



TRANSIT WINDSOR

On Demand Transit Strategic Assessment

Final Report



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Table of Contents

1.0	Introduction	1
1.1	Purpose	1
2.0	Guiding Principles	2
2.1	Customer Experience	2
2.2	Accessibility and Availability	2
2.3	Community Impact	3
2.4	Operations	3
3.0	Applications of On Demand Service	5
3.1	Background	5
3.2	When is On Demand Service Appropriate?	5
3.3	Service Delivery Models for On Demand Transit.....	6
3.4	Considering On Demand Service for Windsor	7
4.0	On Demand Opportunities in Windsor	9
4.1	Potential On Demand Areas Identified in the Plan	9
4.2	Additional Candidate Areas for On Demand Service	13
5.0	Recommended Operating Model	30
5.1	Operating Model Options	30
5.2	Integrated Service Model.....	31
5.3	Cost Implications.....	34
5.4	Alignment with Guiding Principles.....	36
5.5	Recommendation.....	38
6.0	Stop Type Model	39
7.0	Short-term Service and Implementation Plan	43
7.1	Short-term Phasing Plan	43
7.2	Implementation Requirements.....	45

7.3	Next Steps	58
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Figures

Figure 1	Potential On Demand Areas Overlaying Approved Network	10
Figure 2:	Existing Service in East Windsor	14
Figure 3:	Planned Service in East End Windsor	15
Figure 4:	Existing Service - Devonshire Heights and Walker Farm	23
Figure 5:	Planned Service - Devonshire Heights and Walker Farm	23

Tables

Table 1:	Criteria for Fixed-Route versus On Demand Transit.....	8
Table 2:	Planned Headway (in minutes) by Route, Day, and Period	15
Table 3:	East Windsor - Service Accessibility and Route Alignment	16
Table 4:	Existing Operating Statistics – Ottawa 4 and Lauzon 10	18
Table 5:	Planned Operating Statistics and Projected Ridership	19
Table 6:	East Windsor - Level of Service and Route Productivity.....	20
Table 7:	Resource Comparison for East Windsor	21
Table 8:	Planned Headway (in minutes) by Route, Day, and Period	24
Table 9:	Devonshire Heights and Walker Farm - Service Accessibility and Route Alignment.....	25
Table 10:	Existing Operating Statistics – Routes Central 3 and South Windsor 7	26
Table 11:	Planned Operating Statistics and Projected Ridership	27
Table 12:	Devonshire Heights and Walker Farm - Level of Service and Route Productivity	27
Table 13:	Summary of Service Hour Requirements -Existing and Planned Fixed Route	29
Table 14:	Cost Implications of Ultimate Service Delivery Models.....	35
Table 15:	Evaluation of Operating Models.....	36
Table 16:	Evaluation of Stop Type Models.....	40
Table 17:	East Windsor – Lauzon 10 Pilot Costing	44
Table 18:	Devonshire Heights and Walker Farm – Year 2 Costing	45
Table 19:	Terminal Location for Recommended On Demand Service Areas	48
Table 20:	Potential Short-term Hourly Trip Booking Calls by Phone	51
Table 21:	Potential Key Performance Indicators.....	58

1.0 Introduction

1.1 Purpose

In order to be fully eligible for COVID-19 pandemic recovery funding, the Province of Ontario has indicated that transit agencies must consider alternative service delivery approaches using technology, including microtransit or other On Demand transit service. In addition, the Province has made funding available to assist transit systems with completing assessments of the potential for alternative service delivery approaches, like those described above.

The purpose of this report is to complete an assessment of alternative service delivery approaches for Transit Windsor in order to meet the requirements for funding support from the Province, and to provide a guide for next steps in considering where an On Demand transit service model may be considered within the Transit Windsor service area. Pursuant to the above, this report will:

- Confirm guiding principles for the successful implementation of an On Demand transit model in Windsor;
- Evaluate On Demand service options that may be suitable in the City, aligned with the guiding principles set by Transit Windsor;
- Identify a model to be initially piloted in Windsor in the short-term. This will include:
 - Identification of service area;
 - Specific hours of service;
 - Anticipated ridership;
 - Identification of an operator; and
 - Anticipated operating costs.
- Identify long-term potential service areas or periods to expand On Demand transit services;
- Develop an implementation plan and software requirements that:
 - Integrates On Demand with the conventional transit service already in place;
 - Considers how this initiative may integrate with specialized services in the future;¹
 - Considers how fares will be collected and integration with Intelligent Transit Systems (ITS); and
 - Identifies policies and procedures.
- Identify metrics for measuring success.

¹ While it is recognized that specialized transit is operated under separate contract, it is also important to understand the long-term potential to have specialized transit operate an integrated On Demand transit service.

2.0 Guiding Principles

Guiding principles are a set of values established by an organization that form a framework for decision-making. These were used to develop and assess alternative On Demand service options for Transit Windsor. A working session was held with Transit Windsor staff to determine a set of guiding principles for On Demand transit. These are noted below.

2.1 Customer Experience

Customer experience speaks to a customer's perception of their holistic experience with an organization or service. In the case of Transit Windsor, customer experience is the result of every interaction that a customer will have with Transit Windsor staff, assets (buses, transit stops), or interfaces (booking trips where required, planning a trip, or purchasing fare media). As a guiding principle, the recommended On Demand transit service will reflect the following elements to ensure a positive customer experience:

- **Brand:** The On Demand service, including buses, bus stops, and drivers, should be easily identifiable by customers as part of Transit Windsor's family of services.
- **Safety:** The service is committed to ensuring the safety of all customers, drivers, and other road users. If not operated by Transit Windsor staff, any contracted entity will provide all required training provided to Transit Windsor bus operators.
- **Reliability:** Transit Windsor provides a high quality of service to residents and visitors to the city. It is critical that any new On Demand service reflects these values, and is consistently reliable in terms of:
 - An on-time performance of 99% (based on designated pick-up / drop-off window); and
 - Availability of vehicles to accommodate a trip request made within the acceptable booking window (95%).
- **Level of Service:** The minimum booking time and travel time (taking into account transfers) for an On Demand service should be the same or better than the fixed-route service frequency and travel time that is being replaced. Where the On Demand service is in a new unserved area, the same service standard should apply based on fixed-route local services in the vicinity.

2.2 Accessibility and Availability

Accessibility and Availability speaks to a service that can be used by people of all ages and abilities to make a trip within their community. This includes the ability to easily and comfortably plan, book and pay for a trip, access a pick-up point and travel in the vehicle, when they need to make a trip.

As a guiding principle, the recommended On Demand service will reflect the following elements to ensure accessibility and availability:

- **Booking:** To ensure that the On Demand service will be as accessible as possible, customers should be able to book their ride using a mobile app, over the phone, and on the computer. Assisted phone booking for persons within a mobile phone or internet access should be available during the entire duration of the On Demand service.
- **Stops Type and Location:** Any On Demand service recommended for Transit Windsor will make use of stops (either signed or virtual) as opposed to a curb to curb based service. Stops served On Demand should be spaced to ensure 95% of the population/employment in the service area is within 400 metres walking distance of a stop.
- **Accessibility:** To ensure fair and equitable access to transit service, any proposed On Demand service should be as accessible as possible for all customers. This means:
 - Stop locations (signed or virtual) should meet Transit Windsor accessibility requirements (paved surface, curb cut and access to sidewalk); and
 - An accessible trip must be made available to a passenger that requests an On Demand trip. This could be achieved by using an accessible vehicle, or providing a complete curb-to-curb trip for registered specialized transit customers using a Handi-Transit vehicle.

2.3 Community Impact

Community Impact speaks to the impact that the proposed On Demand service might have on both the local community and the broader environment. As a guiding principle, the recommended On Demand service will reflect the following elements to ensure a positive community impact:

- **Ridership Growth:** The proposed On Demand service should provide a high level of service to attract customers that had previously not used fixed-route service.
- **Reduce GHG Emissions:** The service should operate efficiently, minimizing non-revenue vehicle time/kilometers where vehicles are contributing to traffic and GHG emissions. When possible, Transit Windsor will also consider the introduction of electric vehicles to the fleet.
- **Stop Locations:** Avoid locations on residential property, where possible.

2.4 Operations

Operational principles speak to how the service is structured and delivered. These principles are important to ensure that it is responsive to the changing needs of both the community, and to Transit

Windsor and/or the operator of the new service. This will help to ensure that On Demand service will be integrated and optimized with the family of services offered by Transit Windsor:

- **Service Control:** Transit Windsor will have overall control of the On Demand service with the ability to troubleshoot or override the system if the need should arise.
- **Scalable and Adaptable:** The proposed On Demand service should be scalable and adaptable in order to allow it to respond to future needs or opportunities, for example, integration with new technology, or changing customer demands.
- **Efficiency:** The service should be considered to replace fixed-routes that are operating at or below productivity targets set by Transit Windsor as described in the approved Transit Master Plan.

3.0 Applications of On Demand Service

3.1 Background

On Demand transit is a shared-ride, demand-responsive public transit service. The service model does not follow a fixed-route or schedule. Instead, customers must pre-book trips and vehicles are routed dynamically to the passenger's pick-up and drop-off point.

Modern On Demand services utilize mobile app technology, which allows customers to plan, book, track and pay for their ride in real-time.

The software application generates a real-time dynamic route that is optimized to provide a balance between customer convenience (e.g. travel time) and efficiency (e.g. ridesharing).



3.2 When is On Demand Service Appropriate?

On Demand transit service is often introduced in new, low density communities, or in communities where fixed-route transit service would not be an effective means of transportation. In established communities like Windsor, On Demand transit can provide an additional layer of service to places where a fixed-route service is not effective. Service in these areas typically provides connections for within that service area, or connects customers to the nearest terminal or transit hub where they can connect to conventional transit service.

It is important to note that the introduction of On Demand transit services is not a one-size fits all solution and is not applicable in all contexts. There are many situations where continuing to provide and enhance fixed-route service will provide the most convenient level of service for customers, and will be more cost-effective. For example, fixed-route service in dense areas still carries high numbers of customers far more efficiently than On Demand models would, and it is unlikely that this type of service should be considered along the busy Transit Windsor Transway corridors.

There are three reasons to introduce On Demand transit.

1. Improve the effectiveness and customer-experience of a fixed-route service that does not meet minimum ridership thresholds

2. Introduce service in an area or during a period that does not warrant fixed-route transit service due to low demand
3. Provide a second layer of transit service on top of fixed-route services to increase ridership

3.3 Service Delivery Models for On Demand Transit

On Demand transit service can be structured in a number of different ways, depending on the goals of the municipality and the market in which the service operates in. Some typical service delivery models include:

1. **Origin-to-Hub (First-Mile/Last-Mile)** - On Demand transit provides mobility to customers in lower demand areas to/from the nearest fixed-route transit stop. In this way, this service model provides first-mile/last-mile connectivity to the rest of the transit network, with the majority of a passenger's overall journey undertaken on fixed-route transit. Where possible, the connecting stop is typically a major hub/terminal, transfer point or stop that allows customers to complete their trips from a safe and accessible transfer point, connecting to multiple routes. The model is typically implemented in low density areas where fixed-route transit is uneconomical, is not offered, or to supplement an existing low-frequency fixed-route service.
2. **Origin-to-Destination** - On Demand transit vehicles provide a one-seat ride to connect any origin with any destination in the service area. This means that transfers are not required to a fixed-route service. This model is typically implemented in larger low-density geographic areas where there is no fixed-route service or in smaller geographic areas where it does not make sense to force a transfer. This model can be combined with an Origin-to-Hub model, where Origin-to-Destination is used for internal trips within an On Demand zone and Origin-to-Hub is used to connect customers outside of the On Demand zone.
3. **Flex-Route** - This is a simple form of On Demand transit which is typically implemented in low-demand areas and allows the transit agency to provide additional coverage using a limited resource. Flex routes operate on a fixed-route and fixed-schedule for certain portions of the route. However, at the request of a passenger, the driver has the ability to 'flex' off the route to pre-designated areas to pick up or drop off a passenger. The benefit of flex routes is that it allows the resource to provide coverage to a larger area that may have limited demand without the need to invest in additional service. Extra travel time would need to be included in the route schedule to allow the driver to flex off the route based on a passenger request.

A high-level assessment of Transit Windsor confirmed that a city-wide Origin-to-Destination model in Windsor would not be effective and was not considered further in the analysis. On Demand transit services operate effectively when ridership is below 10-12 boardings per revenue vehicle hour. System-wide ridership for Transit Windsor was 29.7 boardings per revenue vehicle hour in 2019, and is expected to increase with the service improvements recommended in the Transit Master Plan. This level of service productivity is more suited to a fixed-route system and converting it to a pure On Demand

service would result in an increase in vehicles and associated revenue vehicle hours, and a likely decrease in customer satisfaction.

A flex-route model was also not considered suitable to Windsor. There are various complexities with flex-routes, with some stops being fixed and others requiring pre-booking. This may add further complication to passengers trying to learn a new system. These routes are also more suitable to rural or low density hamlet areas as opposed to urban areas, as those seen in the Transit Windsor service area. The most effective On Demand model for Windsor is an Origin-to-Hub model to connect passengers to Primary Transit corridors, combined with an Origin-to-Destination model to allow passengers to better connect to local neighbourhood destinations directly and without a transfer.

The remainder of this report will review and discuss where an Origin-to-Hub/Origin-to-Destination model might be an effective approach with in the Transit Windsor service area.

3.4

Considering On Demand Service for Windsor

The evaluation of alternative locations in Windsor to pilot an On Demand service was based on the criteria noted in **Table 1** below. The criteria used to select the most effective service model addresses:

- Impact to the customer experience (headways/waiting time, directness of service);
- Accessibility and proximity to the service; and
- Productivity of the route and the potential for cost savings.

These criteria were used to assess the potential to introduce On Demand transit in several areas within Windsor.

Table 1: Criteria for Fixed-Route versus On Demand Transit

Criteria	Fixed-Route	On Demand	Discussion
Level of Service and Route Productivity²	<p>Area justifies headways of 30 minutes or better.</p> <p>Ridership of above 15 boardings per revenue vehicle hour.</p>	<p>Area justifies headways of 30 minutes or longer due to low ridership.</p> <p>Ridership falls below:</p> <ul style="list-style-type: none"> • 15 boardings per hour (urban area with a single destination); • 10 - 12 boardings per hour (larger suburban area with multiple destinations); • 2 - 4 boarding per hour (large undeveloped or rural area). 	<p>When the frequency of any fixed-route is low, wait times to access service and the wait time to make transfers can be discouraging to customers. On routes where ridership is low enough to warrant 30 minute headways or longer, then On Demand service could be considered.</p> <p>In new service areas where ridership potential is uncertain, On Demand service can offer a lower risk scenario for transit agencies who are interested in offering a pilot service.</p>
Service Accessibility and Route Alignment	<p>Route can be aligned such that the majority of residents and/or destinations are in close proximity to transit stops (less than 400 m walking distance), while still remaining relatively direct with minimal deviations.</p> <p>High demand for service between similar origins and destinations along a clearly defined corridor.</p>	<p>Improving the proximity of service to residents and employees within a 400m walking distance of a stop necessitates the fixed-route to be indirect (i.e. one way, looping service).</p> <p>No clear origin / destination pairs along a particular corridor, or origins and destinations are more dispersed.</p>	<p>This criteria is typically a result of land use and community planning. For example, in neighbourhoods where different land uses are separated, and/or the community and the road network is circuitous, the topography is hilly or there is limited pedestrian infrastructure, it is harder to meet the 400m walkability guideline without having a very long and meandering (i.e. inefficient) fixed-route.</p> <p>When destinations are dispersed within a neighbourhood, or there's no clear major destination for those living in a particular area, then fixed-route service may be inefficient.</p>

² Note: The exact productivity rate is dependent of the geographic area and the operating model and cost implemented for On Demand service and should be used as a guide.

