

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

1900
20M horse
carriages



1930
15M Model T cars
3K horse
carriages



2000
1.2B private cars
9M buses



2018
~1B global
ridehail users



2025
On-demand
shared, electric,
autonomous



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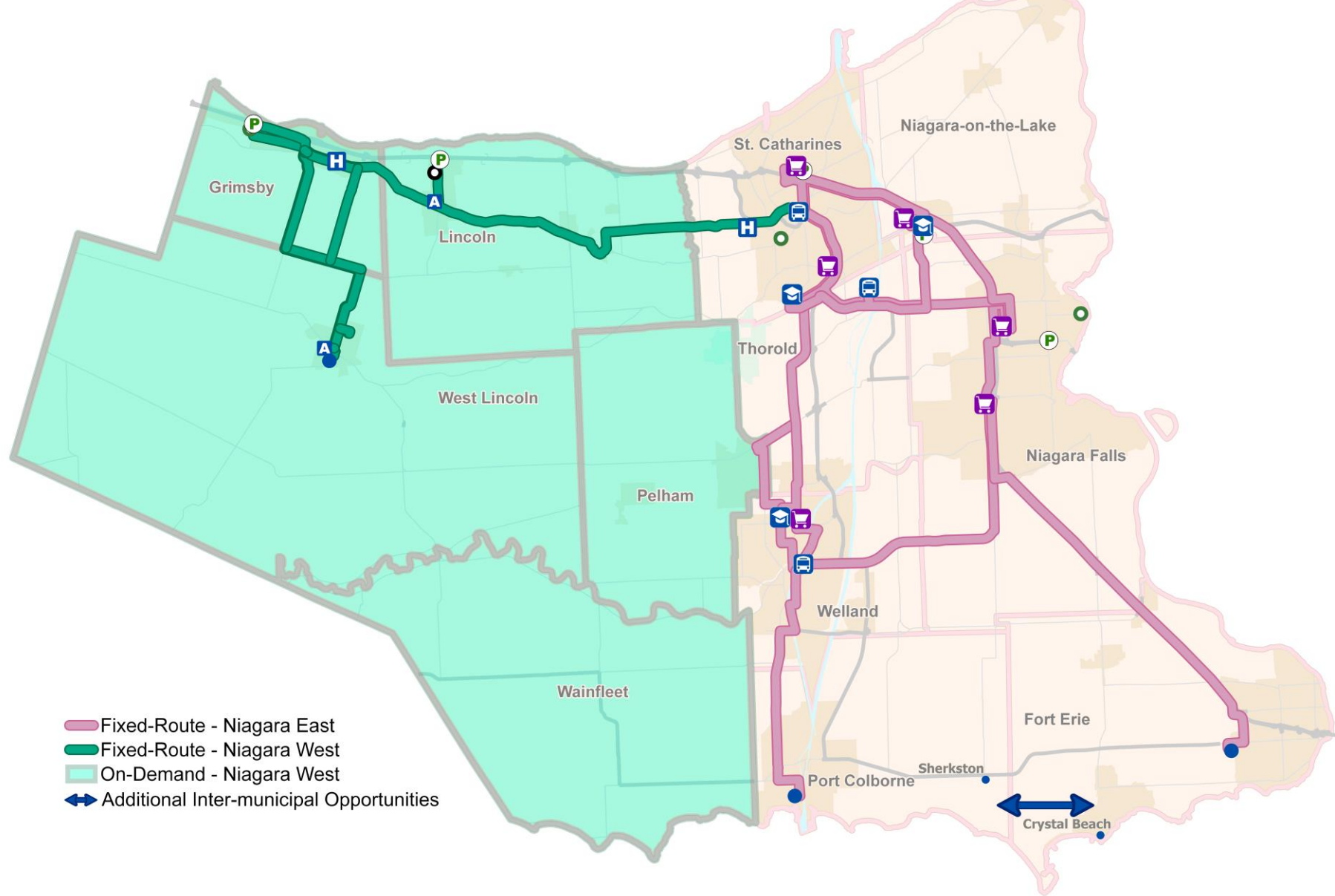
Fixed-Route versus On-Demand

