

# Niagara Region On-Demand Transit

Public Works Committee – November 5, 2019

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# Agenda

- Background
- Fixed-Route versus On-Demand
- Why Via?
- Niagara Feasibility Study
- Next Steps

# Background

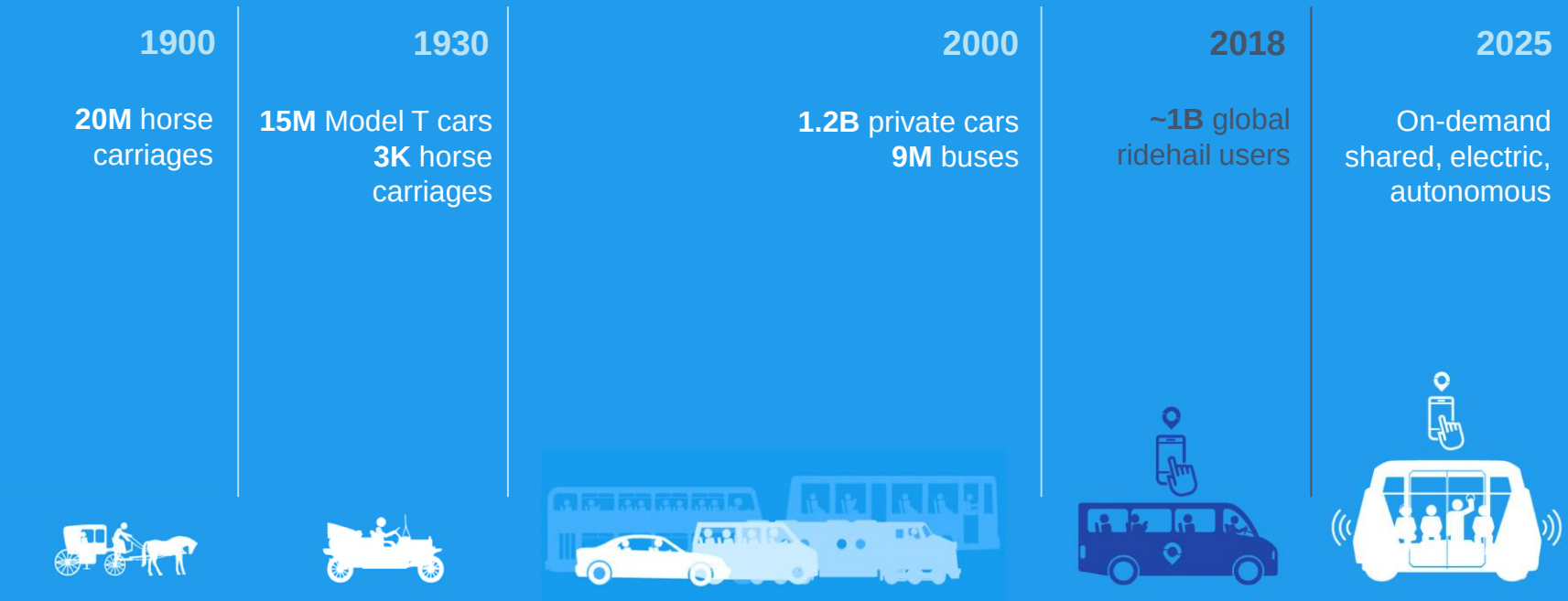
- IMT Service Enhancement Implementation Strategy (LNTC-C 21, 22, 23, 2018) identified NRT expansion pilot projects for Niagara West, as well as Pelham and Lincoln connections
- Niagara Transit Service Delivery and Governance Strategy (Dillion, 2017)
  - Crystal Beach and Sherkston connectivity
- NRT service expansions approved in 2019 Operating Budget
- Modelling simulation done in coordination with IMTWG
  - Part of IMTWG/LNTC workplan
- Jurisdictional challenges pushed Niagara West IMT implementation to 2020

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# Transportation is facing unprecedented transformation



