Lapeer County Road Commission
2025 Culvert
Asset Management Plan

A plan describing the Lapeer County Road Commission's drainage culvert assets and conditions

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CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

EXECUTIVE SUMMARY

As conduits for commerce and connections to vital services, bridges are among the most important assets in any community along with other assets like roads, culverts, traffic signs, traffic signals, and utilities that support and affect the road network. The Lapeer County Road Commission's (Lapeer CRC) roads, bridges, culverts, other road-related assets, and support systems are some of the most valuable and extensive public assets, all of which are paid for with taxes collected from ordinary citizens and businesses. The cost of building and maintaining culverts, their importance to society, and the investment made by taxpayers all place a high level of responsibility on local agencies to plan, build, and maintain the road and bridge network in an efficient and effective manner. This asset management plan is intended to report on how Lapeer CRC is meeting its obligations to maintain the culverts for which it is responsible.

An asset management strategy is critical for effective culvert monitoring. Over the reporting period, Lapeer CRC's prioritization and monitoring have improved the visibility of culvert management. The progress is clear and easy to track. Lapeer CRC's detailed plan outlines the necessary work and prioritizes culvert assets by urgency. Implementation of the plan will continue as work progresses and best practices are applied. A summary of the condition of Lapeer CRC's culvert assets is illustrated in the figure below.

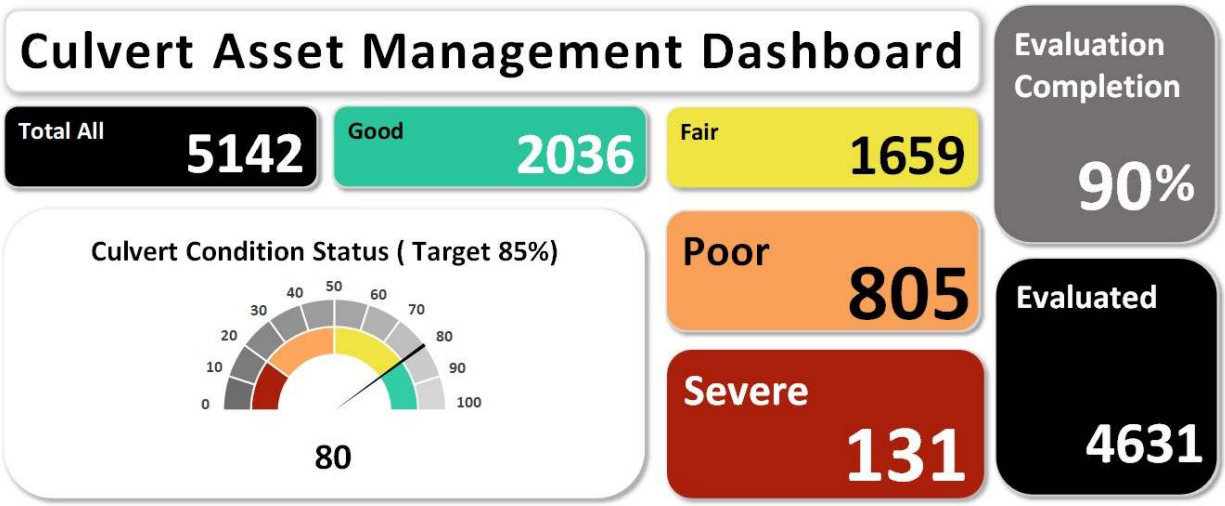


Figure 1: Dashboard of Lapeer CRC's culvert condition status

INTRODUCTION

Asset management is defined by Public Act 325 of 2018 as “an ongoing process of maintaining, preserving, upgrading, and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment and investment to achieve established performance goals”. In other words, asset management is a process that uses data to manage and track assets, like roads and bridges, in a cost-effective manner using a combination of engineering and business principles. This process is endorsed by leaders in municipal planning and transportation infrastructure, including the Michigan Municipal League, County Road Association of Michigan, the Michigan Department of Transportation (MDOT), and the Federal Highway Administration (FHWA). The Lapeer County Road Commission is supported in its use of asset management principles and processes by the Michigan Transportation Asset Management Council (TAMC), formed by the State of Michigan.

