TOOLKIT FOR TRANSIT TECHNOLOGY INNOVATION

ONTARIO SMART MOBILITY READINESS FORUM

MAY 2023

Ontario

CONTENTS

INTRODUCTION

The Transit Technology Toolkit is a public-facing guidebook **for Ontario's small and medium-sized municipalities, transit agencies, and Indigenous communities** to support them with navigating the emerging landscape of transit technologies

Objectives

1. Expand **awareness** of existing and emerging innovative transit technologies.

2. Identify approaches to increase **ridership**, expand **service** and geographic **coverage**, and enhance rider **experience.**

3. Support **connections** between municipalities /transit system operators and Ontario technology companies.

Transit Technology Toolkit

January 2023

Ministry of Transportation
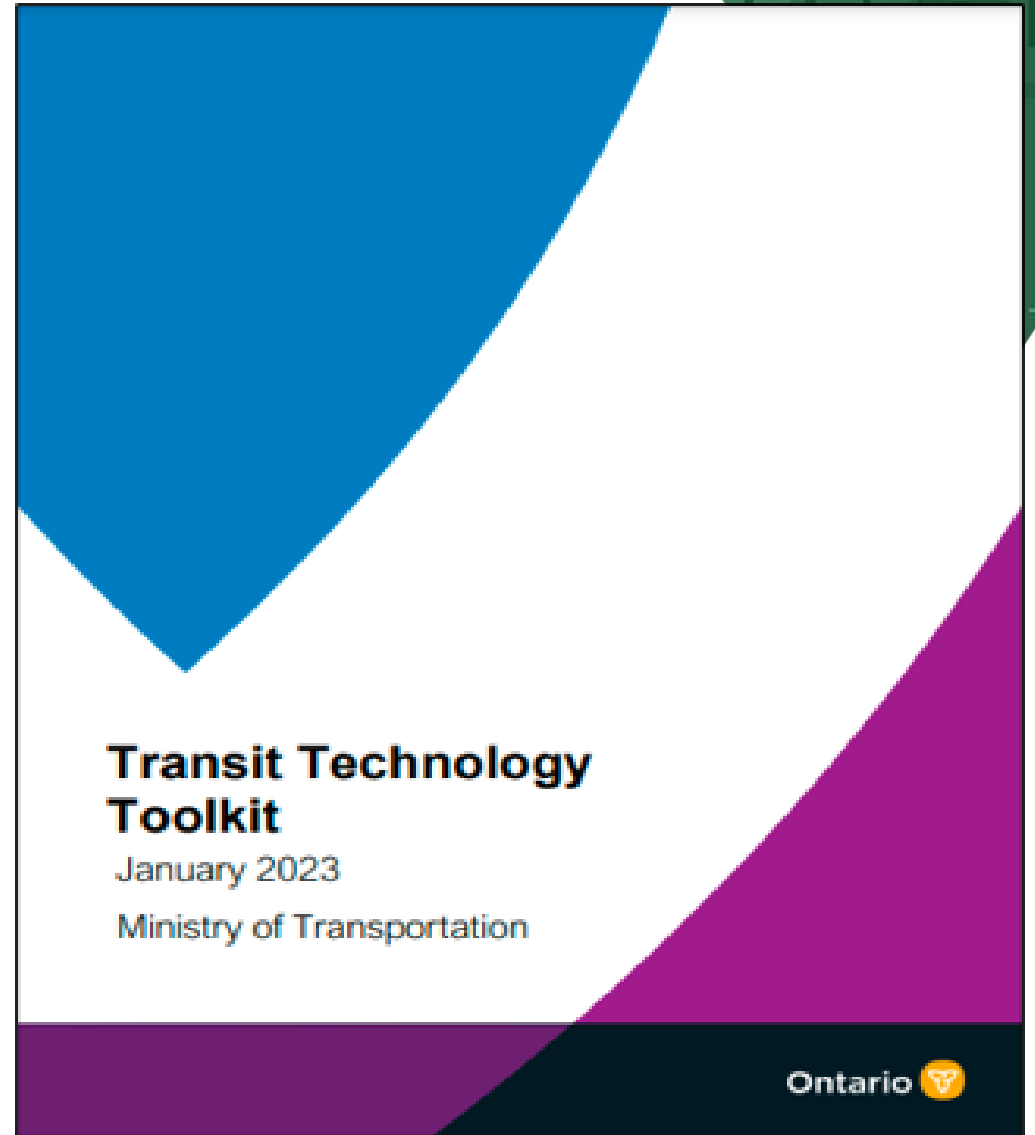
Ontario

CONTEXT

The Transit Technology Toolkit supports skills and capacity-building among Ontario's transit systems, helping them navigate and leverage emerging technologies.

- The toolkit was a commitment under the Ministry of Economic Development, Job Creation, and Trade's (MEDJCT) **Driving Prosperity** Phase 2