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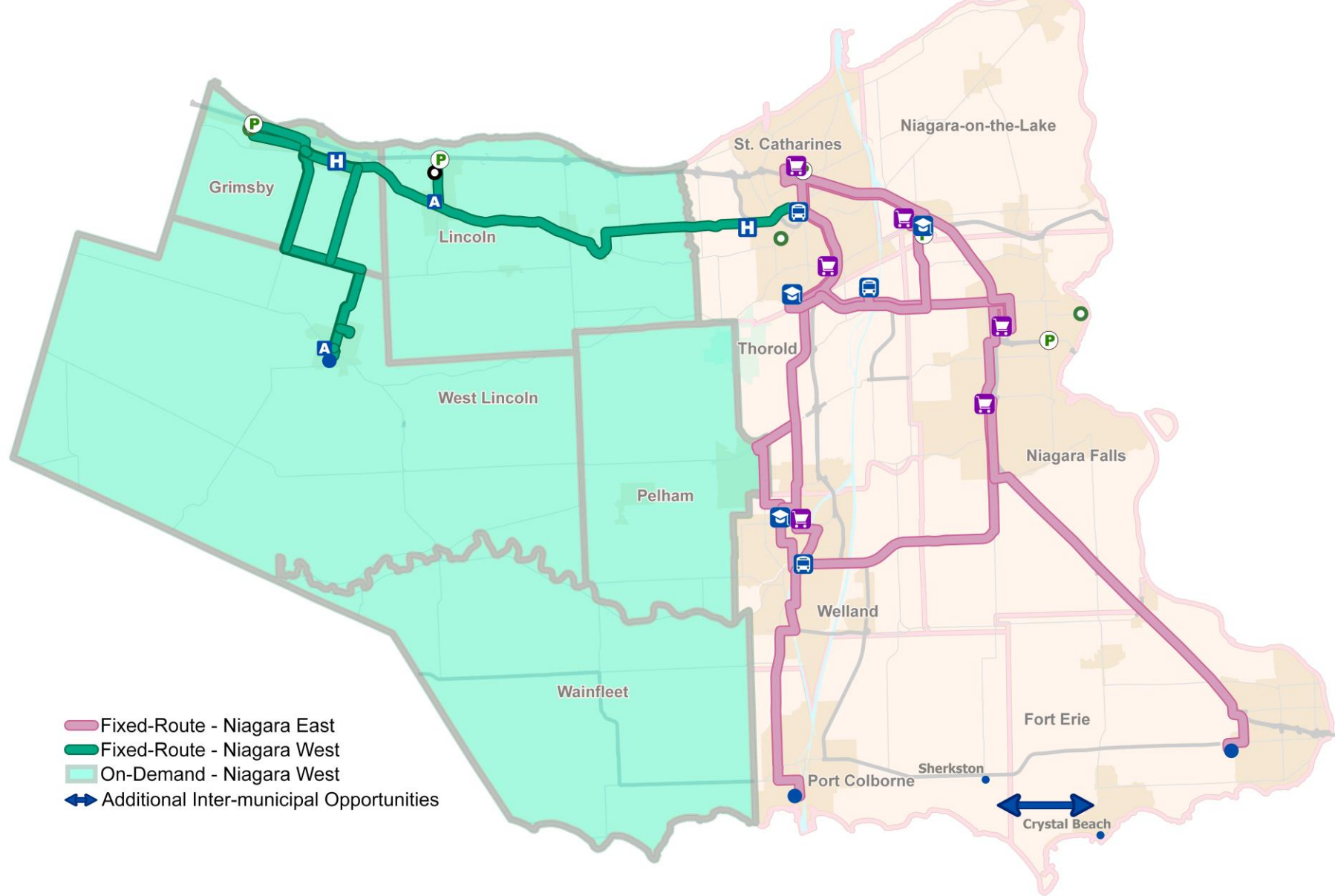
# Fixed-Route versus On-Demand

## Fixed-Route

- Limited area coverage
- Relies on peak demand to maximize vehicle utilization = EMPTY BUSES
- Requires 4 months to adjust schedules and routing
- Requires a special license, limited driver pool
- Limited data

## On-Demand

- Complete area coverage
- Vehicle utilization responds to demand in real-time
- Dynamically adjusts routing
- Requires standard G license, increases potential driver pool
- Significant data analytic potential



