



Welcome

Kirby Road Extension

Environmental Assessment Study

Public Information Centre #1

Maple Downs Golf & Country Club

June 29, 2017



SCHAEFFERS
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ACOUSTICS

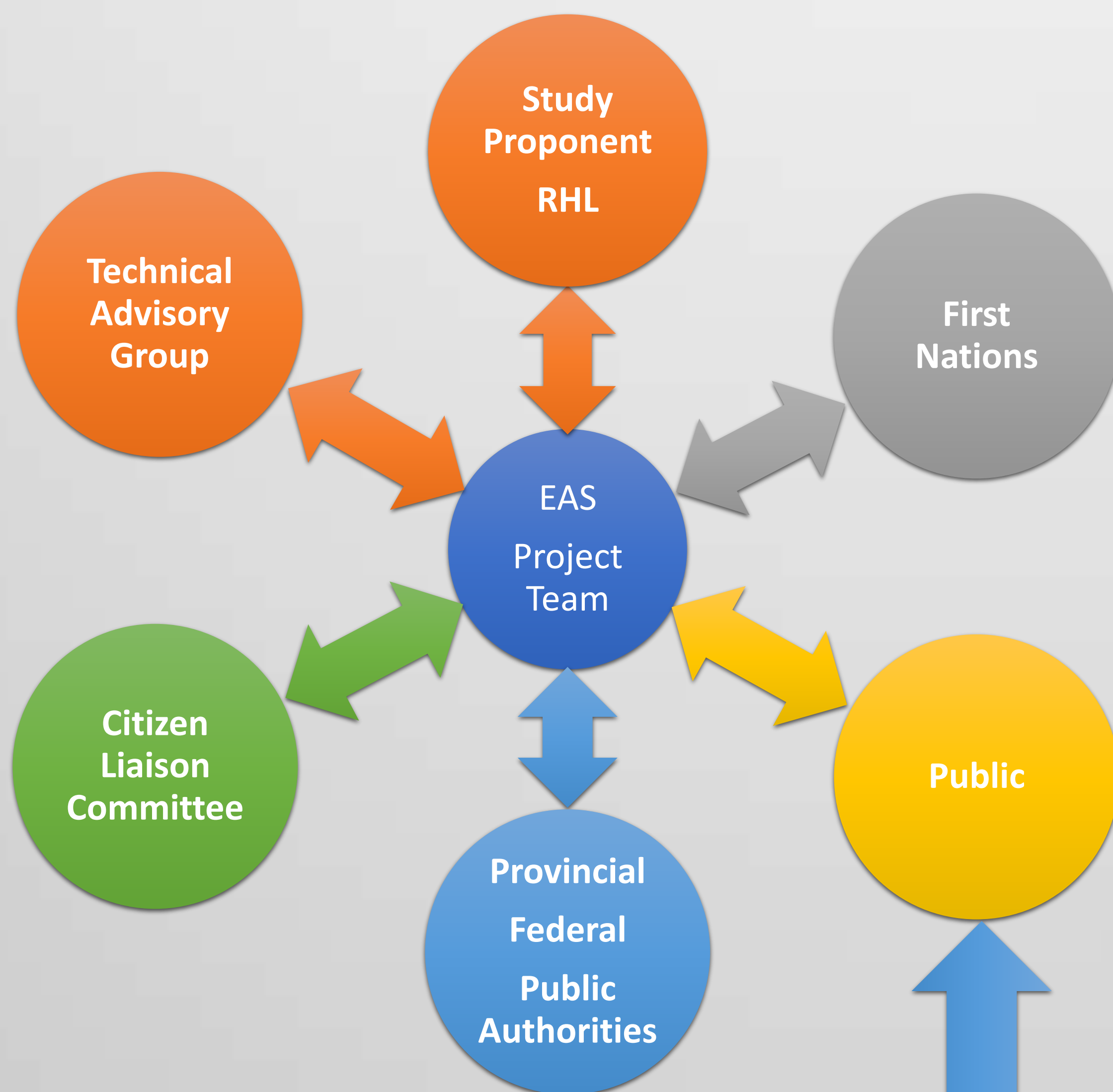


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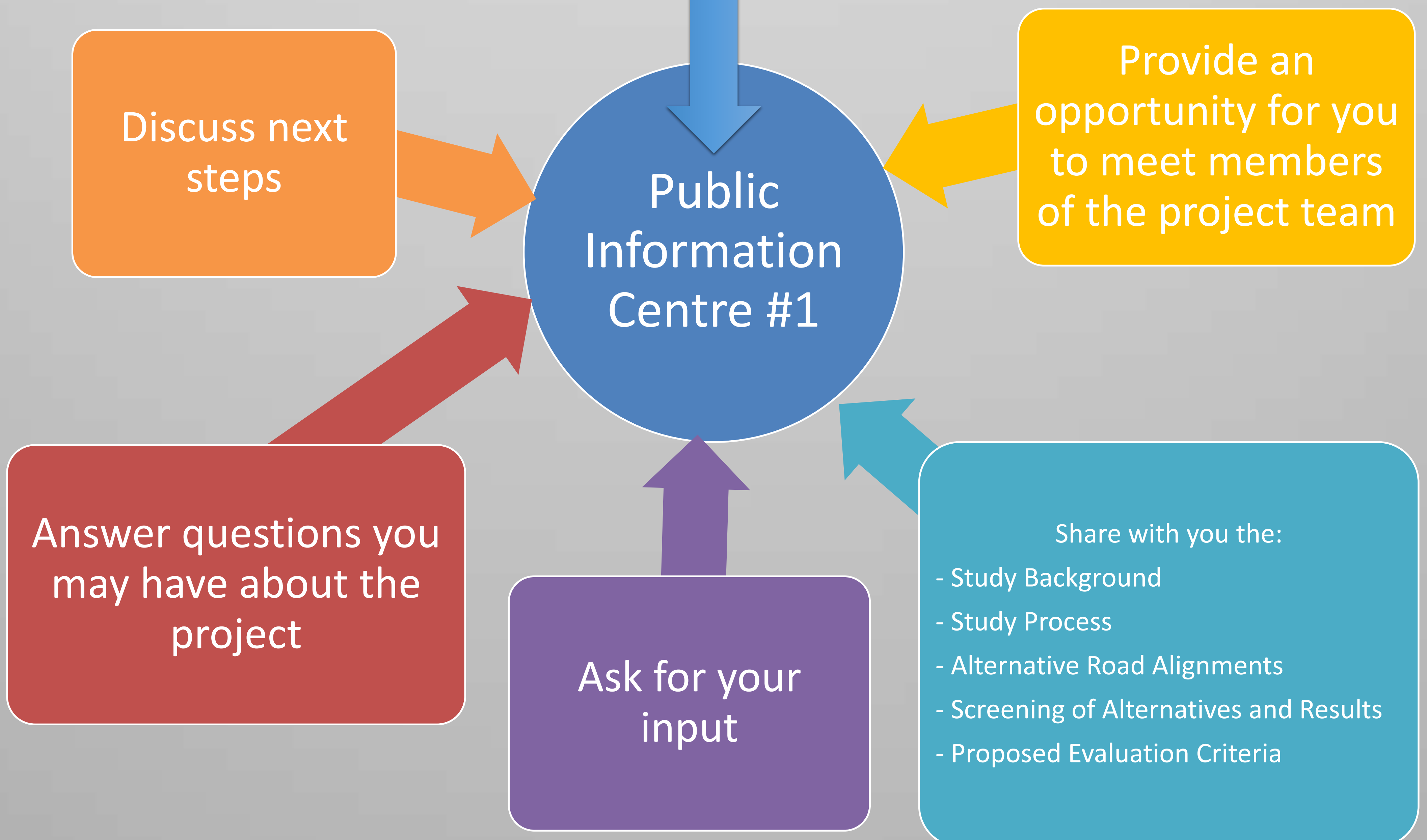


Terraprobe

Why are we here?



Consultation early in and throughout the process is a key feature of environmental assessment planning.



Consultation Objectives

- Establish two-way communication between the study proponent and interested stakeholders to influence decision making and to provide opportunities for information exchange.
- Foster public trust and confidence by demonstrating that RHL is following a comprehensive consultation and sound decision making processes.

What is the Study About ?

