

Recommended Plan – Confederation Line East Functional Design Report (Blair Station to Trim Road)

On 25 May 2011, Council approved a motion and key components are summarized below:

- In partnership with the United Counties of Prescott and Russell, the City will jointly undertake an environmental assessment study for the Ottawa Road 174 and County Road 17 between Highway 417/Split to Landry Road in Clarence-Rockland; and,
- The environmental assessment study is to be provincially funded.

Following this motion, on 1 February 2012, Transportation Committee approved the statement of work for Highway 174 and County Road 17 Environmental Assessment Study (ACS2012-ICS-PGM-0014). With provincial funding, the United Counties of Prescott Russell, in partnership with the City of Ottawa are completing a multi-jurisdictional Class Environmental Assessment (EA) Schedule C study for improvements to the Highway 174 (Hwy174) and County Road 17 (CR17). Figure 1 illustrates the study limits, extending from Highway 417/Split in Ottawa to Landry Road, in the United Counties of Prescott and Russell (UCPR), a distance of approximately 34 kilometres.

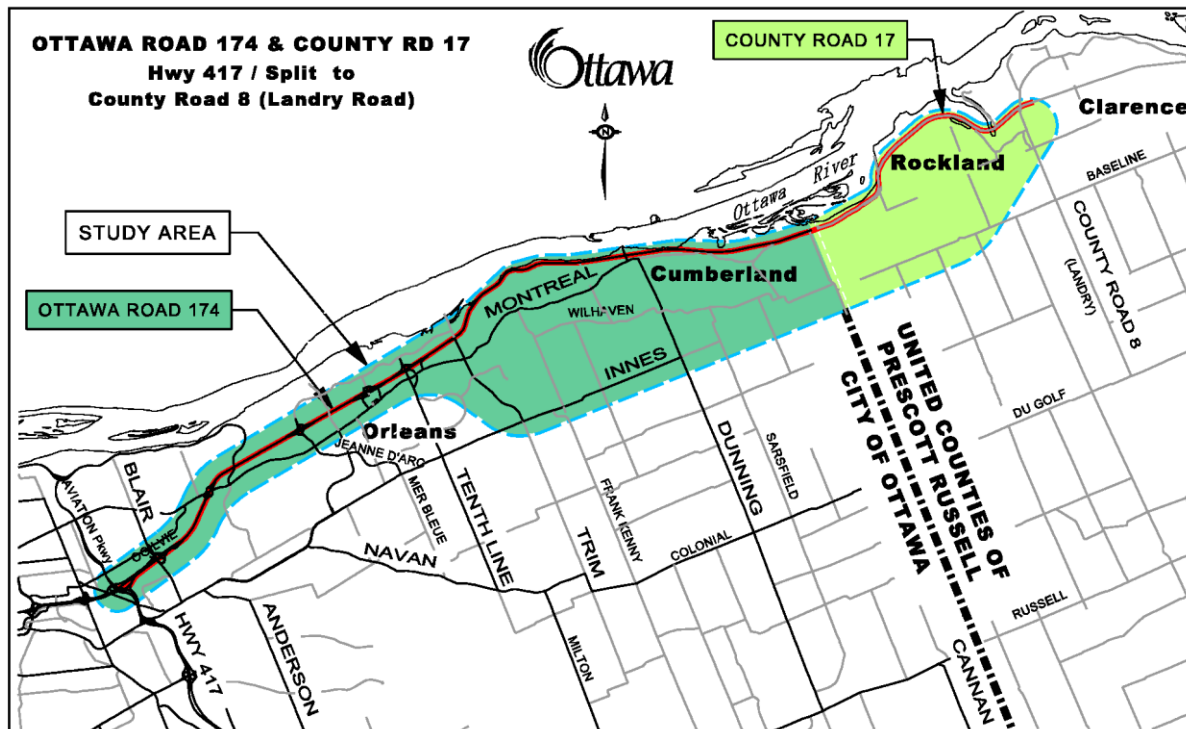


Figure 1: Highway 174/County Road 17 EA Study Limits

On 26 November 2013, Council unanimously approved the 2013 Transportation Master Plan (TMP), that included the Stage 2 rail proposal to extend rail farther east (Confederation Line East extension), west (Confederation Line West extension) and south (Trillium Line extension) of the City. The Confederation Line East extension limits extend from Blair Station to Place d'Orléans Station, and on 5 February 2014, Transportation Committee approved the statement of work for the Planning and Environmental Assessment Study (ACS2014-PAI-PGM-0015).

Recognizing that the 2013 TMP, and historically the 1997 Regional Municipality of Ottawa-Carleton's Official Plan, envisioned the ELRT facility along the Hwy174 road corridor, coordination of both the rail and road EA studies was required. As the limits of the Hwy174/CR17 EA Study extended to Clarence-Rockland, the Eastern LRT EA Study limit was also extended further east to the Trim Park and Ride in order to obtain an optimal solution along the extent of the future planned LRT facility. Figure 2 shows the primary study limits and the interdependence with Hwy174 study.

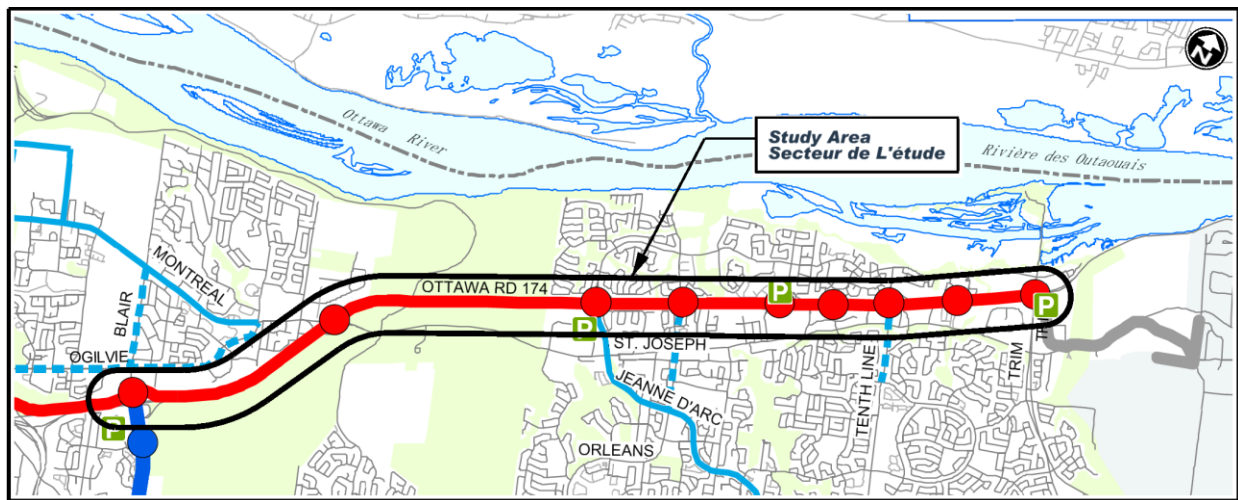


Figure 2: Eastern LRT Planning and EA Study Area

Since coordination of the ELRT and the Hwy174/CR17 EA studies was required for the segment between Highway 417/Split to Trim Road, the following is a discussion on the recommended plan for the ELRT and corresponding Hwy174 road widening.

Alternative Solutions to the LRT Alignment and Corresponding OR174 Road Widening

The joint rail and road EA study reviewed three alternative LRT alignments within the Hwy174 road corridor, each with a corresponding road widening. For each LRT alternative alignment, the road widening was placed in the median where available, with

the balance of the widening to the outside. Consistent with the Hwy174/CR17 EA study, the road widening is protecting for high occupancy vehicle lanes. The alternative alignments are described as follows.

Alternative 1: LRT on the north side of Hwy174

The LRT alignment runs along the north side of Hwy174 with at grade centre platform stations, except at Montreal Road, where it is grade separated. Minimal property is required and there is moderate impact on the National Capital Commission's (NCC) Green's Creek as well as wildlife and woodlands. Where centre platform stations are located at the highway interchanges, several structures will require modifications (typically the perpendicular arterial road and the associated highway ramps).

Alternative 2: LRT on the south side of Hwy174

The LRT alignment runs along the south side of Hwy174 with at grade centre platform stations, except at Montreal Road and Place d'Orléans where it is grade separated. This alternative provides the best transit oriented development potential. However, it impacts private property and NCC lands and has the greatest conflict with major infrastructure. Significant structural work is required on existing bridge structures, including a substantial tunnel and underground station at Place d'Orléans. This option has the greatest impact on high voltage power lines and requires the relocation of approximately 7km of power transmission lines.

Alternative 3: LRT in the median of Hwy174

The LRT alignment runs along the median of the Hwy174 with at grade centre platform stations, except at Montreal Road where it is grade separated. A wide median east of Montreal Road can accommodate the ELRT. This alternative has minimal impact on infrastructure, including bridge structures and the station locations are equidistant, and therefore ensure optimum connectivity to the communities on either side of Hwy174.

An evaluation of the alternative solutions in general, involved a pair-wise comparison of each alternative against the other, in turn, for each of the identified criteria. The alternative that ranked best for the criteria received the higher score when compared to the other alternatives. The alternative with the highest overall score, which was the total score for all the criteria, represented the technically preferred alternative.

The evaluation criteria was developed and based on the six broad categories as follows:

- Social (noise, property impacts, views and vistas, smart growth);
- Transportation (safety, pedestrian and cycling connectivity, road and transit network function);

- Infrastructure (municipal, utilities, structures);
- Cost (capital and operating);
- Biological (wildlife, aquatic, species at risk); and,
- Physical Geography (slope stability)

Once developed, City staff and members of the study team, including technical specialists, assigned weights to each category to reflect the relative importance of each criteria. These weights were then applied to the evaluation matrix for each of the three alternatives. Based on a set of blended weights, the median LRT alternative with the corresponding road widening was identified as the preferred alternative. The results are shown in Table 1.

Table 1: Scoring of Alternatives

Alternatives	Sum	Rank
Alternative 1: ELRT north side of Hwy174	0.70	2
Alternative 2: ELRT south side of Hwy174	0.62	3
Alternative 3: ELRT in the median of Hwy174	1.68	1

A sensitivity analysis, used to test the rigour of the results, confirmed the preferred alternative of LRT in the median alignment with a corresponding widening of the Hwy174. A brief summary of the rationale for this preferred alternative is as follows:

- The wide median east of Montreal Road can generally accommodate the LRT and a partial road widening;
- Requires fewer alterations to existing structures;
- Fewer impacts to utilities;
- Reduces overall capital cost; and,
- Provides less staging impacts on both existing transit and vehicular traffic.

To further improve on the median LRT alternative, the study developed a hybrid solution in which the LRT alignment is north of the Hwy174 between Blair station and Montreal Road, then transitions into the median from the Green's Creek area through to Trim Station. This hybrid solution takes advantage of:

- Better proximity to developed areas that can encourage transit oriented development and ridership;
- Better connections to multi-use pathways;
- Further reduces the number of structures required;

- Maintains the existing Hwy174 Transitway overpass during most of the construction period;
- Further reduces capital costs; and,
- Provides less staging impacts on both existing transit and vehicular traffic.

While the rail EA study was integrated with the Highway 174 widening environmental assessment to achieve better design outcomes, ensure efficiencies of scale, and maximize benefits both to the community and to the environment, timelines to implement each project (rail and highway widening) differ. The Stage 2 LRT extension is planned to be operational by 2023 in advance of the highway widening, which is planned post 2031. As such, a description of the functional design is based on the implementation schedule. The Confederation Line East LRT Extension from Blair to Place d'Orléans Station (Stage 2 LRT Extension East) is described first, followed by the ultimate plan to widen the highway and extend rail to Trim Road (Ultimate LRT and Highway Widening).

General Functional Design

In general, the LRT and Hwy174 widening can be accommodated in the existing road corridor with no additional property required. The corresponding road widening is generally to the outside of the existing roadway and the existing bus shoulder lanes will be repurposed for the widening. Where available, some widening will occur in the median. Typical design elements (Figure 3 and 4) for both the road widening and LRT include the following:

- Dual LRT tracks with six centre platform stations in the median and one side platform station at Montreal Road where the station is to the north side of Hwy174;
- 2 – 3.5 metre general purpose lanes and 2.5 metre shoulders each way;
- Hwy174 widening to protect for 3.75 metre high occupancy vehicle lanes with 1.2 metre buffer; and,
- Rural ditching.

