



**HALIFAX REGIONAL MUNICIPALITY
FUTURE SERVICED COMMUNITIES –
WESTPHAL TRANSPORTATION PLAN**

April 17, 2025
Final Report

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1 Introduction

The Halifax Regional Municipal Planning Strategy (Regional Plan) provides direction on how future settlement should take place in the Halifax Regional Municipality. The Regional Plan outlines the Urban Service Area boundary identifying areas that would be considered as potential Future Serviced Communities; Sandy Lake, Highway 102 West Corridor, Morris Lake Expansion, and the Westphal area.

The scope of work for each study area includes compiling detailed background information needed to inform future decisions about potential development, encompassing transportation infrastructure assets and constraints using multi-modal analysis. Analysis results in recommendations for each study area based on induced needs related to the introduction of new residents and commercial activity within the study area as well as the feasibility of transportation network and service enhancements that are required to connect the study area to surrounding and regional destinations.

The draft Halifax Regional Municipal Planning Strategy presented to Halifax Regional Council on June 20, 2023, and now subject to public review, continues to identify the new development area near Westphal as a Future Serviced Community.

The Westphal Study Area focuses on lands owned by Kiel Developments Limited, Akoma Holdings Incorporated and Annada lands. Akoma Holdings declared its intention to undertake major development on its property before Halifax Regional Municipality (HRM) issued the Request for Proposals (RFP) for the Future Serviced Communities project. The developer-requested scenario also considers input from additional landowners who have indicated development intentions ranging from interest in possible rezoning of their properties to specific subdivision and development proposals expressed in formal plans.

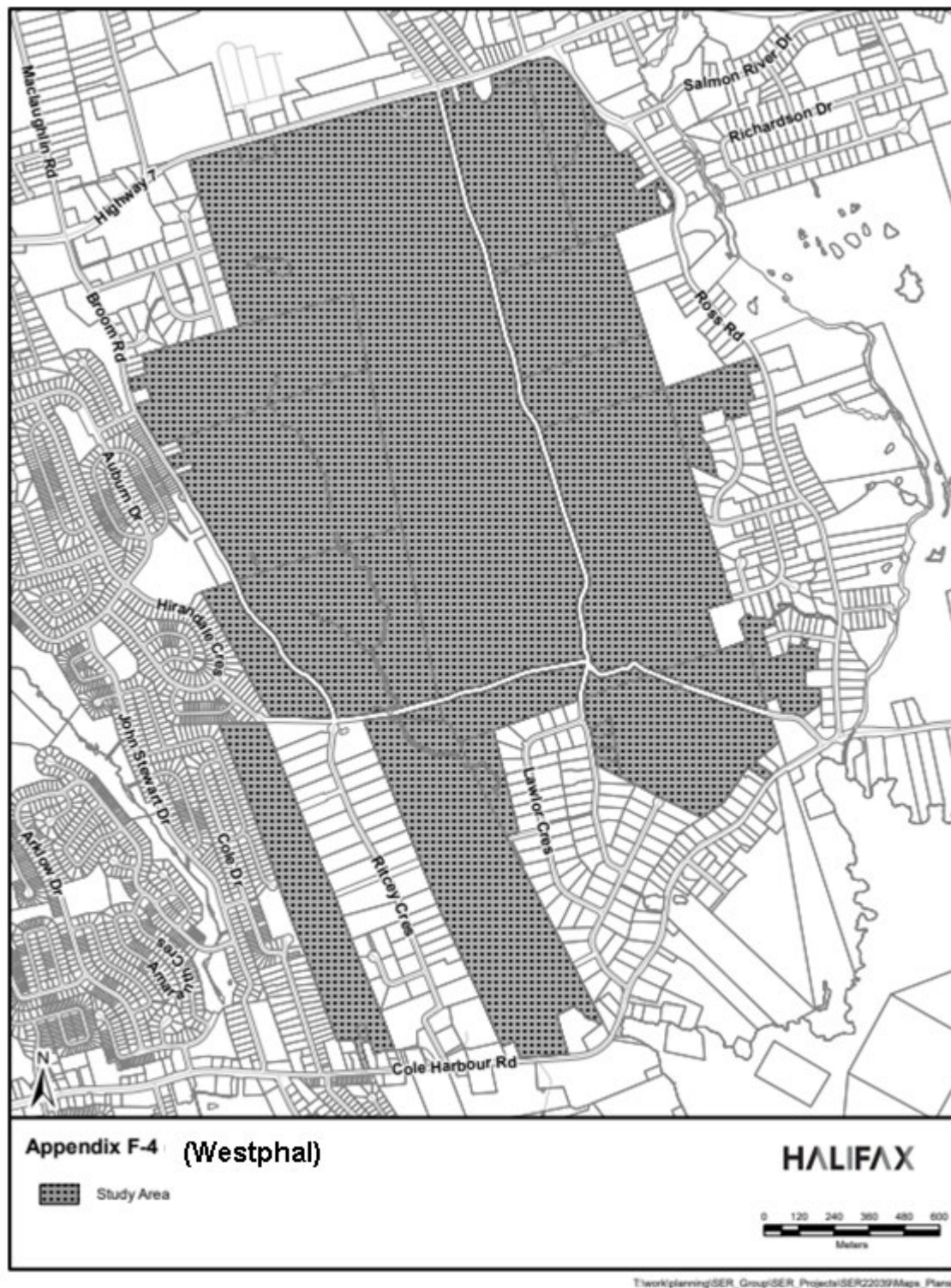
2 Study Area Overview

2.1 Location

Westphal Study Area is located east of Dartmouth and Cole Harbour. The area is bounded by Highway 7 to the north, Robert Lane and Broom Road to the west, and Ross Road to the east (**Figure 1**). The Westphal study area defined by HRM covers roughly 1,032 acres (417 hectares) in total.



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan 2 Study Area Overview



Source: Halifax Regional Municipality

Figure 1: Westphal Study Area



2.2 Existing Land Use

While much of the land within the study area remains underdeveloped, the study area is culturally important to the African-Canadian community as the former location of the Nova Scotia Home for Coloured Children (NSHCC). The home has been preserved on its historic site as the Akoma Family Centre, a residential facility for children with special needs, the Henry G. Bauld Centre, a community centre, and other original buildings. A Nova Scotia Power easement governed by a long-term lease traverses the site, angling around Broom Lake. The remainder is primarily dense woodland.

Multiple trails currently cross the study area. The Preston & Area Trails Association manages a trail extending from Old Miller Road in the south to Highway 7 in the north. A multi-use pathway managed by the Lawrencetown Cole Harbour Trail Association allows for east-west travel, connecting Old Lawrencetown Road to Highway 207. An informal trail connects Broom Road to Ritcey Crescent across the southwest corner of the study area. Other informal trails connect the aforementioned trails, Highway 7, and Ross Road.

2.3 Adjacent Land Use

The study area faces the African-Canadian community of Cherry Brook to the immediate north across Highway 7/Main Street. Coleridge Estates, a small community predominantly comprised of single-detached homes, lies to the south of the study area. Other small clusters of single-detached homes lie just outside the study area, accessed from Broom Road, Ross Road, and Highway 207.

Larger established residential communities like Woodlawn, Cole Harbour, Sunset Acres, and Highland Acres are further west of the study area. These neighborhoods are densely developed with public schools, parks, and commercial areas, primarily featuring single-detached homes on large lots. The communities surrounding the study area to the north, east, and south, while less dense, share characteristics such as large residential lots backing onto woodlands.

The area is well-served by community facilities. Cherry Brook is home to the Black Cultural Centre for Nova Scotia, adding to the cultural significance of the area, and Graham Creighton Junior High School. West of the study area, on Forest Hills Parkway in Cole Harbour, is Cole Harbour Place, a major recreation center featuring arenas, sports fields, a pool, squash courts, fitness rooms, meeting spaces, a library, and health services. Cole Harbour High School and Auburn Drive High School are both located near the western edge of the Westphal study area.

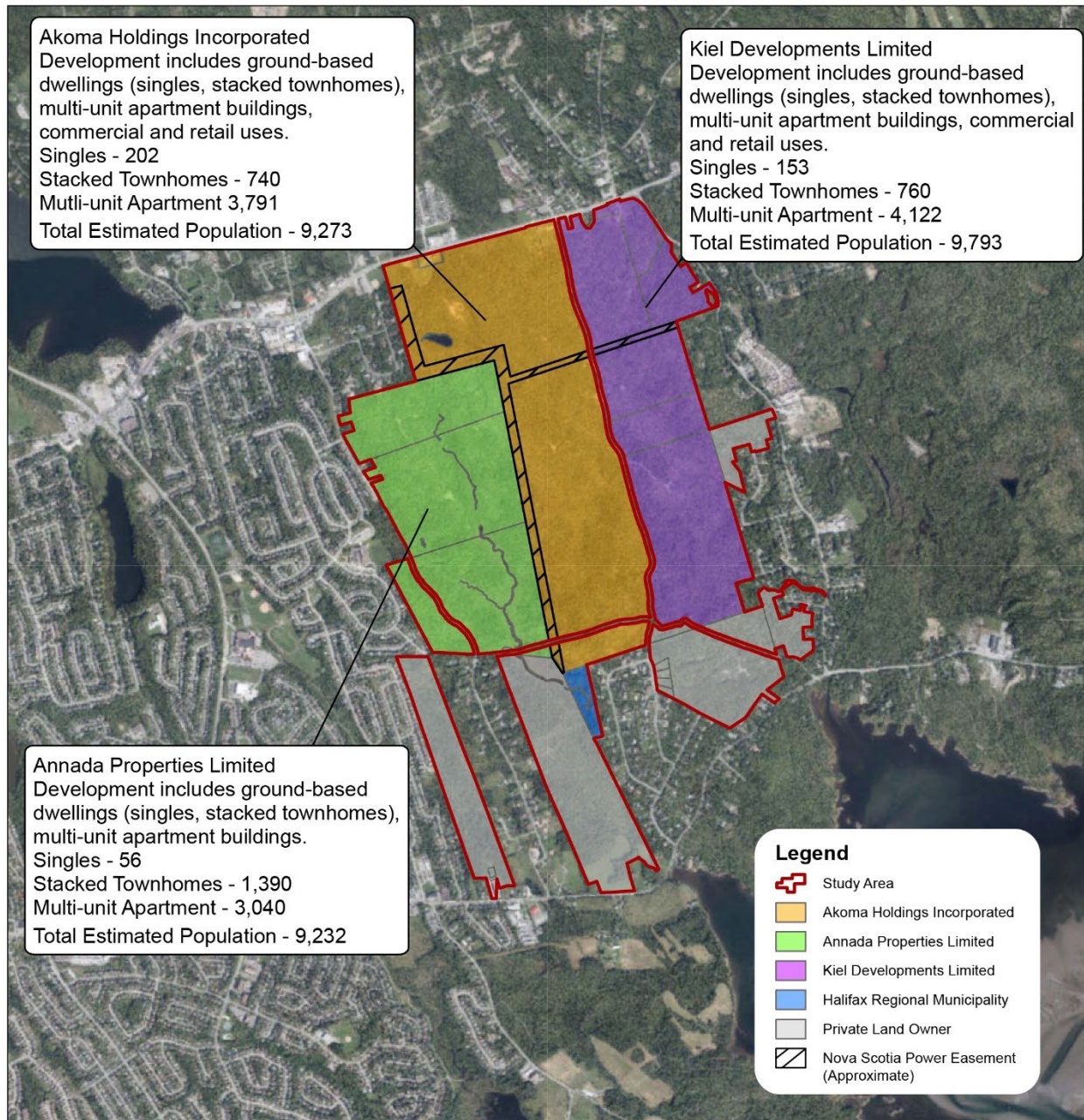
2.4 Development Proposals

Three major landowners plan to develop their lands. Annada Properties owns 228 acres east of Broom Road, Akoma Holdings controls 320 acres in the central area, and Kiel Developments owns 247 acres to the east (**Figure 2**). Together, these parcels total about 795 acres. Stantec has also consulted with additional landowners in the southern area, though their development plans are less definitive and immediate.



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan 2 Study Area Overview

Proposed development plans aim to transform the Westphal study area into a mix of residential and commercial spaces, with each development contributing to a broader vision for the area. The plans provide important context for the anticipated development, illustrating the scale and diversity of what is being proposed for the area.



Source: Halifax Regional Municipality

Figure 2: Westphal Study Area – Land Ownership and Anticipated Development



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan 2 Study Area Overview

Kiel Developments and Akoma Holdings initially prepared independent plans for development of their lands within the study area. After review, Kiel and their representatives consulted with fellow major landowners Akoma and Annada and subsequently prepared a plan for coordinated development of lands owned by all three major landholders (**Figure 3**). Each has stated that the plan reflects the objectives of its organization. The combined plan covers the landholdings of the three companies extending along the entire frontage of the study area on Highway 7 and extending south to Old Lawrencetown Road.

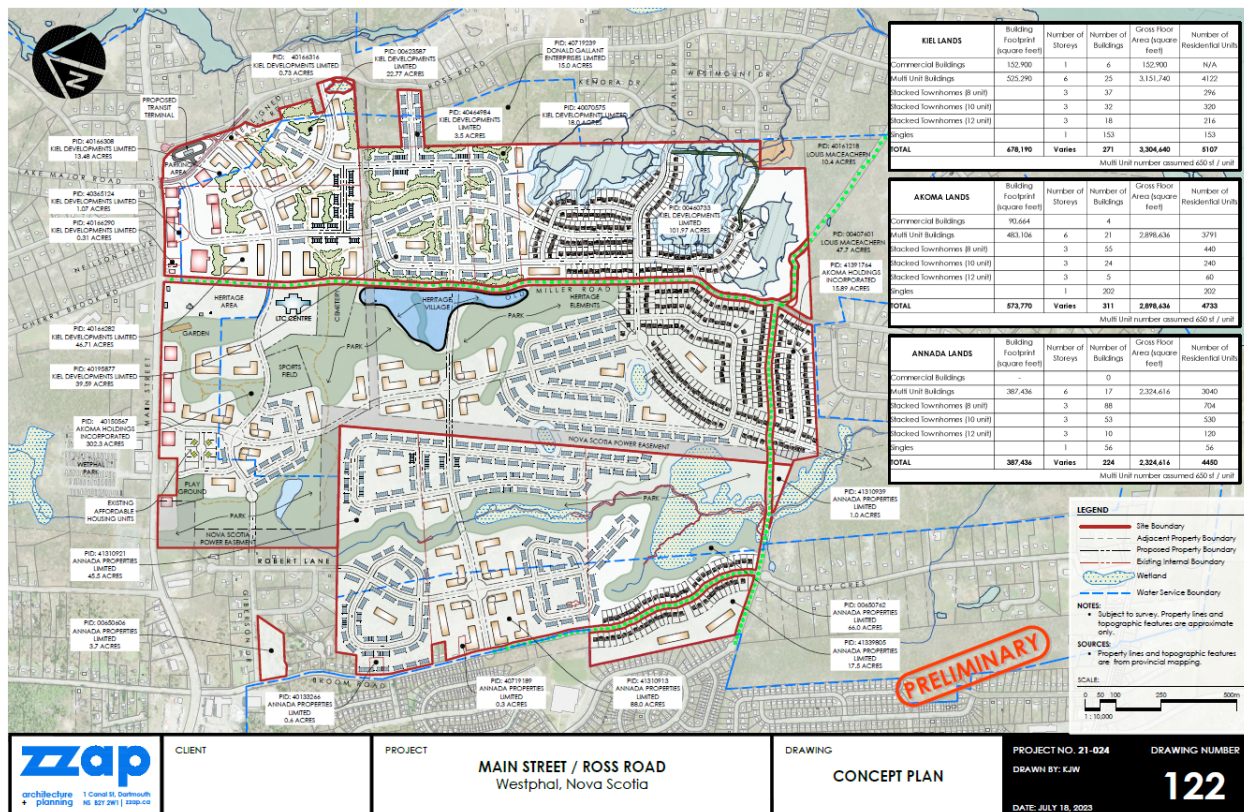


Figure 3: Westphal Study Area Combined Concept Plan

Kiel Developments owns parcels fronting Highway 7 and Ross Road. The proposal for their 247-acre holding incorporates a mixture of residential and commercial development. Their concept plan includes housing types ranging from single-detached homes to stacked townhomes to multi-unit buildings.

The concept plan divides the residential development into three areas on Kiel's land providing progressively lower density from the north to the south (**Figure 4**). The concept shows six commercial buildings with a total gross floor area of 152,900 square feet and a total of 25 mid-rise multi-unit residential buildings. The concept plan shows irregular green spaces along with areas that appear to be reserved wetlands in the southeastern corner of the combined development site.

As a small section of the lands owned by the developer lies outside of the study area, 32 eight-stacked units and 40 ten-stacked units located in this area have been subtracted from the total dwelling unit count listed in the development plan. Census of Canada 2021 figures of 1.8 persons in apartments (i.e., flats in duplexes and low- and high-rise apartments) and 2.6 persons per detached house or stacked townhouse



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan 2 Study Area Overview

inform anticipated population estimates for the Kiel portion of the proposal, other owned lands in the Westphal study area, and for all other development proposals considered for Future Serviced Communities studies. Per census estimates, 9,793 residents will occupy approximately 5,035 units in the Kiel portion of the Westphal study area.

The concept plan describes multiple access points to the new community via Highway 7, Ross Road, and Glendale Drive. The Old Miller Road trail and Old Lawrencetown Road Connector trail, denoted by green dotted lines in the concept plan, mark the western and southern boundaries of the Kiel lands, respectively. A transit terminal and parking area is proposed for the northeast corner. The terminal would be accessible from within the community along a realigned Ross Road as well as a connection to the existing Ross Road. Commercial uses are on the highway frontage to facilitate access for those living outside of the study area.

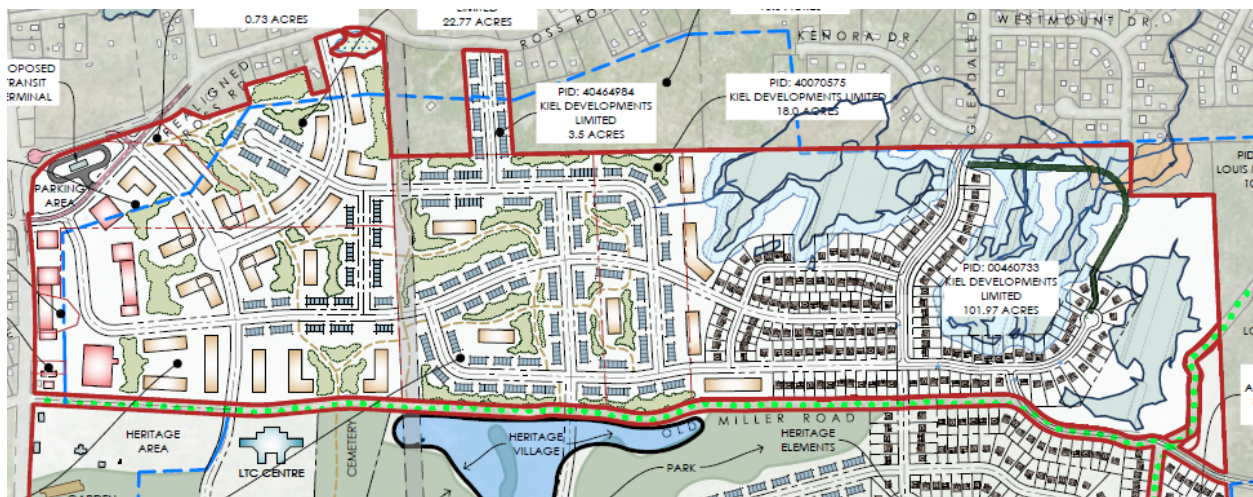


Figure 4: Kiel Developments Concept Development and Circulation Plan

Akoma Holdings Incorporated assumed approximately 320 acres in the central portion of the study area from the NSHCC in 2014. The combined development proposal for Akoma's holding mixes commercial, residential, and community uses in single-detached homes, stacked townhomes, and 25 mid-rise buildings (**Figure 5**). The proposal features four commercial buildings with a total gross floor area of 90,664 square feet, positioned near Highway 7 to facilitate access. Like the Kiel concept plan, multi-unit apartment buildings and stacked townhomes follow the commercial development from north to south. The southern portion of the proposal shows single-family detached dwellings. Per the consistent population estimate methodology described above, the Akoma concept would add about 4,733 residential units, accommodating approximately 9,273 new residents.

The Akoma property holds elevated significance for the African-Canadian community in Nova Scotia. Its development is an identified priority in the African Nova Scotian Road to Economic Prosperity Action Plan, which was noted in the RFP as a special consideration in the expected assessment of the study area. The concept includes a Heritage Area in the northern corner of the site.

The concept plan shows an access network interconnected with the Kiel and Annada holdings as well as Highway 7 and a potential southern access road toward Highway 207. The Old Miller Road trail marks



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan

2 Study Area Overview

the eastern boundary of the Akoma holdings while the Old Lawrencetown Road Connector trail traverses the southern end of the study area.