4.0

On Demand Opportunities in Windsor

The assessment of On Demand opportunities for Transit Windsor starts with the 2028 route structure recommended in the Transit Windsor Transit Master Plan. In the coming years, service will be significantly improved, nearly doubling the number of service hours currently provided. It is anticipated that annual revenue vehicle hours will increase from 267,100 hours (in 2019) to 554,150 hours in 2028. As this level of service and the route network has been approved as part of the Plan, they are presumed to be implemented. Therefore, all evaluation for On Demand service potential will be based on the future network, but informed by observed actual 2019 ridership on comparable routes in the existing network, adjusted at a high-level to reflect frequency improvements to the network.³

4.1

Potential On Demand Areas Identified in the Plan

The future transit network described in the Transit Master Plan identifies a grid route network with a hierarchy of routes defined to meet different levels of demand and varying trip type.

The recommended route network starts with a series of Primary Routes. These are direct-high frequency corridors that connect to major origins and destinations. Since these routes do not fit the characteristics described in **Table 1** for On Demand transit, no further analysis was undertaken on these routes.

Secondary Routes in the plan were designed to follow a general grid structure and are intended to “fill in gaps” between Primary Routes, as well as connect the major transit terminals. Secondary Routes run along arterial and collectors roads, supplementing service provided by Primary Routes. They are less direct than Primary Routes, and they may meet some of the criteria outlined in **Table 1** above. Therefore, they will be considered as candidates for On Demand service.

Local Routes are defined by the plan as more traditional, circuitous routes that travel through a neighbourhood. The purpose of Local Routes is to collect customers in local communities and connect them to the nearest transit terminal or Primary or Secondary route for the rest of their journey. This serves a similar purpose to the Alternative Service Delivery areas (ASDs) also described in the plan, to collect customers and bring them to a transfer point where they can access high frequency routes to complete their trip. Therefore, both service types will be considered as candidates for On Demand service.

³ Ridership figures utilized in this analysis are from 2019, and therefore predate the impacts of the COVID-19 pandemic on transit ridership.

Finally, recognizing that time of day/day of week may also impact how a particular Secondary or Local Route might be evaluated, off-peak periods of the day, and days of the week with low ridership or no existing service will also be considered for On Demand potential.

To summarize, eligibility for On Demand service were considered in the following situations:

- Areas with no transit service in the plan, or identified as ASD zones in the plan;
- Areas identified in the plan as being served with Local or Secondary Routes; and
- Periods of day or days of the week with no service or low ridership on existing routes.

Areas outside of the municipal boundaries of the City of Windsor were not considered. However, there is a potential to expand service to include neighbouring communities, such as Tecumseth, to integrate and improve mobility in the regional area of Windsor.

Figure 1 illustrates the recommended Primary Grid and Highway Routes proposed in the Transit Master Plan. Gaps in the network and projected low ridership routes are identified as potential On Demand areas. Each of these are assessed below.

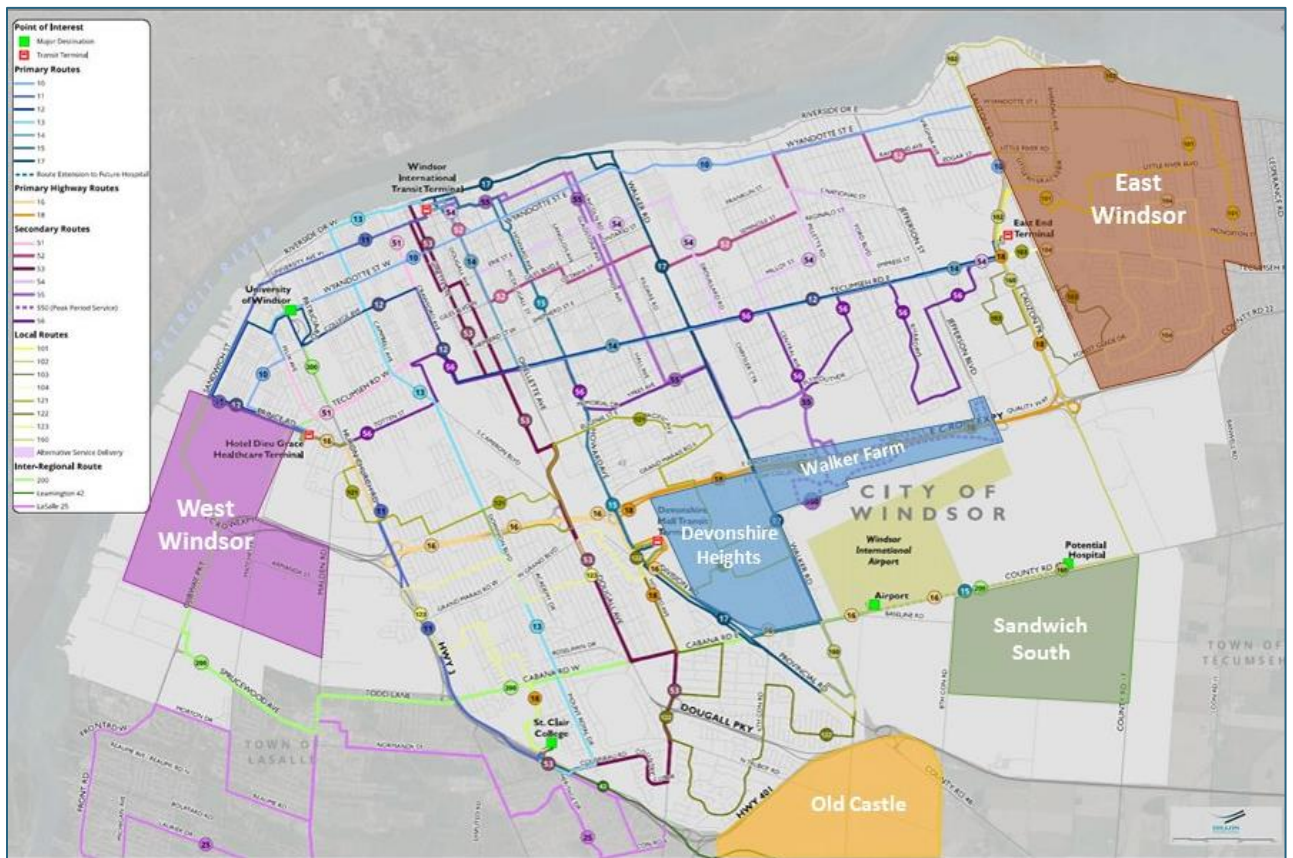


Figure 1 Potential On Demand Areas Overlaying Approved Network

The approved Transit Master Plan recommends several candidate neighbourhoods be served by an Alternative Service Delivery (ASD) model, or On Demand service. According to the Plan, if an area “is located in a low-density and/or emerging development area, ASD service is recommended to develop a ridership base.”⁴ The Plan goes on to identify minimum and target passenger boardings per revenue hour for ASD (four and ten, respectively) and notes that once the service achieves sustained ridership of over 15 boardings per hour, the On Demand service should be replaced by a fixed-route service(s).

The Plan identifies three low density and low demand areas within the Transit Windsor service area in which On Demand transit should be implemented. These are described in the following sections.

4.1.1 Sandwich South

Sandwich South Planning District is located just south of County Road 42 and bordered by Tenth Concession Road/County Road 17 to the east, Eighth Concession Road to the west, and Highway 401 to the south. Customers would be able to request rides within each service area, however, outside of the service area, the On Demand service will be able to connect to the fixed-route network at the future Hospital terminal.

The area is primarily rural farmland but has been designated as an ‘Future Urban Area’ and ‘Future Employment Area’ in Windsor’s Official Plan, which allows for the continuation of existing agricultural operations as a transitional use until detailed development plans are approved. Anticipated future growth over the next 20 years will include a variety of residential, commercial, institutional and industrial land uses, which includes a new regional hospital that will serve the future healthcare needs of Windsor-Essex County.

There is currently no transit service in the Sandwich South Planning District. However, the Plan has identified that this area would be served by On Demand service starting in 2028, in alignment with the anticipated opening of the new hospital site. Resources were budgeted in the amount of approximately 3,600 annual service hours for this service, and 1.0 peak hour bus.

Recommendation

Sandwich South is a growing future development area. Based on available information on future land use plans, and its proximity to adjacent land uses, it is not anticipated that this area will warrant fixed-route transit service in the short-term. Consistent with the recommendations of the Plan, based on this evaluation, early introduction of On Demand transit continues to be recommended. This should be implemented early as development progresses and with the completion of the new Hospital Terminal.

⁴ City of Windsor *More than Transit Plan*, p. 26

4.1.2 West Windsor

West Windsor is located south of Prince Road, west of Malden Road, and north of Ojibway Prairie Provincial Nature Reserve. It is made up of portions of the Ojibway, Sandwich and Malden Planning Districts. The area is predominantly heavy industrial in the north and residential and natural heritage land uses in the south. Currently, this area does not have a Secondary Plan. West Windsor will be the location of the access route to the new international crossing, and it is likely that this new development could significantly impact transportation patterns in the area.

There is currently one route (South Windsor 7) that operates on the periphery of the West Windsor ASD area that connects to the Hotel-Dieu Grace Hospital, St. Clair College, and Devonshire Mall. In 2019 (prior to the COVID-19 pandemic), this route experiences moderate levels of boardings during both weekdays and weekends, with most stops averaging 1-5 boardings per day.

The approved Plan has identified that this area would be served by On Demand service starting in 2028, in alignment with the removal of the existing route South Windsor 7. Resources were budgeted in the amount of approximately 3,600 annual service hours for this service, and 1.0 peak hour bus.

Recommendation

West Windsor is an important economic generator for the City, however, low ridership – likely due in part to the challenging pedestrian environment – indicates that this area continues to be a strong candidate for On Demand transit. Ridership data demonstrates that fixed-route service is not meeting the unique needs of this type of land use, and it is likely that On Demand service would be more efficient, convenient and accessible for customers.

Future land use plans would indicate that in the short-term, demand in this area will not grow enough warrant the expansion of a fixed-route transit service. Consistent with the recommendations of the Transit Master Plan, it is recommended that On Demand service be introduced to this area when the existing Route South Windsor 7 is removed, anticipated for 2028. This should be an origin-to-hub model, with some origin-to-destination service allowed within the On Demand area. This may occur earlier if travel demand to West Windsor changes with the completion of the new bridge to the United States. The potential to integrate this On Demand service with the fixed-route transit service to/from LaSalle should also be explored.

4.1.3 Oldcastle

The Oldcastle area is part of the Town of Tecumseh and is located south of Highway 401. The area is primarily an industrial business park (440 ha.), which employs a number of Windsor residents, but also has 'hamlet residential' and 'general commercial' designated areas in the southern section.

Transit Windsor currently operates a fixed-route service (Walkerville 8) in the northern section of Oldcastle, which connects Windsor residents to the industrial area south of Highway 401. This route experiences a substantial number of boardings during the weekday daytime (particularly during morning and afternoon peaks), averaging 22 boardings per revenue hour. During weekday evenings and on weekends, the route experiences low levels of boardings in the Oldcastle area; although the route overall performs quite well.

The approved Transit Master Plan removed service to Oldcastle and identified the area as a potential for ASD. It is important to note that concerns were raised during the community consultation about replacement of the existing fixed-route service with ASD by Windsor residents who rely on the route to commute to work in the industrial park.

Recommendation

Ridership during the weekday daytime is significant enough to warrant a fixed-route service and a switch to an On Demand service is not likely to yield any cost savings. Many workers rely on this route for their commute to work and switching this in the short-term to an On Demand service is not recommended at this time.

Oldcastle's ridership levels during the weekday evenings and on weekends does drop, and fits within the productivity target for On Demand service. Consistent with the recommendations of the Transit Master Plan, it is recommended that On Demand service be introduced to this area for weekday evenings and weekends once the existing Route Walkerville 8 is removed. This is anticipated to occur in 2028.

4.2 Additional Candidate Areas for On Demand Service

In addition to the ASD areas noted above, two additional locations have been identified as candidate areas for consideration for On Demand service. The characteristics on fixed-route and On Demand transit services in **Table 1** was used as a guide to assess the most effective service delivery model in each of these areas. A summary of this analysis is outlined below.

4.2.1 East Windsor

East Windsor is an existing residential area located in the neighbourhoods of East Riverside, Forest Glade, and Tecumseh, bordered by Lauzon Parkway to the west, the E.C. Row Expressway to the south, the municipal boundary to the east, and the Detroit River to the north. Transit service in this area is centred around the East End Terminal, and the neighbourhood is served by Route Lauzon 10, and to a lesser extent, Routes Transway 1C, Crosstown 2, and Ottawa 4. Although there is observable low ridership in this community, it is likely that this is due in part to the fact that the bulk of the area is served by Lauzon 10, which offers a relatively indirect trip, and operates in a complicated, circuitous route.

The Transit Master Plan recommends a significant restructuring of the Local Routes in East Windsor, and proposes four new routes be implemented, shifting towards a hub-and-spoke model of service provision. The service recommended for this area in the Transit Master Plan includes Local Routes 101, 102, 103, and 104, all of which converge at the East End Terminal where customers can transfer to Primary Routes 14 and 18, and Secondary Routes 54 and 56. Local Routes are planned to operate as small loops with two-way service, with the exception of Route Lauzon 103 which will be a one-way loop. The approved East End route network is illustrated in **Figure 3** with planned levels of service described in **Table 2**.

