

City of Hamilton
Airport Employment Growth District

*Transportation Master Plan
Implementation Update*



December 2016

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1.0 INTRODUCTION

On February 17th, 2015, the Ontario Municipal Board (OMB) approved the Airport Employment Growth District (AEGD) Secondary Plan (Appendix 24 of the Urban Hamilton Official Plan) which was based on the Minutes of Settlement signed by the City of Hamilton, Silvestri Investments, Twenty Road West Landowners Group, and Craig Smith.

The approved Secondary Plan included revised Land Use Schedule showing lands subject to the Secondary Plan which were added to the City of Hamilton Urban Boundary. Compared to the initial Secondary Plan Land Use approved by Council in 2010, there are four notable geographic differences:

- Addition of land west of Highway 6 and east of Fiddler's Green Road;
- Addition of lands south of Book Road East, and west of Smith Road;
- Removal of Silvestri lands (south of Garner Road East, north of the Utility Corridor, and west of Smith Road); and
- Removal of Twenty Road West lands (east of Glancaster Road, South of Twenty Road West, and North of Dickenson Road West) while maintaining a Garth Street Corridor.

The newly approved Secondary Plan will affect the future needs of the transportation system. The purpose of the updated transportation analysis is to confirm the ultimate network recommendations and the potential change in timing and priorities of improvements and service provisions required to accommodate the new land use configuration.

2.0 2011 AEGD TRANSPORTATION MASTER PLAN

In June of 2011, Dillon completed a comprehensive Transportation Master Plan for the AEGD (based on the original land use as identified in Figure 5 of the 2011 AEGD TMP). There were a number of Part II orders received by the City and the Ministry of Environment and Climate Change during the 30 day review period for the Class EA and as a result, the schedules of two projects (Dickenson Road Extension and New Collector 7E Roadway) were changed from Schedule B to Schedule C.

Overall, the specific objectives of the 2011 Transportation Master Plan included:

- Preparing a transportation strategy that supports development of the AEGD;
- Identifying problems or opportunities and related alternative solutions to transportation issues anticipated for a 2031 horizon;
- Identifying and protecting future transportation corridors;
- Integrating policies, programs, funding and infrastructure needs;
- Identifying preliminary cost estimates for transportation infrastructure improvement projects; and

- Developing a Transportation Master Plan for the AEGD to satisfy Phases 1 and 2 of the Municipal Class Environmental Assessment process.

As a result of the analysis and assessment undertaken at the time, a number of infrastructure and service improvements were necessary to achieve the preferred road network alternative. Network recommendations were identified within the study area for:

- Infrastructure including:
 - New and expanded roadways;
 - Typical cross-sections;
 - “Greenway” provisions;
 - Roadway improvements; and
 - Other transportation-related infrastructure (e.g. Employment Supportive Centres and integrated transit facilities, cycling lanes, and a pedestrian and trails network);
- Transit recommendations identified the development of local and regional transit initiatives to provide high quality service to the AEGD area;
- Transportation Demand Management (TDM) measures and guidelines were recommended for the AEGD. Cycling/Pedestrian/Trails networks were developed to provide multi-modal connections throughout the AEGD; and
- Potential Truck Routes were identified based on the need for goods movement between the study area and major goods movement destinations. These findings were consistent with those of the City’s Truck Route Master Plan.

In particular, where relevant and significant, City documents that guided the development of the original TMP and this update included:

- City-wide Transportation Master Plan (2007) and Update;
- Cycling Master Plan – Shifting Gears (2009);
- Truck Route Master Plan Study Final Report (April 2010);
- Transit Oriented Development Guidelines for Hamilton (August 2010);
- Pedestrian Mobility Plan – Step Forward (December 2012);
- Rapid Ready – Expanding Mobility Choices in Hamilton (February 2013);
- Multi-year Accessibility Plan (2013 to 2017);
- Transit Bus Stop Accessibility Criteria and Guidelines (January 2014);
- Ten Year Local Transit Strategy (2015 to 2024);
- Transportation Demand Management for Development (June 2015);
- Co-ordinated Street Furniture Guidelines (August 2015); and
- Recreation Trails Master Plan (May 2016);

The following sections describe the updates made to the transportation assessment to reflect the long-term land use change, and the implications of these changes to the recommended transportation network plan.

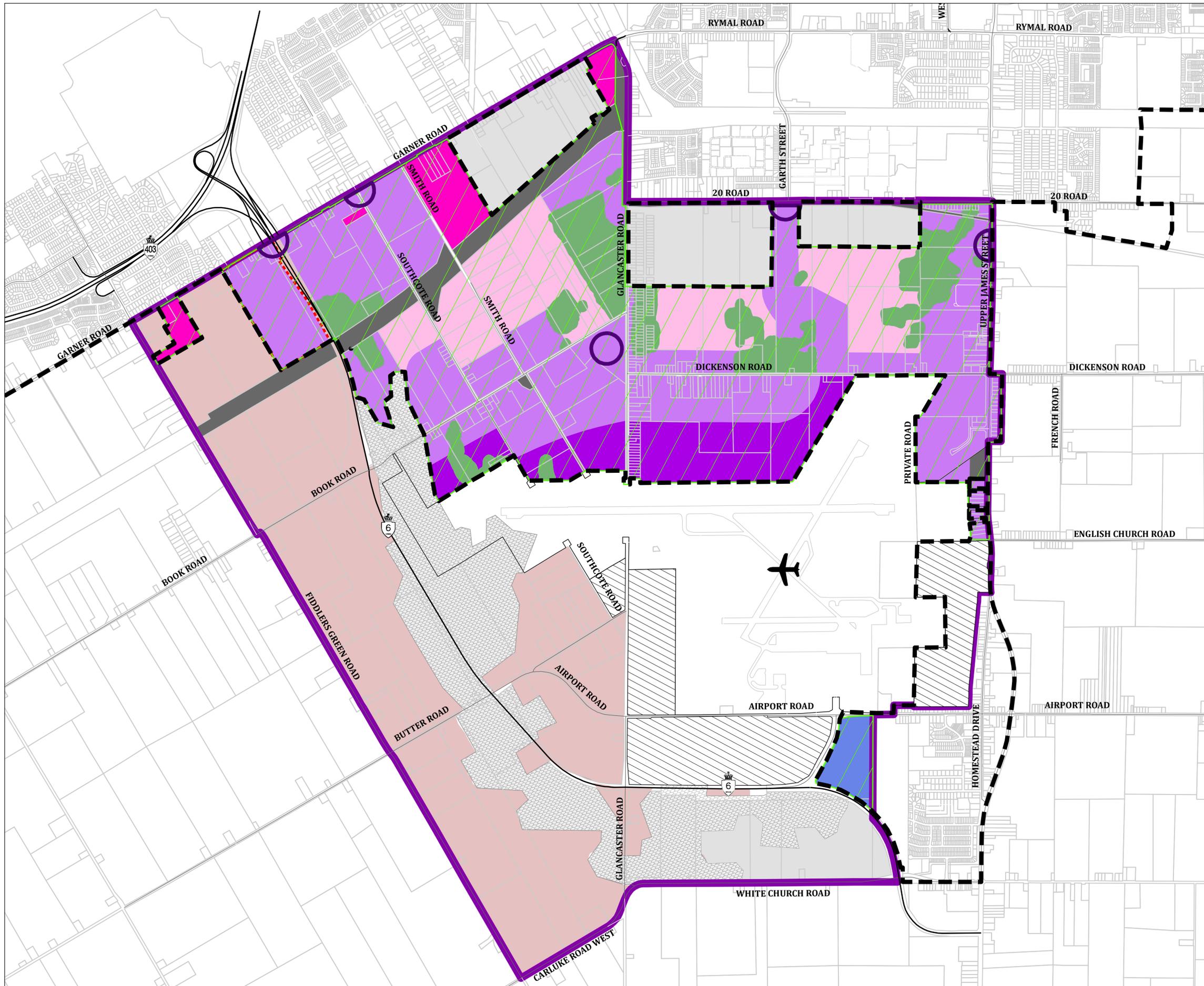
3.0 LAND USE AND TRIP GENERATION

In 2015 a settlement was reached at the OMB between the City and the development community that allowed for the Secondary Plan to be finalized and approved. The settlement included study area land use changes that affected the trip generation calculations. This memo provides an update to the Transportation Master Plan that reflects the impacts of changes to the land uses and configuration of the AEGD.