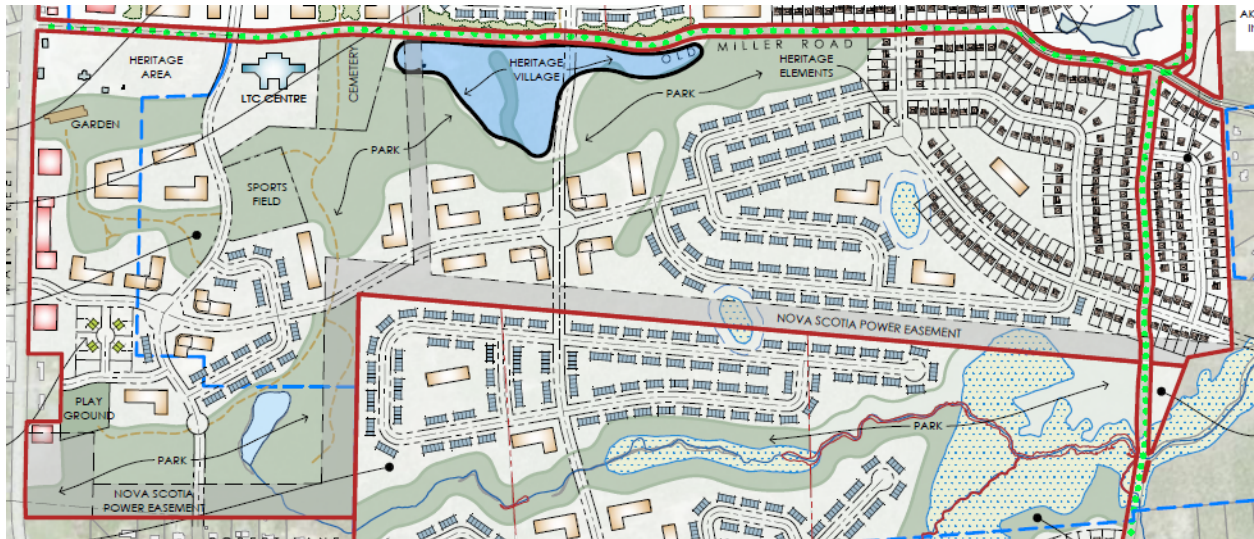


Figure 5: Akoma Holdings Concept Development and Circulation Plan

Annada Properties owns 228 acres along Broom Road on the western edge of the study area and is also part of the joint proposed concept plan (**Figure 6**). The plan includes 4,486 residential units, with a mix of single-detached homes, townhomes, and multi-unit buildings. The northern two-thirds of the property will primarily feature townhomes with some apartment buildings, while the southern section along a potential Broom Road extension is reserved for single-detached homes. Watercourses surrounded by a wetland at the southern end of the site will be preserved, surrounded by a park-like buffer. Applying consistent population estimate criteria, the Annada site will house 9,232 people.

The concept plan shows Broom Road as the primary access to the site. The plan would provide secondary access is provided through new street connections to the Akoma portion of the study area and to Robert Lane in the Sunset Acres subdivision to the north. The plan further indicates a re-envisioning of the informal trail currently connecting Ritcey Crescent and Broom Road starting at its intersection with the Old Lawrencetown Road Connector trail.

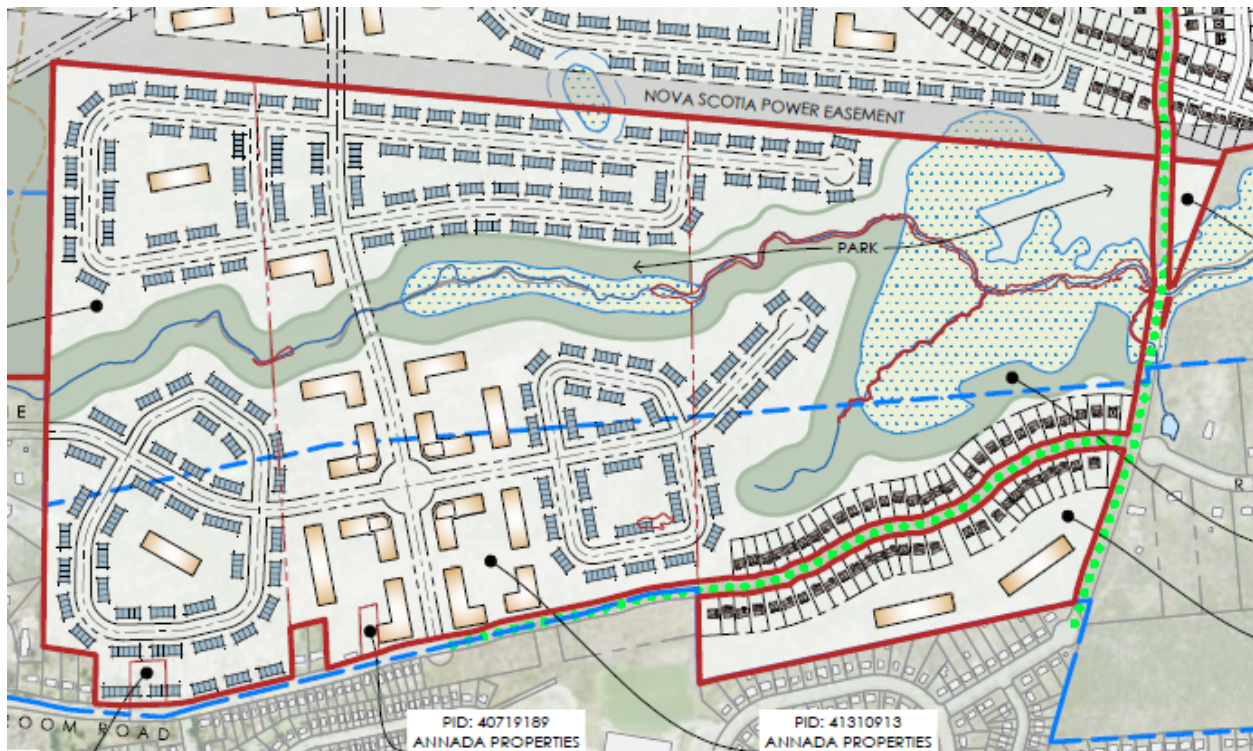


Figure 6: Annada Properties Concept Development and Circulation Plan

Additionally, in August 2021, Jim Morash Construction submitted a proposal to develop a small parcel at the end of Kenora Drive to the east of lands owned by Kiel Developments. This plan involves subdividing the lot into five single-family homes, projected to add 13 new residents to the study area, with Kenora Drive ending in a cul-de-sac. There are also undeveloped parcels south of Old Lawrencetown Road, where landowners have indicated no immediate plans for development. These owners favour lower-density development than proposed for the nearby lands.

In summary, the joint concept plan spans 795 acres of land owned Kiel, Akoma, and Annada, and others, and is poised to create approximately 14,259 residential units, accommodating 28,311 residents. Assuming connections can be made from the Akoma property through Sunset Acres and the Annada lands, residents of the study area will have internal access to Auburn High School and Cole Harbour Place.

3 Transportation Policy Context

The 2017 Halifax **Integrated Mobility Plan (IMP)** is the foundation that seeks to inform municipal mobility and land-use planning and decision-making until 2031. The IMP provides policies and tools to enable the municipality, transportation authorities, developers, organizations, and community members to build an integrated mobility system that promotes sustainable growth. The IMP's guiding principles are structured into four core elements:

- **Foundational Policies** provide objectives, policies and actions for integrated planning, land use, Complete Streets and Transportation Demand Management;
- **Mode-Specific Policies** provide objectives, policies and actions for active transportation, transit, goods movement, the road network, and parking;
- **Monitoring and Evaluation** describes how projects will be evaluated and how the progress of the IMP will be monitored by municipal staff and Council; and
- **Implementation** includes an Action Plan to translate the IMP into practice and describes how the plan will be implemented.

The IMP contains direction to facilitate the integration of mobility options, land use policy, and municipal departments. Its principles and guidelines directly inform subsequent transportation analyses pertaining to the study area such as the 2020 Rapid Transit Strategy. The Westphal development site falls within the IMP-defined Outer Suburban area, which is identified as an area of high private motor vehicle use where, "Neighbourhoods should be designed with walking, bicycling and transit in mind to provide mobility for people of all ages and abilities."

The **Active Transportation Priorities Plan**, a precursor to the IMP that proposed a vision for active transportation in 2026 and a broad set of priority initiatives for the years between 2014 and 2019, relevantly recommends that bicycle facility development outside the regional centre should focus on improved connections to local destinations such as schools, community centres, and transit hubs as well as completion of the greenway network and the addition of new bicycle lanes where identified.

The **Rapid Transit Strategy** is HRM's plan to realize a rapid transit system by 2030 that builds on the vision of the IMP, supporting population growth by investing in high-quality transit service. The Strategy proposes a Bus Rapid Transit (BRT) network, new ferry services, and a direction for land use policy to align with Rapid Transit. The proposed Red Line BRT offers a direct connection from the southern peninsula to Portland Hills Terminal, the nearest access point to the future rapid network from the Westphal study area.

These prior plans inform the latest update to the **Regional Municipal Planning Strategy**, which frames the Future Serviced Communities designation and requirements in the process of defining long-range regional policies outlining expectations of future settlement and development. Its new community planning framework redefines major planning geographies, placing the vast majority of the Westphal study area in a newly defined Rural Community area consisting of lands within rural designations that use on-site services such as water wells and sewers.



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan

3 Transportation Policy Context

Chapter 7 of the new Planning Strategy focuses solely on transportation and establishes objectives that aim to connect people, improve public health, support environmental responsibility, align capital investments, and allow for streets to perform multiple functions by facilitating sustainable choice in transportation and lifestyle. It establishes new mode share targets aligned with the planning geographies and provides guidance for planning the regional and community mobility networks. The Strategy links to the IMP and Active Transportation Priorities Plan by defining consideration criteria for active transportation projects, especially emphasizing transit connections.

The entirety of the study area is within the plan area of the **Cole Harbour/Westphal Municipal Planning Strategy**. The Planning Strategy establishes policy related to environmental health services, waste management strategies, infrastructure charges, land use designations, transportation, and other community factors for an area which arcs along the eastern edge of Dartmouth.

The transportation section of the document encompasses a wide range of both detailed and broad policy proposals. Those most pertinent to the development of the Westphal study area include:

- Control the location, size and number of access points from a lot to a street through access control measures for commercial and higher density residential uses in order to reduce traffic in lower density residential areas as well as to promote traffic safety
- Determine the potential impact of a proposed Highway 107 extension, now known as the Cherry Brook Bypass
- Resolve pedestrian walkway accommodation, design, and construction issues
- Improve transit service to destinations throughout the community
- Ancillary, but linked to transportation considerations, acknowledge the reservation of the former NSHCC property for future serviced development and propose a new land use designation to enable adaptive reuse and development of the site

Specific policies in the adopted strategy:

- Establish provisions regulating site access points (TR-10)
- Establish standards for walkways to ensure public access between community facilities, parks, and bus stops, ensure safety, and contribute to ease of maintenance (TR-13)
- Undertake a review of existing sidewalks, crosswalks and street lighting and to produce a priority list of future improvements including overhead walkways (TR-14)
- Monitor the adequacy of transit service within the community (TR-16)
- Investigate the provision of additional transit services in the Westphal portion of the Plan Area (TR-17)
- Coordinate new road construction and subdivision design to facilitate the provision of public transportation by encouraging adequate road rights-of-way and paved bus stop areas (TR-18)



3.1 Site Relationship to Policy and Planning

The HRM Integrated Mobility Plan reiterates regional mode share targets originally established in the 2014 Regional Plan. To be achieved by 2031, the planning targets were only project to be achievable through incorporation of IMP recommendations. The IMP anticipates arrangements and behaviour in the various sub-areas of the region to contribute differently to overall regional goals. Within the Outer Suburban area, where the Westphal study area is found, the 2031 targets seek at least 10 percent transit mode share and at least 4 percent for trips made by walking and cycling.

The Active Transportation Priorities Plan recommends that bicycle facility development outside the regional centre should focus on improved connections to local destinations such as schools, community centres, and transit hubs as well as completion of the greenway network and the addition of new bicycle lanes where identified.

Implementation actions within the IMP define preferred approaches to meet planning targets. Individual approaches integrate and support a number of the foundational and mode-share specific policies described in the plan. Large-scale developments like the combined Westphal concept plan present an opportunity to require the application of those approaches to contribute to the realization of regional goals. The IMP does not however, characterize major corridors in the immediate vicinity of the study area as transit priority corridors, nor does it identify any nearby potential Transit Oriented Communities.

The 2020 Rapid Transit Strategy advances the importance of Portland Street/Highway 207 and the Portland Hills Terminal by routing and terminating the proposed Red Line BRT approximately 3 kilometres from the western edge of the development area, connecting Cole Harbour with Dartmouth and ferries to the southern peninsula. Immediately adjacent to the study area, the Draft Regional Municipal Planning Strategy recognizes Main Street (Highway 7/Highway 107) as a Strategic Corridor. Strategic Corridors are designed to improve public safety, connect communities, and manage congestion by prioritizing sustainable modes of transportation over private motor vehicles, and are intended to integrate regional and community mobility connections with land use planning.

The Cole Harbour/Westphal Municipal Planning Strategy places a high priority on advancing active transportation through walkway standards and the provision of quality transit service. The emphasis on walkways stems from design and construction issues as well as maintenance responsibility. The strategy recognizes the importance of public transit in managing increased population and energy costs.



4 Site Transportation Assessment

Identification of transportation system implications associated with new development requires a comprehensive assessment of prior transportation study related to the Westphal development. Key assumptions underlying methodology are critically examined to ensure their validity and relevance. As prior traffic impact analysis does not reflect current development proposals for the Westphal study area, we extrapolate development site trip generation values using comparable estimation methodology while challenging decisions related to modal adjustments. Examination of concept plans yields insight into proposed internal circulation networks and their interaction with existing surrounding active transportation and public transportation facilities and services.

4.1 Roadway Network Impacts

Fathom Studio completed a Transportation Impact Study (TIS) in November 2021 to evaluate the anticipated impacts of only Akoma's proposed development as understood at the time. The development plans included 291 multi-family residential units, 14 single family residential units and 28 commercial units, with full build-out expected by 2031. The study established the following objectives:

- To project 2031 weekday AM and PM peak hourly volumes for adjacent intersections in the study area.
- To estimate the number of weekday AM and PM peak hour trips generated by the proposed development.
- To assign and distribute site-generated trips to study area intersections and project 2031 peak hourly volumes inclusive of these trips.
- To assess the impact of site-generated traffic on adjacent intersections along Main Street.
- To recommend potential improvements or mitigations to address the development's traffic impacts.

The TIS analyzed five key intersections along Main Street using historical traffic data from Halifax Regional Municipality (HRM) adjusted for baseline and projected scenarios.

4.1.1 TRANSPORTATION IMPACT STUDY CONCLUSIONS

The TIS evaluated the operational performance of Main Street and adjacent intersections in 2031 after the full build-out of the proposed development. Noting that the site would be subject to further refinement, the study assumed a total of 400 residential units.

The TIS relies on a range of assumptions and technical methodologies to project future trip volumes. Projections are based on published rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). Estimates depend on the number of proposed residential dwelling units. Trip generation tables account for ground floor commercial development in some buildings by



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan

4 Site Transportation Assessment

utilizing a land-use code for mid-rise multi-unit buildings with ground floor commercial that limits the independent variable to residential units.

The TIS reached the following conclusions:

- The development as understood would generate 160 external vehicle trips during the AM peak hour and 198 trips during the PM peak hour.
- The existing signalized intersection at Westphal Way could accommodate projected traffic volumes without upgrades.
- Giberson Drive or an additional access point on Main Street may be required as a secondary access if the development exceeds 100 residential units.
- Maintaining appropriate signal spacing along Main Street is essential for smooth traffic flow and minimizing delays.

The TIS notes that the active transportation and transit infrastructure along Main Street are expected to mitigate vehicular demand, though these impacts were not quantified in the study. Consequently, the analysis provides cautious traffic volume estimates.

4.1.2 VALIDATION OF TRIP GENERATION ASSUMPTIONS

The TIS did not account for the latest concept plan for the development, nor did it account for development on the adjacent Kiel and Annada holdings, which represent a scale increase of nearly two orders of magnitude. Applying comparable methodology to over 14,250 residential units and 250,000 ft² of commercial space would generate 4,611 trips during the AM peak hour and 6,215 trips during the PM peak hour, significantly exceeding the original TIS estimates.

Further, the analysis did not incorporate the mode split targets outlined in HRM's Integrated Mobility Plan (IMP), striving to achieve at least a 14 percent reduction in vehicular trips. Trip generation estimates based on unadjusted ITE constants reflect traditional vehicle-dominant patterns rather than potential future reductions in car dependency related to site, facility, and service considerations. While acknowledging that expanded development scope correlates directly to greater travel demand, the methodology likely overestimates the site-generated vehicle trips.

Finally, trip distribution and assignment were conducted using logical assumptions about connectivity and network patterns, anticipating that 50 percent of the total trips heading west on Main Street towards the downtown area of Dartmouth and Halifax. The study's approach did not employ a formal destination-based modeling framework and was limited to general assumptions aligned with observed travel behaviors in the area. While these methods provide a foundational understanding of traffic impacts, the absence of a detailed destination attraction model limits the precision of distribution patterns and may underestimate the influence of future active transportation and transit improvements.



4.2 Active Transportation

Planning context for the study area is limited to a plan view description of generic transportation corridor locations. The proposed implementations appear to create multiple connectivity options for future residents, contributing to a more comprehensive local transportation network. However, the lack of detail leaves uncertainty regarding active transportation facilities, amenities, and connections. Further examination identifies potential access deficiencies and opportunities for future residents, informing strategies related to bicycle and pedestrian facility types as well as transit vehicle routing.

4.2.1 NON-MOTORIZED MODES

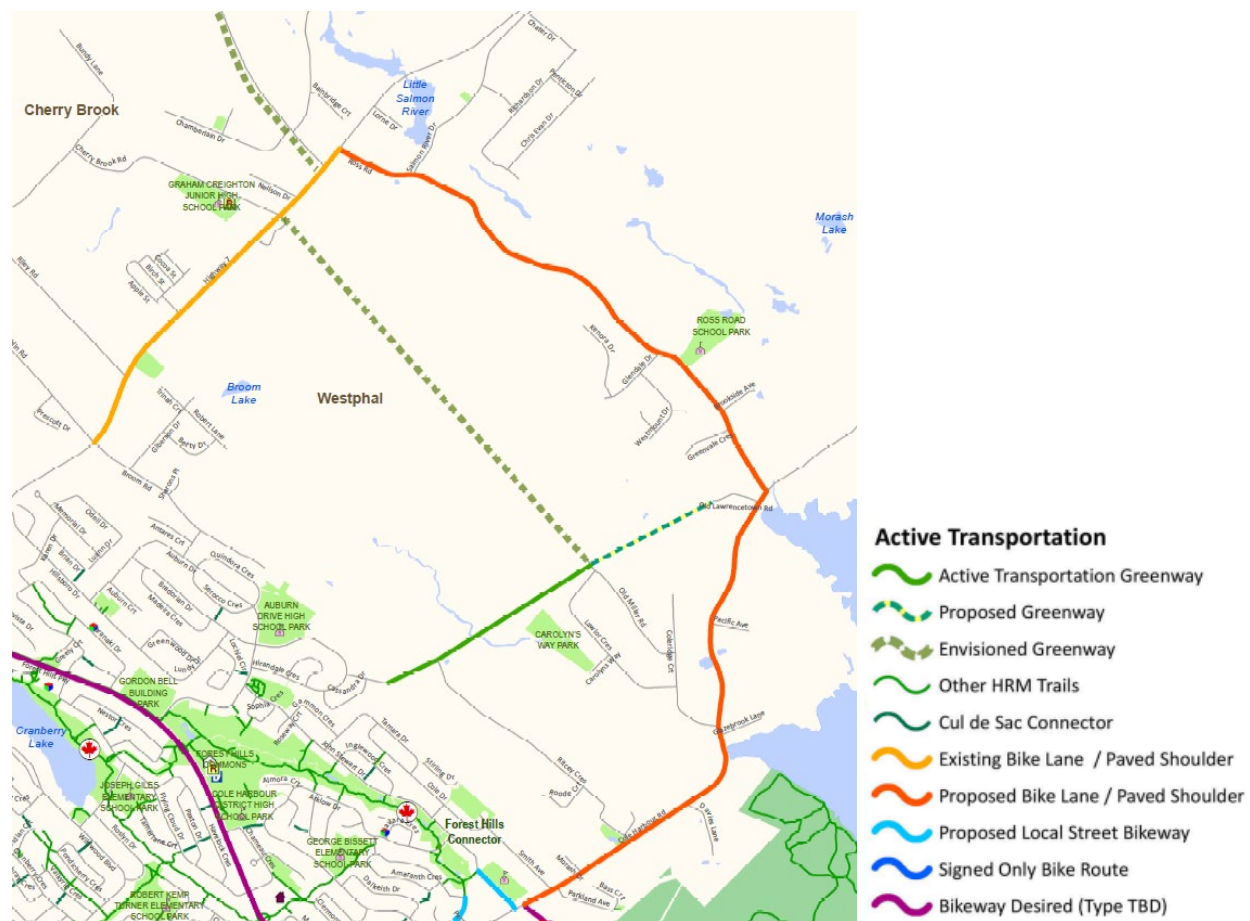
Currently, active transportation facilities along major roadways surrounding the study area are limited to unbuffered bicycle lanes along Main Street and newly constructed and buffered concrete sidewalks along Main Street from Lake Major / Ross Roads to the Henry G. Bauld Centre where they transition into less separated asphalt sidewalks until they reach the western site boundary. Anticipated traffic volumes, speeds, and turning movements induced by this scope of development are likely to create a high-stress environment for active transportation users that requires expansion or upgrade of fully separated and buffered facilities. Increasing the quality of active transportation options along this major corridor would better connect the study area to the neighbouring communities' commercial hubs, and other destinations of eastern Dartmouth while reducing the impact of newly generated vehicular traffic.

The Integrated Mobility Plan seeks to require developers to plan and implement pedestrian and cyclist facilities in early phases. The Plan states that a multi-connection pedestrian and bicycling network should be provided where topography and other environmental conditions allow that connects street and pathway networks with those of existing communities and neighbourhoods. In addition to an existing greenway that integrates sections of the Forest Hills subdivision and Cole Harbour Place for non-motorized modes, the Active Transportation Priorities Plan indicates a desire for bicycle lanes on Ross Road and Cole Harbour Road / Highway 207 around the eastern and southern perimeter of the Westphal study area (**Figure 7**). A Cole Harbour Road facility would have great utility for new resident cyclists as it would link existing on-site trails to the centre of Cole Harbour.



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan

4 Site Transportation Assessment



Source: HRM – 2014-2019 Halifax Active Transportation Priorities Plan

Figure 7: Westphal Study Area Candidate Bicycle Routes and Greenway Network

The combined development concept plan for the Kiel, Akoma, and Annada holding acknowledge the multiple off-road trails that currently cross the study area. As previously described, local associations manage trails that cross the proposed development area. As drawn, several blocks of single-family detached housing lots appear to front the trail corridors without any complementary roadway access (**Figure 8**). The study team and HRM staff met with the landholders' architecture and planning representatives to discuss the implication of this visual representation.