Asset management, in the context of this plan, ensures that public funds are spent as effectively as possible to maximize the condition of the bridges in Lapeer County Road Commission’s road network. Asset management also provides a transparent decision-making process that allows the public to understand the technical and financial challenges of managing infrastructure with a limited budget.

The Lapeer County Road Commission (Lapeer CRC) has adopted an “asset management” business process for its culverts to overcome the challenges presented by having limited financial, staffing, and other resources while needing to meet safety standards and road users’ expectations. Lapeer CRC is responsible for maintaining and operating an estimated 5,142 culverts.

This 2026 plan outlines how Lapeer CRC determines its strategy to maintain and upgrade culvert asset condition given agency goals, priorities of its bridge users, and resources provided. An updated plan is to be released approximately every three years to reflect changes in bridge conditions, finances, and priorities.

Questions regarding the use or content of this plan should be directed to Destain Gingell, PE, Managing Director 820 Davis Lake Road, Lapeer, Michigan, 48446. A copy of Lapeer CRC's culvert asset management plan can be found here: www.lcrconline.com/resources/assetplans/

Key terms used in this plan are defined in Lapeer CRC's comprehensive transportation asset management plan (also known as the "compliance plan") used for compliance with PA 325 or 2018.

Knowing the basic features of an asset class is a crucial starting point to understanding the rationale behind an asset management approach. The following primer provides an introduction to culverts.

Culvert Condition Evaluation System

In 2022, the Michigan TAMC published the *Michigan Non-NBI Culvert Structure Inspection Guide* (Mi-NCSIG) to provide culvert owners and safety inspectors and consistent standard for assessing culvert condition. This condition rating system replaces the Michigan culvert pilot data collection condition rating system. With the Mi-NCSIG condition rating system, culverts are rated on a scale of good, fair, poor, or severe, where good is in like-new condition and severe is not functioning as designed and possibly structurally unsound. The condition rating system covers the culvert vicinity and appurtenant structure component category—including roadway, channel scour and blockage, and end treatments and appurtenant structures—and culvert barrel component category—including barrel condition, alignment, joints, and seams—as well as characteristics related to the aforementioned categories. By rating culvert components and characteristics, an overall score may be assigned.

For the purposes of the transportation asset management compliance plan, Lapeer CRC identifies some of its severe culverts as failed, when approriate.

The *Michigan Non-NBI Culvert Structure Inspection Guide* (Mi-NCSIG) can be accessed at https://www.michigan.gov/mic/tamc/training/culvert-training-and-resources.

1. CULVERT ASSETS

The main goal of this plan is to continually improve the condition monitoring of Lapeer CRC's culvert assets and management of culvert maintenance activities. The purpose of this continual improvement is to manage risk of the overall transportation network and individual assets based on criticality and vulnerability.

This culvert asset management plan will also serve as a historical document trail for legacy transfer of information due to staff turnover or training needs.

It is a resource for the management of culverts ranging in size from 8-inches to 19.9-feet and located under agency-owned roadways. It excludes driveway culverts.

Asset data was retrieved from the following application / database:

Data Source
ArcGIS / Collector / Excel

Lapeer CRC remains focused on regularly evaluating and monitoring the condition of culverts. This year's assessments show an overall improvement compared to previous years. The improvement is largely due to having a complete inventory with condition data, which allows for more accurate budgeting and project scheduling. Lapeer CRC will continue to carry out maintenance activities to meet the goals and objectives outlined in this report.

This CAMP identifies the work needed to achieve successful asset management outcomes.

Inventory

Lapeer CRC is responsible for an estimated 5,142, reported by not inventoried/unknown, inventoried/not condition evaluated, and inventoried/rated (see Table 1).