Figure 1 identifies the preferred land use used for this update based on the settlement at the OMB.

In determining the employment levels in the revised areas, assumptions from the original AEGD analysis were carried forward along with some minor tweaks as follows:

- Net land use area represents 80% of the identified gross land use area;
- Employment densities; and
- New institutional densities of 11 people per hectare were provided by City.



Land Use Designations

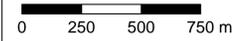
- Airside Industrial
- Airport Related Business
- Airport Light Industrial
- Airport Prestige Business
- Institutional
- Natural Open Space
- Utility
- Airport Reserve

Other Features

- Employment Supportive Centre
- + John C. Munro Hamilton International Airport
- Greenbelt Natural Heritage System
- Secondary Plan Area
- Additional Study Area
- Lands Subject to Rural Hamilton Official Plan
- Urban Boundary
- Airport Employment Growth District Study Boundary

Figure 1
Airport Employment Growth District
 AEGD Final Approved Land Use









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Planning and Economic Development Department

Table 1 summarizes the employment calculations for the subject lands.

Table 1: Employee Forecasts

	Area of Land		Distribution of Land	Employment Density		Total Employment (Target)
	Net Ha	Net Acre		Emp / Net Ha	Emp / Net Acre	
Airside Industrial	87	215	12.6%	36	15	3,132
Airport Related Business	16	40	2.3%	81	33	1,299
Airport Light Industrial	150	371	21.7%	23	9	3,451
Airport Prestige Business	398	983	57.5%	39	16	15,509
Institutional (Church)	8	20	1.2%	11	4	91
Institutional (College)	25	61	3.6%	11	4	270
Institutional (Secondary School)	8	20	1.2%	11	4	90
TOTAL	692	1,709	100.0%	-	-	23,843

These employment values were used to recalculate the number of trips for the subject lands, using the following methodology:

- ITE Trip Generation Manual, 7th Edition rates were used for consistency with previous analysis;
- Trip generations were calculated from employment numbers from AEGD assumed densities;
- Adjustments were made to trip generation rates to account for mode share targets set by the City;
- Additional trip generation rates were added based on an employment density of 11 employees per net hectare for institutional land uses as provided by the City; and
- Phase 1 and 2 trip generation outputs were used as input to Emme model. As an AM peak hour model, rates were only calculated for the AM peak hour.

Table 2 provides an overview of the trip generation by Hamilton Traffic Analysis Zone.

Table 2: TAZ Trip Generation

Zone Number	Area Description	Net Area (Ha)			Employment			AM Peak Hour Trips				AM Peak Total	
		Phase 1	Phase 2	Total	Phase 1	Phase 2	Total	Phase 1		Phase 2		In	Out
								In	Out	In	Out		
101	Garner West	7.25	0.00	7.25	80	0	80	6	5	0	0	6	5
102	Garner East	0.00	32.78	32.78	0	1,279	1,279	0	0	428	56	428	56
104	Southcote Northwest	41.86	0.00	41.86	1,605	0	1,605	535	71	0	0	535	71
105	Southcote Southwest	0.00	41.37	41.37	0	1,438	1,438	0	0	490	89	490	89
106	Airport West	0.00	17.00	17.00	0	636	636	0	0	399	189	399	189
108	Southcote Northeast	8.19	24.58	32.78	90	270	361	229	93	183	183	411	276
109	Southcote Southeast	0.00	56.63	56.63	0	1,484	1,484	0	0	532	173	532	173
110	Book Airport	0.00	13.59	13.59	0	461	461	0	0	158	31	158	31
111	Airport Northwest	0.00	63.39	63.39	0	2,416	2,416	0	0	1,195	441	1,195	441
112	Glancaster Twenty	0.00	16.40	16.40	0	621	621	0	0	209	30	209	30
113	Glancaster Greenbelt	0.00	2.42	2.42	0	94	94	0	0	32	4	32	4
114	Smith North	25.25	0.00	25.25	985	0	985	330	43	0	0	330	43
115	Smith South	0.00	26.82	26.82	0	756	756	0	0	267	76	267	76
201	Glancaster North	0.00	58.40	58.40	0	1,808	1,808	0	0	628	149	628	149
202	Airport North Central	0.00	98.21	98.21	0	3,653	3,653	0	0	2,434	1,209	2,434	1,209
203	Dickenson North	72.30	0.00	72.30	2,166	0	2,166	757	192	0	0	757	192
204	Upper James North	30.87	0.00	30.87	1,204	0	1,204	403	53	0	0	403	53
205	Airport Northeast	30.94	0.00	30.94	1,207	0	1,207	404	53	0	0	404	53
206	Upper James East	3.22	0.00	3.22	125	0	125	42	6	0	0	42	6
310	Airport Terminal East	16.03	0.00	16.03	1,299	0	1,299	621	114	0	0	621	114
311	Airport East	4.30	0.00	4.30	168	0	168	56	7	0	0	56	7
901	Existing Airport							348	392	708	798	1,056	1,190
TOTAL - Excluding Airport		240.21	451.59	691.80	8,928	14,915	23,843	3,382	638	6,954	2,630	10,336	3,268
GRAND TOTAL		240.21	451.59	691.80	8,928	14,915	23,843	3,730	1,030	7,662	3,428	11,392	4,458

4.0 EMME MODIFICATIONS AND ANALYSIS

As with the original Master Plan work, the City's strategic demand forecasting tool (Emme) was used to generate travel demand forecasts for the updated AEGD Study Area. Since the 2011 plan, the City has initiated several key studies for which the model has been modified and enhanced, most notably the city-wide Transportation Master Plan Update (Cole Engineering) and the LRT Planning, Design, and Engineering Study (Steer Davies Gleave).

The most recent 2011 and 2031 horizon year Emme models from the TMP Update were provided by the City in April 2016 and were used for the development of the revised AEGD land use scenario.

Network modifications were made within the model to represent the anticipated study area road network. **Table 3** identifies the revisions made to the base 2031 network for the purposes of the updated AEGD analysis. This included some modifications that are identified as "Network Housekeeping" in order to ensure that the model reflected the appropriate base condition. Other changes to the model included modifications to the Volume Delay Function (VDF). Volume Delay Functions are equations used within the model to express the travel time on the roadway as a function of the volume on that portion of the roadway - meaning that as congestion increases, so does travel time. "Type" within the model is an indication of the role and function of a roadway in a network such as its typical lane capacity and travel speed.