Site planners expect to retain the trail corridors, but will connect roadways as illustrated in certain portions of the Old Miller Road Trail, Old Lawrencetown Road Trail and the Ritcey Crescent – Broom Road Link alignments. Citing needs to realign these corridors to HRM roadway specifications due to the erratic geometry of the trails and junctions, they anticipate that trail connections will be maintained parallel to roadway segments in those corridors, with greater detail to be resolved during the detailed design stage.

As there is no narrative accompanying the currently available site plan, any provision of active transportation facilities on secondary area corridors is unclear. Pedestrian pathways appear to weave through green space in the northern sections of the Kiel and Akoma properties, but the drawing lacks confirmation. The shortage of detail leaves gaps in understanding of any planned accommodations for



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non-motorized modes in the final distances to and from the points of destination and origin of many potential trips.

Future interior corridor design decisions come with considerations for improving the quality of the active transportation network and access to transit. Shared facilities, such as multi-use paths operate well in a recreational context, where cyclists are generally moving at lower speeds and may tolerate pedestrian conflict, but do not serve regular commuting behaviours as well due in part to accessibility concerns for people with vision, hearing, or mobility issues. Bicycle-only facilities enable cyclists to more consistently travel at higher speeds with lesser risk of dangerous interaction with pedestrians and greatly increase the usefulness of active transportation in reducing the number of internal vehicle trips. Bicycle-only facilities must be supported through roadway intersections with a protected design. A shared roadway context is appropriate for local streets with lower speeds and vehicular volumes, and should target a vehicle design speed of 30 km/h or less.

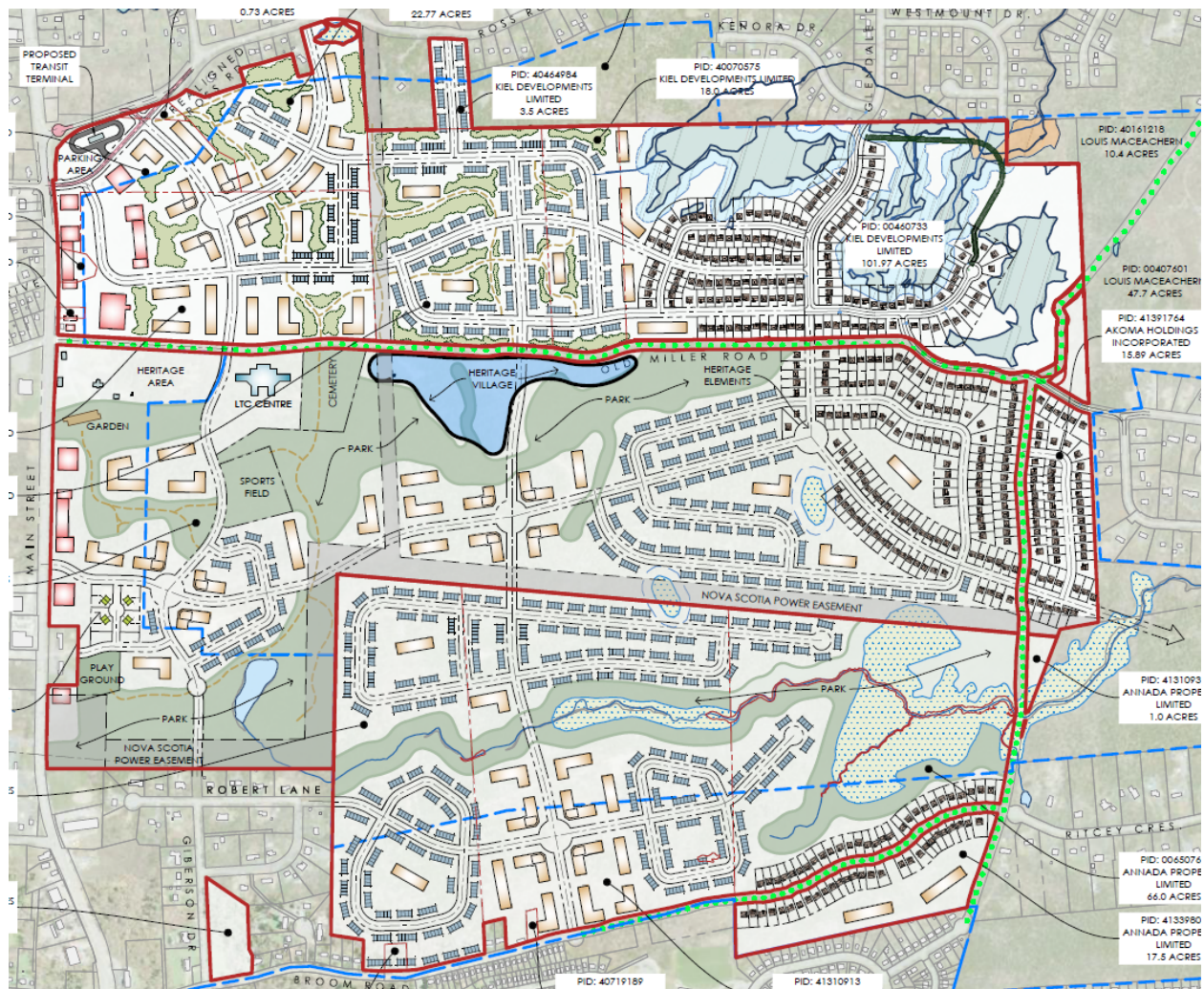


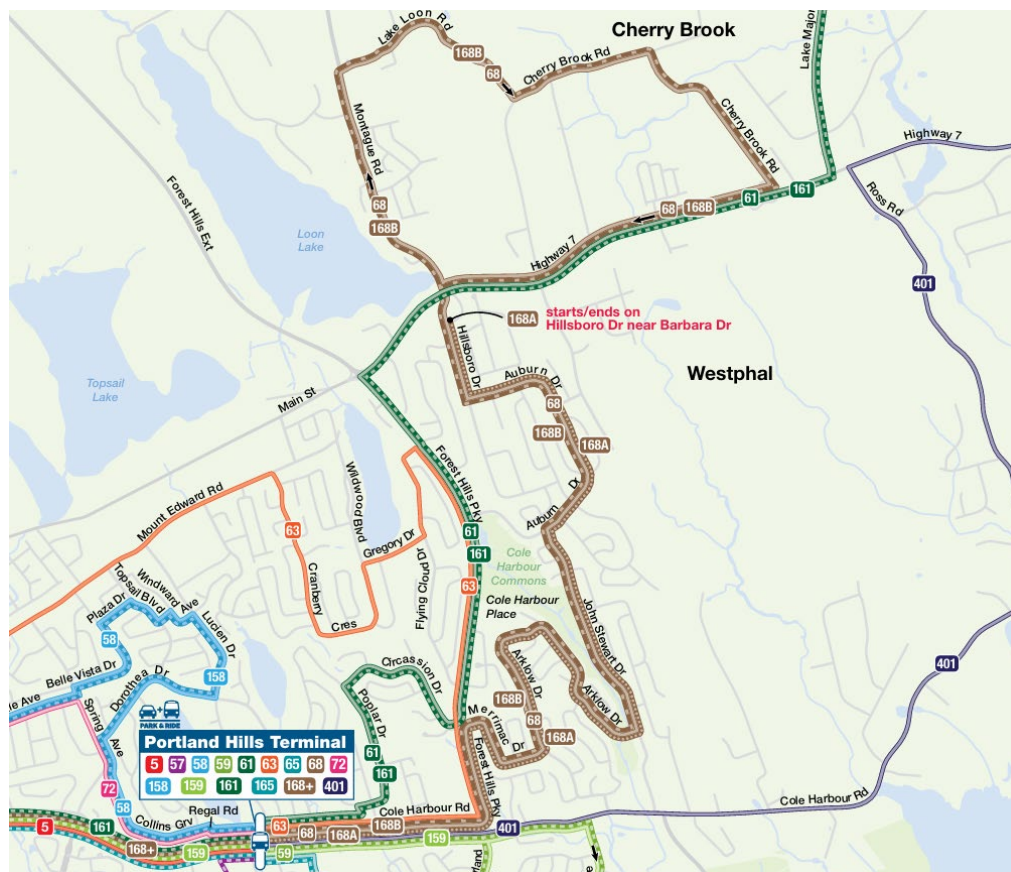
Figure 8: Westphal Study Area Combined Concept Circulation Plan



4.2.2 PUBLIC TRANSPORTATION

Approximately three kilometres from the southwest corner of the proposed development area, Portland Hills Terminal features eight bus loading platforms, indoor waiting facilities, and a park and ride lot where Portland Street becomes Cole Harbour Road. The terminal is a primary stop that enables wider connections from the four routes that stop on Main Street / Highway 7 / Highway 107, the northern edge of the Westphal study area.

A pair of local routes directly link study area gateways to the Portland Hills Terminal. From Main Street, Route 61 travels along Forest Hills Parkway, Circassion Drive, Poplar Drive, and Cole Harbour Road. Route 68 departs Main Street to provide primary transit service for the Sunset Acres and Forest Hills subdivisions. Express Routes 161 and 168B follow comparable routings as Routes 61 and 68, respectively, but continue beyond the Portland Hills Terminal to the Alderney Gate and connection to the Alderney Ferry before crossing the Macdonald Bridge on their way to Scotia Square and Dalhousie University (**Figure 9**). The express runs, which make limited stops in the urban core, replace local service in the Cole Harbour/Westphal area during peak periods. Additionally, rural Route 401 to and from Porters Lake meets the northeast corner of the development site and utilizes Ross and Cole Harbour roads to directly connect to the Portland Hills Terminal.



Source: Halifax Transit

Figure 9: Transit Routes Serving the Westphal Study Area and Portland Hills Terminal



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Route	Route Type	Destination	Weekday Service Details	Saturday Service Details	Sunday and Holiday Service Details
61	Local	Portland Hills Terminal	~60-minute intervals: 9:13 a.m. – 4:16 p.m., 6:45 p.m. – 10:41 p.m. Irregular 25-35 minute intervals: 4:16 p.m. – 6:45 p.m.	~60-minute intervals: 6:38 a.m. – 11:38 p.m.	~60-minute intervals: 7:38 a.m. – 10:38 p.m.
68	Local	Portland Hills Terminal	~60-minute intervals: 9:37 a.m. – 3:39 p.m., 8:06 p.m. – 12:06 a.m. Irregular 25-80 minute intervals: 3:39 p.m. – 8:06 p.m.	~60-minute intervals: 6:14 a.m. – 12:15 a.m.	~60-minute intervals: 7:14 a.m. – 10:14 p.m.
161	Express	Dalhousie University	Six (6) departures from Lake Major Road and Main Street: 5:43 a.m. – 8:13 a.m. Six (6) arrivals at Lake Major Road and Main Street: 4:01 p.m. – 6:30 p.m.	No service	No service
168B	Express	Dalhousie University	Five (5) departures from Cherry Brook Road and Main	No service	No service



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Route	Route Type	Destination	Weekday Service Details	Saturday Service Details	Sunday and Holiday Service Details
			Street: 5:51 a.m. – 7:51 a.m. Six (6) arrivals at Cherry Brook Road and Main Street: 4:20 p.m. – 6:47 p.m.		
401	Rural	Portland Hills Terminal	Seven (7) departures from Ross Road and Highway 7: ~6:10 a.m. – 10:55 a.m. and ~5:10 p.m. – 8:30 p.m. Six (6) arrivals at Ross Road and Highway 7: ~6:45 a.m. – 9:55 a.m. and ~4:05 p.m. – 7:25 p.m.	Three (3) departures from Ross Road and Highway 7: ~7:35 a.m., 12:40 p.m., 6:40 p.m. Three (3) arrivals at Ross Road and Highway 7: ~8:20 a.m., 11:45 a.m., 5:45 p.m.	Three (3) departures from Ross Road and Highway 7: ~7:35 a.m., 12:40 p.m., 6:40 p.m. Three (3) arrivals at Ross Road and Highway 7: ~8:20 a.m., 11:45 a.m., 5:45 p.m.

Figure 10: Existing Transit Service Characteristics – Westphal Study Area

While the harmonized development concept plan includes a proposed transit terminal at the northeast corner, people accessing transit generally limit the distance they are willing to walk to reach bus services. Practical maximums are 400 metres for local service stops and 800 metres for express services. While the plan portrays all commercial development along Main Street, one higher density node of multi-unit buildings within 300 metres of the proposed terminal, and another higher density residential area within 300 metres of Main Street, all other significant development would be located greater than 800 metres from an existing transit stop or route.

While cycling to reach transit may be an option for some, the proposed development area's street network creates an opportunity for transit routing through the development. Additional access points to the west and south along with distributed pockets of high-density housing lend themselves to an intra-site bus route that is capable of bringing transit access well within 400 metres for a large percentage of new



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residents. Proper planning for on-site routing requires a clearer understanding of new roadway geometry and configuration. When accommodating an increase in transit demand, additional travel distances require a routing that allows for minimal delay of movement through the community.

Further, the transit terminal siting is sub-optimal for serving a distribution of denser multi-unit residential buildings between the three land holdings that comprise the combined development site. To best serve the new community and minimize the need for first/last kilometre transfers, siting of any potential terminal requires additional consideration of proximity to residents, final alignment of internal corridors, and distribution of commercial buildings within the site.

Consistent with the transit section of the IMP Action Plan, siting a new transit terminal at the development site creates a potential need for transit priority lanes along Main Street to position transit service as a competitive alternative to personal vehicle use for new area residents.



5 Analysis and Considerations

5.1 Connectivity and Access Audit

Stantec developed a GIS-based analytical tool for examination of public and active transportation connectivity and levels of connectivity deprivation to inform investment in transportation infrastructure and services. The primary use of the tool is to determine the quality of pedestrian and transit access to key services and amenities from a neighborhood in various scenarios. In this case, the tool was employed to identify connectivity deficiency for the future residents of the proposed Westphal development to predict and prevent access-related deprivation.

The connectivity tool assessed pedestrian and transit access to 14 key service and amenity categories for the entirety of Halifax roughly equivalent to the sum of the Regional Centre and Inner Suburban areas defined in the Integrated Mobility Plan.

A second evaluation scenario solely considers the Westphal study area and assigns it the approximately 28,000 new residents expected by developer requests. This scenario assesses future resident connectivity to health care (Hospital, Doctor, Pharmacy), transportation (Public Transport, Train Station), education (Primary Education, Higher Education), daily needs (Supermarket, Local Shops), leisure (Entertainment, Park Land, Natural Space, Sports), and places of worship if no other action is taken to diversify land use within the development site.

A third and final evaluation scenario adds new destinations and services to the future development area to determine relative connectivity improvements for the new population according to intentional land use decisions. The study area was subsequently reassessed with a public transit stop (route undefined), a doctor's office, a pharmacy, local shops, an entertainment venue, and a primary school included.

Macro level connectivity data from the connectivity tool indicates that if certain destination types are not located within the new development or served by frequent and rapid transit, that the entirety of the newly settled population would not be able to access health care or higher education opportunities via walking/public transit within 30 minutes (**Figure 11**). The vast majority of new residents would not have access to a shopping centre or pharmacy.



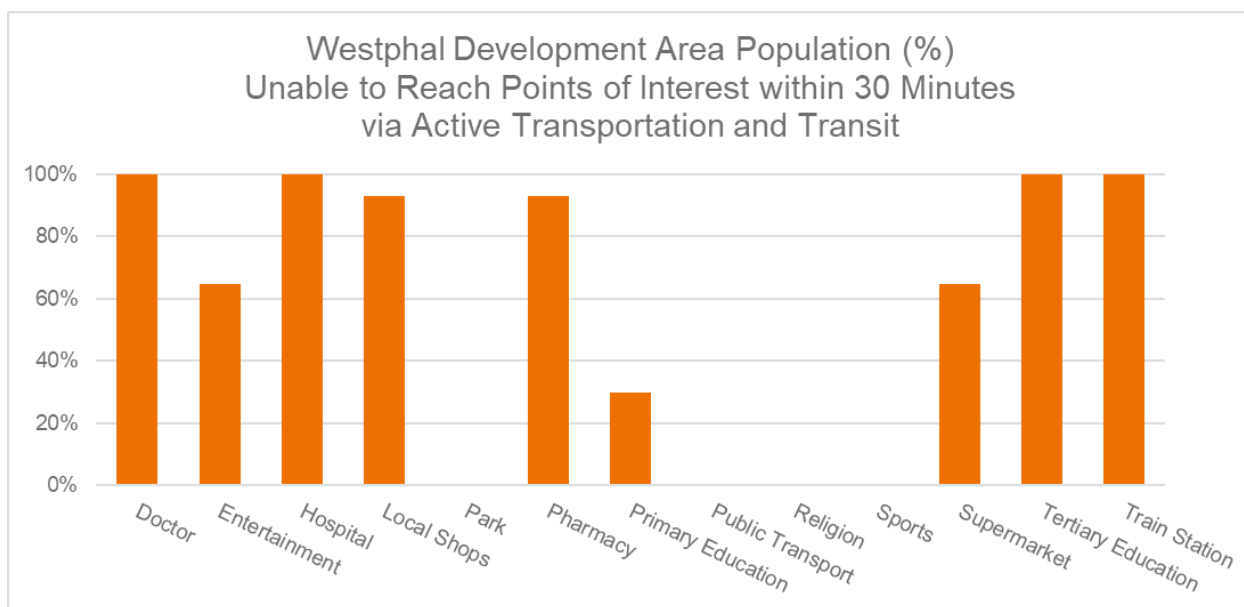


Figure 11: Connectivity Analysis – Undefined Development Site Destinations and Services

While some study area residents might have access to a subset of destinations in less than 30 minutes, average travel times often exceed 30 minutes as seen in the polar chart (**Figure 12**). Even destinations seemingly more accessible to more of the development population such as the supermarket at Main Street and Forest Hills Parkway require 30 minutes or greater to reach by foot dependent on the location of one's dwelling unit within the development.

Access issues can be mitigated from either the land use or transportation planning perspective. The third trend recalculates average active transportation access times if shopping and entertainment along with basic health care options are included in the commercial portions of the proposed development. This scenario improves missing connectivity in important categories. Average active transportation travel time to a doctor's office, a pharmacy, local retail, and entertainment options drop to 13-19 minutes for new development residents. Land use and siting decisions not only bring daily destinations closer to affected populations, but also reinforce the value of local active transportation networks for short trips.

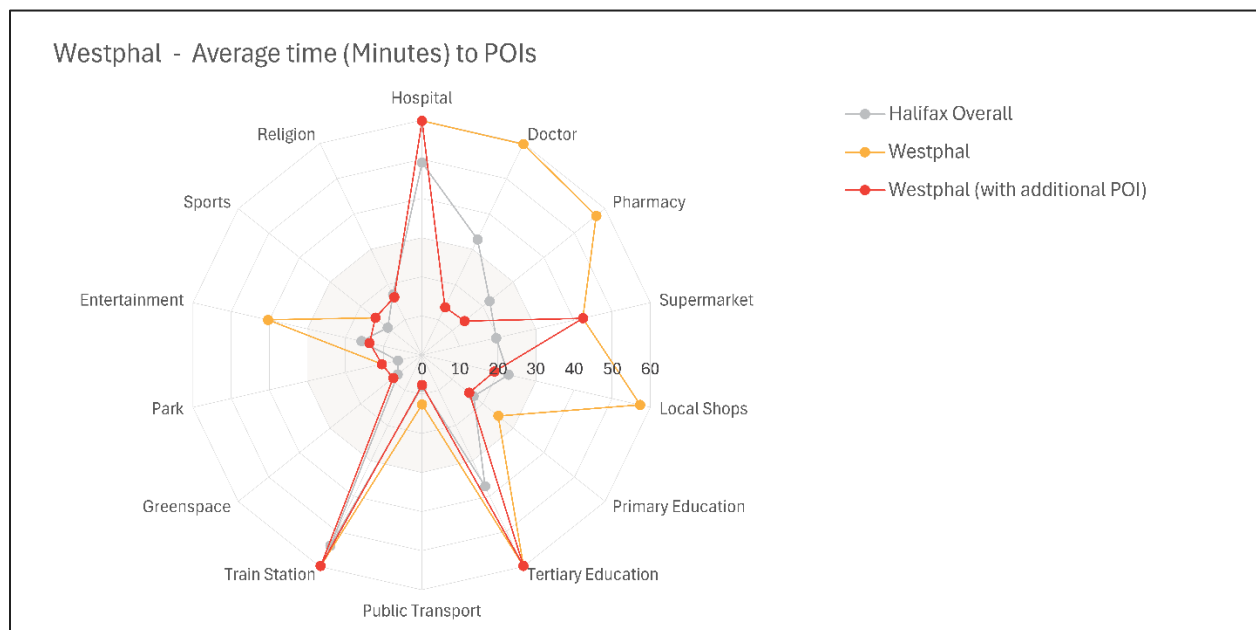


Figure 12: Connectivity Analysis – Associated Access Improvement (Sample On-Site Services)

The connectivity analysis outputs indicate that the greatest access benefits realized by the integration of commercial and service destinations within the development site are related to basic daily and medical needs. Inclusion of a pharmacy in the site plan would reduce the average pedestrian/transit access time for a potential resident from 57 minutes to 14 minutes. Addition of a primary care physician and/or other medical or dental care offices realize even greater access benefits, a decrease in estimated active transportation travel time from over 60 to 14 minutes. Likewise, the addition of a shopping centre or other varied local retail options would reduce access time for the average resident from 57 to 19 minutes.

5.2 Detailed Transportation Modeling

The JRTA and HRM (in partnership with WSP Canada and the University of Toronto) have completed a new activity-based travel demand model named the Joint Regional Transportation Simulator. The model provides the ability to interpret development impacts on the regional transportation network through the model's innovative Agent Based Model (ABM) process of simulating travel behavior (where, how, and when people travel), including trip generation, trip distribution, mode choice, and reassignment impacts. These processes are modeled using an ABM framework, which captures the behavior of individual agents, such as travelers or households, allowing for a more precise representation of travel demand and network effects at the regional level.