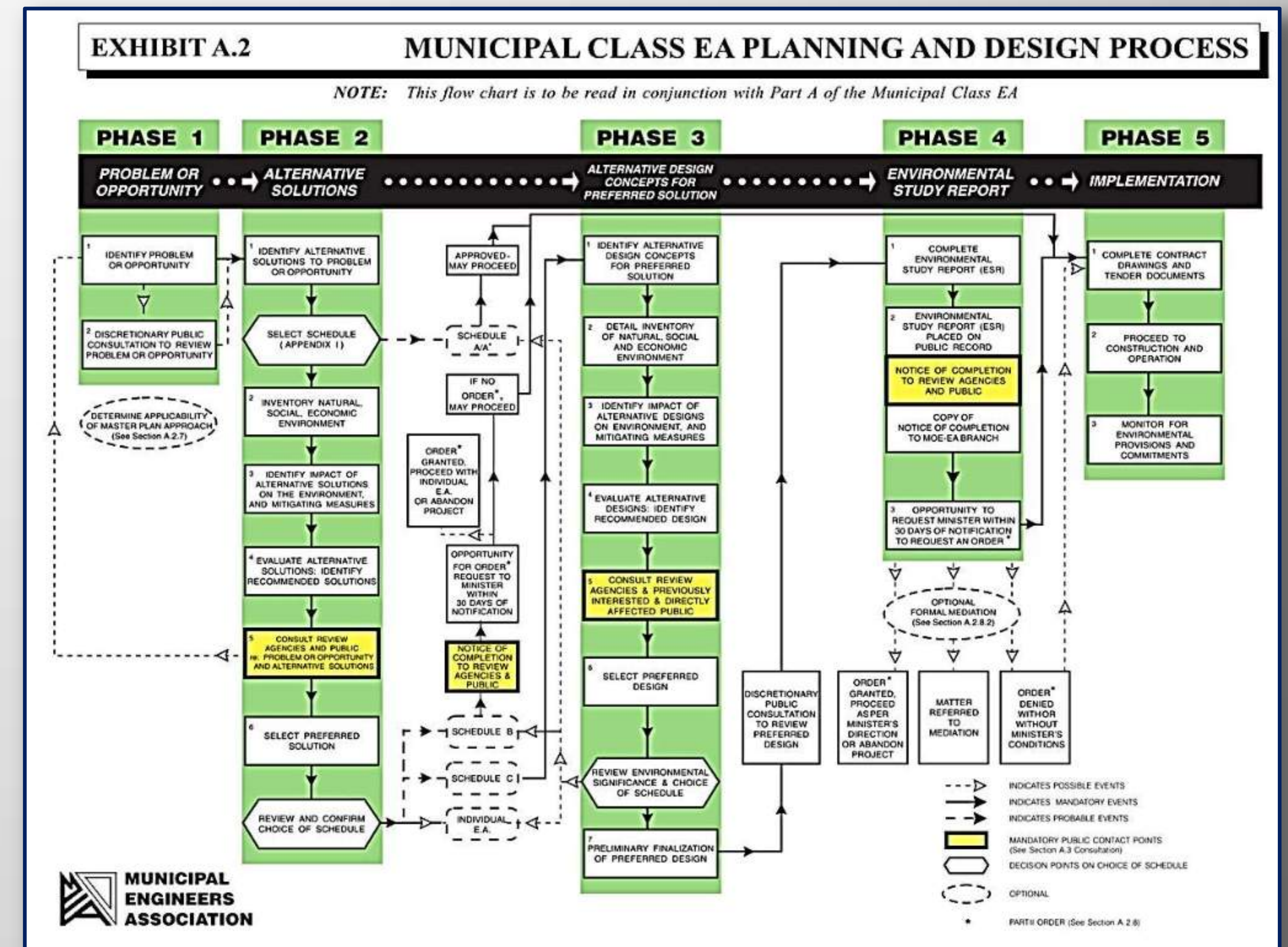
- ❑ Study Area is located immediately **west of municipal border of Town of Richmond Hill** within the City of Vaughan.
- ❑ **Kirby Road connection** between Dufferin Street and Bathurst Street is missing.
- ❑ **New road projects** involve the construction of an **approved surface for various modes of transportation** on an existing road allowance where **no road surface** previously existed or the **acquisition of a new Right-Of-Way (ROW)** and **constructing a road on a new road allowance**, which is separate from an existing ROW.
- ❑ Existing **Kirby Road is currently owned by the City of Vaughan (CoV)**, including the untraveled existing **road allowance spanning through the Study Area** between Dufferin Street and Bathurst Street.
- ❑ The existing road allowance is 20.10m wide ROW. The **minimum required ROW for a new road is 36.0m**. The required width may increase through certain areas of the study to accommodate transit (bus bays, stops, shelters, etc.). The total length of the unopened road allowance is about 2 km.
- ❑ **Environment** is applied broadly and includes the natural, social, cultural, built and economic components.
- ❑ **Environmental Assessment (EA)** is a decision making process to promote good environmental assessment planning under Ontario Environmental Assessment Act (EA Act)(1990).



- ❑ The purpose of the EA Act is “... the betterment of the people of the whole or any part of Ontario by the protection, conservation and wise management in Ontario of the environment...”

What is the Study About ?

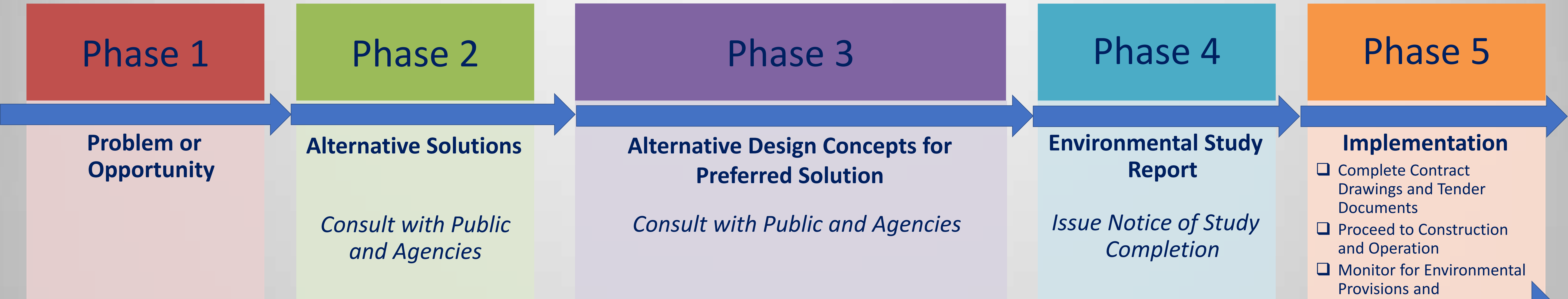
- ❑ Rizmi Holdings Limited (RHL) has been authorized by the City of Vaughan to undertake the necessary Environmental Assessment Study (EAS) to establish the preferred alignment and design for the extension of Kirby Road between Dufferin Street and Bathurst Street.
- ❑ The EAS is being planned as a **Schedule 'C' Municipal Road Project** in accordance with the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (MCEA) Document (2000, as amended).
- ❑ The **Class EA** is a planning and design process defined under Ontario EA Act for a group or "Class" of projects.
- ❑ The **Municipal Class EA** is an approved process which **applies to a group of municipal infrastructure projects** including roads, water, wastewater and transit.
- ❑ In the MEA MCEA Document, projects are categorised into four Schedules (A, A+, B, C) given the nature of the project, its complexity and magnitude of anticipated environmental effects.
- ❑ The Municipal Class EA provides a **framework for the EAS planning**. This is a **self-assessment process** where the responsibility for the process and compliance with its requirements rests with the study **proponent**. Subject to compliance with the Municipal Class EA, the new road project is deemed to fulfill the requirements of the EA Act.
- ❑ **New road** projects which have high **potential for significant effects** on the environment must **follow the Schedule 'C'** planning procedure outlined in the MEA MCEA Document.
- ❑ **Phases 1 and 2** of the Municipal Class EA have been **completed and addressed** in the **2013 City of Vaughan Transportation Master Plan (TMP)** and **2016 York Region TMP**.



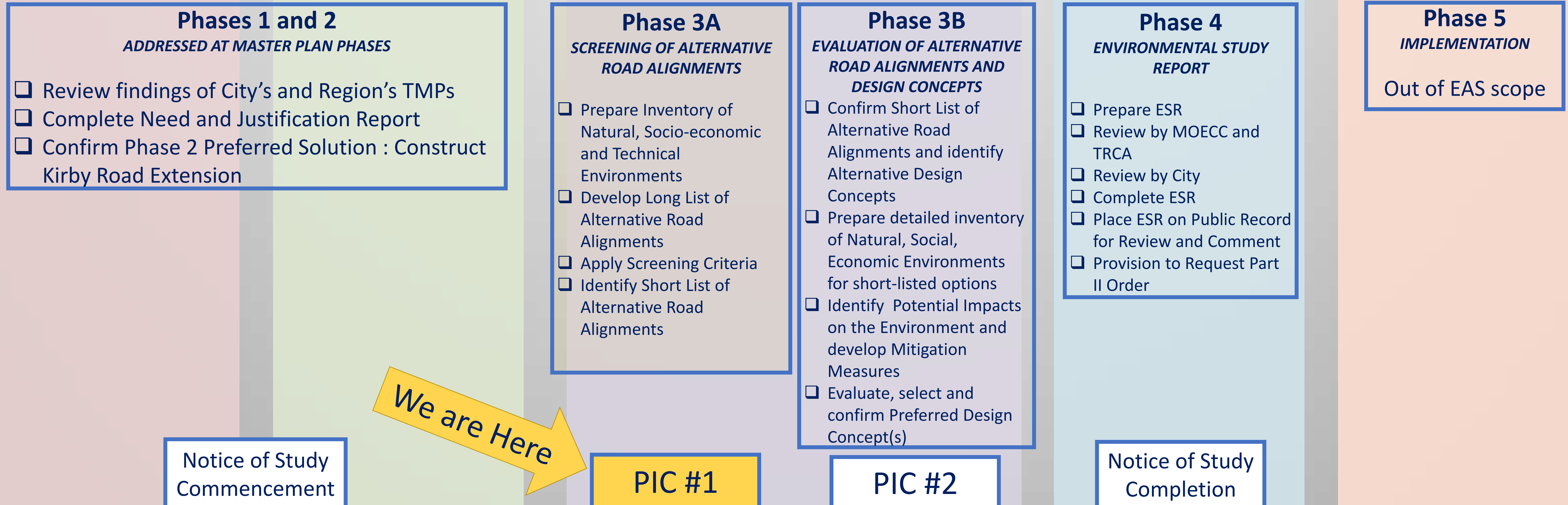
- ❑ **Phases 1 and 2** of the Municipal Class EA are being **revisited** as part of the EAS. **Phases 3 and 4 will be completed** by the **RHL, a private sector developer acting as the study Proponent**.
- ❑ The EAS will consider and evaluate alternative design concept(s) for the new roadway, identify a preferred design concept(s) and complete an **Environmental Study Report (ESR)**.
- ❑ The **ESR will be provided to the City of Vaughan**, who will determine whether or not to issue a Notice of Study Completion as a Study **co-Proponent** and file the ESR for mandatory public review.