Table 3: Transportation Base Model Network Revisions/Inclusions

Road Link	From	To	Modification
Garner Road	Fiddler's Green Road	Glancaster Road	<ul style="list-style-type: none"> - Match characteristics of Rymal Road to East - Reduce speed to 60 km/h - Modify Volume Delay Function (VDF) to 36 - Modify Type to 646
Twenty Road	Glancaster Road	Upper James Street	<ul style="list-style-type: none"> - Increase lanes to 2 lanes each direction - Increase capacity to 1400 vehicles per hour (vph)
Twenty Road (Extension to West)	Glancaster Road	Southcote Road	<ul style="list-style-type: none"> - Match Twenty Road to East - Add 1 lane each direction - Add speed of 60 km/h - Add capacity of 1400 vph
Dickenson Road	Upper James Street	Glancaster Road	<ul style="list-style-type: none"> - Increase lanes to 2 lanes each direction - Increase capacity to 1600 vph
Dickenson Road (New Connection)	Smith Road	Glancaster Road	<ul style="list-style-type: none"> - Match characteristics of Dickenson Road to East - Add 1 lane each direction - Add speed of 60 km/h - Add capacity of 1600 vph
Book Road (Removed)	Smith Road	Glancaster Road	<ul style="list-style-type: none"> - Removed due to Dickenson Road realignment
Book Road	Smith Road	Highway 6	<ul style="list-style-type: none"> - Reduce speed to 60 km/h - Increase lanes to 3 lanes each direction - Increase capacity to 2400 vph - Modify VDF to 31 - Modify Type to 644

Road Link	From	To	Modification
Garth Street (New Connection)	Twenty Road	Dickenson Road	<ul style="list-style-type: none"> - Match Garth Street to North - Add 1 lane each direction - Add speed of 60 km/h - Add capacity of 1400 vph
Glancaster Road	Garner Road	Dickenson Road	<ul style="list-style-type: none"> - Similar to Twenty Road Extension - Increase speed to 60 km/h - Increase lanes to 2 lanes each direction - Increase capacity to 1400 vph - Modify VDF to 31 - Modify Type to 644
Southcote Road	Garner Road	Book Road	<ul style="list-style-type: none"> - Similar to Twenty Road Extension - Increase speed to 60 km/h - Increase lanes to 2 lanes each direction - Increase capacity to 1400 vph - Modify VDF to 31 - Modify Type to 644
Homestead Drive	Upper James Street (North Access)	Upper James Street (North Access)	<ul style="list-style-type: none"> - Restrict network access to southbound direction only
Upper James Street	Rymal Road	Highway 6	<ul style="list-style-type: none"> - Increase speed to 60 km/h north of Dickenson Road - Reduce speed to 60 km/h south of Dickenson Road
Trinity-Church Connection (New Connection)	Upper James Street	Red Hill Valley Parkway (RHVP)	<ul style="list-style-type: none"> - Used 1400 vph capacity and 70 km/h speed as configured at RHVP junction.
Collector 6N / 7E (New Connection)	Glancaster Road	Upper James Street	<ul style="list-style-type: none"> - Add speed of 60 km/h - Add 2 lanes - Add capacity of 1000 vph

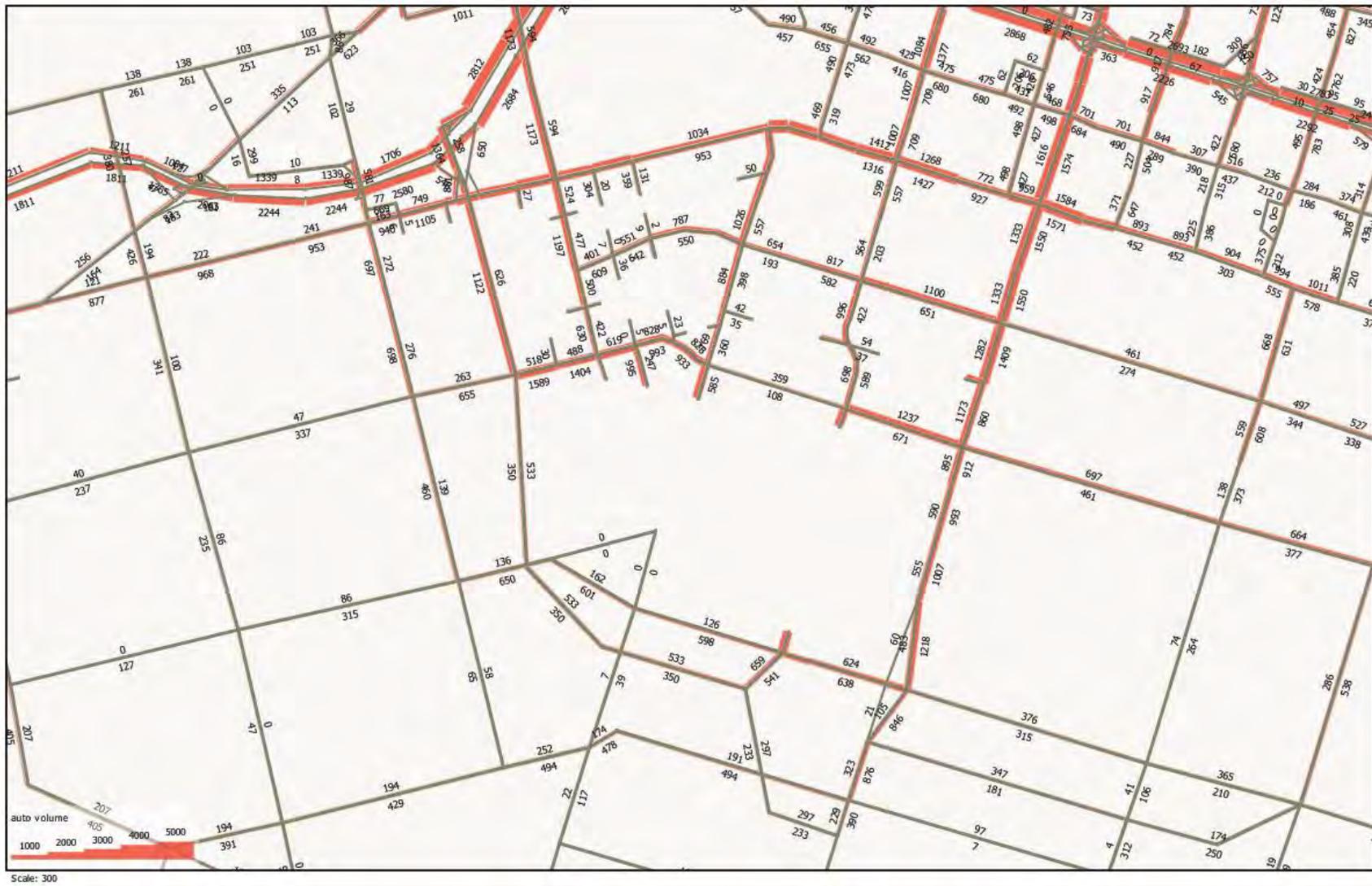
Road Link	From	To	Modification
Other Minor Collector Roads	-	-	<ul style="list-style-type: none"> - Add speed of 50 km/h - Add 1 lane - Add capacity of 500 vph
<i>Network Housekeeping</i>			
Garden Avenue	Fiddler's Green Road	Garner Road	<ul style="list-style-type: none"> - Reduce speed to 50 km/h - Modify VDF to 20 - Modify Type to 643
Dickenson Road	Upper James Street	Nebo Road	<ul style="list-style-type: none"> - Reduce capacity to 500 vph to match adjacent original links to east/west
Garth Street	Rymal Road	Twenty Road	<ul style="list-style-type: none"> - Reduce lanes to 1 lane each direction - Reduce capacity to 700 vph - Modify VDF to 31
Highway 6 / Butter Road	-	-	<ul style="list-style-type: none"> - Modify to grade separation per existing conditions
Airport Road	Upper James Street	Nebo Road	<ul style="list-style-type: none"> - Reduce capacity to 500 vph to match adjacent corridors
White Church Road	Upper James Street	Nebo Road	<ul style="list-style-type: none"> - Reduce speed to 60 km/h to match adjacent corridors

Modifications to the study area structure were also made to recreate the detail used for the 2011 AEGD transportation work. These modifications were as follows:

- Increased zone detail from 386 TAZ to 406 TAZs to include more detail within study area;
 - Added TAZ prefix pattern of “9XXX” to reflect TAZs in trip generation table above;
 - Included Mount Hope residential area (south east of the airport) as TAZ 9004, using the same values as in the previous 2011 AEGD analysis; and
 - **Figure 2** provides an overview of study area TAZ structure;
- For new matrices with AEGD demands, the original parent TAZ trip patterns with revised Productions and Attractions was used for the AEGD update;
- Created two new scenarios from 2031 base model:
 - Phase 1 area employment limited mostly to land uses coming online in northern portion of study area; and
 - Phase 2 area employment mostly surrounding the airport itself.