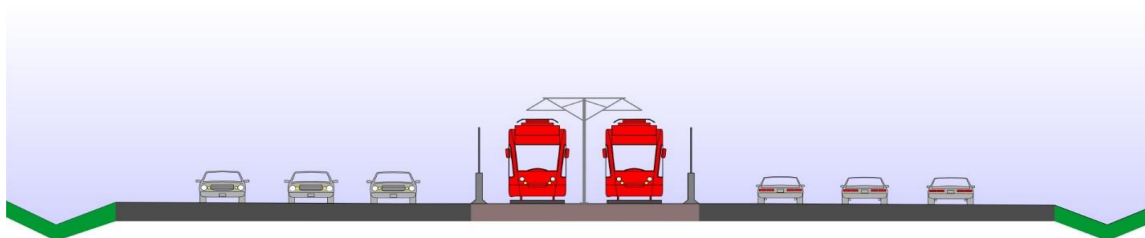


Figure 3: Typical Road Cross-section with Median LRT Runningway and Road Widening

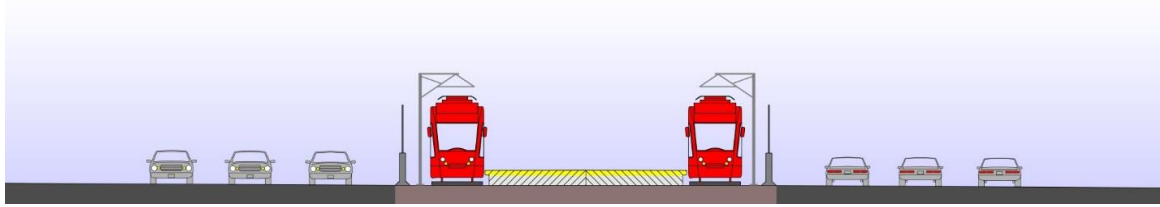


Figure 4: Typical Road Cross-section with median LRT Station and Road Widening

Stage 2 LRT Extension East Functional Design

Blair Station and East

Blair Station is the terminus for the Confederation Line, currently under construction. From this station, the LRT will continue along the north side of Hwy174 to Montreal Road Station. A continuous pathway from Blair Station to Montreal Road Station is proposed in the future and could be placed alongside the LRT alignment or through the local neighbourhood. The LRT alignment (shown in pink) will extend directly east and bypass the existing Transitway alignment, passing under Blair Road and the interchange ramps. To accommodate the LRT alignment, new bridge structures are required to carry Blair Road and the Hwy174 on and off ramps over the LRT.

While a more economical alignment option of converting the existing East Transitway to LRT was available, this Transitway (shown in red dashed line) is being protected for the future Cumberland Transitway, as identified in the August 2011 Hospital Link and Cumberland Transitway Westerly Environmental Project Report. Although the Cumberland Transitway is shown as being outside of the affordable funding envelope of the 2013 TMP, the project still holds importance and its corridor remains protected in the 2013 Official Plan. The Cumberland Transitway was identified as a necessary part of the transportation network solution when the East Urban Community was expanded south of Innes Road.

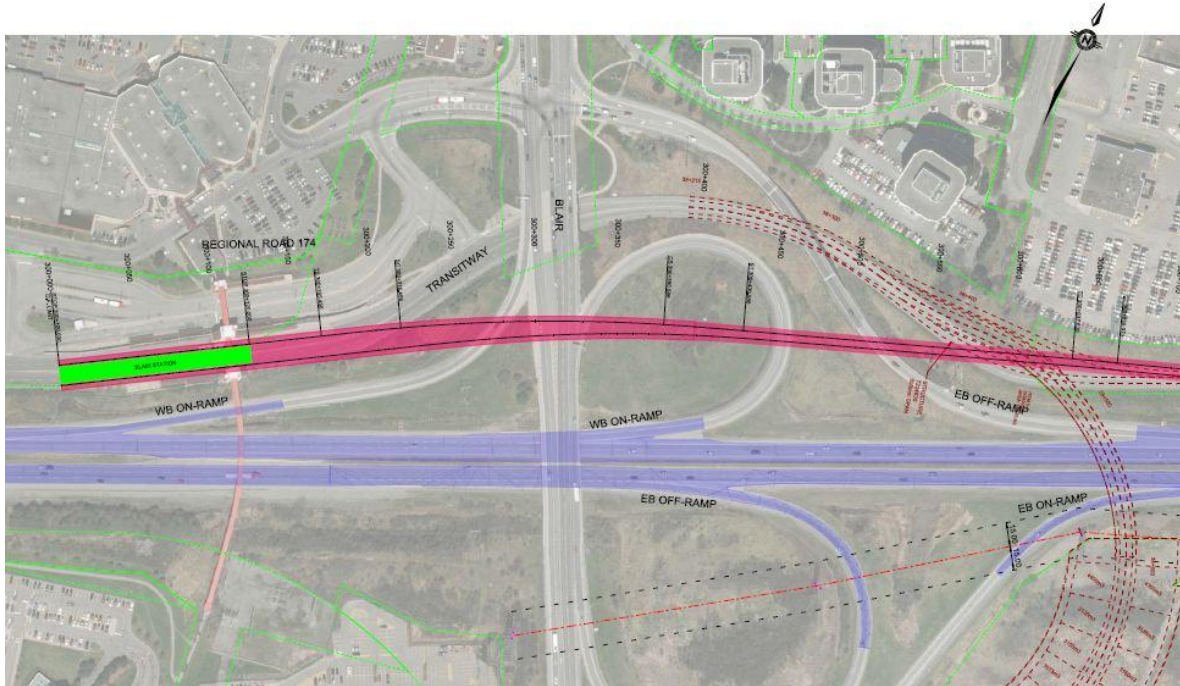


Figure 5: ELRT alignment east of Blair Station

Proceeding east for 800 m, protection for a future station (post 2031) is proposed in the vicinity of Gloucester High School, in response to public comments regarding desirability for an additional station between Blair and Montreal Road. The station would need to be implemented in cooperation with the adjacent land owner(s) as there may not be sufficient space for this station within the existing road corridor, and access to the station would need to be provided via adjacent properties. Future transit oriented development (TOD) potential in the area, good station spacing, and convenient access to Gloucester High School, the adjacent community centre and recreational facility will support eventual construction of this station.

Montreal Road Station

As the LRT approaches Montreal Road, it continues along the north side of the highway rising up to the same elevation as Hwy174, while Montreal Road passes under the LRT station and the highway. This station is advantageously situated in the northwest quadrant of the interchange to serve the nearby Beacon Hill community and Canotek Business Park. By contrast, the Greenbelt lands south of Hwy174 is sparsely populated, serving very few potential riders.

The westbound ramp will be modified (shown in dark blue) to reduce the conflicts between vehicular traffic and pedestrians and cyclists accessing the station. Access to the station stairs and elevators is concentrated at the north end of the platform where it

connects down to a lower level concourse to provide connectivity on the south side of Montreal Road. The Hwy174 westbound ramp modification also frees up space for a bus loop to provide for local bus connections, if required.

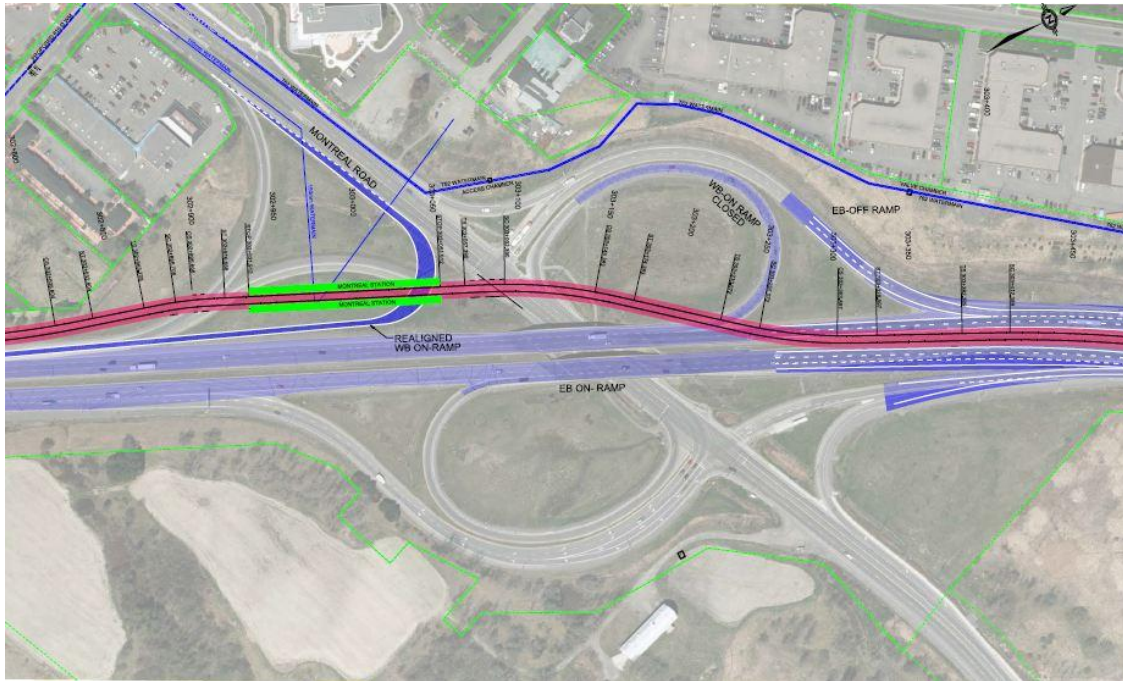


Figure 6: Montreal Road Station

Immediately east of Montreal Road Station, the LRT will cross over the westbound highway lanes and transition into the median at this location. The LRT drops down to highway grade as it continues east towards the George-Étienne Cartier Parkway overpass. Proceeding further east, the LRT passes under the Parkway bridge structure, which requires some modifications to accommodate the LRT. The NCC have been advised and are aware of the bridge modifications required.

Jeanne D'Arc Station

Jeanne D'Arc Station is the first Confederation Line stop east of the NCC Greenbelt. The station spans under the existing bridge structure with a design resembling Cyrville Station (Figure 8) on the Confederation Line. There will be a station house on either side of the roadway to allow direct access down to the station for passengers transferring to and from buses or from the pedestrian plaza on either side of the road. The interchange will be modified to remove the free flow ramp for northbound to westbound traffic and direct traffic through the intersection to improve bus, pedestrian and cycling connectivity at the station.

This station ultimately requires the widening of Jeanne D'Arc Boulevard and the bridge structure to accommodate bus lanes, cycling facilities, and wider sidewalks for station access. Bus connections will be limited to through routes as there is no space to accommodate bus lay-up or turnaround at this location but opportunities to provide these in nearby locations could be explored. Potential pathway connections to adjacent communities will require property acquisition for future pathway corridors between existing homes to shorten the walking distance. In the short term, the existing four-lane bridge will provide adequate space for station access, although one lane in each direction will be converted to a transit priority lane to accommodate space for local bus connections. Existing travel demand is adequately provided by the one general purpose lane in each direction, with future widening opportunities identified post 2031.

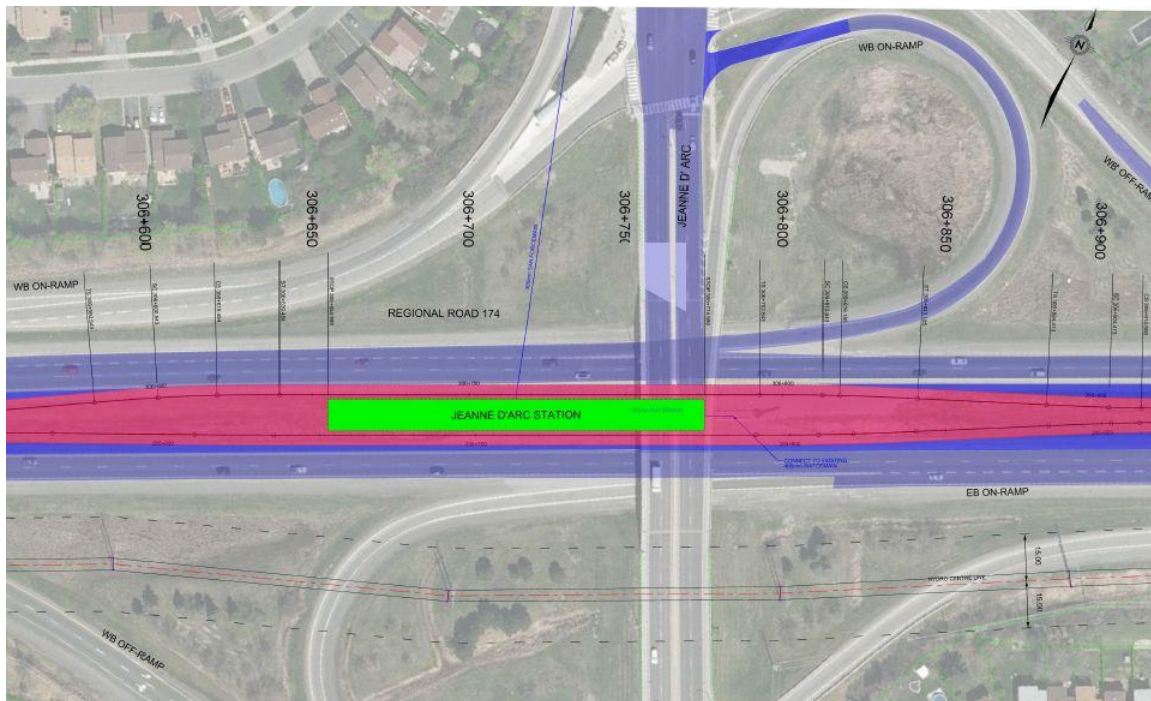


Figure 7: Jeanne D'Arc Station and road widening



Figure 8: Cyrville Station Example

Orleans Boulevard

Orleans Boulevard Station will be a smaller volume station similar to Jeanne d'Arc Station. It will be centered under the existing bridge structure, with station access from either side of the road. With no highway access to/from Orleans Boulevard, this station is closer, more compact, and more accessible to the adjacent communities.