The ABM is a flexible, and policy-sensitive tool. A regional-scale travel demand model examines the interactions of population, employment, land use, and mobility options and allows the testing different possible futures, estimate the future need for travel, and assesses the impact and benefit of different modes of transportation that will be required to serve the region in the future.

In analyzing the transportation impacts of the Westphal development, the ABM approach predicts how trips will be distributed to and from the development site. This process involves assigning each study



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area resident a Place of Work (POW) and, at the same time, matching the projected employment opportunities with potential residents. This allocation of trips is carried out using a gravity-based distribution model, which factors in both the distance between residential areas and employment centers, as well as the size and capacity of these employment areas. The model ensures a balance of trips by weighing the proximity of residents to available job spaces. In addition to work-related trips, the ABM also accounts for other tour-based travel patterns, such as school commutes and shopping trips. This approach provides a detailed distribution of trips to and from the development site.

However, the ABM process has limitations, particularly when a large development site is introduced. The model has sensitivity to shifts in existing travel demand, especially when assigning Place of Residence (POR) to POW connections. As new developments create a significant influx of residential and employment opportunities, the model can react to the POR-POW relationship by reallocating existing trips to the new site, therefore creating changes across the Halifax region.

Matrices visually illustrate the relationship between Place of Residence (POR) and Place of Work (POW) and how this relationship shifts across sectors when the proposed developments are introduced (**Figure 13**). The four development sites are represented at the bottom of the matrix. Compared to the scenario with no developments, all sectors show an increase in activity (highlighted in orange), while the introduction of the new development redistributes existing POW-POR relationships, shifting employment demand away from certain sectors and toward the newly developed site.

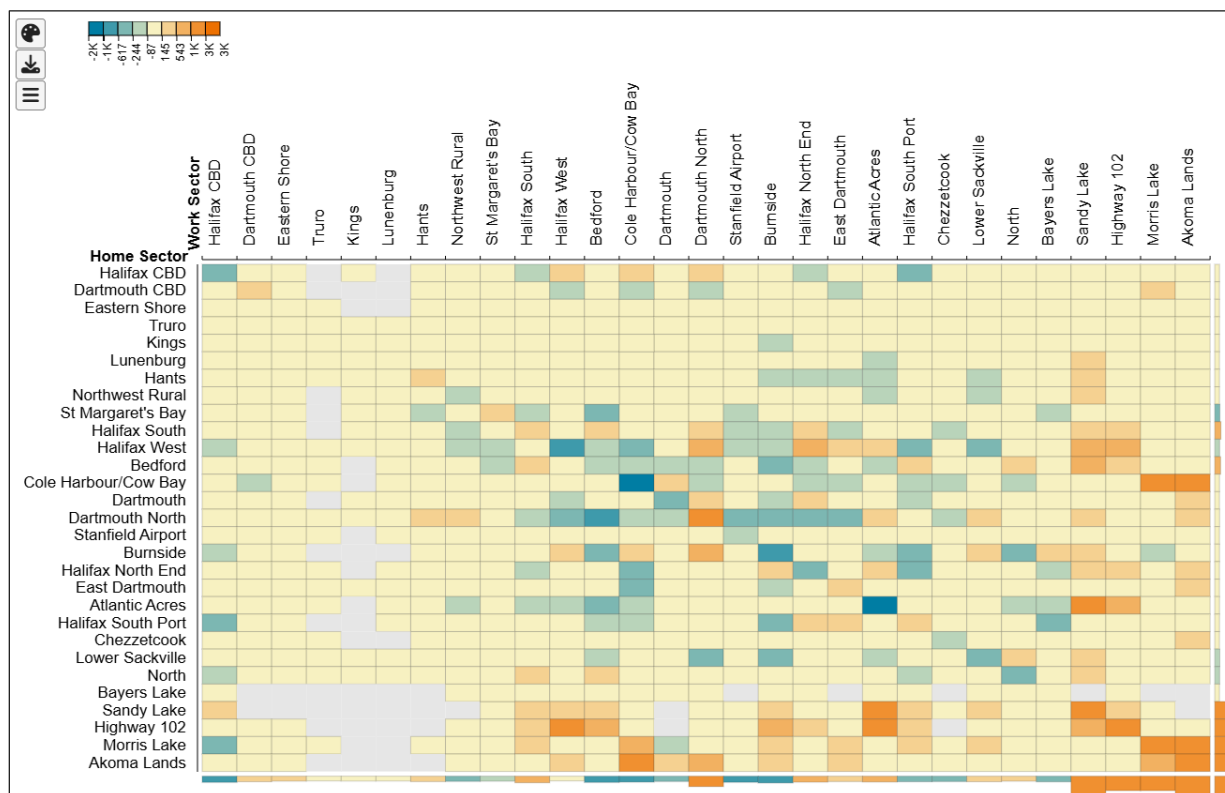


Figure 13: POR-POW – Shift Between 2031 No Dev – 2031 All Dev



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Comparing trip length distributions between the development and no-development scenario illustrates that the shift in POW-POR relationships does not significantly alter the overall trip length distribution (**Figure 14**). The existing distribution, which was calibrated to census data for place of work, remains largely consistent despite the introduction of the new development.

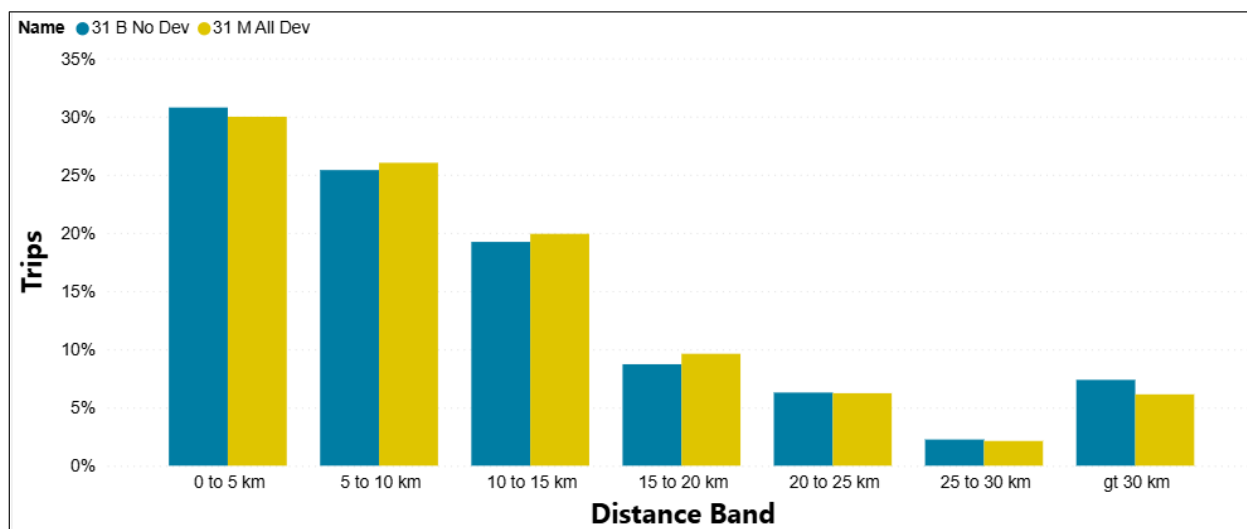


Figure 14: Trip Length Distribution Change between 2031 Baseline and Development Scenarios

Sensitivity testing was conducted to determine the most appropriate scenario to use and to better understand the HRM model's response to changes in travel demand. Several scenarios were tested, revealing that the POR to POW sensitivity was significantly higher when the impact of development sites was added to the 2045 forecast, compared to applying the same development to the 2022 base year. The logic supporting this concept follows the addition of population and accompanying increases in network congestion and travel time. The model showed increased sensitivity in areas far removed from development sites in the 2045 scenario.

To investigate the cause of this sensitivity, additional sensitivity tests were performed to examine whether it was due to the higher levels of congestion in the 2045 model affecting the cost of travel, or whether the additional infrastructure in the 2045 network played a role. The results indicated that the sensitivity was not driven by congestion or network changes, even under extreme conditions such as closing major bridges between Halifax and Dartmouth. Instead, it stemmed from sensitivities in the 2045 POW-POR gravity model, which became more pronounced when development site contributions were introduced, causing a ripple effect in trip assignments across the region.

To assess the infrastructure requirements for the Westphal study area, an interim 2031 model has been developed as a baseline. The interim model provides a more focused assessment baseline, as the 2045 model incorporates a broader range of infrastructure schemes intended to support wider development, potentially overestimating infrastructure capacity at the time of new development buildout, and underestimating impacts. This model includes a reduced level of committed infrastructure compared to the 2045 baseline model. Notwithstanding the reduced levels of traffic demand growth, the 2031 forecast year is still deemed as being highly sensitive in trip reassignment when adding Future Serviced Communities development site contributions.



As such, two future scenarios have been created in order to benchmark the impact of the Westphal development:

- **2031 Do Minimum Scenario (Baseline):** This scenario assumes no new development or infrastructure beyond those already planned and committed. It serves as a baseline to understand the impact of maintaining the current trajectory without additional interventions. The 2031 scenario provides a midpoint between the model base year of 2022 and the end of the JRTA planning period in 2045. The Do Minimum model provides a high level of travel demand growth, corresponding to a regional population increase of approximately 50 percent. This scenario was created by interpolating population and employment inputs between 2022 and 2045.
- **2031 All Development Scenario:** This scenario builds upon the Do-Minimum scenario by incorporating all development, including the Highway 102 West Corridor, Sandy Lake, Westphal, and Morris Lake study areas. It considers the full build-out of these developments, including residential, commercial, and educational components, and aggregates all inter-related effects of their associated traffic generation.

5.2.1 MODEL APPLICATION

The HRM model provides a framework for analyzing the transportation impacts of the Westphal development, covering key elements such as trip distribution, mode choice, and time-of-day travel patterns. These components allow the model to predict how trips will be generated, distributed, and assigned across the network, as well as the modal split between car, transit, and other forms of transportation. For this analysis, we have used the model's outputs to inform key aspects of the transportation impact assessment, such as traffic volumes, congestion hotspots, and transit demand, focusing on the outputs of the AM and PM Peak period models.

In order to inform and understand the transportation network impact of, and constraints posed by the Westphal development, the following key metrics have been derived from the HRM Model:

- **Link Volume-to-capacity (V/C):** - This metric represents the capacity of the road network relative to total hourly vehicle demand. Any value exceeding 100 percent indicates that the road segment is over capacity and likely to experience congestion.
- **Mean Link Delay:** – This measures the delay per kilometer, capturing traffic slowdowns based on the relationship between link speed and traffic flow. Since delay increases with link length, the metric accounts for this by incorporating the length of each link in the calculation.
- **Transit Volume-to-Capacity:** – Calculated at link level (each road section) by using the transit frequency from the modelled headway and the capacity of each transit vehicle type to obtain an estimated capacity, then comparing against the calculated link transit person volume.



It should be noted that junction delay has not been simulated within this assessment. Within a modelled junction, turning movements are given a constant turn time independent of junction type (1 second for right turn, 10 seconds for left turn, and zero turn delay for through movements). This limitation means that the full impact of traffic congestion, particularly at critical junctions or high-traffic intersections, may be underestimated in the analysis.

Likewise, modelling may overestimate traffic growth in certain areas. In such cases, the model may predict higher traffic volumes than would realistically occur, as it assumes that the network can absorb large amounts of traffic, limiting the scale of potential behavioral changes, such as shifts in mode choice or reduced travel during peak times. To address this, professional judgment has been applied alongside the model outputs, ensuring a more balanced and accurate interpretation of potential transport impacts, especially in future-year scenarios (e.g., 2031). This approach allows for a realistic assessment of the effect of development in the Westphal study area on the transportation network.

5.2.2 NETWORK IMPACTS

The application of the HRM Activity-Based Model contributes greatly to an assessment of the network impacts associated with the Westphal development. Analysis has identified specific effects on traffic flow, congestion levels, and overall connectivity within the surrounding transportation network.

5.2.2.1 Future Do-Minimum Network Constraints

An analysis of forecasted transportation network constraints in a 2031 Do Minimum scenario identifies key areas of congestion prior to development of Future Serviced Communities sites. Volume-to-Capacity (V/C) plots (**Figure 15, Figure 16**) reveal a significant increase in existing congestion by the 2031 forecast year. Throughout the HRM region in the AM peak period, 15 percent of the 2031-modelled vehicle-kilometres are on roads with V/C values exceeding 85 percent of the road capacity, rising to 24 percent in the PM peak period, indicating severe levels of congestion.

Traffic congestion in the Do Minimum scenario is projected to be more severe during the PM peak period than the AM peak period. PM peak congestion is particularly visible on corridors proximate to the Westphal development site, including along Main Street / Highway 7 / Highway 107 across the northern edge of the study area leading to the intersection with the Forest Hills Parkway, which similarly experiences volumes exceeding capacity immediately south of that intersection. Further west along Main Street / Highway 7, beyond Topsail and Lemont Lakes and nearing Highway 111, analysis shows volume nearing or exceeding capacity with the forecast background increase in overall regional population.

The most severe congestion in the region is projected on the MacKay and Macdonald Bridges, reflecting ongoing congestion issues in these areas. Modelling additionally shows heavy congestion in a non-development baseline scenario along Portland Street / Highway 207 from the area near the Portland Hills Terminal west to Highway 111.

Delay per kilometre plots (**Figure 17, Figure 18**) reinforce the volume-to-capacity analysis and reflect the same congestion areas. Pinch points just east of Highway 111 on both Main Street / Highway 7 and Portland Street / Highway 207 show significant delay of four minutes per kilometre. Other segments previously described as nearing or exceeding capacity approach one minute of delay per kilometre.



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In summary, the following roadway corridors experience appreciable levels of congestion within the 2031 baseline:

- Main Street / Highway 7 / Highway 107 – Between Ross Road and Forest Hills Parkway
- Forest Hills Parkway – Between Main Street / Highway 7 / Highway 107 and Taranaki Drive
- Main Street / Highway 7 – Between Brigadoon Avenue and the Highway 111 Interchange
- Portland Street / Highway 207 – Between Portland Hills Drive and the Highway 111 Interchange

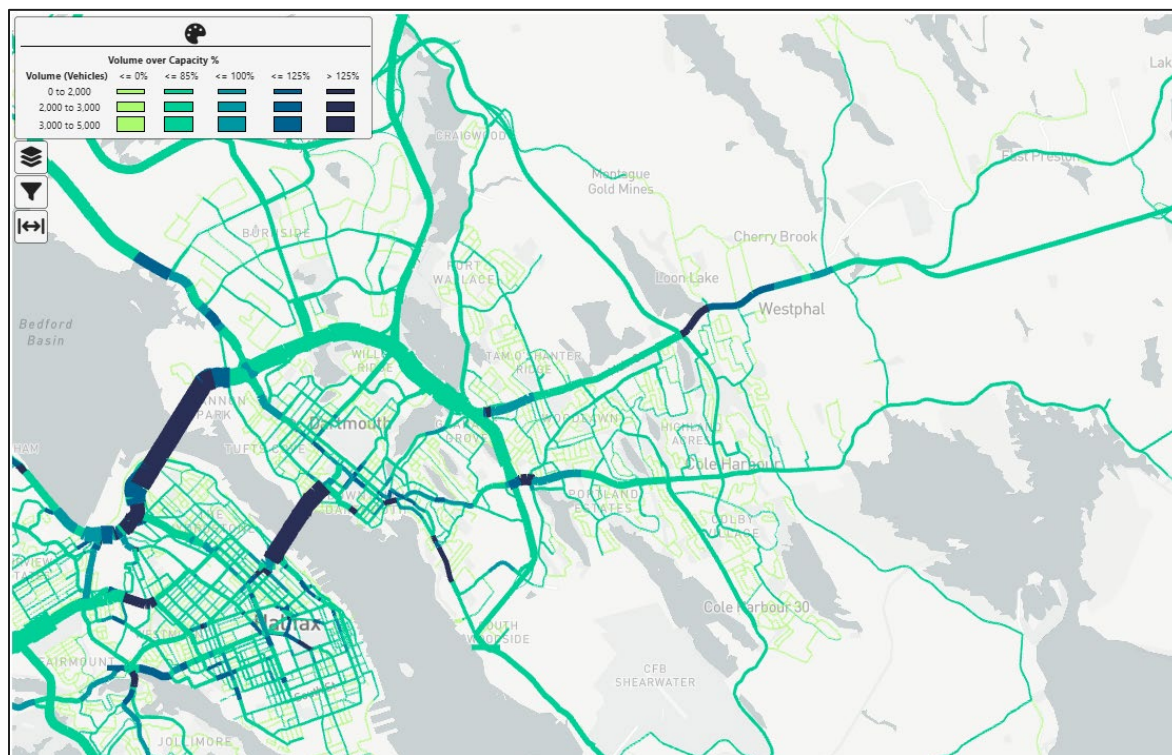


Figure 15: V/C Ratio – AM Peak – 2031 Do Minimum Scenario

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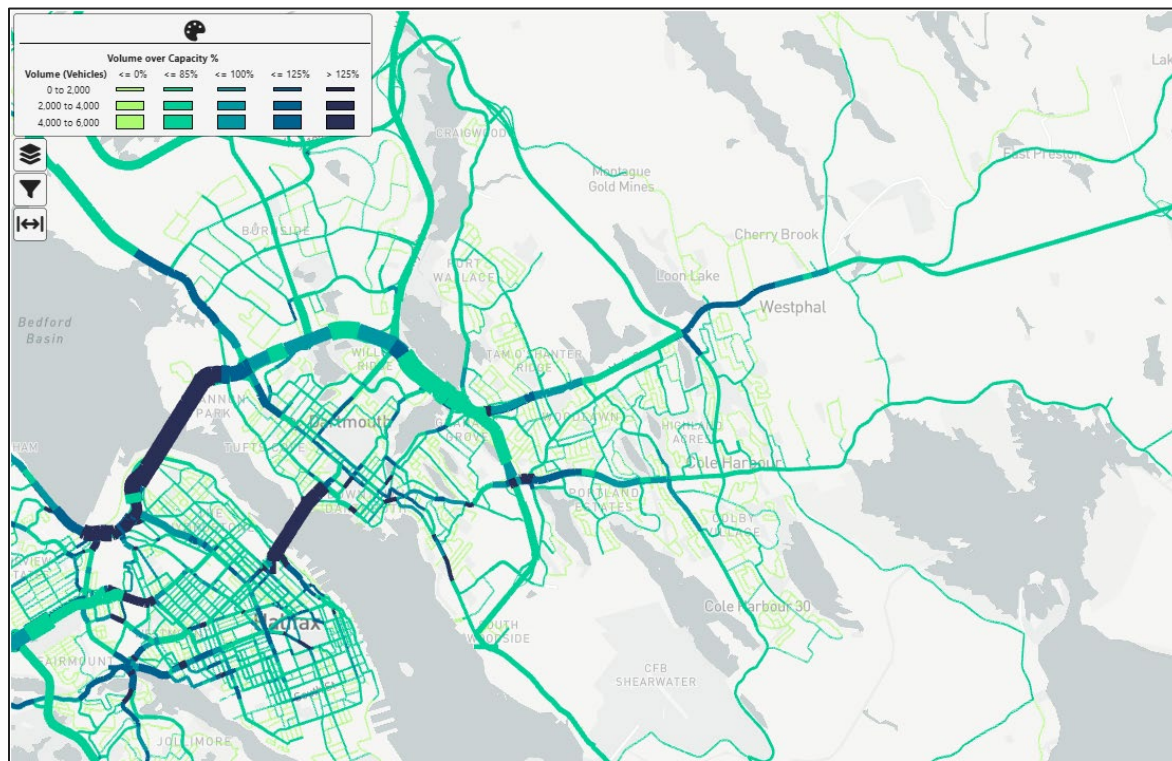