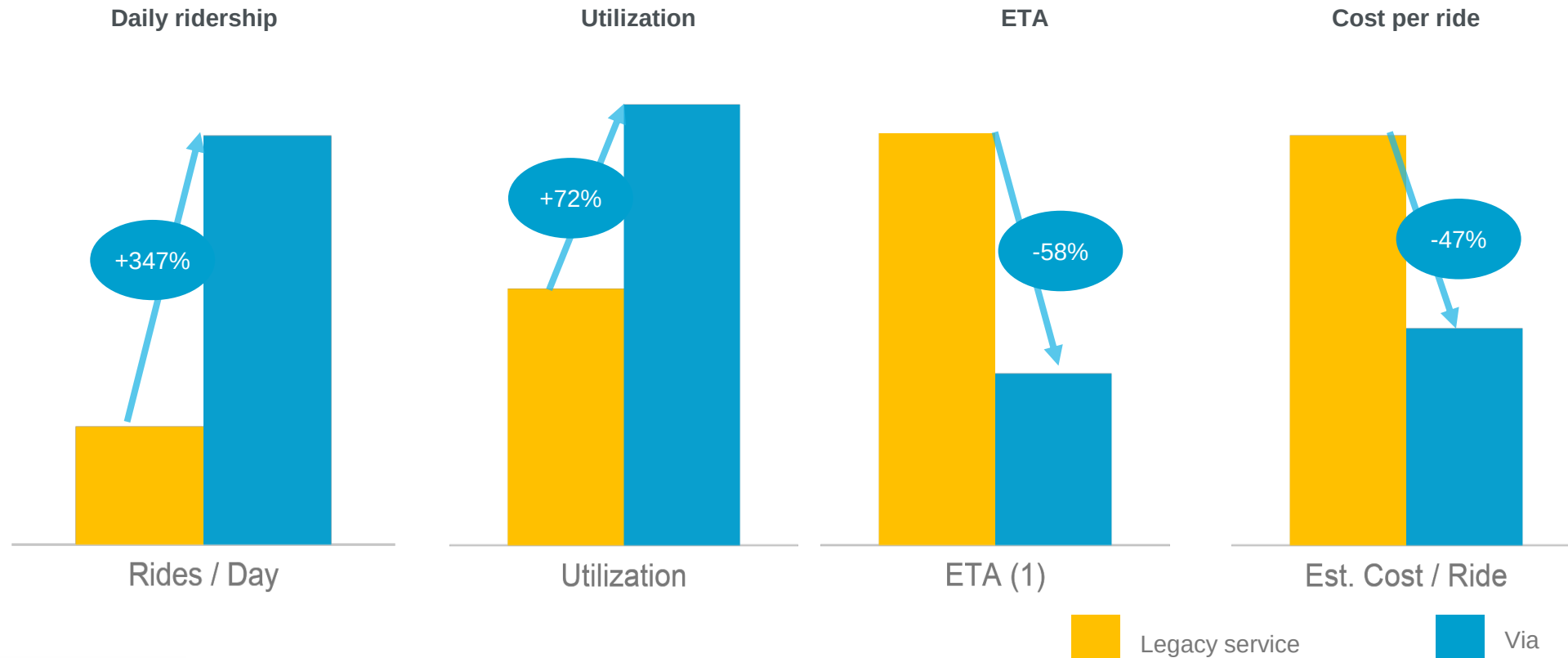
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# On-demand transit technology achieves significant improvement across multiple operational metrics



(1) Based on 60-min loop. Excludes 1-hour during AM/PM weekday peak with 30-min loop.  
Note: Utilization and cost figures estimated based on best available information.

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# Why Use Via?

## Consulting and Planning

In-depth analysis using proprietary approaches and tools to understand the potential for innovative mobility



## Microtransit Platform (SaaS)

Licensing Via's on-demand shuttle system to transit agencies and operators who prefer to use their own vehicles and drivers



## Microtransit Operations (TaaS)

Turnkey solution that includes technology plus drivers, vehicles, and operations management



## New Mobility Solutions

Mobility-as-a-Service (MaaS) products, demand management tools, school bus platforms, and more...



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# Via's Global Presence: Via, ViaVan and Partners