Travel demand forecasts for these scenarios were generated. **Figure 3** and **Figure 4** provide auto volume assignment results for the two 2031 scenarios.

Figure 4: 2031 A.M. Peak Hour Traffic Volumes - Phase 2



5.0 MODIFICATIONS FROM PREVIOUSLY RECOMMENDED ROADWAY PROJECTS

The travel demands as assigned to the originally recommended road network were reviewed and assessed to confirm their need and contribution to the area traffic conditions. The roadway link volumes were compared to the road improvement plan from the 2011 AEGD Master Plan.

The analysis identified projects that need to be accelerated, deferred, modified, or removed based on the revised land use. **Table 4** summarizes these projects. The table references the project ID numbers from the 2011 AEGD TMP. Where the need for a project within the Phase 2 or Medium Term (15-year) timeframe is no longer required due to land use changes or connections to other modified links/improvements, the project can be removed from the Phase 2 (15-year) program and moved to Long-Term (“beyond 2031”) timeframe.

Table 4: Modifications from Previously Recommended Roadway Projects

Id	Road	From	To	Description	Phase	Notes	EA Schedule
Accelerated Elements – Moved up Timing							
R21	Collector 10N	Smith Road	Collector 2W	New 2 lane construction	1	Project shortened due to land use changes	C
R22	Smith Road (excluding hydro crossing)	Garner Road	Dickenson Road Extension	New 2 lane construction	1		C
R23	Smith Road Extension	Hydro Corridor North Crossing		New 2 lane construction	1		B
R31	Collector 2W	Garner Road	Collector 10N	New 2 lane construction	1	Extent updated	C
R64	Smith Road	Dickenson Road Extension	Collector 1N	Widening 2 to 4 lanes	2	Moved from Long to Medium Term	C
Deferred Elements – Moved to Medium-term (Phase 2) or Long-term time period							
R4	Upper James Street	Alderlea Avenue	Homestead Drive	Widening 4 to 6 lanes	2	Moved to Long Term	C

Id	Road	From	To	Description	Phase	Notes	EA Schedule
R12	Twenty Road	Glancaster Road	Aldercrest Avenue (Upper James Street)	Widening 2 to 4 lanes	2	Moved to Medium Term	C
R15	Airport Service Road	Glancaster Road	Airport Road	New 4 lane construction	2	Moved to Long Term	C
P41	Collector 12S	Collector 4E	Collector 5E	New 2 lane construction	2	Moved to Long Term	B
P44	Collector 4E	Collector 12S	White Church Road	New 2 lane construction	2	Moved to Long Term	B
P45	Collector 5E	Collector 12S	White Church Road	New 2 lane construction	2	Moved to Long Term	B
Modified Elements – Modified timing or description							
R1	Southcote Road	Garner Road	Twenty Road Extension	4 lane reconstruction	2	Changed timing for 2 to 4 lane reconstruction due to higher demands, removed R47	C
R2	Southcote Road	Twenty Road Extension	Book Road	4 lane reconstruction	2	Changed timing for 2 to 4 lane reconstruction due to higher demands, removed R48	C
R13	Twenty Road Extension	Southcote Road	Glancaster Road	New 4 lane construction	2	Changed widening consistent with demands, removed R55	C

Id	Road	From	To	Description	Phase	Notes	EA Schedule
R16	Collector 1N	Southcote Road	Collector 2E	New 4 lane construction	2	Increased capacity required to accommodate higher demands	C
Removed Elements - Removed from the Medium-Term or Long-Term Networks							
R29	Collector 1W	Garner Road	Collector 10N	New 2 lane construction	-		B
R30	Collector 1W	Collector 10N	Twenty Road Extension	New 2 lane construction	-		C
R47	Southcote Road	Garner Road	Twenty Road Extension	Widening 2 to 4 lanes	-	Long Term	B
R48	Southcote Road	Twenty Road Extension	Book Road	Widening 2 to 4 lanes	-	Long Term	B
R55	Twenty Road Extension	Southcote Road	Glancaster Road	Widening 2 to 4 lanes	-	Long Term	C
R58	Collector 1N	Smith Road	Collector 2E	Widening 2 to 4 lanes	-	Long Term	C
R65	Smith Road	Garner Road	Dickenson Road Extension	2 lane reconstruction	-	Long Term	C
R66	Smith Road Extension	Hydro Corridor North Crossing		Widening 2 to 4 lanes	-	Long Term	B
P70	Collector 11N	Fiddler's Green Road	Collector 9W	New 2 lane construction	-	Long Term	B

6.0 FINAL RECOMMENDED PROJECT PHASING AND REVISED COST ESTIMATES

Based on the above findings, **Table 5** summarizes the revised timing and costs of the recommended AEGD Road Improvement Plan and projects are shown in **Figure 5**. This table references the project ID numbers from the 2011 AEGD plan. The table highlights those aspects of projects (timing or description) that have been modified from the original recommendations.

In the original 2011 plan, detailed assessments of cross-sectional elements were considered to determine right-of-way (ROW) needs (see Figures 33 to 36 in the original 2010 AEGD TMP) and were reviewed in the updated assessment.

With regard to the road costs, the following is noted:

- Cost estimates have been updated to 2016 \$ based on available tender package quotes from other roadway project work;
- Unit costs were used where possible;
- Applied general trend of 20% increase for lump sum items over 2011 analysis; and
- Property costs were update by applying Consumer Price Index (CPI) change between 2008 and 2016 (estimated at 1.11 over the 8 years).

The general methodology undertaken to derive road costs related to transportation projects was as follows:

- Identify unit costs for materials related to roadway, drainage, structures, landscaping, electrical, property, utilities, services, and other items;
- Develop typical “per kilometre” cross-sections for the various roadway classifications located within the study area;
- Identify the potential number of intersections, intersection treatments (e.g. traffic signals, roundabouts), bridge works, drainage, property requirements, etc. for individual projects; and
- Calculate total road costs for the length of the specified project.

The costing indicated reflects construction costs only (2016 \$).