Figure 16: V/C Ratio – PM Peak – 2031 Do Minimum Scenario

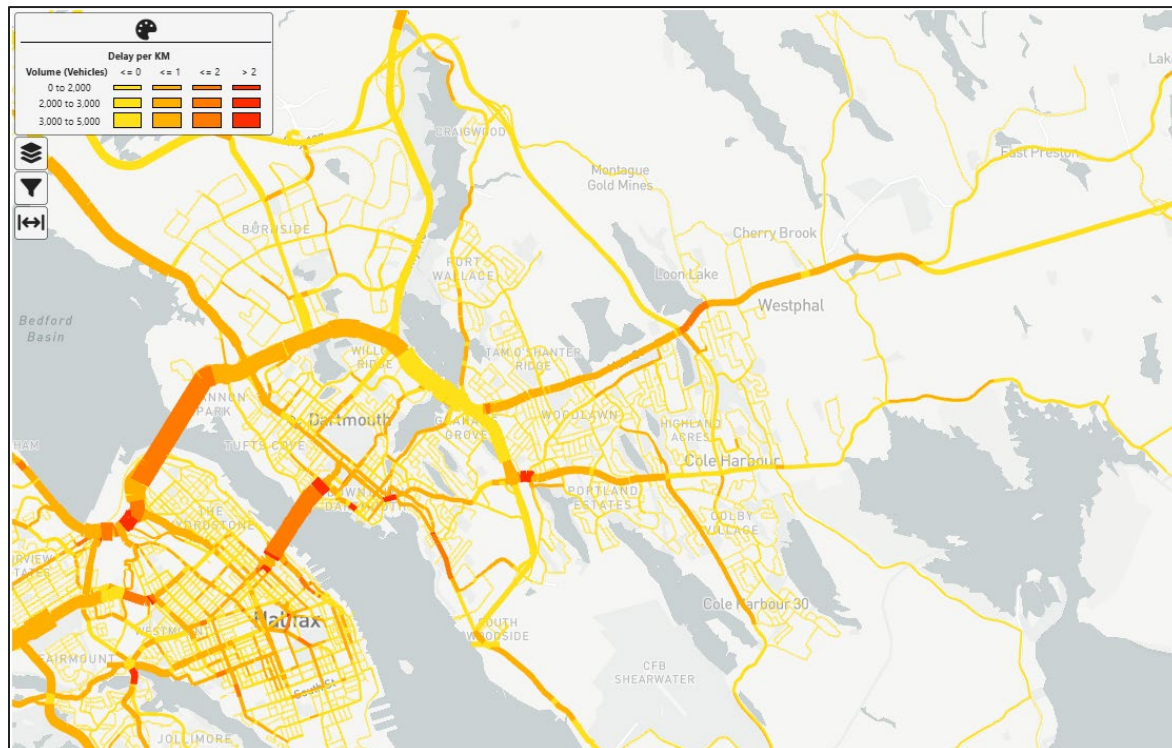


Figure 17: Travel Delay per km – AM Peak – 2031 Do Minimum Scenario



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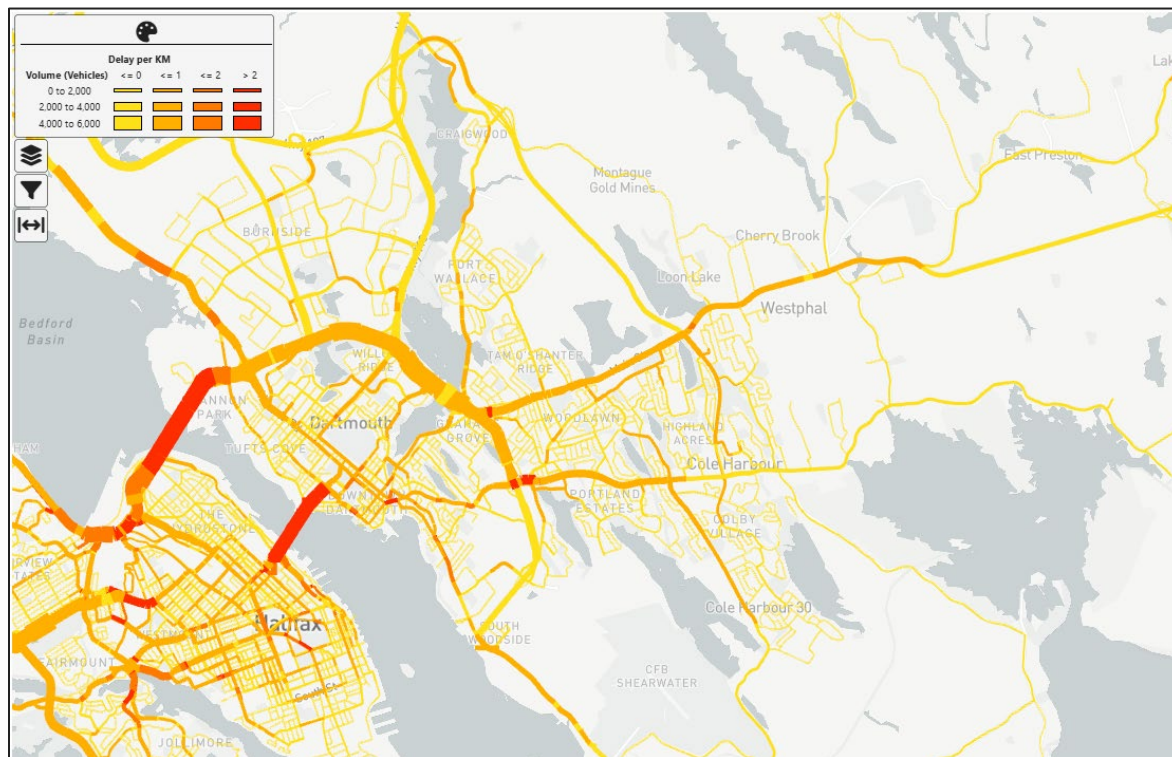


Figure 18: Travel Delay per km – PM Peak – 2031 Do Minimum Scenario

5.2.2.2 Existing Transit Constraints

Each modelled scenario includes ferry routes while excluding proposed Bus Rapid Transit routes as they are not part of the projects list that informs the 2031 scenarios. Transit demand versus capacity maps of the HRM (**Figure 19**, **Figure 20**) highlight several routes that would operate at or near capacity, particularly in the central areas of Halifax and Dartmouth as well as along Portland Street west of the study area. This underscores that projected population growth in the HRM independent of Future Serviced Communities site development will add to demand for existing transit services. Transit flow-to-capacity analysis further indicates that most corridors near the Westphal study area would operate far from maximum capacity as the currently available transit service is expected to be able to absorb baseline demand increases.

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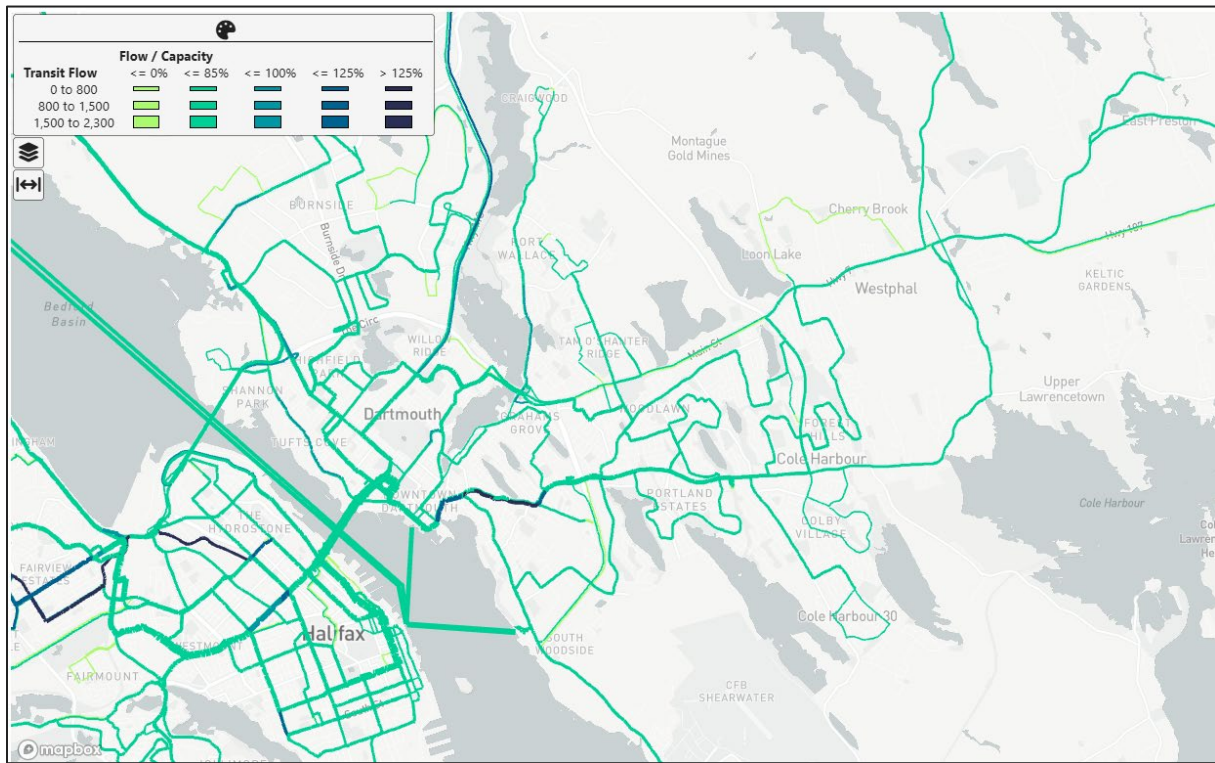


Figure 19: Transit Flow/Capacity Ratio – AM Peak – 2031 Do Minimum Scenario

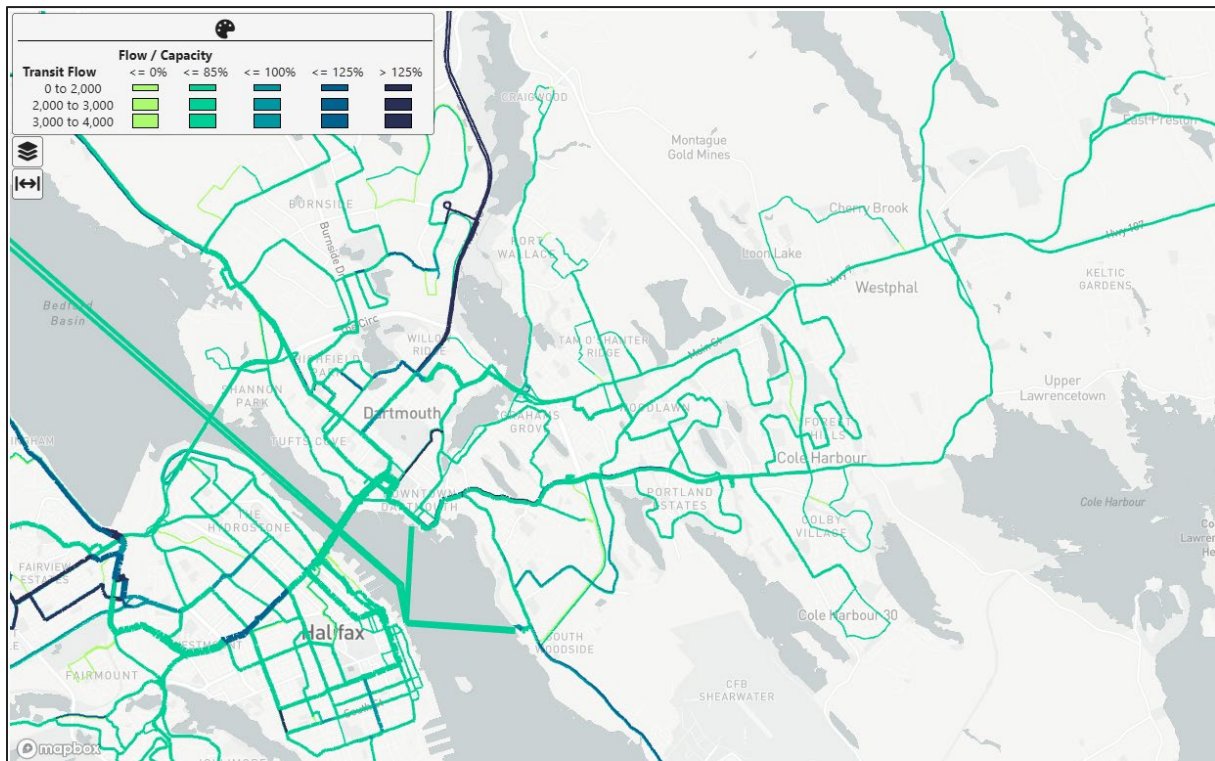


Figure 20: Transit Flow/Capacity Ratio – PM Peak – 2031 Do Minimum Scenario



5.2.2.3 Distribution of Westphal Development Travel Demand & Mode Share

Charts describe the External Only (**Figure 21**) and Internal Only trip mode share (**Figure 22**) separately and show the variance of mode share for internal and external travel demand projected through the HRM mode choice model. Of note, walking trips comprise over one-quarter of trips anticipated to remain within the Westphal study area compared with under five percent of external trips. Combined walk, bicycle, and transit mode share of 13.4 percent across all trips nearly meets the Integrated Mobility Plan's goal of at least 14 percent for this location with a greater walking than transit emphasis.

Per the Development Scenarios report, the combined concept plan devotes approximately 243,600 square feet (22,628 square metres) of gross leasable floor area. Using median floor space per worker ratios ranging from 21 square metres for small-format retail to 29 square meters for general office, the development concept would host 780 to 1,078 workers, far below embedded model inputs 6,701. This difference may inflate the modelled number of internal trips and thus the overall proportion of trips made by people walking.

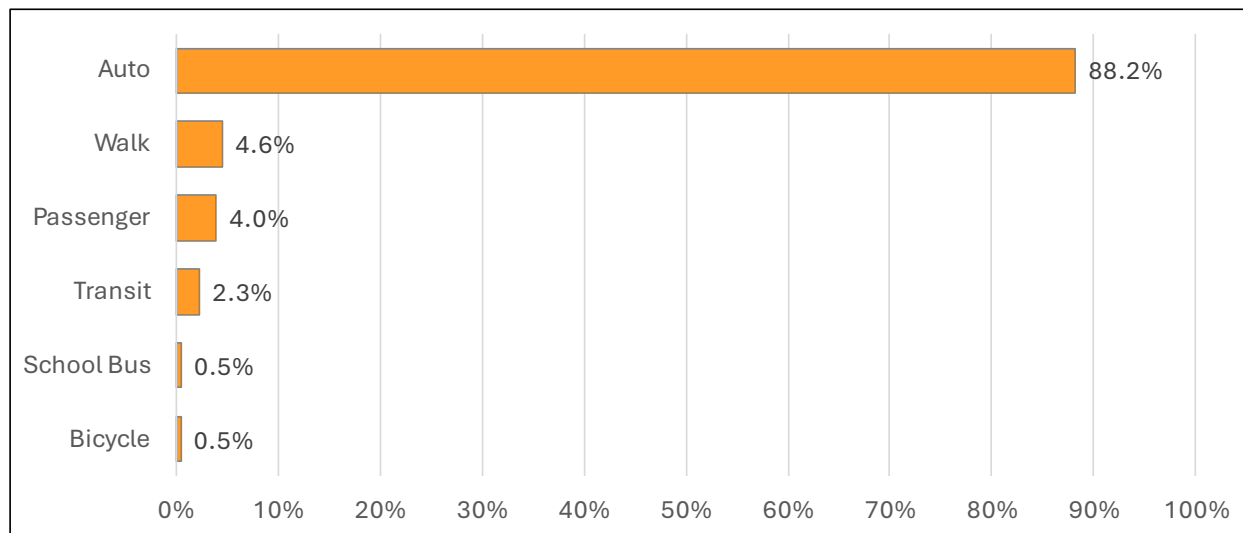


Figure 21: Westphal Study Area 2031 Projected Mode Share – External Trips

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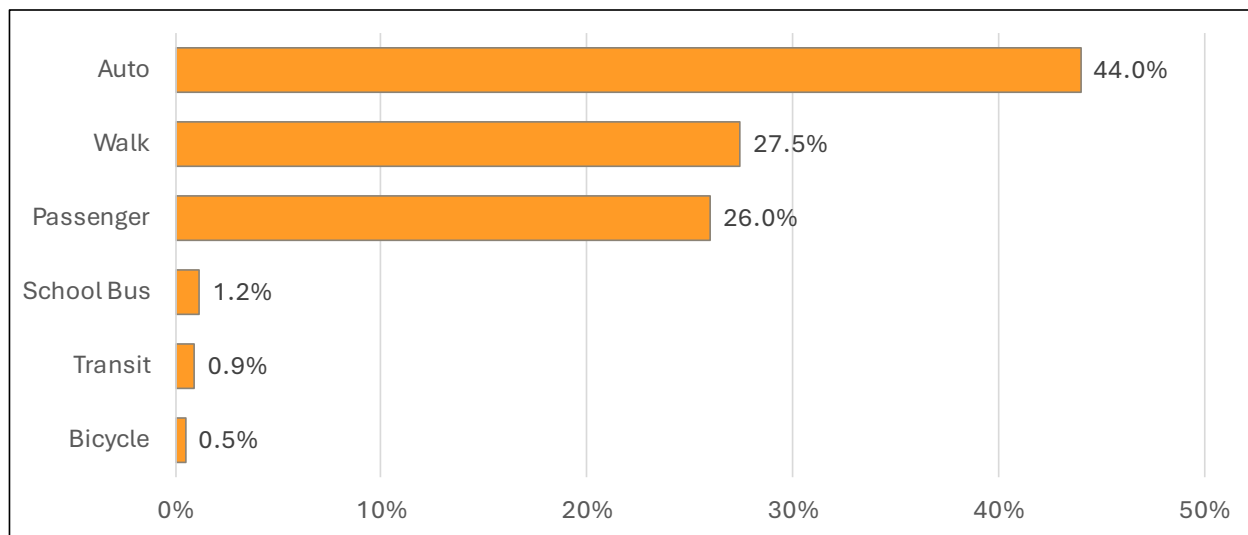


Figure 22: Westphal Study Area 2031 Projected Mode Share – Internal Trips

Spatial visualization (**Figure 23**) and tabulation (**Figure 24**) of projected travel demand to and from the Westphal development, for all motorized vehicles including both private auto and transit users, consists of all travel throughout the entire day and the other modelled time periods within the ABM, including mid-day, evening, and overnight time periods. Approximately 7,500 projected internal vehicular trips, roughly 13 percent of all projected vehicle trips, are excluded from comparison of trip generation and attraction. A plurality of generated and attracted external trips begin and end relatively nearby in the Cole Harbour/Cow Bay analysis zone.

Previously discussed disparities between modelled and expected commercial activity/employment location also imply that future study area residents are more likely to travel outside of the development to reach places of employment or services than the model states while non-residents are less likely to travel to the developed Westphal study area for the same purposes.

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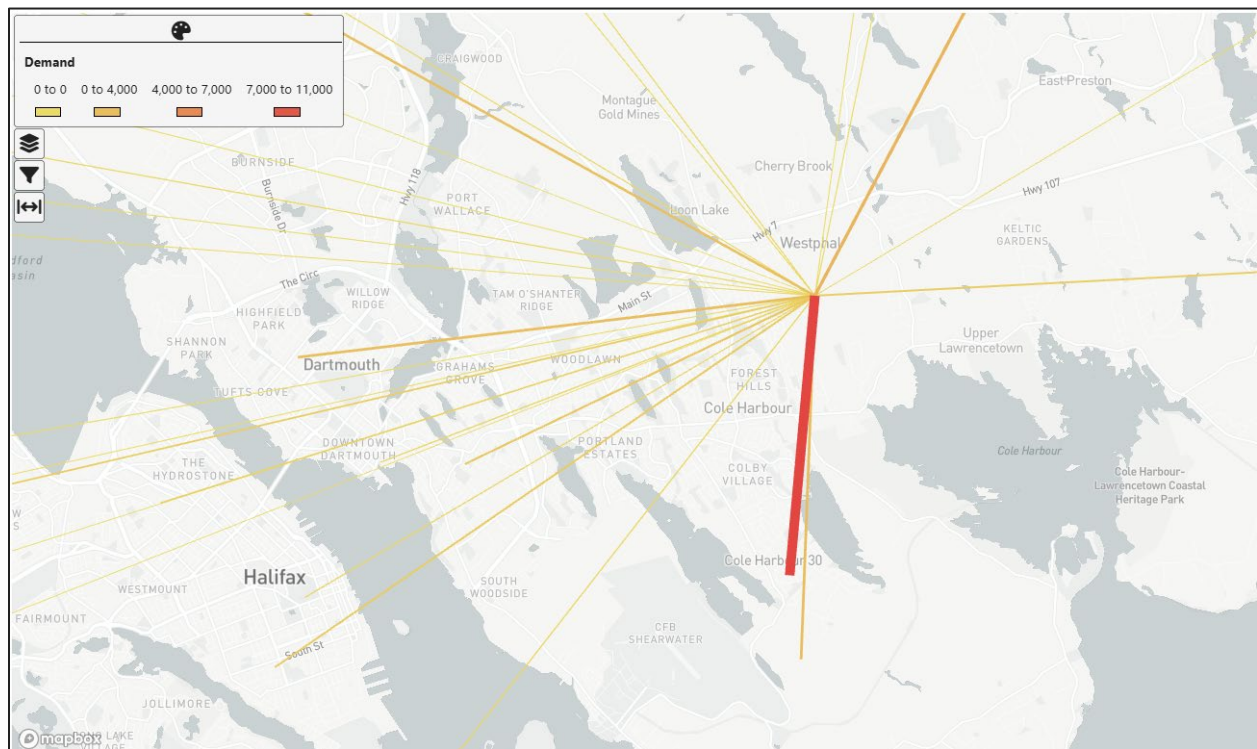


Figure 23: Visual Projected Trip Destination Demand from Westphal Study Area

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Destination	Demand	Percent	Origin	Demand	Percent
Cole Harbour/Cow Bay	9,375	37.2%	Cole Harbour/Cow Bay	9,426	37.4%
East Dartmouth	2,392	9.5%	East Dartmouth	2,785	11.1%
Dartmouth North	2,008	8.0%	Morris Lake	2,606	10.3%
Morris Lake	1,925	7.6%	Dartmouth North	1,620	6.4%
Burnside	1,813	7.2%	Burnside	1,431	5.7%
Dartmouth	1,330	5.3%	Dartmouth	1,357	5.4%
Halifax South Port	1,114	4.4%	Chezzetcook	904	3.6%
Halifax West	959	3.8%	Bedford	756	3.0%
Chezzetcook	926	3.7%	Halifax West	723	2.9%
Halifax North End	670	2.7%	Halifax North End	709	2.8%
Halifax CBD	424	1.7%	Halifax South Port	632	2.5%
Halifax South	374	1.5%	Halifax CBD	484	1.9%
Dartmouth CBD	316	1.3%	Dartmouth CBD	335	1.3%
Lower Sackville	302	1.2%	North	252	1.0%
Bedford	249	1.0%	Halifax South	228	0.9%
North	237	0.9%	Lower Sackville	222	0.9%
Atlantic Acres	201	0.8%	Eastern Shore	124	0.5%
Eastern Shore	125	0.5%	Atlantic Acres	121	0.5%
Stanfield Airport	83	0.3%	Stanfield Airport	99	0.4%
Hants	79	0.3%	Highway 102	83	0.3%
Highway 102	79	0.3%	Hants	82	0.3%
Northwest Rural	47	0.2%	Sandy Lake	52	0.2%
St Margaret's Bay	37	0.1%	Northwest Rural	47	0.2%
Sandy Lake	33	0.1%	St Margaret's Bay	44	0.2%
Truro	30	0.1%	Truro	30	0.1%
Kings	23	0.1%	Kings	21	0.1%
Bayers Lake	13	0.1%	Bayers Lake	20	0.1%
Lunenburg	8	0.0%	Lunenburg	6	0.0%
Total	25,172		Total	25,199	

Figure 24: Tabulated Projected Travel Demand to/from Westphal Study Area

External trip distribution maps highlight the diffusion of auto trips on the highway network during the AM and PM modelled peak periods (**Figure 25, Figure 26**), reflecting the heavy demand along the Main Street / Highway 7 / Highway 107 and the Cole Harbour Road / Highway 207 corridors to access Dartmouth, Downtown Halifax, and Highway 111. Also noteworthy is sizable trip attraction to and from portions of Bedford via Highway 107.