Global Deployments

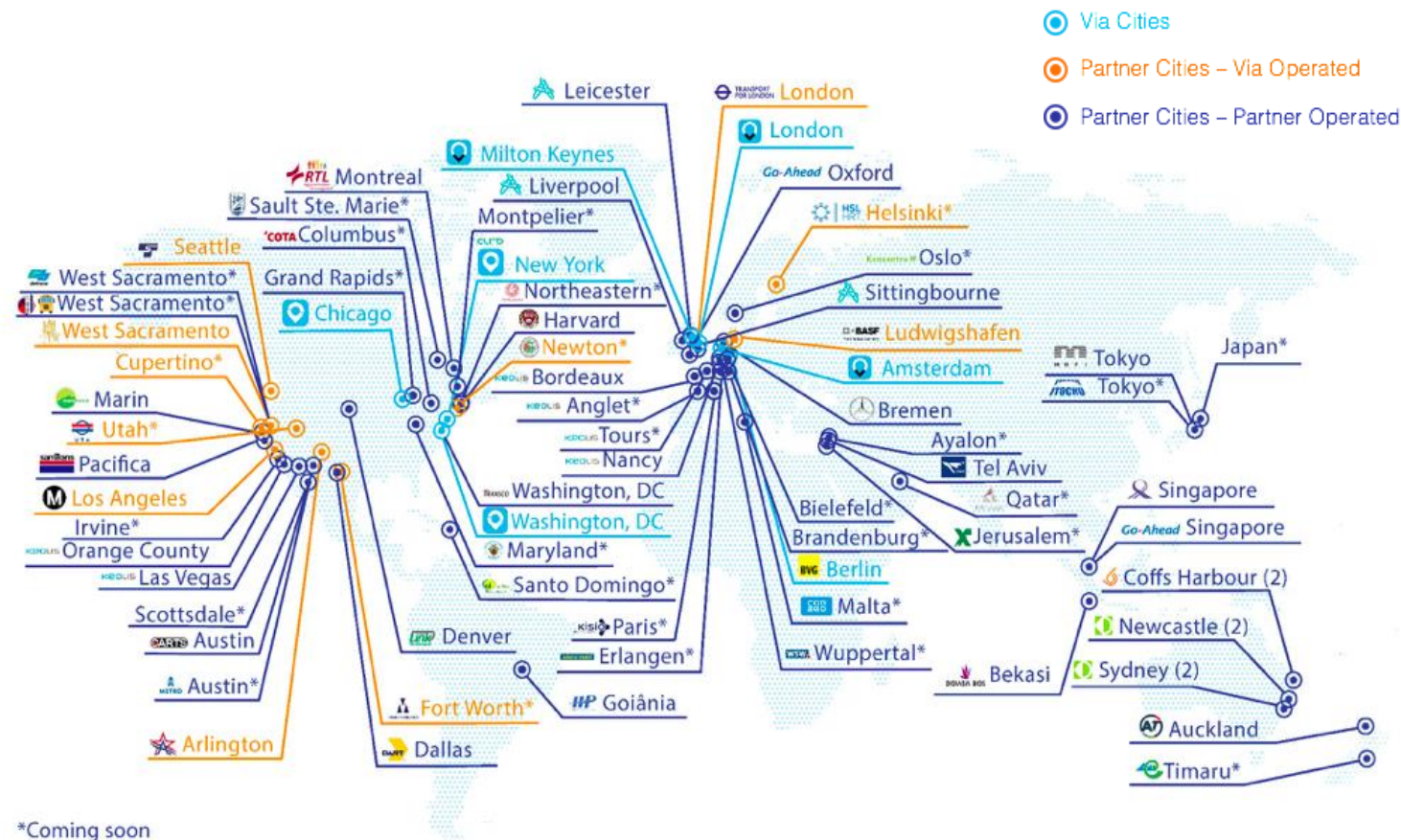
80+

Rides/Month

2m+

Engineers

225+



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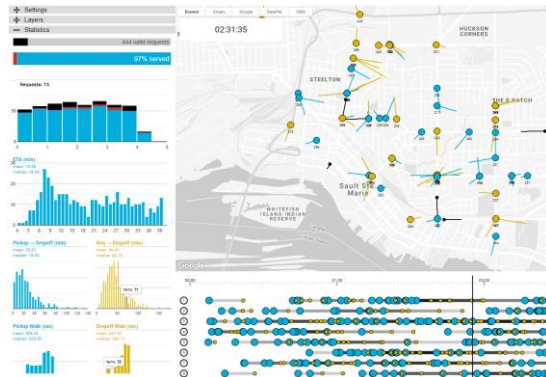
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# Via in Canada

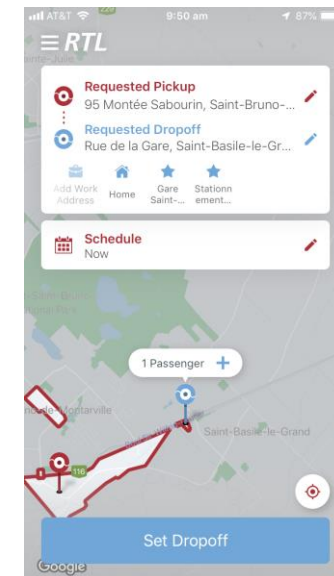
## Sault Ste Marie, ON

- Launched **September 2019**
- Provide on-demand service on **Sunday evenings**
- Goal: **reduce the number of vehicles** in operation and **improve quality** of service for residents
- **Utilization** in first few weeks of service has been outstanding and **exceeded expectations**



## Longueuil, QC

- Launched **October 2018**
- Provides **first mile, last mile** connection to **EXO stations** in St. Bruno de Montarville



