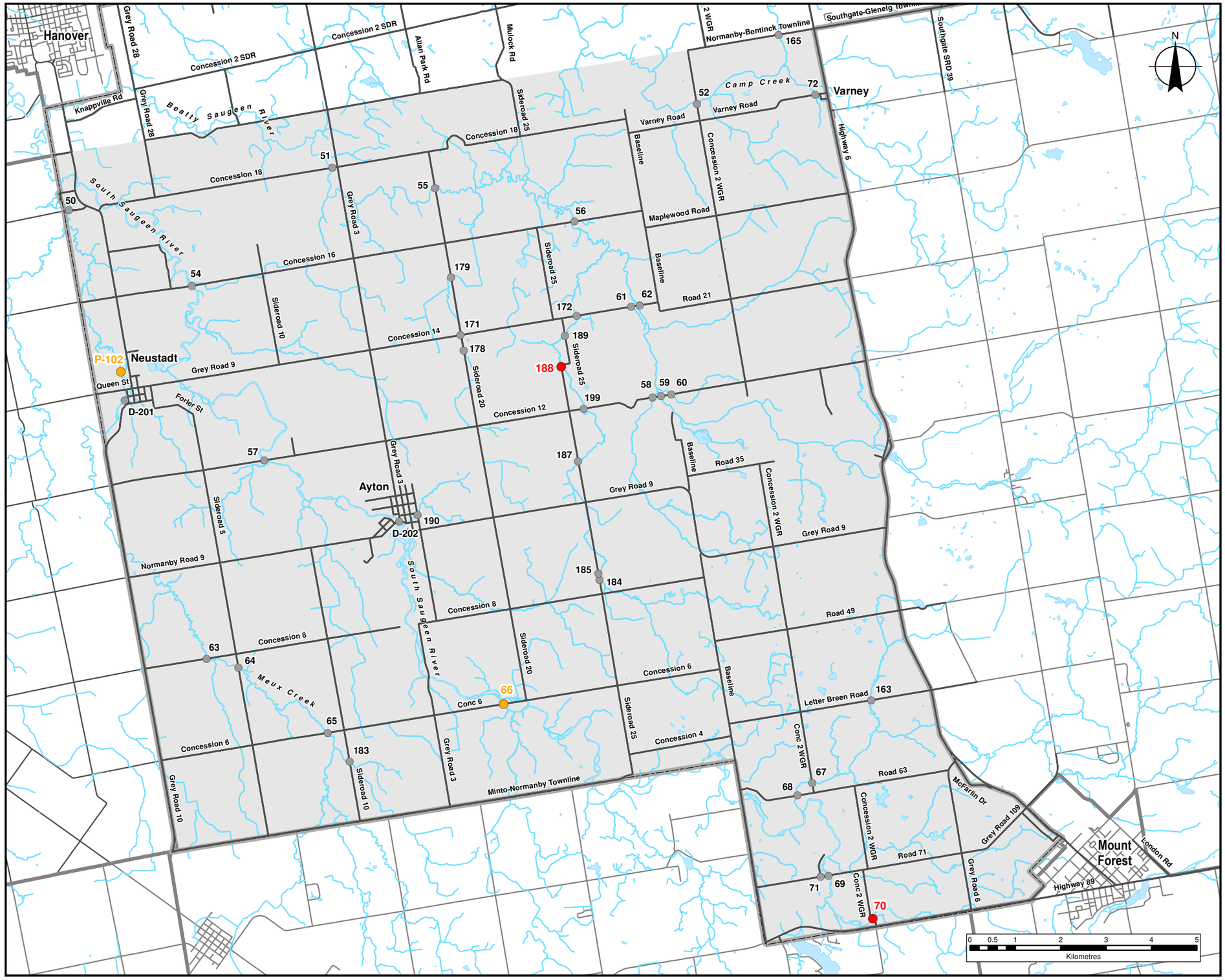

LEGEND

- WEST GREY MUNICIPAL BOUNDARY
- FORMER NORMANBY TOWNSHIP
- WATERBODY
- RIVER/STREAM
- ROAD MAINTAINED IN WINTER
- 50 STRUCTURE - BRIDGE/CULVERT/DAM
- 70 RECOMMENDED STRUCTURE CLOSURE
- 66 RECOMMENDED STRUCTURE REHABILITATION AND/OR POTENTIAL FUTURE CLOSURE

BASE MAP DATA PROVIDED BY THE COUNTY OF GREY AND THE MINISTRY OF NATURAL RESOURCES AND FORESTRY, LAND INFORMATION ONTARIO, RETRIEVED FROM https://www.javacoeapp.lrc.gov.on.ca

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STRUCTURE LOCATION MAP
RECOMMENDED CLOSURES
STRUCTURE RATING AND RATIONAL REPORT
FORMER NORMANBY TOWNSHIP
MUNICIPALITY OF WEST GREY

SCALE:	1:85,000	DATE:	APRIL 2019
DRAWN:	JET	PROJECT:	171-04854-00
APPROVED:	KH/CW	FIGURE:	4

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