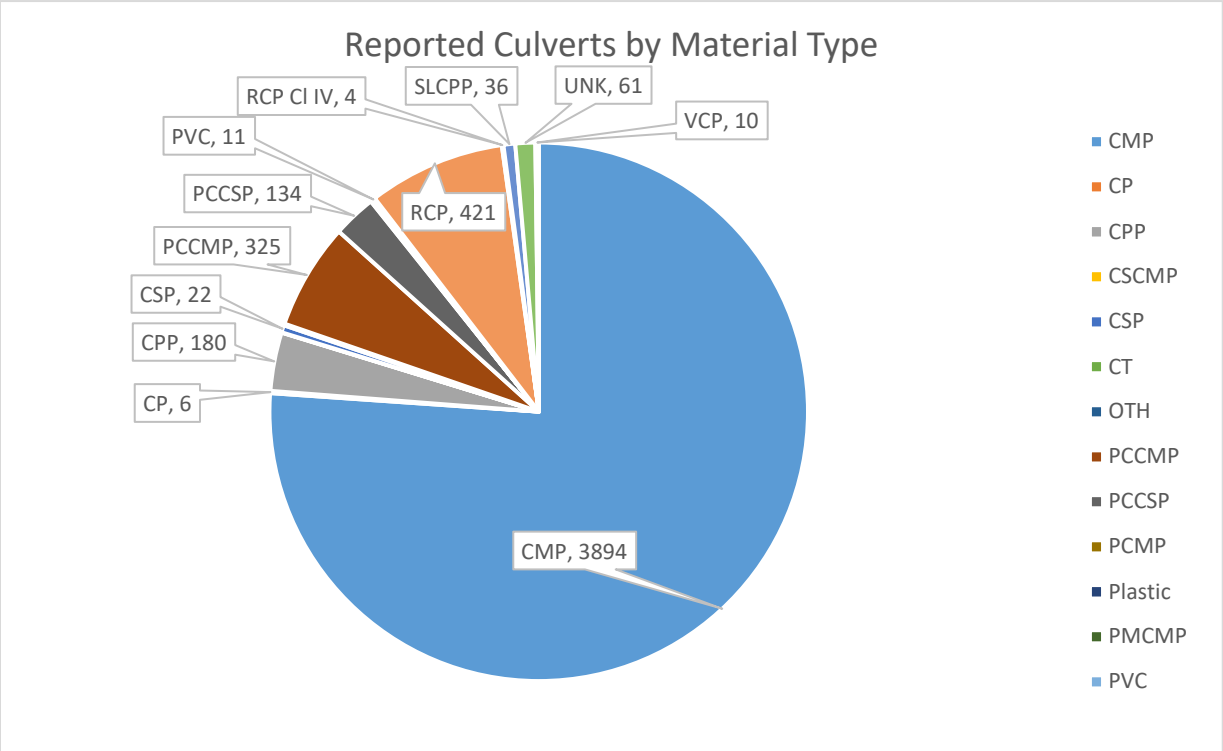
Table 1: Inventory Status

Culvert Inventory Status	Culverts
Not Inventoried/Unknown (estimated)	25
Inventoried/Not Condition Evaluated	486
Inventoried/Rated	4631
Total	5,142

On average, Lapeer CRC estimates, based on historical data over the past 7 years, that approximately 25 culverts each year are not yet included in the inventory. These culverts are typically unknown, buried, or dissolved culverts that come to light during rain events. When field staff discover a culvert that is not inventoried, maintenance personnel mark the location on the interactive mapping system with a "missing asset" pin. This information is then entered into the asset management system, and the condition of the culvert is assessed at the time of discovery.

