# Lakeshore Mobility Options Study

Prepared for: Municipality of Lakeshore

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# EXECUTIVE SUMMARY

The Municipality of Lakeshore undertook this study to identify the feasibility and potential demand for mobility and transit travel options to support its vision of, "A progressive Town of healthy integrated communities." Growth of the community needs a diversity in choice for both internal movements within Lakeshore and connectivity to neighbouring municipalities and throughout the region.

The **objectives** of this study were as follows:

- To gauge the appetite of Lakeshore residents to support establishing alternative mobility options for travel and to engage with stakeholders to get input into potential plans and options
- To analyze travel data to identify major travel patterns and key destinations within Lakeshore and between Lakeshore and neighbouring communities.
- To provide an indication of:
  - Where the greatest demand exists for establishing some form of service?
  - Which mobility services could be considered for delivering the service?
  - The extent of service and financial implications of a transit solution?

These outcomes will form the basis of more detailed service planning once there is a shared desire by the community and Council to pursue this initiative further.

A **Literature Review** of relevant documents and plans was undertaken to provide background and a better understanding of the issues, challenges and opportunities relating to land use and transportation plans and transportation services. This included the Windsor and Tecumseh Transit Master Plans, the Lakeshore Official Plan and the Waterfront Master Plan.

A **Peer Review** focusing on the integration of transportation modes made possible by smart phone and wireless technological developments provided examples of successful mobility services that have recently been established – notably in Innisfil and Oakville, Ontario.

**Location-Based Data** was acquired and analyzed to identify the major origin-destination patterns in Lakeshore and the region and to estimate ridership for potential transit options that serve the needs of Lakeshore residents, workers, and visitors. It found that 5 neighbourhoods/areas within Lakeshore (Belle River, Lakeview Regional Park, Pike Creek/Old Tecumseh Area, Patillo Road Industrial and Emeryville/Puce) generate and attract the majority of trips in Lakeshore. The biggest travel destination was found to be Windsor. The analysis concluded that service option that links the largest trip generating zones in Lakeshore and connects them through the Town of Tecumseh along Tecumseh Road, to a location within the City of Windsor should be considered.

**Stakeholder Consultation** included a workshop that held with members the Lakeshore Corporate Leadership Team and Transit Synergy Team to establish the following framework for a vision, goals and objectives that would guide the development of transit and mobility options:

**Mobility Vision:** "Connecting Lakeshore into the future"

**Mobility Goal:** "Create mobility/transit options to support growth and connectivity in Lakeshore between communities that link to key regional destinations"

**Mobility Objectives**:

1. Creating travel choices for all age groups by providing alternative mobility options to the private vehicle

2. Creating connections between communities to provide access to local, regional and seasonal destinations

3. Promoting and supporting growth, land use densification and economic diversification in Lakeshore to increase the economic viability and diversity of the municipality

4. Promoting sustainability and improve the environment through mobility options that lessen the reliance upon private vehicles, especially single occupancy and fossil fuel-based vehicles, for travel in key corridors in the region that will assist in reducing greenhouse gas emissions

5. Promoting the benefit and use of mobility options through educational opportunities using digital and other media

**Public Engagement** with residents and other stakeholders was undertaken to identify existing and future travel demands and preferences as well as focused on soliciting feedback on the findings of data analysis and concept service options that were developed.

Based on the findings relating to the peer review, data analysis and stakeholder input there is a projected demand that indicates a regular regional mobility service is warranted which addresses the greatest travel demand. This will promote an alternative mode of travel, that will contribute to removing private vehicles from the road that will ease congestion and reduce greenhouse gas emissions.

The following **Service Options** have been recommended for further evaluation:

**Option 1a**: A Primary route to form the core component of a mobility service, in the form of regular service from Belle River in the east to Tecumseh Mall in the west. It is proposed that this service will align along Route 22, Old Tecumseh Rd, Amy Croft Drive and Tecumseh Rd East.

**Option 1b**: Extension of this primary routing from the Sobeys Shopping Centre along Amy Croft Dr into the Patillo Industrial area on weekdays.

**Option 1c**: Providing additional, seasonal service on the Primary Route in the summer months to meet the demands for travel to the Lakeview Regional Park.

Once the regional service is established, a secondary service that can be considered, is the provision of local service that provides expanded coverage within neighbourhoods to improve overall accessibility by providing a feeder service to the regional transit service. Such service can range from on-demand services to a scheduled, fixed route service.

It is **recommended** that the Municipality of Lakeshore:

- Consider establishment of Option 1a as the Primary Route along the Lakeshore-Tecumseh corridor.
- Engage with Transit Windsor and Tecumseh Transit in terms of operating permissions and delivery options.
- Engage with Tecumseh with respect to cost sharing of services.
- Engage with Patillo Road Industrial Area to consider establishing a shuttle service or contributing to cost sharing of transit services as a feeder service to the Primary Route.
- Examine ways of integrating Essex services to provide feeder services.
- Engage with Transport Service Providers to support the provision of feeder services to the Primary Services as has been successfully demonstrated in Oakville Ontario.

# 1 Introduction

The Municipality of Lakeshore undertook this study to identify the feasibility and potential demand for mobility and transit options to support its vision to sustain this thriving, resilient community that offers an exceptional quality of life. Growth of the community needs a diversity in choice for both internal movements within Lakeshore and connectivity to neighbouring municipalities such as Tecumseh and Windsor.

In addition, establishing an alternative transportation option is especially important to those with limited travel options, it will promote environmental sustainability by reducing greenhouse gases and assist in reducing congestion by removing private cars from the road network.

Mobility options refer to a wide variety of modes that include taxis, rideshare services, car share programs, accessible services, on-demand community services as well as conventional, scheduled transit services.

The objectives of this study were as follows:

- To gauge the appetite of Lakeshore residents to support establishing alternative mobility options for travel and to engage with stakeholders to get input into potential plans and options
- To analyze travel data to identify major travel patterns and key destinations within Lakeshore and between Lakeshore and neighbouring communities.
- To provide an indication of:
    - Where the greatest demand exists for establishing some form of service?
    - Which mobility services could be considered for delivering the service?
    - What the extent of service and financial implication could be to establish a transit solution?

These outcomes will form the basis of more detailed service planning once there is a shared desire by the community and Council to pursue this initiative further.

# 2 Literature Review

A review of relevant documents and plans was undertaken to provide background and a better understanding of the issues, challenges and opportunities relating to land use and transportation plans and transportation services. This review is included in Appendix A and a summary of the major findings is noted below:

## 2.1 Windsor Transit Master Plan (2019)

- The Windsor transit system operates 14 routes, three of which provide interregional service connecting Windsor to parts of neighbouring communities namely Leamington, Tecumseh and Lasalle.
- Service was delivered with 258,000 annual revenue hours with only 2 routes having frequencies better than 20 minutes in peak periods. 3 routes are currently classified as well utilized (25 to 40 boardings per revenue hour) and 9 as underutilized.
- Travel patterns show that in the AM peak less than 10% of trips are destined to Downtown with the balance distributed relatively evenly across the city.
- The Transit master plan which was updated 2019 noted the following:

- Smartphone and other technologies have led to the rise in new mobility demand-based services such as car sharing, ride sharing, and micro-transit.
- Shift towards communities that are environmentally sustainable and healthy has led to the wide-ranging support for public transit.
- Feedback from the community has revealed strong desire for increased evening, weekend, and holiday service. This is particularly relevant to shift and weekend workers.
- Top improvements have been identified relating to better routes, faster service, and a longer service day.
- The plan emphasizes the need to increase the transit mode share in Windsor and well as address the need for interregional transit with extensions to the east shown as routing along Tecumseh Rd and/or Country Rd 42. The plan identifies establishing regional transit services through continued partnerships.

## 2.2 Tecumseh Transportation Master Plan (2017)

- The transit system, established in 2009, consists of 1 circuitous route serving the most densely populated northern part of town that connects to the Tecumseh Mall in Windsor where riders can connect to various Windsor transit routes.
- It operates Monday to Saturdays only from 6am to 6pm, providing hourly service (11 round trips per day).
- Free transfers are permitted from the Windsor transit system to the Tecumseh route.
- The service is operated by a private contractor using equipment belonging to the Town.
- According to the master plan, the County of Essex is considering developing a regional transit service that would include two urban connectors through Tecumseh (semi-express service with limited stops) that will improve the travel options for commuters to Windsor.
- The operation of multiple transit services in close proximity or within the same jurisdiction will require coordination of service planning and fare integration and the Town will work with the County and Transit Windsor to coordinate service delivery.

## 2.3 Lakeshore Official Plan review (2020)

- The 2010 Official Plan to manage future growth, development and change in the Municipality was reviewed and updated in 2020. It promotes the logical, efficient and cost-effective distribution of land uses and services to ensure the long-term health, and the economic and environmental well-being of the Municipality.
- The planning framework and policies of this Plan are based on the Municipality's Vision, Mission and Planning Objectives:
  - **Vision**: A progressive Town of healthy, integrated communities
  - **Mission**: To nurture a unified Town that sees possibility, inspires innovation and realizes potential.
- Transportation-related objectives focus on the creation of an efficient multi-modal transportation system through the following strategies:
  - Promoting efficient and reliable modes of transportation and support active transportation
  - Promoting sustainable development that supports public transit and is oriented to pedestrians
  - Transit connections within Lakeshore and the County, including transit connections to the City of Windsor and transit links between Primary development nodes

- Creation of compact, walkable, pedestrian-oriented, mixed-use developments to support, and integrate with, future transit and rail systems
- Compact urban form, mixed land uses and the use of active transportation and transit-supportive development
- Connections with a Regional public transit system
- Supporting the development of County Road 22 as a higher density, mixed use transit supportive corridor (Belle River Downtown, Wallace Woods and Lakeshore West) which connects the primary development nodes in Lakeshore and work with the neighbouring municipalities of Tecumseh and Windsor, the Region, and transit providers to provide a viable transit service
- Promoting public transit connections to major community destinations, including shopping, employment, public services, institutional and major recreational destinations.

- The population of the Municipality is projected to grow at a modest rate of 0.6% to 41,000 by 2031. Employment is expected to increase by 2.2% per annum to 15,180 jobs.

## 2.4 Waterfront Master Plan (2020)

- A master plan for the waterfront that integrates the 3 existing spaces consisting of Belle River Marina, Lakeview Park and West Beach was recently completed. This initiative will contribute as a catalyst to the future redevelopment of the downtown core.
- The need to accommodate green transportation (walking, biking and shuttles) in the waterfront design and better connections to downtown were identified through public engagement to further help to clarify the identity of the municipality as a waterfront destination.
- The plan proposes that a dedicated shuttle service could run on the half hour connecting visitors to major amenities and a proposed shuttle route was identified.


Waterfront Plan: Proposed shuttle Route

## 2.5 Economic Development Strategy (2006)

- An economic development strategy was prepared to guide and optimize the economic growth of the Municipality of Lakeshore. This plan is currently being updated.
- The 2001 census estimated the employed labour force living in Lakeshore to be 14,885 and that the municipality had a total of 7350 jobs (the majority of which were is in the manufacturing sector). This suggests that 50.6% of the workforce travel beyond the Lakeshore boundaries to access jobs.
- An action item that identified by this strategy was to examine feasibility of providing a public transportation system to support retail development by providing access to the main retail/commercial centres.

## 2.6 Tourism Development Strategy (2008)

- The report noted that the composition of the visitor market has changed significantly over the past five years (2003 – 2008), with increased share of domestic travel accounting and notable declines in visitation from the US.
- The report concluded that the major Core Attraction for Lakeshore is Water-Based Recreational opportunities, in particular sportfishing, and with further development Lakeview Park has the potential to play a larger role in the Town's tourism strategy, and to be positioned as a focal point for regional tourism festivals and events.

# 3 Peer Review

Smart phone and wireless technological developments have resulted in changes in the way in which transportation services are provided. Historically, when transit services were established, they typically operated on a scheduled, fixed route basis or, at best, operated as a paratransit service where the fixed route service could deviate from its route in certain areas to pick up customers who had booked a ride. The result was inefficient service in terms of productivity where initial uptake of the new service is slow or, deviating from its route often resulted in service reliability (on time performance) issues. On demand services were established to act as feeder services to scheduled service and trips had to be booked in advance.

Technological advances have led to a vast improvement in operating efficiency in terms of requesting service by customers as well as dynamic and optimized dispatch algorithms to route vehicles in on-demand service areas. This has increased the demand for on-demand services is low density residential areas – also known as "first mile-last-mile" solutions, where scheduled services are inefficient and unproductive. It should be noted that on-demand services should be monitored and, when warranted by demand, be considered for upgrading to a fixed route, conventional feeder service as per guidelines for a transit progression strategy.

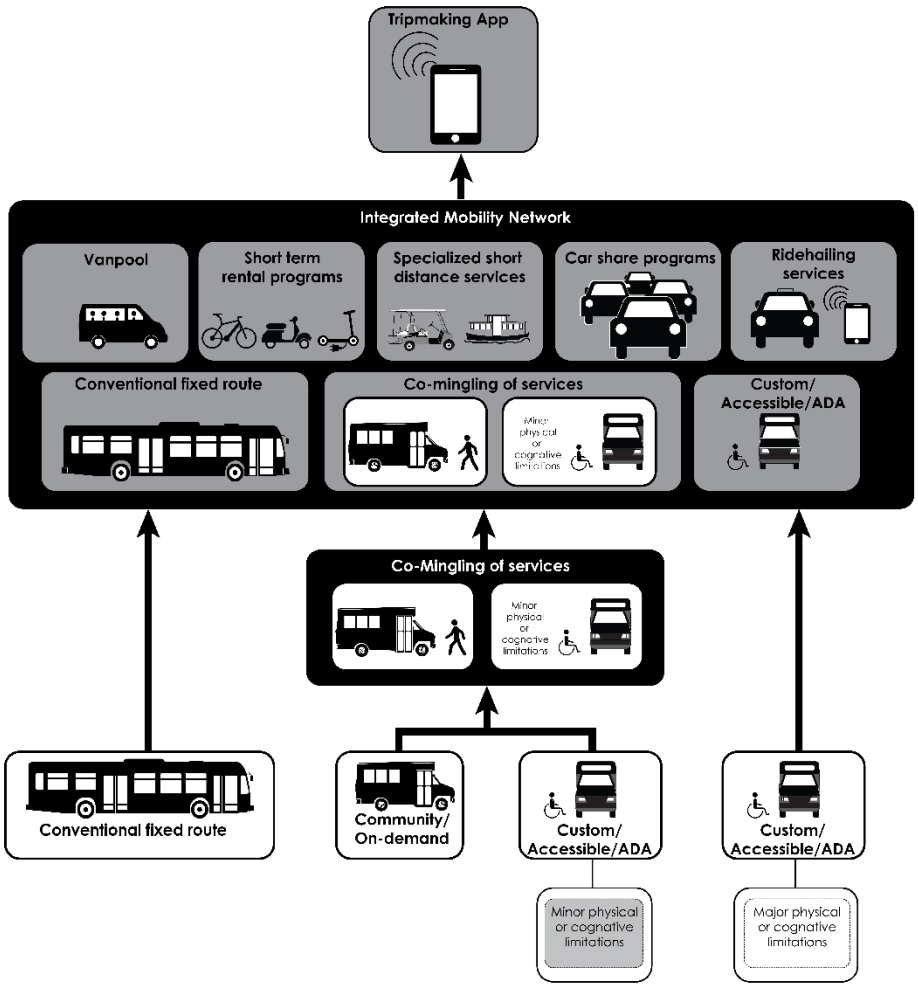
Software and app developments have led to the development of Mobility as a Service (MaaS) strategies that offer the ultimate level of sophistication and integration of transportation modes, whereby different modes are brought together and presented in a complimentary and integrated way in terms of schedules and fare payment options to enable all customers to plan, book and pay for complete transportation trips irrespective of mode. This strategy manages the evolution from individual/stand alone transit and transportation service providers to an integrated multi-modal mobility service platform, where users can plan, book, and pay for multiple modes of travel in one integrated system. This strategy has emerged from cities' interest in providing alternative and flexible travel options in the

face of increased density and congestion. MaaS provides transportation options from public and private transportation providers that can include transit, carshare, bike share, taxis and rideshare services that could include both intracity travel as well as intercity trips that utilize regional transportation services. Users can pay for travel by individual trip or via a monthly fee that is valid for a maximum travel distance.

In addition to the convenience of trip planning and booking, the MaaS strategy offers additional benefits to both the user and the community. MaaS reduces the need for individuals to own personal vehicles, which in turn reduces the number of single-occupancy vehicles on the road, greenhouse gas emissions and improves traffic congestion issues. The uptake of MaaS systems also increase the use of complementary modes such as active transportation, which also has health benefits.

MaaS is part of a global shift from vehicle ownership to shared services (see Figure 1), which has been facilitated by technological innovations and the rise of mobility apps. The most simple and common form of MaaS is via integrated ride-hailing mobility services such as Uber or Lyft, and bikeshare services that are integrated into transit planning or map applications such as Google Maps.

*Figure 1 - Transit Integration Components*



Examples of recent MaaS strategy implementation projects are summarized below.

## 3.1 Whim - Helsinki, Finland

Whim is often cited as the first fully integrated MaaS system. Since 2016, residents of Helsinki have been able to use the Whim App to plan trips and pay fares for all modes of public and private transportation within the city and by 2018, it had over 70,000 registered users.

The app provides a mobility package that includes public transportation, city bikes, taxis, ride-hailing services, rental cars and car share, which allows users to combine, plan, and pay for multiple mobility options in a single trip. Three service tiers are offered:

- Whim to Go: pay-as-you-go
- Whim Urban: limited public transportation and city bike trips, reduced taxi fares, and fixed rental car fees ($75 monthly fee)
- Whim Unlimited: unlimited public transportation, city bike, taxi, and rental car trips ($750 monthly fee)

Initial findings from the first year of operation suggest that public transit is key component to the success of MaaS, as between 73% to 95% of Whim trips were taken on transit which is significantly which is much higher than the 25% transit mode share in Helsinki as a whole.

## 3.2 UbiGo – Gothenburg, Sweden

A pilot MaaS program was initiated in Gothenburg, Sweden with the primary goal of bringing all transportation modes such as carsharing, ridesharing, and bike sharing options together in one app. It is based on a flexible monthly subscription that can be shared by all members of a household, encouraging users to forego car ownership. A key finding from the pilot was that people's travel behaviours did change and users were happy with the introduction of this app. Following the pilot, UbiGo was then launched in Stockholm, with the intention of expanding across the country.

## 3.3 Choice and RideMate - Queenstown and Auckland, New Zealand

In 2017, The Choice app was launched in Queenstown to improve mobility options and provide seamless connections between modes. This was followed by the release of RideMate in Auckland. Between the two apps, 15 private transportation providers were involved in the pilots and they brought together buses, trains, boats, ferries, taxis, shuttles, and rideshare as part of a Mobility Marketplace.