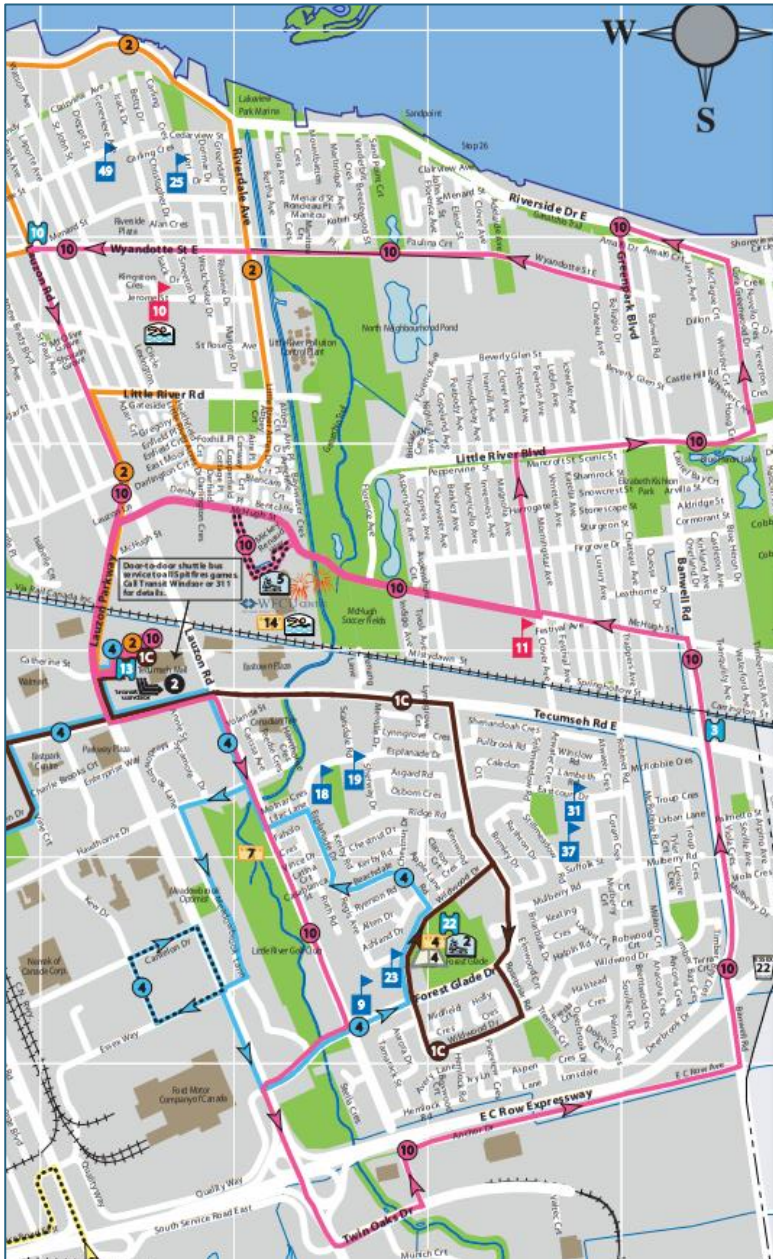


Figure 2: Existing Service in East Windsor

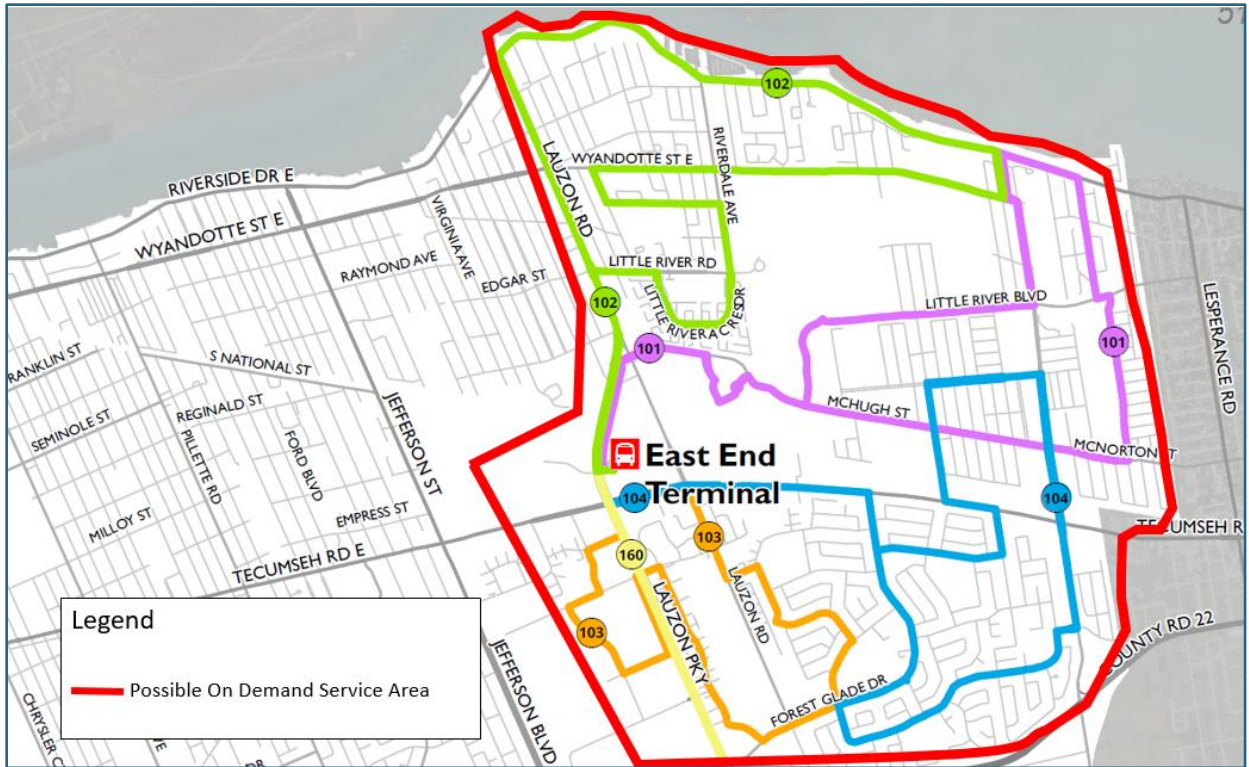


Figure 3: Planned Service in East End Windsor

Table 2: Planned Headway (in minutes) by Route, Day, and Period

Route	Route 101	Route 102	Route 103	Route 104
Weekday				
Early AM	60	30	30	30
AM Peak	30	20	20	20
Midday	45	30	30	30
PM Peak	30	20	20	20
Early Evening	45	30	30	30
Late Evening	60	60	45	30
Saturday				
Early Morning	60	60	60	45
Midday	45	30	45	30
Evening	60	60	60	45
Sunday				
Early Morning	60	60	60	60
Midday	60	45	45	30
Evening	60	60	60	60

4.2.1.1

Assessment: Service Accessibility and Route Alignment

The assessment of Service Accessibility and Route Alignment is based on three factors:

1. Land Use and Road Network
2. Directness of Travel
3. Proximity of Customers to Routes

The findings of this assessment, when compared to the approved TMP network for this area, is summarized in **Table 3** below.

Table 3: East Windsor - Service Accessibility and Route Alignment

Criteria	Evaluation	Service Type Suitability
Land Use and Road Network	East Windsor is a low-density residential area with limited destinations. The street network is fairly disconnected, particularly north-south, with limited crossings of an existing rail line located between Tecumseh Road and McHugh Street.	On Demand The road network is more difficult to serve efficiently with fixed-route service. On Demand has more flexibility.
Directness of Travel	<p>The proposed route structure provides one one-way and three two-way loops to the East End Terminal. From here, customers can transfer to a Primary Route to access other key destinations in Windsor.</p> <p>For three of the routes, every second trip runs in the opposite direction, meaning the proposed service structure simulates two-way service on a loop. However, the headways identified in the plan are based on the total route and not each direction. This means that a 20 minute peak headway on Route Lauzon 102 equals a 40 minute headway per direction. For customers that live or are destined near the beginning or end of a loop, their travel time in one direction may be up to 25 minutes long if their trip is not timed with the run that provides the most direct service to/from the East End Terminal. This reduces the directness of service, particularly during evening or weekend periods where the headway on each route is reduced. Route Lauzon 103 also only operates in one direction.</p> <p>While there is some opportunity to transfer between routes outside of the East End Terminal, travel within the area can be indirect and require a transfer, even for relatively short trips.</p>	<p>Peak Period: No Preference Headways are high and customers may be able to schedule travel with the two-way loops on three of the four routes to avoid long trips.</p> <p>Off-Peak: On Demand Longer headways make it more difficult for customers to coordinate direct trips. There may also be more demand to travel within the East End during off-periods.</p>

Criteria	Evaluation	Service Type Suitability
	It should be noted that there are few key destinations within the East Windsor area outside of the East End Terminal (Techumseh Mall). Based on the APC data, the stops with the highest boardings include the Ford Essex Engine Plant, Banwell Road and Tecumseh, and McHugh Street at Clover Avenue.	
Proximity to Route	The majority of residents are within a 400 metre walking distance of a fixed-route stop. To achieve this, loops are required at the end of each route, however, travel times are relatively short due to the short 30 minute run time.	No Preference Run time for planned routes are relatively short. On Demand transit may improve proximity and ease of access, but not significantly.

4.2.1.2

Assessment: Level of Service and Route Productivity

Boardings per revenue vehicle hour for each of the proposed route modifications were not forecasted in the Transit Master Plan. In order to determine the suitability of the area to operate as an On Demand service, future ridership of the planned routes was projected using following steps:

- Sum average daily boardings from APC data in the East End area by time period. These figures excluded boardings which took place at terminals, or along corridors shared with planned Primary Routes;
- Increase the sum of the boardings by 54% to reflect the anticipated increase in ridership identified in the Transit Master Plan;⁵
- Calculate the combined services hours and vehicle requirements for each time period based on the recommendations in the Transit Master Plan; and⁶
- Calculate potential boardings per revenue vehicle hour for the East End area.

At present, this area is served primarily by Route Lauzon 10, with additional service provided by Routes 1C, 2, and 4. As the level of service planned for Local Routes in East Windsor were most comparable to Routes 4 and 10, ridership figures from these routes were used to anticipate ridership projections for Routes 101, 102, 103 and 104. Existing and planned operating statistics for these routes are summarized

⁵ As per the 2019 Transit Master Plan, Table 17: Forecasted System Performance and Financial Performance

⁶ As per Appendix E of the 2019 Transit Master Plan, this assumes the conservative approach that the 54% increase is applied equally, with a relative increase of 54% per revenue service hour. In all likelihood, this increase would be lower on Local routes, and higher on the Primary and Secondary routes where there will be more frequent service provided. This methodology also assumes that all expansion service hours would see a similar average boardings per revenue hour, again making these ridership projections high (or conservative).

in **Table 4** and **Table 5**, respectively. Ranges are provided to reflect the existing and planned headways between periods and routes. They are presented as a range because to reflect the impact of the proposed level of service on existing and potential ridership.

Table 4: Existing Operating Statistics – Ottawa 4 and Lauzon 10

Period	Times	Ottawa 4 ⁷			Lauzon 10 ⁸		
		Existing Headway (minutes)	Boardings per Service Hour	Service Span	Existing Headway	Boardings per Service Hour	Service Span
Peak AM	6-9am	20	16	5:30am - 1:30 am	35	15	6:30am – 8:00pm
Middy	9-3pm	45	4.2		35	8.7	
Peak PM	3-6pm	20	3.1		35	10.7	
Early Evening	6pm - 10pm	45	2.1		35	5.1	
Late Evening	10pm and later	45	<1		N/A	N/A	
Saturday	Average Daily	30/45	10.1	6:00am - 1:00am	70	4.4	7:30 am - 7:30pm
Sunday	Average Daily	50	14.3	9:00am – 9:00 pm	N/A	N/A	N/A

A more in depth analysis of planned service is detailed in the following tables, including the proposed service hours, peak vehicle requirements, ridership projections and performance for the proposed fixed-route service for the weekday daytime, weekday evenings, Saturday and Sunday operating periods.

⁷ For the purposes of this analysis, ridership information was used from the stops between Yolanda Street at Lauzon Road to Forest Glade at Lauzon Road.

⁸ Ridership from 2019 for the entire Lauzon 10 was used in this analysis as it is the route serving the East End today.

Table 5: Planned Operating Statistics and Projected Ridership⁹

Period	Route 101		Route 102		Route 103		Route 104		Anticipated Boardings per Service Hour	Revenue Service Hours per Day
	Planned Headway	Vehicle Requirement	Planned Headway	Vehicle Requirement	Planned Headway	Vehicle Requirement	Planned Headway	Vehicle Requirement		
Peak AM 6-9am	30	3	20	5	20	2	20	5	22.5	202
Midday 9am-3pm	45	2	30	3.5	30	1	30	3	18.4	
Peak PM 3pm-6pm	30	3	20	5	20	2	20	5	25.9	
Early Evening 6pm-10pm	45	2	30	3.5	30	1	30	3	15.0	
Late Evening after 10pm	60	1.7	60	1.7	30	1	30	3	9.4	
Saturday	45/60	2	30/60	3	45/60	1	30/45	3	11.2	121
Sunday	60	2	45/60	2	45/60	1	30/60	3	11.2 ¹⁰	92

An assessment of the planned Level of Service and Route Productivity is summarized below.

⁹ Represents a conservative figure of average boardings per revenue service area in the community across four routes.

¹⁰ Projected Sunday ridership was estimated to be 22 boardings per revenue hour. This is considered unlikely due to the significant increase in Sunday service hours. For the purposes of analysis, Saturday forecasts were used.

Table 6: East Windsor - Level of Service and Route Productivity

Criteria	Evaluation	Suitability
Headway during each time period	<p>The average headways for the proposed route structure are noted below.</p> <p>Weekday Day time: 20 to 45 minutes Weekday Evenings: 30 to 60 minutes Saturday: 30 to 60 minutes Sunday: 30 to 60 minutes</p> <p>Headways noted above for Route Lauzon 101, 102 and 103 are based on each departure from the East End Terminal, and not by direction. If a passenger wanted to travel in a specific direction (e.g. clockwise on the loop), the headway would be double.</p>	<p>Weekday Daytime: Fixed-Route Outside the early morning and midday period for Route Lauzon 101, headways are suitable for fixed-route services.</p> <p>Weekday Late Evenings, Saturdays and Sundays: On Demand Headways do not provide a high level of service for fixed-routes.</p>
Boardings per revenue vehicle hour	<p>Weekday Daytime: An anticipated average of 20 to 25 boardings/revenue vehicle hour is considered high for an On Demand service. If switched, this would likely require an increase in vehicles and service hours, limiting the potential for cost savings.</p> <p>Weekday Evening and Weekends: An anticipated average of 9 to 11 boardings/revenue vehicle hour is considered low for a fixed-route service. There may be an opportunity to reduce vehicle requirements and associated service hours and reduce average waiting time.</p>	<p>Weekday Daytime: Fixed Route B/RVH exceed minimum On Demand threshold</p> <p>Weekday Evening and Weekends: On Demand B/RVH below fixed-route standards</p>

Recommendation:

Table 2 illustrates the potential resource requirements that would be needed if this zone was maintained as a fixed-route model or converted to an On Demand service model. This analysis is completed for three different operating periods where, based on preceding criteria, On Demand service may be considered. These periods are: weekday evenings, Saturdays and Sundays.

Table 7: Resource Comparison for East Windsor

Period	Performance Measure	Fixed-Route	On Demand
Weekday Late Evenings Only	Boardings /RVH	9.4	11.0
	Service Hours	26	22.2
	Boardings per period	244	
	Vehicles Required	7	6
	Hours per veh per period	3.7	3.7
Saturday All Day	Boardings /RVH	11.2	12.4
	Service Hours	121	110
	Boardings per period	1,355	
	Max Vehicles Required	10	9
	Hours per veh per period	12.1	12.1
Sunday All Day	Boardings /RVH	11.2	12.8
	Service Hours	92	81
	Boardings per period	1,030	
	Max Vehicles Required	8	7
	Hours per veh per period	11.5	11.5

Based on the table described above, it is possible that On Demand service could provide Transit Windsor operating efficiencies in late evening during the week, as well as on Saturday and Sunday, when compared to the approved TMP network for East Windsor. It is estimated that at least one bus could be removed from fixed-route service in any of these periods. It should be noted that this represents an approximate savings for the purposes of determining the suitability of this zone for On Demand transit. More detailed scheduling of vehicles would still need to be completed using an On Demand simulation tool that could be completed by an On Demand technology provider. This would help to determine the impact on customer wait time and travel time.

4.2.2 Devonshire Heights & Walker Farm Industrial Area

The Devonshire Heights & Walker Farm Industrial Area were also assessed as another On Demand opportunity.

Devonshire Heights is a primarily residential area, which for the purposes of this analysis, is bounded by Division Road, Cabana Road, Walker Road, and E.C. Row Expressway. There is no service operating within the neighbourhood, although there is some service along the periphery of the area provided by Routes Walkerville 8 (on Walker Road) South Windsor 7 (on E.C. Row Avenue and Marenette Drive) and Parent 14 (on Division Road and Marenette Drive). The area's destinations include two elementary schools in the north and a conservation area in the south. There are also three major destinations surrounding it: Devonshire Mall/Transit Terminal to the west, the airport is to the east, and Costco to

the south. Despite being adjacent to the Devonshire Mall and the Devonshire Mall Transit Terminal, a significant portion of residents in this area are more than 400m away from transit service.

On Demand provides an opportunity to introduce transit early, and assess the potential for ridership growth before implementing the recommended local route identified in the Transit Master Plan.

Walkers Farm Industrial Area is located on the east side of Walker Road, and is currently serviced by Route Central 3. The route provides intermittent one-way loop service beyond the Transit Windsor Transit Centre to employment opportunities in the Walker Farm Industrial Area. This route serves Central Avenue, Deziel Drive, St. Etienne Boulevard, Rhodes Drive, and Jefferson Avenue, before returning to regular Route Central 3 service via North Service Road. At present, this route provides 20 – 30 minute headways,¹¹ Monday to Friday between 8:00 am and 6:00 pm. Industrial areas such as this may benefit from On Demand service as it provides the potential to flex off route to provide closer proximity to employers that have front entrances far from the street, and minimum pedestrian infrastructure on the road.