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan 5 Analysis and Considerations

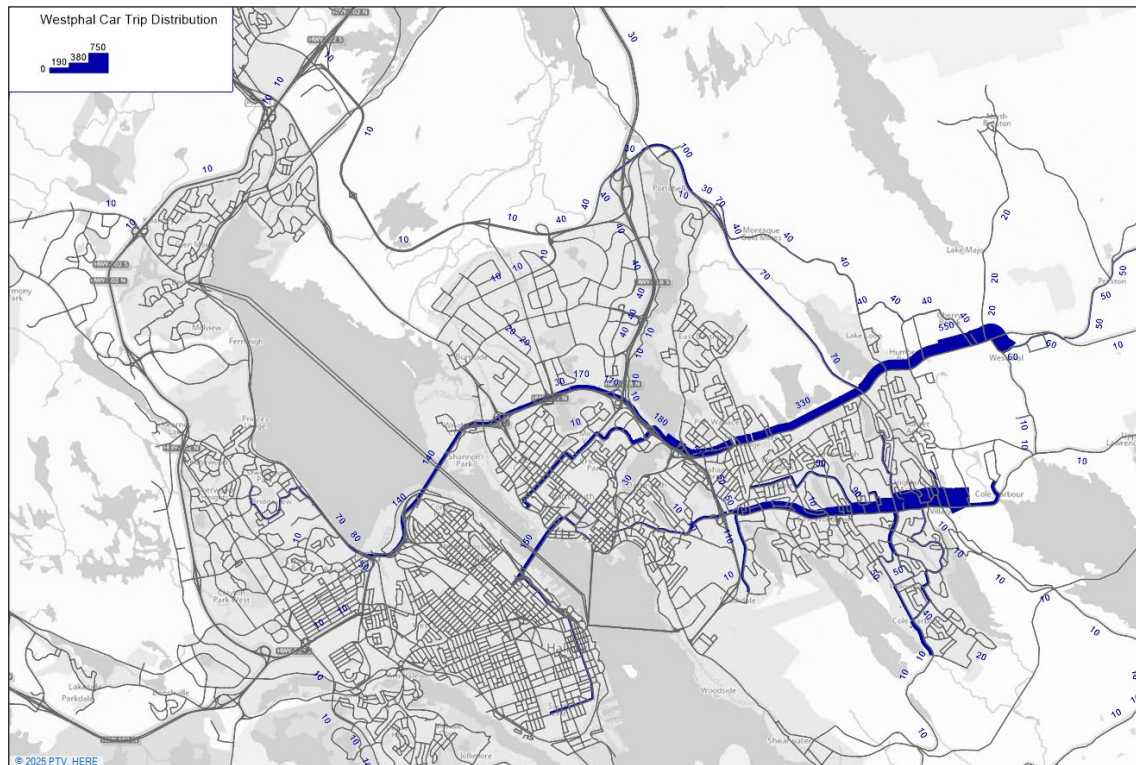


Figure 25: Projected Westphal Development External Trip Distribution – AM Peak

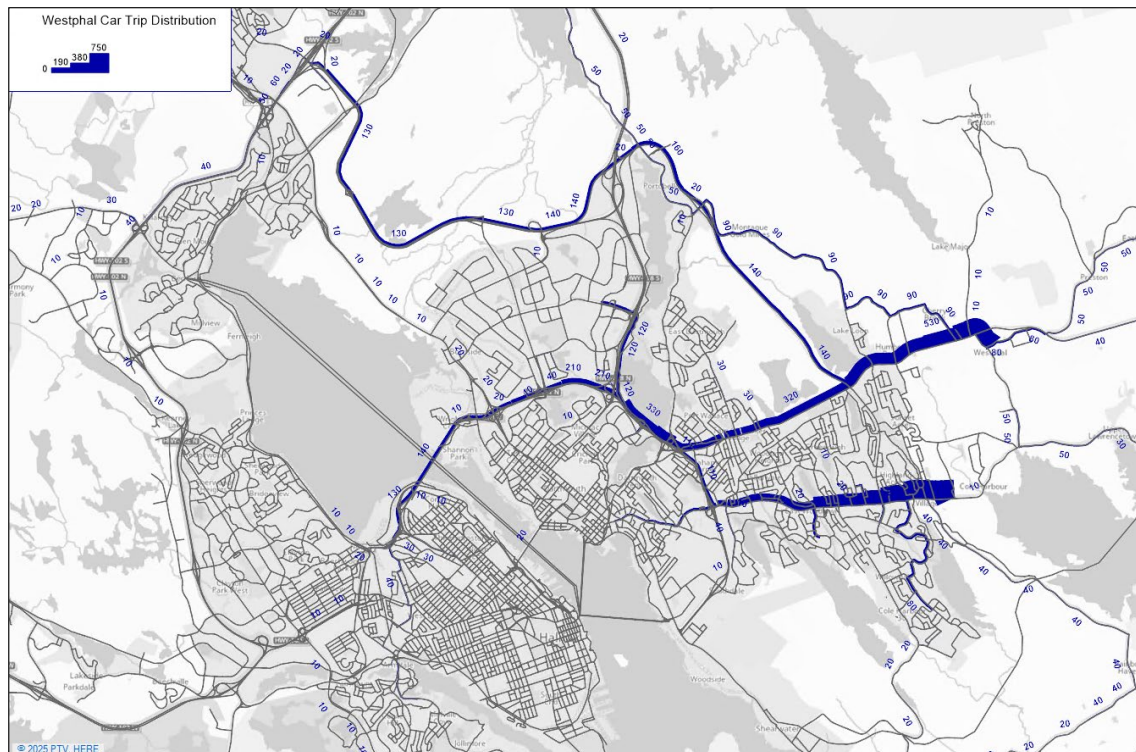


Figure 26: Projected Westphal Development External Trip Distribution – PM Peak



5.2.2.4 Highway Traffic Impacts

The Westphal development is expected to add to dominant traffic patterns on the surrounding highway network. As this and other development projects introduce new residential, commercial, and educational facilities, the resulting increase in travel demand will have direct implications for highway capacity, congestion and overall traffic flow. Analysis of the projected highway traffic impacts focuses on key corridors and junctions that will experience the greatest shifts in volume.

Flow differential maps (**Figure 27, Figure 28**) highlight the distribution and impacts of car trips from all Future Serviced Communities study areas. As expected, trends are similar to trip distribution plots. Large increases in hourly volume are seen along Highway 111, Main Street / Highway 7, Highway 107, and Cole Harbour Road / Portland Street during both the AM and PM Peak periods. Lesser increases are observed along the Forest Hills Parkway and alternate routes around Lake Loon through Cherry Brook, especially during the PM peak period.

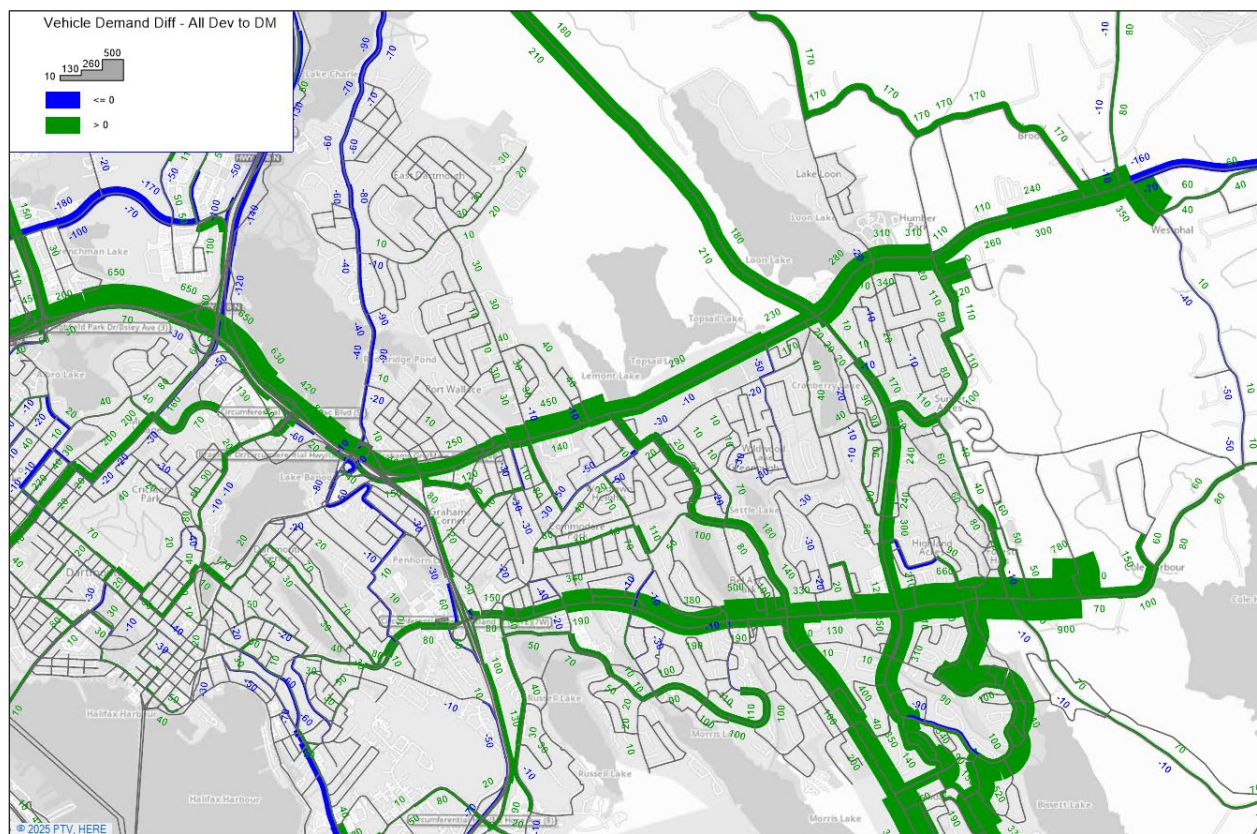


Figure 27: Trip Distribution Peak Flow Change – AM Peak – 2031 All Development Scenario

Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan 5 Analysis and Considerations

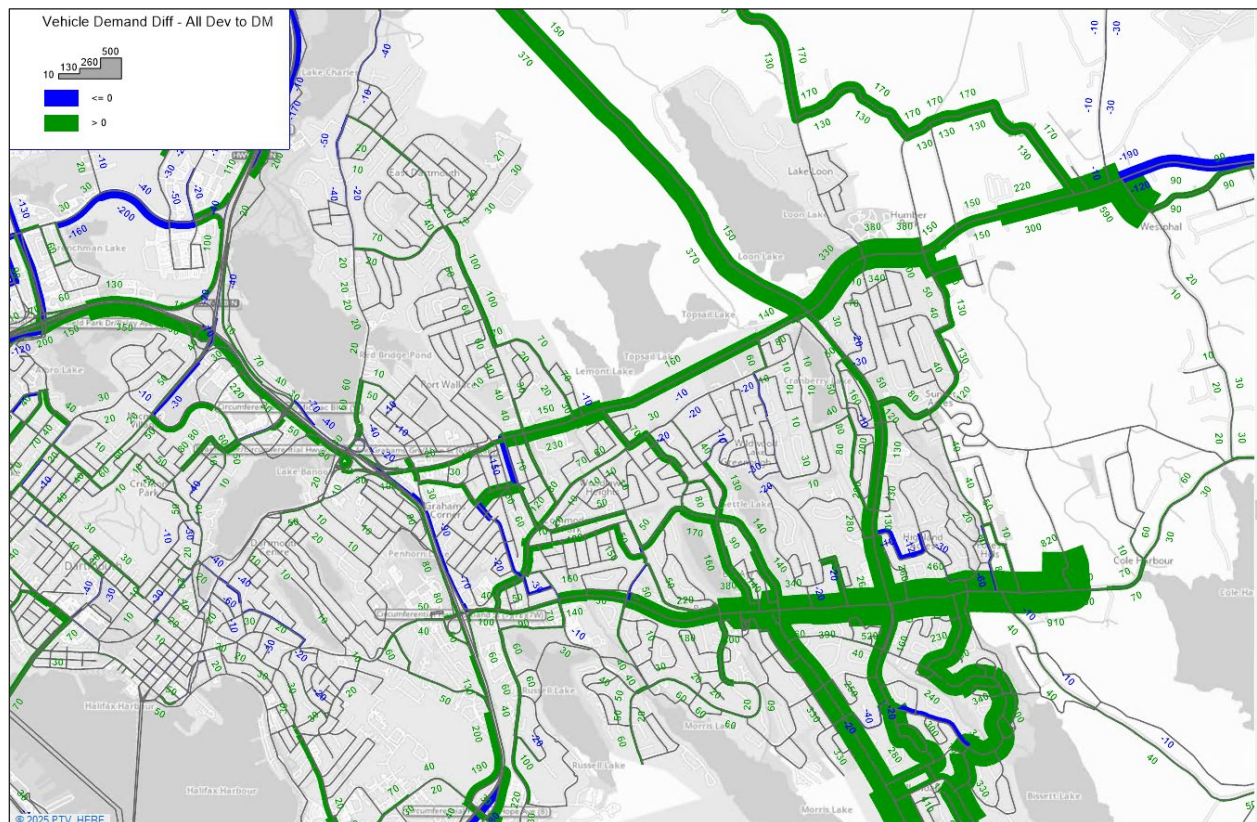


Figure 28: Trip Distribution Peak Flow Change – PM Peak – 2031 All Development Scenario

Significant increases in peak period traffic flows are observed at the intersection of Main Street / Highway 7 and Forest Hills Parkway / Highway 107 (**Figure 29**). The largest increases in the development scenario, over 200 additional vehicles per peak hour, are observed for westbound traffic west of the intersection during the AM peak hour, southbound traffic north of the intersection during the PM peak hour, and bi-directional traffic east of the intersection during both the AM and PM peak hour.

Joint impacts resulting from the introduction of both the Westphal and Morris Lake developments forecast heavy added demand on the Cole Harbour Road corridor from multiple approaches including non-traditional access routes along local streets (**Figure 30**). Cole Harbour Road nearest the southern access to the Westphal development site may experience additional peak period demands of 900 vehicles or more while segments of Caldwell Road may be required to accommodate over 450 vehicles during peak periods. Demand appears to be even higher for the Caldwell Road corridor such that modelled behaviour shows increases of 300 peak hour vehicles or more on currently lightly travelled roadways such as sections of Colby Drive, Astral Drive, Flagstone Drive, and Fiddlers Green.

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Figure 29: Trip Distribution Peak Flow Change – Main Street / Highway 7 & Forest Hills Parkway / Highway 107 Intersection – AM and PM Peak Periods – 2031 All Development Scenario

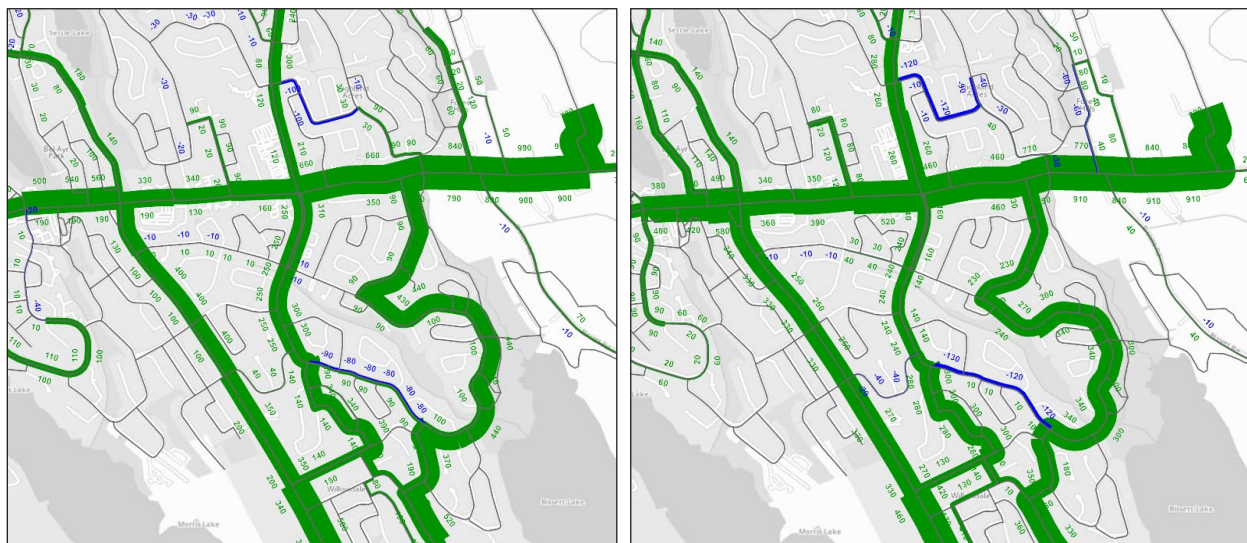


Figure 30: Trip Distribution Peak Flow Change – Cole Harbour Road & Caldwell Road / Forest Hills Parkway / Ashgrove Avenue Intersections – AM and PM Peak Periods – 2031 All Development Scenario

Likewise, the bulk of volume-to-capacity ratio increases attributable to new development occur in the Cole Harbour Road corridor and along feeder corridors to the south (**Figure 31, Figure 32**). Lesser increases take place along Main Street / Highway 7 at northern access points to the Westphal development and approaching Forest Hills Parkway / Highway 107.



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan

5 Analysis and Considerations

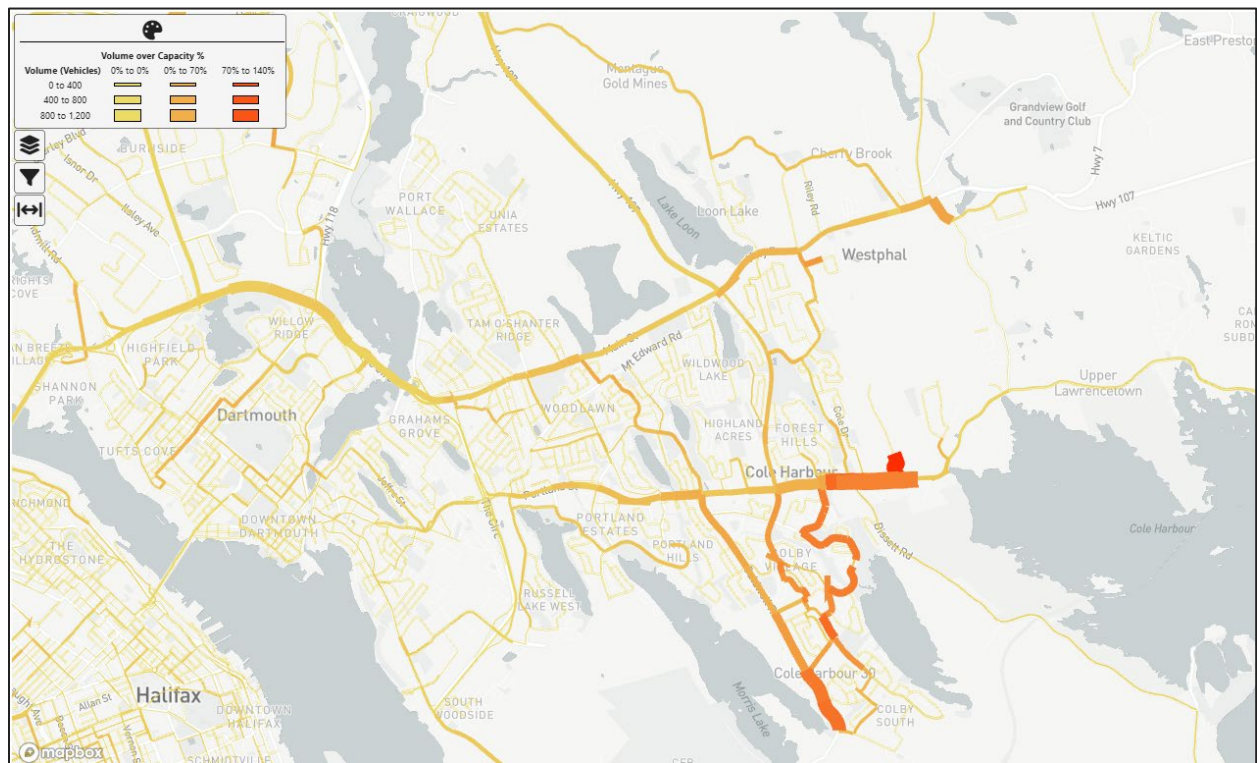


Figure 31: Volume/Capacity Ratio Change – AM Peak – 2031 All Development Scenario

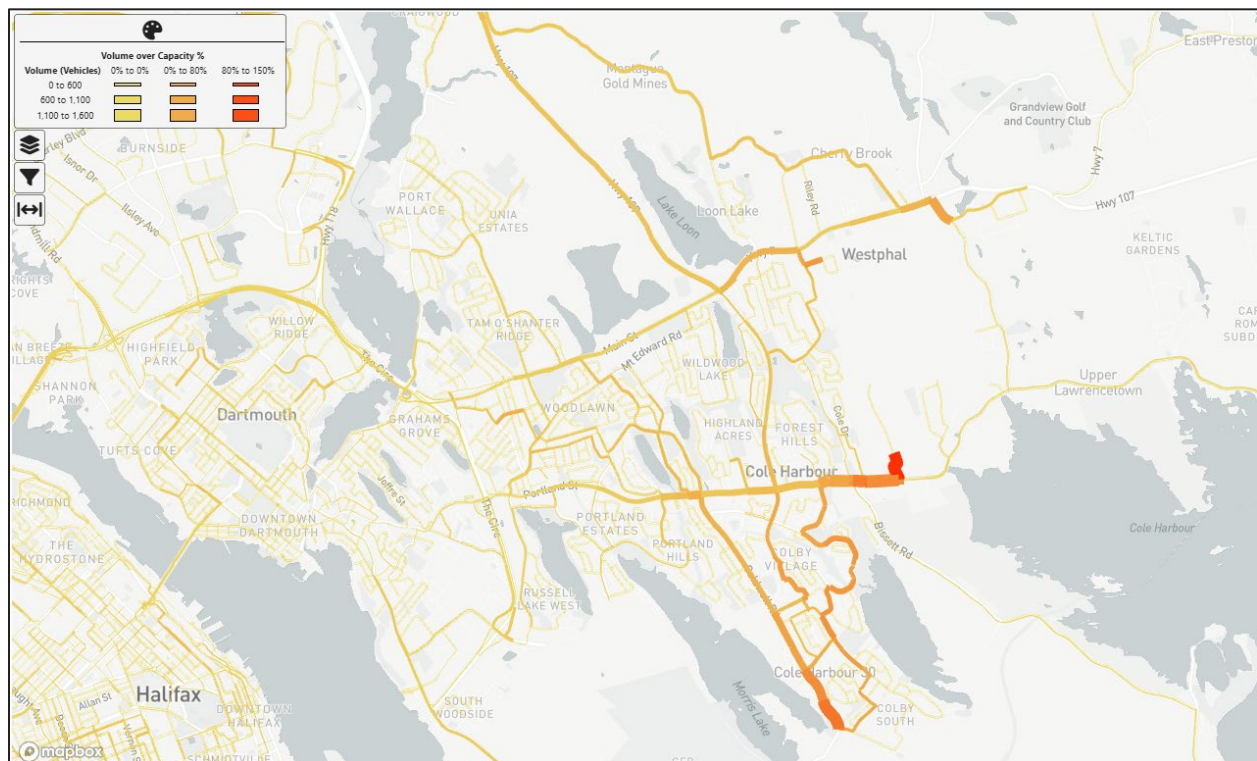


Figure 32: Volume/Capacity Ratio Change – PM Peak – 2031 All Development Scenario

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Model results predict intensification of initial issues identified by the Do Minimum scenario (**Figure 33**). Congestion worsens on previously identified primary corridors near Highway 111 as well as along Main Street / Highway 7 / Highway 107 across the northern edge of the Westphal development site. Volumes above capacity accompany the introduction of development along previously uncongested segments of Cole Harbour Road near the southern site access and segments of the Forest Hills Parkway joining the two primary corridors parallel to the western edge of the study area.