## 3.4 Innisfil, Ontario

The Town of Innisfil, a relatively low-density community of 37,000 residents located an hour north of Toronto in Simcoe County has experienced significant growth in recent years. To address mobility challenges, the Town started exploring options to establish a local transit service provide services to all parts of the town. A transit feasibility study identified that it would cost in the region of $600,000 to establish a two-bus transit network providing a rudimentary fixed-route service. As this also meant that residents would be left without transportation service options outside of operating hours, it was decided to initiate a more cost efficient, on-demand ridesharing service as a pilot project that could potentially serve a greater population with fewer resources. Approximately $125,000 was allocated to

the project to establish an alternative transportation option which made it Canada's first ridesharing partnership.

The service is managed by the Town and operated by two third parties (Uber and Barrie Taxi). Riders can request trips through the Uber app, or use Barrie Taxi for accessible trip requirements. Key destinations include regional GO Transit stations (providing regional service to Toronto) which demonstrates Innisfil Transit's ability to address the first/last mile demands.

Since the introduction of this service, demand is outpacing supply demonstrating the success of the pilot study and necessitating a monthly limit of 30 trips. If this trend continues, travel data collected by Uber can be used to guide the potential establishment of a fixed-route transit service in future.

Lessons learned include that there is not a "one-size-fits-all" solution for transit services, as fixed-route bus services are not always the solution in areas that demand a more efficient system. In addition, when attempting to enhance a transit network, public-private partnerships have become a very efficient strategy to resolve many service problems.

### 3.5 Oakville, Ontario

In 2015, Oakville Transit introduced a Home to Hub program that provided residents living in areas that lacked fixed-route transit service, with a basic level of on-demand service to connect to the existing transit service. The service was integrated with Oakville Transit's existing transportation network and underutilized custom transit vehicles were used to deliver this flexible and cost-effective transit service. This arrangement brings together custom and conventional transit services that provide both rides to those with disabilities that qualify for such services, while also offering on-demand "conventional" rides in peak travel times to others living within the Home to Hub service areas. The service was designed to offer commuters an affordable and environmentally sustainable way to travel, demonstrating an integrated transit system as opposed to two independent systems. Commuters are required to book trips at least two days in advance by calling or e-mailing the transit agency, or through a mobile app, and pay a conventional fare for this service which includes a transfer to the fixed route network.

The program in Oakville has demonstrated a relatively low-cost approach to expanding the service area of their existing fixed-route system by adding a flexible route transportation option. Since the introduction of the program, ridership has increased by 80%.

## 4 Location-Based Data Analysis

For mobility services to be realistic and successful, options need to accurately address the demand for travel. In this regard, mobility data can help supplement local knowledge to help identify and quantify travel movements. In recent times, location-based smart device data (referred to as location-based services or LBS) technology and the availability of these data sets has become a significant source in identifying travel origins and destinations. This adds to the robustness of the planning process and relevance of service options.

The details of this analysis is contained in Appendix B and a summary of the methodology and findings is presented below.

## 4.1 Purpose

The purpose of this task was to develop data-based solutions to:

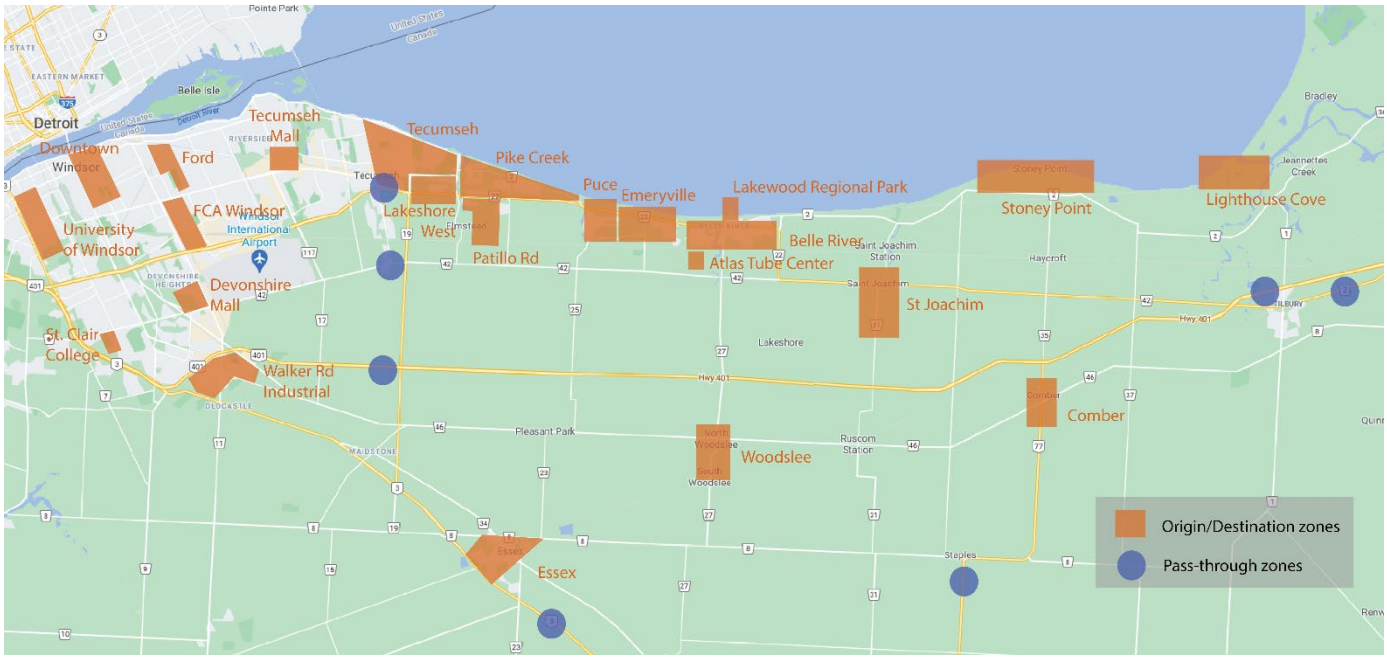
- identify the major origin-destination patterns in the area
- estimate ridership for potential transit options that serve the needs of Lakeshore residents, workers, and visitors.

## 4.2 Methodology

We analyzed anonymized, aggregated smartphone-based mobility data to understand the major origin-destination movements between destinations within Lakeshore and to regional destinations in the adjacent municipalities of Essex County and Windsor.

The zones (origins and destinations) that were identified in the study area are shown in Figure 2 below:

*Figure 2: Zone System for Origin-Destination Analysis*




Within Lakeshore, origin-destination zones were defined at key locations that could potentially be candidates for transit connections.

The project team initially believed there was a strong connection between locations in Lakeshore and specific destinations in the neighbouring City of Windsor, which included:

- University of Windsor
- St. Clair College
- The Ford development
- FCA Windsor
- Walker Road Industrial area
- Downtown Windsor

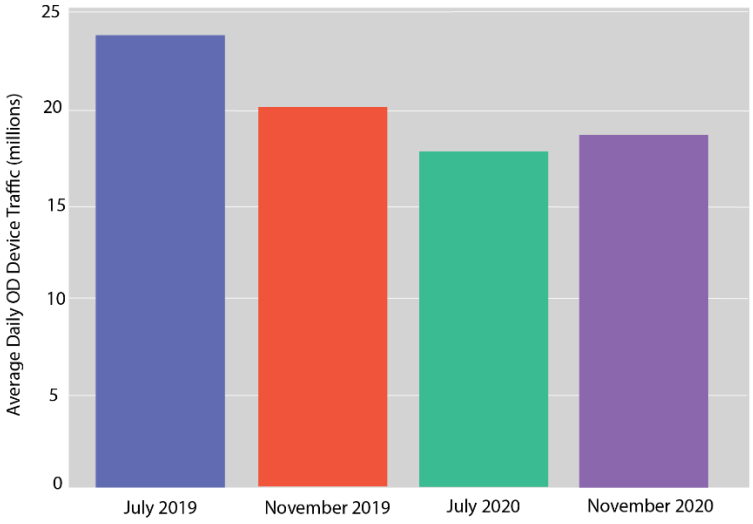
Pass-through zones were defined as critical roadways connecting Lakeshore to surrounding communities and these were used to calibrate smartphone data to convert device movements into vehicle trips.

Data from a network of app providers is aggregated and anonymized from smartphone users. Typical sample sizes range between 20-35% of the entire traveling population due to the data vendor not having the ability to track every single traveler as there are travelers that do not carry and use cell phones and of those that do, not all users use the apps that are part of the location data supplier network.

This data can be queried for any month of the year since 2016 and it was recommend using data beyond 2018 as later years typically represent a larger sample sizes. By month, average data is available for specific hours of the day, days of the week, and months of the year to analyze travel variations.

The travel patterns in the study area are significantly different in the summer and winter seasons, due to the large volume of recreational travel in the summer months. We also examined the impact of COVID on travel patterns (see Figure 3). July 2019 was observed to have the highest travel volumes and November 2019 was significantly lower, especially for recreational destinations such as the Lakeview Regional Park. The overall observed demand to travel in the region in 2020 was lower due to COVID impacts. In 2020, travel demand in July and November were observed to be at similar levels suggesting that the summer recreational tripmaking was impacted the most due to COVID travel restrictions.

*Figure 3- - Variation in Regional Monthly Travel Demand in Pre- and Post-COVID Conditions*



## 4.3 Data Calibration

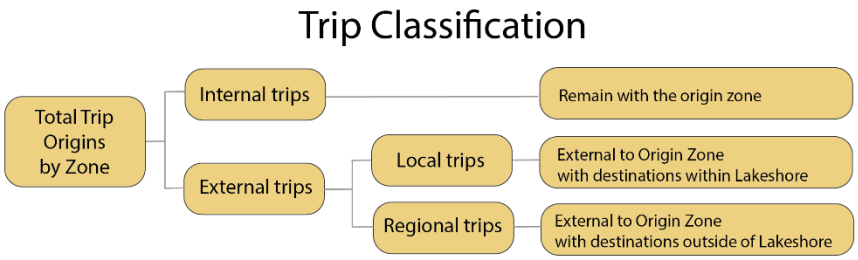
As smartphone data depicts the movement of devices between zones which is higher than vehicle trips, a calibration process was undertaken that compared smartphone-based travel activity with actual traffic count data to develop a factor by which smartphone data can be scaled to be more representative of actual, real-world traffic data. The universal scaling factor was determined to be 0.68, which means that each Streetlight reported device trip equated to 0.68 observed vehicle trips. This factor was applied for all subsequent analyses.

From the estimated vehicle trips between zones, the number of person-trips is calculated by applying an average vehicle occupancy; and to estimate potential demand for mobility services between zones, a transit absorption rate (for example, 5% of all person trips) is assumed.

## 4.4 Findings

- In the initial analyses, it was determined that there was strong travel demand between Lakeshore and the defined zones in Windsor. However, it was found that the destinations of travelers to Windsor was different than what was originally envisioned by the project team. Many of the pre-determined destination zones in Windsor such as Downtown and the University of Windsor showed limited connections to Lakeshore. Instead, from the pre-set geography, areas that appeared to have the most OD patterns included Tecumseh Mall and the Devonshire Mall and these zones were subsequently added to the analysis platform.
  It should be noted that the intent of the analysis was to identify the potential demand for transit. Providing services to destinations in Windsor, such as Devonshire Mall, would require further discussion with Transit Windsor in terms of service arrangements. For example, a Lakeshore transit vehicle may be permitted to provide services to certain destinations in Windsor, or Lakeshore services could simply connect to the Windsor transit system in locations served by multiple Windsor routes such as at the Tecumseh Mall.

- The analysis of Lakeshore zones showed that the majority of trips remain internal to zones, meaning that they start and end within the same zone. These trips are referred to as “internal” trips.




- On the other hand, external trips start and end in different zones and they are divided into trips that end in zones within the Municipality (so-called “local” trips, e.g. Belle River to Patillo Road Industrial Area) and trips that end in zones outside of the municipal boundaries (or “regional” trips such as Belle River to Tecumseh Mall in Windsor).

- When internal trips were removed from the origin-destination matrix it revealed that the following zones are the major generators of these external trips:
  - Belle River
  - Lakeview Regional Park
  - Pike Creek/Old Tecumseh Area
  - Patillo Road Industrial
  - Emeryville/Puce.
- These 5 zones account for 87% of all external trips generated from the Lakeshore zones of which approximately 60% are regional trips having destinations outside of Lakeshore. Of these external trips, 60% are regional trips having destinations outside of Lakeshore. This means that individuals within the 5 identified zones are most likely to move throughout Lakeshore, but also most likely to go to destinations outside of Lakeshore.
- Only 13% of external trips (traveling outside of one's own zone) occurs from the other identified areas of the Municipality. This is consistent with the population density of the 5 identified zones.
- Most external trips beyond Lakeshore are destined for Windsor in general, and that specific destinations within the city of Windsor are not as prominent as was presumed earlier on in the project. After Windsor, Tecumseh and Essex attracted the most trips from Lakeshore.
- With respect to trip destinations in Lakeshore, the same 5 zones that generate the most external trips also attract the most trips in Lakeshore (Belle River, Emeryville, Lakeshore West, Patillo Road and Pike Creek).
- In terms of the identification of potential mobility service options based on demand, the origin destination data shows that the majority of trips generated by Lakeshore zones remain within their respective zones, and that the majority of trips from zones that generate the most trips have destinations beyond the Municipality with the major destination being various locations within Windsor. An obvious conclusion is thus to consider a service option that links the largest trip generating zones in Lakeshore, and connects them via Tecumseh, to a feasible location(s) in the City of Windsor.

## 4.5 RoutePlan Analysis

A program developed by Stantec allowed the project team to define a potential route, input some key assumptions and generate the total origin-destination demand between identified locations along that route, as well as estimate the projected transit ridership demand. This is intended to guide decision making relating to service type, vehicle selection, fleet size, and operating requirements.

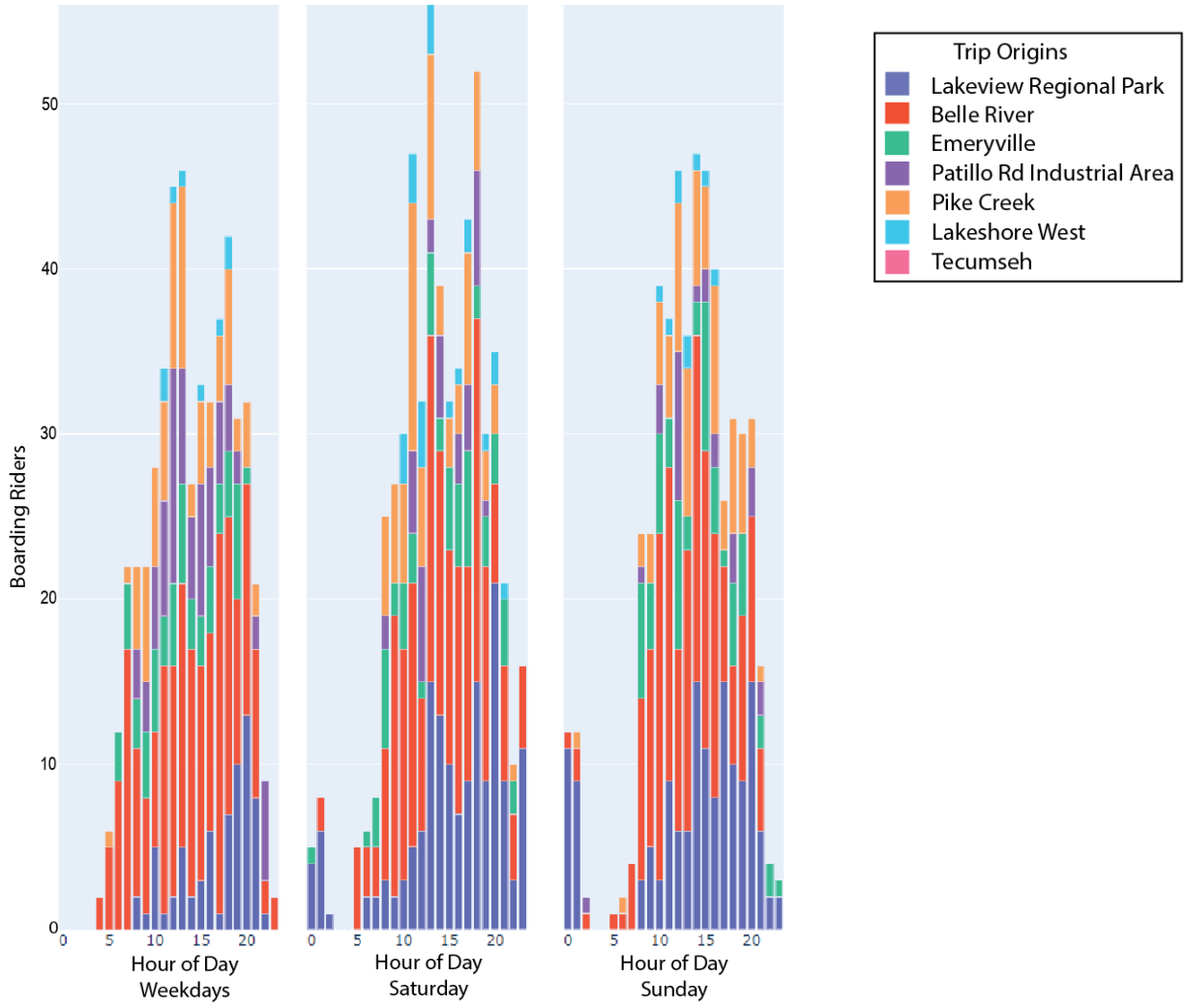
The inputs to RoutePlan are the route definition described as a sequence of stops, the average vehicle capacity, and the transit capture rate for each zone. Based on the analysis of origin-destination (OD) data, the following route assumptions were made:

- A route extending from Lakeview Regional Park to Tecumseh Mall that connects the following zones:
  - Belle River
  - Emeryville/Puce
  - Patillo Road Industrial Area
  - Pike Creek/Old Tecumseh
  - Lakeshore West
  - Tecumseh

- Connecting service may be provided to other destinations within Windsor, however, only the travel demand for Tecumseh Mall is included for the purposes of this analysis.
- An average vehicle occupancy of 1.5 for vehicle trips is assumed which is used to convert vehicle trips to person trips.
- A transit capture rate comprising of 1% of internal trips within zones and 5% of all external trips .

The results in terms of ridership demand by hour of day from these Lakeshore origin zones to Tecumseh Mall for different days of the week, is shown in Figure 4

*Figure 4 – Ridership demand by hour from Lakeshore*



Based on this route configuration and the transit capture rate assumptions, the data suggests that in a westbound direction (from Lakeshore to Windsor) the following cumulative demand by hour of day can be expected:

- Weekday projected demand of 10 -20 riders per hour during peak periods with a higher average demand of 35 rides during the midday
- Saturday projected demand of 30 and 60 rides per hour between 10am and 10pm
- Sunday projected demand of 35 and 45 rides per hour between 11am and 6pm.

As a sanity check, the OD data was analyzed in both directions that confirmed that the travel demand is roughly in the same in both directions.

It is thus clear that there is a healthy demand for travel from these Lakeshore zones to Tecumseh Mall in Windsor. Travel demand does suggest that the weekday peak predominantly reflects regular commuters whereas the higher demand during the midday, evening, Saturday and Sunday is made up of a large proportion of the travelling public that travel less regularly.

It is important to note that the priority for a scheduled mobility service is to capture regular riders to form a stable ridership base.