Table 5: Road Improvement Plan - Final

Id	Road	From	To	Description	Total Road Cost* (\$M)	Anticipated Timing	EA Schedule
North-South Arterials							
R1	Southcote Road	Garner Road	Twenty Road Extension	4 lane reconstruction	6.61	Short Term	C
R2	Southcote Road	Twenty Road Extension	Book Road	4 lane reconstruction	6.61	Medium Term	C
R3	Glancaster Road	Garner Road	Dickenson Road	Widening 2 to 4 lanes	12.90	Medium Term	C
R4	Upper James Street	Alderlea Avenue	Homestead Drive	Widening 4 to 6 lanes	9.78	Long Term	C
R5	Garth Street Extension	Twenty Road	Dickenson Road	New 4 lane construction	11.28	Medium Term	C
R6	Garth Street	Dickenson Road	Collector 2E	New 4 lane construction	3.45	Medium Term	C

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Id	Road	From	To	Description	Total Road Cost* (\$M)	Anticipated Timing	EA Schedule
	Extension						
R46	Fiddler's Green Road	Garner Road	Carluka Road	Widening 2 to 4 lanes	24.33	Long Term	C
R49	Glancaster Road	Butter Road	White Church Road	Widening 2 to 4 lanes	19.19	Long Term	C
North-South Collectors							
R22	Smith Road (excluding hydro crossing)	Garner Road	Dickenson Road Extension	New 2 lane construction	10.85	Short Term	C
R23	Smith Road Extension	Hydro Corridor North Crossing		New 2 lane construction	1.18	Short Term	B
R24	Glancaster Road	Dickenson Road Extension	Collector 1N	Widening 2 to 4 lanes	2.22	Medium Term	B
R25	Collector 1E	Collector 6N	Dickenson Road	New 2 lane construction	5.23	Medium Term**	C
R26	Collector 6E	Collector 6N	Dickenson Road	New 2 lane construction	5.25	Short Term	C
R27	Collector 7E	Dickenson Road	Collector 6N	New 2 lane construction	3.12	Short Term	C
R28	Collector 7E	Collector 6N	Upper James Street	New 4 lane construction	2.84	Short Term	C
R31	Collector 2W	Garner Road	Collector 10N	New 2 lane construction	3.65	Short Term	C
R32	Collector 2W	Collector 10N	Dickenson Road Extension	New 2 lane construction	6.57	Medium Term	C
R33	Collector 7N	Book Road	Southcote Road	New 2 lane construction	5.89	Medium Term	C
P42	Glancaster Road	Collector 1N	Airport Boundary	2 lane reconstruction	6.65	Medium Term	C
P43	Collector 2E	Collector 1N	Airport Boundary	New 2 lane construction	3.27	Medium Term	C
P44	Collector 4E	Collector 12S	White Church Road	New 2 lane construction	1.42	Long Term	B
P45	Collector 5E	Collector 12S	White Church Road	New 2 lane construction	1.41	Long Term	B
R63	Southcote Road	Book Road	Collector 1N	Widening 2 to 4 lanes	4.01	Long Term**	C

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Id	Road	From	To	Description	Total Road Cost* (\$M)	Anticipated Timing	EA Schedule
R64	Smith Road	Dickenson Road Extension	Collector 1N	Widening 2 to 4 lanes	2.84	Medium Term	C
R67	Collector 8W	Garner Road	Collector 5N	New 2 lane construction	5.84	Long Term	C
R68	Collector 9W	Garner Road	Carluka Road	New 2 lane construction	27.99	Long Term	C
P77	Southcote Road (south)	Airport Boundary	Butter Road	2 lane reconstruction	3.15	Long Term	C
P78	Smith Road	Collector 1N	Airport Boundary	2 lane reconstruction	1.95	Long Term**	B
P79	Collector 3E	Collector 12S	White Church Road	New 2 lane construction	1.53	Long Term	B
P80	Collector 6W	Collector 3S	Butter Road	New 2 lane construction	2.45	Long Term	C
East-West Arterials							
R7	Book Road	Highway 6	Southcote Road	Widening 2 to 4 lanes	4.16	Medium Term	C
R8	Garner Road	Fiddler's Green Road	Glancaster Road	Widening 2 to 4 lanes	11.04	Medium Term**	C
R9	Dickenson Road	Glancaster Road	Upper James Street	Widening 2 to 4 lanes	12.95	Medium Term **	C
R10	Dickenson Road Extension	Southcote Road	Smith Road	Widening 2 to 4 lanes	2.08	Medium Term	C
R11	Dickenson Road Extension	Smith Road	Glancaster Road	New 4 lane construction	3.79	Medium Term	C
R12	Twenty Road	Glancaster Road	Aldercrest Avenue (Upper James Street)	Widening 2 to 4 lanes	13.31	Medium Term**	C
R13	Twenty Road Extension	Southcote Road	Glancaster Road	New 4 lane construction	9.30	Medium Term	C
R14	Airport Road	East Cargo Road	Upper James Street	2-lane Reconstruction	1.84	Short Term	B

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Id	Road	From	To	Description	Total Road Cost* (\$M)	Anticipated Timing	EA Schedule
R14b	Airport Road	Terminal Access Rd	East Cargo Road	Widening 2 to 4 lanes	0.56	Short Term	B
R15	Airport Service Road	Glancaster Road	Airport Road	New 4 lane construction	8.86**	Long Term	C
R50	Book Road	Fiddler's Green Road	Highway 6	Widening 2 to 4 lanes	4.06	Long Term	C
R51	Book Road	Highway 6	Southcote Road	Widening 4 to 6 lanes	4.85	Long Term	C
R52	Butter Road	Fiddler's Green Road	Airport Road	Widening 2 to 4 lanes	9.38	Long Term	C
R53	Airport Road	Butter Road	Glancaster Road	Widening 2 to 4 lanes	4.47	Long Term	C
R54	Dickenson Road Extension	Southcote Road	Smith Road	Widening 4 to 6 lanes	2.3	Long Term	B
R56	Carluk Road E	Fiddler's Green Road	Glancaster Road	Widening 2 to 4 lanes	4.56	Long Term	C
R57	White Church Road	Glancaster Road	Highway 6	Widening 2 to 4 lanes	16.45	Long Term	C
East – West Collectors							
R16	Collector 1N	Southcote Road	Collector 2E	New 4 lane construction	9.04	Medium Term	C
R17	Book Road E	Collector 2W	Glancaster Road	2 lane reconstruction	2.02	Medium Term	B
R18	Collector 6N	Glancaster Road	Collector 6E	New 4 lane construction	8.82	Medium Term **	C
R19	Collector 6N	Collector 6E	Collector 7E	New 4 lane construction	3.78	Short Term	C
R20	Collector 10N	Garner Road	Smith Road	New 2 lane construction	2.83	Short Term	C
R21	Collector 10N	Smith Road	Collector 2W	New 2 lane construction	2.35	Short Term	C
P40	Collector 7N	Southcote Road	Collector 2W	New 2 lane construction	4.67	Medium Term	C
P41	Collector 12S	Collector 4E	Collector 5E	New 2 lane construction	1.26	Long Term	B
R59	Collector 5N	Fiddler's Green Road	Collector 8W	New 2 lane construction	3.20	Long Term	C

Id	Road	From	To	Description	Total Road Cost* (\$M)	Anticipated Timing	EA Schedule
R60	Collector 2S	Fiddler's Green Road	Collector 9W	New 2 lane construction	1.56	Long Term	B
R61	Butter Road E	Airport Road	Glancaster Road	2 lane reconstruction	3.26	Long Term	C
R62	Collector 8S	Fiddler's Green Road	Collector 9W	New 2 lane construction	1.56	Long Term	B
P69	Collector 2N	Collector 7N	Smith Road	New 2 lane construction	2.43	Long Term**	C
P71	Collector 1S	Fiddler's Green Road	Collector 9W	New 2 lane construction	1.56	Long Term	B
P72	Collector 3S	Collector 6W	Southcote Road	New 2 lane construction	1.96	Long Term	B
P73	Collector 6S	Glancaster Road (north)	Airport Road	New 2 lane construction	2.71	Long Term	C
P74	Collector 6S	Airport Road	Glancaster Road (south)	New 2 lane construction	3.45	Long Term	C
P75	Collector 7S	Fiddler's Green Road	Collector 9W	New 2 lane construction	1.69	Long Term	B
P76	Collector 12S	Collector 3E	Collector 4E	New 2 lane construction	1.27	Long Term	B

* Road costs include property and exclude transit-related landscaping costs. Road costs are in 2016\$.