- The toolkit complements the **On-Demand Transit Toolkit** developed by the Canadian Urban Transit Association (CUTA) and Metrolinx

- Aims to support Ontario's transit system operators, in particular smaller transit systems with limited resources to undertake this analysis independently.

Driving Prosperity:
Ontario's Automotive Plan
Phase 2

November 2021
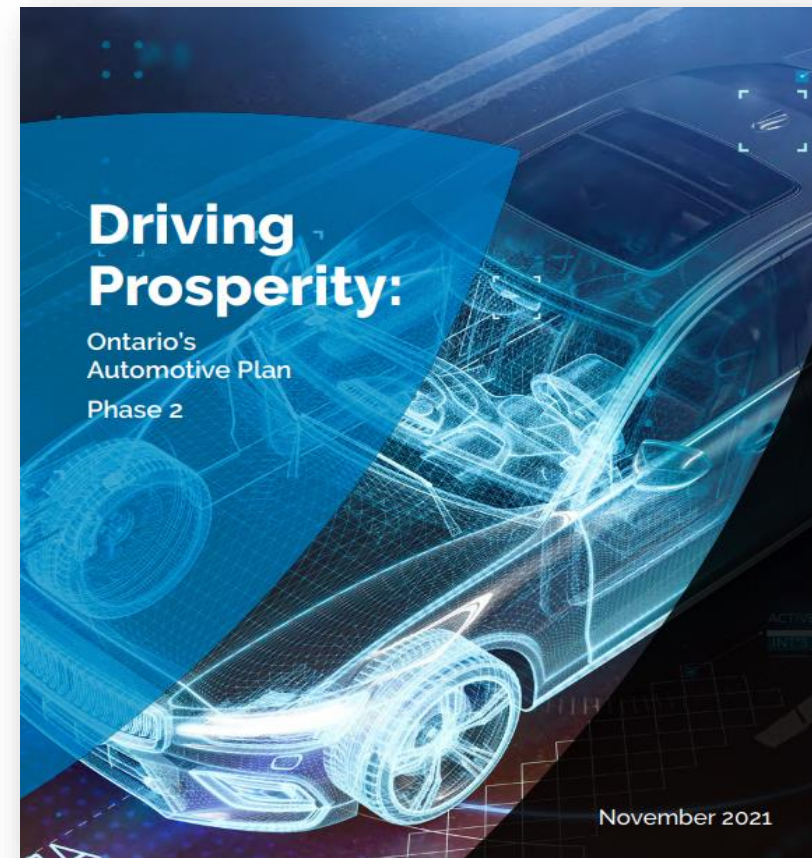
BACKGROUND

The Transit Technology Toolkit was developed with engagement from a variety of provincial and municipal representatives to better understand the challenges with adopting transit technology solutions.

Engagement

- Engaged with municipalities, transit agencies, and Indigenous communities through MTO-led survey and case study interviews
- MTO, MEDJCT, Ontario Centre of Innovation, and Metrolinx participated in a visioning workshop

February – May 2022

Report Development

- Engaged *Left Turn Right Turn Ltd*, a consulting firm, to conduct research and develop the toolkit in July 2022.