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

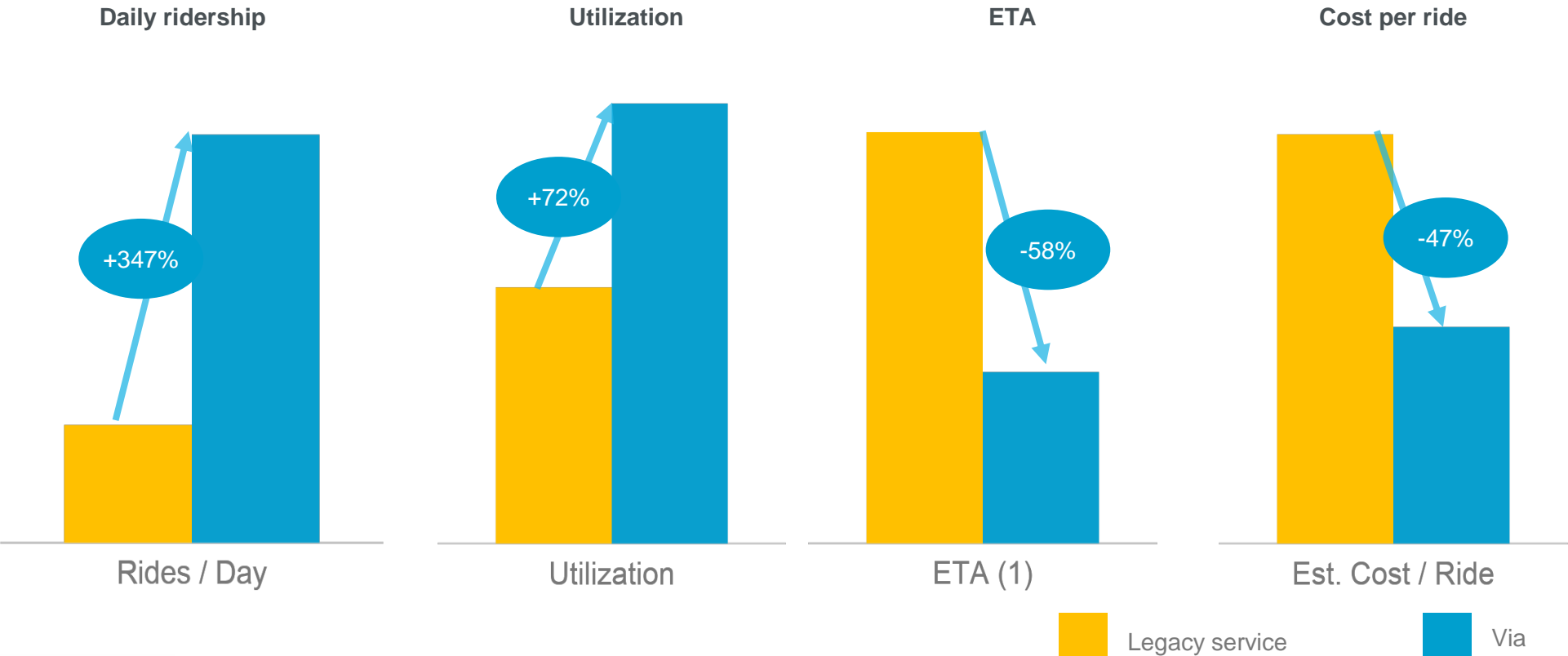


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On-demand transit technology achieves significant improvement across multiple operational metrics