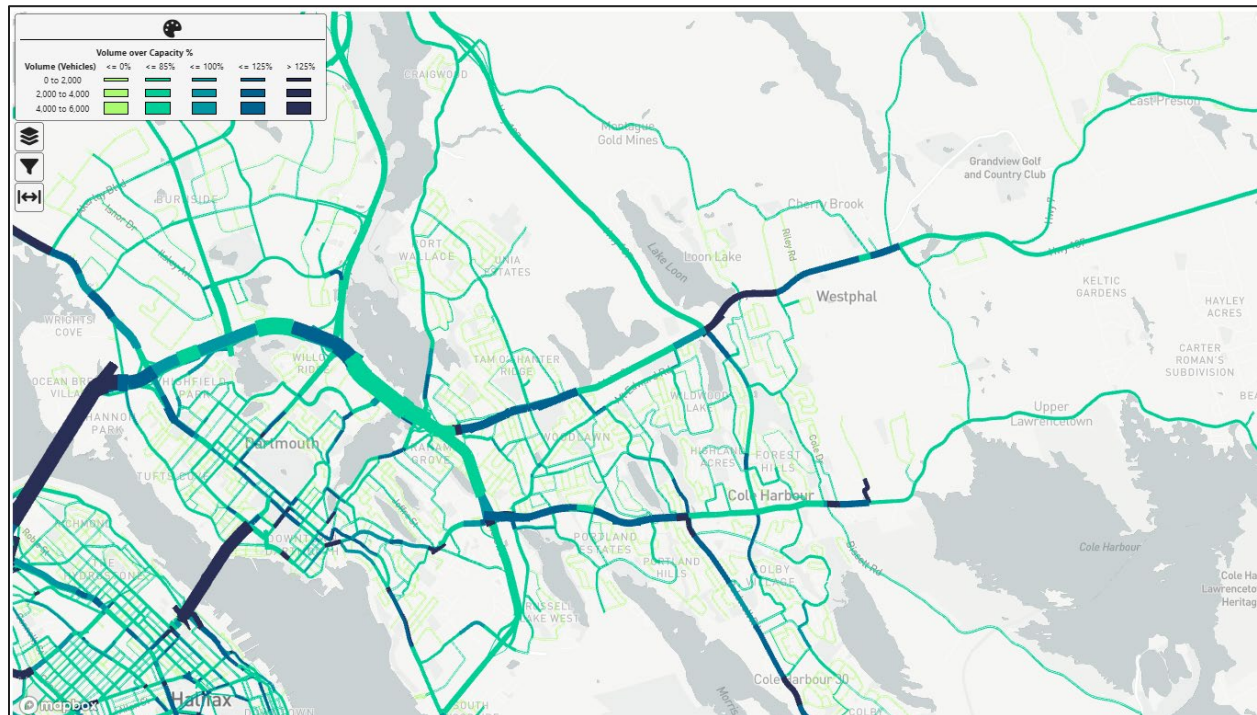


Figure 33: Volume/Capacity Ratio – PM Peak – 2031 All Development Scenario

The 2014 Regional Municipal Planning Strategy¹ and draft updates include a provincial project extending an alternate routing of Highway 107 north of Loon Lake that would rejoin the existing Highway 107 east of the Westphal development area after travelling a route that roughly parallels Montague, Lake Loon, and Cherry Brook Roads. Also known in planning literature as the Cherry Brook By-Pass, its purpose has been stated to divert traffic from Main Street and the over capacity intersection of Main Street and Forest Hills Parkway.

Predicted traffic analysis shows bi-directional demand for vehicular travel along Main Street / Highway 7 exceeding capacity by 500 to 1,100 vehicles during the peak hour, suggesting mitigation is necessary. These figures already take trip distribution from the new Westphal development into account that portrays 300 vehicles attempting to use a route similar to the Cherry Brook By-Pass during the PM peak period (**Figure 28**). The same analysis attributes 520 bi-directional trips to the new development along the section of Highway 107 parallel to Loon Lake.

¹ [Regional Plan | Halifax](#)



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan 5 Analysis and Considerations

A synthesis of these factors suggests local benefit for a Cherry Brook By-Pass project in alleviating traffic pressure immediately adjacent and attributable to the new Westphal development that exacerbates expected capacity constraints further west along Main Street prior to the introduction of new residents, commercial opportunities, and travel demands.

Noting potential complications related to land assembly, any reconsideration of alignment may consider reconnection to the existing eastern alignment of Highway 107 at a point closer to Ross Road to increase the utility of a bypass road to divert traffic generated and attracted by the Westphal development to and from points north. Final decisions require comprehensive evaluation of localized community impacts, acute and broad environmental impacts, cost of construction, and other factors.

5.2.2.5 Transit Impacts

Modelled transit ridership and capacity impacts associated with the introduction of the Westphal development indicate increases in demand originating from the development site during peak periods. Modelled transit distribution from the new development indicates that nearly all new ridership is destined to and returns from the direction of the Portland Hills Terminal and destinations further west (**Figure 34**, **Figure 35**). The transit demand model attributes approximately 100 and 170 new boardings to the study area during AM and PM Peak periods, respectively, as well as roughly 180 alightings during each peak period. Most activity is attributed to the Ross Road / Cole Harbour Road corridor connecting directly to Portland Hills Terminal. Currently this corridor hosts only a rural commuter route with weekday service limited to peak periods.



Figure 34: Projected Westphal Development Transit Trip Distribution – AM Peak



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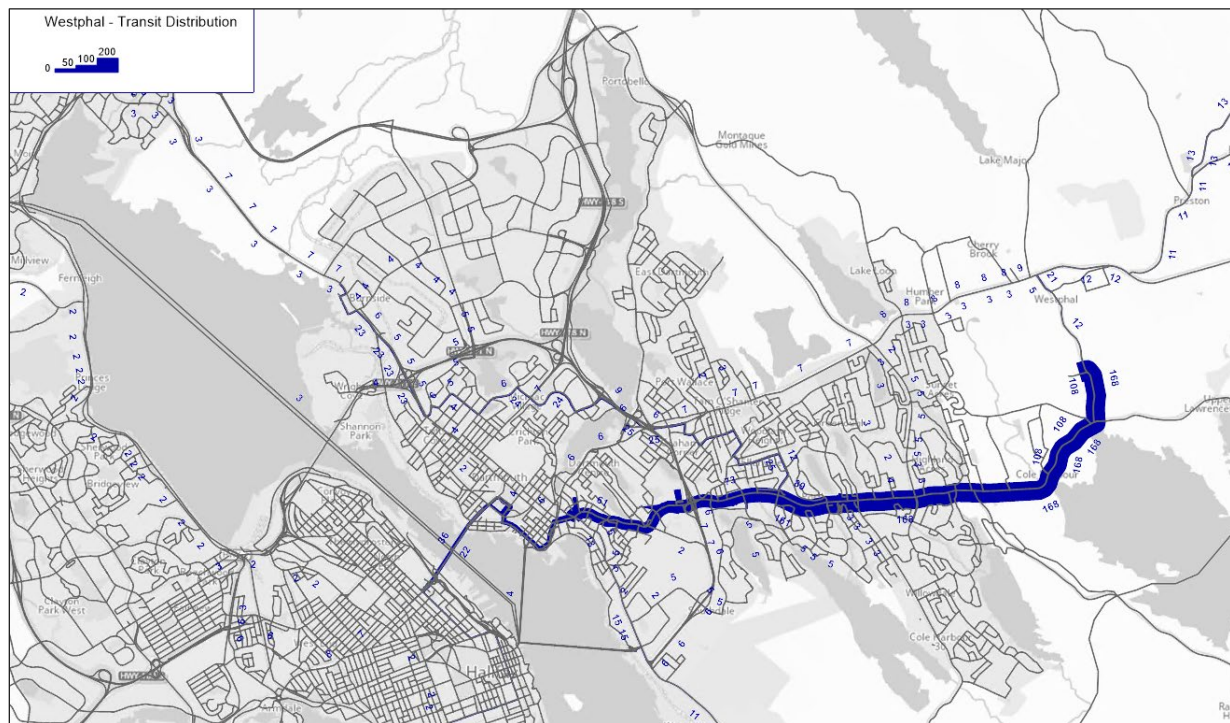


Figure 35: Projected Westphal Development Transit Trip Distribution – PM Peak

Modelled transit flow-to-capacity information for the development scenario shows a future with transit demand above capacity in the Ross Road and Cole Harbour Road corridors carrying increased demand for Route 401 (**Figure 36**). As a rural commuter route, the model's understanding of capacity for Route 401, 122 riders in each direction, is low due to relatively infrequent peak period operation.

Recommendations for any transit service increases will focus on corridor level travel demand, inclusive of all modes, rather than bus route level projections. For example, Main Street retains transit capacity versus predicted demand after absorbing anticipated increased subscription for its portions of Routes 61, 68, 161, and 168, but experiences vehicular demand stress that may be mitigated through greater transit adoption and mode share increase.

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5 Analysis and Considerations

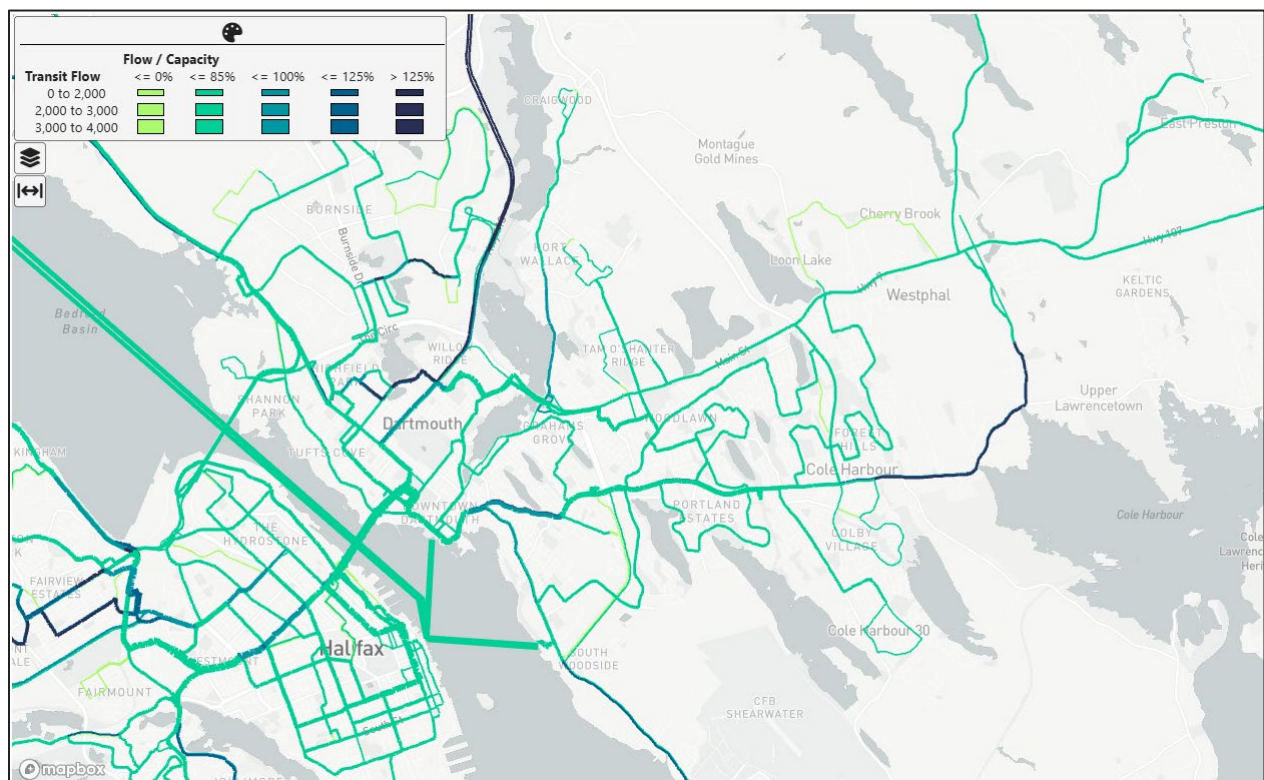


Figure 36: Transit Flow/Capacity Ratio – PM Peak – 2031 Westphal Development Scenario

5.2.2.6 Active Transportation

Within the Westphal development area, the model estimates that active mode trips (walking, cycling) comprise 25 percent of all internal trips, based on the HRM model's default algorithms and the established Place of Residence (POR) to Place of Work (POW) ratios (**Figure 22**). This approach assigns a higher proportion of internal trips to the walk mode, particularly for individuals walking to their workplace, as POW model parameters include a high level of self-contained employment within the development.

The HRM model predicts a regional mode share of 6.2 percent for walking and 0.2 percent for cycling. However, evaluation of external active transportation generated by the new development yields a lower active transportation mode share of only 5.1 percent (**Figure 21**). The modest disparity between internal and external active mode shares reflects active transportation facilities along Main Street and regional trails traversing the site as well as distances to the Cole Harbour activity centre and a lack of active transportation facilities along connecting corridors from the southern end of the development.

5.3 Compatibility with Ecology

The Halifax Green Network Plan (GNP), released in 2018, defines an interconnected open space system, highlights ecosystem functions and benefits, and outlines strategies to manage open space. The GNP applies a variety of environmental values to each area within HRM. The plan identifies **Regulated Areas** as riparian buffers, large wetlands and wetland complexes and other land protected from development by



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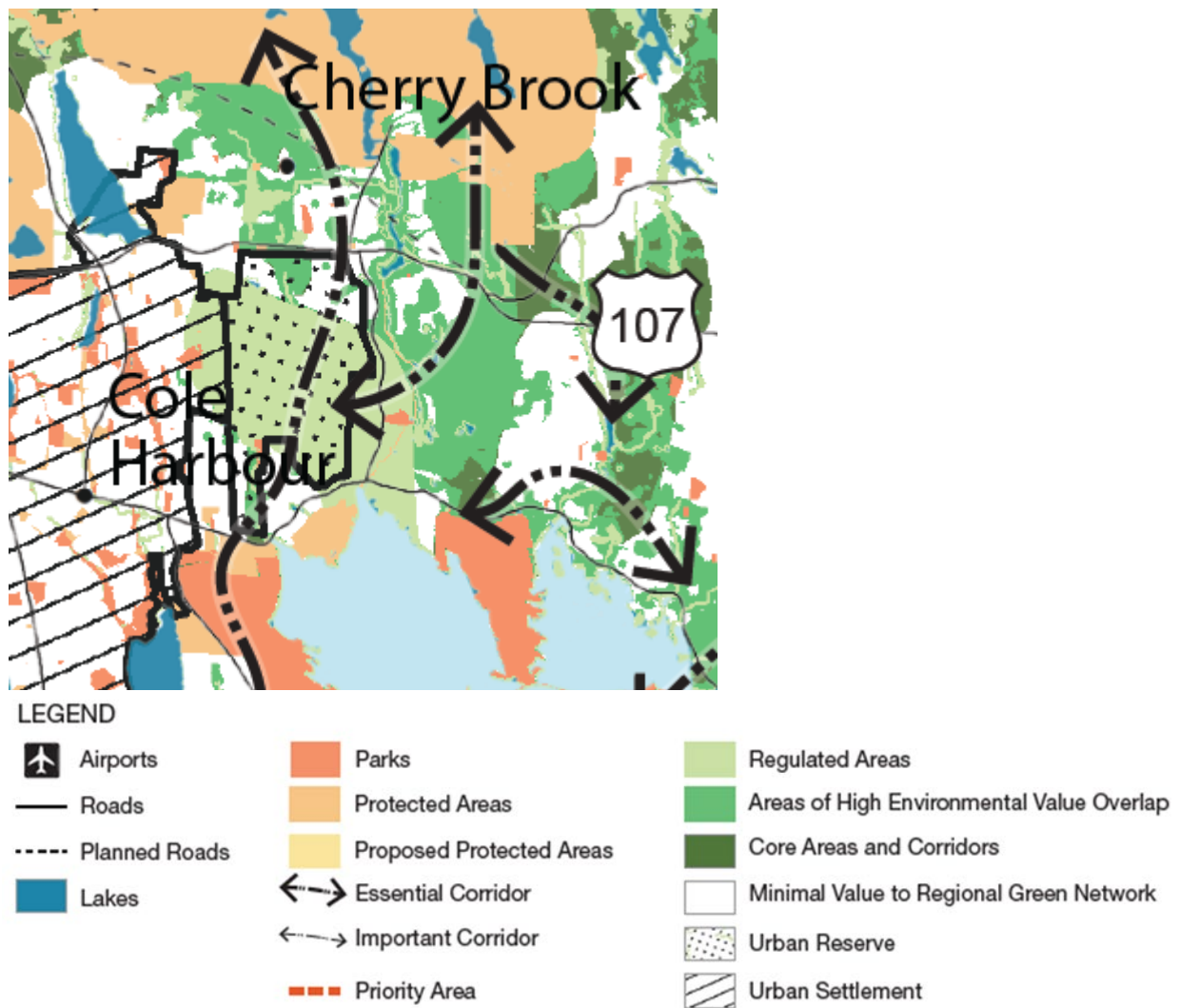
5 Analysis and Considerations

Municipal or Provincial regulations and **Areas of High Environmental Value-Overlap** as high-valued areas whose loss would have a detrimental impact on ecological integrity.

The Regional Municipal Planning Strategy's Urban Reserve designation identifies areas that may be suitable for future urban development beyond the life of the Regional Plan. While designated as Urban Reserve by the Regional Plan, the Green Network Ecology Map in the GNP (**Figure 31**) identifies majority of the Westphal development area as a Regulated Area with Areas of High Environmental Value-Overlap at the northern and southern edges.

The concept plan for the combined Westphal development shows aerial plan-level waterbodies, watercourses, and wetlands without an accompanying narrative description. The concept plan shows irregular green spaces in the eastern parcels along with areas that appear to be reserved wetlands in the southeastern corner of the combined development site. Watercourses surrounded by a wetland in the southwestern corner of the site appear to have been preserved, surrounded by a park-like buffer. Analyses identified in the Watershed Study and Stormwater Management Plan will determine the adequacy of any ecological mitigation approaches and have been noted as a qualifying factor that may impact transportation solutions pending changes to the development proposal.





Source: HRM – Halifax Green Network Plan (2018)

Figure 37: Green Network Ecology Map

6 Limitations/Qualifications

Factors persist that limit or qualify the accuracy and value of analyses performed to date. As discussed previously regarding future connectivity analyses, future commercial and service offerings available within or near the development site change the perception of access for new development residents and are not precisely captured in available concept plans and impact analyses.

The planned extent and quality of the pedestrian and cycling networks within proposed developments is unknown at this time. Beyond what appear to trails largely mirroring trails currently present on the undeveloped site, network analyses depend on understanding all pedestrian and bicycle access options. The location of all sidewalks and walking paths should be known to ensure accuracy in connectivity analyses based on trip distance. Additionally, clarity is lacking regarding facility type and right-of-way preservation for existing trail corridors that appear in concept plans as candidates for conversion to primary access corridors for residential buildings.

Available transportation impact studies do not comprehensively assess the scope and configuration of contemporary concept plans. The primary traffic impact analysis references an out-of-date development program that is orders of magnitude smaller in scope for its initial trip generation estimates. This same analysis only assesses access points to the study area along Main Street as eastern, western, and southern access to a larger development area had not yet been proposed.

6.1 Transportation Modelling

Junction delay was not simulated within the Joint Regional Transportation Simulator. While the model provides valuable data on link-level metrics, such as mid link volume-to-capacity ratios and travel demand distribution, it does not capture delays at intersections, particularly at signalized junctions. The absence of junction-level analysis means that the full extent of congestion, and its impact on network performance, are not reflected in the results. Thus, while general traffic patterns and transit demands can be assessed, the localized impacts of high-traffic intersections – key areas for congestion – may be underestimated.

The proximity of the Westphal and Morris Lake development sites yields overlapping modelled travel demand impacts, especially along the Cole Harbour Road / Portland Street corridor. Additionally, the combination of simultaneous transit demand contributions of all Future Serviced Communities development sites uncovers certain limitations in accurately capturing route-level changes in transit demand. The aggregated system-wide impact of multiple new large population concentrations may dilute the visibility of localized fluctuations from baseline conditions against wider model sensitivity that considers complete route lengths and the broader transit system.

6.2 Impact of Other Assessments

Parallel accompanying reports tasked with assessing development suitability based on environmental and servicing factors may impact the future scale of development as well as the provision and alignment of transportation infrastructure. Regulated constraints for development may result in modified development plans and thus, modified transportation recommendations.