** Timing to be coordinated with Water and Wastewater Servicing.

*** Costs for project R15 Airport Service Road are based on a four-lane arterial road cross-section and the alignment as identified in **Figure 5**. The costs for this project, and other projects identified with proposed alignments, could change as actual alignment will be determined through the EA/detailed design process.

Notes:

- 1) Anticipated timing represents approximate horizons as follows – Phase 1 - Short Term (0-5 years), Phase 2 - Medium Term (5-15 years), and Long Term (beyond 2031). Timing is subject to change based on available funding, combination with other capital works projects, and other potential timing influences.
- 2) With the exception of R64, projects with ID numbers 46 to 80 were not originally calculated because they were beyond the 2031 program.

Future street design will conform to design guidelines and specific elements to be included in the design of a roadway (e.g., on-road bike route) would be identified at the detailed design stage. The final road network and phasing is provided in **Figure 5**. **Figure 6** shows the final road network with the roads and road type labeled. These modifications do not result in any significant changes to the recommended recreational

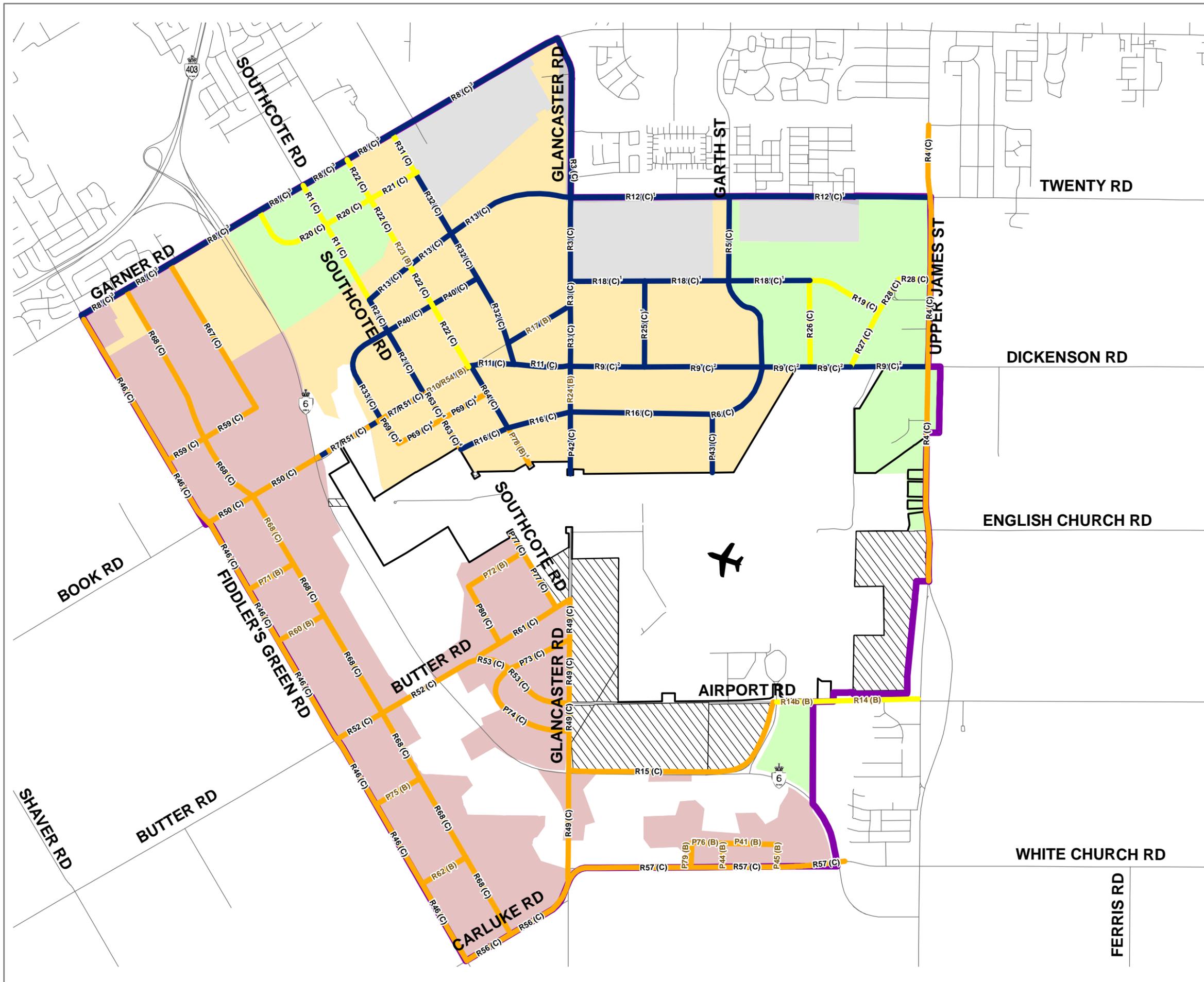
trails networks. The final recreational trails network can be found in **Figure 7**.¹ There are also no significant changes to the truck route network; the final truck route network can be found in **Figure 8**.

7.0 ANTICIPATED TIMING OF TRANSPORTATION INFRASTRUCTURE AND WATER/WASTEWATER SERVICING

In all cases, the timing of transportation infrastructure and water/wastewater servicing is dependent on the timing of development. In specific cases (as noted in **Table 4**), the identified timing for water/wastewater servicing needs is earlier than demands for transportation infrastructure. Therefore transportation infrastructure should be advanced as necessary to minimize capital cost of construction and implementation. The specific road projects and sections of road projects that should be considered for advancement to Phase 1 (2016 to 2021) are as follows:

- R8 – Garner Road, Fiddler’s Green Road to Glancaster Road;
- R9 - Dickenson Road, Garth Street to Upper James;
- R12 – Twenty Road, Glancaster Road to Aldercrest Avenue;
- R18 - Collector 6N, Garth Street Extension to Collector Road 6E; and
- R25 – Collector 1E, Collector 6N to Dickenson Road.

¹ **Figure 7** shows proposed carpool lots which have not changed from the 2011 AEGD TMP. It should be noted that the ownership, location, and details of carpool lots are to be planned at a later stage. The City’s intent is that the carpool lots are to be located in strategic locations and be municipally operated. Implementation would be best achieved through dedication of portions of employment lands parking areas for carpooling determined through the subdivision/site plan application process.



Legend

- Secondary Plan Area, Phase 1 Projects (Short Term)
- Secondary Plan Area, Phase 2 Projects (Medium Term)
- Additional Study Area Projects (Long Term)
- Airport Employment Growth District Secondary Plan Boundary
- Secondary Plan Area (Phase 1 - Short Term)
- Secondary Plan Area (Phase 2 - Medium Term)
- Lands Subject to Rural Hamilton Official Plan
- Additional Study Area (Long Term)
- Hydro Corridor
- Airport Reserve
- John C. Munro Hamilton International Airport