In the approved TMP, service will be introduced into the Devonshire Heights area provided by the new local Route 121. This route will connect Hotel Dieu Grace Terminal and Devonshire Mall Transit Terminal via the neighbourhoods of South Cameron, South Walkerville and Devonshire Heights. Connections to Primary and Secondary Routes can be made at either terminal to travel to the University of Windsor, Downtown, or across town towards the East End.

In Walker Farm, approved service is provided by the Route 550, a peak only extension of the planned Local Route 55.

The existing potential On Demand study area is illustrated in **Figure 4**. **Figure 4** also illustrates the existing route structure, while the planned route structure (from the TMP) is illustrated in **Figure 5** and planned headways in **Table 8**.

This area presents an opportunity to introduce transit service to Devonshire area early to test ridership, using considerably less vehicles than what is proposed in the TMP. Combining this area with Walkers Farm allows the vehicle resources to be combined during low demand periods (e.g. late evening), thereby servicing both areas using one vehicle. It also moves the transfer point for businesses in Walkers Farm to the Devonshire Bus Terminal, an area that is more central than the Transit Windsor garage.

¹¹ At time of writing, this route was providing 30-60 minute service in this area due to COVID-19 service reductions.

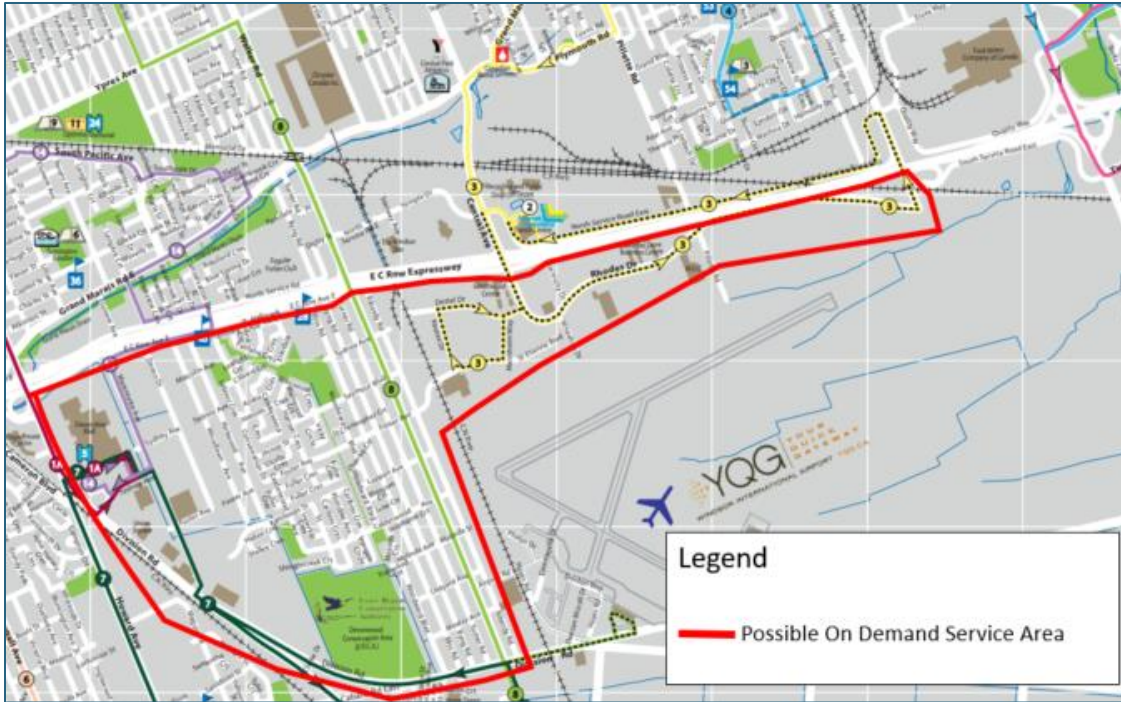


Figure 4: Existing Service - Devonshire Heights and Walker Farm

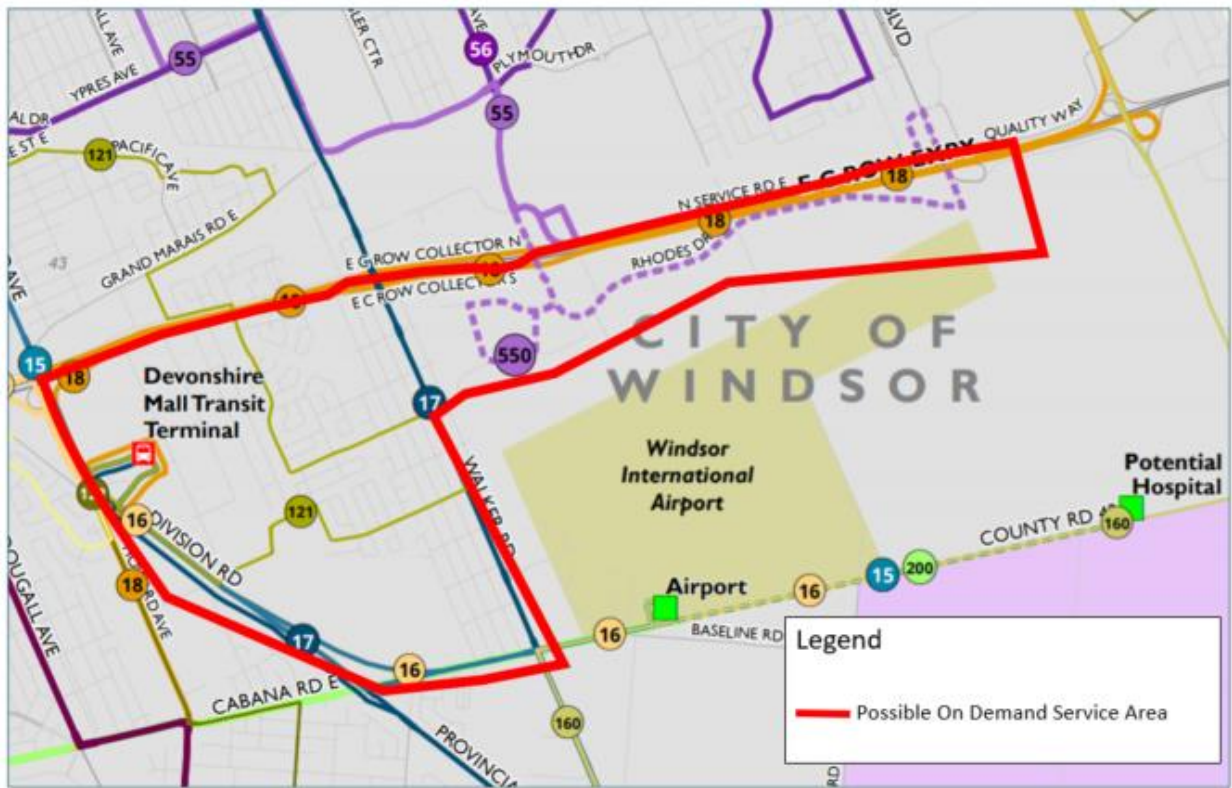


Figure 5: Planned Service - Devonshire Heights and Walker Farm

Table 8: Planned Headway (in minutes) by Route, Day, and Period

Route	Route 550	Route 121
Weekday		
Early AM	N/A	60
AM Peak	30	30
Midday	N/A	45
PM Peak	30	30
Early Evening	N/A	45
Late Evening	N/A	60
Saturday		
Early Morning	N/A	60
Midday	N/A	45
Evening	N/A	60
Sunday		
Early Morning	N/A	60
Midday	N/A	45
Evening	N/A	60

4.2.2.1

Assessment: Service Accessibility and Route Alignment

As with East Windsor, the assessment of Service Accessibility and Route Alignment is based on three factors:

1. Land use and road network
2. Directness of travel
3. Proximity of customers to routes

The findings of this assessment, when compared to the approved TMP network for these areas, is summarized in **Table 9** below.

Table 9: Devonshire Heights and Walker Farm - Service Accessibility and Route Alignment

Criteria	Evaluation	Service Type Suitability
Land Use and Road Network	<p>Devonshire Heights is a residential area with some industrial uses in the west and natural heritage area in the south. Walker Farm is an industrial area across Walker Road from Devonshire Heights, and adjacent to the Windsor International Airport.</p> <p>The street network is an interrupted grid network in the area of Devonshire Heights, with shorter blocks closer to Walker Road, and larger blocks towards Devonshire Mall. Most, but not all, of this area has pedestrian facilities on one or both sides of the street, providing fairly comfortable walking facilities. Pedestrian short cuts through the neighbourhood mean that walking time to access transit can be shortened, making it more attractive.</p> <p>By contrast, the area of Walker Farm is characterized by a circuitous, and linear road network with large blocks. This area is designed for heavy truck traffic, and lacks pedestrian facilities.</p>	<p>Fixed-Route (Devonshire Heights) On-Demand (Walker Farm)</p> <p>Circuitous road networks are more difficult to serve efficiently with fixed-route service. On Demand has more flexibility in a disconnected street network.</p> <p>The area described here shows characteristics of both circuitous and grid road networks, and also includes a variety of land uses.</p>
Directness of Travel	<p>Proposed route structure provides two-way local service within the Devonshire Heights area on the new local Route 121. As it is a Local route, proposed routing is circuitous, and most passengers will likely have a less direct trip.</p> <p>In addition, the peak only Route 550 would provide service to the Walker Farm/Rhodes Drive Area.</p> <p>It should be noted that although these areas are adjacent to one another, in order to make a trip between Devonshire Heights and Walker Farm, passengers will need to transfer at least once.</p>	<p>On Demand</p> <p>Route can be fairly circuitous. On Demand may provide more direct travel to the Devonshire Heights terminal.</p>
Proximity to Route	<p>While the majority of residents will be within a 400 metre walking distance of a planned route (either to the Primary Route 17, or the local Route 121 through the neighbourhood), at present many are without a transit service.</p> <p>Most businesses today are within walking distance to the Route Central 3, and will be within walking distance to the peak only Local Route 550 through Walker Farm. However, long distances to the front of door increases walking distance and On Demand transit has the potential to deviate off route to provide closer proximity to each business.</p>	<p>On Demand</p> <p>On Demand transit will improve proximity when compared to existing service in both areas, but not significantly when compared to future service in Devonshire Heights.</p>

4.2.2.2 Level of Service and Route Productivity

Boardings per revenue vehicle hour for each of the proposed route modifications were not forecasted in the Transit Master Plan. In order to determine the suitability of the area to operate as an On Demand service, the level of service of the existing routes were compared to the proposed service levels.

The Walker Farm industrial area saw 83 average daily boardings pre-pandemic spread over 27 trips on Route 3, approximately two-thirds of which took place during peak times. This ridership was used to estimate future ridership on the planned Route 550. Since the TMP does not identify an increase in service levels in this area, similar ridership levels were assumed for this service area.

As there is no existing service in the area of Devonshire Heights, there is no existing ridership from which projections could be made for the new Local Route 121. Therefore, for the purposes of this analysis, it was assumed that if there was service in Devonshire Heights today, it would have a similar productivity to the existing Route South Windsor 7 between Legacy Park/Silver City and Cabana & Mount Royal (as existing service levels on Route 7 are similar to proposed service levels on new Local Route 121). Service levels and productivity by route (or route segment), by period is summarized in **Table 10** below.

Table 10: Existing Operating Statistics – Routes Central 3 and South Windsor 7

Period	Times	Route South Windsor 7 ¹²			Route Central 3 Loop		
		Existing Headway (minutes)	Boardings per Service Hour ¹³	Service Span	Existing Headway (minutes)	Boardings per Service Hour	Service Span
Peak AM	6 - 9 a.m.	30	33.2 (24.3)	7:00 - 19:30	22	8.4	6:00 - 18:00
Midday	9 - 3 p.m.	30	26.5 (16)		33	8.8	
Peak PM	3 - 6 p.m.	30	22.9 (10.6)		22	27.1	
Early Evening	6 - 10 p.m.	30	20.5 (11.4)		N/A	4	
Late Evening	After 10 p.m.	N/A	N/A		N/A	N/A	
Weekday	Average Daily	30	26.2 (15.6)		22-33	12.2	
Saturday	Average Daily	50	8.9 ¹⁴	7:00 - 20:00	30	10.2 ¹⁵	N/A
Sunday	Average Daily	N/A	N/A	N/A	N/A	N/A	N/A

¹² Route South Windsor 7 between Legacy Park/Silver City and Cabana & Mount Royal.

¹³ Values in brackets indicate boardings per service hour excluding those that take place at Devonshire Mall during this period.

¹⁴ Updated Route South Windsor 7 ridership information was not available for weekends for this analysis, this figure was extracted from the 2019 TMP.

¹⁵ As 2019 ridership sample represented weekday figures only, Saturday figures represent data from the approved TMP.

A more in depth analysis of planned service is detailed in the **Table 11** and **Table 12**, including the proposed service hours, peak vehicle requirements, ridership projections and performance for the proposed fixed-route service for the weekday daytime, weekday evenings, Saturday and Sunday operating periods.

Table 11: Planned Operating Statistics and Projected Ridership

Period	Times	Route 121			Route 550			Revenue Service Hours per Day ¹⁶
		Planned Headway	Vehicle Requirement	Anticipated Boardings/Hr	Planned Headway	Vehicle Requirement	Anticipated Boardings/Hr	
Peak AM	6 – 9 a.m.	30	3.9	33.2 (24.3)	30	3.3 (1.0) ¹⁷	8.4	34 ¹⁸
Midday	9 – 3 p.m.	45	2.6	26.5 (16)	N/A	N/A	N/A	
Peak PM	3 – 6 p.m.	30	3.9	22.9 (10.6)	30	3.3 (1.0)	27.1	
Early Evening	6 – 10 p.m.	45	2.6	18 (12)	N/A	N/A	N/A	
Late Evening	After 10 p.m.	60	2.0	12 (8)	N/A	N/A	N/A	
Saturday	Daily	45/60	2.0/2.6	14	N/A	N/A	N/A	17
Sunday	Daily	45/60	2.0/2.6	10 ¹⁹	N/A	N/A	N/A	16

Table 12: Devonshire Heights and Walker Farm - Level of Service and Route Productivity

Criteria	Evaluation	Suitability
Headway during each time period	<p>The average headways for the planned routes are noted below.</p> <p>Weekday Day time: 30 to 45 minutes Weekday Evenings: 45 to 60 minutes Saturday: 45 to 60 minutes Sunday: 45 to 60 minutes</p> <p>There is presently no service within the Devonshire Heights community, and 20-30 minute service on the Central 3 (weekdays only).</p>	<p>Weekday Daytime: No preference Early morning and midday period headways are more suited to On Demand. Peak headways are suited for both.</p> <p>Weekday Evenings, Saturdays and Sundays: On Demand Headways do not provide a high level of service for fixed-routes during these period.</p>

¹⁶ Note that Route 550 is a peak only service with no trips offered off peak, evenings, or weekends.

¹⁷ The vehicle requirement of 3.3 at peak reflects the peak requirement for the entire Secondary Route 55, as per Appendix E or the Transit Master Plan. It was estimated that at a maximum, the planned Route 550 extension would have a requirement of one vehicle when in operation.

¹⁸ Assumes approximately 9 hours of service per day on the Central 3 Loop Only, and 25 hours of service on the Route 121 within the On demand Area (50% of the service hours identified for this route in the TMP)

¹⁹ Assumes a reduction from Saturday ridership.