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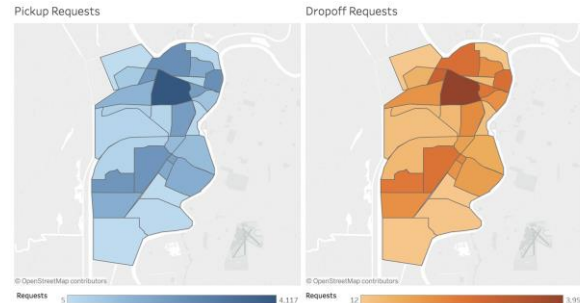
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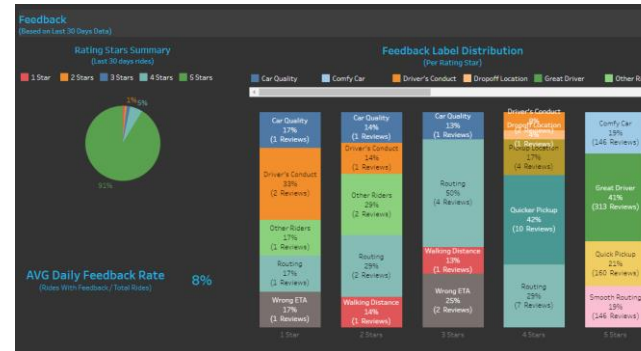


# Reports and Shared Data

## Destination



## Customer Feedback Dashboard



## And more including:

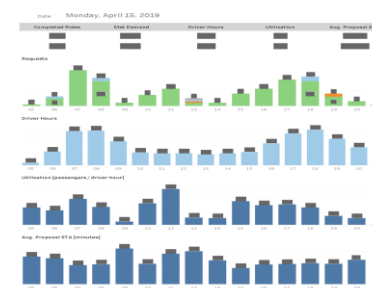
- Growth Dashboard
- Rides Table
- Daily Reports
- Bespoke reports

Via's experienced data science team will provide high-touch support and bespoke reports upon request

## Dashboard



## Report



## Efficiency Dashboard



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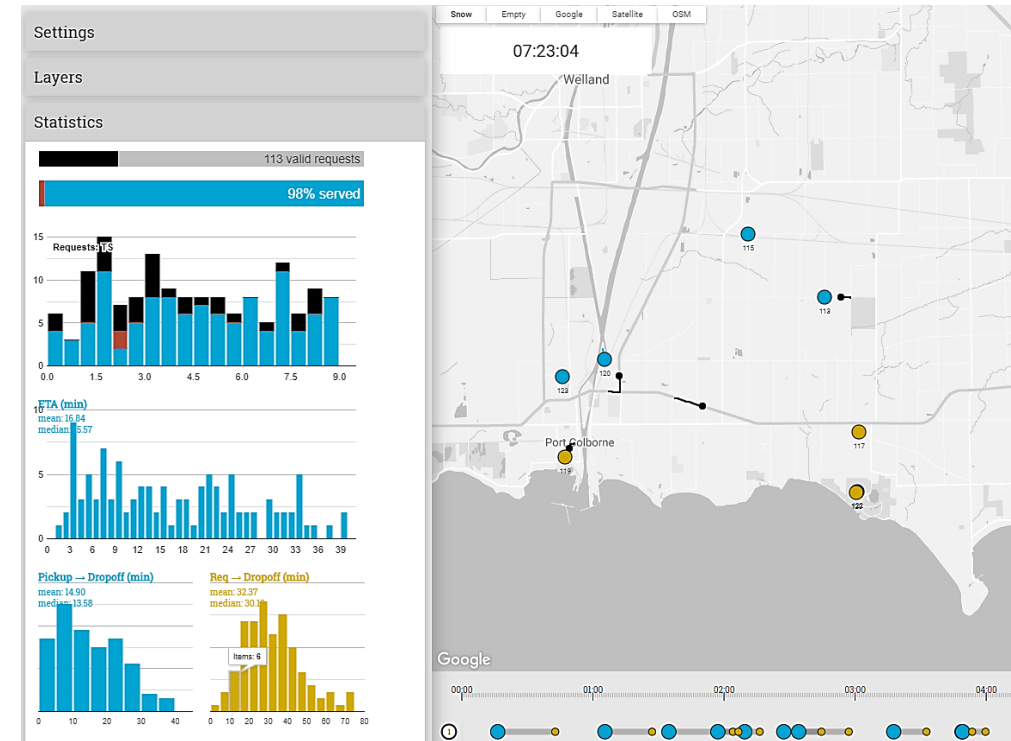
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# Niagara Feasibility Study