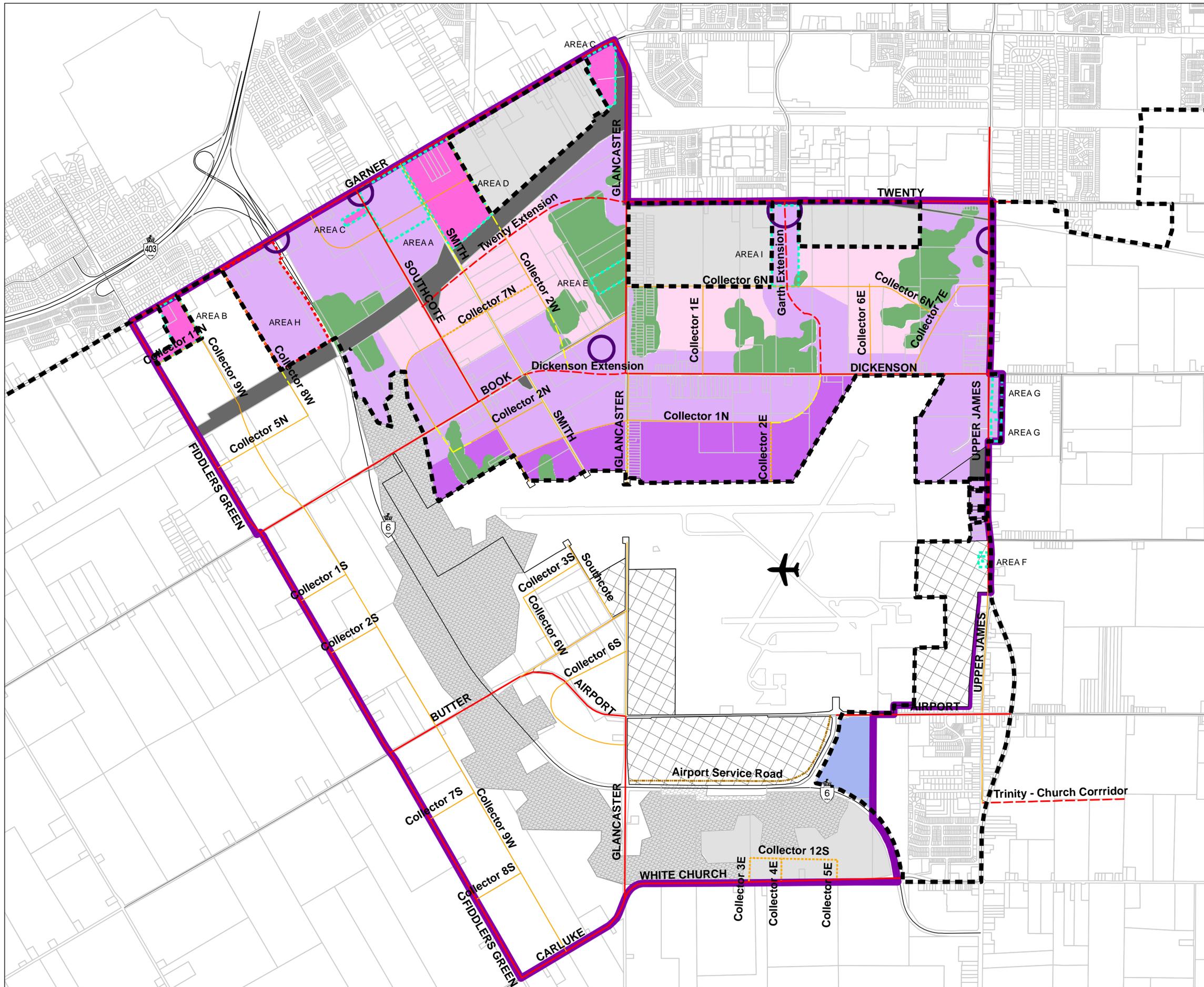
Notes:
¹ Projects R12, R18, and R25 are high priority projects for Phase 2.
² Project R9 (Dickenson Road) is a Phase 1 priority project as it is foundational to the development of the AEGD.
³ Project R8 (Garner Road) is already programmed through the City's capital plan.
⁴ Projects R63, P69, and P78 are to be coordinated with water and wastewater servicing in Phase 1 or Phase 2 as needed.

Location of new proposed roads reflects a potential alignment. Actual alignment of new proposed roads is to be determined during the EA/detailed design process

Figure 5
 Airport Employment Growth District
 AEGD Revised Road Network Phasing

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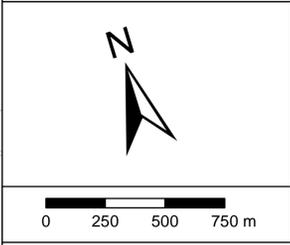
Land Use Designations

- Airside Industrial
- Airport Related Business
- Airport Light Industrial
- Airport Prestige Business
- Institutional
- Natural Open Space
- Utility
- Airport Reserve

Other Features

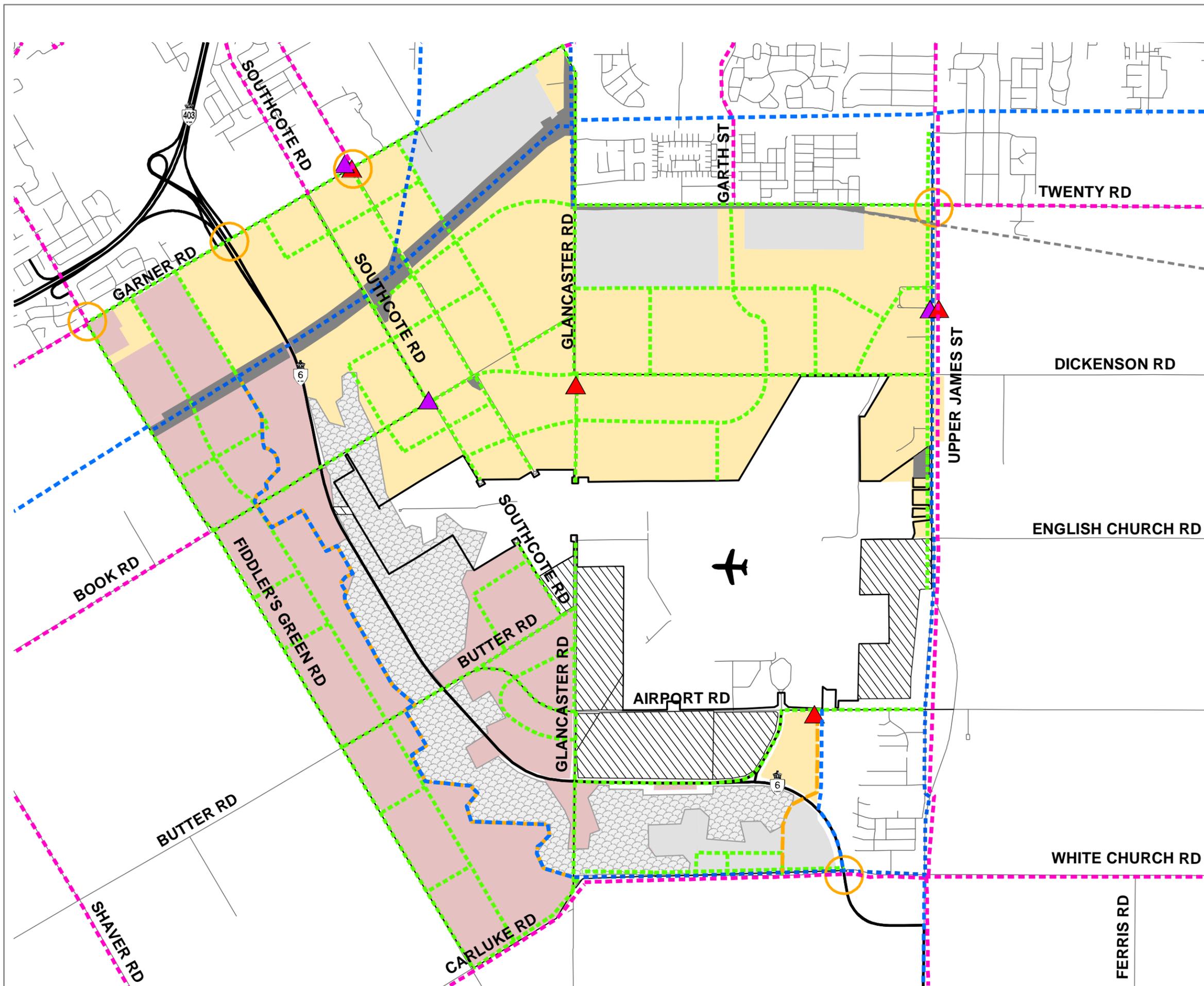
- Site Specific Policy Area
- Employment Supportive Centre
- Major Arterial Road
- Major Arterial Road (Potential Alignment)
- Minor Arterial Road
- Major Collector Road
- Major Collector Road (Potential Alignment)
- Minor Collector Road
- Minor Collector Road (Potential Alignment)
- Proposed Service Road (Potential Alignment)
- + John C. Munro Hamilton International Airport
- Greenbelt Natural Heritage System
- Lands Subject to Rural Hamilton Official Plan
- Urban Boundary
- Airport Employment Growth District Study Boundary

