TOOLKIT FOR TRANSIT TECHNOLOGY INNOVATION

ONTARIO SMART MOBILITY READINESS FORUM
MAY 2023
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.
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.
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

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

**Publication**
- Published the [Transit Technology Toolkit](https://www.ontario.ca) on Ontario.ca in January 2023
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

---

**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 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
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
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>
<thead>
<tr>
<th>Need</th>
<th>Score (0 - 5) Alternative #1</th>
<th>Score (0 - 5) Alternative #2</th>
<th>Score (0 - 5) Alternative #3</th>
<th>Score (0 - 5) Alternative #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional Need 1</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Functional Need 2</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Functional Need 3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Non-functional Need 1</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Non-functional Need 2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Non-functional Need 3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total Score</td>
<td>14</td>
<td>22</td>
<td>24</td>
<td>26</td>
</tr>
</tbody>
</table>
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
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
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

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.

<table>
<thead>
<tr>
<th>Risk Number</th>
<th>Risk Name</th>
<th>Effect/Description</th>
<th>Probability [Very Low, Low, Medium, High, Very High]</th>
<th>Severity [Very Low, Low, Medium, High, Very High]</th>
<th>Management Strategy (Mitigation)</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 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 policies in line with Municipal/Agency standards (Workplace Safety/Insurance Board, etc.) |          |
| 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
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:

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

Matt Lattavo
Innovation Lead
Left Turn Right Turn
T: (647) 998-1471
E: matt@lurt.ca

Alexandra Baldassarra
Senior Policy Advisor
Emerging Technologies Office
Ontario Ministry of Transportation
T: (437) 332-5062
E: alexandra.c.baldassarra@ontario.ca