What is the Municipal Class EA Process ?

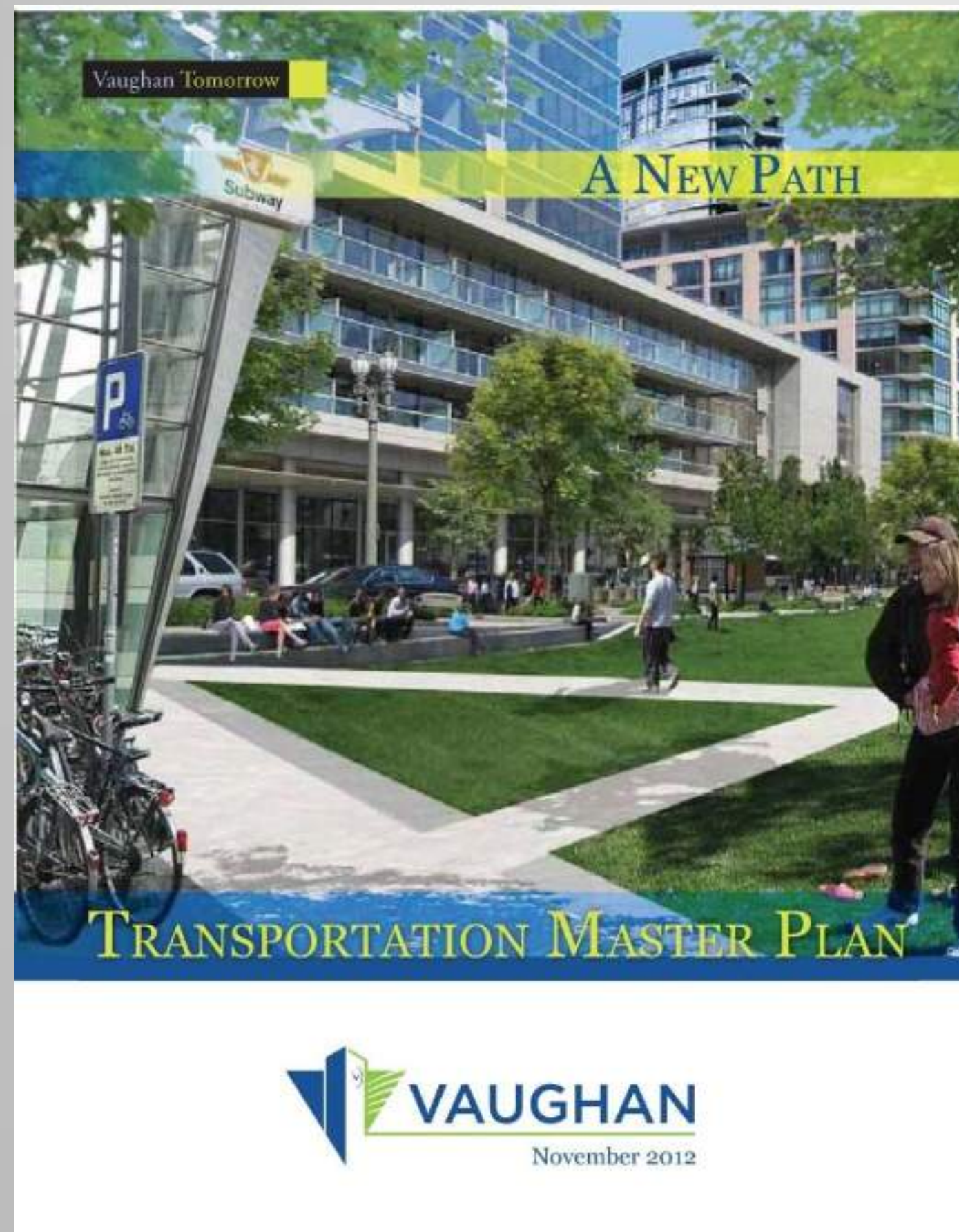
Overview of how the Kirby Road Extension EAS process follows the Municipal Class EA process is presented on the chart below.



KIRBY ROAD EAS PLANNING AND DESIGN PROCESS

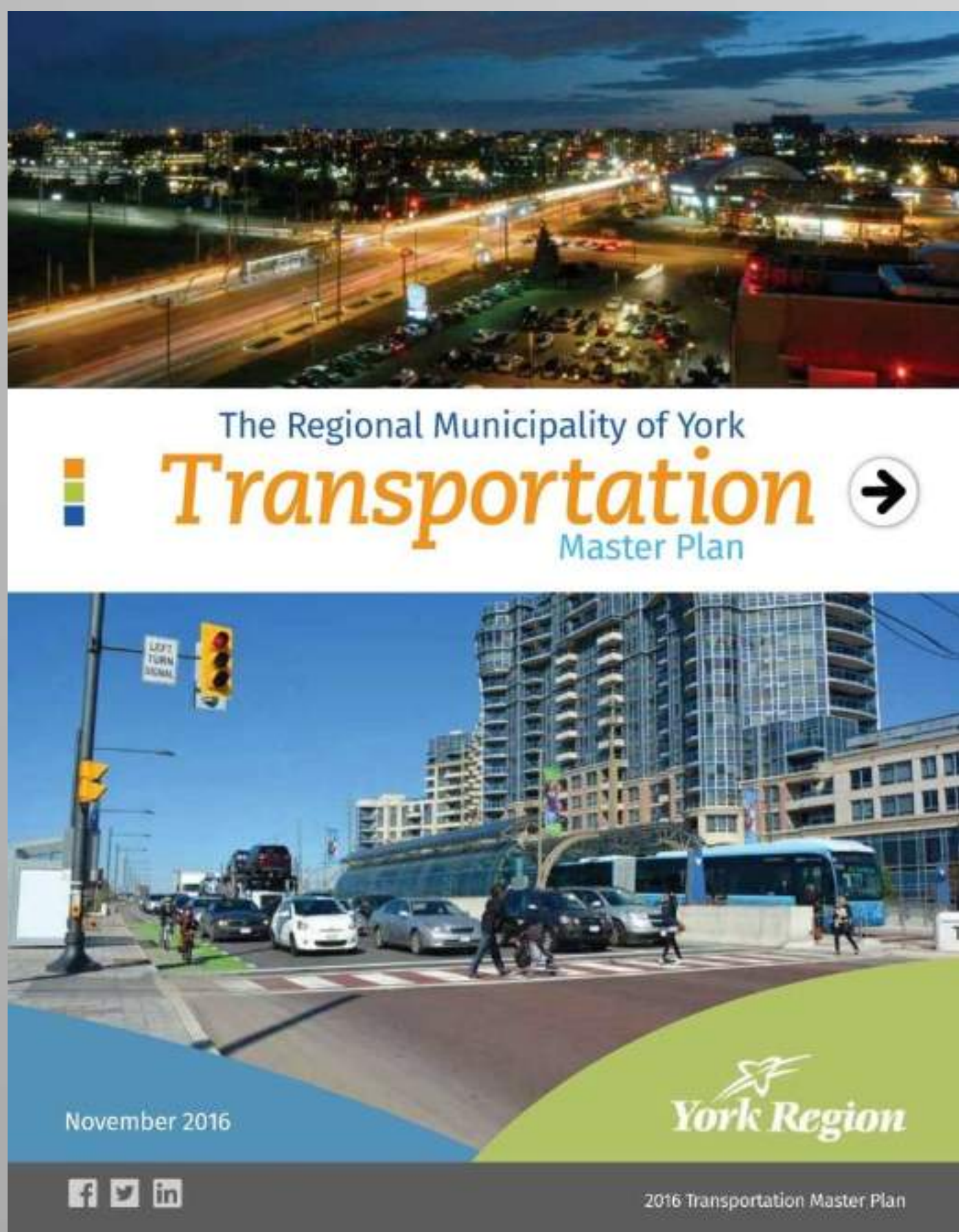


Why is this project needed ?



2013 City of Vaughan TMP identified the need for Kirby Road corridor improvements and confirmed the requirements for a new 4-lane roadway between Bathurst and Dufferin Streets, roadway widening to 4 lanes between Dufferin and Keele Streets and railway grade separation west of Keele Street.

Justification: “These are strategic road improvements needed to enhance network connectivity and the effectiveness of existing network, including for pedestrian and cycling modes. Corridor deficiency analysis indicates that the Kirby Road corridor will be approaching capacity and will need to be improved given its proximity to the urbanized area and its potential to serve east-west travel oriented to the future Highway 400 North employment area.”