(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

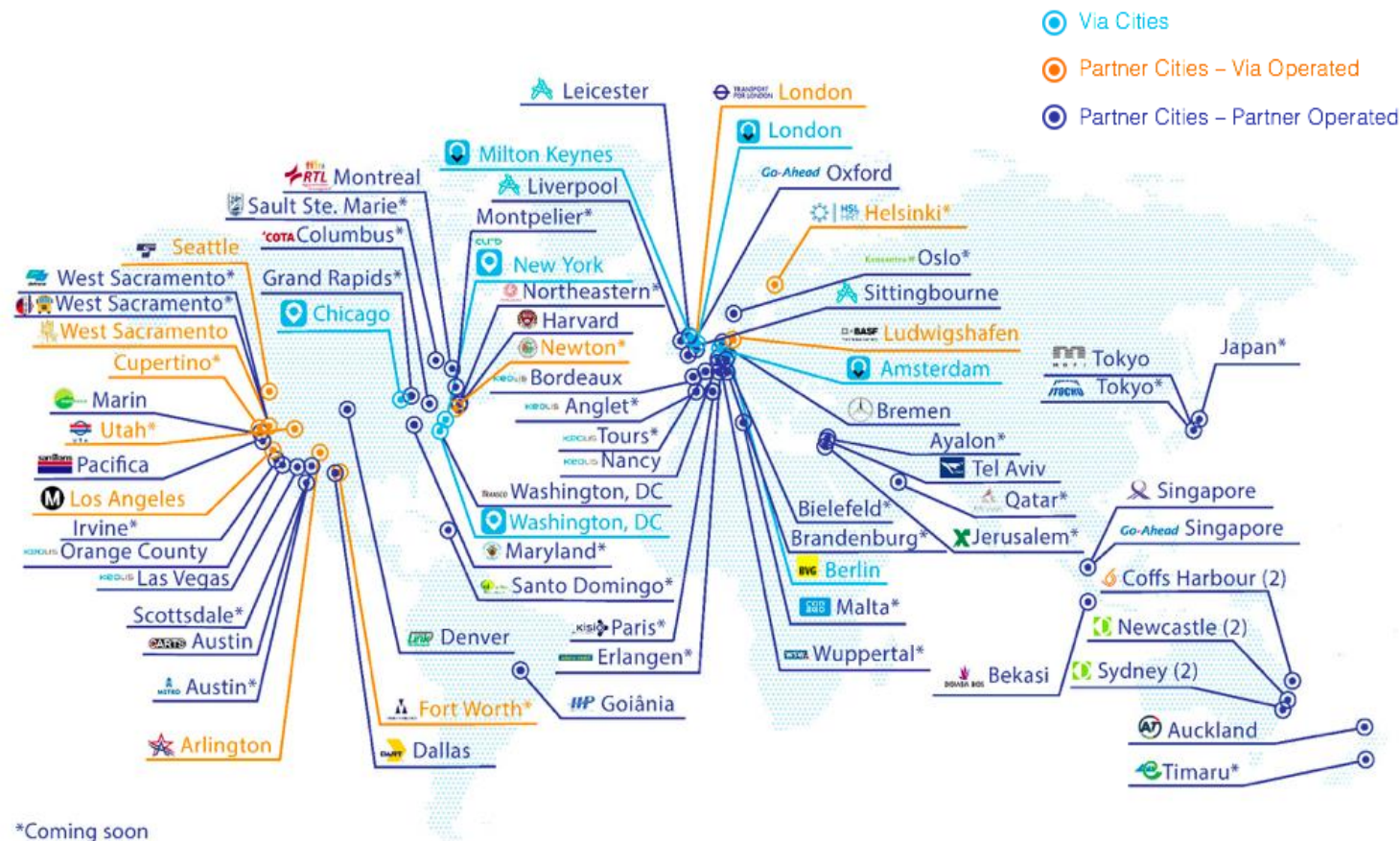
80+

Rides/Month

2m+

Engineers

225+



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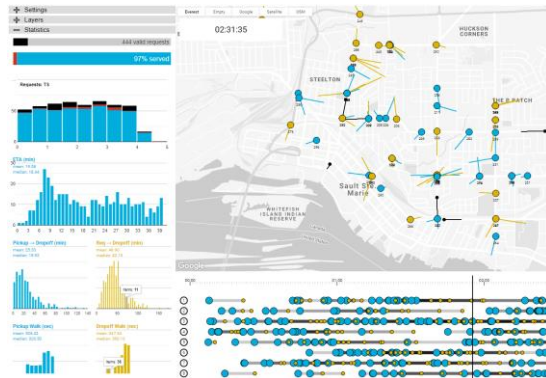
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Via in Canada