July 2022

Publication

- Published the Transit Technology Toolkit on Ontario.ca in January 2023

January 2023

TOOLKIT OVERVIEW

1. Introduction
2. Transit Technologies
3. Lifecycle: Planning
4. Lifecycle: Procurement
5. Lifecycle: Implementation
6. Lifecycle: Administration and Maintenance
7. Case Studies

The Toolkit includes:

- **Information** on best practices to expand awareness of existing and emerging technologies that can be implemented in Ontario

- **Approaches** on how innovative technologies can be leveraged to optimize and improve service

- **Tools and templates** that agencies, consultants and vendors can use to improve their technology programs

- **Lessons Learned** from case studies across Ontario communities

THE TRANSIT TECHNOLOGY LIFECYCLE

- Provides description of the four stages of the transit technology lifecycle

- Describes the different maturity levels of technologies in the market and impact on decision-making process.

- Different maturity levels in toolkit: new, improving technology, mature technology, ageing

FIGURE 1: THE TRANSIT TECHNOLOGY LIFECYCLE
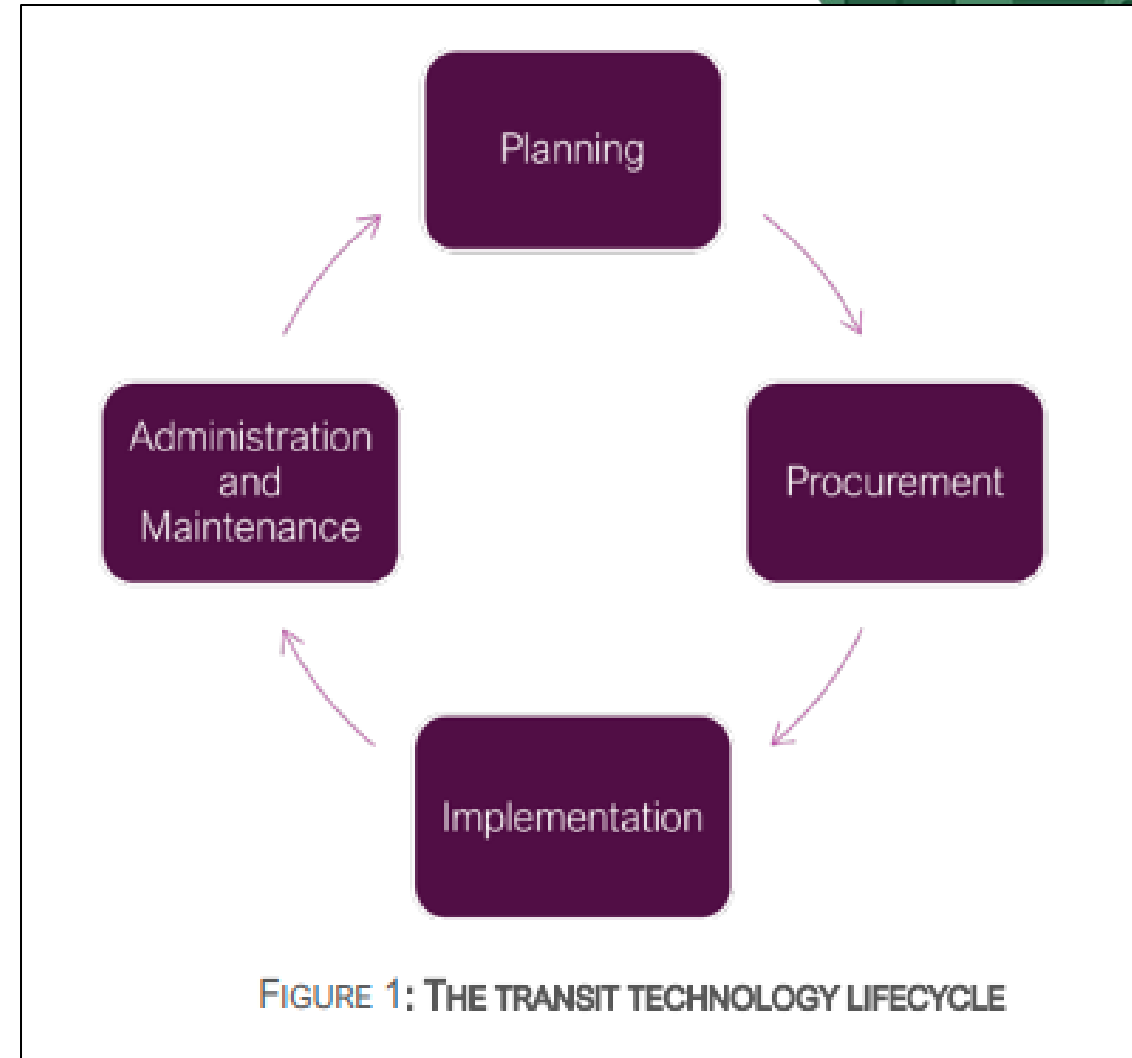
ABOUT TRANSIT TECHNOLOGIES

- Introduces transit technologies and describe their use, maturity and typical lifespan

- Rates the appropriateness and scalability of each technology by agency size

- Identifies the key benefits of each technology

FIGURE 15: TICKET VENDING MACHINE INSTALLED AT A TRANSIT STATION

General Usage: Ticket vending machines are convenient for customers especially as they offer variety and affordability. These machines offer automated, interactive and dynamic services which allow for simple, fast, and safe transactions. These machines provide a strong and convenient user experience allowing for more autonomy and interactivity. TVM's improve the purchasing process for customers as this process is fully automated and delivers both speed and security.

Maturity: Mature and likely ageing as other alternatives (Smart Cards, Mobile Payments, etc.) increase in prevalence.

Appropriateness/Scalability:

Medium and Large Transit Services	Small Transit Services	Rural & Remote Transit Services
Larger transit services will often implement TVM's at major inter-modal points or hubs with high foot traffic	Seldomly deployed, except in niche applications	Seldomly deployed, except in niche applications

Technology Lifespan: 3-5 years

Implementation Costs: Refer to Appendix G

LIFECYCLE: PLANNING

- Details the key components of technology planning including a **needs assessment, alternatives/feasibility analysis** and **turning plans into projects**

- Useful tools in the Toolkit:
  - Budgeting table for various technologies
  - Options analysis template
  - Example need statements

A _<role>_ needs to _<issue to be resolved>_, because _<benefit that would be experienced>_.

Examples of needs statements are:

- An operator, needs to locate their vehicle at the depot quickly, at the beginning of their shift, because they only have 15 minutes to start the vehicle, complete the pre-trip inspection and leave the depot if they are to meet the schedule.; or

TABLE 4: SAMPLE OF AN OPTIONS ANALYSIS SCORING SHEET, WHERE THE SCORE OF ZERO TO FIVE IS ATTRIBUTED TO FOUR ALTERNATIVES RELATIVE TO THE FUNCTIONAL AND NON-FUNCTIONAL NEEDS IDENTIFIED. IN THIS CASE, THE PREFERRED ALTERNATIVE WOULD BE THAT WITH THE HIGHEST SCORE

Need	Score (0 - 5) Alternative #1	Score (0 - 5) Alternative #2	Score (0 - 5) Alternative #3	Score (0 - 5) Alternative #4
Functional Need 1	3	4	3	5
Functional Need 2	0	3	4	5
Functional Need 3	2	3	4	5
Non-functional Need 1	5	5	5	5
Non-functional Need 2	3	4	5	4
Non-functional Need 3	1	3	3	2
Total Score	**14**	**22**	**24**	**26**

LIFECYCLE: TECHNOLOGY PROCUREMENT

- Details the key components of technology procurement including establishing a **procurement strategy,** developing a **procurement package, evaluations** and **contract negotiations**

- Useful tools in the Toolkit:
  - Sample RFP library
  - Evaluation template

APPENDIX B: SAMPLE RFP EVALUATION TEMPLATE

The following is a sample evaluation template that can be adapted to score a technology RFP.