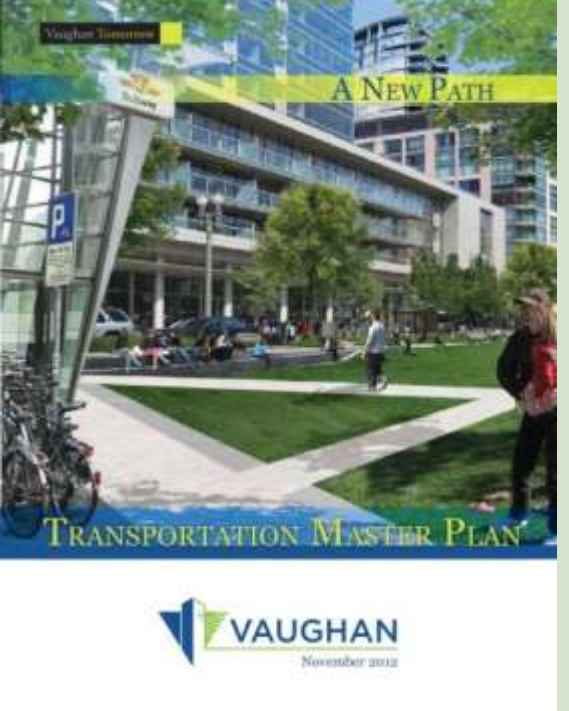
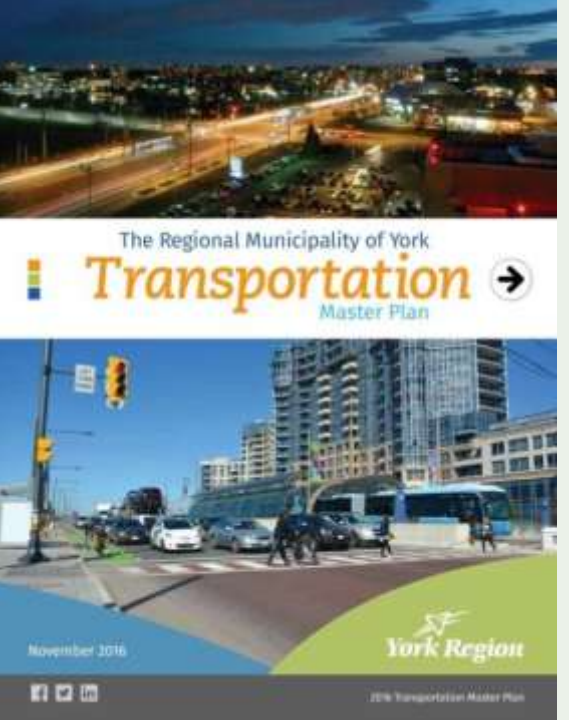


2016 York Region TMP identified the need for Kirby Road extension between Dufferin Street and Bathurst Street and confirmed the requirement to construct the 4-lane missing link.

Justification: “New road link serves approved development in North Vaughan and provides network connectivity. Corridor also supports goods movement as an Interim Primary Arterial for Goods Movement. Opportunity to improve walking and cycling facilities. Note: Currently under City of Vaughan jurisdiction but is a potential candidate for transfer to York Region. MNRF and TRCA have identified that this project is in an area with significant environmental sensitivities and the Region is committed to revisiting Phase 1 and Phase 2 of the Class EA as part of the next stage of the EA.”

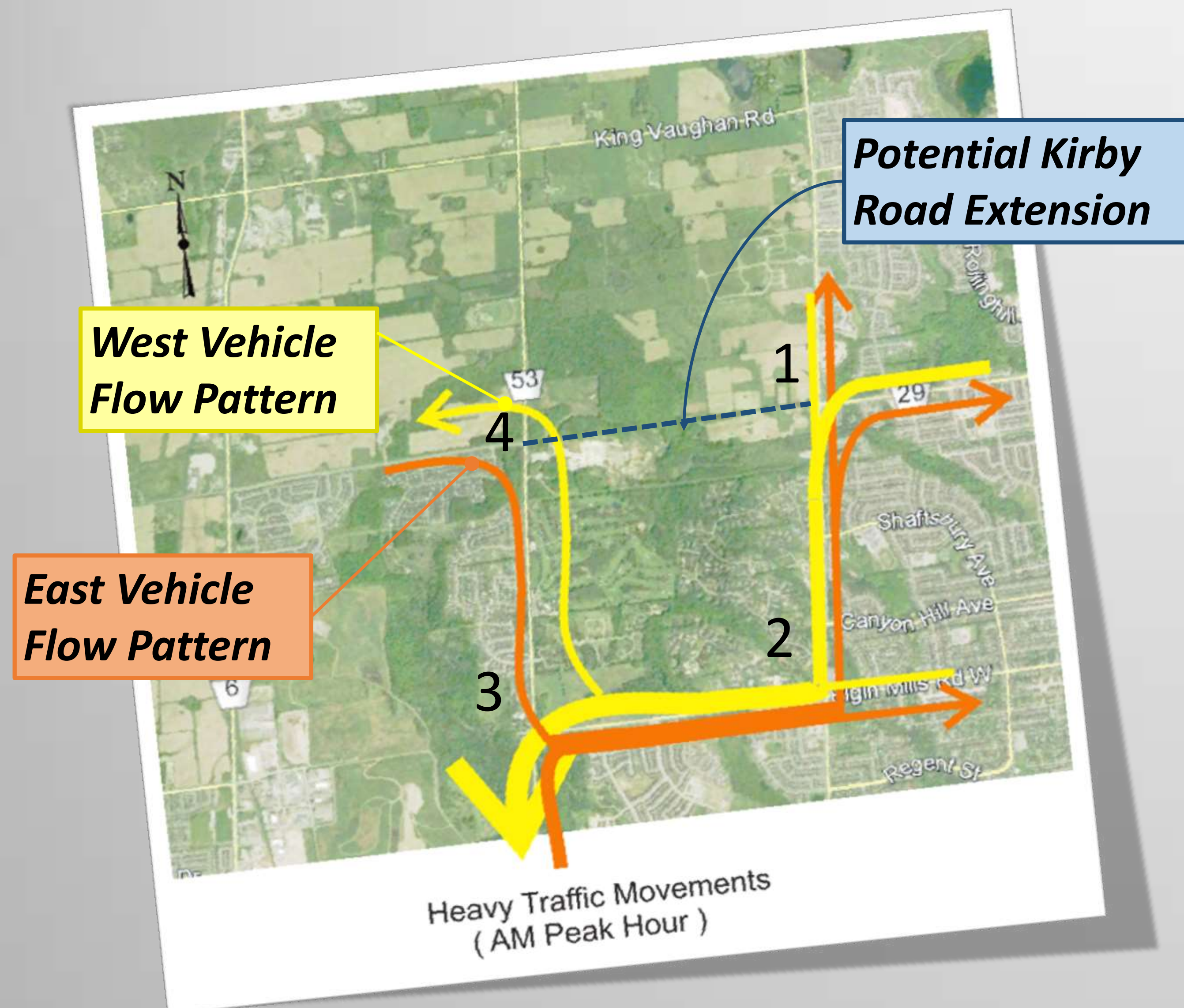
Municipal Class EA Process - PHASES 1 & 2

Summary of the Municipal Class EA process phases addressed through Master Planning

Planning Document	PHASE 1 Problem or Opportunity	PHASE 2 Alternative Solutions	TMP's Conclusion / Recommendation
<p>2013 City of Vaughan TMP</p> 	<ul style="list-style-type: none"> ➤ To serve future Highway 400 North employment area and support provision of enhanced pedestrian /cycling infrastructure; improve network continuity and the effectiveness of the existing network. 	<ul style="list-style-type: none"> ➤ Transit Improved transit services in the Kirby Road corridor are not warranted given that the immediate area is not being proposed for urbanization. ➤ Roads Regional road improvements along King-Vaughan Road and Teston Road were considered in the corridor needs analysis, and have also been incorporated into the recommended TMP road network. 	<ul style="list-style-type: none"> ➤ Corridor improvements will be required by 2031, with some being required by 2021. ➤ 4 Lane Link is required by 2021. ➤ Further study with the Region is needed to determine the sequence of corridor improvements. ➤ Recommended for Phase 3 and 4 EA Study.
<p>2016 York Region TMP</p> 	<ul style="list-style-type: none"> ➤ Improved network connectivity needed to move people and goods. ➤ Network improvements needed to accommodate future travel demands. ➤ Network improvements needed to support walking and cycling. ➤ Network improvements needed to support transit. 	<ul style="list-style-type: none"> ➤ Do Nothing Does not address Problem or Opportunity Statement. ➤ Widen parallel/adjacent corridor May not fully address travel demand needs as adjacent corridor is at capacity. No improvements to walking and cycling. No improvement to transit service. ➤ Construct missing link Addresses travel demand. Opportunity to provide walking and cycling facilities. Potential to improve transit service. 	<ul style="list-style-type: none"> ➤ Construct 4-lane missing link. ➤ Phases 1 and 2 alternatives to be revisited as part of subsequent Environmental Assessments and network analysis.