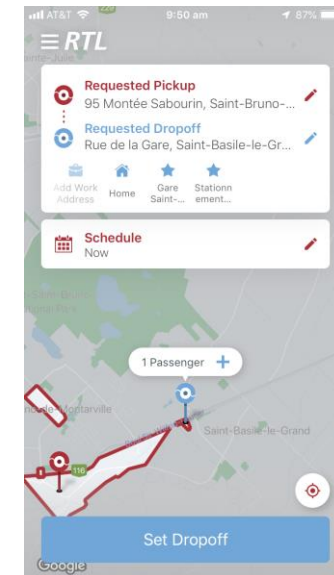
Sault Ste Marie, ON

- 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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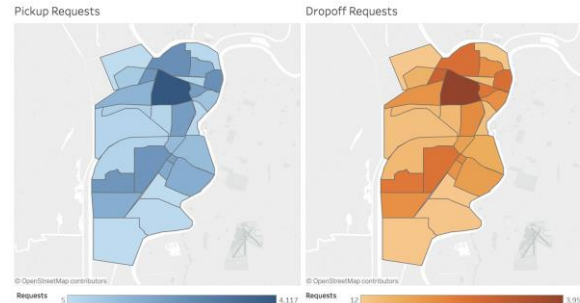
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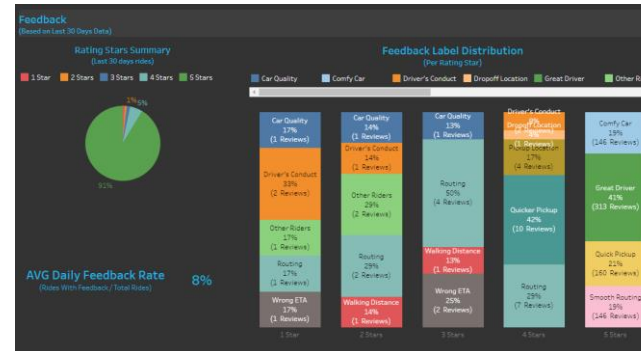
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Reports and Shared Data

Destination



Customer Feedback Dashboard



And more including:

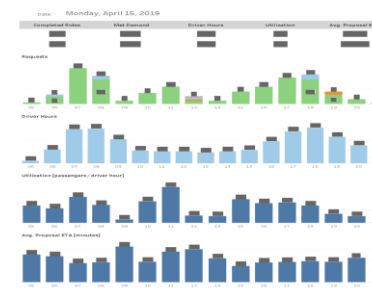
- *Growth Dashboard*
- *Rides Table*
- *Daily Reports*
- *Bespoke reports*