Halifax Regional Municipality Future Serviced Communities – Westphal Transportation Plan

6 Limitations/Qualifications

- Land suitability analysis identifies which portions of the Study Area are most suitable for new community development based on an assessment of wetlands, watercourses, water quality, forest habitat, species-at-risk, surficial and bedrock geology, topography, contaminated sites, and areas of cultural significance. Combined concepts plans describe development in lands considered of low suitability for development, especially parcels controlled by Annada Properties Limited.
- The Westphal Development Servicing Scenario report recommends reassessment of the level of service and distribution system requirements and consideration of sizing and placement of regional water infrastructure during subsequent design stages. It also recommends that the proposed development be incorporated in an all-pipe hydraulic model to perform a more refined fire flow level of service assessment.
- The Watershed Study and Stormwater Management Study noted increased contaminant loading compared to existing conditions, linking the greatest impact to developed area and total population. Implementation of structural Low-Intensity Development measures would be expected to reduce contaminant loads for the development area. Centralized wastewater treatment should be considered to reduce phosphorous loads in wastewater systems. Overall recommendations follow a no-net increase of loading approach prepared by Hutchinson Environmental Sciences for HRM in 2014.
- The stormwater management analysis recommends revising conceptual development plans to accommodate existing watercourses and wetlands, unless otherwise specified in future environmental assessments. It suggests completing flow monitoring in the watercourses to confirm regulatory floodplain limits and prohibiting active development within the 100-year regulatory floodplain, with some reduced-risk exceptions in agreement with HRM by-laws and the Nova Scotia Statement of Provincial Interest, subject to design considerations that mitigate the impact on the floodplain and riparian corridor. A detailed geotechnical investigation is recommended at the detailed design stage, and the feasibility of implementing an additional stormwater management pond should be investigated. The analysis also advises revising land use distribution to increase high-density uses and reduce development footprints, ensuring stormwater management ponds are located outside the 100-year floodplain and/or delineated wetlands, and starting future development phasing in higher areas outside the identified preliminary floodplain. Additionally, it emphasizes prioritizing the retention of native and existing ground cover to preserve ecosystem service function and reduce runoff discharged into watercourses.



7 Conclusions and Recommendations

7.1 Conclusions

The Westphal development, like all Future Serviced Communities, should prioritize the creation of a well-connected multimodal and complete community to ensure its success. Our connectivity analysis has highlighted the necessity for a more integrated and cohesive community structure in terms of co-located daily needs. Embracing the principles of a complete community, which includes an idealized ratio of residential spaces, commercial spaces, and sustainable transportation modes will be necessary to realize a functional development that reduces the transportation burden of its residents. Macro level connectivity data demonstrates that if key destinations are not located within the new development or connected by frequent and rapid transit, a significant portion of the new population will be unable to access essential services on foot or by public transit within 30 minutes. Current conceptual plans include a low amount of commercial space relative to residential units, though proximity to Cole Harbour commercial, educational, and community centres present opportunities to integrate additional destinations through transportation facility design and enhancement.

A deeper understanding of detailed development plans, particularly regarding the inclusion of commercial services, is of primary importance for accurately assessing the environmental and social impacts related to transportation access. Our connectivity analysis further showed that access issues can be mitigated from either the land use or transportation planning perspective. Incorporating shopping, entertainment, and basic healthcare options within the commercial areas of the proposed development reduces the average active transportation travel time for new residents to reach common destinations. Strategic land use and siting decisions not only bring daily destinations closer to the community, but also reinforce the value of local active transportation networks for short trips. Furthermore, a comprehensive understanding of vehicle parking, including inventory and utilization management, impermeable surface quantification, and an electric vehicle charging program have implications for achieving mode share targets and mitigating environmental impacts. Additional site plan detail also facilitates the evaluation of opportunities to efficiently implement shared mobility services. Micromobility options such as scooters, cargo bikes, golf carts, and shared car services not only provide localized access for neighbourhood residents, but also extend access and connectivity to and from adjacent neighbourhoods without requiring personal vehicle ownership.

Travel modelling indicates that the Volume-to-Capacity ratio on segments of Main Street, Portland Street, and the Forest Hills Parkway will exceed 100 percent by 2031, characterized by severe congestion before the Westphal development is introduced. Mitigation measures should ideally be implemented before or in parallel with the development of the study area to mitigate further negative effects of congestion. Upon buildout of the Westphal development, sections of the Forest Hills Parkway and Cole Harbour Road demonstrate comparable levels of congestion in the absence of modifications to transportation facilities and mobility services.

Modelling further indicates that the proposed BRT Red Line has a role to play in contributing to the handling of increased travel demand in the Portland Street / Cole Harbour Road corridor. While transit services in the area near the Westphal development are projected to absorb most incremental transit



demand with the exception of routes currently only served by commuter service, transit service increases and potential extension of the BRT system eastward are necessary to alleviate overall travel demand pressure from new development sites.

Effective on-site transit routing is equally important to increase adoption of transit by residents of new development and requires that developers determine and specify the right-of-way dimensions of proposed internal roadways. Primary corridors should be conceived and aligned to ensure that all new residents live within 400-metres, or a five-minute walk, of a transit stop. Connectivity analysis outputs indicate that without bus service more closely servicing the development, the average time required to access public transportation will exceed 10 minutes.

Further, while denser multi-unit residential buildings are distributed evenly between the Kiel, Akoma, and Annada portions of the combined development site, concept plans site a proposed transit terminal at the northeast corner of the Kiel lands. As people accessing transit generally limit the distance they are willing to walk to reach bus service, alternative siting for the transit terminal further west and more central within the population distribution of the development should be considered as site plans are refined.

The typologies of active transportation facilities suggested by development concept plans should be clarified and supported through any roadway intersections with protected design features. Further, concept plans do not describe active transportation facilities slated for local roads, which leaves a gap at the point of origin and destination for all trips. Future plans should include greater detail related to any on-street bicycle facility, sidewalk, and other pedestrian path routing.

While the Main Street / Highway 7 corridor along the northern edge of the development area currently features dedicated facilities for people both walking and cycling, creating external active travel connections from the development area to activity centre at Cole Harbour Road and Forest Hills Parkway would be highly beneficial. These connections could link the internal active travel infrastructure within the development to nearby destinations to support the usefulness of active transportation mode choices.

7.2 Recommendations

The needs summarized in the conclusions correspond to specific transportation infrastructure and service implementation recommendations. Transportation corridors that carry general traffic and transit vehicles, parallel active transportation opportunities, and intersections expected to experience significant increases in use form a sub-network of routes and nodes that require enhancements (**Figure 38**). Class E construction cost estimates attempt to associate a preliminary, directionally accurate cost with recommendations as a function of corridor segment length, transit operating cost, or figures previously cited by other planning efforts (**Figure 39**).

As compound factors due to the proximity of the Westphal and Morris Lake developments have been previously identified through transportation demand modelling, the Morris Lake Transportation Plan restates recommendations related to traffic impact mitigation and transit service increases for the Portland Street / Cole Harbour Road corridor, but does not imply duplication of actions and associated costs. The Westphal Transportation Plan otherwise limits facility and service recommendations to locations north of Cole Harbour Road / Portland Street.



7.2.1 ROADWAYS

Noting that current policy direction encourages investment in sustainable modes rather than additional vehicle capacity, automobile transportation system needs persist in the area of the Westphal development site based on the magnitude of predicted transportation network capacity stress. HRM may opt for an approach that leans more heavily on other enhancements to person throughput. Additionally, physical constraints may preclude the addition of general purpose or transit priority lanes.

As modelling is link-based rather than based on intersection analysis, the extents of required capacity upgrades given in the recommendation summary table are broad. With or without the Westphal development, predicted congestion is particularly visible along Main Street / Highway 7 adjacent to the study area leading to the intersection with the Forest Hills Parkway, which similarly experiences volumes exceeding capacity immediately south of that intersection. Further west along Main Street / Highway 7, beyond Topsail and Lemont Lakes and nearing Highway 111, analysis shows volume nearing or exceeding capacity with the forecast background increase in overall regional population. As the Main Street / Highway 7 corridor already possesses two general traffic lanes in each direction along its entire length to the eastern edge of the Westphal development, redesignation of lane purpose or periodic transit priority measures may be a more practical intervention than the addition of any conventional traffic capacity.

Analysis of modelled travel demand suggests that the proposed Cherry Brook By-Pass, included in the 2014 Regional Municipal Planning Strategy and draft updates as a potential future provincial connective project, possesses benefit and ability to divert traffic from Main Street and the over capacity intersection of Main Street and Forest Hills Drive. Such a project has potential to alleviate traffic pressure immediately adjacent and attributable to the new Westphal development that exacerbates baseline expected capacity constraints along Main Street. Final decisions, which may consider repositioning of the eastern terminus of the bypass, require in-depth evaluation of environmental, community, and fiscal impacts.

Modelling additionally shows heavy congestion in a non-development baseline scenario along Portland Street / Highway 207 from the area near the Portland Hills Terminal west to Highway 111, coinciding with the planned Red Line BRT route, whose 10-minute frequency will provide the person moving capacity needed to absorb vehicular demand above capacity.

Introduction of the development intensifies capacity constraints on previously named corridors in addition to creating new capacity bottlenecks along Forest Hills Parkway and Cole Harbour Road closer to southern access roadways to the Westphal development. These roadway segments possess more flexibility to add width and/or undertake right-of-way reprioritization.

7.2.2 TRANSIT

As proposed, the BRT Red Line would terminate at Portland Hills Terminal, south and west of the Westphal development area, along a corridor identified to experience heavy traffic congestion in background projections. Thus, the Westphal development does not directly contribute to the justification to build initial BRT lines. Extending the BRT Red Line east to Forest Hills Parkway would align the Red Line terminus with nodes expected to experience heavy travel demand contributions from both the Westphal and Morris Lake Future Serviced Communities.



In addition to the introduction and any possible extension of BRT routes, an increase in regular bus frequency and implementation of transit priority measures along Main Street / Highway 7 (current Routes 61, 68, 161, 168) and Cole Harbour Road (Current Route 401) represents an alternative solution to accommodate the anticipated increase in general travel demand. If physical constraints and/or policy constraints preclude the addition of general-purpose travel lanes, high level analysis informs the level of transit service necessary to deliver a major mode shift from vehicle drivers to bus passengers. Combining traffic and transit demand as well as traffic and transit capacity at the corridor level allows for a more holistic determination of transportation needs.

Analysis finds comparable additional transit service requirements needs along the Main Street / Highway 7 corridor between the Westphal development and Highway 111 as well as the Cole Harbour Road corridor between the Westphal development and Portland Hills Terminal or any future terminus of the Red Line BRT. Preliminary analysis related to the Forest Hills Parkway corridor reveals that current bus service levels along that corridor provide sufficient capacity to accommodate modal shift from modelled vehicular traffic demand to transit ridership where modelling predicts vehicular congestion.

Absorbing the 2031 combined development scenario travel demand volume over capacity in the Main Street / Highway 7 corridor would require 3-4 additional buses during the AM peak hour, 6-7 additional buses during the PM peak hour, and 3 additional buses per hour during non-peak periods. Likewise, the southern and eastern development transit access along the Cole Harbour Road / Ross Road corridor, or a routing through the development, requires 3 additional buses during the AM peak hour, 6-7 additional buses during the PM peak hour, and 2-3 additional buses per hour during non-peak periods.

The range of added bus needs is based on occupancy per bus of either 40 or 50 passengers. Also note that this calculation does not apply a factor to adjust for the average number of people per vehicle. It effectively and conservatively treats each vehicle as containing only a driver in terms of its contribution to transit demand. Further, the calculations only attempt to reduce the V/C ratio to 1, which remains a severely congested condition.

7.2.3 ACTIVE TRANSPORTATION

Consistent with the Active Transportation Priorities Plan (ATPP), the study team identified a need for active transportation enhancements in the Cole Harbour Road corridor. In addition, the plan calls for bicycle lanes or a paved shoulder along the entire extent of Ross Road. As facilities along these corridors would be geared toward transportation functions more so than recreation, dedicated bicycle facilities are preferred to multi-use paths. The ideal bicycle facility for such corridors would be a uni-directional cycle track, a bike lane raised and curb separated from the roadway, parallel to, but separate from the pedestrian sidewalk. Technical and practical considerations related to curb/sidewalk presence and other right-of-way reassignment factors may dictate alternate facility type selection.

To better serve people walking, sidewalks along Cole Harbour Road should be extended to primary southern accesses of the new development. As is it likely to split primary southern access between Ritcey Crescent and the Coleridge Court / Old Miller Road corridor, pedestrian facilities should be added along those roadways. As roadway traffic volumes are better understood, primary access roadways should also feature dedicated cycling facilities to link apparent paths in concept plans to new facilities along Cole Harbour Road.



7.2.4 SHARED MOBILITY

Major new development should properly site a mobility hub to serve as a transportation anchor in a new community and offer a safe, comfortable, convenient, and accessible space to seamlessly transfer between different travel modes. Costs of mobility hubs are highly variable dependent on amenities provided and modes accommodated. Potential co-location at a commercial or transit centre within this and other Future Serviced Community development sites can centrally provide a mix of transportation options to users to reduce car dependence for internal trips within new neighbourhoods.

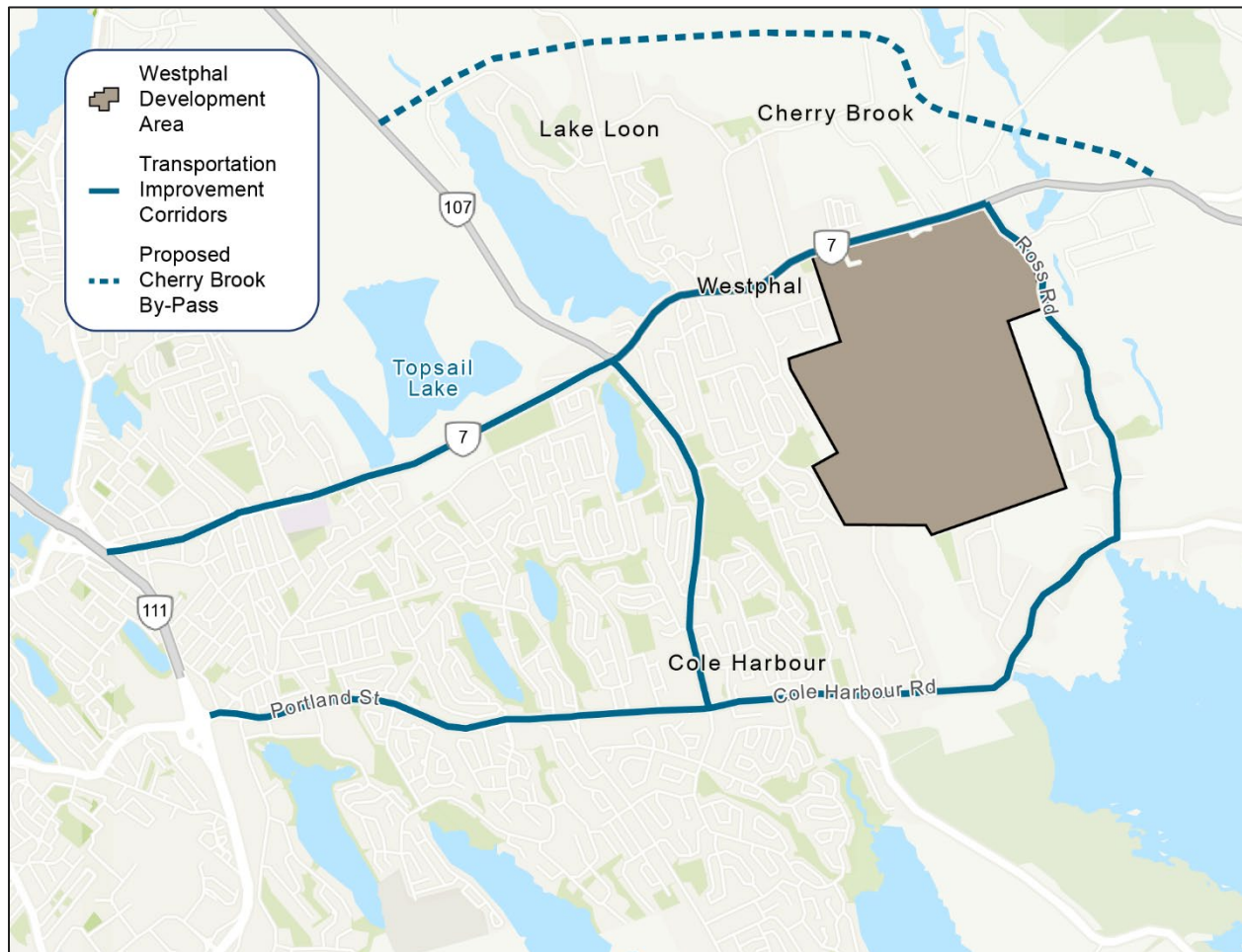


Figure 38: Spatial Recommendation Representation

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Facility/ Service	Baseline 2031 Improvements	Class E Construction Cost Estimate	Development- Specific Improvements	Class E Construction Cost Estimate
Roadway Infrastructure				
Cherry Brook By-Pass			Identified provincial initiative within Regional Municipal Planning Strategy	Requires further scoping
Portland Street	Construction of initial Red Line BRT to Portland Hills Terminal Extension of Red Line BRT from Portland Hills Terminal to Forest Hills Parkway	Scoped per the 2020 Rapid Transit Strategy \$0.48 million (station) \$2.18 million (1.3 km transit priority lanes and intersection enhancements) \$0.74 million annual (operating)²		
Cole Harbour Road			Increased person movement capacity from Bissett Road to Coleridge Court	Potential lane additions – \$5.14 million based on \$3,835,000 per linear kilometre
Main Street / Highway 7	Lane reallocation to transit priority from Highway 111 to Ross Road	Requires further scoping related to signalization in addition to pavement marking		

² [Rapid Transit Strategy - Final - May 2020.pdf](#)



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Facility/ Service	Baseline 2031 Improvements	Class E Construction Cost Estimate	Development- Specific Improvements	Class E Construction Cost Estimate
Forest Hills Parkway			Increased person movement capacity from Main Street / Highway 7 to Cole Harbour Road	Potential lane additions – \$10.35 million based on \$3,835,000 per linear kilometre
Transit				
Main Street / Highway 7			3-4 additional buses per hour during a.m. peak period 6-7 additional buses per hour during p.m. peak period 3 additional buses per hour before, after, between peaks.	\$1.54-1.60 million annual based on \$100.85 operating cost per hour for new service
Cole Harbour Road			3 additional buses per hour during a.m. peak period 6-7 additional buses per hour during p.m. peak period 2-3 additional buses per hour before, after, between peaks.	\$1.11-1.58 million annual based on \$100.85 operating cost per hour for new service
Development Site Primary Corridor(s)			Routing through the development site + stops.	Pending future detailed transit analysis



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Facility/ Service	Baseline 2031 Improvements	Class E Construction Cost Estimate	Development- Specific Improvements	Class E Construction Cost Estimate
Active Transportation				
Ross Road			Bicycle lanes/paved shoulders from Main Street / Highway 7 to Cole Harbour Road	\$988,000 - \$1,126,000 dependent on level of pavement marking and paved buffer area
Cole Harbour Road			Bicycle lanes from Ross Road to Coleridge Court	\$40,000 for signs, pavement markings in existing paved shoulders
			Paired one-way cycle tracks from Ross Road to Bissett Road	\$1,085,000 excluding design and signal modifications
			Sidewalk from Morash Drive to Coleridge Court	482,000 based on 1.8m width, site prep, minor drainage modification
Ritcey Crescent			Sidewalks Bicycle Lanes From Westphal development access to Cole Harbour Road	\$602,000 based on 1.8m sidewalk width, site prep, minor drainage modification \$476,000 assumes road reconstruction required for added pavement width



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Facility/ Service	Baseline 2031 Improvements	Class E Construction Cost Estimate	Development- Specific Improvements	Class E Construction Cost Estimate
Old Miller Road / Coleridge Court			Sidewalks Bicycle Lanes From Westphal development access to Cole Harbour Road	\$463,000 based on 1.8m sidewalk width, site prep, minor drainage modification \$366,000 assumes road reconstruction required for added pavement width

Figure 39: Recommendation and High-Level Cost Estimate Summary Table



7.3 Follow-On Work Required

To adequately meet the mobility study goals of the Future Serviced Communities initiative, HRM and study area developers must perform further investigations, analysis, and planning. The Westphal development, due primarily to its distance from existing commercial, educational, and civic destinations, is expected to demonstrate a personal vehicle orientation. While modelling indicates that the new development is likely to nearly meet the Integrated Mobility Plan's grouped active transportation mode goals, this largely due to a larger anticipated percentage of people walking than people taking transit and potential overstatement of internal trips to commercial destinations. Additional efforts may be necessary to achieve the objectives of HRM policies supporting individual sustainable transportation modes, especially transit use for external trips.

- Connectivity analyses will require repetition as different assumptions, especially the inclusion of specific uses and destinations on site, become more concrete. These analyses should consider the distribution of residents throughout the development area and the cumulative effects of new commercial development in tandem with the existing commercial portions of nearby activity centres.
- To fully understand traffic volume and congestion mitigation needs, supplementary analysis focusing on junction performance is necessary to ensure a more complete assessment of network impacts and potential bottlenecks. Additionally, transportation impact study should be revisited that includes the most recent combined development concept plan housing and commercial space estimates.
- More detailed transit demand modelling is required to more accurately predict transit mode share of the new development, the associated increased demand for service adjacent to the study area, and capacity needs for an on-site route. Needed adjustments relate to the physical arrangement of residential development and inclusion of an example route travelling along primary corridors within the development that provides proximate access for all new residents. Using a more detailed development plan, determine ideal on-site routing, stop siting, and potential terminal siting for high quality transit service and other micromobility that links to regional destinations.
- Current concept plans do not describe bicycle or pedestrian facilities slated for local roads and intra-development connections, which contributes to difficulties in routing and siting other transportation enhancements. Future plans should explicitly include intended pedestrian and bicycle circulation pathways.