Boardings per revenue vehicle hour	<p>Weekday Daytime: The Route South Windsor 7, used to assess the Devonshire Heights area (Route 121), has approximately 23-30 projected boardings/revenue hour, which is considered appropriate for fixed-route service. Walker Farm, planned to be serviced by Route 550 is projected to have approximately 30 boardings/per hour.</p> <p>Weekday Evening and Weekends: The Route South Windsor 7 is projected to average 10 - 18 boardings/revenue hour evenings and less than 12 boardings/revenue hour (when excluding Devonshire Mall). While these boardings/revenue hour are considered low for a fixed-route service, it would likely not generate any savings to provide an On Demand service model, nor would it positively impact customer wait times.</p>	<p>Weekday Daytime: Fixed Route B/RVH exceeds minimum fixed-route threshold</p> <p>Weekday Evening and Weekends: No Preference Sundays and late evenings could potentially be serviced by On Demand. Saturdays and Early Evenings may have ridership figures more in line with fixed-route.</p>
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Recommendation

Based on the anticipated ridership figures described above, in the longer term, it is not anticipated that On Demand service alone could meet the needs of these two adjacent communities during the day-time periods. There may be some potential on Sundays and late evenings, and ridership should be monitored.

However, there is still an opportunity to implement On Demand transit early in these two areas. Transit Windsor staff indicated that the roll out of the TMP will likely be extended beyond the previously anticipated timespan. This means that Route 121 would not be introduced until Year 5 of the plan (to coincide with the removal on existing Route 14). In the interim, Transit Windsor could introduce an On Demand bus operating in both communities between 7:00 am and 8:00pm on weekdays and Saturdays (initially). The existing 9 hours of service used to provide service in Walker Farm could be separated from Route 3 and used as part of the On Demand service (with a connection to Devonshire Mall terminal instead of the Transit Windsor garage). Two buses are estimated to be required for 3 hours in the morning and 3 hours in the afternoon on weekdays to accommodate peak demand, while the one bus could accommodate demand in both communities during the off-peaks.

As demand grows, additional service hours could be added, until it reaches the service hours estimated in the TMP. This would be a trigger to switch to a fixed-route service. The hours of service for existing, On Demand pilot and 5-year fixed-route option are presented in **Table 13**.

Table 13: Summary of Service Hour Requirements -Existing and Planned Fixed Route

Service Hour Requirements	Existing Service Requirements	On Demand Pilot	TMP Service Requirement
Weekday – Devonshire Heights	0	13	25 ²⁰
Weekday – Walker Farm	~9 ²¹	6	7
Total Weekday Service Hour Requirements	9	19	32
Saturday – Devonshire Heights	0	13	17
Saturday – Walker Farm	9	0	0
Total Saturday Service Hour Requirements	9	13	17
Sunday – Devonshire Heights	0	0	16
Sunday – Walker Farm	0	0	0
Total Sunday Service Hour Requirements	0	0	16
Total Annual Requirements	2,700	5,400	9,700

As illustrated above, while the early introduction of service using the On Demand model would result in an increase in service, it is a more cost effective way to introduce service to the Devonshire Heights neighbourhood early and continue access opportunities to Walker Farm.

²⁰ This represents 50% of hours budgeted for Route 121 in the approved TMP

²¹ Approximately 15 minute run time plus 5 min layover at a total of 27 trips per weekday

5.0

Recommended Operating Model

5.1

Operating Model Options

There are three operating models that are typically used to deliver On Demand transit services:

1. Operated by conventional transit operators using existing fleet (Transit Windsor);
2. Integrated and operated by specialized transit operators, and integrated as part of a Family of services approach; and
3. Contracted out to either a dedicated or non-dedicated operator.

Operated by Conventional Transit Operators

In this model, Transit Windsor would operate the service using their existing buses and operators, with the potential of purchasing smaller vehicles to right-size the fleet and match demand. Transit Windsor drivers would be paid based on the hours of operation under the terms of the existing collective agreement as they would when providing any other fixed-route services. Since all Transit Windsor vehicles are accessible, the On Demand service could be used by registered Handi-Transit customers, but only for customers that could access a bus stop and that were able to transfer onto a conventional accessible fixed-route to complete their trip, as needed. If a registered Handi-Transit customer required a full curb-to-curb ride, they would continue to book their trip through Handi-Transit and would be picked-up by a separate Handi-Transit vehicle, thus creating a duplication of service.

While this model presents some limitations with regards to efficiency and accessibility, it is relatively easy to implement and was therefore considered for further evaluation.

Specialized Transit

In this model, Handi-Transit would operate the service using their existing vehicles and operators. This would involve co-mingling conventional On Demand customers with registered specialized transit customers, using the same booking/scheduling platform and being transported in the same vehicle. The only difference between the two customer groups is that a registered specialized transit customer may require a full origin-to-destination trip to the curb of any destination in Windsor, whereas a conventional customer may only be permitted an origin-to-hub trip, picked up at a bus stop instead of a curb. In this model, a registered specialized transit customer booking a trip would follow the same process as a customer that does not have a disability (whether booking through a mobile app or a call centre). The requirements of the person with a disability would be included in the customer's profile and identify trip characteristics such as the type of trip (e.g. origin-to-destination), whether the person is travelling with an attendant, etc. A vehicle would be dispatched that meets the customer's requirements.

The existing Collective bargaining agreement with Local ATU 616 prohibits the contracting of conventional transit service to third-party operators. However, the service provided by Handi-Transit on contract to the City of Windsor is more similar to On Demand than the service currently provided by conventional Transit Windsor service. Therefore, this model was considered for further evaluation.

Contracted Service

In this model, Transit Windsor would contract the supply of vehicles and drivers to a third-party operator. This could be a dedicated service, typically contracted with the On Demand technology provider, or a non-dedicated service, such as a local taxi provider or a ridesharing service (e.g. Uber). Dedicated contractors are typically compensated by hour of service or service kilometer (with a minimum number of hours/kilometres guaranteed). The potential benefit of contracted service is the flexibility to use a fleet of smaller vehicles, at a lower operating cost. Integration with the existing Transit Windsor fleet and fare technology can be difficult, which may offset the benefits of any potential cost savings.

Non-dedicated contractors are typically compensated for each trip delivered based on a pre-established rate. This model is useful if demand for a service in a particular area is too low to warrant a dedicated vehicle, and if there is a supply of drivers to guarantee a trip request is delivered. For ridesharing services, citizens with their own automobiles set their own schedules and provide rides to other citizens. They have the opportunity to accept or decline a ride request. Therefore, to ensure availability of vehicles at a high level of service, pricing strategies are typically in place to ensure supply meets demand. Since this model is based on a cost-per-trip, it can be difficult to set budgets and control costs if demand grows, and it also in some cases disincentives the use of shared trips.

Transit Windsor does not have experience contracting service to third-party providers. The existing Collective Agreement with Local ATU 616 prohibits the contracting of transit service to third-party operators. Due to these challenges and the limited benefits of this model, contracting On Demand services to a third-party operator was not considered further.

5.2 Integrated Service Model

One of the key benefits of operating the On Demand service through Handi-Transit is the ability to move towards and Integrated Service Model.

A trend among many transit agencies is to use the same technology platform to book and schedule On Demand and specialized transit trips, using the same operator. This is being done by Guelph Transit, St. Catharines Transit, Durham Region Transit, York Region Transit and Milton Transit to name a few. The vision is to move towards a fully integrated conventional fixed-route and demand-responsive service, which includes both On Demand and specialized transit.

This model would integrate Handi-Transit and On Demand pilot service using the same scheduling and booking platform, and Handi-Transit as the operator. This would also include the same customer service and staff booking both On Demand trips for conventional customers and Handi-Transit customers. The goal is to provide the same level of customer experience to all customers, regardless of ability.

Demand-responsive services will provide either door-to-door service or connect to fixed-route service at key terminals and hubs to form part of a complete trip. The type of trip will be dependent on the customers' ability to access fixed-route service, based on functional ability, geography, time of day and other relevant factors. This model will move away from separate specialized, On Demand and fixed-route transit systems, creating opportunity for seamless travel across the City. This may also involve removal of the Handi-Transit brand from vehicles, creating a single Windsor brand for all services.

Benefits

There are several benefits of this model:

1. **Increase Travel Options for Handi-Transit Customers:** An integrated service model has the opportunity to introduce Handi-Transit customers to conventional service who otherwise may not have chosen to use it independently. The conventional portion of an integrated trip would include an additional level of support from a booking agent, which may serve to reduce uncertainty about using conventional service. Furthermore, if a customer becomes comfortable using conventional service as part of an integrated trip or independently, this would increase their overall mobility and could be seen as an improvement in service. It offers the greatest level of freedom and flexibility for riders with a diverse range of abilities and needs.
2. **Availability:** The reduction in trip distance when integrated trips are made increases the availability of the same vehicle, which will benefit all customers, including those that cannot use an accessible fixed-route service. This increases the availability to book a same-day trip for persons that require a full curb-to-curb service.
3. **Same-Day Bookings:** The use of On Demand software schedules and dispatches trips in real-time. This increases the ability to book same-day trips, including adding trips when late cancellations have occurred. This may increase the ability for all customers to book same-day service, including registered Handi-Transit customers.
4. **Booking Agent Time:** The use of On Demand software may reduce the amount of time Handi-Transit customers service agents spend booking and scheduling trips. Some registered Handi-Transit customers may transition to the mobile application and reduce the number of calls into Handi-Transit. Scheduling of trips is also completed in real-time, and does not require the Handi-Transit booking agent to do this separately. This may increase the amount of time booking agents have to deal with clients that require telephone-assisted contact to book a trip. The

scheduled trips are also visible to the booking agent, and can be overridden and reschedule for specific customers.

5. **Equity:** Providing service to both conventional and Handi-Transit customers at the same time supports the goals of transit equity and further supports the goals of enhancing accessibility network wide.
6. **Operations:** The operation of an integrated network offers a more efficient network: rather than operating two systems in parallel, with two separate fleets. The service operator can leverage the use of technology to optimize the fleet deployment to better meet customer needs. Certain specialized transit trips will also be shorter by connecting certain customers to a fixed-route hub. This will increase the ability of the fleet to carry more customers, reducing the overall number of vehicles in service.

Challenges

Despite the benefit of an integrated service model operated by Handi-Transit, there are a number of challenges that would need to be overcome. These should be weighed against the benefits of operating a future integrated service. They are identified below:

1. **Collective Agreements:** Specialized and conventional transit services are currently operated by two service providers. The collective agreement for ATU Local 616 states that the Employer will not contract out any work that is performed by employees in the bargaining unit, which would preclude the provision of On-Demand service by Handi-Transit at this time. However, it is possible that this could be overcome through negotiations, should this be desired. Based on the analysis in the preceding report, and when taken with the implementation of the TMP, it will be important for the Union members to be aware that there will be no job loss or reduction of hours of service allocated to conventional operators. As a general rule, the hours of service of any existing fixed-route replaced by an On Demand service should be moved to another fixed-route service in accordance with the service investment noted in the Transit Master Plan.
2. **Branding:** In order to ensure consistency across the entire network (fixed-route and On Demand), Handi-Transit would need to rebrand their vehicles to something more generic. This is discussed in more detail in **Section 7.2.1**.
3. **Seat Belts:** Unlike conventional Transit Windsor vehicles, all Handi-Transit vehicles are equipped with seat belts. The *Highway Traffic Act* requires that any passenger must wear a seat belt when the vehicle is equipped with them. When the passengers are under the age of 16, it is the operator's responsibility to ensure they are belted. While not likely to be a significant stumbling block, it will be critical that if Handi-Transit vehicles are to be used for this service, appropriate messaging and communications are shared with the public, as this represents a change in practice for existing passengers of conventional transit service.

4. **Child Seats:** In Ontario, as noted above, where seat belts are present in the vehicle, they must be used, no matter the age of the passenger. Since Handi-Transit vehicles have seat belts, children and infants using any On Demand service which uses these vehicles would need to be restrained in a child seat. This would require a customer to bring their own child seat onto a bus, secure the seat onto the bus and then secure the child into the seat. While this practice reduces any potential liability to the City, it is fairly onerous for the customer, particularly as it adds additional delay to other passengers waiting in the vehicle, and is not practical when the passenger carrying a child, a child seat, and a stroller transfers onto a fixed-route vehicle. If this model were to be pursued, it is recommended that Transit Windsor purchase at least two vehicles with a minimum of 10 ambulatory seats that do not have seat belts and do not require child seats and lease them to Handi-Transit. When a trip is booked by a passenger travelling with a child, one of these vehicles could be dispatched. This approach would reduce some of the efficiencies noted above, as these vehicles may not be used by Handi-Transit customers who are used to wearing seat belts. This is further discussed in **Section 7.2.1**.
5. **Fleet Availability:** During some periods of the day, or days of the week, it is possible that Handi-Transit vehicles may not be available to support On Demand services. It is likely that this would mean that additional vehicles would need to be purchased in order to ensure a reasonably short pick up and drop off window for passengers.
6. **Fare Integration:** At present, there is no integration across the Handi-Transit and Transit Windsor networks, and there is no fare reconciliation which takes place between the organizations. In order for On Demand service to be offered using Handi-Transit, these vehicles would need to have standard fare box infrastructure installed or the ability to validate smartcards on board to ensure seamless transfers from On Demand to fixed-route services.

If Transit Windsor were to pursue the provision of On Demand service using their existing conventional fleet rather than the Handi-Transit fleet, then most of the above mentioned issues are no longer relevant, with the exception of fleet availability (i.e. additional vehicles will still be required). However, many of the benefits of the integrated service model noted above would not be realized.

5.3 Cost Implications

The following table shows the cost implications of both operating models for each of the recommended On Demand Service areas. To be conservative, a ratio of one conventional Transit Windsor vehicle to 1.5 Handi-Transit vehicles was used to reflect the reduced capacity of Handi-Transit vehicles.²²

²² 2019 Ontario Specialized Transit Factbook notes that each of the 13 Handi-Transit vehicles has a maximum capacity of five wheelchair and six ambulatory passengers.

Table 14: Cost Implications of Ultimate Service Delivery Models

Operating Parameter		Transit Windsor	Handi-Transit
Peak Vehicle Requirements	Sandwich South	1	1.5
	West Windsor	1	1.5
	Oldcastle	1	2
	East Windsor	9	11
	Devonshire Heights/Walker Farm	2	3
Peak Vehicles Total		14	19
Expansion Vehicle Requirements	Sandwich South	1	1.5
	West Windsor	1	1.5
	Oldcastle	1	2
	East Windsor	0	2
	Devonshire Heights/Walker Farm	1	1
Expansion Vehicles Total		4	8
Capital Costs for Vehicles*	Sandwich South	\$675,000	\$337,500
	West Windsor	\$675,000	\$337,500
	Oldcastle	\$675,000	\$450,000
	East Windsor	\$0	\$450,000
	Devonshire Heights/Walker Farm	\$675,000	\$225,000
Total Expansion Costs for Vehicles		\$2,700,000	\$1,800,000
Additional Fit Up Capital Costs	Rebranding of Vehicles (\$7,500 per peak vehicle)**	N/A	\$90,000
	Fare box/Smartcard reader (\$50,000 per peak vehicle)**	N/A	\$600,000
	Security Cameras (\$5,000 per peak vehicle)**	N/A	\$60,000
	On Board Tablets (\$1,000 per peak vehicle)	\$14,000	\$19,000
Additional Capital Costs		\$14,000	\$769,000
Annual Operating Hours	Sandwich South	3,600	5,400
	West Windsor	3,600	5,400
	Oldcastle	3,600	7,200
	East Windsor	15,500	19,700
	Devonshire Heights/Walker Farm	5,400	7,500
Annual Operating Hours		31,700	45,200
Annual Operating Cost***	Sandwich South	\$375,900	\$336,300
	West Windsor	\$375,900	\$336,300
	Oldcastle	\$375,900	\$448,300
	East Windsor	\$1,618,700	\$1,226,700
	Devonshire Heights/Walker Farm	\$563,900	\$467,000
	Software licence fees (\$1,000 per vehicle per month)	\$168,000	\$228,000
Anticipated Annual Operating Cost		\$3,478,300	\$2,814,600

*Note: Assumes capital costs of \$675,000 per conventional vehicle and \$225,000 per specialized (assuming a low-floor 10-passenger vehicle would be purchased)

** Costs only assumed for existing fleet, and not new vehicles purchased (would come equipped and rebranded)

*** Assumes hourly cost of \$104.43 for Transit Windsor and \$62.27 for Handi-Transit (based on 2019 CUTA Factbook)

As summarized above, the Handi-Transit capital costs would be approximately \$145,000 lower than Transit Windsor in the long-term, even with the additional costs of refitting existing vehicles with technology. This is due to the lower cost per each vehicle. This does not take into account vehicle replacement costs, which occur more frequently in smaller vehicles.