Kirby Road Extension EAS Process - PHASES 1 & 2

Example of traffic analysis conducted by the Project Team:

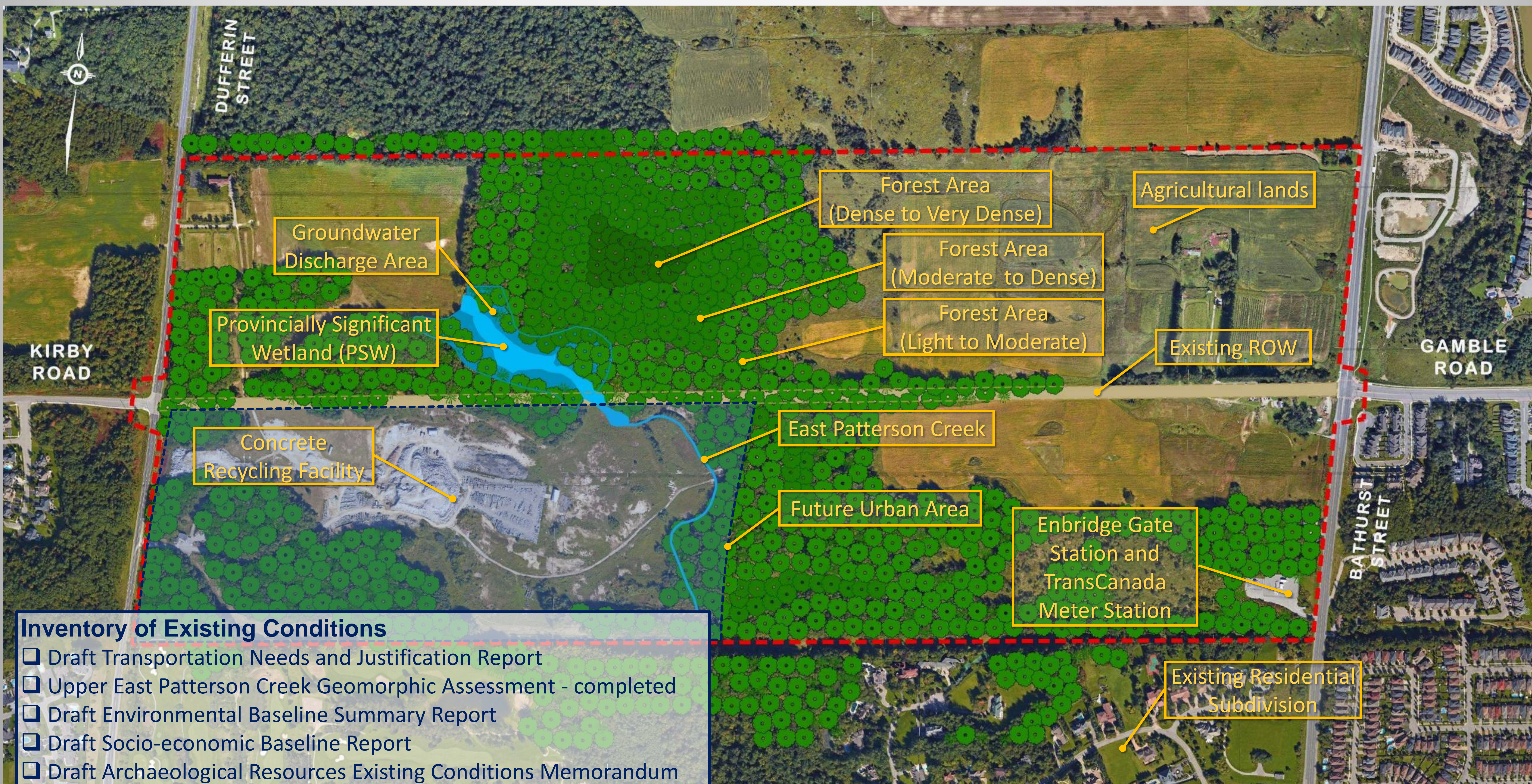


- Vehicle flow patterns from lack of Kirby Road extension is shown on left.
- Traffic counts conducted by both York Region and Poulos & Chung transportation consultants have been used for the analysis.
- High vehicle turning movements have been identified during typical weekday peak hours causing delays and congestion at all four of the primary intersections studied: **1.** Gamble Road at Bathurst Street, **2.** Teston Road/Elgin Mills Road West at Bathurst Street **3.** Teston Road at Dufferin Street, and **4.** Kirby Road at Dufferin Street.

Need and Justification: Conclusions of the Transportation Analysis Study by the Project Team:

- Verified the need for Kirby Road Extension
- Recommended that Kirby Road connection have two (2) lanes of traffic in each direction of travel
- Concluded that Kirby Road should be connected between Dufferin Street and Bathurst Street by 2021
- Concluded that the four (4) lanes on this missing segment of Kirby Road are sufficient to meet the total traffic demands for 2031

What are the Key Features within the Study Area ?



Inventory of Existing Conditions

- Draft Transportation Needs and Justification Report
- Upper East Patterson Creek Geomorphic Assessment - completed
- Draft Environmental Baseline Summary Report
- Draft Socio-economic Baseline Report
- Draft Archaeological Resources Existing Conditions Memorandum
- Preliminary Cultural Heritage Resource Assessment

Note: Wetland limits and creek alignment need to be confirmed with MNRF

What are the Existing Natural Environment Conditions?

Savanta has been carrying out ecological studies within portions of the Study Area since 2010. Recent work (2015-present) has included new studies for the Kirby Road EAS and updates to existing studies in the context of Study Area.

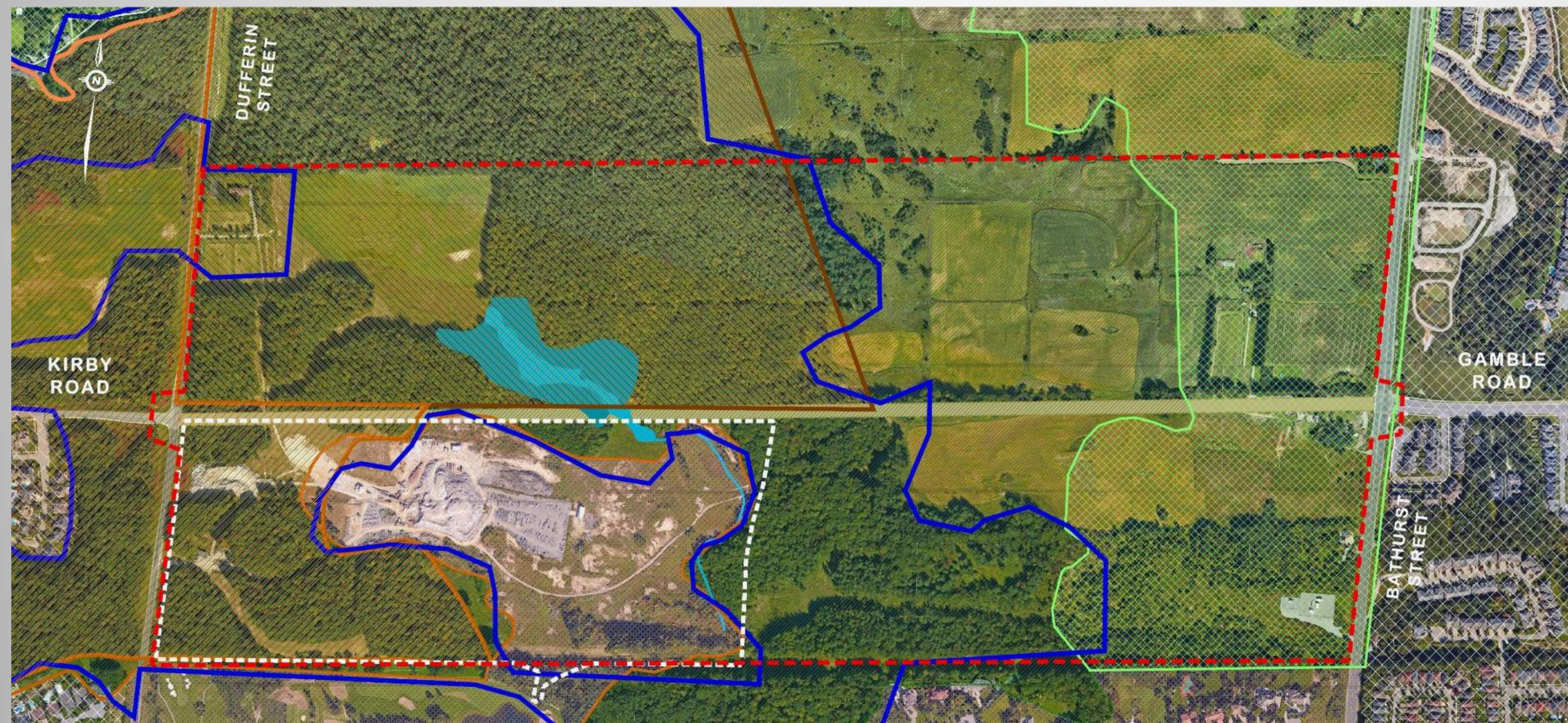
What are we Studying?



Natural heritage features are associated with the Study Area:

- A tributary of Patterson Creek – drainage feature emanating from the King-Vaughan Wetland Complex and flowing towards the TransCanada Pipeline corridor running along the southern boundary of the Study Area
- Groundwater discharge areas (seeps) along the north and south boundary of the Organic Thicket Swamp Ecosite and near the southern boundary of the Study Area
- Provincially Significant Wetland – defined as an organic thicket swamp ecosite (unit of the King-Vaughan Wetland Provincially Significant Wetland (PSW) Complex)
- Significant wildlife habitat
- Significant Woodlands (Deciduous forest communities and mixed communities)
- Habitat for Species at Risk