Scoring Guidelines:

- Poor : 0-49
- Marginal: 50-69
- Good: 70-89
- Very Good: 90-100

Company:				
Evaluator:				
EVALUATION CRITERIA	**Weight**	**Score**	**Total**	**Comments**
1. Completeness of Solution - Case Management	20%		0.0	
a) Case (or ticket) Management function				
2. Completeness of Solution - Customer Interaction	20%		0.0	
a) Contact Management function to manage customer and partner profiles				
b) Customer Login function to track communications				
c) Email Campaign function				
d) Monitor and capture interactions from social media				
e) Chatbot function				
3. Completeness of Solution - Reporting and Administration	5%		0.0	

LIFECYCLE: TECHNOLOGY IMPLEMENTATION

- Details the key components of technology implementation including **project management, system design, business process re-engineering, integration, verification** and **testing, deployment, validation** and **training**

- Useful tools in Toolkit:
  - Risk register
  - Action log templates

Transit Technology Toolkit — Appendix D: Sample Risk Register Template — MTO

APPENDIX D: SAMPLE RISK REGISTER TEMPLATE

A key output of the risk assessment process described in Section 5.2.3 is a risk register. The risk register documents foreseen risks, potential impacts, associated mitigation plans, and people responsible for taking appropriate actions. The following sample risk register can be tailored for technology implementations.

| Project Name: |
| Date Updated: |
| Updated By: |

Risk Number	Risk Name	Effect/Description	Probability (Very Low, Low, Medium, High, Very High)	Severity (Very Low, Low, Medium, High, Very High)	Management Strategy (Mitigation)	Comments
Example	Employee Safety	• Employees becoming injured on the job • Operational impact, reputation risk, long term disability payments, worker shortages	Very Low	Low	• Maintain health and safety training and policies in line with Municipality/Agency standards (Workplace Safety Insurance Board, etc.)	

APPENDIX C: SAMPLE PROJECT ACTION ITEM LOG TEMPLATE

The following is a sample structure for a project action item log, used for tracking requests and actions during the implementation phase. In many cases, vendors may use a spreadsheet application to house the log. Guidance is provided in the first row to indicate how the template is intended to be completed and subsequently updated.

ID	Date Added	Target Date	Action Item / Description	Priority	Owner	Status	Updates / Comments
1	Insert Date	Insert Date	Insert text description of the action item	High / Med / Low	Initials of individual responsible	Open / Paused / For Review / Closed	**2022-07-20**: Insert text description of updates and comments. **2022-07-21**: Add the date in bold when new comments are added
2							

LIFECYCLE: ADMINISTRATION AND MAINTENANCE

- Details the key components of administration and maintenance including maximizing **tech investments, system monitoring, continual improvement** and support **roles** and **responsibilities**

- Useful tools in Toolkit:
  - Typical ITS technology lifespans
  - Sample IT Administration job description

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1		.				
2		.			.	
3		.			.	

TOOLKIT HIGHLIGHTS: CASE STUDIES

The toolkit includes **technology-focused case studies** derived from interviews with a range of **small, rural, and Indigenous communities** who deployed technologies as well as vendors to gauge their use and experience in deploying various technologies.
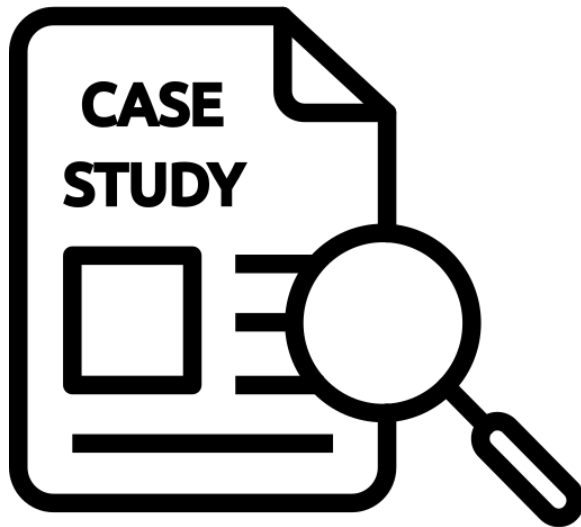
- The case studies focus on the following technologies:
  - Operational technologies
  - Fare collection and customer experience technologies, and
  - Specialized integrations