Types

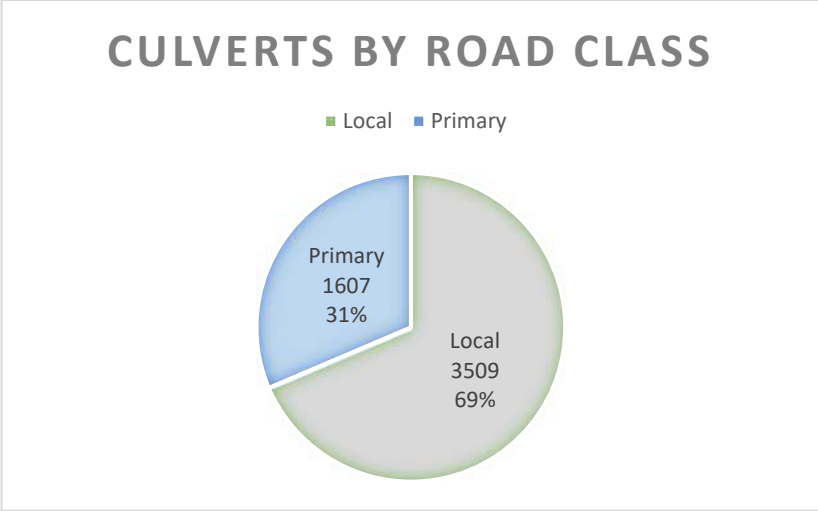
The following assets are included in this plan as reported by material type:

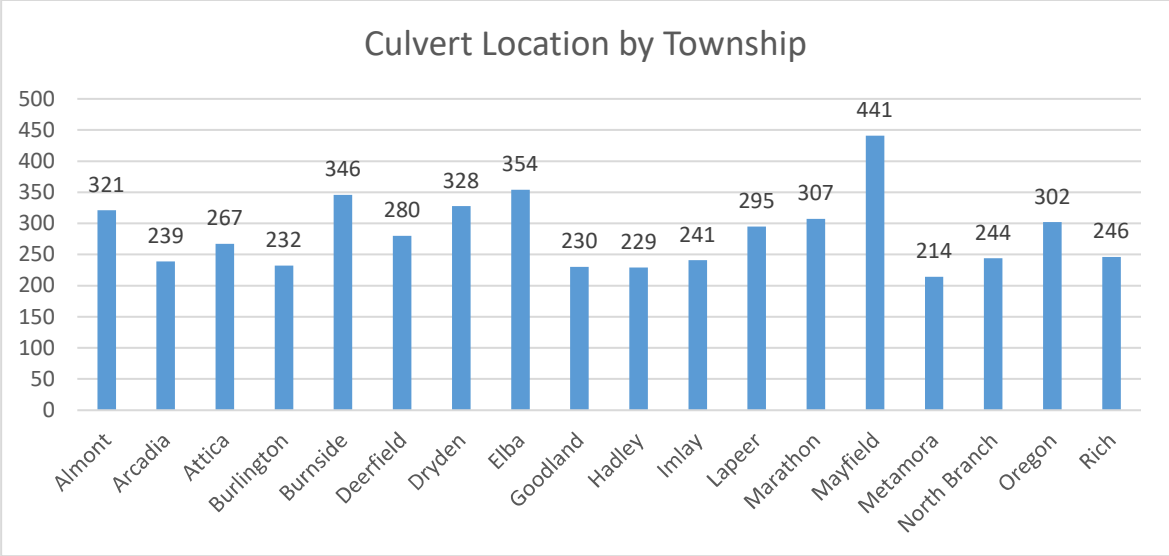


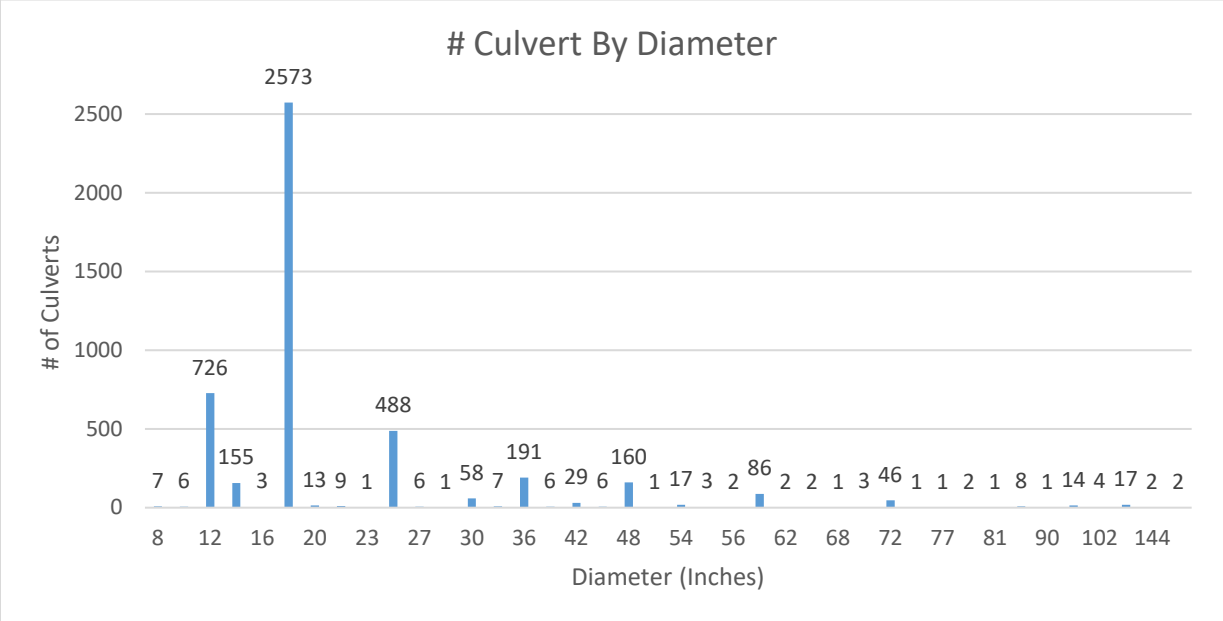
Locations and Sizes

The culvert assets are included in this plan as reported by

1. Road Class
2. By Township Location
3. By Diameter







For more information, please refer to the agency contact listed in the *Introduction* of this culvert asset management plan.

Condition

Of Lapeer CRC's estimated 5,142, there are 4,631 culverts that have been rated. Currently, 80% of evaluated culverts are rated *good* or *fair*.

Table 2: Inventoried & Evaluated Culverts by Mi-NCSIG Condition

Good	2036
Fair	1659
Poor	805
Severe	107
Failed	24
Total	4631

Although the Mi-NCSIG does not define culverts as *failed*, Lapeer CRC has identified 24 of its culverts in *severe* condition that it considers to be *failed* for the purpose of the Public Act 325 transportation asset management compliance plan.

Data Visualization – Culvert Asset Management Dashboard

Lapeer CRC maintains a culvert asset management dashboard, developed using ArcMap and Collector software, to track and manage culvert information. This dashboard is available on the Lapeer CRC website and provides an easy-to-use platform for data visualization and monitoring. Users can view progress toward targets, condition ratings by culvert type, and overall completion rates in a single view. Both Lapeer CRC maintenance personnel and Township staff have access to the dashboard and interactive map to support effective monitoring and coordination.

The target percentage for culvert condition status is customizable. Lapeer CRC has selected the target of 85 percent for total culverts rated good and fair in this reporting period.