Orleans Boulevard is currently four general purpose lanes. Converting one lane in each direction for transit priority in the vicinity of the station will provide space for local bus connections at curb-side in front of the station. Existing pathways in the southeast and southwest provide good connectivity to the station. Pathway opportunities in the northeast and northwest would require property acquisition to provide direct pathway corridors into the community in the future.

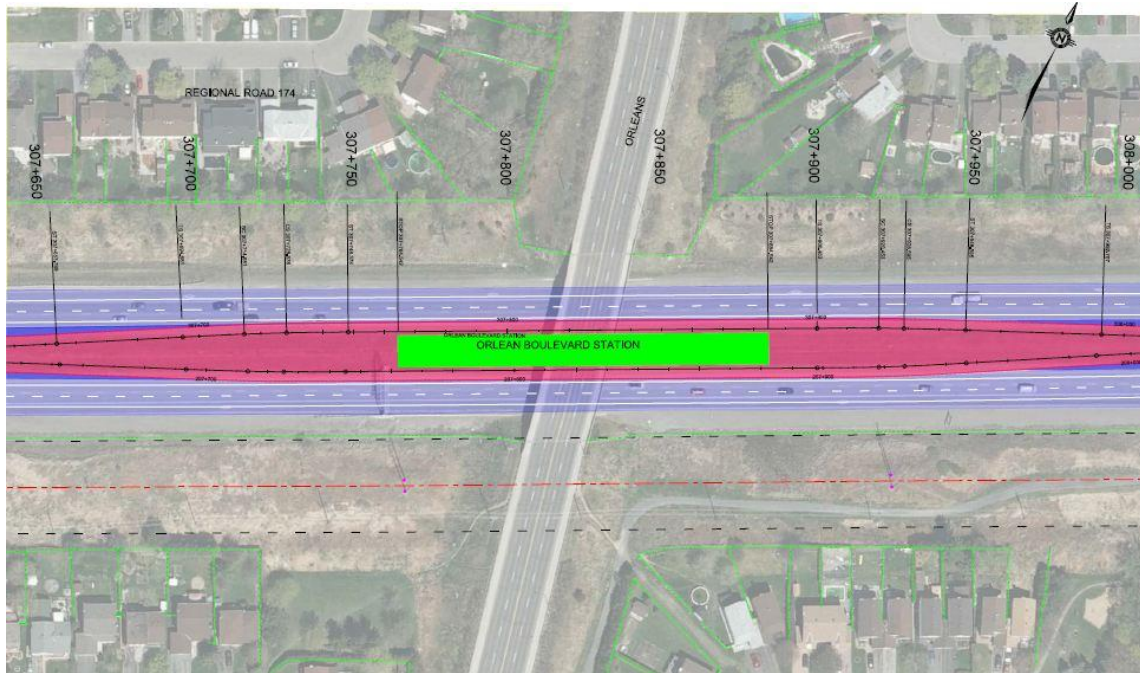


Figure 9: Orleans Boulevard Station

Place d'Orléans Station

Place d'Orléans Station will serve as the terminus for the Stage 2 Confederation Line East Extension to Orleans, and as such, will include public washrooms. It will connect to the existing Transitway station north of Place d'Orléans (immediately south of Hwy174) and to the park and ride lot (to the north) via an existing pedestrian bridge.

The new station is deliberately placed west of Champlain Street as this bridge structure can accommodate the construction of LRT tracks in the short term, however a new structure will be required to accommodate future highway widening. The station also

aligns more directly with the centre of the park and ride and the bus platforms. A future connection from the east end of the platform directly to Champlain Street is recommended as the area becomes more urbanized. There is some limited capacity to expand the park and ride.

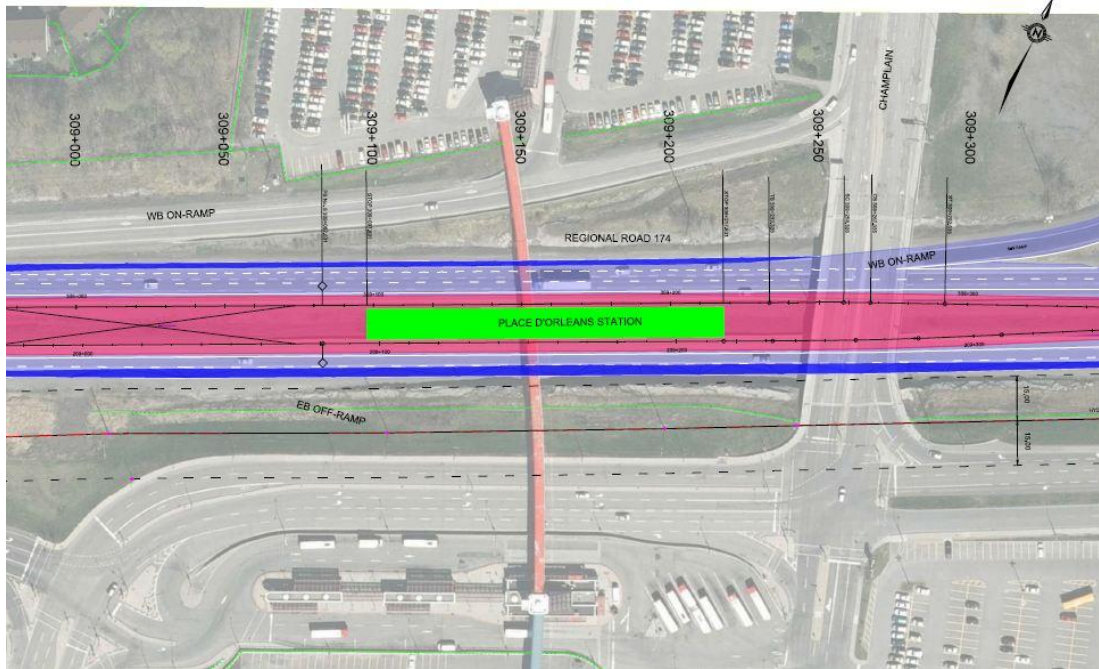


Figure 10: Place d'Orléans Station

Figure 11 illustrates an example of a mid-block station with a pedestrian overpass along a six lane freeway in Calgary, Alberta (Tuscany Station).



Figure 11: Example of Mid-Block Station

Ultimate LRT and Highway Widening Functional Design

Plan views for the ultimate LRT and widening of Hwy174 from the Highway 417/Split to Trim Road are available at the end of this document in Appendix A. While the widening is generally contained within the highway corridor and is well illustrated in the plan views, only specific areas of the functional design needing further clarification are described below.

In general, highway widening is in the median where available, with widening to the outside if required. Wider medians east of the George-Etienne Cartier Parkway bridge structure, combined with repurposing the existing bus shoulder lanes will accommodate the road widening. The highway ramps at all interchanges will be realigned and new bridge structures over Montreal Road as well as the Champlain Street overpass is needed to accommodate the widening.

With the anticipated Place d'Orléans LRT station in place by 2023, the highway widening will encroach on the existing Hydro One high voltage power lines, which are located on the south side of Hwy174 (Figure 32). According to Hydro One, a 15m setback is required and relocation of the line further south is the preferred solution. Hydro One is aware of these impacts following two meetings held during the study process and further discussions are needed to develop the plan to address these impacts.

Orleans Town Centre Station

This mid-block station serves the Orleans Town Centre with amenities such as the Schenkman Arts Centre, Peter D. Clark Place, a hotel, restaurants, retail shopping, medical and personal services, as well as existing higher density residential development. A new pedestrian overpass will link the communities from north and south of Hwy174, similar to the station example noted in Figure 11. The station is positioned to allow access from existing pedestrian pathways on the north side that will be upgraded to multi-use pathway standards.

TOD of mixed use and higher density residential housing is currently under construction directly south of the highway and will be served by this station. As part of the development, a road network has been designed to connect to the station to support passenger drop off and pick up. Highway widening is to the outside to accommodate the station.

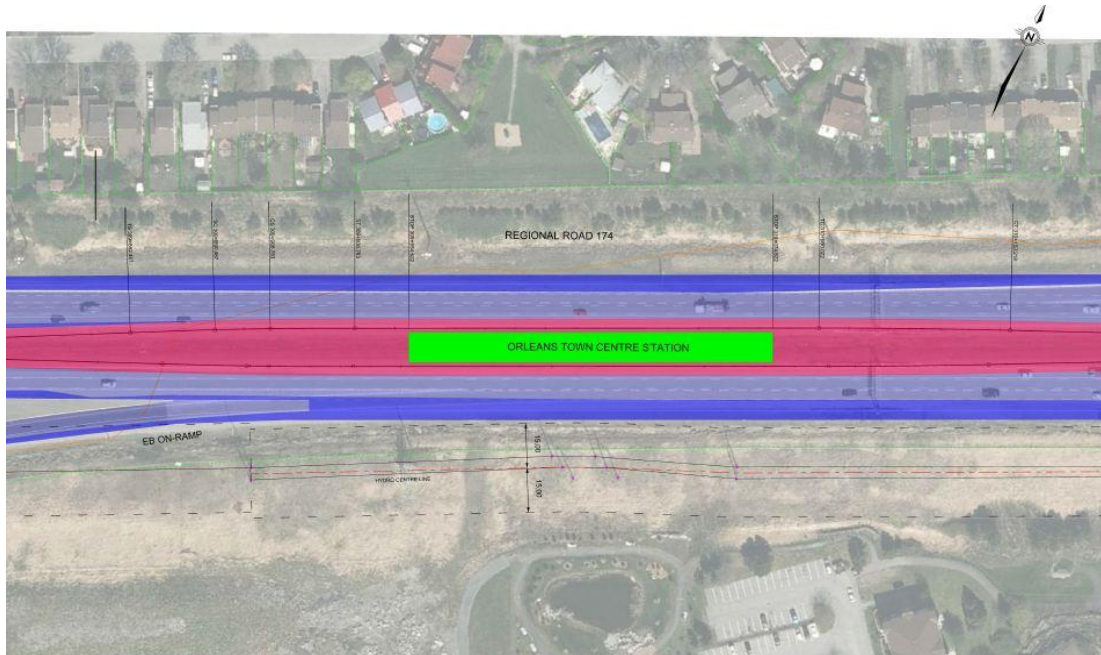


Figure 12: Orleans Town Centre Station (Option A)

Tenth Line Station

Although the City's TMP identified a station directly at Tenth Line Road (Option A), the Tenth Line interchange design with wide ramps poses challenges for station connectivity. An alternative station location 300m east of Tenth Line was considered and is recommended as a mid block station with a pedestrian overpass (Option B).

While the land use is currently vacant, concept development plans are underway on both sides of Hwy174 consisting of high density commercial on the south side and higher density residential on the north. There are opportunities to incorporate bus passenger drop off and pick up during the development phase. This location also provides better station spacing as the original Tenth Line station was only a 600m distance from Orleans Town Centre Station.