# 5 Stakeholder Consultation

## 5.1 Workshop

A workshop was held with members of the Lakeshore Project Team and Lakeshore Corporate Leadership Team to establish what Lakeshore wants to achieve and why, by identifying a framework for a Mobility Vision and its Goals and Objective that would guide the development of transit and mobility options as well as to help guide associated decision making. Part and parcel of this discussion is talking about trade-offs that are required based on fiscal realities. One such trade-off is to identify the primary purpose of mobility services in the transit system. For example:

- Is the emphasis of the service to provide service coverage i.e., providing basic access to travel to the majority of residents?
- Is the emphasis to promote ridership by focusing services where the demand is the greatest?
- Is the goal to primarily to connect commuters into Windsor for work?
- Is there a desire simply to connect Lakeshore and surrounding communities to keep smaller communities economically viable?

Working notes and details of this Task are provided in Appendix C and the final Mobility Framework that was identified, is presented below:

The **Mobility Vision** addresses the question of what we want it to be and describes the end state of mobility services within Lakeshore:

"Connecting Lakeshore into the future"

The **Mobility Goal** that describes how this Vision is to achieved:

"Create mobility/transit options to support growth and connectivity in Lakeshore between communities that link to key regional destinations"

The following 5 **Mobility Objectives** describe specific outcomes on how the Mobility Goal it to be achieved:

1. Creating travel choices for all age groups by providing alternative mobility options to the private vehicle
2. Creating connections between communities to provide access to local, regional and seasonal destinations
3. Promoting and supporting growth, land use densification and economic diversification in Lakeshore to increase the economic viability and diversity of the municipality
4. Promoting sustainability and improve the environment through mobility options that lessen the reliance upon private vehicles, especially single occupancy and fossil fuel-based vehicles, for travel in key corridors in the region that will assist in reducing greenhouse gas emissions
5. Promoting the benefit and use of mobility options through educational opportunities using digital and other media

## 5.2 Phase 1 Stakeholder Engagement

The first phase of Stakeholder Engagement can be described as the "listening" phase that focuses on the collection of data from respondents regarding their existing and future travel demands and preferences.

Project-related information was developed by the team and made available to the Municipality for posting on the Lakeshore website and used in the PlaceSpeak application to generate interest and solicit input and comments.

A comprehensive survey was developed and published online and made available in a hard copy format in May to gather data on existing travel patterns/habits as well as thoughts on potentially using some form of a mobility service in the future. Stakeholder responses, together with the analysis of travel

data, assisted in identifying transportation demand and mobility needs to develop realistic service options.

The survey questionnaire is included in Appendix D. As part of the Employer outreach initiative that was currently undertaken by the Municipality, a specific mobility/transit question was incorporated into that engagement.

The detailed summary of the stakeholder survey is included in Appendix E and key findings of this task are highlighted below.

- A total of 82 responses were received with the majority from Puce & Emeryville (West Puce Road to the Belle River/ Lake St. Clair to County Road 42), and Belle River (South Street to Strong Road/ Lake St. Clair to County Road 42).
- The vast majority of respondents use a private vehicle for travel (80%), followed by biking.
- 26% of respondents indicated that they have used rideshare services such as Uber and Lyft, and that they are used seldomly.
- The following communities in the region were identified as the priority destinations for mobility services:

| Jurisdiction | Priority | Community |
|---|---|---|
| Lakeshore | 1 | Belle River/Main Street |
| | 2 | Lakeshore West/Amy Croft area |
| | 3 | Puce/Emeryville |
| | 4 | West Beach/Belle River Marina |
| | 5 | Patillo Road |
| Tecumseh | 1 | Tecumseh shopping area (Zehrs) |
| | 2 | West Tecumseh / Banwell area |
| | 3 | Lakewood Park |
| Windsor | 1 | Tecumseh Mall |
| | 2 | Devonshire Mall |
| | 3 | University of Windsor |
| | 4 | St. Clair College |
| | 5 | Windsor Regional Hospital: Met Campus |

- For travelling to destinations within Lakeshore, respondents indicated low desire to use transit/mobility services. Recreational and social trip purposes on weekends were identified as being most dominant
- Beyond Lakeshore, the dominant destinations for trips using mobility services were identified as Windsor and Tecumseh. Trip characteristics indicated a greater demand for regional travel options using mobility services for work, school and shopping trip purposes.
- 53% of respondents indicated that they were willing to contribute to the cost of providing mobility services indicating $3 for short trips and $10 - $15 for longer trips with free service for seniors and students.

**Business Survey**

As part of this engagement phase, a business survey was undertaken by the Municipality and posed the following transit-related question: "The Municipality of Lakeshore is currently exploring a transit feasibility study. Do you think a public transit system would be beneficial for your business and employees?

Of the respondents that answered, the result was roughly evenly split (yes (36) and no (39)). However, when cross tabulated against business location, the positive responses were concentrated in the neighbourhoods identified as the priority destinations for mobility services as part of the stakeholder questionnaire, namely Puce/Emeryville West, Belle River/Main Street, Patillo Road and Lakeshore West.

## 5.3 Phase 2 Stakeholder Engagement

The Second Phase of Stakeholder Engagement focused on soliciting feedback on concept service options that were developed. These options were accompanied by descriptions relating to major trip origins and destinations in the study area, how services may be phased in and expanded, and how services could be delivered.

To assist in this task, summaries of findings of the travel data analysis and Phase 1 survey results were made available to prospective respondents (see Appendix F).

Only 3 comments were received from the public as well as one from a large employer in the Patillo Road Industrial Area on behalf of employers in that area.

Public comments related to:

- Concerns relating to service options do not providing residential neighbourhood coverage
- Raising awareness of the importance of the length of the service day to ensure that it accommodates industrial and commercial shift times and store hours
- Supporting the use of Country Road 22 as a transit corridor and noting that traffic congestion requires to be managed.

The business comment noted that all employees in the Patillo Road are required to have access to personal transportation which resulted in the provision of (excess) parking by employers to accommodate shift changes. It also confirmed:

- the inability of attracting entry-level employees
- that a private shuttle service had been considered for that purpose
- that many employees live in the catchment area between Belle River and Tecumseh Mall

# 6 Draft Service Options

Concept service options that were shared with stakeholders are described below in terms of:

- Key origins and destinations of trips
- Service phasing and expansion
- Operational considerations

Based on the engagement findings and results of the data analysis the following major zones or origins and destinations were identified:

*Figure 5 – Major Zones*


Based on the mobility vision, location-based data analysis and the engagement results, there is an appetite to consider developing and implementing some form of a mobility service that addresses the greatest travel demand which indicates that a regular regional service is warranted and the implementation and promotion of this alternative mode of travel, will contribute to removing private vehicles from the road which will ease congestion and reduce greenhouse gas emissions.

As shown below, conceptual routing options were developed between major land use nodes and destinations (zones) and shared with stakeholders:

*Figure 6 – Draft Route Options*


## 6.1 Primary Service

**Connections:** The primary service option that is proposed, connects the major origin zones in Lakeshore that comprise Belle River, Lakeshore West, Emeryville, Pike Creek and Patillo Road Industrial Area along

Highway 22 and Tecumseh Road, to Tecumseh Mall in Windsor. Such a route will connect all the zones in Lakeshore that generate not only the most external trips within Lakeshore, but also the most external trip to regional destinations outside of Lakeshore.

As there are multiple destination locations in Windsor for trips that originate in Lakeshore, as opposed to a single, major attraction, a suitable terminal point in Windsor can only be identified in consultation with Transit Windsor who have sole authority in the provision of transit services in that jurisdiction. Potential arrangements may include the identification of stops at several destinations in Windsor, or a single stop that is served by multiple Windsor routes where passengers may transfer to the local Windsor system to complete their journeys. This proposal assumes that the route may initially terminate at the Tecumseh Mall which is the second largest exchange in the Windsor transit system that accommodates 4 transit routes.

**Service phasing**: Typically, when new services are established, a phased start-up is followed. Initially the first service priority is the implementation of weekday services that primarily caters to work and educational trips in the morning and afternoon peak periods. In order to address service convenience and reliability, initial peak service frequencies should be no longer than a trip every 30 minutes, however smaller vehicles with less capacity could warrant better frequencies. Lower frequencies could be considered during the midday and early evening to provide some level of service to accommodate shopping, medical and social trips.

A second phase of this service would be to expand transit services on weekends to cater to shopping and recreational trips.

Final phases of service improvements would relate to frequency increases when warranted by demand.

**Operations**: From an operational perspective, a proposed service between Lakeshore and Windsor needs to be discussed in detail with Transit Windsor, not only from a stop location perspective, but also to obtain permission to operate in their jurisdiction.

The are 4 operating options that can be considered to deliver service:

- Service could initially be delivered as an on-demand service by Private Transportation Operators (e.g. Lyft, Uber, etc.).
- Service could be delivered by the Municipality itself which would require the acquisition of skills and equipment (vehicles, maintenance, scheduling and dispatch).
- Service could be provided by a third party either using their own equipment or equipment acquired by Lakeshore.
- Transit Windsor could potentially deliver service on behalf of Lakeshore and this could simply consist of an extension of a Windsor route into Lakeshore. In this case Lakeshore would reimburse Windsor for services delivered in their jurisdiction.

## 6.2 Seasonal Service

The intent of this service is to improve access from the region to Lakeview Regional Park in summer by extending the route from Belle River to serve this area. Typically, such services operate between July 1 and Thanksgiving in September, and this service should be operated on weekdays as well as weekends. It is important that this service is well publicized ahead of time to encourage ridership uptake.

## 6.3 Local Service

A secondary service that can potentially be considered once the regional service is established, is the provision of some level of local service that would act as a feeder service to the regional route for residents, as well as provide access to local commercial services.

When additional services come on board such as feeder services from residential neighbourhoods to connect to the Primary route, operations can range from initial on-demand services (e.g. ridesharing options such as Lyft and Uber) to a scheduled, fixed route service. This evolution is often referred to as Transit Service Progression. It should be noted as service evolves into a scheduled service with improved frequencies, it does allow for riders to better plan their trips.

The extent of the demand for service also dictates the preferred vehicle type and its associated capacity ranging from small vans and minibuses to conventional buses.

It is thus important that the growth of ridership on services is regularly monitored to respond to changes in demand and ensure that the appropriate level of service (service frequency), service type (on-demand versus scheduled service) and vehicle type (and size) is provided.

The regional service described above provides the foundation to expand services that focus on local connections. Belle River, Lakeshore West, Emeryville, Pike Creek and Patillo Road Industrial Area are the major zones in Lakeshore both in terms of the origin and destination of local trips and such services could provide expanded coverage within neighbourhoods to improve overall accessibility in terms of walking distances to transit services. However, it should be noted, that the public engagement results do not indicate an appetite for using local services on a regular basis.

## 6.4 Integration of Community Support Centre Services

The Community Support Centre currently provides two types of services to Lakeshore residents, namely St Clair College Transit and Carelink Health Transit. It is proposed that that consideration be given to promote the integration of these services by offering connections to the proposed regional service to provide more travel options so that customers may transfer to this service to access destinations in Tecumseh and Windsor.

With respect to accessibility, it should be noted that today, the majority of transit vehicles are 100% accessible.

## 6.5 Supporting Infrastructure

Once routes have been defined, attention needs to be given to providing appropriate and accessible infrastructure to accommodate passengers at transit stops that enhance the transit experience. This includes the consistent provision of facilities such as sidewalks, accessibility ramps, tactile surfaces, shelters and transit information.

Consideration should also be given to potentially establishing park and ride facilities at selected locations along the regional route within Lakeshore, to provide residents to better access the regional service.

## 6.6 Alternative Proposal Evaluation

During the initial stages of this project, staff from the Municipality of Lakeshore had independent preliminary discussions with Transit Windsor and Tecumseh Transit with respect their thoughts of

establishing some form of regional service. Pending results from the Lakeshore Mobility Options Study, and direction from Lakeshore Council, Lakeshore staff can re-engage these conversations with a more fulsome understanding of the mobility requirements for Lakeshore.

# 7 Lakeshore Final Transit Options

A second workshop was held with the project team to revisit the results of both stakeholder engagement activities to initiate conversation that would serve to refine and integrate proposals to create a set of recommended service options that could be developed in further detail.

As there was limited feedback beyond the first phase of stakeholder input, refinement to service proposals were minimal. However distinct service options were developed in more detail with respect to service requirements and operating options.

One of the primary travel demands identified through stakeholder engagement was the provision of options to connect destinations in the major communities along the St Clair shoreline to provide access to shopping, services and employment. In addition, location-based data suggested that the primary origin-destination demand was between these Lakeshore communities and Windsor - notably to the Tecumseh Mall and Devonshire Mall.

Recommended service options are shown diagrammatically in Figure 7.

*Figure 7 - Recommended Service Options*


**Option 1a**: The Primary Routing that has been identified to form the core service of a mobility service, is proposed to comprise some level of regular service from Belle River in the east to Tecumseh Mall in the west. It is proposed that this service will align along Route 22, Old Tecumseh Rd, Amy Croft Dr and Tecumseh Rd East.

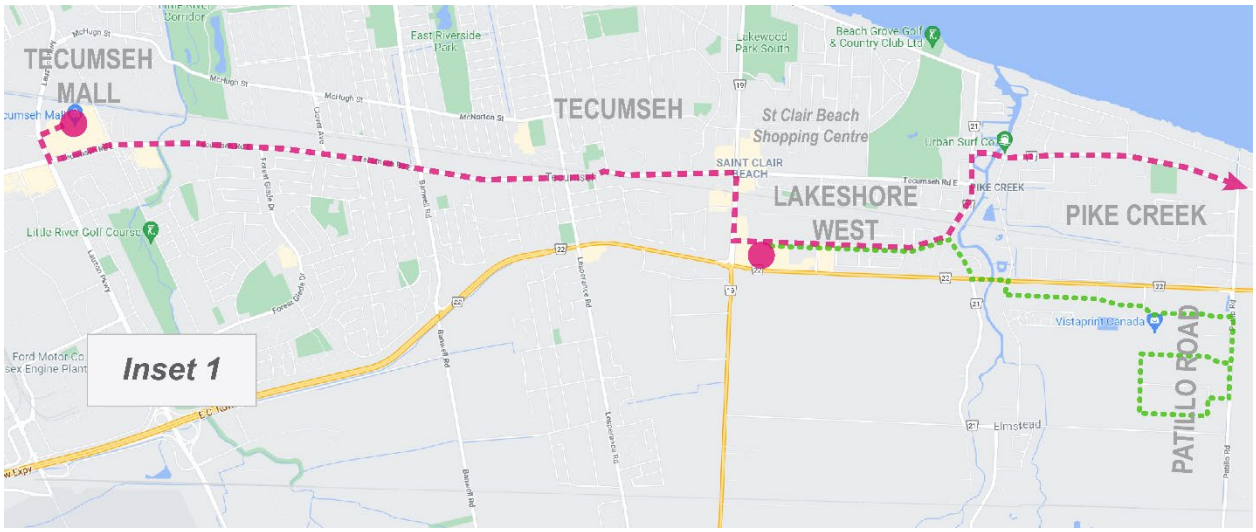
This service should terminate at the northern end of the Tecumseh Mall where the Windsor transit exchange is located as shown in Figure 8 to allow for the seamless transfer to and from the different routes of that system to access other destinations in Windsor.

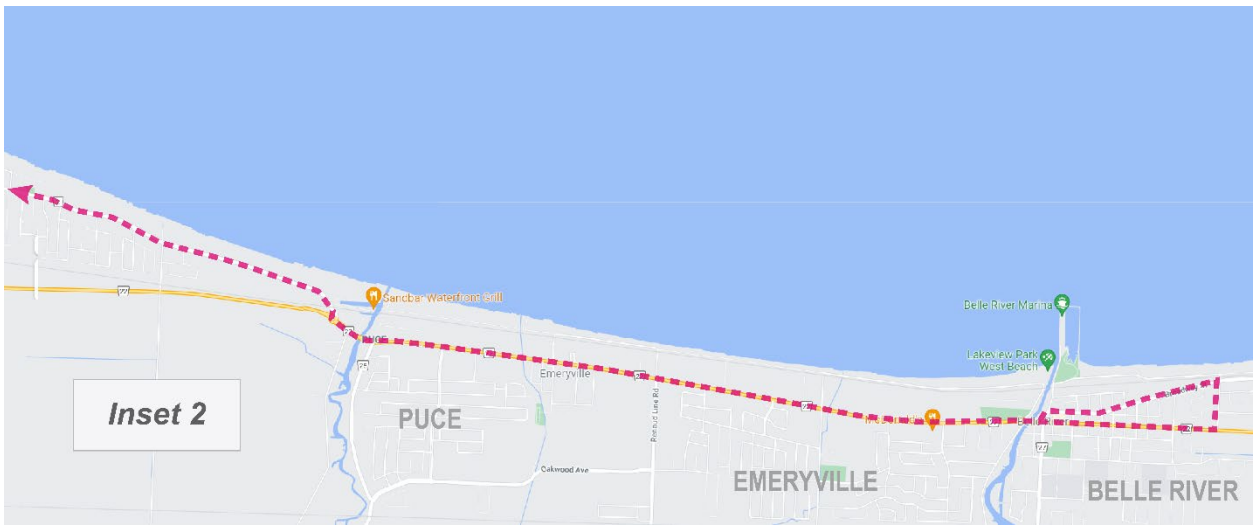
*Figure 8 – Proposed Route Terminal at Tecumseh Mall*


It is recommended that such a service should consist of substantial scheduled service in order to qualify as and establish an alternative travel option to attract regular riders, as opposed to only offering a couple of trips in the morning and the evening. A high-level service schedule for such a service that focuses on Weekday and Saturday service has been developed, to estimate requirements and costs for consideration.

For illustrative purposes, a proposed alignment of such a primary service routing together with a potential Patillo extension/feeder service is shown below in Figure 9. It should be noted that the biggest refinement to this route is the deviation from Tecumseh Rd E along Amy Croft Drive to provide service to the higher density developments as well as the St Clair Shores Shopping Centre. This node could potentially accommodate some form od a park and ride facility as well as an exchange to transfer from residential and Patillo Rd Industrial area feeder services.

*Figure 9 – Proposed Primary Route Alignment*




The following route extension options have been refined to provide a sense of the impact of service and vehicle requirements as well as financial implications:

**Option 1b**: Extension of the Primary Routing from the Sobeys Shopping Centre along Amy Croft Dr, routes 21 and 22 to provide scheduled service into the Patillo Industrial area on weekdays only.

**Option 1c**: Providing additional, seasonal service on the Primary Route in the summer months to meet the demands for travel to the Lakeview Regional Park. Typically seasonal service is offered between July 1 and Labour Day in September on all days of the week. Initially it is proposed that this service is not an actual route extension as the park is within a 400m walking distance, and that this option consists of additional service hours on the Primary route to cover full weekdays and weekends. In this way, overall service on the Primary Route is increased during summer.

**Option 2a**: Extension of Primary Routing (Option 1a) from Tecumseh Mall to the Devonshire Mall. This option also proposes that the service would route to the transit exchange within that mall in order to allow for transfers to the Windsor transit system. Other than both shopping malls, it could potentially

also provide riders access to some employment opportunities along Walker Road in Windsor, without having to transfer.