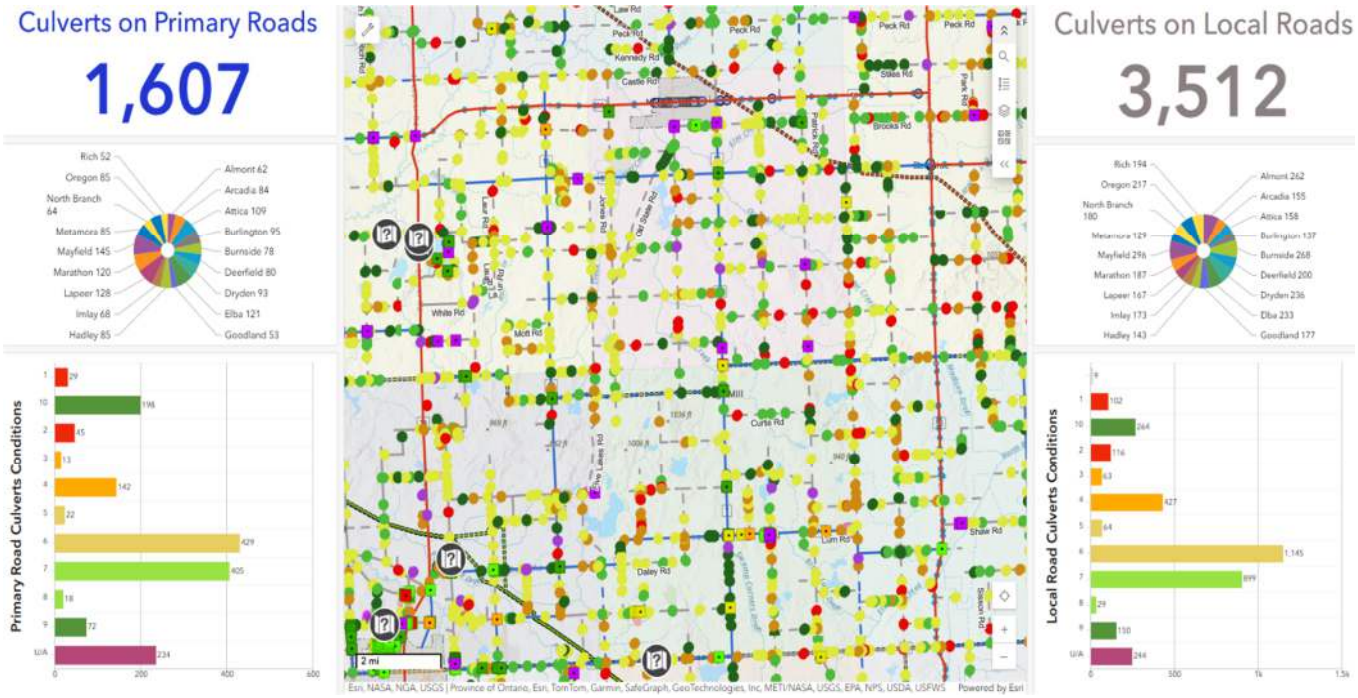


Figure 2: Map of Lapeer CRC's culvert condition status

Goals/Plan Details

This culvert asset management plan identifies the work needed to achieve successful asset management outcomes.

Primary CAMP Objective
Maintain culverts at a condition status of good or fair **for at least 85%** of the total rated culverts (using the Mi-NCSIG).

The following two phases of work are needed to complete this plan:

Work Phases	
Phase 1	*Phase 2*
Inventory and Condition Evaluation of All Culverts	Condition-based Prioritization of Work

The phases can be completed simultaneously as assets become inventoried/condition evaluated.

Phase 1 – Inventory and Condition Evaluation of All Culverts

The goal of Phase 1 is to increase the visibility of assets through classification. To accomplish this, there is one objective:

Phase 1 Objective	All culverts are inventoried and condition evaluated

Phase 1 work is 90% complete.

Phase 2 – Condition-based Prioritization of Work

The goal of Phase 2 is to use the inventory and condition evaluation data to effectively plan maintenance activities for Lapeer CRC's culvert assets.

Phase 2 Objectives	
2.1	Sort condition-evaluated culverts by *good*, *fair*, *poor*, or *severe* rating
2.2	Prioritize work order using condition rating, work type urgency, and criticality

Currently, 80% of rated culverts are *good* or *fair* and 9.3% do not have a condition rating associated with the asset.

Prioritization, Programmed/Funded Projects, and Planned Projects

Work Prioritization Guidelines

In addition to condition ratings, Lapeer CRC uses both work type definitions and criticality scoring to determine the urgency/risk level of asset repairs. Risk mitigation actions are then prioritized during work planning to adhere to these criticality rankings.

Work Type Definitions

Example 1.1 provides an example of a decision-making tool for determining work type.