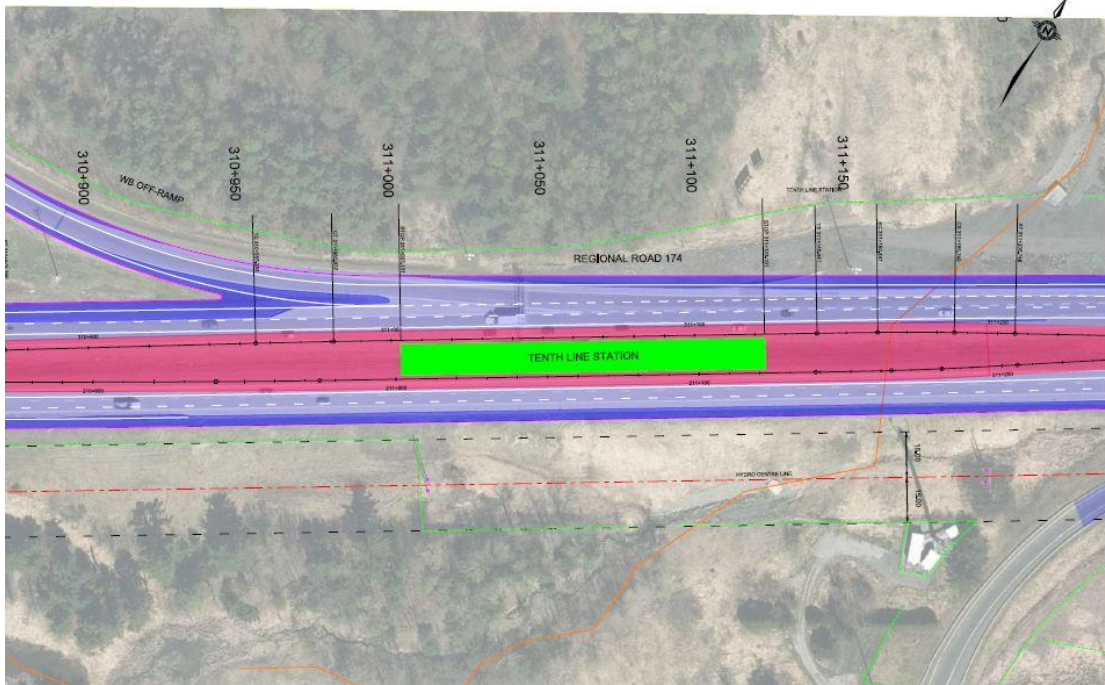


Figure 13: Recommended Tenth Line Station (Option B)

Taylor Creek Station

While it was considered, due to very low projected ridership and proximity to Trim Road Station (500m), an additional station at Taylor Creek is not recommended for construction.

Trim Park and Ride Station and Interchange

As the LRT approaches the planned terminus at Trim Road, there are double crossovers immediately in front of the station to manage train operations. Today, Trim Road and Hwy174 is an at-grade signalized intersection. A grade separation will be required to integrate with the new station. Highway ramps will be provided for all movements, but will be positioned to allow for good access to the LRT station and permit some TOD nearby. This will allow the station to be placed under the new Trim Road bridge structure with a pedestrian bridge connecting to the park and ride lot. A roundabout at Trim Road and North Service Road is recommended to facilitate local access.

Currently the bus loop is at the south end of the park and ride lot and will be relocated closer to the LRT station for greater connectivity. There is TOD or Park and Ride lot expansion potential for the development block on the north side, which is the former MTO works yard.

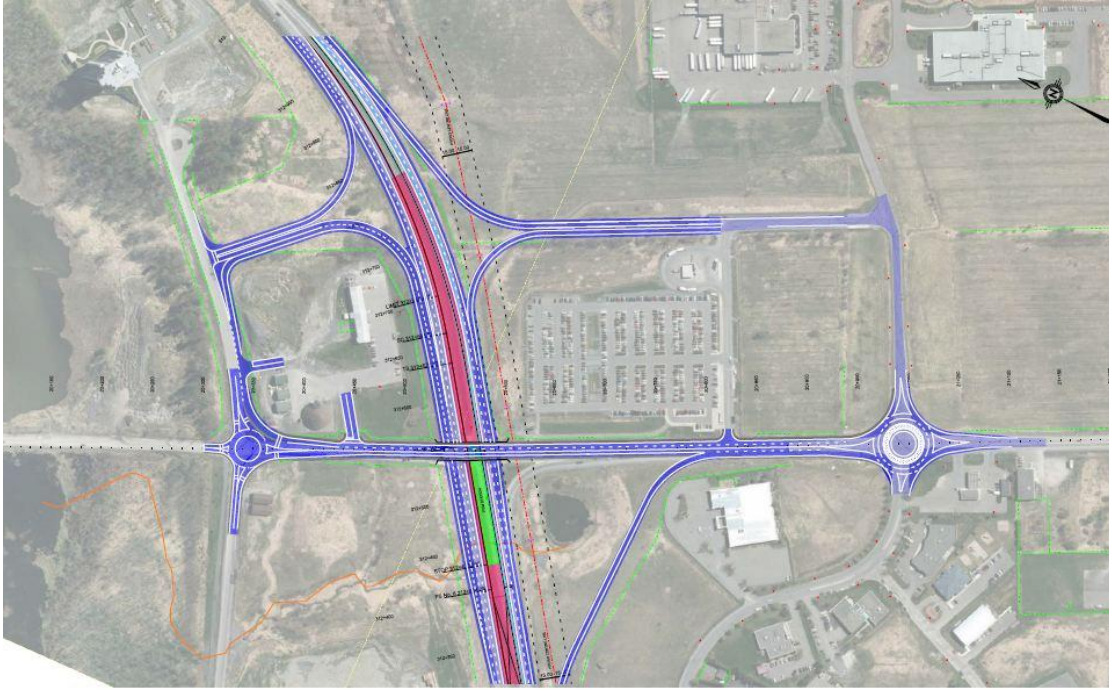


Figure 14: Trim Park & Ride and Interchange

General Impacts and Mitigation Measures

Property Impacts

There is no property impact for the LRT project and no NCC land is required through the Greenbelt. In addition, Green's Creek culverts will not be altered or extended.

Noise Impacts

Operational noise impacts due to the LRT were assessed according to the City of Ottawa's Environmental Noise Control Guidelines. While there was no future increase in noise levels as a result of the LRT project, existing noise levels in some locations exceed acceptable levels due to highway traffic and mitigation is recommended. Approximately five kilometres of noise barriers have been identified in limited locations and will be implemented with the LRT project.

Vibration Impacts

Vibration has been identified as a concern in two locations. Typical measures (sub-ballast blast mats or isolation slabs) to isolate the track will be implemented to reduce the vibration impact. Similar methods have been used effectively elsewhere and are planned for incorporation into the Confederation Line.

Stormwater Management

Quantity and quality control of storm runoff will be modified slightly, and are anticipated to have minor net impacts. All road drainage will be redirected to the ditches and outlets along the outside edge of the highway. LRT drainage will be contained within the median and filtered through the track ballast and granular base before being conveyed to the highway outlets. Oil/grit separators will be installed at the outlets to manage quality. Outlet constraints will allow the track bed to be used to hold water during major events to reduce peak flows.

Construction Staging

Construction of the LRT in the median of the highway will require changes to drainage, construction of the track bed and stations, and installation of track, overhead power, and communications and signal systems. At the stations, work will include the platform and tracks as well as the connections up to the local road and/or pedestrian bridge. At several stations new pedestrian bridges will be required, which would be lifted using weekend closures similar to the Coventry Bridge installation. Through much of the corridor there is a generous median which will allow this work to proceed with little interference to the adjacent road traffic.

The drainage system is central to the plan. Modifying the road drainage so that all the water runs to the outside edge of the highway (by padding up the inside lane) will reduce the size of the system needed for the central LRT corridor. This smaller drainage system can be installed from the median without impacting the adjacent traffic lanes. Installation of the barrier between the LRT and the highway can be done with midday, evening and weekend lane restrictions.

The exception to this is at the stations, where the platform and tracks are wider than the sections between stations. Near the stations, a temporary highway widening will be required to allow the contractor to locally close the inside lane to make construction faster and more efficient. Once the barriers are in place, much of the work can be done from inside the LRT area. The detour lanes around the three stations can be retained and be incorporated into the ultimate highway widening.

Summary of Public Consultations

A series of three coordinated rounds of consultations were held throughout the study. Each round consisted of an Agency, Business, and Public Consultation Group meeting as well as three Open Houses in various locations along the Hwy174/CR17 road corridor. A summary of the public consultation dates, locations, comments and responses is noted below.

The first round of consultation was held between January 28 through to February 7, 2013 for the Hwy174 widening and prior to the LRT study commencing. This round introduced the existing conditions of the road corridor in which the ELRT alignment is located, as well as the need to protect for a dedicated transit facility. In addition, it established the groundwork for subsequent rounds of consultation. Dates, locations and attendance at the three open houses were as follows:

February 5, 2013 Cumberland Village – Maple Hall 93 people signed the registry	February 6, 2013 Orleans – Sir Wilfrid Laurier Secondary School 28 people signed the registry	February 7, 2013 Clarence Rockland – City Hall Council Chambers 47 people signed the registry
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All comments were related to the Hwy174/CR17 road widening.

The second and third round of consultation was held in coordination and together with the ELRT Extension. For the purposes of this report, the discussion below was limited to the ELRT and Hwy174 widening between Hwy 417/Split to Trim Road.

The second round of consultation was held between January 27 through to February 5, 2015. Dates, locations and attendance at the three open houses are as follows:

February 2, 2015 Cumberland Village – R.J. Kennedy Memorial Community Centre 132 people signed the registry	February 3, 2015 Orleans – Bob MacQuarrie Recreation Complex 164 people signed the registry	February 4, 2015 Clarence Rockland – Guy Faubert Hall 51 people signed the registry
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The third round of consultation was held between April 13 through to April 23, 2015. Dates, locations and attendance at the three open houses are as follows:

April 20, 2015 Orleans – Community Pentecostal Church 90 people signed the registry	April 21, 2015 Cumberland – R.J. Kennedy Community Centre 90 people signed the registry	April 23, 2015 Clarence Creek Community Hall 97 people signed the registry
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General Comments/Responses
There was overall general support for the LRT and median alignment in both Orleans and Clarence-Rockland
<p>LRT should extend to Trim station immediately and defer building some stations</p> <ul style="list-style-type: none"> Implementation of the LRT is limited by the City's financial affordability plan outlined in the TMP but the study team will review ridership and the cost to extend the LRT to Trim Road.
<p>Need to expand the park and rides</p> <ul style="list-style-type: none"> The existing park and rides will be reviewed and designed based on need. There are no plans for additional park and ride locations.
<p>Concern for noise and vibration impacts</p> <ul style="list-style-type: none"> The study will review impacts on noise and vibration and mitigation will be identified where warranted
<p>Concern about pedestrian and cycling access to the median stations and the distance from the local feeder buses</p> <ul style="list-style-type: none"> Stations will be designed to be fully accessible and convenient to/from the local feeder buses
<p>Concern for personal safety at stations</p> <ul style="list-style-type: none"> Stations will be designed with personal safety considerations such as glass enclosures and clear sightlines to and from the station
<p>Consider an extra station at Jasmine Park</p> <ul style="list-style-type: none"> The study will review a potential station between Blair and Montreal Road station given the 3km distance between these stations
<p>Consider moving the Tenth Line station about 300m east where potential high density commercial development is being proposed</p> <ul style="list-style-type: none"> The study will review a potential station in the vicinity
<p>Consider pathway connections between stations</p> <ul style="list-style-type: none"> The study is reviewing opportunities for pathway connections such as between Blair Station and Montreal Road station on the north side of Hwy174.

Will stations have washroom facilities

- Washrooms are planned at terminal stations such as Blair and Place d'Orléans.

The following First Nations groups were also consulted during the three rounds of consultation.

- Algonquins of Ontario Consultation Office;
- Algonquins of Pikwakangan;
- Kitigan Zibi Anishinabeg First Nation;
- Métis Nation of Ontario; and,
- Quebec Métis Nation.

Responses were received from two groups. On 18 September 2014, the Quebec Métis Nation indicated by letter that this project was outside of their jurisdiction. From early 2013 through to study completion, the study team communicated periodically by email and phone with the Algonquins of Ontario. Furthermore, a meeting was held on 6 February 2015 to discuss the coordinated studies and their parcel of land they own abutting the Hwy174 east of Trim Road, which was their primary area of interest.