**Option 2b**: Similar to Option 2b, extension of the Primary Routing from St Clair Shores Shopping Centre to provide scheduled service into the Patillo Industrial area on weekdays only.

**Service Frequencies and Length of Service Day**

As mentioned, in order to provide a convenient and desirable alternative service option, it is recommended that 30-minute frequency (i.e. 2 trips per hour) is recommended in the peak travel time to offer travel choices to potential riders, and an initial maximum service frequency of 40 minutes between trips in the off-peak. As ridership and demand increases, service frequencies can be improved. This does however come at a cost. Due to the length of proposed routes, the number of vehicles required to deliver the service do increase dramatically.

In order to ensure service convenience and travel options, it is recommended that the service day should be substantial as opposed to being limited to a couple of trips in the early morning and late afternoon peak travel periods. Typically, when new service is introduced, the focus is on weekday service to accommodate commuters (employment and education) in the peak periods to establish a regular ridership base, and providing some midday trips to accommodate employment shift changes and shopping trips, as well as some early evening trips to accommodate shift workers and evening shopping and recreational trips. A second priority would be to offer some basic service for Saturday shopping and recreational purposes. As Sundays generate to lowest ridership in the week, such services are only implemented once the basic mobility service is established in the community.

For illustrative purposes, Table 1 summarizes the service days and service frequencies (minutes between trips) that have been proposed to illustrate the impact of service provision, for consideration:

*Table 1 – Proposed Service Frequencies*

**Summary of Service Frequencies (minutes)**

| Weekdays | | 1a Primary Routing | 1b Patillo Rd Extension | 1c Sesonal Service Extension | 2a Devonshire Mall | 2b Devonshire Mall + Patillo Extension |
|---|---|---|---|---|---|---|
| Early Morning | - | - | - | - | - | - |
| AM Peak | 5.30 - 8.30am | 30 | 30 | - | 30 | 30 |
| Mid Morning | 9am - 12pm | - | - | 40 | - | - |
| Midday | 12 - 2pm | 40 | 40 | - | 40 | 40 |
| Early Afrernoon | 2 - 4pm | - | - | 40 | - | - |
| PM Peak | 4 - 7pm | 30 | 30 | - | 30 | 30 |
| Early Evening | 7.30 - 10.30pm | 40 | 40 | - | 40 | 40 |
| **Weekends** | | | | | | |
| Saturday | 7am - 10.30pm | 40 | - | - | 40 | - |
| Sunday/Holiday | 9am - 7pm | - | - | 40 | - | - |

**Service Implications**

A summary of the implications for the different service options is summarized inTable 2. Two scenarios of fares ($2 and $3 average fare) are presented to illustrate their impact in offsetting total operating cost.

*Table 2 – Proposed Service Requirements and Financial Implications*

| Route Option | | Round Trip (minutes) | Day of Week | Revenue hours/day | Annual Revenue Hours | Peak vehicle requirement | Annual Operating Cost ($ millions) | $2 Fare Annual Net Operating Cost ($ millions) | $3 Fare Annual Net Operating Cost ($ millions) |
|---|---|---|---|---|---|---|---|---|---|
| 1a | Primary Routing (Belle River - Tecumseh Mall) | 130 | Weekday | 43 | 10,560 | 5 | $0.950 | $0.674 | $0.536 |
| | | | Saturday | 50 | 2,570 | 1 | $0.231 | $0.180 | $0.154 |
| | | | Sunday | 0 | 0 | | - | - | - |
| | | | **Total** | | **13,130** | | **$1.181** | **$0.854** | **$0.690** |
| 1b | Primary Routing to Tecumseh via Patillo Road Industrial Area | 165 | Weekday | 60 | 13,400 | 6 | $1.207 | $0.856 | $0.681 |
| | | | Saturday | 72 | 2,570 | 1 | $0.231 | $0.180 | $0.154 |
| | | | Sunday | 0 | 0 | | - | - | - |
| | | | **Total** | | **15,970** | | **$1.438** | **$1.036** | **$0.835** |
| 1c | Additional Seasonal Routing serving Lakeview Park | 130 | Weekday | 20 | 960 | 0 | $0.087 | $0.064 | $0.052 |
| | | | Saturday | 0 | 0 | | - | - | - |
| | | | Sunday | 35 | 360 | 0 | $0.032 | $0.025 | $0.020 |
| | | | **Total** | | **1,320** | | **$0.119** | **$0.089** | **$0.072** |
| 2a | Primary Routing (Belle River - Devonshire Mall) | 185 | Weekday | 55 | 15,000 | 7 | $1.353 | $0.960 | $0.763 |
| | | | Saturday | 50 | 3,660 | 1 | $0.329 | $0.256 | $0.219 |
| | | | Sunday | 0 | 0 | | - | - | - |
| | | | **Total** | | **18,660** | | **$1.682** | **$1.216** | **$0.982** |
| 2b | Primary Routing to Devonshire Mall via Patillo Rd | 220 | Weekday | 70 | 17,900 | 8 | $1.609 | $1.142 | $0.908 |
| | | | Saturday | 50 | 3,660 | 1 | $0.329 | $0.256 | $0.219 |
| | | | Sunday | 0 | 0 | | - | - | - |
| | | | **Total** | | **21,560** | | **$1.938** | **$1.398** | **$1.127** |

As noted above, due to the regional nature of these routes, the estimated round-trip times are long. The implication of such service is that service productivity (i.e., the number of customers that are picked up and dropped off along the way or turnover of customers, and expressed as rides per service hour) is typically on the lower end of the scale side as well as that the improvement in service frequency in peak periods has a significant impact on the vehicle requirement to deliver services at those specified frequencies. Note that the peak vehicle requirement increases from 5 to 7 between Option 1a and 2a respectively, due to the significant increase in trip duration.

Annual revenue hours (when mobility/transit vehicles are in service) is an important statistic that defines the size of the service and is used to calculate the operating cost per hour metric. The main variable cost elements of operating cost are labour, fleet maintenance and fuel. Fixed cost such as administrative costs and capital costs (e.g. vehicles and infrastructure) are not reflected.

Operating cost varies in accordance to vehicle type (size). For this analysis an operating cost of $90 per hour was used which is considered conservative given the likely requirement of smaller vehicles as opposed to heavy duty and higher capacity (40 ft) buses to deliver service. It should be noted that costs

noted in the table above reflect the variable cost (based on operating cost per hour) of service delivery to illustrate the impact of service options.

Ridership per revenue hour rates ranging between 10 and 15 depending on time of day are based on the ridership estimations results of the RoutePlan Analysis (rides per hour of day). These are considered typical for new system start-ups

To estimate the net operating cost of service, two average fares ($2 and $3) were analyzed to illustrate the variance in the operating cost recovery. A $2 fare generates a cost recovery between 25 to 30% while a $3 fare yields a recovery between 35 to 45%. The latter is considered an average to high cost recovery for new mobility/transit systems.

**Service Delivery Options and Other Considerations**

It should be noted that all transit systems have defined and regulated service areas and neighbouring systems are prohibited to operate in these areas without permission. Therefore, offering services across jurisdictions can be come complicated and can lead to inconvenience to passengers. Service delivery options for establishing service between Lakeshore, Windsor, and Tecumseh can thus be undertaken with one of the following arrangements:

- The City of Windsor granting permission for a Lakeshore service to meet the local Windsor transit service at a specific location in close proximity to the municipal boundary such as the Tecumseh Mall as proposed in Option 1a. This will also require approval by the Town of Tecumseh to provide service within their jurisdiction.

  The Lakeshore service may not be permitted to drop off or pick up in any other location within the City and at this location, passengers would have to transfer to the local Windsor service to complete their trips and quite possibly pay an additional fare if some integrated fare arrangement is not established. Option 2b assumes that Lakeshore service may service multiple stops. Typically, such an arrangement permits drop off only in the inbound direction and pickup only in the outbound direction at permitted stops.

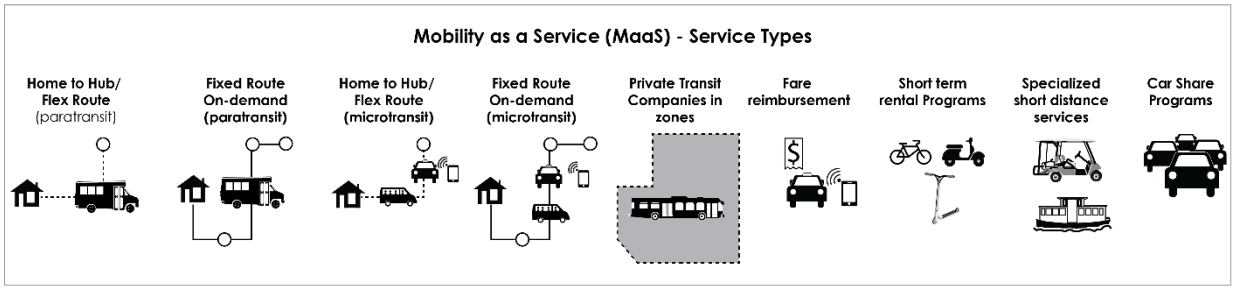
  The Lakeshore service could be delivered by the Municipality or by a third-party operator – the former option will require the municipality to develop and acquire transit delivery expertise and equipment.

- A second arrangement would be that the Lakeshore service is operated by Transit Windsor. In this instance passengers will not be inconvenienced by limited stops and transferring at specific locations. Typically, an integrated fare structure is developed which may require a top-up for regional travel only. The advantage of such an arrangement is that Lakeshore (and potentially Tecumseh) only “pay” for service that is delivered within their jurisdictions however have limited control over service priorities and the details and refinements of services.

It should be noted that Town of Tecumseh which offers limited transit services, could be a potential cost-sharing partner in establishing a regional service to Windsor as the proposed service will route through the centre of the town which will increase the mobility and travel options of its residents to reach regional destinations in either direction.

The above estimation is based on a transit solution for service provision, and it should be noted that other service options should be considered to deliver the service or that such services could be integrated with transit services. Mobility-as-a-Service (MaaS) solutions should be considered that leverage transportation investments and integrate all mode options into a single platform or app so that trip planning becomes less about a specific mode and more about the options to complete a trip. The range of MaaS service types are depicted below:

*Figure 10 – Mobility as a Service*




While not all solutions are relevant to Lakeshore, components that could be incorporated into a MaaS solution include:

- St Clair College Transit and Carelink Health Transit services provided by the Community Support Centre of Essex County
- Rideshare services such as Uber and Lyft
- Private partners such as the Patillo Road Industrial area that could potentially offer or co-fund a shuttle service from the Primary Route to this employment area
- Transit Windsor delivering some component of this service

As mentioned, these services could act as feeder services to the core transit service between Belle River and Tecumseh Mall, which will increase the accessibility and use of this travel option. Typically, such feeder services start off as being on-demand as part of a MaaS transportation strategy and if warranted by demand, evolve into scheduled services.

Finally, it should be noted that to further improve accessibility to the transit service, the establishment of park and ride facilities in proximity to the route should be considered. This could range from informal arrangements with shopping centres (e.g. Sobeys Shopping Centre parking lot to the west/ Value Mart parking lot to the East) to utilize a section of existing parking for this purpose, to establishing formal park and ride facilities. This has been successfully implemented in a number of regional commuter services.

# 8 Recommendations

It is recommended that the Municipality of Lakeshore:

- Consider Option 1a to establish a Primary Route along the Lakeshore-Tecumseh corridor.
- Engage with Transit Windsor in terms of operating permissions and delivery options.
- Engage with Tecumseh with respect to cost sharing of services.
- Engage with Patillo Road Industrial Area to consider establishing a shuttle service or contributing to cost sharing of transit services as a feeder service to the Primary Route.
- Examine ways of integrating Essex services to provide feeder services.
- Engage with Transport Service Providers to support the provision of feeder services to the Primary Services as has been successfully demonstrated in Oakville Ontario.

# APPENDIX A

# LITERATURE REVIEW

**LAKESHORE LITERATURE REVIEW**

**1 Windsor Transit Master Plan (2019)**

- Windsor Transit system operates 14 routes, three of which provide interregional service connecting Windsor to parts of neighbouring communities namely Leamington, Tecumseh and Lasalle.
- Service was delivered with 258,000 annual revenue hours with only 2 routes having frequencies better than 20 minutes in peak periods. 3 routes are currently classified as well utilized (25 to 40 boardings per revenue hour) and 9 as underutilized.
- Travel patterns show that in the AM peak less than 10% of trips are destined to Downtown with the balance distributed relatively evenly across the city.
- The Transit master plan which was updated 2019 noted the following:
    - Smartphone and other technologies have led to the rise in new mobility demand-based services such as car sharing, ride sharing, and micro-transit.
    - Shift towards communities that are environmentally sustainable and healthy has led to the wide-ranging support for public transit.
    - Feedback from the community has revealed strong desire for increased evening, weekend, and holiday service. This is particularly relevant to shift and weekend workers.
    - Top improvements have been identified relating to better better routes, faster service, and a longer service day.
    - The plan emphasizes the need to increase the transit mode share in Windsor and well as address the need for interregional transit with extensions to the east shown as routing along Tucumseh Rd and/or Country Rd 42. The plan identifies establishing regional transit services through continued partnerships.

**2 Tecumseh Transportation Master Plan (2017)**

- The transit system, established in 2009, consists of 1 circuitous route serving the most densely populated northern part of town that connects to the Tecumseh Mall in Windsor where riders can connect to various Windsor transit routes.
- It operates Monday to Saturdays only from 6am to 6pm, providing hourly service (11 round trips per day)
- Free transfers are permitted from the Windsor transit system to the Tecumseh route.
- The service is operated by a private contractor using equipment belonging to the Town.
- According to the master plan, the County of Essex is considering developing a regional transit service that would include two urban connectors through Tecumseh (semi-express service with limited stops) that will improve the travel options for commuters to Windsor.
- The operation of multiple transit services in close proximity or within the same jurisdiction will require coordination of service planning and fare integration and the Town will work with the County and Transit Windsor to coordinate service delivery.

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**3. Lakeshore Official Plan review (2020)**

- The 2010 Official Plan to manage future growth, development and change in the Municipality was reviewed and updated in 2020. It promotes the logical, efficient and cost-effective distribution of land uses and services to ensure the long-term health, and the economic and environmental well-being of the Municipality.
- The planning framework and policies of this Plan are based on the Municipality's Vision, Mission and Planning Objectives:
    - **Vision**: A progressive Town of healthy, integrated communities
    - **Mission**: To nurture a unified Town that sees possibility, inspires innovation and realizes potential.
- Transportation-related objectives focus on the creation of an efficient multi-modal transportation system through the following strategies:
    - Promoting efficient and reliable modes of transportation and support active transportation
    - Promoting sustainable development that supports public transit and is oriented to pedestrians
    - Transit connections within Lakeshore and the County, including transit connections to the City of Windsor and transit links between Primary development nodes
    - Creation of compact, walkable, pedestrian-oriented, mixed-use developments to support, and integrate with, future transit and rail systems.
    - Compact urban form, mixed land uses and the use of active transportation and transit-supportive development.
    - Connections with a Regional public transit system
    - Supporting the development of County Road 22 as a higher density, mixed use transit supportive corridor (Belle River Downtown, Wallace Woods and Lakeshore West) which connects the primary development nodes in Lakeshore and work with the neighbouring municipalities of Tecumseh and Windsor, the Region, and transit providers to provide a viable transit service.
    - Promoting public transit connections to major community destinations, including shopping, employment, public services, institutional and major recreational destinations.
- The population of the Municipality is projected to grow at a modest rate of 0.6% to 41,000 by 2031. Employment is expected to increase by 2.2% per annum to 15,180 jobs.

**4 Waterfront Master Plan (2020)**

- A master plan for the waterfront that integrates the 3 existing spaces consisting of Belle River Marina, Lakeview Park and West Beach was recently completed. This initiative will contribute as a catalyst to the future redevelopment of the downtown core.
- The need to accommodate green transportation (walking, biking and shuttles) in the waterfront design and better connections to downtown were identified through public engagement to further help to clarify the identity of the municipality as a waterfront destination.
- The plan proposes that a dedicated shuttle service could run on the half hour connecting visitors to major amenities and a proposed shuttle route was identified.

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Waterfront Plan: Proposed shuttle Route

## 5 Economic Development Strategy (2006)

- An economic development strategy was prepared to guide and optimize the economic growth of the Municipality of Lakeshore. This plan is currently being updated.
- The 2001 census estimated the employed labour force living in Lakeshore to be 14,885 and that the municipality had a total of 7350 jobs (the majority of which were is in the manufacturing sector). This suggests that 50.6% of the workforce travel beyond the Lakeshore boundaries to access jobs.
- An action item that identified by this strategy was to examine feasibility of providing a public transportation system to support retail development by providing access to the main retail/commercial centres.

## 6 Tourism Development Strategy (2008)

- The report noted that the composition of the visitor market has changed significantly over the past five years (2003 – 2008), with increased share of domestic travel accounting and notable declines in visitation from the US.
- The report concluded that the major Core Attraction for Lakeshore is Water-Based Recreational opportunities, in particular sportfishing and with further development Lakeview Park has the potential to play a larger role in the Town's tourism strategy, and to be positioned as a focal point for regional tourism festivals and events.

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# APPENDIX B

# LOCATION-BASED DATA ANALYSIS

# Location Based Data Analysis: Methodology and Findings

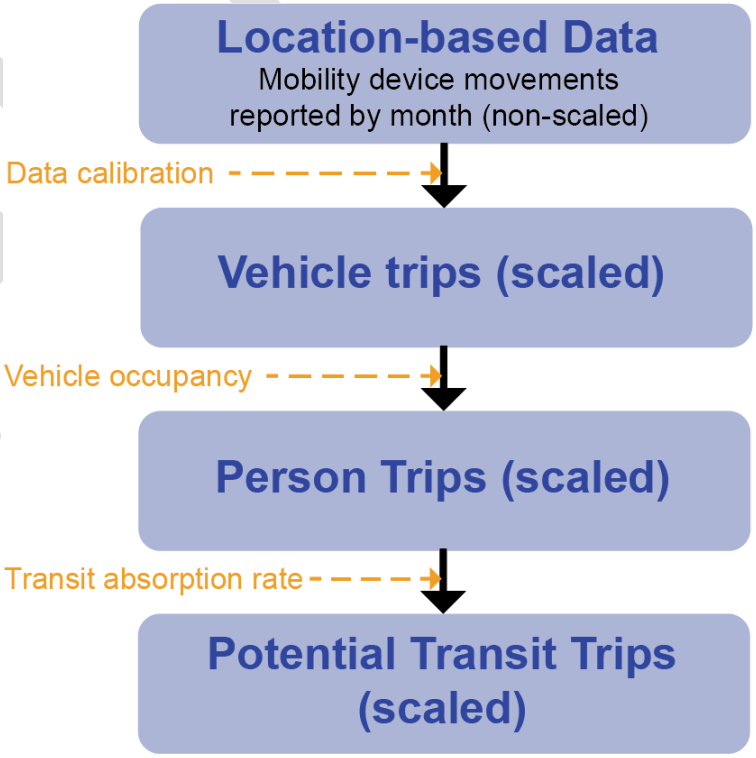
## Project Purpose

The purpose of this task was to develop data-based solutions to:

- identify the major origin-destination patterns in the area
- estimate ridership for potential transit options that serve the needs of Lakeshore residents, workers, and visitors.