Operating costs are also lower using Handi-Transit as an operating (based on 2019 operating rates noted in the CUTA Factbook), representing approximately a 19% savings when compared to operation by Transit Windsor.

5.4 Alignment with Guiding Principles

Based on the preceding assessment, both service models described above were further considered for the operation of On Demand services. The implications of each operating model assessed below, based on the Guiding Principles noted in **Section 2.0**.

Table 15: Evaluation of Operating Models

Guiding Principle	Transit Windsor	Handi-Transit
Customer Experience	<p>Brand: Easily identifiable buses.</p> <p>Safety: Very high level of safety, operated by Transit Windsor staff. All vehicles have security cameras.</p> <p>Reliability: High, as vehicles operated in house, but might not be as responsive to increased demand.</p> <p>Level of service: Since buses have larger capacities, there is a higher ability to share rides, which may increase travel time for customers over the Handi-Transit operated service.</p>	<p>Brand: Customers may not be used to riding Handi-Transit buses, would require a rebrand of vehicles.</p> <p>Safety: Very high level of safety, operated by Handi-Transit staff. Vehicles would need to be fit up with security cameras.</p> <p>Reliability: High level of reliability. It is possible that if there are many users who require curb-to-curb trips and/or assistance, this model could see a lower rate of on-time performance since certain passengers may require more assistance to their door (which created unplanned dwell time).</p> <p>Level of service: May be able to provide additional vehicles at the same price as conventional transit, reducing in-vehicle travel time and wait-time.</p>

Guiding Principle	Transit Windsor	Handi-Transit
<p>Accessibility and Availability</p>	<p>Booking: Conventional transit customers are provided with the On Demand app to book trips in real-time. Passengers may also book by phone.</p> <p>Stops Type and Location: Large buses may not be able to go down smaller residential streets to pick-up passengers that require pick-up from the curb.</p> <p>Accessibility: Most accessible as it utilizes the existing low floor accessible Transit Windsor fleet.</p>	<p>Booking: Handi-Transit customers are provided with the On Demand app to book both curb-to-hub and curb-to-curb trips in real-time. Passengers may also book by phone. May increase same day trips accommodated.</p> <p>Stops Type and Location: Use of smaller buses better able to access any street, picking up both at the stop and curb.</p> <p>Accessibility: The most accessible, as specialized transit customers. High-floor not as accessible for seniors and strollers.</p>
<p>Community Impact</p>	<p>Ridership Growth: Both models offer similar opportunities for ridership growth.</p> <p>Reduce GHG Emissions: Use of larger vehicles may emit more GHG.</p> <p>Stop Locations: Potential for higher concerns by residents due to stops on residential streets being serviced by larger buses.</p>	<p>Ridership Growth: Both models offer similar opportunities for ridership growth. May be higher growth if more vehicles are in service (reducing in-vehicle travel time).</p> <p>Reduce GHG Emissions: Use of smaller vehicles may reduce GHG emissions than larger vehicles. However, there may be a need for more vehicles, which reduces benefit of this model.</p> <p>Stop Locations: There may be fewer complaints by residences over stop locations if stops are serviced by smaller vehicles.</p>
<p>Operations</p>	<p>Service Control: Transit Windsor would have overall control of the service in both models.</p> <p>Scalable and Adaptable: Can change service levels based on demand only during board periods.</p> <p>Efficiency: Higher capital costs due to vehicle type and highest operating cost due to hourly cost (see Section 5.3).</p> <p>Ease of Implementation: In line with collective agreement.</p>	<p>Service Control: Transit Windsor will have overall control of the service in both models.</p> <p>Scalable and Adaptable: Higher potential to change service levels based on demand.</p> <p>Efficiency: Lower capital costs due to vehicle type and lowest operating cost due to hourly cost (see Section 5.3).</p> <p>Ease of Implementation: This option would be significantly more complicated to implement, due to restrictions within the Collective Agreement, use of seat belts and vehicle branding.</p>

Guiding Principle	Transit Windsor	Handi-Transit
Suitability to Windsor	Moderate This model is well suited to Windsor as it is already enabled within the existing Collective Agreement. In the longer term, however, this is likely to be a less efficient option and will not realize a number of customer benefits, including the Integrated trip model (Section 5.2).	High This model provides the highest customer benefit for both conventional transit and Handi-Transit customers, and has the potential to save operating dollars over time. In the short term, however, this option may be limited by Collective Agreement.

5.5 Recommendation

It is recommended that Transit Windsor explore the opportunity to have the On Demand service operated by Handi-Transit. This model provides a number of customer benefits to both conventional transit and Handi-Transit customers, and will lead to lower operating costs that can be reinvested back into the fixed-route system.

Moving to this model will be difficult, and there will be a number of challenges that will need to be overcome. Understanding this, the implementation plan below identifies next steps if the Transit Windsor were to move ahead with either operating model.

Stop Type Model

On Demand transit service can be structured based on the traditional proximity targets of a transit system (requiring customers to walk up to 400m to the closest transit stop), or to provide more convenient service right to the curb of the customer's origin and/or destination. Some typical pick-up/drop-off models include:

1. **Bus Stop** - The On Demand service picks-up and drops-off customers at predesignated transit stops only. It is common to use pre-existing fixed-route stops (e.g. when fixed-route service is replaced by On Demand service during certain periods of the day), or to designated On Demand stops. Stops are placed so that the majority of residents are within a 400m walking distance of a stop.
2. **Corner** - Customers must walk a short distance to a street corner within 100 metres of their origin/destination to get picked-up and dropped-off by an On Demand service. This type of pick-up/drop-off point is only used by technology-based ride hailing services as stops are virtual and only visible on the mobile app. This is because the location of a corner stop can change with each trip request, as the stop is selected to minimize the travel time of the vehicle that is destined to pick-up or drop-off the next customer (e.g. the location of a corner stop may be the north-east corner of an intersection for an inbound vehicle coming from the south, or the south-west corner for an inbound vehicle coming from the north). Customers are asked to walk a short-distance to optimize the service.
3. **Curb** - Customers are picked up/dropped off directly at the curb of their origin and/or destination. This model is typically used in more rural or low-density areas with limited ridership, where consolidating pick-up and drop-off points at a common stop would not significantly increase the efficiency of the service. For origin-to-hub service models, the curb is only used for one end of the journey.

Proximity of Service is important to consider when identifying how to operate the On Demand transit service in Windsor. The implications of each stop model assessed below are based on the guiding principles in **Section 2.0**.

Table 16: Evaluation of Stop Type Models

Guiding Principle	Bus Stop	Corner	Curb
Customer Experience	<p>Brand: Stops clearly identified as a Transit Windsor service.</p> <p>Safety: Customers may have to walk longer to their origin and destination, which may be unsafe during late night service.</p> <p>Reliability: Reduces vehicle travel time, resulting in improved reliability. Reduces potential conflicts with parked vehicles or operation on narrow streets.</p> <p>Level of service: Consistent with fixed route.</p>	<p>Brand: No identified marker at the stop. Passengers may be confused about where to wait.</p> <p>Safety: Stop near pick-up and drop-off point can increase perception of safety, particularly late night service.</p> <p>Reliability: Likely to have the slightly lower level of reliability due to the potential for deviations to pick up and drop off passengers at a corner, or need to operate on narrow streets.</p> <p>Level of service: Higher convenience for customers, shorter walking distance.</p>	<p>Brand: No brand required. Passengers wait at the curb of their origin (e.g. home) or destination.</p> <p>Safety: Stop in front of pick-up and drop-off point can increase perception of safety, particularly late night service.</p> <p>Reliability: Likely to have the lowest level of reliability due to the potential for significant deviations to pick up and drop off passengers at the curb and need to operate on narrow streets.</p> <p>Level of service: Highest convenience for customers, shortest walking distance.</p>
Accessibility and Availability	<p>Booking: N/A</p> <p>Stops Type and Location: Would meet the Transit Windsor requirement of making use of stops (either signed or virtual).</p> <p>Accessibility: Stops that don't have a hard accessible surface or are connected to a sidewalk would not be accessible. Passengers would need to walk/roll the longest distance to access the stop. Lowest level of accessibility.</p>	<p>Booking: N/A</p> <p>Stops Type and Location: Would meet the Transit Windsor requirement of making use of stops (either signed or virtual).</p> <p>Accessibility: Stops that don't have a hard accessible surface or are connected to a sidewalk would not be accessible. Passengers would need to walk/roll only a short distance, making is more accessible if there is a sidewalk in place. Second lowest level of accessibility.</p>	<p>Booking: N/A</p> <p>Stops Type and Location: Would not meet the Transit Windsor requirement of making use of stops.</p> <p>Accessibility: This model is the most accessible, and most consistent with the service provision of existing specialized service. Highest level of accessibility.</p>

Guiding Principle	Bus Stop	Corner	Curb
Community Impact	<p>Ridership Growth: The need to walk to a bus stop would not offer any additional convenience. Lowest potential for ridership growth.</p> <p>Reduce GHG Emissions: Reduced travel time, fewest stops and increased opportunities for ridesharing. Highest potential for GHG reduction.</p> <p>Stop Locations: Stops would be formalized and identified by Transit Windsor. Since infrastructure is being built, there may be objections by residents.</p>	<p>Ridership Growth: Reduced walking distance to the stop may make the service more attractive. Second highest potential for ridership growth.</p> <p>Reduce GHG Emissions: Increased number of deviations and stops (to pick-up and drop-off passengers). This also limits the potential for ridesharing. Second lowest potential for GHG reduction.</p> <p>Stop Locations: This model would have no formalized stop locations. It is possible there will be community concerns due to buses travelling on local residential streets and stopping at seemingly random locations for passenger pickups/drop offs.</p>	<p>Ridership Growth: Pick-up at a customer's door makes the service very attractive, particularly during inclement weather. Highest potential for ridership growth.</p> <p>Reduce GHG Emissions: Increased number of deviations and stops (to pick-up and drop-off passengers), since there are no shared stops in this model. This also limits the potential for ridesharing. Lowest potential for GHG reduction.</p> <p>Stop Locations: This model would have no formalized stop locations. It is possible there will be community concerns due to buses travelling on local residential streets and stopping at seemingly random locations for passenger pickups/drop offs.</p>
Operations	<p>Service Control: N/A</p> <p>Scalable and Adaptable: Lowest level of scalability and adaptability, as this model requires the siting of stops and the installation of bus stop infrastructure.</p> <p>Efficiency: Highest potential for ridesharing, as passengers are required to access the service at common stops.</p>	<p>Service Control: N/A</p> <p>Scalable and Adaptable: Highly scalable and adaptable. As this model does not require stop infrastructure, and only requires passengers to walk a short distance.</p> <p>Efficiency: Second lowest potential for ridesharing, as vehicles spend more time stopping, which results in a slower service.</p>	<p>Service Control: N/A</p> <p>Scalable and Adaptable: Highly scalable and adaptable. As this model does not require stop infrastructure, and only requires passengers to walk a short distance.</p> <p>Efficiency: Lowest potential for ridesharing, as vehicles spend more time stopping, which results in a slower service.</p>

Guiding Principle	Bus Stop	Corner	Curb
Suitability to Windsor	High Highly suitable to Windsor, highly implementable and familiar for existing ridership. Drawbacks include lower levels of accessibility.	Moderate Highly suitable to Windsor, highly implementable. Drawbacks include the fact that this represents a significant departure from conventional transit stops, and has a significant education & communication component would be required. Some passengers may find it difficult to follow directions to the stop, which may lead to increased calls to customer service.	Low Highly suitable to Windsor, highly implementable. Drawbacks include difficulty of access for conventional transit vehicles, and generally decreased operational efficiency.

Recommendation

Based on the above assessment, it is recommended that Transit Windsor operate a 'bus stop' model for its On Demand service. This may require the installation of additional stops in the On Demand service area to meet the proximity targets set for this service (see **Section 7.2.4**).

7.0

Short-term Service and Implementation Plan

The following present the details of the recommended service delivery model for both the short and long-term.

7.1

Short-term Phasing Plan

While significant work and analysis has been undertaken to anticipate demand and ridership, with a new service model, and in the context of a post-Pandemic return to normal, there are a number of unknowns which could impact the success of the implementation of On Demand. For this reason, it is recommended that a smaller area be piloted first in order to identify lessons learned regarding customer communications, customer experience, and operations. The following identify the recommended priority for implementation:

Year 1: East Windsor – Lauzon 10 Pilot

It is recommended that for an initial pilot, Transit Windsor consider converting the evening and weekend service on Route Lauzon 10 to operate as an On Demand service.

The Lauzon 10 is an underutilized route, currently providing largely unidirectional service on a circuitous route from the East End Terminal. Operating with two vehicles during the week and one vehicle on Saturday (no Sunday service), it would appear that during most periods, this route is well suited for On Demand service. The route also operates entirely within the proposed East Windsor On Demand service area, described in this report. This means that converting this route early will not result in further changes to customer travel behaviour when the rest of the East Windsor area is converted to an On Demand service (see **Section 4.2.1**).

Although there will unlikely be cost savings and some overlap with the adjacent routes of Transway 1C, Crosstown 2, and Ottawa 4, the pilot would test what On Demand service could look like in Windsor, and familiarize riders with On Demand service ahead of more substantial changes to the transit network.

It is recommended that as a pilot, Transit Windsor reassign the two vehicles currently scheduled to the Lauzon 10 to operate as On Demand after PM peak until the end of the existing service day for this route and one vehicle all-day on Saturday. Staff should monitor wait time, and ensure that average travel time to the Hub (East End Terminal) is 30 minutes or less. If observed demand is low, there may be opportunities to reduce the resource requirement to one bus in the weekday evening period.

As noted above, the service area will overlap existing to varying degrees with Transway 1C, Crosstown 2, and Ottawa 4. To mitigate overlap in service, Transit Windsor should work with the On Demand technology provider to identify stops that avoid duplication with fixed-routes. Customers that live near a

fixed-route in this area would only be directed to an On Demand stop if they are destined within the On Demand service area, and not to the transfer hub. Table 17 illustrates the initial capital and operating costs, but with the Transit Windsor and Handi-Transit operating model.

Table 17: East Windsor – Lauzon 10 Pilot Costing

Operating Parameter		Transit Windsor	Handi-Transit
Capital Costs	Cost for Expansion Vehicles ²³	\$0	\$225,000*
	Required On Board Tablets	\$2,000	\$3,000
	Farebox and Smartcard reader install	\$0	\$100,000
	Fit up with Security Cameras	\$0	\$10,000
	Rebranding of vehicles	\$0	\$15,000
Additional Operating Costs	Software Licensing	\$24,000	\$36,000
	Additional Operating Cost	\$0	-\$49,300**
Total Costs for Year 1 Pilot		\$26,000	\$339,700

*Additional vehicle required to accommodate passengers travelling with children

**Assumes Handi-Transit requires an extra vehicle during peaks, however, operates at a lower hourly operating cost

Year 2 (or as resources become available): Devonshire Heights and Walker Farm

Based on the findings of the Year 1 Pilot, it is recommended that Transit Windsor apply the lessons learned in East Windsor to Devonshire Heights and Walker Farm. Devonshire Heights is an area largely unserved by transit today while Walker Farm only has limited coverage (nine hours per weekday only). Combining both areas into an On Demand zone will allow Transit Windsor to better utilize resources and improve services in both areas.