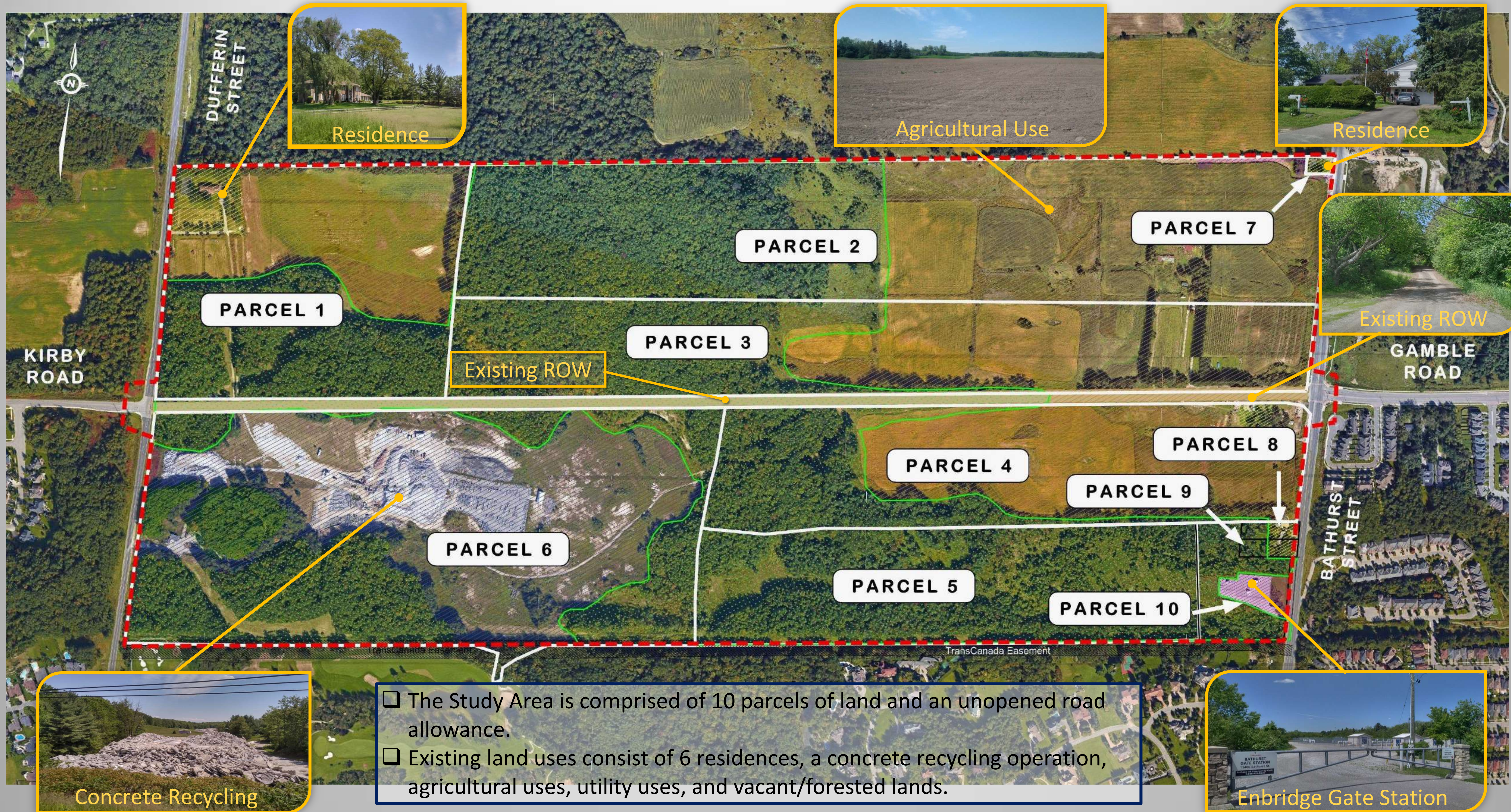
What are the Existing Natural Environment Conditions?



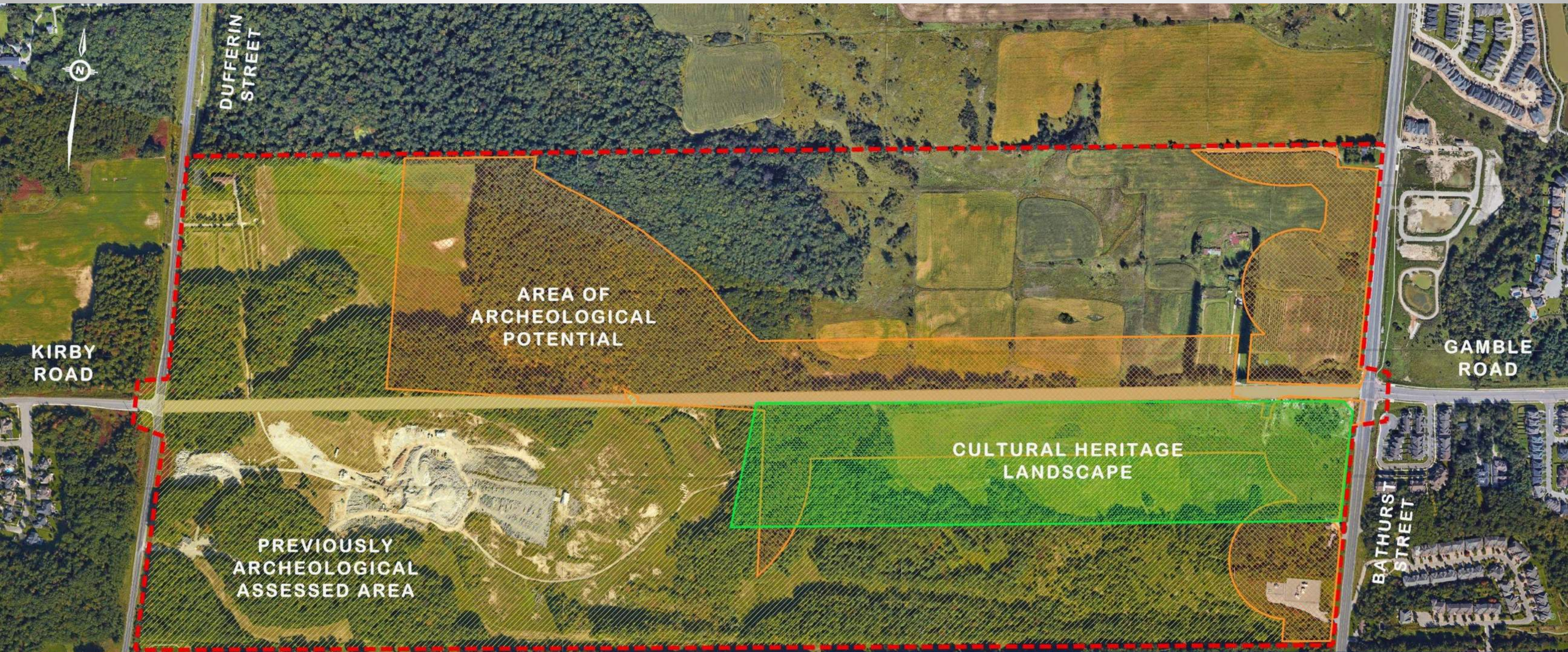
The Natural Heritage Features associated with the Study Area include:

- The Oak Ridges Moraine Conservation Plan (ORMCP) area
- The Maple Spur Oak Ridges Moraine Regionally Significant Earth Science ANSI - the wooded areas associated with the western portion of the Study Area
- The Maple Spur Oak Ridges Moraine Provincially Significant ANSI - the northern forested areas of the Study Area
- The King-Vaughan Wetland Provincially Significant Wetland (PSW) Complex - Study Area includes one of the 23 wetland units mapped in this complex. Most of the mapped wetland units for this complex appear north of the Study Area.
- The McGill Area ESA that is designated by Toronto and Region Conservation Authority (TRCA) and includes the King-Vaughan Wetland Complex, Maple Uplands and Kettle Wetlands Life Science ANSI, Cook's Area Life Science ANSI and the Maple Spur of the Oak Ridges Moraine Earth Science ANSI.
- Regional Greenlands as identified within the York Region Official Plan (2013) – the wooded areas within the Study Area.

What are the Existing Socio – Economic Conditions?



What are the Existing Cultural and Archeological Features?