- Each case study discusses lessons learned, vendors involved, implementation costs, timelines and considerations

EXAMPLE CASE STUDY

- Milton Transit deployed an integrated Specialized and Conventional On Demand Transit technology
- Case study walks through the justification, the organizational and service impacts, the benefits and challenges experienced

Transit Technology Toolkit	Appendix I: Detailed Case Studies	MTO

Case Study: Deploying an Integrated Specialized and Conventional On-Demand Technology

In accordance with Milton Transit's 2020 Accessibility plan, the town has identified the need to develop and implement a centralized reservation process and same-day booking features for their specialized transit services. As a result, Milton Transit conducted a replacement of the current specialized transit scheduling and booking system with a new on-demand platform to address this need.

COMMUNITY:	Town of Milton
POPULATION:	126,355
TRANSIT SERVICE PROVIDER:	Milton Transit
TYPE OF SERVICE:	Local, in-house service
CONVENTIONAL BUSES:	20 (2021)
SPECIALIZED VEHICLES:	6 (2021)
ANNUAL SERVICE HOURS:	50,031 (Conventional vehicle hours) N/A (specialized vehicle hours)
COMMUNITY TECHNOLOGY STATUS:	Modern
ON-DEMAND TECHNOLOGY VENDOR:	Spare Labs

TOOLKIT HIGHLIGHTS: CHECK OUT THE APPENDICES!

The appendices of the Transit Toolkit contain **useful resources and tools** to support municipalities, communities, and transit agencies at different stages of your transit technology project.
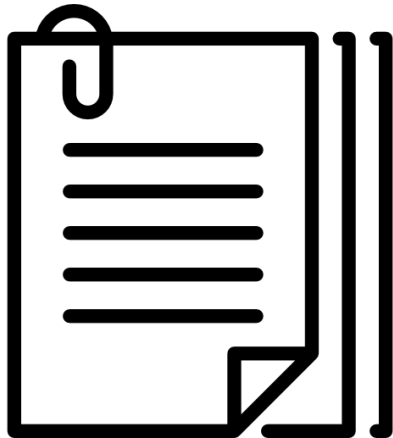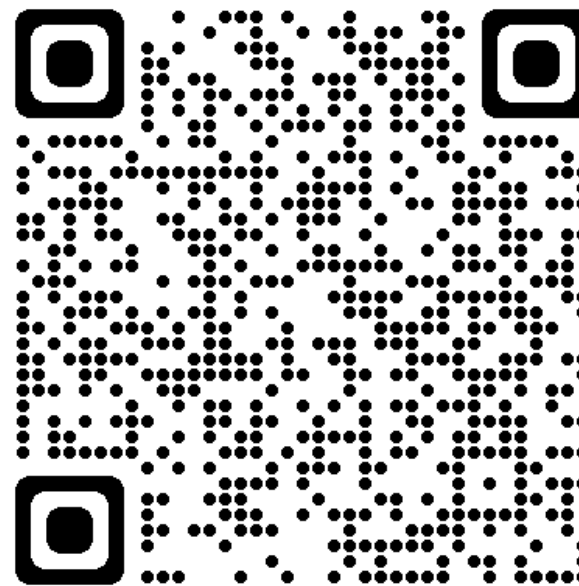
- In the appendices of the Toolkit you can find:
    - Transit Technology Glossary
    - Sample RFP Evaluation Template
    - Sample Risk Register Template
    - Sample Project Action Item Log Template
    - Typical ITS technology lifespans
    - Sample ITS administrator job description
    - Budgeting template
    - RFP Library

LINK TO THE TOOLKIT:

Transit Technology Toolkit
January 2023
Ministry of Transportation

Ontario

https://www.ontario.ca/page/transit-technology-toolkit

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