Although it is anticipated that in the midterm, demand in the Devonshire Heights area will warrant fixed-route service, the introduction of On Demand service in the short term will provide access to service for many Windsor residents who currently fall outside of an easy walk to transit service, without having to wait for the roll out of the full TMP.

It is recommended that in this scenario, an expansion bus is purchased to operate 13 hours each weekday and on Saturdays. The Route 3 Loop in Walker Farm that currently operates nine hours on weekdays only, would continue, but operate as a peak-only On Demand service out of the Devonshire Mall terminal six hours per day. Both services would be anchored by Devonshire Mall. Transit Windsor staff would need to monitor closely and ensure that, if uptake is rapid in Devonshire Heights, that On Demand users in Walker Farm industrial area are still receiving a high quality of service (i.e. wait times are not too long, trip times are reasonable). **Table 18** illustrates the upfront costs for both the Transit Windsor and Handi-Transit operating model.

²³ Assumes no vehicle

Table 18: Devonshire Heights and Walker Farm – Year 2 Costing

Operating Parameter		Transit Windsor	Handi-Transit
Capital Costs	Cost for Expansion Vehicles	\$675,000	\$225,000
	Required On Board Technology	\$2,000	\$3,000
	Fare box and Smartcard reader install	\$0	\$100,000
	Fit up with Security Cameras	\$0	\$10,000
	Rebranding of Vehicles	\$0	\$7,500
Additional Operating Costs	Software Licensing	\$24,000	\$36,000
	Additional Service Hours	\$282,000	\$298,900
Total Costs for Year 2		\$983,000	\$680,400

7.2 Implementation Requirements

The following implementation requirements are recommended for the service. This addresses both the operating model and the technical requirements that should be requested from the selected On Demand software provider. For each of the implementation sections noted below, recommendations and next steps are identified for both the scenario in which Transit Windsor operates the service, and the scenario in which Handi-Transit operates the service.

7.2.1 Vehicle Requirements and Specifications

The following specifications are recommended for On Demand vehicles:

Transit Windsor Operator

All vehicles should be low-floor, fully accessible vehicles and include a fare box and smartcard reader and onboard cameras. Existing 40-foot buses should be used for the pilot. Transit Windsor should explore the use of smaller low-floor accessible 30-foot or cutaway vehicles as part of a fleet right sizing strategy. Vehicles used should accommodate at least 10 ambulatory passengers and have space to accommodate 2 wheelchair positions.

Handi-Transit

If the service is operated by Handi-Transit, the existing fleet should be used for the pilot. The existing fleet are high-floor lift-equipped vehicles with a maximum 6 ambulatory seats. Vehicles do not have fare boxes or smartcard reader, which should be explored to allow customers to pay their Transit Windsor fare (see **Section 7.2.7** below) and ensure seamless integration for those transferring between fixed-route and On Demand services.

Two new low-floor cutaway buses are recommended to be purchased (one peak and one spare). These vehicles should accommodate at least 10 seated ambulatory passengers and two spots for mobility

devices. Vehicles should not include seatbelts. These vehicles would be used if a passenger that is travelling with a child or infant requests a ride. These vehicles do not require passengers travelling with children to bring their own child seat.

Handi-Transit operators would need to update their licence rating from an F-Class (current) to a B-Class in order to operate this new vehicle type. Only one or two existing operators have this licence, as the license is not required to operate the existing fleet. It is possible that Transit Windsor could offer licensing to Handi-Transit operators, as is currently done for the operators of conventional Transit Windsor vehicles.

Handi-Transit customers are accustomed to wearing seatbelts, and a communication strategy would need to be in place to inform registered Handi-Transit customers and caregivers that certain vehicles that arrive may not have seatbelts (if a new buses are purchased without seatbelts to accommodate travelling with children). The communication should focus on the safety of passengers on board this vehicle, despite the lack of seatbelts, due to the crash-rating of the vehicle. While there are several examples of specialized transit agencies that operate vehicles without seatbelts, this is not something that existing Handi-Transit customers are used to, and a change management strategy would be recommended to ensure everyone feels safe and comfortable. By that same token, Transit Windsor customers would also need to be informed that when they use On Demand service, they may ride in a vehicle with seatbelts, in which case they would be required to put them.

If this approach were pursued, Handi-Transit has indicated that discussions would also need to take place with their insurance providers regarding liability associated with carrying the public (as opposed to registered clients), operating vehicles without seatbelts, and any change in rates associated with a new vehicle type.

Consideration should also be made to rebranding the Handi-Transit vehicles, removing the “Handi-Transit” branding. Vehicles deployed on this service should be rebranded to focus on a message of ‘mobility’ in general, instead of targeted to persons with disabilities only. This will help create a more integrated service in general and is a first step in moving towards a more equitable and accessible ‘family of services’ in Windsor.

Next Steps

The following next steps should be completed by Transit Windsor staff:

1. Confirm the most appropriate vehicle operator for the On Demand service.
2. If operated by Transit Windsor:
 - a. Select an On Demand software provider;
 - b. Install tablets on vehicles selected to compete the On Demand service that provide operators directions to their next pick-up and drop-off;

- c. Train operators on how to use the tablet and operate the On Demand service; and
 - d. Explore the most appropriate fleet size and mix system-wide once the pilot is complete.
3. If operated by Handi-Transit:
- a. Develop a policy for fare reconciliation with Handi-Transit;
 - b. Select an On Demand software provider;
 - c. Re-brand vehicles to something more suitable to both On Demand and Handi-Transit customers (e.g. Windsor Mobility);
 - d. Develop communications strategy about the use of seatbelts (or travelling without seatbelts);
 - e. Develop communications on travelling with children (need to bring and secure child seat in vehicle for the duration of the pilot, or until such a time a vehicle without seatbelts is available);
 - f. Purchase two smaller low-floor cutaway vehicles with a minimum of 10 ambulatory seats and 2 wheelchair positions to be used for the On Demand service. Prioritize these vehicles when a customer books a ride with a child or infant, to eliminate the need to bring a child seat. Consideration can be given to vehicles with built in infant seats;
 - g. Upgrade Handi-Transit operators to a B Class licence, to meet the requirements of the new vehicles;
 - h. Handi-Transit to work with insurer to see if there is any change in rates associated with the new operating model; and
 - i. Enter into collective bargaining agreement negotiations with ATU.

7.2.2 Terminal Requirements

A bus bay (or several bus bays) would be required to allow On Demand Transit to transfer to fixed-route services. On Demand vehicles require a location to pick up and drop off passengers as well as wait the prescribed amount of time set out in the Wait Time Policy (**Section 7.2.8**). This location must be at or have direct and accessible access to the fixed-route stop to provide for seamless transfers.

The following table summarizes the recommended Terminal/Hub for the On Demand service areas, and identifies available capacity to accommodate this service within the existing layout.

Table 19: Terminal Location for Recommended On Demand Service Areas

Service Area	Transfer Location	Bay Requirement and Capacity
East Windsor On Demand	East Terminal	Short-term: One bay required. Use the bay allocated to Route Lauzon 10. Long-term: Two to three bays required. This may require an expansion of the terminal as identified in the Transit Master Plan.
Devonshire Industrial On Demand	Devonshire Mall Terminal	One bus bay required. This is a new service that would require a new bus bay. This bay would eventually be used by Route 121, as identified in the Transit Master Plan. The existing terminal has long bus pullouts (over 35m) and has capacity to accommodate four buses, all of which are being used. The terminal would need to be expanded. In the short-term, there may be an opportunity to pull into an existing bus bay when a fixed-route bus is not present.
Sandwich South	Future Hospital Terminal	Ensure new terminal design incorporates separate bus bay to facilitate On Demand transfers.
West Windsor	Hotel-Dieu Grace Healthcare Terminal	One bay required. The terminal has multiple bays and capacity for vehicles to stop along outer ring.
Oldcastle	Devonshire Mall Terminal	One bay required. May require an expansion of the terminal, depending on the timing of new routes identified in the Transit Master Plan.

Next Steps:

The following next steps should be completed by Transit Windsor staff:

1. Assess the ability to accommodate an extra two On Demand buses at existing bus bays at the Devonshire Mall terminal;
2. Confirm the recommended passenger amenities and accessibility requirements noted above are in place at each of the transfer hubs;
3. Identify the On Demand bus bay requirements noted above for any expansion plans or new terminals; and
4. Add a requirement that the On Demand technology provider restrict access to a terminal to selected drop-off/pick-up times when there is a bus bay available and not being used by another fixed-route bus.

7.2.3**Stops and Shelters**

Transit Windsor should develop Service Guidelines for the On Demand service, stating that all customers should be able to access an On Demand stop within 300 to 400 metres of their residence. Existing transit stops can be used as On Demand stops where they are already in place, and new stops can be identified in collaboration with the On Demand technology provider to ensure an appropriate balance is struck between customer access and efficient operations.

All stop, shelters, and hubs should meet the Accessible Transportation Facilities Standards set out in the City of Windsor’s Facility Accessibility Design Standards (2006). All bus stops must have a paved, firm, level surface, with a curb cut and sidewalk at each stop location. Shelters should similarly be on paved, level surfaces with clearances of 1.22m on at least two sides of the shelter. Major transfer points at Transit Terminals should be furnished with benches and shelters.

Next Steps:

The following next steps should be completed by Transit Windsor staff:

1. Confirm service guidelines (minimum walking distance) for On Demand zones; and
2. Work with On Demand technology provider to select stops in the On Demand zone that meet Transit Windsor’s requirements, and optimize operations.

7.2.4 Trip Booking and Dispatching

Unlike conventional Transit Windsor routes, trips will need to be booked ahead of time by passengers to reserve their space. To book a ride, a passenger must download the On Demand mobile app and register for the service. Customers must have a valid credit card or debit card if they want to use the mobile fare payment option.

To book a ride, a passenger will enter their pick-up and drop-off location when they want to travel, similar to ridesharing apps which some customers may already be familiar with. Stops will be coded into the app to identify which stops a customer can travel within the On Demand zone. It is also recommended that a feature be included to allow customers to identify if they are registered for Handi-Transit. This would allow registered Handi-Transit customers to get a curb-to-curb service anywhere within the On Demand zone while an On Demand customer would be picked-up and dropped-off at a bus stop.

If the service was operated by Transit Windsor, registered Handi-Transit customers that use the service would need to be informed that they would only get a curb-to-curb service within the On Demand zone and would need to book Handi-Transit separately if they wanted a complete curb-to-curb trip elsewhere in the City. If the service was integrated and provided by Handi-Transit, the same customer could receive a curb-to-curb trip anywhere in Windsor, or a curb-to-hub trip, connected with a fixed-route.

The app should also provide an option to identify if a customer:

- Is travelling with more than one passenger;
- Is travelling with an attendant (and would receive a free fare);
- Is travelling with a service animal;
- Is travelling with child or infant; or
- Has a wheelchair or other mobility device.

This information will help Transit Windsor understand the passenger profile and ensure adequate space on vehicles, particularly if smaller capacity vehicles are used to deliver the service.

The app will identify the trip options available and seek to optimize the trip to encourage ridesharing. Available trip times will be provided to the customer to select. A pick-up window will be displayed, which will reduce and provide real-time information to closer the driver is to the pick-up location.

Different fare payment options would also need to be identified in the app. This should include:

- Cash fare (pay online or to the driver);
- Smart Pass or Smart Ride (see **Section 7.3.8** below);
- Transfer; and
- Other.

The operator should be notified to require a fare payment for every customer boarding the vehicle, unless a proof of mobile fare payment is shown when the customer is boarding the vehicle.

For customers that do not have a smartphone, the On Demand technology provider should be required to develop a website booking application that is integrated into the Transit Windsor website. Once a trip is booked, a text message can be sent to the customer's mobile phone or the customer can print out a receipt for the ride. An option should also be provided to allow automated text messages to be received on a customer's mobile phone to alert them when the vehicle is arriving. This is useful for customers that do not have a smartphone or internet access.

Customers should also be given the option to call in to book a ride. In this case, the customer must have registered for an On Demand account and provide the customer service representative access to book on their behalf. The customer service representative would confirm the details of the trip and inform the customer of the pick-up location and time. More details on telephone booking requirements are noted in **Section 7.2.5** below).

Next Steps

The following next steps should be completed by Transit Windsor staff:

1. Identify requirements in the RFP for an On Demand technology provider to address the fare payment options, text messaging and customer identification requirements noted above;
2. Identify requirement in the RFP for an On Demand technology provider to develop a website that customers can use to register for the service any book a trip;
3. Work with the On Demand provider to allow curb pick-ups and drop-offs for registered Handi-Transit customers within the On Demand zone(s); and

4. Work with On Demand provider to develop a paper receipt (taking into account the potential for fraud).

7.2.5

Customer Call Centre

In order to facilitate booking for individuals who cannot or would prefer not to use a smartphone or computer, a telephone booking option must be made available.

To facilitate this service, it is recommended that Windsor have a staff member available at least one hour before the start of the On Demand service and one hour before the end of the On Demand service to book and schedule a ride by phone. The same phone number would also be available for customers to report on any issues with their trip (e.g. the vehicle did not show up).

The required staffing is dependent on the number of On Demand areas implemented and associated number of bookings that require staff involvement. Experience shows that the large majority of On Demand customers use a smartphone to book a trip. While there may be a higher call volume initially, it is expected that 10 to 15% of customers will call in once the service is well established. **Table 20** illustrates the potential calls per hour by period in the short-term, assuming between 10 - 12 boardings/revenue vehicle hour.

Table 20: Potential Short-term Hourly Trip Booking Calls by Phone

On Demand Area	East End	Devonshire – Industrial	Total
Weekday Peak	N/A	2.0 – 3.6	2.0 – 3.6
Weekday Afternoon	N/A	1.0 – 1.8	1.0 – 1.8
Evenings	2.0 – 3.6	1.0 – 1.8	3.0 – 5.4
Weekends	1.0 – 1.8	1.0 – 1.8	2.0 – 3.6

There are three potential options for Transit Windsor to consider for telephone booking:

1. **311 Windsor:** This is currently a general municipal help line that operates on weekdays between 8:00am and 4:00pm. This line could accommodate trip bookings that occur in On Demand zones during the day, however existing staff would need to be trained on how to book a ride. In order to accomplish this, customer agents would require administrative access to On Demand software in real time, to answer questions about trips already booked (e.g. has my vehicle arrived yet?). As this is an additional job duty, these agents are not used to booking rides and this option may pose a challenge. Further, the hours of service for one booking agent would also need to be extended to accommodate the evening service day in the On Demand zone.
2. **Handi-Transit:** Handi-Transit has two booking agents on during the day and one in the evenings. Customers can book trips between 7:00am and 9:00pm on weekdays, and between 9:00am and

4:00pm on weekends and holidays. Staff availability is limited and Handi-Transit has indicated that there is limited capacity to take on additional On Demand calls without additional support, particularly when the service is launched. This solution may require an increase in staff during certain periods, which would partially be used to answer On Demand calls and take on additional Handi-Transit calls. The benefit of this option is that Handi-Transit booking agents are familiar with Windsor and have experience booking trips. The hours of service for one booking agent would need to be extended to accommodate the evening On Demand zone.