- **Project Goal:** To understand how **on-demand transit** can best provide coverage in low-density and under-served areas of Niagara (e.g., Western Niagara)?
- **Consultant:** **Via** (an on-demand transit planner, technology provider, and operator).
- **Scope of Work:**
  - Understand **existing transit options** (bus ridership data, specialized transit data, Transportation Tomorrow Survey).
  - Develop potential service '**scenarios**' (see following slides)
  - **Simulate** each scenario — number of vehicles, utilization (passengers per vehicle hour), wait times, walking distance, etc.
  - Agree on an **optimal** solution for inter- and intra-municipal transit options

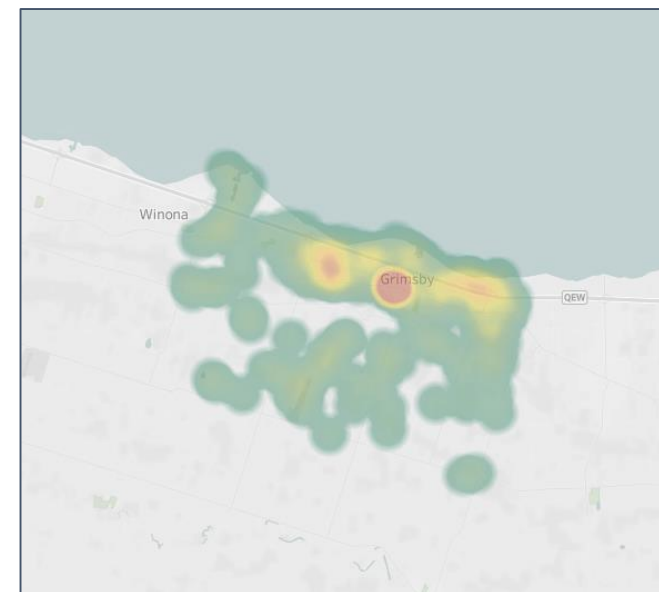


Screenshot of a simulation performed using Via's simulation tool. The map displays routing, pickups, and drop-offs, while the dashboard left of the map displays key performance indicators including the number of requests, wait time distributions, and pickup and drop-off walking distance.

# Overview of Simulations

## Assumptions

- Simulated **low**, **medium**, **high** demand scenarios
- Demand patterns were based on **Transportation Tomorrow Survey** and **specialized transit data** (see example demand heat map, upper right)
- **Wait times:** 20 - 30 min average, 60 min max.
- **Walking distances:** 100 - 200m average walk to pick up/drop-off, curb-to-curb where walking is unsafe or difficult.
- **Vehicles:** 6+ seat minivans recommended (see example vehicle, lower right).



*Example demand heatmap for Grimsby*



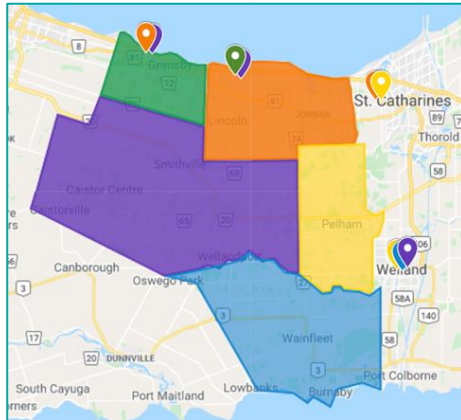
*Example vehicle type*

# Inter-municipal Scenarios

Niagara Regional Transit can only provide **inter-municipal** trips. However, residents also want to travel **within** their municipality. 'First Mile, Last Mile' (FMLM) options:

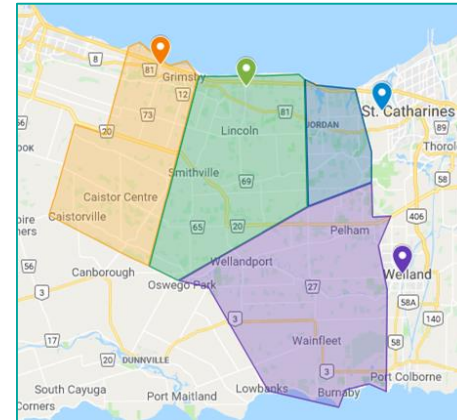
## Compliant FMLM Option (least flexible):

- Travel to nearest transit hub in another municipality **ONLY** (e.g., Grimsby residents must travel to Lincoln to connect to a bus/train)
- Requires another option for intra-municipal trips