Appendix A: Plan Views of the Ultimate Plan for Confederation Line East LRT Extension and Full Highway Widening



Figure 15: Highway 417/Split transition to Highway 174 and widening

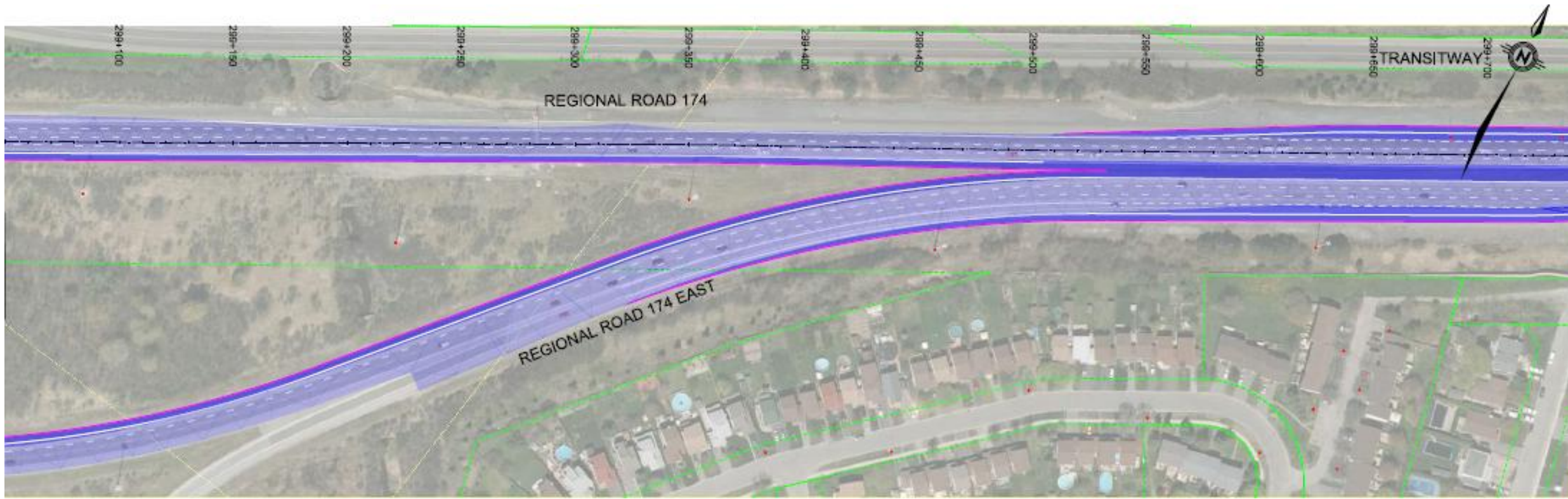


Figure 16: Highway widening west of Blair Road

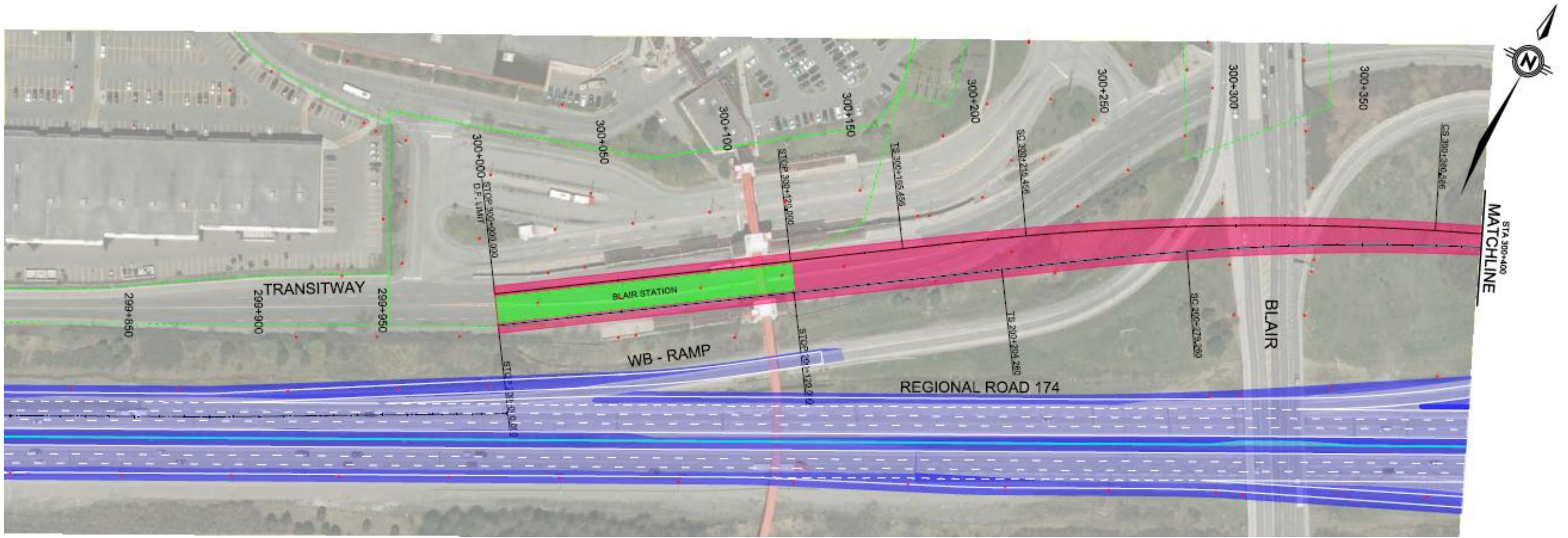


Figure 17: Blair Station and highway widening

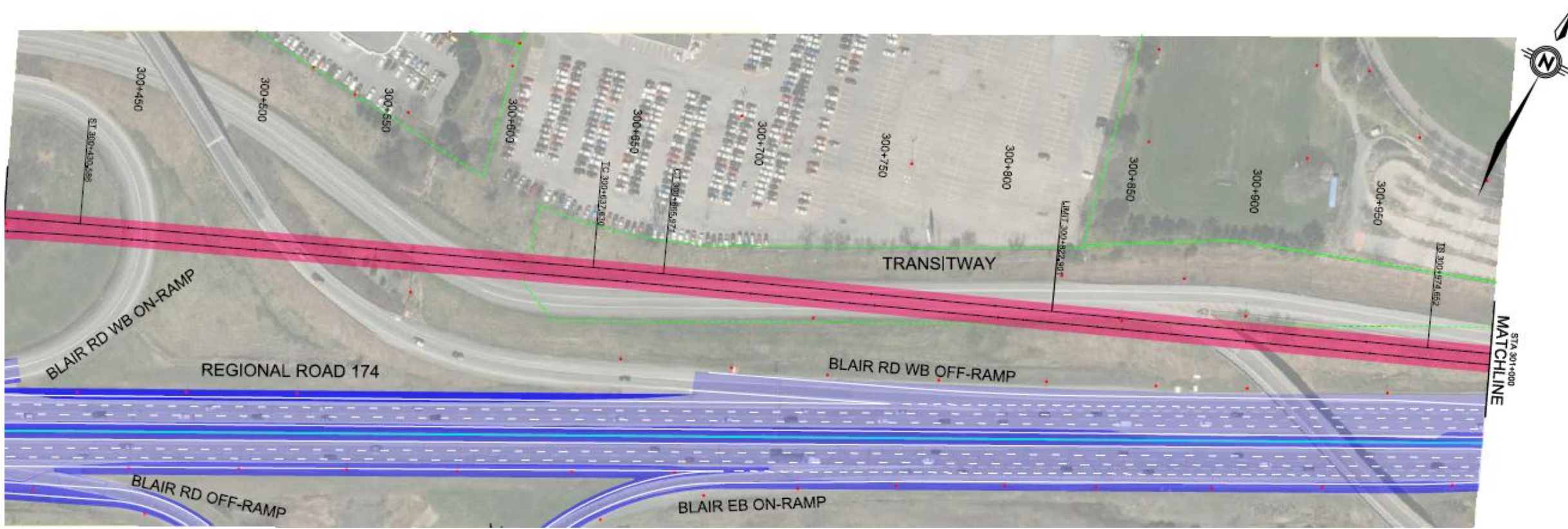


Figure 18: East of Blair Road LRT track and widening

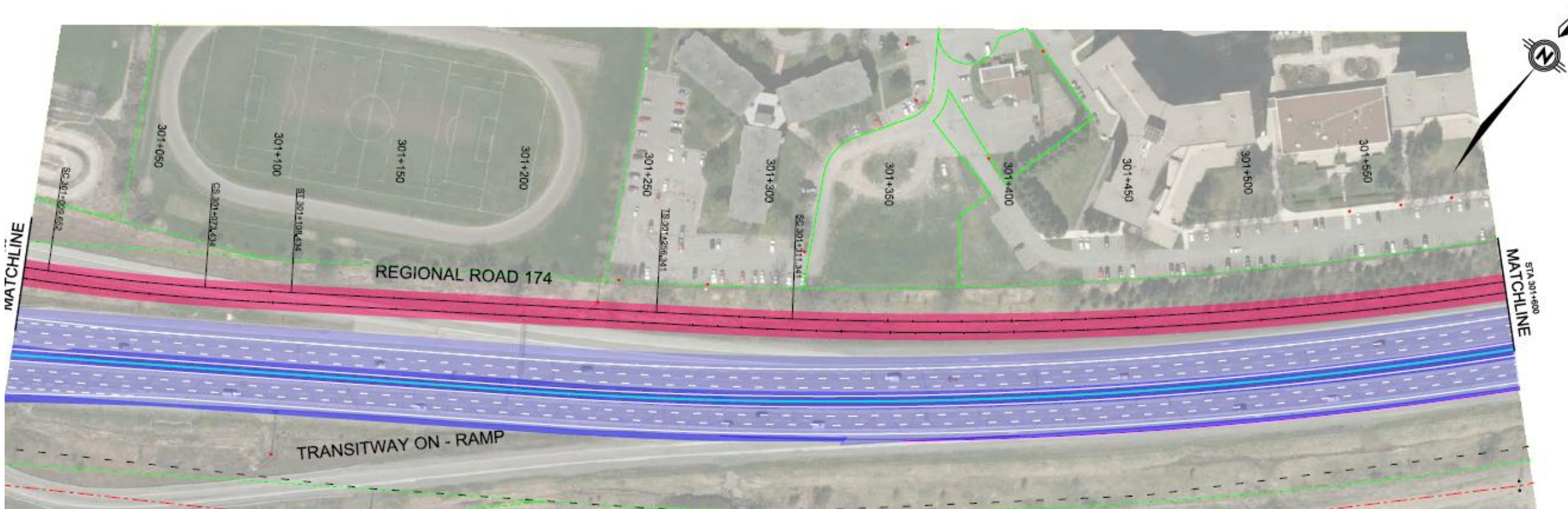


Figure 19: LRT track and widening near Gloucester High School