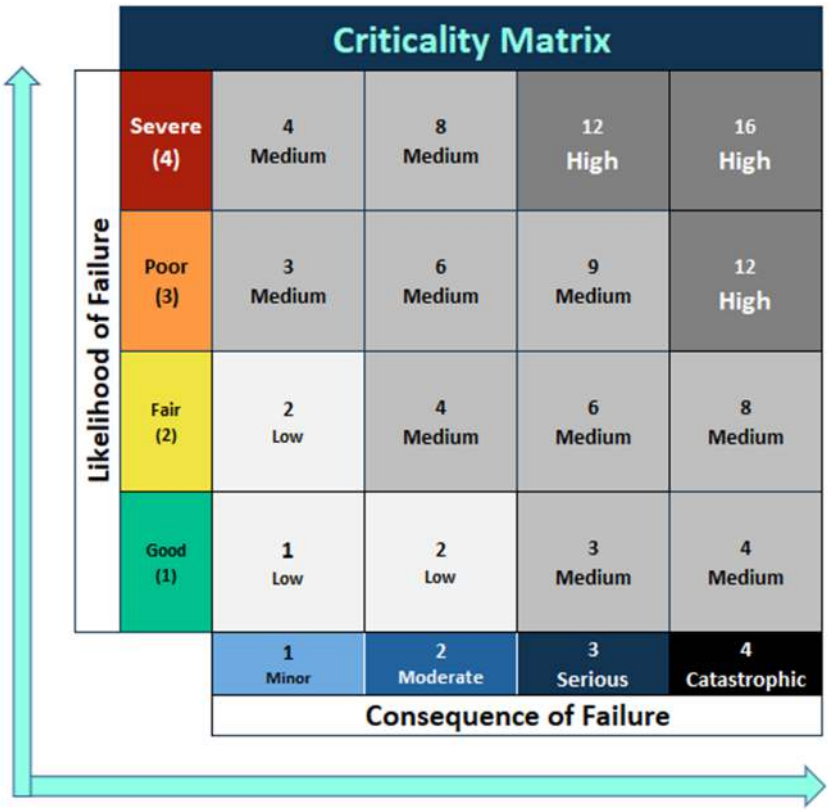
Example 1.1: Work Type Decision-making Tool			
Work Type	**Definition**	**Urgency/Risk Level**	**Example**
Emergency	Any repair that must be started **immediately** to avoid a safety or operational catastrophe for the public or agency; considered break-in work that interrupts the planned work scheduling process due to urgency	Highest	Culvert on major road destroyed and roadway is unusable (storm, accident, catastrophic failure), requires immediate road closure
Urgent	Any repair that has to be started **within several weeks** because of the safety and operational risk to the public or agency; considered break-in work that interrupts the planned work scheduling process due to urgency	Medium	Damage that impairs a roadway or poses a risk of damage occurring, causing traffic delays or detours
Planned Work	Repairs that can be put into the work order backlog and addressed through methodical planning processes	Lowest	Properly identified, condition-based, planned repairs that are cost-effective, safe and minimize inconvenience to drivers

Criticality

Example 1.2 shows a weighted decision-making tool for calculating criticality scores. This tool gauges an asset's *likelihood (probability) of failure* and *consequence of failure* (impact on network) at the same time. Lapeer CRC considers the criticality of all emergency, urgent, and planned work types.

The low, medium, and high criticality scoring is further used to identify prioritization for planned work and any deferred work backlog. Following the 1 to 16 scale of ranking, the higher the criticality score, the higher the work's priority for completion. This scale is shown below.

Example 1.2: Criticality Decision-making Tool



Prioritization Key:

Low = 1-2
Medium = 3-9
High = 10-16

Work Prioritization Planning

Lapeer CRC's policy is to replace or repair assets concurrent with road projects affecting *poor* and *severe* rated culverts when a more urgent response is not warranted.

To increase the number of culverts rated *good* or *fair*, the following *poor* and *severe* assets are prioritized for repair in the next three (3) years. This work will bring them into *good* or *fair* condition.