3. **Outsource to an External Call Centre:** Another option would be to include the requirement as part of the RFP for the On Demand technology provider. The RFP would state the hours that a live person would need to be available to book a trip, register for the account or ask questions. This could be done by either extending hours of service for Call Centre or reservation staff or outsourcing the work to the On Demand technology provider. This can be done for the entire duration of the On Demand service, or combined with Option 1 or 2 above, to be in place after hours only. The challenge with this option is that not all On Demand technology providers may have access to a call centre, which many limit responses if this is a requirement.

A combination of Option 2 and 3 would likely be the most effective, particularly during the pilot. This would allow Handi-Transit staff to monitor the volume of On Demand-related calls and assess the resourcing needs going forward as On Demand expands across multiple service areas. If On Demand calls impact the ability to book Handi-Transit trips, the outsourced call centre option can be extended or another call taker hired. Additional training would be required for existing Handi Transit Call Centre staff to support On Demand booking functions.

Next Steps:

The following next steps should be completed by Transit Windsor staff:

1. Confirm that Handi-Transit call centre has the capability to take additional calls for customers that do not have a smartphone;
2. Set up a phone number for passengers to call, linked to the Handi-Transit call centre;
3. Identify hours of service for customer service centre staff;
4. Identify requirement in RFP for On Demand technology provider to have an afterhours number for customers to book trips and answer questions;
5. Identify requirement in the RFP for the On demand technology provider to provide technical support for customers registering or using the app; and
6. Train existing Handi-Transit call centre staff on the On Demand service area and use of the On Demand app, including how to view trips in real-time (administrative access to the On Demand platform would need to be provided to Handi-Transit customer service staff).

7.2.6 Fare Integration with Fixed-Route Transit

A key requirement for On Demand transit is the ability for customers to seamlessly transfer between this service and a fixed-route Transit Windsor route to complete their trip.

On Demand customers that paid an electronic cash fare will need to show the Transit Windsor operator either their ticket on their smartphone, via text message or a printed receipt. It will be important for all of these to have a similar format and display the same information to reduce driver confusion. Drivers should also be instructed not to handle customer smartphones or mobile phones to avoid any liability in case of damage. Passengers who have a Smart Pass or a Smart Ride card would also be required to tap when boarding a Transit Windsor vehicle (see **Section 7.2.7** for more detail on Smartcard integration).

On the return trip, all customers should pay the fare on the fixed-route conventional transit vehicle and request a transfer. When transferring onto an On Demand vehicle, customers with Smart Pass or Smart Ride card will show their transfer to the operator, or tap the card if boarding a vehicle equipped with a smartcard reader.

Next Steps:

The following next steps should be completed by Transit Windsor staff:

1. Identify the fare payment and receipt requirements in the RFP for an On Demand technology provider;
2. Work with the selected technology provider to develop a simple receipt that can be displayed on a customer's smartphone, through text message or printed. All three should have a similar format and be easy to read, displaying the date and time of the trip and method of fare payment; and
3. Train operators to review, validate and accept the On Demand receipt.

7.2.7 Smartcard Integration

Transit Windsor uses a stored-value smartcard. Customers can by a Smart Ride card with a minimum of five rides, or a Smart Pass card with a minimum of 15 days loaded on the card. Both provide automatic transfers and can be reloaded.

Smartcard readers are required to debit the card and record a transaction for both Smart Ride and Smart Pass. While these readers are in place on all Transit Windsor conventional buses, there are not readers on Handi-Transit vehicles. Next steps required for implementation using both Transit Windsor and Handi-Transit as an operator are explored below:

Transit Windsor Operator

There are no additional implementation steps required for this model as each Transit Windsor bus is equipped with a Smartcard reader. For customers that routinely use this fare medium, the On Demand software would require a payment option titled “Smart Pass” and “Smart Ride”. Customer who select this option would not be charged, but instead would be notified to tap when they boarded the vehicle. The driver would also be notified that the customer entering the vehicle would need to pay upon boarding.

Handi-Transit Operator

Two smartcard integration options were explored under this operating model:

1. **Install Smartcard Readers on Handi-Transit Vehicles:** This option would require the installation of registered fare boxes with smartcard readers on each vehicle providing On Demand service. Each unit costs approximately \$50,000, and discussions would need to take place with the operator about the room available in the vehicle to provide these devices. In the short-term, the two new vehicles purchased (see **Section 7.2.1**) would be equipped with these readers. Two to three additional vehicles would also need to be retrofit. From a customer perspective, this is the best alternative, but comes with the highest price-tag, which limits potential for cost savings.
2. **Do not Collect Smart Pass Fares on the On Demand Portion of Trip:** During of the pilot, a simple approach would be to provide a free fare for Smart Pass holders during the On Demand portion of the trip. Passengers that use the service to connect to another Transit Windsor service would still be required to validate their card when boarding the Transit Windsor fixed-route vehicle. On the return portion of the trip, passengers would validate their card when boarding a Transit Windsor vehicle and receive a transfer when boarding the On Demand vehicle. Fare loss would only occur if a customer used an old card without any loaded fare value to access a local destination within the On Demand service area (e.g. free trip to a shopping mall).

For Smart Ride holders, an option could be identified on the mobile app to allow customers to select a Smart Ride fare. This would require customers to add a method of fare payment on their account that would be debited for each ride. When boarding the On Demand vehicle, customers would show their card and ask for a paper transfer if they were transferring onto a fixed-route bus. The value on the card would remain the same, as the fare would be taken from the mobile fare app. The challenge with this solution is that customers would require two forms of fare payment (on the app and on the card). Customers that have an empty card would still be able to receive the ‘ticket’ price, even if they didn’t have the minimum five tickets purchased on the smartcard. This is a small revenue risk for Transit Windsor.

For the purposes of this pilot, Option 2 is recommended if Handi-Transit is the operator. From a customer perspective, Smart Pass users should see no change. There is a slight inconvenience

for Smart Ride holders, as their card is not debited with each On Demand trip, requiring them to purchase extra fares. For customers that routinely use On Demand, they will likely quickly switch to using the mobile fare payment option.

From an operator perspective, there is no additional capital cost for retrofitting existing vehicles. This provides some time for Transit Windsor to assess the pilot and purchase new vehicles already equipped with readers and assess potential upgrades to their smartcard.

In the future, it is also recommended that Transit Windsor explore the potential to switch to an account-based smartcard that can be integrated with a mobile fare payment option provided by the On Demand technology provider. In this scenario, customers would register their smartcard when registering for the On Demand service. The account would be debited when purchasing a ride on the mobile app, but could still be used to tap onto a fixed-route bus. This would eliminate the need to install smartcard readers on Handi-Transit buses.

Next Steps:

The following next steps should be completed by Transit Windsor staff:

1. Confirm operating model and required next steps noted above;
2. Include requirement in the On Demand technology provider RFP to be able to integrate with an account-based smartcard (in the future); and
3. Explore potential to migrate to an account-based smartcard.

7.2.8 Policy and Procedure Updates

In order to ensure the smooth and efficient implementation of On Demand service, seamless integration with fixed-route service, and high quality customer experience, policies will need to be put in place to govern requirements and expectations of both Transit Windsor and customers related to On Demand transit. These policies will outline the acceptable parameters of service provision by Transit Windsor as well as the expectations of customers using the service.

Pick-up Window

When a customer trip is confirmed, they will be provided with a pick-up window of up to 10 minutes. Customers are expected to be at the pre-designated stop within the entire duration of the pick-up window. This is particularly important for customers that do not have access to a smartphone. For customers with a smartphone, the pick-up window will be refined and real-time data on the vehicle arrival time will be displayed on the customers' smartphone.

Drivers can wait for a customer to arrive for up to 30 seconds if they arrive at the stop within the pick-up window. If a driver arrives at the stop early (outside the pick-up window), the driver would be required to wait to the start of the pick-up window before departing.

No Show Policy

Late arrivals and No Shows can add cost to the service. There is also an opportunity cost, where another passenger may have been denied a ride because the vehicle was scheduled to capacity. While late arrivals and no shows occur occasionally, a system needs to be in place to reduce the number of repeat occurrences.

On Demand vehicles and customers are expected to be at the stop within the designated pick-up window. Once the vehicle arrives, the driver can wait up to 30 seconds. If there is no sign of the passenger, the driver will note this and proceed to the next pick-up/drop-off.

Incidents of No Shows and late arrivals should be linked to a customer account where it can be tracked. No fare penalty will be charged immediately, but if a customer is constantly late or does not show for a scheduled pick-up, a warning should be given to the customer at the next time of booking. If this continues to occur without a reasonable explanation (e.g. more than twice a month), the customer should be suspended from the service for a one month period. The Handi-Transit No Show policy should be reviewed as a starting point to develop a No Show Policy for this service.

Next Steps:

The following next steps should be completed by Transit Windsor staff:

1. Identify Booking window with the selected On Demand technology provider;
2. Develop a No Show Policy and Late Arrival Policy, including a way to track and communicate with repeat offenders; and
3. Set up a dispute resolution process in case there are conflicts/disagreements with customers.

7.2.9 Trip Planning Integration

A number of Transit Windsor customers use their-party trip planning applications to identify their route and plan their trip. Transit Windsor facilitates this by making GTFS data available to Google. The implementation of On Demand transit should allow customers to continue to use these third-party apps to plan their complete trip, including trips that have an On Demand and fixed-route connection.

To facilitate this, the RFP for the On Demand technology provider should specify the requirement for native integration with third-party trip planning applications available in Windsor (e.g. Transit App). This would allow customers to plan their trip and proceed to booking without being required to leave the original app.

7.2.10 Level of Service and Customer Focus

In order to function as a viable part of the transit network, On Demand services needs to be able to provide service to customers without excessive wait times. While lower wait time options provide

greater customer benefits, the cost is higher as additional vehicles are required to ensure that they can provide the required coverage. As such, utilization time per vehicle will likely decrease.

As a general rule, the level of service for On Demand transit should match the conventional fixed-route service it is connecting to. Beyond customer convenience, service levels affect the overall capacity and attractiveness of the service. If demand and capacity are high, the cost of providing the service may exceed that of a fixed-route and therefore productivity gains are lost. If this is the case, an On Demand service may be the precursor to conventional fixed-route transit as demand grows.

7.2.11 Software Pricing Models

There are a number of different pricing models that the Transit Windsor should consider when implementing an On Demand service. Most On Demand technology providers charge an initial set-up fee, and then provide a monthly charge per vehicle. Others provide a charge per vehicle hour, reflecting that some vehicles may only be used for short periods of the day (e.g. evening service) while others are used all-day. This type of charge would be reflected in the operating budget of the transit system.

Other municipalities have treated On Demand transit technology as a capital cost. The benefit of this is the ability to use federal transit funding to pay for the technology and/or to include it as part of an upcoming Development Charges update. This is completed by asking On Demand technology providers that respond to the RFP to provide fixed-price over the term selected, based on the On Demand vehicles anticipated as part of the service contract. The risk with this model is that Windsor may pay for service not provided if the On Demand service does not materialize as anticipated.

Both options should be considered and discussed with the Finance Department at the City, with a decision made before proceeding to the RFP stage.

7.2.12 Key Performance Indicators

As the new On Demand service is implemented, ongoing monitoring must take place to evaluate its effectiveness and the extent to which it is achieving desired outcomes. To facilitate this process, Transit Windsor staff should develop a Monitoring Plan which would identify key performance indicators (KPIs) as well as desired or targeted outcomes for each indicator if applicable. These KPIs should be selected based on the initial goals and intentions of the service. The Plan would also identify the timing of evaluation and reporting, ensuring a balance between monitoring regularly enough to identify red flags and opportunities quickly, and allowing enough time between evaluations to effectively see the results of changes made. These KPIs can be used to inform Transit Windsor staff, local councillors, and the public about the effectiveness of the service and should be used as a starting point for any proposed changes.

The On Demand technology provider should be able to provide the required data as set out in the Monitoring Plan. These requirements should be included as part of the RFP to ensure the selected

contractor has this capability. **Table 21** identifies a number of potential KPIs covering a wide variety of components relating to On Demand service. Depending on the priorities and goals of Transit Windsor relating to On Demand service, not all KPIs may be applicable.

Table 21: Potential Key Performance Indicators

Category	KPI
Service	Revenue and Total Vehicle Hours (TVH and RVH)
	Revenue and Total Vehicle Kilometers (RVK and TVK)
	Ratio of Revenue to Total Vehicle Kilometres
	Revenue Service Hours per Capita (in On Demand area)
Trip Booking	% of Dropped Trips (Trips Looked-up but not Booked)
	Trip Cancellations (booked then cancelled both within time parameters and late cancellations)
	No Shows (booked trip but passenger does not show at scheduled pick-up time)
	Wait Time (time between booking and trip pick-up)
Ridership	Passenger Boardings
	Passenger Kilometres Travelled (PKT)
	Linked Trips (Passengers that transfer to or from On-Demand services)
	Passenger Trip Duration (minutes and kilometres)
	Origin and destination data by trip, both of which must at a minimum be tagged by postal code
	Boardings by Source (e.g., booked by app, website or by phone)
	Boardings per Capita (in On Demand area)
	Boardings per Revenue Vehicle Hour
Fare Payment	Fare Category and Payment Used (cash, Smart Ride, Smart Pass, U-Pass, transfer, mobile payment, promo, etc.)
	Fare revenue collected and
	Average Fare
On-time Performance	Time of pick-up and drop-off relative to estimated and guaranteed times upon booking
Vehicle	Breakdowns by vehicle and day
	Chronological vehicle manifests of pullout from garage, first pick-up, all pickup/ drop-off times and locations
Rating	Driver and Trip Rating
	Complaints per Trip (monthly)
	Response to survey questions posted by Transit Windsor on the mobile app

7.3 Next Steps

The following next steps should be considered if Transit Windsor is interested in implementing an On Demand service as described in this report:

1. **Confirm with Legal and Procurement:** An On Demand model will collect data on customer information, including potential credit card data for mobile fare payment. The policies and rules

in the municipality around privacy, data storage, data ownership and procurement should be known before proceeding, as it influences what is included in the RFP for a technology platform provider.

2. **Determine Potential to Operate a Call-Centre:** Not all customers will have access to a mobile phone or computer to book a ride. Approximately 10 to 15% of customers may still want to call a live operator to book a ride. Transit Windsor will need to determine whether Handi-Transit has capacity to take on this function (potentially adding to an existing customer service agent's role) and what it will cost. The alternative would be to contract this service out. This will influence what is included in the RFP for a technology platform provider.
3. **Engage with the Public:** On Demand services involve a significant change in how customers interact with transit, particularly the need to book a ride ahead of time. The advantages and disadvantages of an On Demand service should be presented to the public to understand any concerns they may have. This may also result in changes to the service model and the requirements requested from the technology provider in the RFP.
4. **Communication:** Funding should be set aside for marketing and communication, as this new model will involve some change management for both drivers and customers.
5. **Write RFP and Initiate Procurement of a Technology Platform Provider:** The RFP for the technology platform provider should identify the specific service and operating model, hours of service, vehicle requirements and specifications and Key Performance Indicators. The RFP should include the following:
 - Service hours and level of service;
 - Service area(s);
 - Service delivery model;
 - Operating model(s);
 - Length of contract;
 - Whether Transit Windsor is providing vehicles;
 - Accessibility requirements;
 - Driver training requirements;
 - Cost and cost control requirements;
 - Branding requirements; and
 - If Specialized Transit integration is a current or future goal.
6. **Add Additional Bus Stops:** Transit Windsor should work with the successful proponent to confirm vehicle requirements and stop locations. Additional bus stops should be implemented based on a set of 'bus stop' criteria that takes into consideration safe vehicle stopping, customer safety while waiting (e.g. segregation from traffic, lighting), proximity and accessibility.

7. **Allow Curb-to-Curb Trips for Handi-Transit Customers:** Should Transit Windsor elect allow curb-to-curb trips within the On Demand service are for persons with disabilities, a number of other next steps are required to create a separate customer profile for registered Handi-Transit customers and identifying policies and procedures for operators.