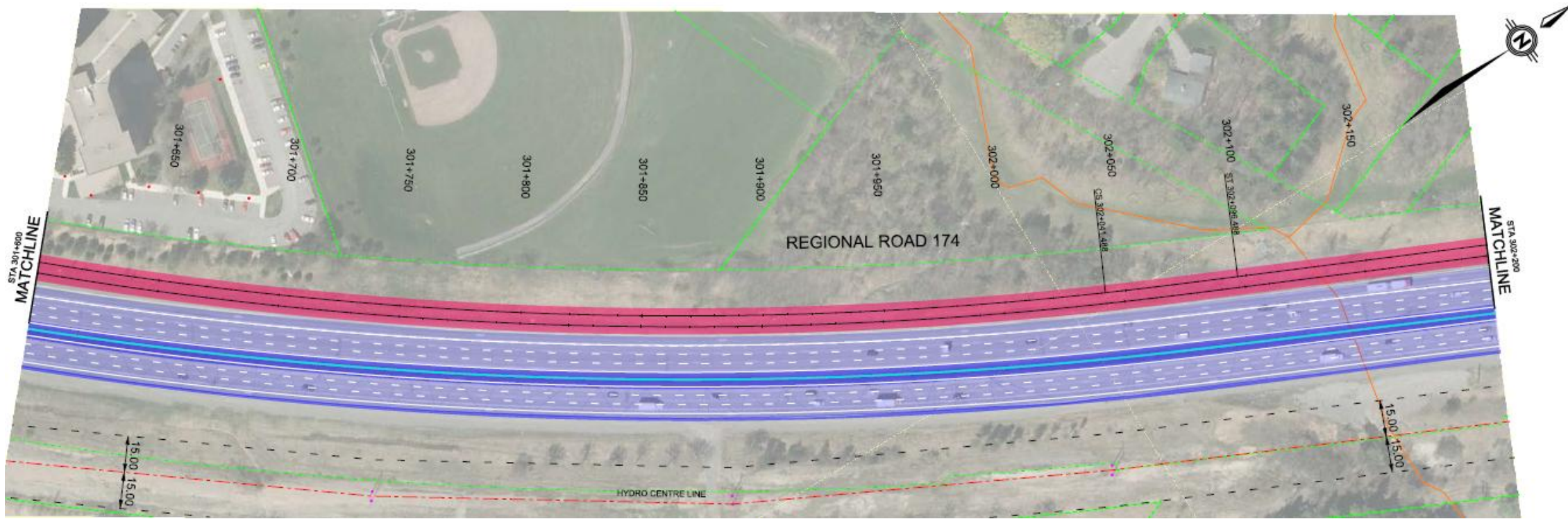


Figure 20: LRT track and widening near ball diamond and park



Figure 21: LRT track and widening near East Acres Road

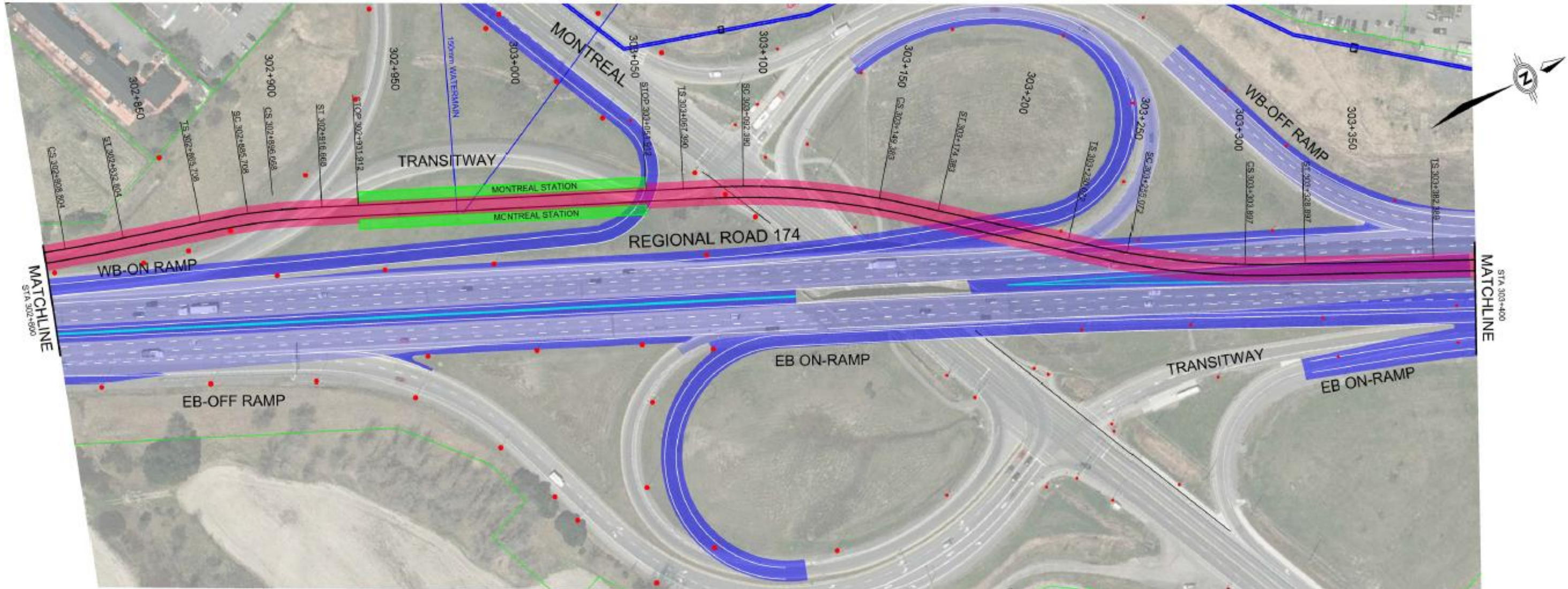


Figure 22: Montreal Road Station, highway widening and ramp modifications

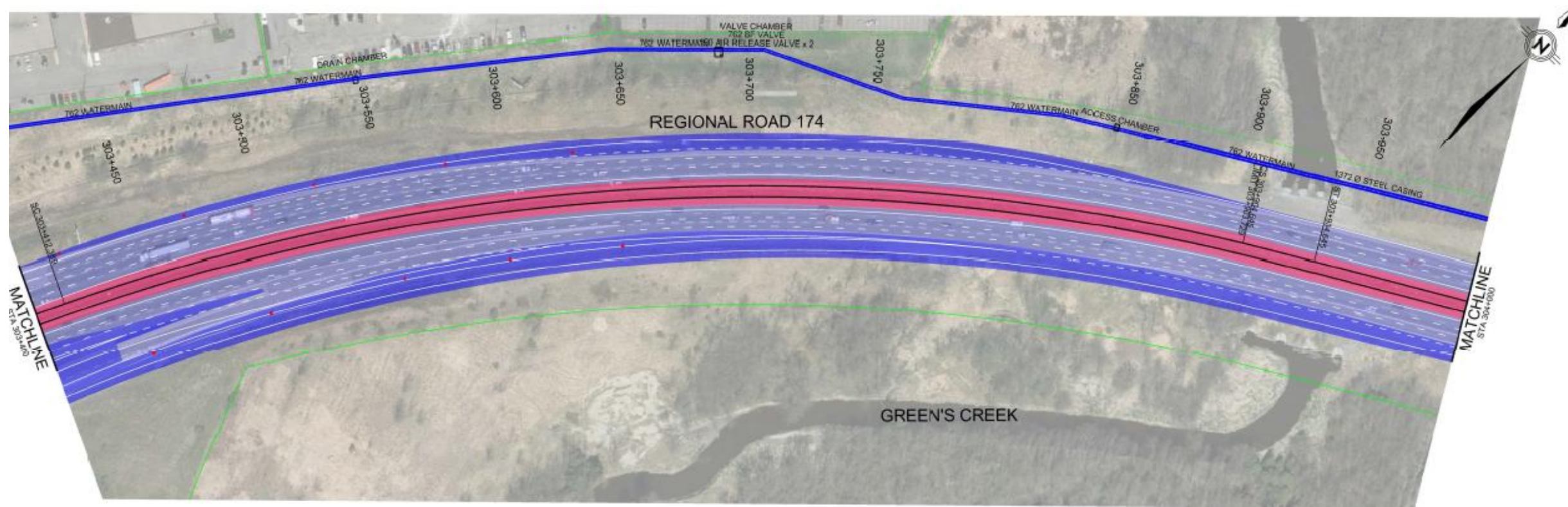


Figure 23: LRT track and highway widening east of Montreal Road

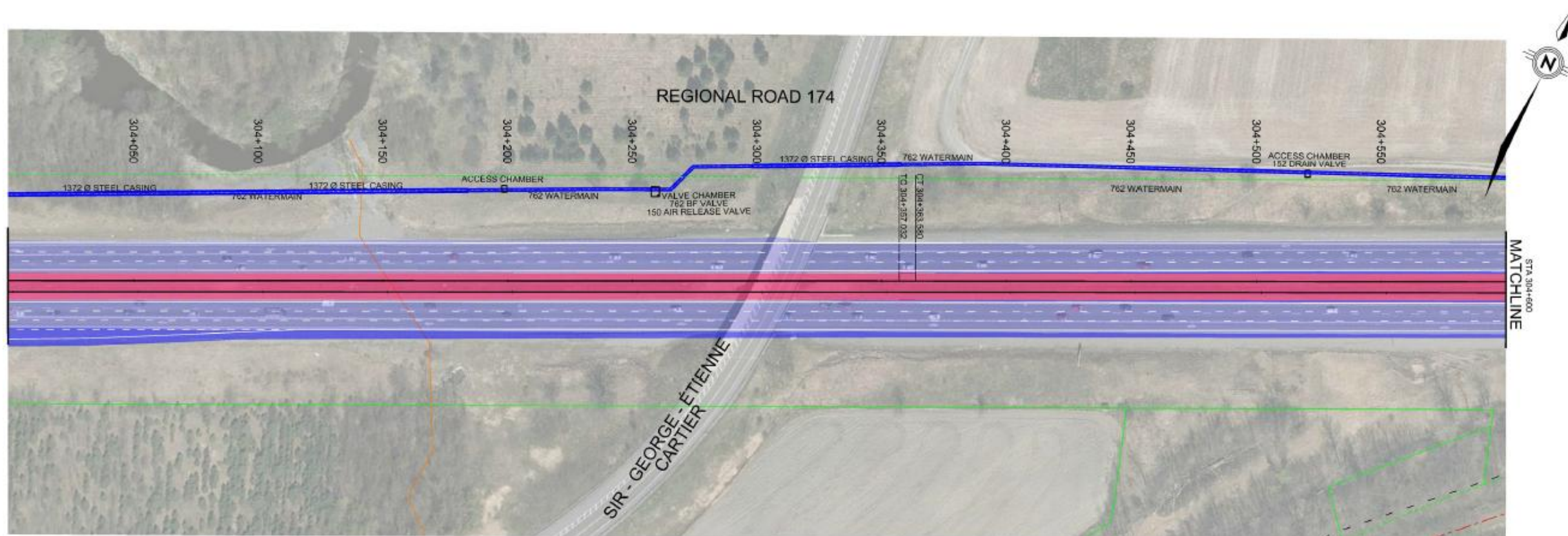


Figure 24: LRT track and highway widening at Sir George – Etienne Cartier Parkway