## Non-compliant FMLM Option (more flexible):

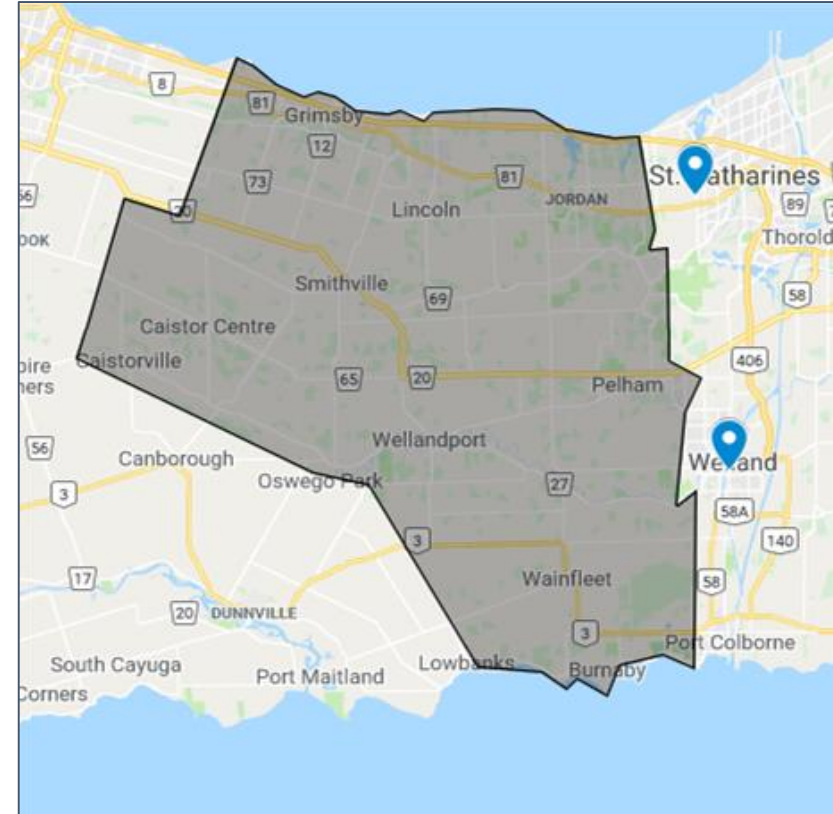
- Allow trips to nearest transit hub (even in same municipality)
- Based on their origin, each passenger will only have 1-2 possible destinations (transit hubs)



# Inter-municipal Scenarios

## Integrated / Most Flexible Option:

- All trips permitted (**between** or **within** municipalities)
- Most efficient option (\$)
- Connections to St. Catharines and Welland
- Requires partnership with each municipality in the defined zone.
- Zone boundary can be amended depending on local participation
- Separate municipal services **not required**



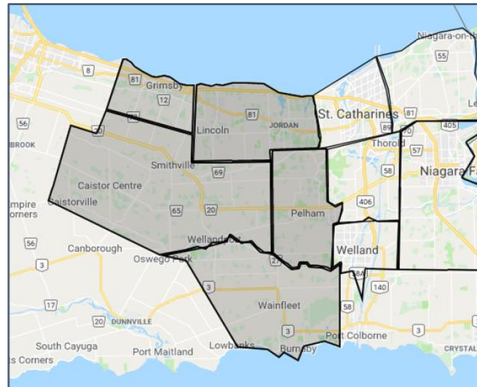


# Comparison Between Medium Scenarios

## Intra-municipal Scenarios

| Zone         | Zone Size (sq mi) | On-Demand (trips / day) | Vehicles (# of 6 seat vans) | Utilization (trips / vehicle hour) |
|--------------|-------------------|-------------------------|-----------------------------|------------------------------------|
| Grimsby      | 29                | 60 - 138                | 3 - 4                       | 2.2 - 3.8                          |
| Lincoln      | 60                | 46 - 108                | 3 - 4                       | 1.7 - 3.0                          |
| West Lincoln | 153               | 18 - 52                 | 3 - 4                       | 1.0 - 1.9                          |
| Wainfleet    | 89                | 4 - 23                  | 1 - 2                       | 0.5 - 1.3                          |
| Pelham       | 49                | 24 - 69                 | 2 - 3                       | 1.3 - 2.6                          |
| <b>Total</b> | <b>380</b>        | <b>151 - 390</b>        | <b>12 - 17</b>              | <b>1.5 - 2.5</b>                   |