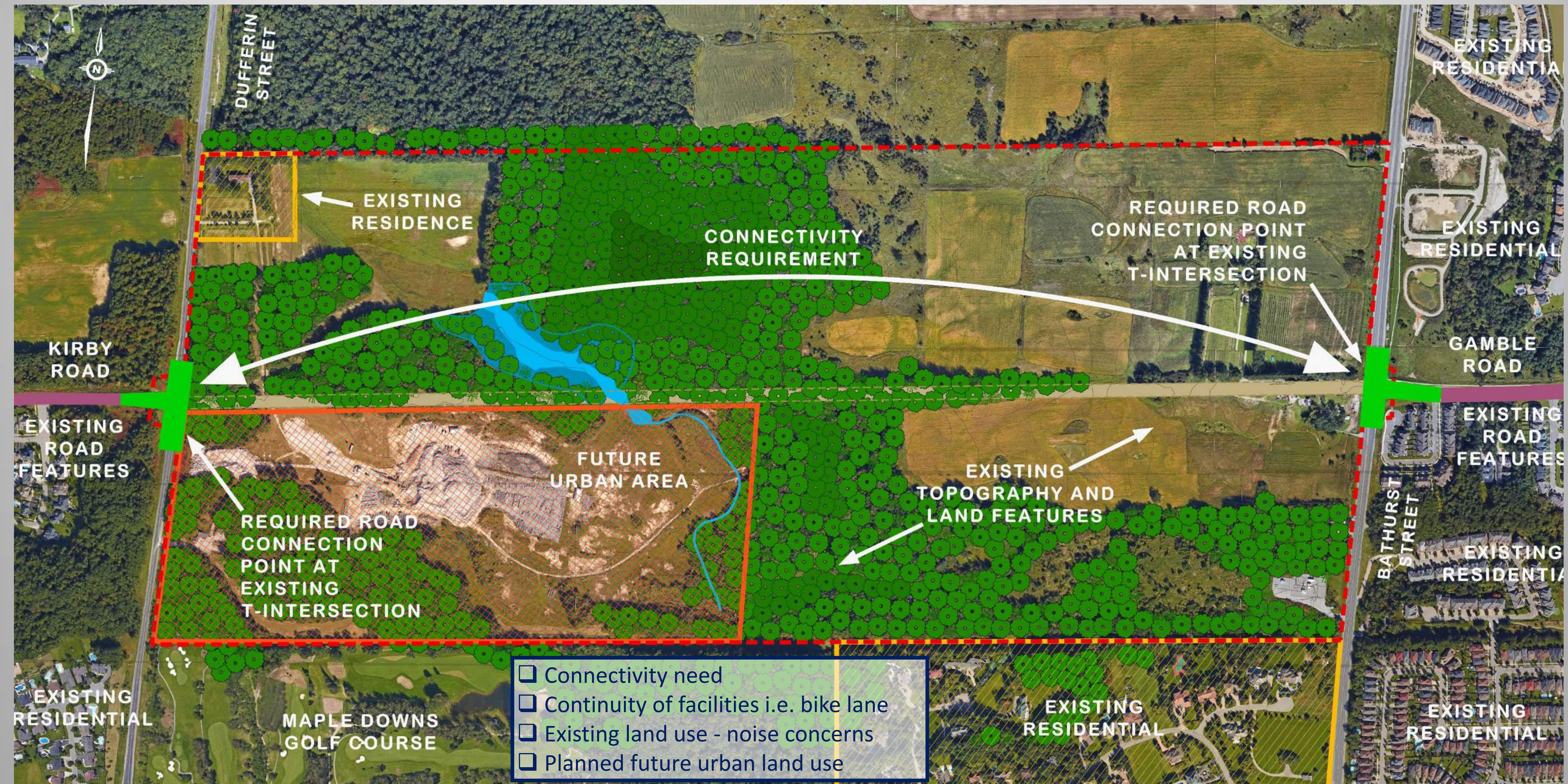
Archeological Resources Assessment

- Stage 1 Desktop Research for the Archaeological Assessment is completed
- Area of archaeological potential was identified
- Comprehensive property inspection is required to further assess archaeological potential of short-listed road alignments

Cultural and Built Heritage Resources Assessment

- Desktop background research to identify the cultural heritage is completed
- One feature of cultural heritage value previously identified within the study area is a farmscape at 11490 Bathurst Street (CHL 1)
- Field review is required to identify additional heritage resources, confirm the integrity of previously identified heritage properties and areas, and to obtain information to accurately map above-ground cultural heritage resources.

What are the Existing Technical Environment Conditions?



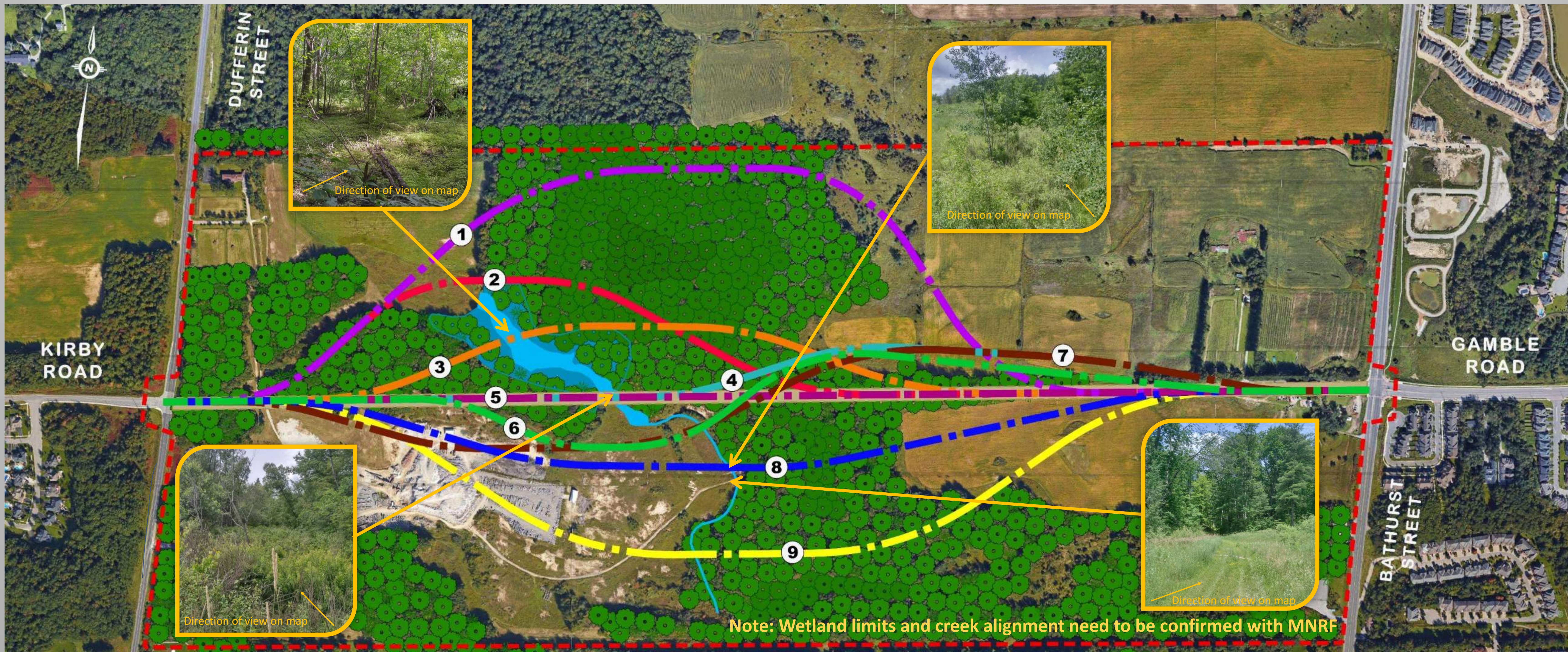
Future Land Use




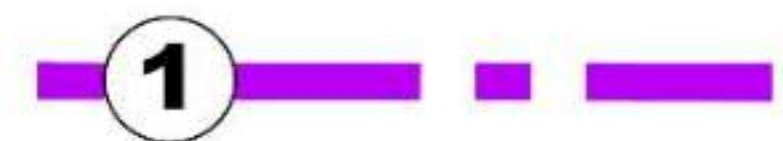








- ❑ Future Urban Area (Parcel 6) is located at the corner of Kirby Road and Dufferin Street on the east side of Dufferin Street.
- ❑ In **February 2015**, the Minister of Municipal Affairs and Housing issued an Order made under Section 18 (1) of the Oak Ridges Moraine Conservation Act, 2001.
- ❑ The **Order applies specifically to Parcel 6**. It prevails over existing provincial policies applicable to the Study Area and amends the Region of York Official Plan, the City of Vaughan Official Plan and the City of Vaughan Zoning By-law 1-88.
- ❑ The **Order amends** specific sections of the **Region's Official Plan** to indicate that lands (identified as **Parcel 6**) are intended to be **developed for urban uses** and that the lands shall only be developed on the basis of full municipal services, an approved and registered draft plan of subdivision and implementing zoning by-law.

- ❑ The **Order amends City's Official Plan** by designating the subject lands for following uses: **Low Density Residential** and **Valley and Stream Corridor**.
- ❑ In addition, the City's Official Plan is amended to indicate that the lands shall only be developed on the basis of full municipal services, an approved and registered draft plan of subdivision and implementing zoning by-law.
- ❑ The **Low Density Residential Area** uses shall be limited to detached houses, semi-detached houses, school, parks and open space, private home daycare, home occupations, and local convenience centres.
- ❑ The **Order also amends the City's Zoning By-law 1-88** by rezoning the lands from **M4 Pits and Quarries Industrial Zone** to **Future Urban Area Zone**.
- ❑ The **Future Urban Area Zone** shall permit the development of Residential, Local Commercial, and Open Space uses.
- ❑ A **Zoning By-law amendment** and Plan of Subdivision application is required to identify appropriate land use zones, delineate development limits, roadways, buffers, parks, etc.

Long List of Alternative Road Alignments



Note: Wetland limits and creek alignment need to be confirmed with MNRF

-  DENOTES KIRBY ROAD EXTENSION STUDY AREA
-  MAJOR NORTHERLY DIVERSION TO AVOID WETLAND AND DENSE FOREST
-  MODERATE NORTHERLY DIVERSION TO AVOID WETLAND AND GROUNDWATER DISCHARGE AREA
-  MINOR NORTHERLY DIVERSION WITH WETLAND CROSSING TO AVOID DENSE FOREST
-  MINOR NORTHERLY DIVERSION WITH WETLAND CROSSING TO MINIMIZE IMPACTS TO FOREST
-  DIRECT EXTENSION WITH WETLAND CROSSING
-  SOUTH TO NORTH MINOR JOG DIVERSION TO AVOID WETLAND AND MINIMIZE IMPACTS TO FOREST
-  SOUTH TO NORTH MINOR JOG DIVERSION TO AVOID WETLAND AND MINIMIZE IMPACTS TO FOREST
-  MINOR SOUTHERLY DIVERSION TO AVOID WETLAND
-  MODERATE SOUTHERLY DIVERSION TO AVOID WETLAND AND MINIMIZE IMPACTS TO DENSE FOREST

Screening Criteria and Methodology

Purpose of Screening Analysis

- Assess comprehensive range of Alternative Road Alignments.
- Narrow down potential design concepts to a manageable number of options.
- Ensure that only viable design concepts will be carried forward for detailed evaluation.