## Methodology

Stantec recommended the use of anonymized, aggregated smartphone-based mobility data to obtain information on travel patterns. We leveraged this data to understand the major origin-destination movements between destinations within Lakeshore and to regional destinations in the adjacent municipalities of Essex County and Windsor. The methodology that was followed is summarized as follows:




## Data Sources

For the purposes of this analysis, Stantec leveraged the "Essentials" package from StreetlightData. This was selected because it provided information on travel behavior, by month, since 2016, between a maximum of 50 areas of interest, or zones. A zone can be represented either a pass-through location (where trips pass through but do not stop), or an origin and destination zone, where trips start or end. A roadway, for example, is a pass-through zone, while a major destination (e.g. Tecumseh mall), neighbourhood (e.g. Belle River) or town (e.g. Essex), would represent an origin/destination zone.

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This data is aggregated from smartphone users and Streetlight and their partners work with a network of app providers to collect, aggregate, and anonymize smartphone location data. Typical sample sizes range between 20-35% of the entire traveling population due to Streetlight not having the ability to track every single traveler as there are travelers that do not carry and use cell phones and of those that do, not all users use the apps that are part of the location data supplier network. Machine learning algorithms can be used to convert the device data into actual vehicle trips by extrapolating from the sample size to an estimate of actual travel demand.

The data provided by Streetlight Data is anonymized and aggregated and can be queried for any month of the year since 2016. We recommend using data beyond 2018 since this typically represents a larger sample size of collected data. By month, average data is also available for specific hours of the day, days of the week, and months of the year to analyze travel variations. For example, it is therefore possible to estimate the average travel demand by hour for all Mondays in August 2018, but not for a specific Monday in August. For the purposes of this study, granular trip data on an individual day-level was not required.

## Variation in Demand

The Streetlight platform allowed us to understand variation in demand by specific days of the week, in monthly averages. The travel patterns in the study area are significantly different in the summer and winter seasons, due to the large volume of recreational travel in the summer months. We also used the ability to query data by month and year to examine the impact of COVID on travel patterns. Historical travel demand was modeled for several months to reflect seasonality as well as the impact of COVID, namely July 2019 versus November 2019; and July 2020 versus November 2020.

In general terms, July 2019 was observed to have the highest travel volumes (see Figure 1). November 2019 was significantly lower, especially for recreational destinations such as the Lakeview Regional Park. The overall observed demand to travel in the region in 2020 was lower due to COVID impacts. In 2020, travel demand in July and November were observed to be at similar levels suggesting that the summer recreational tripmaking was impacted the most due to COVID travel restrictions.

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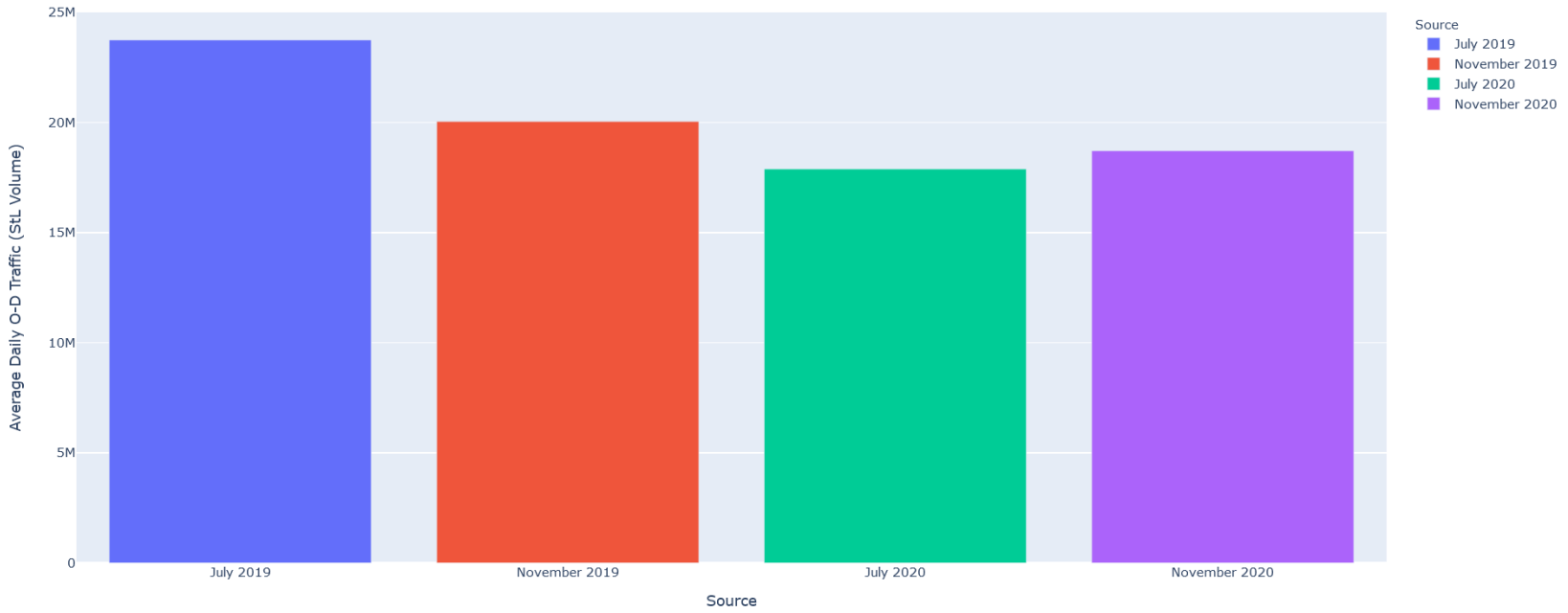
*Figure 1: Variation in Regional Monthly Travel Demand in Pre- and Post-COVID Conditions*




## Metrics

The primary metrics are the travel demand at each of the designated locations of interest, as well as the origin-destination demand between a specific pair of locations. We evaluated both of these for the purposes of this tripmaking analysis, and used them directly and quantitatively in the model. Additional metrics, such as trip purpose, traveler demographics, and travel speed, are also available, that can be examined to guide the transit results as well.

## Calibration

Traffic count data indicates the number of vehicles passing along different roadway segments that could comprise a transit route. However, while this is a good indication of the level of demand and possibly the volume-to-capacity ratio along a corridor, it is not sufficient for estimating origin-destination demand. Instead, for transportation studies, it is essential to have an understanding of the origin-destination trip patterns between specific zones, in addition to traffic counts.



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A calibration process includes comparisons of smartphone-based travel activity to actual count data. Stantec received traffic data on the local roads and on the 401 Expressway from the Municipality of Lakeshore. We compared these two sources and developed a factor to scale smartphone data to actual, real-world conditions. The universal scaling factor was determined to be 0.68, that is, each Streetlight reported trip equated to 0.68 observed vehicle trips. This factor was applied for all subsequent analyses. Table 1 shows the calibration process at select locations where AADT is available.

*Table 1: Calibration Factor Using AADT Locations*

| Location - Route | East or West of Lakeshore? | Direction of Travel | StL_2019AADT | Actual_2019 AADT | Scale Factor |
|---|---|---|---|---|---|
| 22 | West | EB | 27054 | 18231 | 0.67 |
| 22 | West | WB | 25856 | 18231 | 0.71 |
| 401 | West | WB | 20889 | 13788 | 0.66 |
| 401 | West | EB | 19585 | 12791 | 0.65 |
| 42 | West | EB | 11143 | 5651 | 0.51 |
| 42 | West | WB | 10565 | 5651 | 0.53 |
| 401 | East | WB | 19274 | 12172 | 0.63 |
| 401 | East | EB | 13184 | 12702 | 0.96 |
| 42 | East | EB | 3540 | 3127 | 0.88 |
| 42 | East | WB | 3570 | 3127 | 0.88 |
| Total Trips | | | 154660 | 105470 | **0.68** |

Recommended Scale Factor for Streetlight Trips

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## Origin-Destination Profile

The basic origin-destination demand was estimated between a set of zones as defined in the platform.

Within Lakeshore, origin-destination zones were defined at key locations that could potentially be candidates for transit connections. These included:

- Belle River
- Lakeview Regional Park
- Emeryville
- Stoney Point
- Saint Joachim
- Comber
- Lighthouse Cove
- Woodslee
- Essex
- Patillo Road Industrial Center
- Pike Creek
- Lakeshore West
- Atlas Tube Center

The project team initially believed there was a strong connection between locations in Lakeshore and specific destinations in the neighbouring City of Windsor, that included

- University of Windsor
- St. Clair College
- The Ford development
- FCA Windsor
- Walker Road Industrial area
- Downtown Windsor

In addition, a zone was created to encompass all destinations in Windsor that was intended to estimate the total demand between Lakeshore and Windsor.

Pass-through zones were defined as critical roadways connecting Lakeshore to surrounding communities, including:

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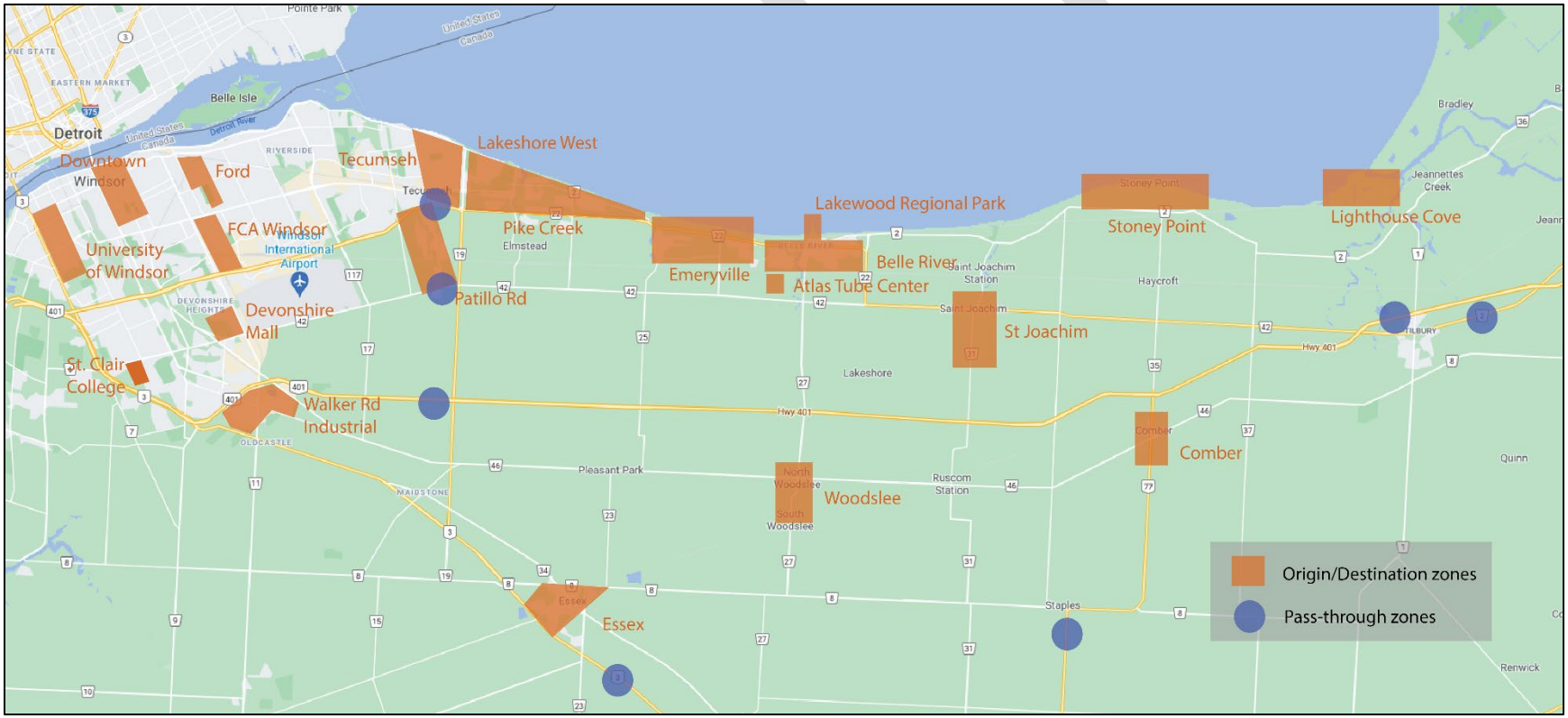
- Route 22 east
- Route 42 east and west of Lakeshore
- Route 401 east and west of Lakeshore
- Route 3 south of Essex County
- Route 77 south of Lakeshore

The zone system is shown in Figure 2.

*Figure 2: Zone System for Transit Analysis*



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## Pre-Set Geography

In addition to measuring activity at user-defined zones such as Universities, malls, and communities, Streetlight uses “pre-set geography” for basic data analyses which is based on the census block definitions as defined by Census Canada.

In the initial analyses, it was determined that there was strong travel demand between Lakeshore and the defined zones in Windsor. However it was found that the destinations of travelers to Windsor was different than what was originally envisioned by the project team. Many of the pre-determined destination zones in Windsor such as Downtown and the University of Windsor showed limited connections to Lakeshore. Instead, from the pre-set geography, areas that appeared to have the most OD patterns included Tecumseh Mall and the Devonshire Mall and these zones were subsequently added to the analysis platform.

It should be noted that the intent of the analysis was to identify the potential demand for transit. Providing services to destinations in Windsor, such as Devonshire Mall, would require further discussion with Windsor Transit in terms of service arrangements. For example, a Lakeshore transit vehicle may be permitted to provide services to certain destinations in Windsor, or Lakeshore services could simply connect to the Windsor transit system in locations served by multiple Windsor routes such as at the Tecumseh Mall.

## Origin Destination Analysis

Overall trip-making characteristics for the month of July 2019 and expressed as scaled vehicle trips between the identified origin and destination zones for July 2019 is shown in Table 2.

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*Table 2: Scaled Vehicle Trip Origin-Destination Matrix*

| Origins | Destinations | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlas Tube Centre | Belle River | Comber | Devonshire | Downtown Windsor | Emeryville | Essex | FCA Windsor | Ford | Lakeshore West | Lakeview Regional Park | Lighthouse Cove | Patillo Road Industrial Center | Pike Creek | Saint Joachim | St.Clair College | Stoney Point | Tecumseh | University of Windsor | Walker Road Industrial | Windsor | Woodslee | Total |
| Atlas Tube Centre | 1 | 308 | 3 | - | - | 96 | 18 | - | - | 17 | 10 | 10 | 6 | 16 | 1 | - | 12 | 7 | - | - | 148 | 6 | 660 |
| Belle River | 316 | 9,712 | 72 | 175 | 327 | 1,353 | 301 | 86 | 20 | 625 | 1,123 | 41 | 451 | 269 | 201 | 26 | 327 | 286 | 28 | 134 | 4,366 | 101 | 20,338 |
| Comber | - | 81 | 1,122 | 13 | 13 | 18 | 80 | - | - | 12 | 4 | 10 | 7 | 12 | 3 | - | 130 | 2 | 6 | 20 | 183 | 45 | 1,760 |
| Devonshire Mall | 5 | 197 | 9 | 693 | 1,004 | 89 | 242 | 11 | 24 | 141 | 7 | 5 | 20 | 190 | 5 | 96 | 14 | 283 | 120 | 179 | 19,466 | 16 | 22,815 |
| Downtown Windsor | 5 | 336 | 2 | 1,104 | 8,133 | 152 | 238 | 64 | 63 | 126 | 16 | - | 156 | 286 | 7 | 199 | 15 | 483 | 573 | 362 | 51,269 | 5 | 63,594 |
| Emeryville | 99 | 1,378 | 16 | 92 | 185 | 1,032 | 116 | 44 | 97 | 303 | 177 | 1 | 284 | 248 | 19 | 4 | 44 | 105 | 46 | 28 | 2,098 | 12 | 6,427 |
| Essex | 22 | 343 | 95 | 199 | 260 | 115 | 13,955 | 5 | 7 | 112 | 16 | 8 | 66 | 77 | 14 | 2 | 61 | 77 | 35 | 301 | 3,256 | 194 | 19,217 |
| FCA Windsor | 1 | 104 | 4 | 40 | 99 | 41 | 13 | 821 | 14 | 13 | 2 | - | 52 | 14 | 2 | 7 | 4 | 54 | 3 | 55 | 4,029 | 2 | 5,375 |
| Ford | - | 11 | - | 16 | 117 | 51 | - | 18 | 197 | 14 | - | - | 3 | 7 | 3 | - | - | 52 | - | 58 | 2,368 | - | 2,917 |
| Lakeshore West | 12 | 874 | 7 | 56 | 107 | 453 | 101 | 8 | 12 | 541 | 24 | 3 | 289 | 1,286 | 20 | - | 40 | 226 | 22 | 32 | 3,374 | 14 | 7,502 |
| Lakeview Regional Park | 9 | 1,077 | 16 | - | 15 | 201 | 21 | - | - | 25 | 51 | 20 | 10 | 33 | 18 | 2 | 35 | 17 | - | - | 326 | 5 | 1,883 |
| Lighthouse Cove | 7 | 39 | 2 | 3 | 5 | 10 | 10 | - | - | 2 | 8 | 541 | - | 3 | 5 | - | 29 | - | - | - | 29 | - | 693 |
| Patillo Road Industrial Center | 4 | 573 | 12 | 44 | 137 | 275 | 57 | 46 | - | 466 | 15 | 2 | 539 | 449 | 3 | 3 | 10 | 89 | 3 | 70 | 3,150 | - | 5,949 |
| Pike Creek | 13 | 275 | 14 | 201 | 284 | 281 | 81 | 16 | - | 991 | 39 | 2 | 398 | 1,017 | 10 | 3 | 17 | 173 | 71 | 101 | 3,518 | 5 | 7,509 |
| Saint Joachim | 5 | 163 | - | 3 | 1 | 20 | 14 | - | 12 | 8 | 28 | 2 | 14 | 10 | 74 | - | 37 | 3 | - | 6 | 89 | 2 | 492 |
| St.Clair College | - | 19 | - | 97 | 197 | 1 | 7 | 2 | - | - | - | - | 3 | 1 | - | 94 | - | 7 | 78 | 29 | 2,632 | 2 | 3,170 |
| Stoney Point | 7 | 186 | 143 | 10 | 23 | 29 | 52 | 14 | - | 12 | 14 | 47 | 8 | 7 | 18 | - | 803 | 20 | 4 | 2 | 282 | 2 | 1,684 |
| Tecumseh Mall | 3 | 333 | 5 | 241 | 367 | 140 | 115 | 18 | 60 | 217 | 22 | 2 | 33 | 262 | - | 15 | 20 | 1,336 | 20 | 21 | 22,970 | 13 | 26,213 |
| University of Windsor | - | 46 | 51 | 137 | 607 | 27 | 71 | 10 | 4 | 26 | 1 | - | 11 | 69 | 2 | 52 | 2 | 36 | 688 | 90 | 8,645 | 5 | 10,581 |
| Walker Road Industrial | - | 158 | 17 | 251 | 345 | 28 | 366 | 52 | 38 | 31 | 2 | - | 62 | 111 | - | 25 | 8 | 46 | 96 | 2,383 | 9,330 | 17 | 13,365 |
| Windsor | 146 | 4,814 | 248 | 18,909 | 49,516 | 2,259 | 3,705 | 3,191 | 2,473 | 3,744 | 401 | 37 | 2,834 | 3,839 | 92 | 2,591 | 273 | 22,246 | 7,220 | 9,008 | 672,455 | 225 | 810,225 |
| Woodslee | 5 | 66 | 35 | 3 | 3 | 9 | 114 | - | - | 3 | 5 | - | 7 | 1 | - | 2 | 6 | 10 | 2 | 9 | 171 | 143 | 595 |
| Total | 658 | 21,093 | 1,875 | 22,290 | 61,745 | 6,680 | 19,676 | 4,406 | 3,018 | 7,428 | 1,967 | 732 | 5,253 | 8,208 | 495 | 3,121 | 1,888 | 25,559 | 9,013 | 12,888 | 814,154 | 814 | **1,032,963** |
| External zones | | | | | | | | | | | | | | | | | | | | | | | |

From this table it is evident that the majority of trips are internal to zones, meaning that they start and end within the same zone.