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

Dashboard



Report



Efficiency Dashboard



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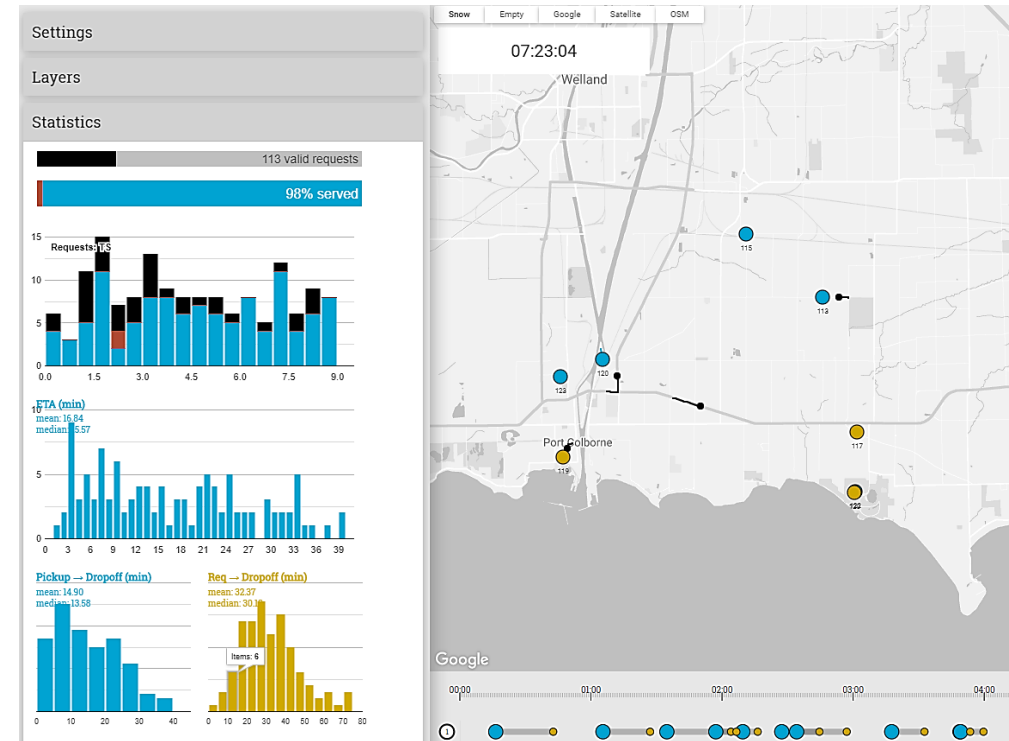
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Niagara Feasibility Study

- **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

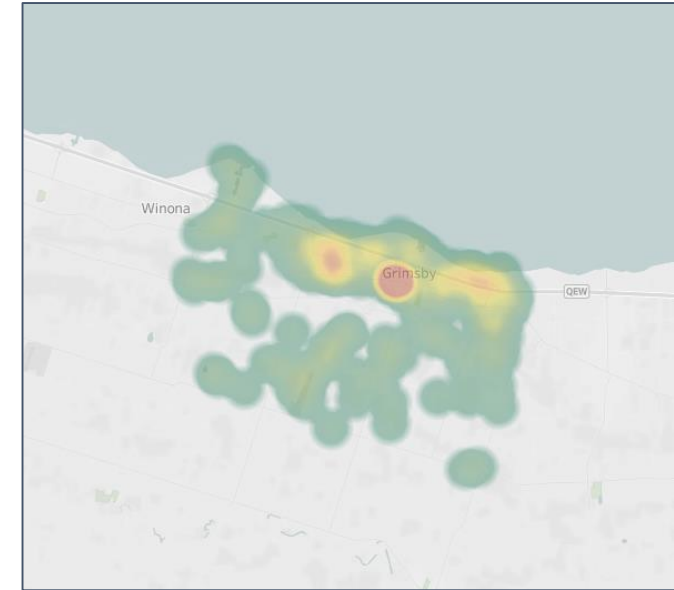


Screenshot of a simulation performed using Via's simulation tool. The map displays routing, pickups, and drop-offs, while the dashboard left of the map displays key performance indicators including the number of requests, wait time distributions, and pickup and drop-off walking distance.