Table 3: Planned Action for this Year

Culvert ID	Criticality	Maintenance Needs	Work Scheduled	In-House OR Contracted?	Priority
STC-2613	16	Replacement	2026	In – House	Low
STC-266	16	Replacement	2027	In - House	Low
STC-3213	16	Replacement	2026	In - House	Low
STC-3955	16	Replacement	2027	In - House	Low
STC-1836	16	Replacement	2026	In - House	Low
STC-1845	16	Replacement	2026	In - House	Low
STC-3248	16	Replacement	2027	In - House	Low
STC-3252	16	Replacement	2027	In - House	Low
STC-2384	16	Replacement	2026	In - House	Low
STC-2430	16	Replacement	2027	In - House	Low
STC-4917	16	Replacement	2028	In - House	Low
STC-4967	16	Replacement	2026	In - House	Low
STC-6647	16	Replacement	2026	In - House	Low
STC-2579	16	Replacement	2026	In - House	Low
STC-3669	16	Replacement	2027	In - House	Low
STC-3586	16	Replacement	2028	In - House	Low
STC-4158	16	Replacement	2027	In - House	Low
STC-5045	16	Replacement	2028	In - House	Low
STC-3099	16	Replacement	2028	In - House	Low
STC-5391	16	Replacement	2028	In - House	Low
STC-2191	16	Replacement	2027	In - House	Low
STC-3277	16	Replacement	2028	In - House	Low
STC-1593	16	Replacement	2028	In - House	Low
STC-1644	16	Replacement	2028	In - House	Low

All of the above work is known and planned, actual schedules may vary based on available personnel and equipment.

Gap Analysis

When Lapeer CRC compares its funding and its programmed / funded projects with all of its prioritized projects as shown in Table 3 above, Lapeer CRC believes it should be able to achieve all of its asset management goals for the period of this plan.

For projects it cannot complete due to funding, Lapeer CRC will continue to monitor those culvert assets and take any necessary steps within its budget to prevent or mitigate a condition decline or a need to post or close the structure.

Lapeer CRC will prioritize and execute projects based on criticality and risk, within budgetary limitations. Any remaining culvert assets will be monitored and addressed as appropriate.

2. FINANCIAL RESOURCES

Anticipated Revenues

Lapeer CRC has a multi-year budget funded by various sources to maintain culvert assets.

Table 4: Funding Awards

Source Name	Amount	Year(s) of Use
Primary Road Routine Maintenance	$200,000 / year	3
Local Road Routine Maintenance	$120,000 / year	3
Township Funding	$250,000 / year	3

Culverts located within the limits of any pavement resurfacing or rehabilitation project are verified and evaluated before road work begins. This proactive approach helps prevent situations where newly completed pavement must be cut open to replace an underground culvert or other utility, thereby reducing costs, avoiding public inconvenience, and maintaining public confidence in the quality of the work.

Anticipated Expenses

Scheduled maintenance activities that are not affiliated with applications, grants, or other funded projects will be performed by the agency's maintenance forces and funded through the agency's annual operating budget.

3. RISK MANAGEMENT

Lapeer CRC recognizes that the potential risks associated with culverts generally fall into several categories:

- Personal injury and property damage resulting from a bridge collapse or partial failure;
- Loss of access to a region or individual properties resulting from bridge closures, restricted load postings, or extended outages for rehabilitation and repair activities; and
- Delays, congestion, and inconvenience due to serviceability issues, such as poor-quality riding surface, loose expansion joints, or missing expansion joints.

Lapeer CRC addresses these risks by implementing regular culvert inspections and a preservation strategy consisting of preventive maintenance.

The inspection reports document the condition of Lapeer CRC's culvert under 20 feet, identifying new defects and tracking deterioration.

The preservation strategy identifies actions in the operations and maintenance plan that are preventive or are responsive to specific culvert conditions. The actions are prioritized to correct critical structural safety and traffic issues first, and then to address other needs based on the operational importance of each culvert and the long-term preservation of the network. The inspection results serve as a basis for modifying and updating the operations and maintenance plan annually.