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Table 3 has internal trips removed from the matrix and shows the origins of external trips from Lakeshore zones and their ranking in terms of vehicle volumes.

*Table 3 – Trip Origins*

| Origins | Destinations | | | | | | | | | | | | | | | | | | | | | | Lakeshore External Trips | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlas Tube Centre | Belle River | Comber | Devonshire | Downtown Windsor | Emeryville | Essex | FCA Windsor | Ford | Lakeshore West | Lakeview Regional Park | Lighthouse Cove | Patillo Road Industrial Center | Pike Creek | Saint Joachim | St.Clair College | Stoney Point | Tecumseh | University of Windsor | Walker Road Industrial | Windsor | Woodslee | Total | **Total Vehicle Trips** | **Rank** |
| Atlas Tube Centre | | 308 | 3 | - | - | 96 | 18 | - | - | 17 | 10 | 10 | 6 | 16 | 1 | - | 12 | 7 | - | - | 148 | 6 | 658 | 1,316 | 8 |
| Belle River | 316 | | 72 | 175 | 327 | 1,353 | 301 | 86 | 20 | 625 | 1,123 | 41 | 451 | 269 | 201 | 26 | 327 | 286 | 28 | 134 | 4,366 | 101 | 10,626 | 20,937 | 1 |
| Comber | - | 81 | | 13 | 13 | 18 | 80 | - | - | 12 | 4 | 10 | 7 | 12 | 3 | - | 130 | 2 | 6 | 20 | 183 | 45 | 638 | 1,276 | 9 |
| Devonshire Mall | 5 | 197 | 9 | | 1,004 | 89 | 242 | 11 | 24 | 141 | 7 | 5 | 20 | 190 | 5 | 96 | 14 | 283 | 120 | 179 | 19,466 | 16 | 22,122 | | |
| Downtown Windsor | 5 | 336 | 2 | 1,104 | | 152 | 238 | 64 | 63 | 126 | 16 | - | 156 | 286 | 7 | 199 | 15 | 483 | 573 | 362 | 51,269 | 5 | 55,461 | | |
| Emeryville | 99 | 1,378 | 16 | 92 | 185 | | 116 | 44 | 97 | 303 | 177 | 1 | 284 | 248 | 19 | 4 | 44 | 105 | 46 | 28 | 2,098 | 12 | 5,396 | 10,693 | 5 |
| Essex | 22 | 343 | 95 | 199 | 260 | 115 | | 5 | 7 | 112 | 16 | 8 | 66 | 77 | 14 | 2 | 61 | 77 | 35 | 301 | 3,256 | 194 | 5,262 | | |
| FCA Windsor | 1 | 104 | 4 | 40 | 99 | 41 | 13 | | 14 | 13 | 2 | - | 52 | 14 | 2 | 7 | 4 | 54 | 3 | 55 | 4,029 | 2 | 4,554 | | |
| Ford | - | 11 | - | 16 | 117 | 51 | - | 18 | | 14 | - | - | 3 | 7 | 3 | - | - | 52 | - | 58 | 2,368 | - | 2,720 | | |
| Lakeshore West | 12 | 874 | 7 | 56 | 107 | 453 | 101 | 8 | 12 | | 24 | 3 | 289 | 1,286 | 20 | - | 40 | 226 | 22 | 32 | 3,374 | 14 | 6,961 | 13,910 | 2 |
| Lakeview Regional Park | 9 | 1,077 | 16 | - | 15 | 201 | 21 | - | - | 25 | | 20 | 10 | 33 | 18 | 2 | 35 | 17 | - | - | 326 | 5 | 1,832 | 3,655 | 6 |
| Lighthouse Cove | 7 | 39 | 2 | 3 | 5 | 10 | 10 | - | - | 2 | 8 | | - | 3 | 5 | - | 29 | - | - | - | 29 | - | 152 | 298 | 12 |
| Patillo Road Industrial Center | 4 | 573 | 12 | 44 | 137 | 275 | 57 | 46 | - | 466 | 15 | 2 | | 449 | 3 | 3 | 10 | 89 | 3 | 70 | 3,150 | - | 5,410 | 10,816 | 4 |
| Pike Creek | 13 | 275 | 14 | 201 | 284 | 281 | 81 | 16 | - | 991 | 39 | 2 | 398 | | 10 | 3 | 17 | 173 | 71 | 101 | 3,518 | 5 | 6,493 | 12,972 | 3 |
| Saint Joachim | 5 | 163 | - | 3 | 1 | 20 | 14 | - | 12 | 8 | 28 | 2 | 14 | 10 | | - | 37 | 3 | - | 6 | 89 | 2 | 418 | 830 | 11 |
| St.Clair College | - | 19 | - | 97 | 197 | 1 | 7 | 2 | - | - | - | - | 3 | 1 | - | | - | 7 | 78 | 29 | 2,632 | 2 | 3,076 | | |
| Stoney Point | 7 | 186 | 143 | 10 | 23 | 29 | 52 | 14 | - | 12 | 14 | 47 | 8 | 7 | 18 | - | | 20 | 4 | 2 | 282 | 2 | 881 | 1,754 | 7 |
| Tecumseh Mall | 3 | 333 | 5 | 241 | 367 | 140 | 115 | 18 | 60 | 217 | 22 | 2 | 33 | 262 | - | 15 | 20 | | 20 | 21 | 22,970 | 13 | 24,876 | | |
| University of Windsor | - | 46 | 51 | 137 | 607 | 27 | 71 | 10 | 4 | 26 | 1 | - | 11 | 69 | 2 | 52 | 2 | 36 | | 90 | 8,645 | 5 | 9,893 | | |
| Walker Road Industrial | - | 158 | 17 | 251 | 345 | 28 | 366 | 52 | 38 | 31 | 2 | - | 62 | 111 | - | 25 | 8 | 46 | 96 | | 9,330 | 17 | 10,982 | | |
| Windsor | 146 | 4,814 | 248 | 18,909 | 49,516 | 2,259 | 3,705 | 3,191 | 2,473 | 3,744 | 401 | 37 | 2,834 | 3,839 | 92 | 2,591 | 273 | 22,246 | 7,220 | 9,008 | | 225 | 137,770 | | |
| Woodslee | 5 | 66 | 35 | 3 | 3 | 9 | 114 | - | - | 3 | 5 | - | 7 | 1 | - | 2 | 6 | 10 | 2 | 9 | 171 | | 452 | 900 | 10 |
| Total | 657 | 11,381 | 753 | 21,597 | 53,613 | 5,648 | 5,721 | 3,586 | 2,821 | 6,887 | 1,916 | 191 | 4,714 | 7,192 | 421 | 3,027 | 1,085 | 24,223 | 8,325 | 10,505 | 141,699 | 671 | **316,634** | | |

Zones outside of Lakeshore

This shows that Belle River, Lakeview Regional Park, Pike Creek, Patillo Road Industrial and Emeryville as being the major generators of external trips from Lakeshore. These 5 zones account for 87% of all external trips generated from the Lakeshore zones.

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Table 4 shows the extent of destinations beyond Lakeshore. In total, roughly half of the external trips generated in Lakeshore have destinations beyond its boundaries, .and it is interesting to note that the majority of trips from zones with the highest external trip generation, have destinations outside of Lakeshore (60%).

*Table 4 – Percentage of trip destinations beyond Lakeshore*

| Lakeshore Zones | Total External trips | Ranking | % of external trips beyond Lakeshore |
|---|---|---|---|
| Belle River | 20,937 | 1 | 54% |
| Lakeshore West | 13,910 | 2 | 57% |
| Pike Creek | 12,972 | 3 | 68% |
| Patillo Road Industrial Center | 10,816 | 4 | 67% |
| Emeryville | 10,693 | 5 | 52% |
| Lakeview Regional Park | 3,655 | 6 | 21% |
| Stoney Point | 1,754 | 7 | 46% |
| Atlas Tube Centre | 1,316 | 8 | 26% |
| Comber | 1,276 | 9 | 50% |
| Woodslee | 900 | 10 | 69% |
| Saint Joachim | 830 | 11 | 31% |
| Lighthouse Cove | 298 | 12 | 32% |
| Total | **79,358** | Average | 48% |

Table 5 below shows the external vehicle trip generation from Lakeshore zones to destinations outside of the Municipality.

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*Table 5 – Trip Destinations beyond Lakeshore*

| Origins | Destinations | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Devonshire | Downtown Windsor | Essex | FCA Windsor | Ford | St.Clair College | Tecumseh | University of Windsor | Walker Road Industrial | Windsor |
| Atlas Tube Centre | - | - | 18 | - | - | - | 7 | - | - | 148 |
| Belle River | 175 | 327 | 301 | 86 | 20 | 26 | 286 | 28 | 134 | 4,366 |
| Comber | 13 | 13 | 80 | - | - | - | 2 | 6 | 20 | 183 |
| Emeryville | 92 | 185 | 116 | 44 | 97 | 4 | 105 | 46 | 28 | 2,098 |
| Lakeshore West | 56 | 107 | 101 | 8 | 12 | - | 226 | 22 | 32 | 3,374 |
| Lakeview Regional Park | - | 15 | 21 | - | - | 2 | 17 | - | - | 326 |
| Lighthouse Cove | 3 | 5 | 10 | - | - | - | - | - | - | 29 |
| Patillo Road Industrial Center | 44 | 137 | 57 | 46 | - | 3 | 89 | 3 | 70 | 3,150 |
| Pike Creek | 201 | 284 | 81 | 16 | - | 3 | 173 | 71 | 101 | 3,518 |
| Saint Joachim | 3 | 1 | 14 | - | 12 | - | 3 | - | 6 | 89 |
| Stoney Point | 10 | 23 | 52 | 14 | - | - | 20 | 4 | 2 | 282 |
| Woodslee | 3 | 3 | 114 | - | - | 2 | 10 | 2 | 9 | 171 |
| **Total** | **601** | **1,101** | **965** | **214** | **139** | **39** | **938** | **181** | **402** | **17,734** |
| **Rank** | **5** | **2** | **3** | **7** | **9** | **10** | **4** | **8** | **6** | **1** |

This table shows most trips are destined for Windsor in general, and that specific destinations within the city of Windsor are not as prominent as was presumed earlier on in the project. After Windsor, Tecumseh and Essex attracted the most trips from Lakeshore.

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Table 6 provides a summary of inter-zonal vehicle trip activity within Lakeshore:

*Table 6 – Trip destinations in Lakeshore*

| Origins | Destinations | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlas Tube Centre | Belle River | Comber | Emeryville | Lakeshore West | Lakeview Regional Park | Lighthouse Cove | Patillo Road Industrial Center | Pike Creek | Saint Joachim | Stoney Point | Woodslee |
| Atlas Tube Centre | | 308 | 3 | 96 | 17 | 10 | 10 | 6 | 16 | 1 | 12 | 6 |
| Belle River | 316 | | 72 | 1,353 | 625 | 1,123 | 41 | 451 | 269 | 201 | 327 | 101 |
| Comber | - | 81 | | 18 | 12 | 4 | 10 | 7 | 12 | 3 | 130 | 45 |
| Emeryville | 99 | 1,378 | 16 | | 303 | 177 | 1 | 284 | 248 | 19 | 44 | 12 |
| Lakeshore West | 12 | 874 | 7 | 453 | | 24 | 3 | 289 | 1,286 | 20 | 40 | 14 |
| Lakeview Regional Park | 9 | 1,077 | 16 | 201 | 25 | | 20 | 10 | 33 | 18 | 35 | 5 |
| Lighthouse Cove | 7 | 39 | 2 | 10 | 2 | 8 | | - | 3 | 5 | 29 | - |
| Patillo Road Industrial Center | 4 | 573 | 12 | 275 | 466 | 15 | 2 | | 449 | 3 | 10 | - |
| Pike Creek | 13 | 275 | 14 | 281 | 991 | 39 | 2 | 398 | | 10 | 17 | 5 |
| Saint Joachim | 5 | 163 | - | 20 | 8 | 28 | 2 | 14 | 10 | | 37 | 2 |
| Stoney Point | 7 | 186 | 143 | 29 | 12 | 14 | 47 | 8 | 7 | 18 | | 2 |
| Woodslee | 5 | 66 | 35 | 9 | 3 | 5 | - | 7 | 1 | - | 6 | |
| **Total** | **475** | **5,021** | **323** | **2,744** | **2,465** | **1,448** | **139** | **1,475** | **2,335** | **297** | **687** | **192** |
| **Rank** | 8 | 1 | 9 | 2 | 3 | 5 | 12 | 5 | 4 | 10 | 7 | 11 |

This confirms that Belle River, Emeryville, Lakeshore West and Pike Creek are the zones attracting the most trips in Lakeshore.

In terms of the identification of potential mobility service options, the origin destination data shows that the majority of trips generated by Lakeshore zones remain with their respective zones, and that the majority of trips from zones with the highest generation of trips have destinations beyond the Municipality - the major destination being various locations within Windsor. An obvious conclusion is thus to consider a service option that links the largest trip generating zones in Lakeshore, and connects them via Tecumseh, to a feasible location(s) in the City of Windsor.



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# RoutePlan Analysis

A program to allow the project team to estimate transit demand was developed for this project. This tool, named RoutePlan, allows an analyst to define a transit route, input some key assumptions to generate the total origin-destination demand between locations along that route, as well as the projected transit ridership demand. This is intended to be a simple to use program, to guide decision making relating to transit vehicle selection, fleet size, and operating requirements.

RoutePlan is designed to be user-friendly. It will be available as a desktop application or via a web interface to generate a series of charts documenting the demand profile for the route. It is intended to be used for rapid analyses, so analysts can assess the impacts of adding additional stops and routes, for example.

## Assumptions

The inputs to RoutePlan are the route definition, described as a sequence of stops, the average vehicle capacity, and the transit capture rate for each zone.

Based on the OD findings above the following route assumptions[1] were made:

- A route extending from Lakeview Regional Park to Devonshire Mall that connecting and making stops in Belle River, Emeryville, Patillo Road Industrial Area, Pike Creek, Lakeshore West, and the Tecumseh Mall. Connecting service may be provided to other destinations within Windsor, however, only the demand for Devonshire is included for the purposes of this analysis.
- A transit capture rate comprising of 5% of external trips (between zones), and 1% of internal trips (within zones).
- An average vehicle occupancy of 1.5 for vehicle trips is assumed which is used to convert vehicle trips to person trips.

Figure 3 shows sample output from RoutePlan, showing the total travel demand in person trips served by the route.

[1] These assumptions are based on past practices on transit feasibility studies and are deliberately conservative. New transit-based mobility systems take upwards of 3 years to reach their potential ridership levels, therefore a conservative approach ensures that there are no fiscal surprises. The uptake on new technology-based on-request systems is difficult to estimate and that most systems that have used on-demand general public transit services have done so to limit financial risk, service low density areas or replace a low passenger route (Transportation Cooperative Research Board Synthesis #144 - Microtransit or General Public Demand Response Transit Services: State of the Practice, 2019).
The goal is typically to provide access to a conventional, scheduled system through a "trip to transit" type system that aims to get people to the nearest stop or transfer point on a fixed route system. These services are most similar to taxi or ridehailing services that provide optimal flexibility for the user. Edmonton Transit is currently embarking on a major restructure of the transit system with a large on-demand system run by private operators. This is relatively new for the transit industry, therefore there are few available statistics to reference.



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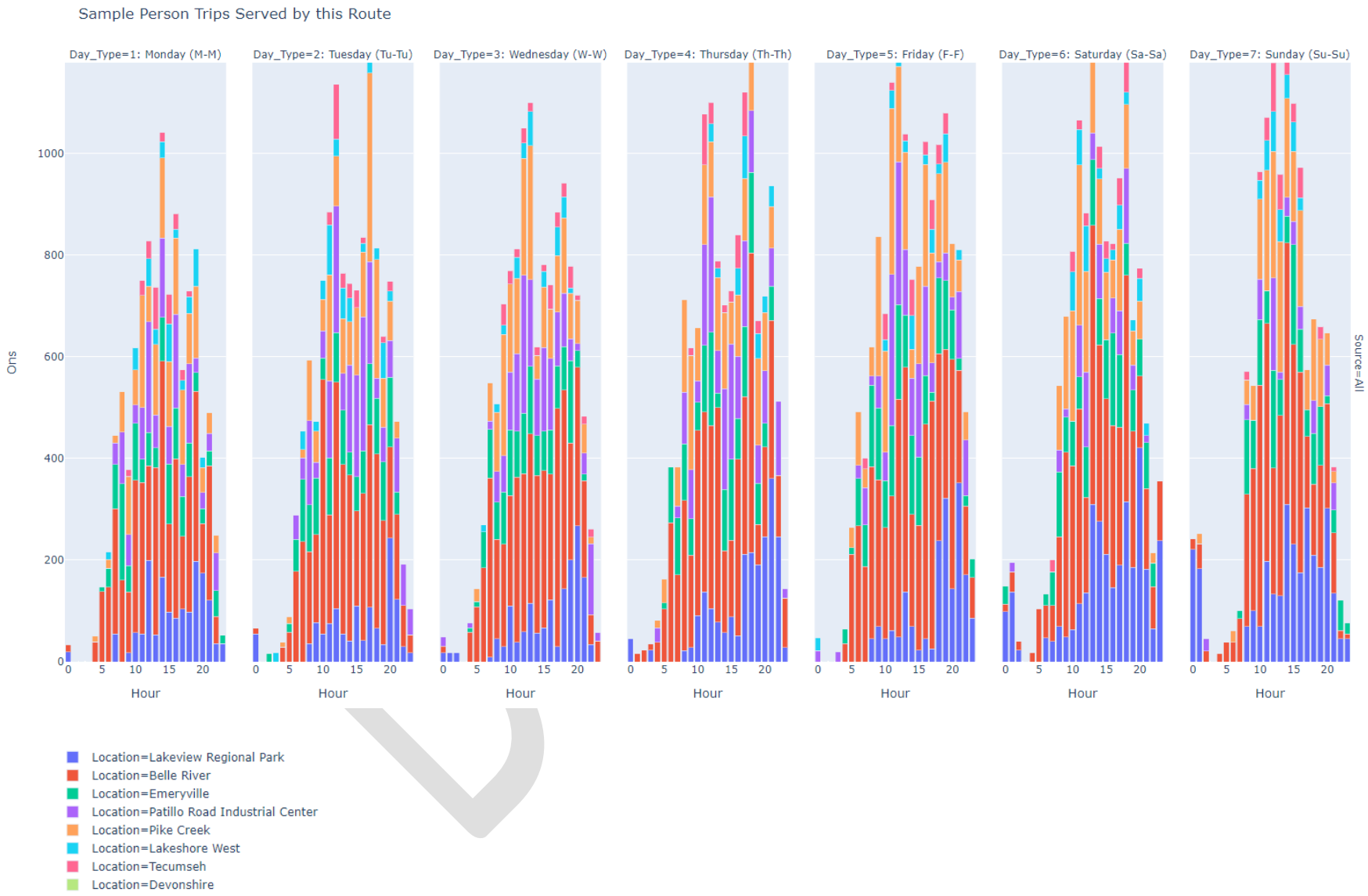
*Figure 3: Total Person Demand on Selected Route*



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**Outputs**

The outputs from RoutePlan are the average estimated transit demand by hour of the day and day of week, by month. To demonstrate the effects of seasonality and quantify COVID impacts, the demand different months and year can be provided. Based on the transit capture rate, the corresponding average transit/mobility travel demand by hour and by day is shown in Figure 4.

the for

*Figure 4: Projected Transit Demand on This Route*




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## Findings

Based on this route configuration and the transit capture rate assumptions, the data suggest that in a westbound direction (from Lakeshore to Windsor) the maximum cumulative hourly demand of approximately 60 rides occur during the weeknight and on weekends in the westbound direction. During weekdays, a baseline demand between 20-30 rides per hour are projected during most hourly periods between 7 AM to 10 PM.