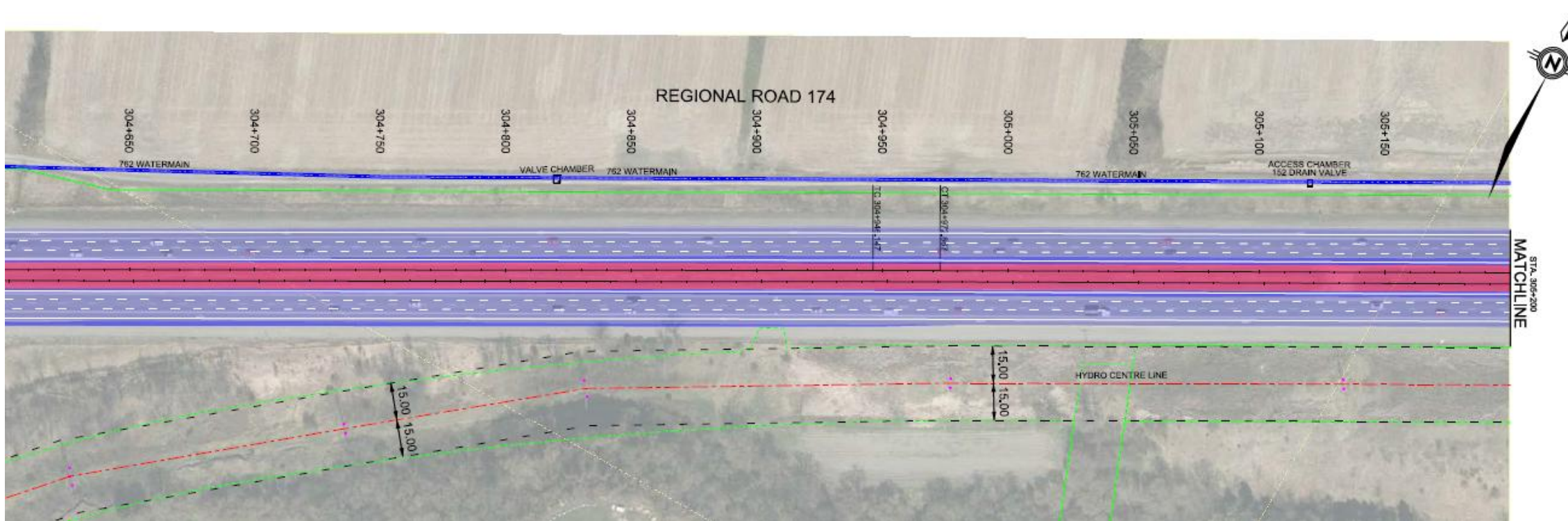


Figure 25: LRT track and highway widening through greenbelt



Figure 26: LRT track and highway widening through greenbelt

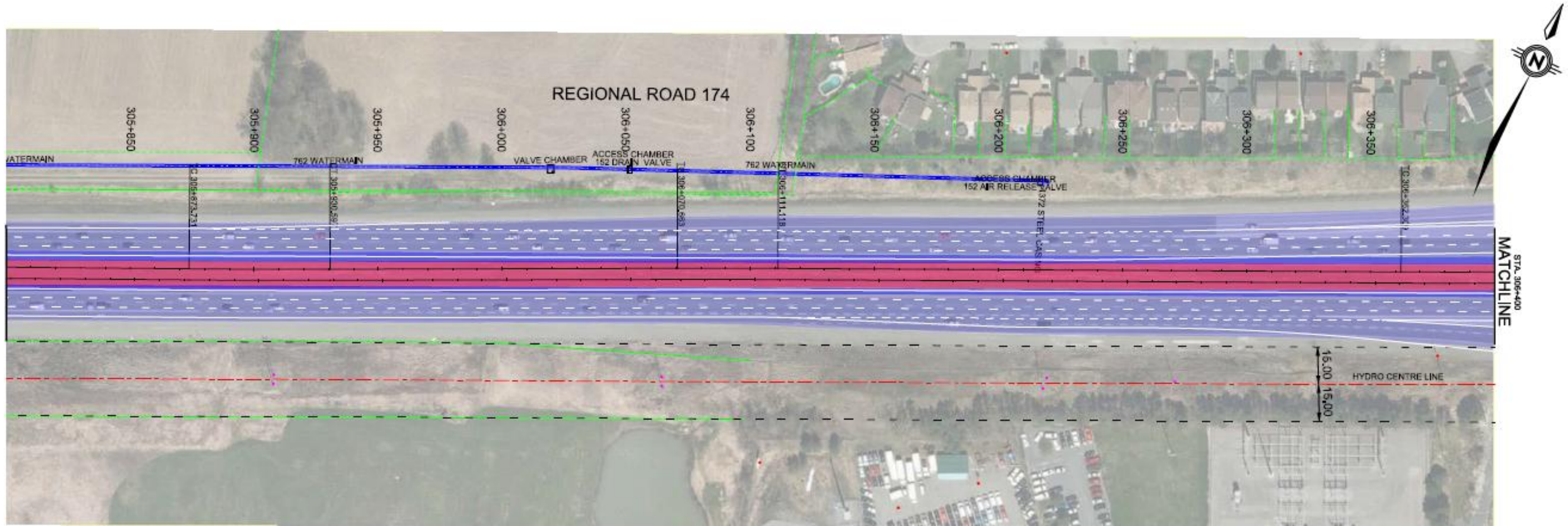


Figure 27: LRT track and highway widening near Burgundy Lane



Figure 28: Jeanne D'Arc Station, highway widening and ramp modifications



Figure 29: Highway widening east of Jeanne D'Arc Boulevard

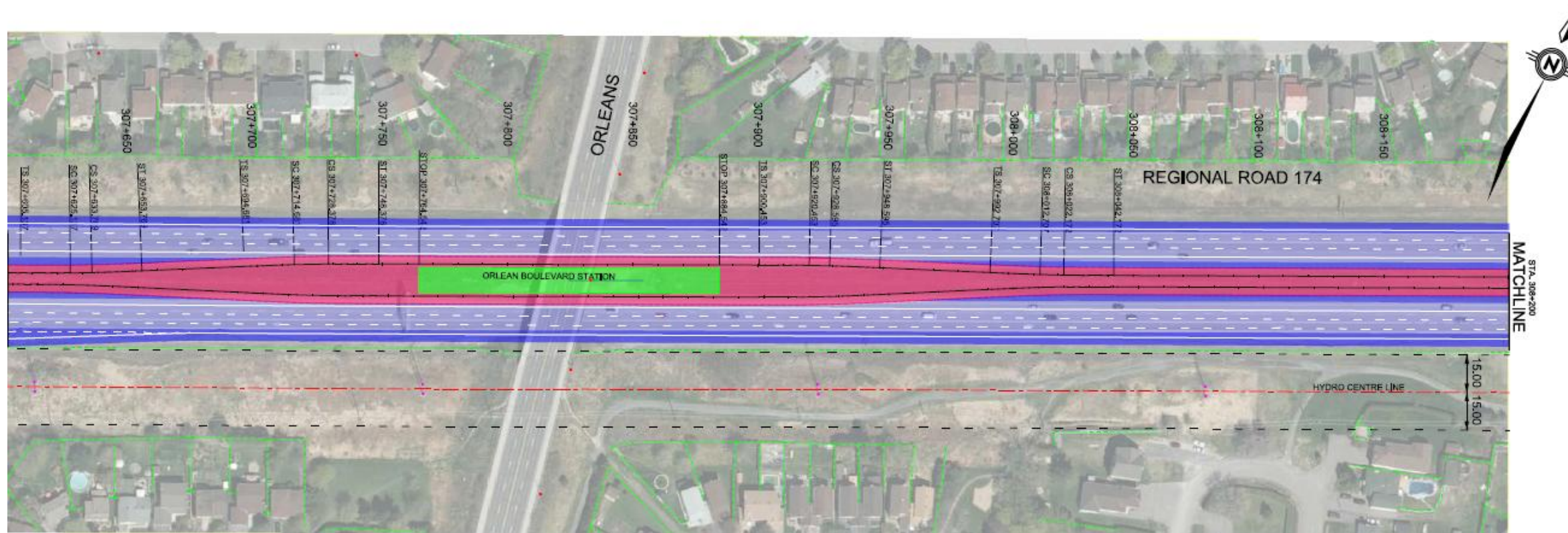


Figure 30: Orleans Boulevard Station and highway widening



Figure 31: LRT track and highway widening near Taffy Lane

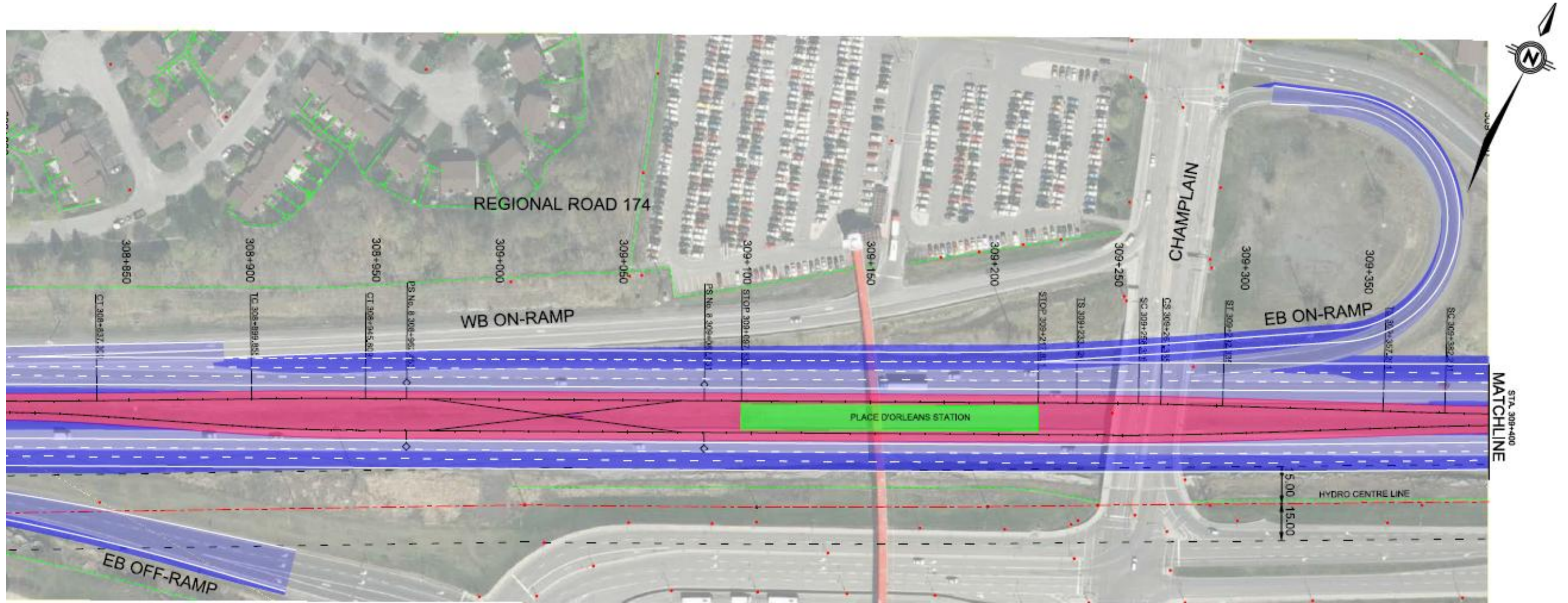


Figure 32: Place d'Orléans Station, highway widening and ramp modifications