Figure 6
 Airport Employment Growth District
 AEGD Revised Road Network and Land Use



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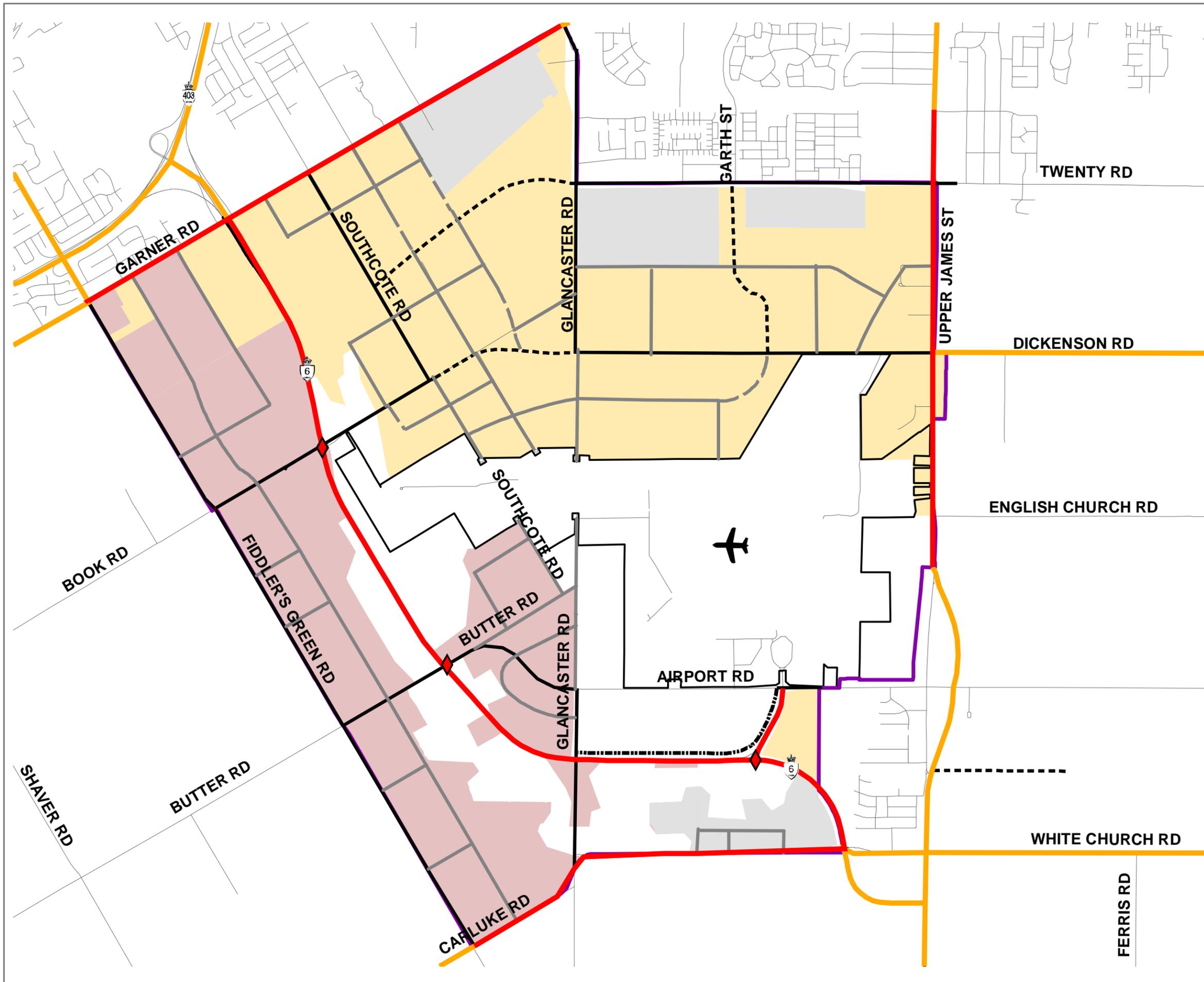
- Legend**
- AEGD Cycling and Pedestrian Facilities**
- Proposed Multi-Use Recreational Trail
 - Proposed Reserved Bike Lanes and Sidewalks
- Recreational Facilities (RTMP 2016)**
- Proposed Multi-Use Recreational Trail
 - Proposed On-Road Bike Routes
 - Existing Trail Amenity (Hydro Line)
- AEGD Features**
- Proposed Car Pools Lot
 - Enhanced Transit Stop
 - Gateway
 - Secondary Plan Area
 - Lands Subject to Rural Hamilton Official Plan
 - Additional Study Area
 - Airport Reserve
 - Utilities
 - Greenbelt Natural Heritage System
 - Road
 - Provincial Highway
 - John C. Munro Hamilton International Airport

Figure 7
 Airport Employment Growth District
 AEGD Revised Recreation Trails

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Legend

-  Proposed Interchange
-  Provincial Highway
-  Full Time Truck Routes Beyond the Hamilton AEGD
-  Hamilton AEGD Proposed Full Time Truck Routes
-  Collector
-  Potential Connections
-  Arterial (Major/Minor)
-  Proposed Arterial (Potential Alignment)
-  Proposed Service Road (Potential Alignment)
-  Secondary Plan Area
-  Lands Subject to Rural Hamilton Official Plan
-  Additional Study Area
-  Airport Employment Growth District Secondary Plan Boundary
-  John C. Munro Hamilton International Airport

Figure 8
 Airport Employment Growth District
 AEGD Truck Route Network









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8.0 CONCLUSION

Based on the reassessment of the road network in consideration of the revised land use allocation, the following conclusions are reached:

- The revised land use allocation results in modest changes to the travel demand in the 2021 and 2031 transportation network conditions;
- Accelerated, deferred, modified, and removed elements as assessed are summarized in **Table 4** with the final proposed road improvement plan in **Table 5**;
- The identified timing for specific projects should be advanced as necessary to align with the identified timing for water/wastewater servicing needs:
 - o R8 – Garner Road, Fiddler’s Green Road to Glancaster Road;
 - o R9 - Dickenson Road, Garth Street to Upper James;
 - o R12 – Twenty Road, Glancaster Road to Aldercrest Avenue;
 - o R18 - Collector 6N, Garth Street Extension to Collector Road 6E; and
 - o R25 – Collector 1E, Collector 6N to Dickenson Road.
- These changes do not result in any proposed changes to the recommended transit network from the 2011 AEGD TMP;
- These changes do not result in any significant changes to the recommended recreational trails (**Figure 7**) nor the truck route networks (**Figure 8**); and
- Overall, these changes as assessed in this Master Plan update represent minor revisions that do not significantly impact the substance of the 2011 Transportation Master Plan. The changes are predominately variations to timing of projects and the removal of a number of projects that are no longer needed with the revised land use configuration. Based on the findings, it is not anticipated that formal public consultation is required as part of this Master Plan update process.