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



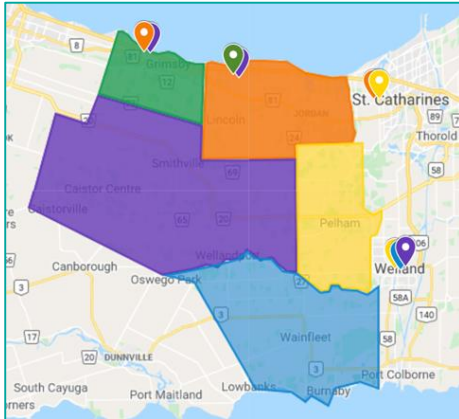
Example vehicle type

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:

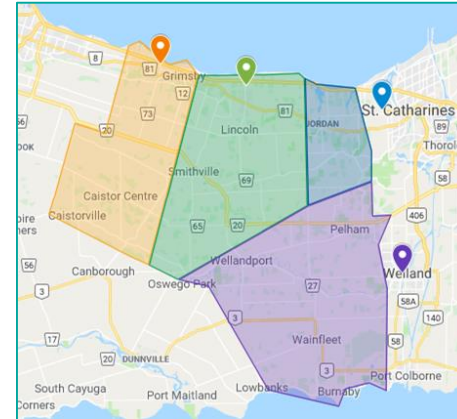
Compliant FMLM Option (least flexible):

- 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):

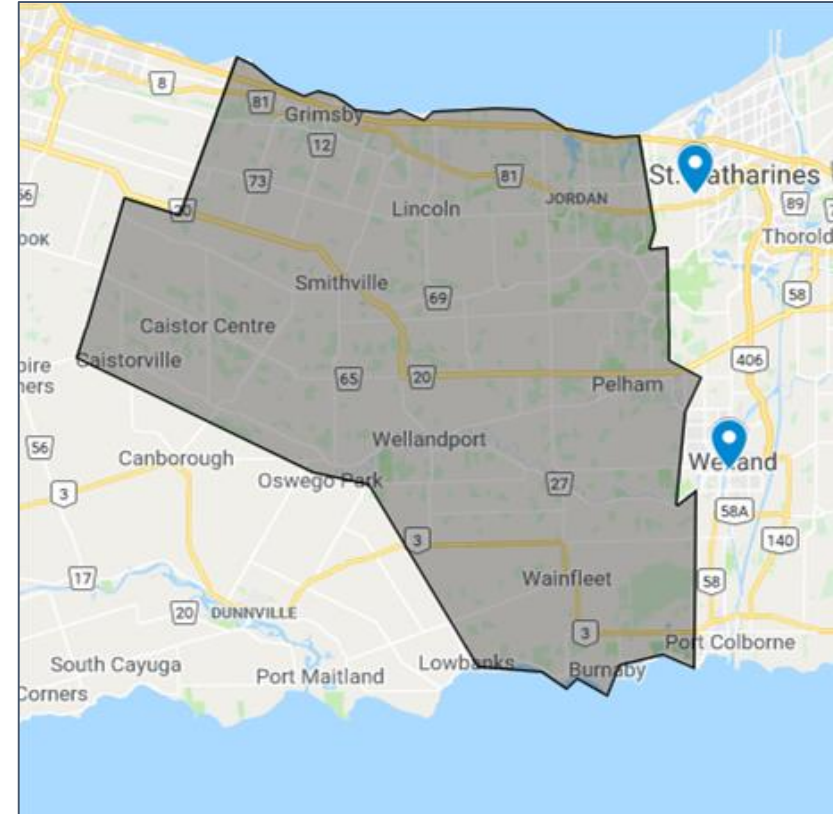
- Allow trips to nearest transit hub (even in same municipality)
- Based on their origin, each passenger will only have 1-2 possible destinations (transit hubs)



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**

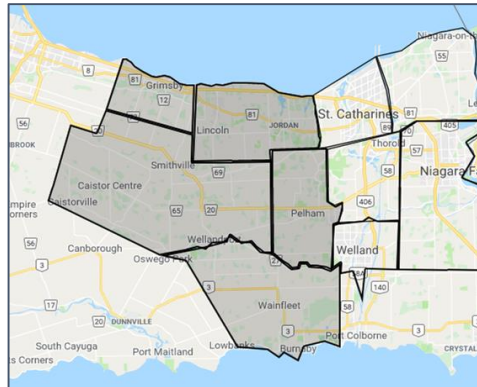


Comparison Between Medium Scenarios

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
Total	380	151 - 390	12 - 17	1.5 - 2.5