As a sanity check, the OD data was analyzed in both directions to confirm that the demand is roughly in the same ballpark in the eastbound direction, as illustrated in the tables below.

*Table 7 – Westbound Transit ride estimation*

| Origins | Destinations | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlas Tube Centre | Belle River | Comber | Devonshire | Downtown Windsor | Emeryville | Essex | FCA Windsor | Ford | Lakeshore West | Lakeview Regional Park | Lighthouse Cove | Patillo Road Industrial Center | Pike Creek | Saint Joachim | St.Clair College | Stoney Point | Tecumseh | University of Windsor | Walker Road Industrial | Windsor | Woodslee | Total |
| Atlas Tube Centre | | | | | | | | | | | | | | | | | | | | | | | - |
| Belle River | | | | 13 | | 101 | | | | 47 | | | 34 | 20 | | | | 21 | | | | | 237 |
| Comber | | | | | | | | | | | | | | | | | | | | | | | - |
| Devonshire Mall | | | | | | | | | | | | | | | | | | | | | | | - |
| Downtown Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Emeryville | | | | 7 | | | | | | 23 | | | 21 | 19 | | | | 8 | | | | | 77 |
| Essex | | | | | | | | | | | | | | | | | | | | | | | - |
| FCA Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Ford | | | | | | | | | | | | | | | | | | | | | | | - |
| Lakeshore West | | | | 4 | | | | | | | | | | | | | | 17 | | | | | 21 |
| Lakeview Regional Park | | 81 | | 0 | | 15 | | | | 2 | | | 1 | 2 | | | | 1 | | | | | 102 |
| Lighthouse Cove | | | | | | | | | | | | | | | | | | | | | | | - |
| Patillo Road Industrial Center | | | | 3 | | | | | | 35 | | | | 34 | | | | 7 | | | | | 79 |
| Pike Creek | | | | 15 | | | | | | 74 | | | | | | | | 13 | | | | | 102 |
| Saint Joachim | | | | | | | | | | | | | | | | | | | | | | | - |
| St.Clair College | | | | | | | | | | | | | | | | | | | | | | | - |
| Stoney Point | | | | | | | | | | | | | | | | | | | | | | | - |
| Tecumseh Mall | | | | 18 | | | | | | | | | | | | | | | | | | | 18 |
| University of Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Walker Road Industrial | | | | | | | | | | | | | | | | | | | | | | | - |
| Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Woodslee | | | | | | | | | | | | | | | | | | | | | | | - |
| Total | - | 81 | - | 61 | - | 117 | - | - | - | 181 | - | - | 56 | 75 | - | - | - | 67 | - | - | - | - | **637** |

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*Table 8 - Eastbound Transit ride estimation*

| Origins | Destinations | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlas Tube Centre | Belle River | Comber | Devonshire | Downtown Windsor | Emeryville | Essex | FCA Windsor | Ford | Lakeshore West | Lakeview Regional Park | Lighthouse Cove | Patillo Road Industrial Center | Pike Creek | Saint Joachim | St.Clair College | Stoney Point | Tecumseh | University of Windsor | Walker Road Industrial | Windsor | Woodslee | Total |
| Atlas Tube Centre | | | | | | | | | | | | | | | | | | | | | | | - |
| Belle River | | | | | | | | | | | 84 | | | | | | | | | | | | 84 |
| Comber | | | | | | | | | | | | | | | | | | | | | | | - |
| Devonshire Mall | | 15 | | | | 7 | | | | 11 | 1 | | 1 | 14 | | | | 21 | | | | | 70 |
| Downtown Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Emeryville | | | | | | | | | | | | | | | | | | | | | | | - |
| Essex | | | | | | | | | | | | | | | | | | | | | | | - |
| FCA Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Ford | | | | | | | | | | | | | | | | | | | | | | | - |
| Lakeshore West | | 66 | | | | 34 | | | | | 2 | | 22 | 96 | | | | | | | | | 219 |
| Lakeview Regional Park | | | | | | | | | | | | | | | | | | | | | | | - |
| Lighthouse Cove | | | | | | | | | | | | | | | | | | | | | | | - |
| Patillo Road Industrial Center | | 43 | | | | 21 | | | | | 1 | | | | | | | | | | | | 65 |
| Pike Creek | | 21 | | | | 21 | | | | | 3 | | 30 | | | | | | | | | | 75 |
| Saint Joachim | | | | | | | | | | | | | | | | | | | | | | | - |
| St.Clair College | | | | | | | | | | | | | | | | | | | | | | | - |
| Stoney Point | | | | | | | | | | | | | | | | | | | | | | | - |
| Tecumseh Mall | | 25 | | | | 11 | | | | 16 | 2 | | 2 | 20 | | | | | | | | | 75 |
| University of Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Walker Road Industrial | | | | | | | | | | | | | | | | | | | | | | | - |
| Windsor | | | | | | | | | | | | | | | | | | | | | | | - |
| Woodslee | | | | | | | | | | | | | | | | | | | | | | | - |
| Total | - | 169 | - | - | - | 93 | - | - | - | 27 | 92 | - | 55 | 130 | - | - | - | 21 | - | - | - | - | **588** |

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# APPENDIX C

# MOBILITY FRAMEWORK

# Transit Visioning and Goals Exercise

Truper McBride, Tammie Ryall, Ryan Donally, Rosanna Pellerito, Aaron Hair, Jeff Wilson, Feng Chen

April 19, 2021

Bolding: Stantec

## Vision:

- Inspirational
- Futuristic
- **Connecting communities**
- **Inclusive**
- Moving Lakeshore along
- Lakeshore in Motion
- **Mobility**
- **Convenience**
- Should mobility be included?
- Mobility is strategic movement of people and goods
- **Affordability**
- **Increase quality of life (young and old)**
- **Achievable**
- Acceptable

## Target Audience

- **Everyone**
- You have to be able to efficiently move goods and people between communities
- Transit has been seen as a low income. Will only "low income" use the transit system?
- You'll need "white collar" to use as well for the system to be successful.
- How can you make people see the convenience of a transit system?
- Regional transit system
- **Younger generations being more green**
- Reduce carbon footprints by less cars on the road, climate crisis.
- Grants for green stream factors in projects
- Is the fleet green?

## What is the Goal?

- **Is the goal to have a regional transit system?**
- **Different goals for short term vs long term.**
- **Short term: low income, students, seniors**
- Have to think small to allow council to grasp the idea
- Results from the survey will help with the vision. What do you the people want?
- Use the new hospital as a focus point. Run a commuter bus to the new hospital.

- Autonomous vehicles… whatever the system is should have on demand aspect.
- Is it good enough for the transit system just to be a 40 passenger bus running down Essex County Road 22 to connect to East Windsor. Should this be a stepping stone for bigger system? In 20 years is Lakeshore going to be an autonomous community?
- Due to density issues a transit system that goes into communities might not work. Lakeshore is too spread out. On demand transit has worked for small communities.
- On demand will help the senior population to not have to rely on family members for rides.
- Not just older population but younger as well. Younger populations are not interested in owning cars, want to live a frugal, environment kind life. Without a transit system in the county they will be forced to move to urban centres. (Tammie via Youth Advisory Committee)
- Mobility is inclusive
- With more people moving from Toronto/Ottawa where transit systems are common and reliable. Everyone is use to not having a car and relying on the transit systems. No prejudice that transit is just for low income people.
- Vision for Belle River to have a Via Rail stop in the future.
- As Lakeshore continues to urbanize transit will help allow us to be ahead of issues instead of behind (i.e. traffic on Essex County Road 22, to narrow to accommodate the recent developments)

What are the goals short term?

- Short term is the next five years. Anything beyond 5 years is long term. Need to target a broader market than the system already in place (students to St. Clair College and elderly to doctor appointments). Survey results will help with who to target.
- Specialized transit will still need to exist. I should run parallel to new transit system. We don't want to duplicate. Community Support Centre will transfer the student part of specialized transit to Lakeshore transit.
- Short term goal is to get the infrastructure set up for a transit system (i.e. sidewalks). How do we link Essex County Road 22 to our future communities?
- What other infrastructure will Lakeshore need for a transit system?
- Create a seamless system (i.e. should have to pay for a bus in Belle River, to transfer and pay again in Tecumseh, and once again in Windsor).
- Can we adopt what Leamington and LaSalle have done by purchasing bus services from the City of Windsor? Is this a benefit? What is the arrangement between these municipalities and City of Windsor for these services?
- As of March 2020 meeting with Transit Windsor, they were open to the idea.
- Cheaper route is to use the City of Windsor's transit. They take the cost, maintenance, liability and risk.

Regional Transit System

- Long term goal: regional transit
- It should be a regional system, but there is no collaboration between the communities. City vs County. Windsor doesn't want to collaborate with county. Strategic plans says Windsor/Detroit.
- Tecumseh is interested in a regional transit system.
- If you go too big to quick (regional system) and council doesn't agree; transit will be stopped immediately.

Most Important: We need to focus on the best value for the dollar instead of who is delivering the service.

Additional Stantec Notes:

- Retain younger and attract new population in/to Lakeshore. Transit to promote quality of life.
- Support growth/diversification and densification.
- Promote collaboration/coordination, integration (and cost sharing) with neighbours (e.g. Tucumseh/Windsor) and other services (e.g. Community Support Centre services , VIA Rail in Belle River).
- Communities isolated and outlying. Connect them with Transit
- Provide access to schools, jobs and services – locally and regionally
- Summer services to increases access to waterfront and reduce parking demand
- Promote environment and sustainability.
- Short term (5 yr): focus on low income, senior and youth groups for providing localized mobility options.
- Long term: target all population groups and focus on regional services

## Proposed draft statements on Lakeshore's Vision, Goals and Objectives

Vision: describing the end state
Goal(s): describing how to achieve the Vision
Objectives: describing how to achieve the Goals

**Vision:** Connecting Lakeshore into the future

**Goal**: Create mobility/transit options to support growth and connectivity in Lakeshore between communities that link to key regional destinations

**Objectives**:

1. Creating travel choices for all age groups by providing alternative mobility options to the private vehicle
2. Creating connections between communities to provide access to local, regional and seasonal destinations
3. Promoting and supporting growth, land use densification and economic diversification in Lakeshore to increase the economic viability and diversity of the municipality
4. Promoting sustainability and improve the environment through mobility options that lessen the reliance upon private vehicles, especially single occupancy and fossil fuel-based vehicles, for travel in key corridors in the region that will assist in reducing greenhouse gas emissions
5. Promoting the benefit and use of mobility options through educational opportunities using digital and other media

# APPENDIX D

# SURVEY QUESTIONNAIRE

# Lakeshore Mobility Options Study: Survey Questionnaire

**Please complete a separate response for each individual person by checking or completing the appropriate shaded boxes. Deadline May 21, 2021**

1. Which is your main mode of travel that you use to get around (*select one only*)?

Car | Rideshare
Bike | Hitch hike
Taxi | Share a ride
Walk | Other...

2. Do you ever make use of private transportation ridesharing or on-demand service providers such as Uber and Lyft? Yes | No

If so, how often? Daily | 3 x per week | Weekends | Seldom

3. Are you aware of the the services provided by the Community Support Centre of Essex County? Yes | No

If so, which services do you use?

St Clair College Transit
Carelink Health Transit
None of the above

The family of Mobility services are 100% accessible and can include options such as:

- Scheduled, fixed-route transit service (bus services along a fixed route that has fixed bus stops);
- On-demand and door-to-door services (phone or app-based request for service from your location to a specific destination);
- Services for registered users with disabilities that prevents them from using other transit options.

These services can be provided by local authorities, not-for-profit organizations as well as private transportation providers such as taxis, Uber and Lyft. Although the majority of mobility aids can be accomodated by these services, there are some larger scooters that are too big to be accomodated in these vehicles.

4. Where in the following communities in the region, would you like to see mobility services to go (*select all that apply*)?

- Lakeshore
  - Lakeshore West/ Amy Croft area
  - Belle River Main Street
  - Deerbrook/Rochester
  - Woodslee
  - Essex area
  - West Beach/Belle River Marina
  - Patillo Road manufacturing area
  - Lighthouse Cove
  - Comber
  - Puce/Emeryville
  - Other: .....
- Tecumseh
  - Lakewood Park
  - West Tecumseh/ Banwell area
  - Tecumseh shopping area (Zehrs)
  - Oldcastle manufacturing area
  - Other: .....
- Windsor
  - Downtown
  - Windsor Detroit Tunnel
  - Devonshire Mall
  - University of Windsor
  - St. Clair College
  - Walker Road shopping area
  - Ambassador Bridge
  - Tecumseh Mall
  - Windsor Regional Hospital: Met Campus
  - FCA/Chrysler/Stellantis Assembly Plant
  - Other: .....

5. **Within Lakeshore**, if accessible mobility services were available, how often and when would you consider using them for the following purposes (*check all of the boxes that apply*)?

| --- Purpose --- | ---------- How Often ---------- | | | | --- When --- | | |
|---|---|---|---|---|---|---|---|
| • Work | Daily | 3 x per week | Weekends | Seldom | Never | AM | Midday | PM |
| • School | Daily | 3 x per week | Weekends | Seldom | Never | AM | Midday | PM |
| • Medical | Daily | 3 x per week | Weekends | Seldom | Never | AM | Midday | PM |
| • Shopping | Daily | 3 x per week | Weekends | Seldom | Never | AM | Midday | PM |
| • Social | Daily | 3 x per week | Weekends | Seldom | Never | AM | Midday | PM |
| • Recreation | Daily | 3 x per week | Weekends | Seldom | Never | AM | Midday | PM |
| • Lakeview Park in Summer | Daily | 3 x per week | Weekends | Seldom | Never | AM | Midday | PM |

6. **Beyond Lakeshore**, if accessible mobility services were available, where, how often and when would you consider using it for the following purposes (*complete only those that apply*)?

| -- Purpose -- | --- Community --- | ---------- How Often ---------- | | | | --- When --- | | |
|---|---|---|---|---|---|---|---|---|
| • Work | ..... | Daily | 3 x per week | Weekends | Seldom | AM | Midday | PM |
| • College/University | ..... | Daily | 3 x per week | Weekends | Seldom | AM | Midday | PM |
| • Medical | ..... | Daily | 3 x per week | Weekends | Seldom | AM | Midday | PM |
| • Shopping | ..... | Daily | 3 x per week | Weekends | Seldom | AM | Midday | PM |
| • Connection to transportation services | ..... | Daily | 3 x per week | Weekends | Seldom | AM | Midday | PM |
| • Other... | | | | | | | | |
| ..... | ..... | Daily | 3 x per week | Weekends | Seldom | AM | Midday | PM |

7. There is a cost involved to operate mobility and transit services and typically fares range from $3 to $4 for short distance trips and $10 to $15 for longer distance trips.

Would you be prepared to contribute to this cost when using these services? Yes No

If yes, how much will you be prepared to pay? $

8. In which suburb or community of Lakeshore do you live (*check appropriate box*)?

- West Lakeshore/ Amy Croft Area (Manning to East Pike Creek/ Lake St. Clair to County Road 42)
- Old Tecumseh Road area (East Pike Creek to West Puce/ Lake St. Clair to County Road 42
- Puce & Emeryville (West Puce Road to the Belle River/ Lake St. Clair to County Road 42)
- Belle River (The Belle River to Strong Road/ Lake St. Clair to County Road 42)
- Deerbrook/Rochester/ Stoney Point (Strong Road to Tracey Sideroad/ Lake St. Clair to County Road 42)
- Lighthouse Cove (Tracey Sideroad to the Thames River/ Lake St. Clair to County Road 42)
- Comber
- North and South Woodslee
- Other: .....

9. In which age group do you fall? Under 16 | 16 - 25 | 26 - 40 | 41 - 60 | Over 60 | Prefer not to answer

10. What is your occupation status (*check appropriate box*)?

- Employed : temporarily working from home
- Employed: permanently working from home
- Employed: working outside your home
- Unemployed
- Retired

11. If you are working outside your home, where is your place of employment?

- East Lakeshore / Tilbury
- Patillo Road area
- East Windsor
- FCA Assembly Plant
- Oldcastle area
- Essex
- Chatham Kent
- Belle River
- Manning Road Area / Tecumseh
- Central / South Windsor
- Downtown Windsor / University area
- LaSalle / Amherstburg
- Leamington / Kingsville
- Other: .....

12. Do you require service that needs to accomodate a mobility aid? Yes | No

If yes, do you use any of the following mobility aids?

- Walker
- Wheelchair
- Scooter
- None of the above

13. Please provide any other comments or suggestions that you may have?

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**Thank you for your participation!**
**Paper copy survey responses should be dropped off no later than May 28 at Town Hall at 419 Notre Dame Street, Belle River.**

# APPENDIX E

# STAKEHOLDER SURVEY RESULTS

# Public Consultation – Stakeholder Survey Results

## Engagement: Session 1

A questionnaire was published online between May …- 31 and residents were invited submit responses regarding their existing travel patterns/habits as well as their thoughts on potentially using a transit service in the future. The questionnaire was also made available in a hard copy format. The Questionnaire is included in Appendix …

A total of 82 online and no hard copy responses were received.

**Results**:

Question 1: The vast majority of respondents use a private vehicle for travel (80%), followed by biking.

Question 2: 21 respondents (26%) indicated that they have used rideshare services such as Uber and Lyft, and that they are used seldomly.

Question 3: Very few respondents (20%) are aware of the services provided by the Community Support Centre of Essex, and only 1 respondent indicated that these (St Clair College Transit and Carelink Health Transit) services are used.