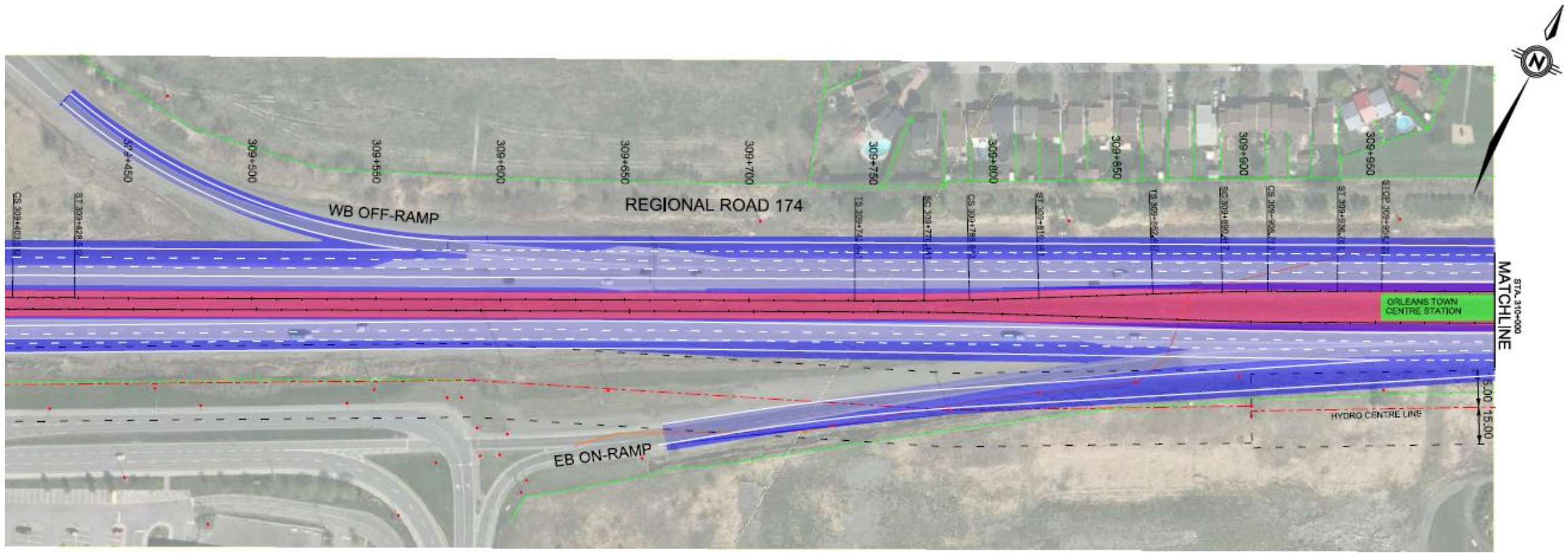


Figure 33: LRT track and highway widening east of Champlain Street

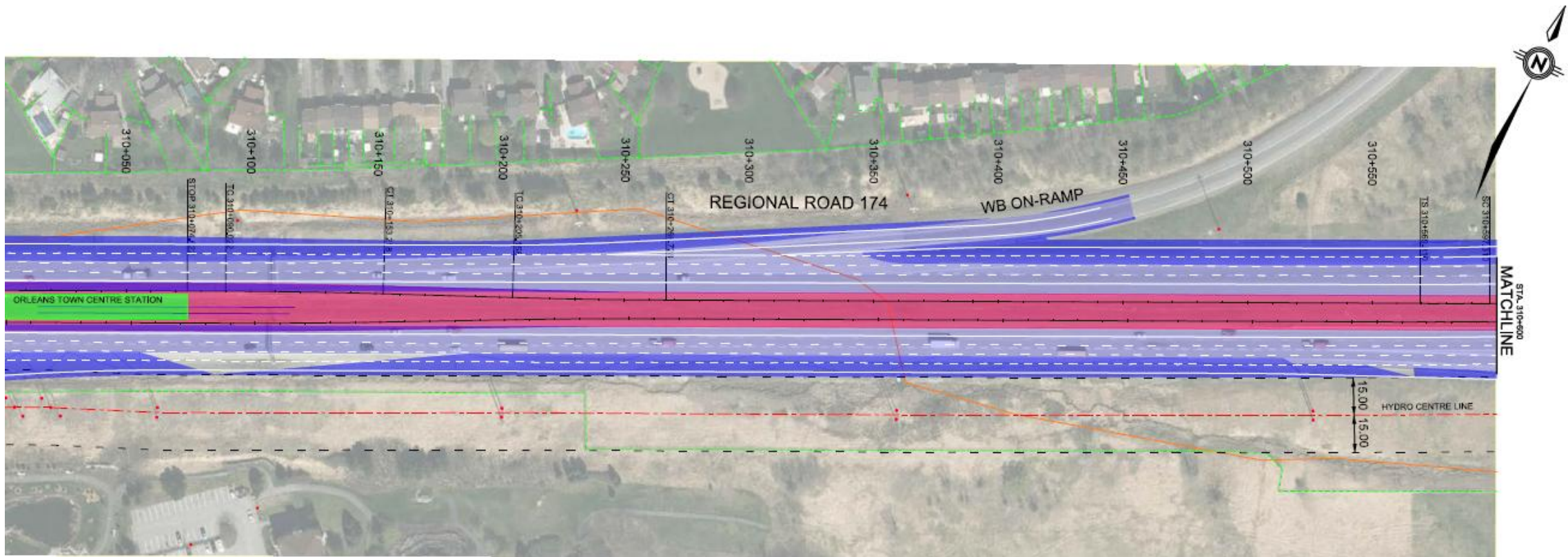


Figure 34: Orleans Town Centre Station and highway widening

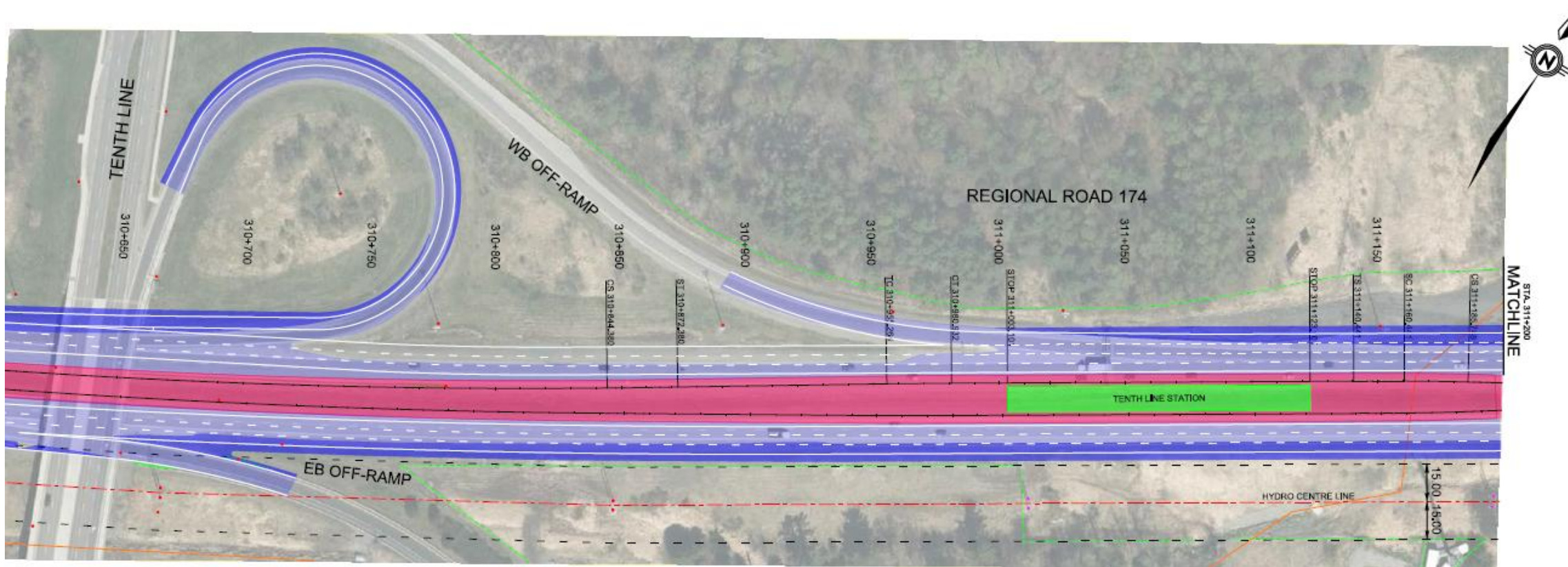


Figure 35: Tenth Line Station and highway widening

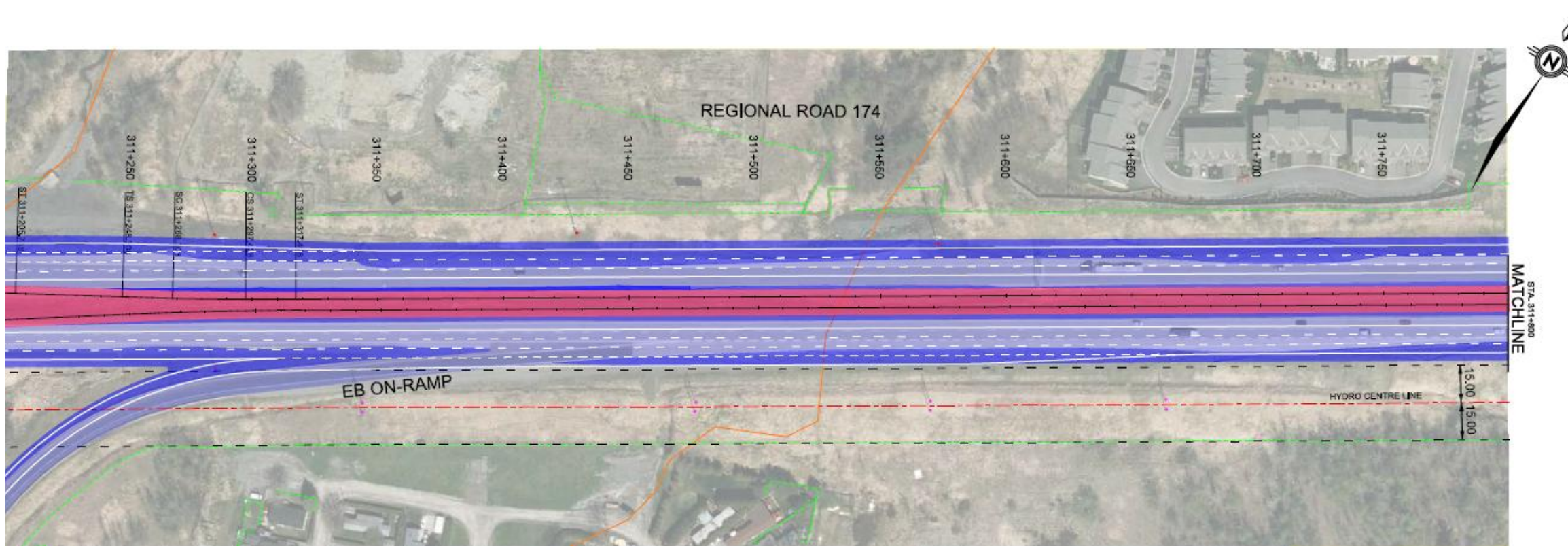


Figure 36: LRT track and highway widening near Prestige Circle

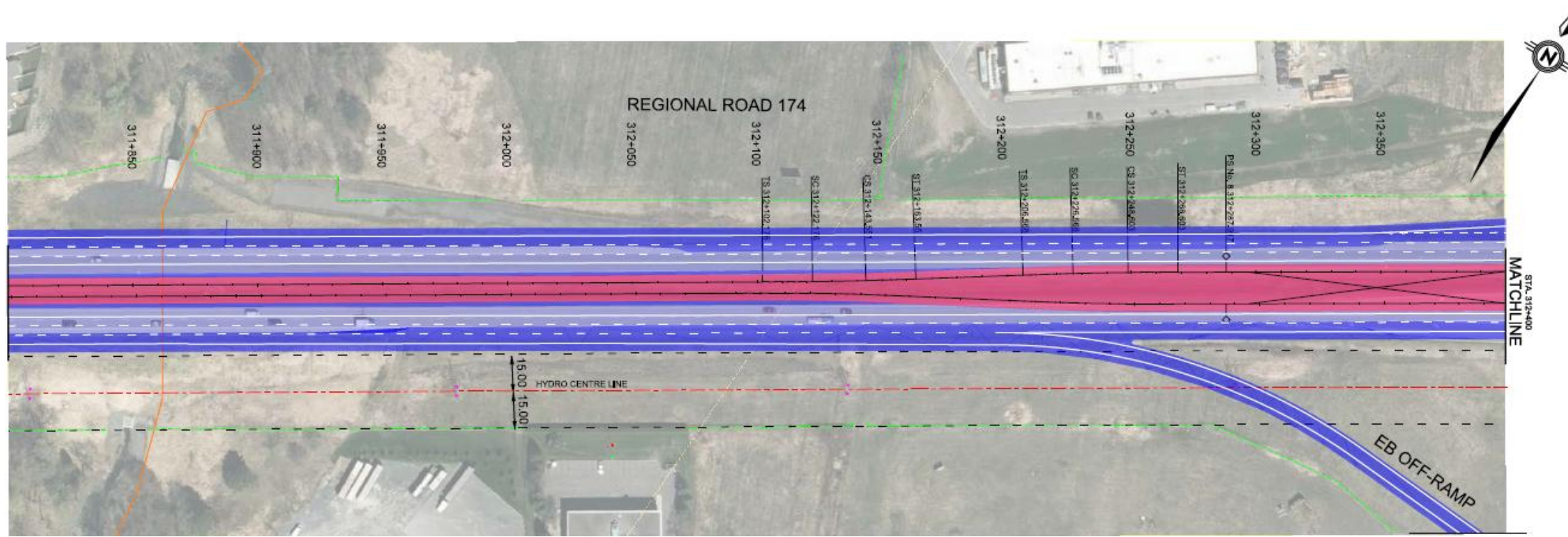


Figure 37: LRT track and highway widening west of Trim Road

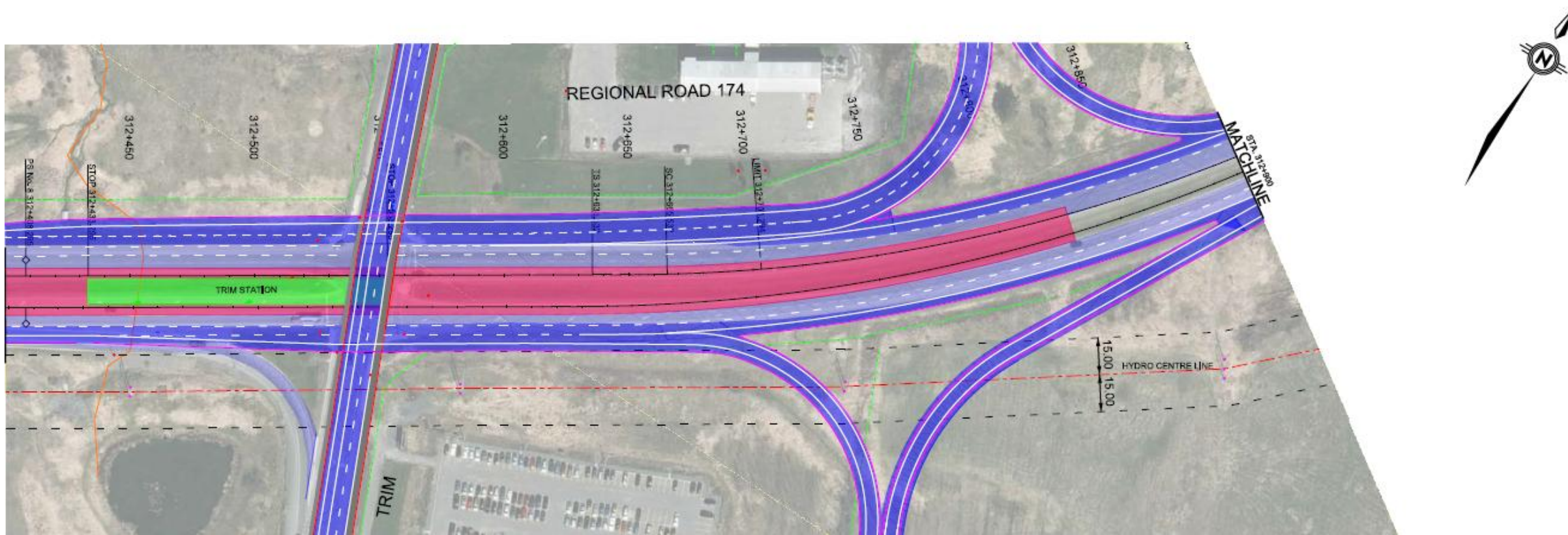


Figure 38: Trim Station and new grade separated interchange



Figure 39: Trim Station and new grade separated interchange