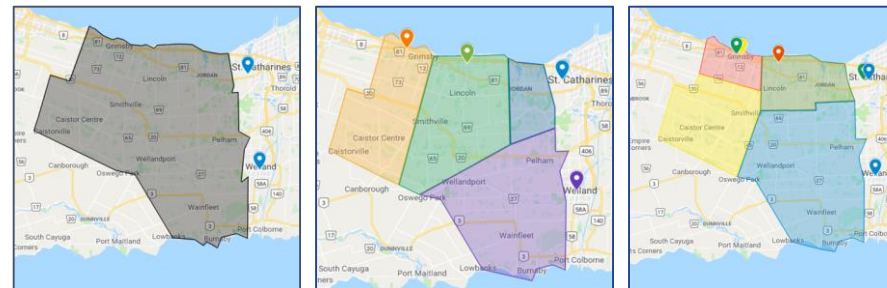
- 12 - 17 vehicles required (medium scenario)
- Estimated 150 - 390 trips across all zones
- No travel between zones (medium scenario would require 4-6 more vehicles)
- No connection to St. Catharines or Welland
- Confusing for riders



Inter-municipal Scenarios (3x options)

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

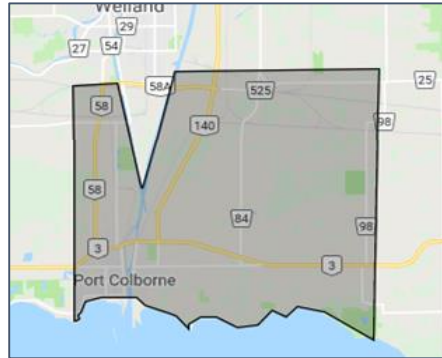
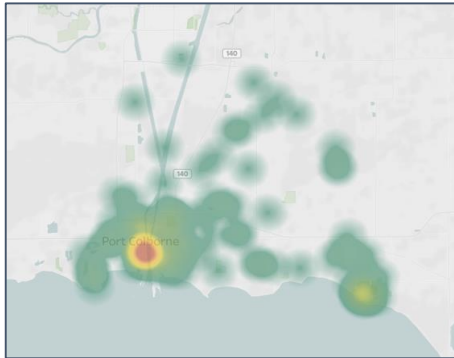
- Assuming 12 - 17 vehicles, more trips (270 - 470 trips day) could be completed (including intra- and inter-municipal trips)
- Less efficient if trips are restricted to transit hubs (b & c)



Additional Inter-municipal Opportunities

Port Colborne:

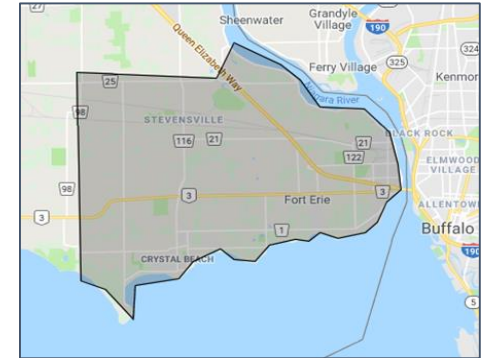
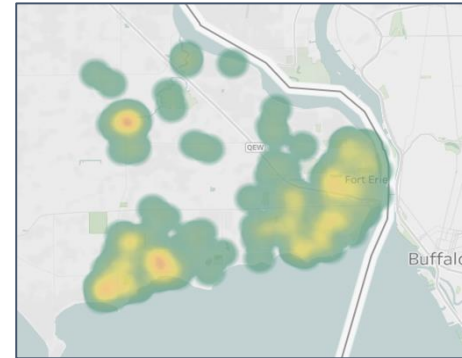
- Community bus completes **40 - 60 trips / day**
- On-demand service expected to complete **50 - 150 trips** per day across the entire municipality with 3-4 vehicles (medium scenario)
- Could complement community bus (during low demand periods)



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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