Question 4: The following communities in the region were identified as the priority destinations for mobility services:

| | Priority | Community |
|---|---|---|
| Lakeshore | 1 | Belle River/Main Street |
| | 2 | Lakeshore West/Amy Croft area |
| | 3 | Puce/Emeryville |
| | 4 | West Beach/Belle River Marina |
| | 5 | Patillo Road |
| Tecumseh | 1 | Tecumseh shopping area (Zehrs) |
| | 2 | West Tecumseh / Banwell area |
| | 3 | Lakewood Park |
| Windsor | 1 | Tecumseh Mall |
| | 2 | Devonshire Mall |
| | 3 | University of Windsor |
| | 4 | St. Clair College |
| | 5 | Windsor Regional Hospital: Met Campus |

Question 5: **Within Lakeshore**, respondents provided the following indication relating to which extent mobility services would potentially be used by trip purpose and time and frequency of use:

| Trip Purpose | % of Respondents | Frequency of Use | Time of Day |
|---|---|---|---|
| Work | 83% | Seldom/never | AM, PM |
| School | 80% | Seldom | AM |
| School | 15% | 3 times per week | AM, PM |
| Medical | 90% | Seldom/never | AM, PM |
| Shopping | 62% | Seldom/never | Midday |
| Shopping | 25% | Weekends | Midday |
| Social | 33% | Weekends | Midday |
| Recreation | 39% | Weekends | Midday |
| Lakeview Park (summer) | 33% | Weekends | Midday |

These results do not tend to indicate a high potential demand for transit/mobility services within Lakeshore, with recreational and social trip purposes being most dominant.

Question 6: **Beyond Lakeshore**, the dominant destinations for trips using mobility services were identified as Windsor and Tecumseh. Trip characteristics were as follows:

| Trip Purpose | % of Respondents | Frequency of Use | Time of Day |
|---|---|---|---|
| Work | 17% | Daily | AM |
| School | 17% | 3 time per week | AM |
| Medical | 17% | Seldom | Midday |
| Shopping | 27% | Weekends | Midday |
| Connections to other transportation services | 19% | Seldom | Midday |

These results suggest that there is a greater demand for regional travel options using mobility services for work, school and shopping trip purposes.

Question 7: With respect to the cost of transit services, 53% of respondents indicated that they were willing to contribute to the cost of providing these services. Responses and comments to the question of what amount respondents were willing to pay, are summarized below:

- $3 for short trips
- $10 - $15 for longer trips
- Services should be free for seniors and students
- Fares should be similar to Windsor Transit
- Fare should be similar to rideshare services.

Question 8: Respondents represented the following communities of Lakeshore:

| % of Respondents | Communities |
|---|---|
| 32% | Puce & Emeryville (West Puce Road to the Belle River/ Lake St. Clair to County Road 42) |
| 23% | Belle River (Belle River to Strong Road/ Lake St. Clair to County Road 42) |
| 6% | Deerbrook/Rochester/ Stoney Point (Strong Road to Tracey Sideroad/ Lake St. Clair to County Road 42) |
| 11% | Other:<br>○ West Lakeshore/ Amy Croft Area (Manning to East Pike Creek/ Lake St. Clair to County Road 42)<br>○ Old Tecumseh Road area (East Pike Creek to West Puce/ Lake St. Clair to County Road 42<br>○ Lighthouse Cove (Tracey Sideroad to the Thames River/ Lake St. Clair to County Road 42)<br>○ North and South Woodslee |
| 28% | No response |

Question 9: The age distribution of respondents was as follows:

| % of Respondents | Age Group |
|---|---|
| 1% | Under 16 |
| 2% | 16 - 25 |
| 20% | 26 - 40 |
| 37% | 41 - 60 |
| 17% | Over 60 |
| 23% | No response |

Question 10: The employment status of respondents was as follows:

| % of Respondents | Employment Status |
|---|---|
| 29% | Employed: working outside your home |
| 18% | Retired |
| 16% | Employed : temporarily working from home |
| 10% | Employed: permanently working from home |
| 5% | Unemployed |
| 22% | No response |

Question 11: The employment location of those respondents working outside of the home are as follows:

| % of Respondents | Employment Location |
|---|---|
| 16% | Downtown Windsor / University area |
| 14% | East Windsor |
| 12% | Belle River |
| 10% | Manning Road Area / Tecumseh |
| 10% | Central / South Windsor |
| 38% | Other |

Question 12: None of the respondents indicated the need for accommodating a mobility aid.

## Business Survey

A business survey was undertaken by the Municipality and posed the following transit-related question: "The Municipality of Lakeshore is currently exploring a transit feasibility study. Do you think a public transit system would be beneficial for your business and employees?:

Of the respondents that answered, the result was roughly evenly split (yes (36) and no (39). However, when cross tabulated against business location, the positive responses were concentrated in the neighbourhoods identified as the priority destinations for mobility services as part of the stakeholder questionnaire, namely Puce/Emeryville West, Belle River/Main Street, Patillo Road and Lakeshore West. Details are shown in the table below:

| **In which Lakeshore boundary is your Company located?** | **Would transit be valuable to your company and employees** | | | |
|---|---|---|---|---|
| | No | Yes | No response | Total |
| Belle River Area | 15 | 9 | 4 | 28 |
| Comber and Tilbury | 5 | | 2 | 7 |
| Essex | 2 | | | 2 |
| Lakeshore West and Amy Croft | 2 | 6 | 1 | 9 |
| Other or Mobile/Digital Company | 1 | 1 | 1 | 3 |
| Patillo Road Area | 6 | 7 | 3 | 16 |
| Puce and Emeryville Area | 4 | 10 | 4 | 18 |
| Stoney Point Area | 3 | 2 | 1 | 6 |
| Woodslee | 1 | 1 | | 2 |
| **Total** | **39** | **36** | **16** | **93** |

# APPENDIX F

# PHASE 2 STAKEHOLDER CONSULTATION

# Stakeholder Consultation

## 1 Introduction

The Municipality of Lakeshore is exploring potential mobility options for the residents of Lakeshore. As part of this study, we are engaging with stakeholders and the public for input into this initiative and a two-phased engagement process is being followed.


Phase 1 Engagement took place in May 2021. We prepared an extensive questionnaire and provided opportunity for respondents to provide an indication of their travel patterns and preferences, as well as input and comment on potential mobility services within Lakeshore and connections to regional destinations.

The analysis of these responses, together with the analysis if travel data will help us to identify transportation demand and realistic mobility needs and options.

## 2 Engagement Phase 2

The purpose of the second phase of public and stakeholder engagement is to provide feedback to stakeholders on what we had heard in Phase 1, as well as presenting a summary of findings of the analysis of travel data. Based on this input we are in a position to make informed decisions in terms of identifying and developing draft service proposals for your consideration.

Concept service options are described below in terms of:

- Key origins and destinations to trips
- Service phasing and expansion
- Operational considerations

We would like to invite you to consider them in light of the engagement and data analysis summary of findings. Any comments or suggestions will be appreciated and will be considered in the refinement of these proposals.

## 3 Phase 1 Engagement Results - What we heard

The vast majority of respondents use a private vehicle for travel and 26% indicated that they seldomly used rideshare services such as Uber and Lyft.

Very few respondents (20%) are aware of the services provided by the Community Support Centre (St Clair College Transit and Carelink Health Transit).

The following communities were identified as priority destinations for mobility services:

| | |
|---|---|
| Lakeshore: | Belle River/Main Street |
| | Lakeshore West/Amy Croft area |
| | Puce/Emeryville |
| | West Beach/Belle River Marina |
| | Patillo Road |
| Tecumseh: | Tecumseh shopping area (Zehrs) |
| | West Tecumseh / Banwell area |
| Windsor: | Tecumseh Mall |
| | Devonshire Mall |
| | University of Windsor |
| | St. Clair College |

**Within Lakeshore**, more than 60% of respondents indicated that they would seldomly or never use mobility services for the purposes of work, school, medical or shopping trips during the weekday. The use of services were limited to weekends only, for shopping, social and recreational purposes.

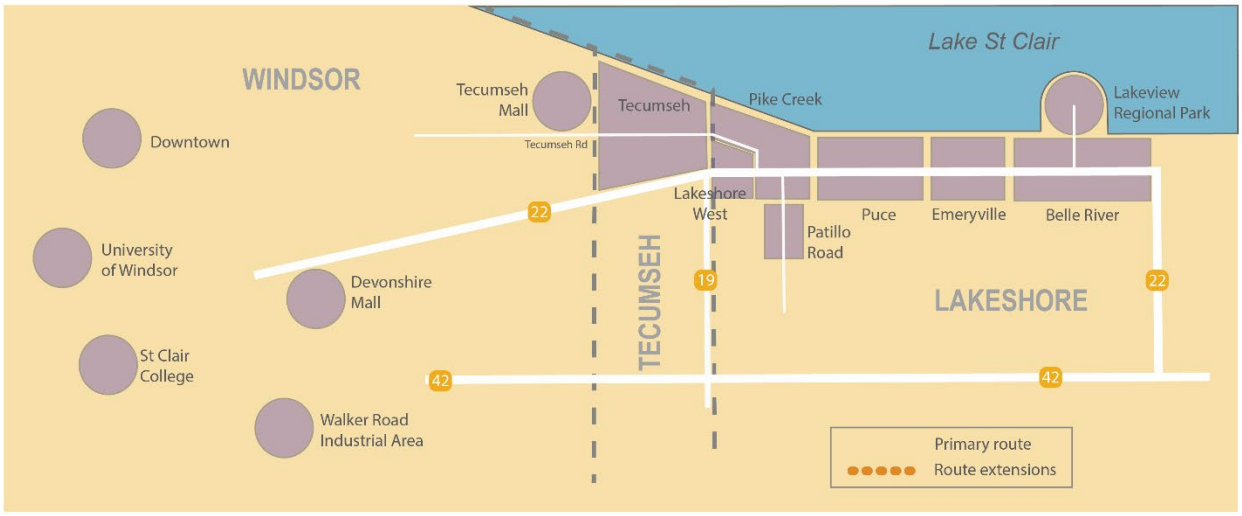
**Beyond Lakeshore**, the dominant destinations for trips using mobility services were identified as Windsor and Tecumseh with demand for work (daily), school (3 times per week) and shopping (weekends) trips.

These results suggest that there is a greater demand for regional travel options using mobility services for work, school and shopping trip purposes and that local services demands within Lakeshore are limited to weekends.

A business survey was undertaken by the Municipality and asked whether a public transit system would be beneficial to businesses and employees. Although the result was roughly evenly split between yes and no, the positive responses were concentrated in the neighbourhoods identified as the priority destinations for mobility services namely Puce/Emeryville West, Belle River/Main Street, Patillo Road and Lakeshore West.

## 4 Data Analysis Results

Smartphone-based data was used to analyze travel movements within Lakeshore and the region. Device movements are tracked using certain device apps and the data is anonymized and aggregated to address privacy concerns. For this analysis, Lakeshore and its surrounding communities was split up into zones in order to observe and quantify device movements between zones. The map below illustrates the major zones that were identified.




This data helps us to make informed decisions with regard to identifying mobility options. It allows us to identify and quantify:

- where travelers are coming from?
- what are the major destination zones within the municipality, and regional destination zones such as Tecumseh Mall, Windsor?
- when do these demands occur (times of day, days of week, and months of the year)?

In terms of total tripmaking per month, July 2019 was observed to have the highest travel volumes with November 2019 being significantly lower, especially for recreational destinations such as the Lakeview Regional Park. The overall observed travel demand in 2020 was lower due to COVID impacts with the summer recreational tripmaking being impacted the most due to COVID travel restrictions.

When considering the overall origin-destination patterns between zones, it is evident that the majority of trips are internal to zones, meaning that they start and end within the same zone.

The Lakeshore neighbourhoods of Belle River, Lakeview Regional Park, Pike Creek, Patillo Road Industrial and Emeryville generate 87% of all external trips to other zones. Roughly half of these external trips have regional destinations beyond the Lakeshore boundaries.

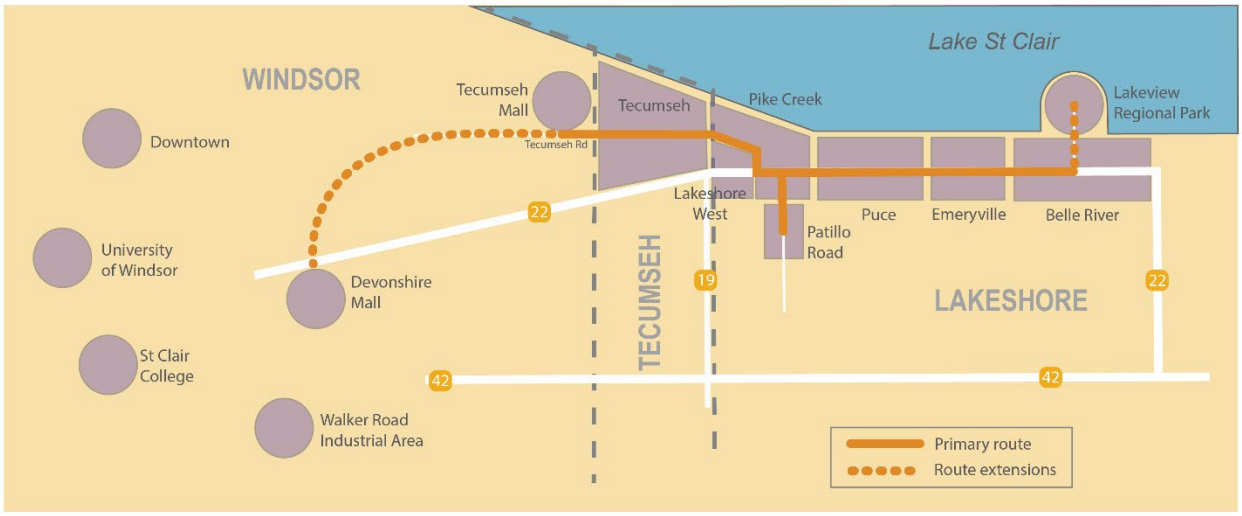
Within Lakeshore, the major destinations that attract the most trips are Belle River, Emeryville, Lakeshore West, Pike Creek and Patillo Road Industrial Area.

90% of the regional trips from Lakeshore have destinations in Windsor. There are no major destinations in Windsor that stand out and trips are relatively evenly distributed within the City. Specific destinations in Windsor include Tecumseh and Devonshire malls, Downtown, University of Windsor, St Clair College and Walker Road Industrial area. After Windsor, other destinations include Essex and Tecumseh.

# 5 Draft Service Proposals

Based on the engagement findings and results of the data analysis, there is an appetite to consider developing and implementing some form of a mobility service that addresses the greatest travel demand that has been quantified through the data analysis. This demand does indicate that a fairly regular regional service is warranted and the implementation and promotion of this alternative mode of travel, will contribute to removing private vehicles from the road which will ease congestion and reduce greenhouse gas emissions.

The following draft service proposals have been developed:




## 5.1 Primary Service

**Connections:** The primary service option that is proposed connects the major origin zones in Lakeshore that comprise Belle River, Lakeshore West, Emeryville, Pike Creek and Patillo Road Industrial Area along Highway 22 and Tecumseh Road, to Windsor. Such a route will connect all the zones in Lakeshore that generate the most external trips.

As there are multiple destination locations in Windsor for trips that originate in Lakeshore, as opposed to a single, major attraction, a suitable terminal point in Windsor can only be identified in consultation with Windsor Transit who have sole authority in the provision of transit services in that jurisdiction. Potential arrangements may include the identification of stops at several destinations in Windsor, or a single stop that is served by multiple Windsor routes where passengers may transfer to the local Windsor system to complete their trips. This proposal assumes that the route may initially terminate at the Tecumseh Mall which is the second largest exchange in the Windsor transit system that accommodates 4 transit routes.

**Service phasing**: Typically when new services are established, a phased start-up is followed. Initially the first service priority is the implementation of weekday services that will primarily cater to work and educational trips in the morning and afternoon peak periods. In order to address service convenience and reliability, initial peak service frequencies should be no longer than a trip every 30 minutes,

however smaller vehicles with less capacity could warrant better frequencies. Lower frequencies could be considered during the midday and early evening to cater to shopping, medical and social trips.

A second phase of this service is proposed to be the provision of weekend services to Windsor that cater to shopping/recreational trips.

**Operations**: The operations of such a mobility service is dependent on the demand for service and can range from an initial on-demand service to a scheduled, fixed route transit service to Windsor. The demand for service also dictates the preferred vehicle type and its associated capacity, and this can range from small vans and minibuses to conventional buses. From an operational perspective, a proposed service to Windsor also needs to be discussed in detail with Windsor Transit, not only from a stop location perspective, but also from a service delivery perspective (on behalf of Lakeshore) which could simply consist of an extension of a Windsor route into Lakeshore.

It is thus important that the growth of ridership on such a service is monitored right from the start in order to respond to changes in demand to ensure that the appropriate level of service (service frequency), service type (on-demand versus scheduled service) and vehicle type is provided. It should also be noted that the sooner such a service can evolve into a scheduled service with improved frequencies, it will allows riders to better plan their trips.

### 5.2 Seasonal Service

The intent of this service is to improve access from the region to Lakeview Regional park in summer by extending the route from Belle River to serve this area. Typically such services can operate between June 1 and Labour Day in September, and this service should be operated on weekdays as well as weekends. It is important that this service is well publicized ahead of time to encourage ridership uptake.

### 5.3 Local Service

A secondary service that can potentially be considered once the regional service is established, is the provision of some level of local service that would act as a feeder service to the regional route for residents, as well as provide access to local commercial services.

The regional service described above provides the foundation to expand services that focus on local connections. Belle River, Lakeshore West, Emeryville, Pike Creek and Patillo Road Industrial Area are the major zones in Lakeshore both in terms of the origin and destination of local trips and such services could provide expanded coverage within neighbourhoods to improve overall accessibility in terms of walking distances to transit services.

However, it should be noted, that the public engagement results do not indicate an appetite for using local services on a regular basis. It is therefore recommended to monitor the performance of other ridesharing options such as Lyft and Uber in terms of fulfilling the role of providing feeder services to the regional route.

### 5.4 Integration with Community Support Centre Services

The Community Support Centre currently provides two types of services to Lakeshore residents, namely St Clair College Transit and Carelink Health Transit. It is proposed that that consideration be given to promote the integration of these services by offering connections to the proposed regional service to

provide more travel options so that customers may transfer to the regional service to access destinations in Tecumseh and Windsor.

With respect to accessibility, it should be noted that today, the majority of transit vehicles are 100% accessible.

### 5.5 Supporting Infrastructure

Once routes have been defined, attention needs to be given to providing appropriate infrastructure to accommodate passengers at transit stops that enhance the transit experience. This includes the consistent provision of facilities such as sidewalks, accessibility ramps, tactile surfaces, shelters and transit information.

Consideration should also be given to potentially establishing park and ride facilities at selected locations along the regional route within Lakeshore, to provide residents to better access the regional service.

## 6 Conclusion

Thank you in advance for reviewing the information presented above and providing comments and suggestions. We will use this input in the refinement of these proposals and form part of the final report to staff for consideration.