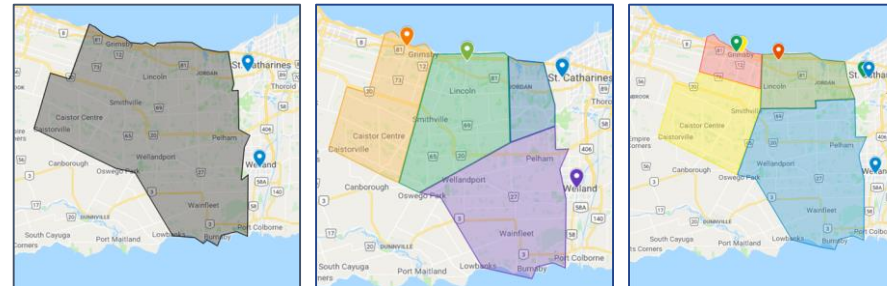
- 12 - 17 vehicles required (medium scenario)
- Estimated 150 - 390 trips across all zones
- **No** travel between zones (medium scenario would require 4-6 more vehicles)
- **No** connection to St. Catharines or Welland
- Confusing for riders



## Inter-municipal Scenarios (3x options)

| Zone                                                         | Zone Size (sq mi) | On-Demand (trips / day) | Vehicles (# of 6 seat vans) | Utilization (trips / vehicle hour) |
|--------------------------------------------------------------|-------------------|-------------------------|-----------------------------|------------------------------------|
| <i>a) Integrated Western Zone (below, left)</i>              | 380+              | 270 - 470               | 12 - 17                     | 2.5 - 3.1                          |
| <i>b) Nearest transit hub (below, center)</i>                | 380+              | 227 - 428               | 12 - 17                     | 2.1 - 2.8                          |
| <i>c) Nearest inter-municipal transit hub (below, right)</i> | 380+              | 205 - 413               | 12 - 17                     | 1.9 - 2.7                          |

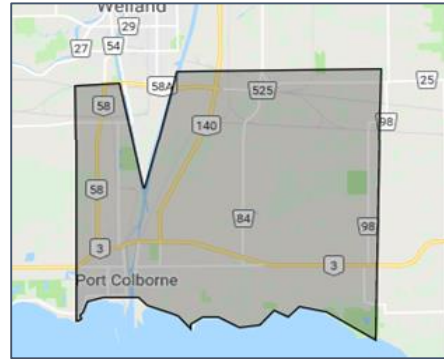
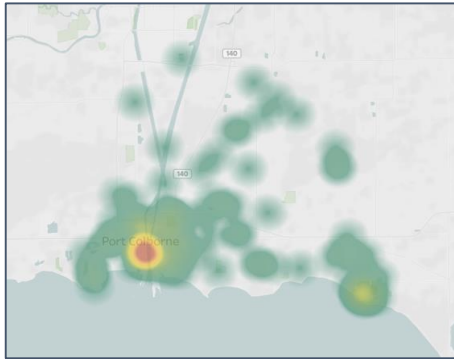
- Assuming 12 - 17 vehicles, more trips (270 - 470 trips day) could be completed (including intra- and inter-municipal trips)
- Less efficient if trips are restricted to transit hubs (b & c)



# Additional Inter-municipal Opportunities

## Port Colborne:

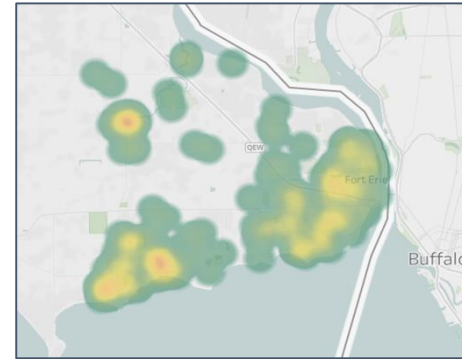
- Community bus completes **40 - 60 trips / day**
- On-demand service expected to complete **50 - 150 trips** per day across the entire municipality with 3-4 vehicles (medium scenario)
- Could complement community bus (during low demand periods)



Heat map and service area used to simulate on-demand transit

## Fort Erie:

- Existing buses (#750, #760, #770) complete **100 - 150 trips / day**
- On-demand service expected to complete **70 - 150 trips** per day across the entire municipality with 3-4 vehicles (medium scenario)
- Could complement existing fixed-route services (or potentially replace one or more fixed routes)



Heat map and service area used to simulate on-demand transit

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# Next Steps

## Service Model Design and Simulation ✓

Hours of operation,  
number of vehicles,  
zone identification

Advanced microtransit  
simulation measuring  
demand and expected  
quality of service (wait  
times, trip lengths, etc

01

## Model Confirmation

Submit  
Recommendations  
Report to Public Works  
Committee – Nov. 5

Confirm local  
partnerships

02

## Localization and Implementation

Finalize service design  
and prepare for  
implementation

Roll out applications and  
service for testing in  
preparation of launch

03

## Continuous Optimization

Ongoing support to  
ensure targets are  
being reached

04



# Questions?

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