Screening Criteria

Screening Criteria	Rationale
TECHNICAL ENVIRONMENT	
Ability to provide highest level of transportation and municipal services to proposed new development	Identify most effective and sustainable design concepts
Optimum footprint promoting compatibility with existing elevations while minimizing the amount of grading required. Minimizes impact to surrounding environment.	Minimize impact to surrounding environment the amount of grading required
Optimum crossing point of the East Patterson Creek/ Provincially Significant Wetland (PSW)	Reduce complexity of design and cost of overpass structure
SOCIO-ECONOMIC ENVIRONMENT	
Compatibility with existing and proposed provincial, regional and municipal long range planning land use policies	Ensure that proposed concepts meet applicable planning policy requirements
Gross impacts on existing and future land use	Avoid or minimize impacts on existing and proposed land uses and reduce land acquisition costs
Need and extent of alterations to the existing unopened Right of Way (RoW)	Avoid or minimize need for land acquisition
NATURAL ENVIRONMENT	
Gross impacts to aquatic resources	Avoid impact on critical Natural Heritage aquatic features
Gross impacts to terrestrial resources	Avoid impact on critical Natural Heritage terrestrial features

Screening Methodology

- Generate Long List of Alternative Road Alignments while avoiding or minimizing potential effects on the environment
- Apply screening criteria to Alternative Road Alignments under consideration
- Rank each alternative depending on how well it fulfilled each screening criterion and document the rationale
- Summarize the results using the following rankings:



Meets criterion

Partially meets criterion

Does not meet criterion

Screening Matrix: Technical Environment

SCREENING CRITERIA	Option 1 Major Northerly Diversion to Avoid Wetland and Dense Forest	Option 2 Moderate Northerly Diversion to Avoid Wetland and Groundwater Discharge Area	Option 3 Minor Northerly Diversion with Wetland Crossing and Avoid Dense Forest	Option 4 Minor Northerly Diversion with Wetland Crossing to Minimize Impacts to Forest	Option 5 Direct Extension with Wetland Crossing	Option 6 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 7 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 8 Minor Southerly Diversion to Avoid Wetland	Option 9 Moderate Southerly Diversion to Avoid Wetland and Minimize Impacts to Dense Forest
<i>Ability to provide highest level of transportation and municipal services to proposed new development</i>	 ➤ Major route diversion possess design challenges, major horizontal realignments require lower speeds for safe operation for most modes of transportation if combined with vertical curves, maintenance challenges, limits access to developable lands and development potential.	 ➤ Moderate route diversion limits design flexibility, moderate horizontal realignments generally well tolerated by most modes of transportation at appropriate speed limits, some maintenance challenges, somewhat limits access to developable lands and development potential.	 ➤ Minor route diversion offers good design flexibility, minor horizontal realignments are well tolerated by all modes of transportation, offers ease of maintenance, provides acceptable access to developable lands and development potential.	 ➤ Minor route diversion offers good design flexibility, minor horizontal realignments are well tolerated by all modes of transportation, offers ease of maintenance, provides acceptable access to developable lands and development potential.	 ➤ Direct route extension offers the most design flexibility, ease of operation for all modes of transportation, offers ease of maintenance and least amount of maintenance, provides the most direct access to developable lands and development potential.	 ➤ Minor jogged route diversion offers good design flexibility, minor horizontal realignments are well tolerated by all modes of transportation, offers ease of maintenance, provides acceptable access to developable lands and development potential.	 ➤ Minor jogged route diversion offers good design flexibility, minor horizontal realignments are well tolerated by all modes of transportation, offers ease of maintenance, provides acceptable access to developable lands and development potential.	 ➤ Minor route diversion offers good design flexibility, minor horizontal realignments are well tolerated by all modes of transportation, offers ease of maintenance, provides acceptable access to developable lands and development potential.	 ➤ Moderate route diversion limits design flexibility, moderate horizontal realignments generally well tolerated by most modes of transportation at appropriate speed limits, some maintenance challenges, somewhat limits access to developable lands and development potential.
<i>Optimum footprint promoting compatibility with existing elevations while minimizing the amount of grading required. Minimizes impact to surrounding environment</i>	 ➤ Route diversion generates a largest grading area footprint of approximately 117,150 m ² .	 ➤ Route diversion generates a medium grading area footprint of approximately 100,470 m ² .	 ➤ Route diversion generates a small grading area footprint of approximately 91,800 m ² .	 ➤ Route diversion generates a small grading area footprint of approximately 90,816 m ² .	 ➤ Route extension generates a smallest grading area footprint of approximately 69,470 m ² .	 ➤ Route diversion generates a small grading area footprint of approximately 89,000 m ² .	 ➤ Route diversion generates a medium grading area footprint of approximately 108,490 m ² .	 ➤ Route diversion generates a medium grading area footprint of approximately 108,289 m ² .	 ➤ Route diversion generates a large grading area footprint of approximately 113,650 m ² .
<i>Optimum crossing point of the East Patterson Creek/Provincially Significant Wetland (PSW)</i>	 ➤ Crossing of creek or wetland not required . Potential interference with a disturbed area with some wetland characteristics can be mitigated.	 ➤ Crossing of creek or wetland not required . Potential interference with a disturbed area with some wetland characteristics can be mitigated.	 ➤ Largest crossing of PSW required . Can likely be accommodated with large bridge structure, however will result in most costly option.	 ➤ Moderate length of PSW and associated groundwater discharge areas crossing required .	 ➤ Moderate length of PSW and associated groundwater discharge areas crossing required .	 ➤ Crossing of creek required . Opportunity to avoid PSW but may impact PSW buffer.	 ➤ Crossing of creek required . Opportunity to avoid PSW but may impact PSW buffer.	 ➤ Crossing of narrow and disturbed portion of intermittent creek required .	 ➤ Crossing of narrow and disturbed portion of intermittent creek required .

Screening Matrix: Socio-Economic Environment

SCREENING CRITERIA	Option 1 Major Northerly Diversion to Avoid Wetland and Dense Forest	Option 2 Moderate Northerly Diversion to Avoid Wetland and Groundwater Discharge Area	Option 3 Minor Northerly Diversion with Wetland Crossing and Avoid Dense Forest	Option 4 Minor Northerly Diversion with Wetland Crossing to Minimize Impacts to Forest	Option 5 Direct Extension with Wetland Crossing	Option 6 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 7 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 8 Minor Southerly Diversion to Avoid Wetland	Option 9 Moderate Southerly Diversion to Avoid Wetland and Minimize Impacts to Dense Forest
<i>Compatibility with existing and proposed provincial, regional and municipal long range planning land use policies</i>	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to least extent. ➤ Longest length passing through Natural Core Area. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Longer length passing through Natural Core Area. ➤ Avoids PSW. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Moderate length passing through Natural Core Area. ➤ Requires crossing of PSW 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Moderate length passing through Natural Core Area. ➤ Requires crossing of PSW. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Moderate length passing through Natural Core Area. ➤ Requires crossing of PSW. ➤ Provides direct access to lands approved for residential development. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Moderate length passing through Natural Core Area. ➤ Potential to impact PSW buffer. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Relatively short length passing through Natural Core Area. ➤ Potential to impact PSW buffer. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Moderate length passing through Natural Core Area. ➤ Avoids PSW. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Compatible with planning policies to less extent. ➤ Moderate length passing through Natural Core Area. ➤ Avoids PSW.
<i>Gross impacts on existing and future land use</i>	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major impact on existing and future land use. Long route requires acquisition of more lands. Severely limits access from the future residential use to the proposed roadway. ➤ Moderate impact on existing agricultural uses. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Moderate impact on existing and future land use. Relatively short route. Requires acquisition of vacant lands and small amount of agricultural lands. ➤ No impact on existing employment use. ➤ Moderate impact on future residential use by limiting access to the proposed roadway. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Moderate impact on existing and future land use. Relatively short route. Requires acquisition of vacant lands. ➤ No impact on existing employment use. ➤ Moderate impact on future residential use by limiting access to the proposed roadway. ➤ Minimal impact on existing agricultural uses. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Moderate impact on existing and future land use. ➤ Minimal impact on existing employment use. ➤ Does not limit access from the future residential use. ➤ Moderate impact on existing agricultural uses. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Minimal impact on existing and future land use. Shortest and most direct route. ➤ Most cost efficient option with respect to land acquisition costs. ➤ Minimal impact on existing employment use and future residential use in the southwest quadrant of the Study Area. ➤ Minimal impact on existing agricultural uses. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Moderate impact on existing and future land use. Less cost efficient option with respect to land acquisition costs. Requires acquisition of lands approved for residential development. ➤ Moderate impact on existing employment use. ➤ Moderate impact on future residential use through the creation of an inefficient development block that will be isolated from the rest of the residential community. ➤ Moderate impact on existing agricultural uses. 	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major impact on existing and future land use. ➤ Least cost efficient option with respect to land acquisition costs. Requires acquisition of lands approved for residential development. ➤ Significant impact on existing employment use. ➤ Significant impact on future residential use through the creation of an inefficient development block that will be isolated from the rest of the residential community. ➤ Moderate impact on existing agricultural uses. 	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major impact on existing and future land use. ➤ Least cost efficient option with respect to land acquisition costs. Requires acquisition of lands approved for residential development. ➤ Significant impact on existing employment use. ➤ Significant impact on future residential use through the creation of an inefficient development block that will be isolated from the rest of the residential community. ➤ Moderate impact on existing agricultural uses. 	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major impact on existing and future land use. ➤ Least cost efficient option with respect to land acquisition costs. Requires acquisition of lands approved for residential development. ➤ Significant impact on existing employment use. ➤ Creates a barrier that divides the future residential community. ➤ Moderate impact on existing agricultural uses.

Screening Matrix: Socio-Economic Environment

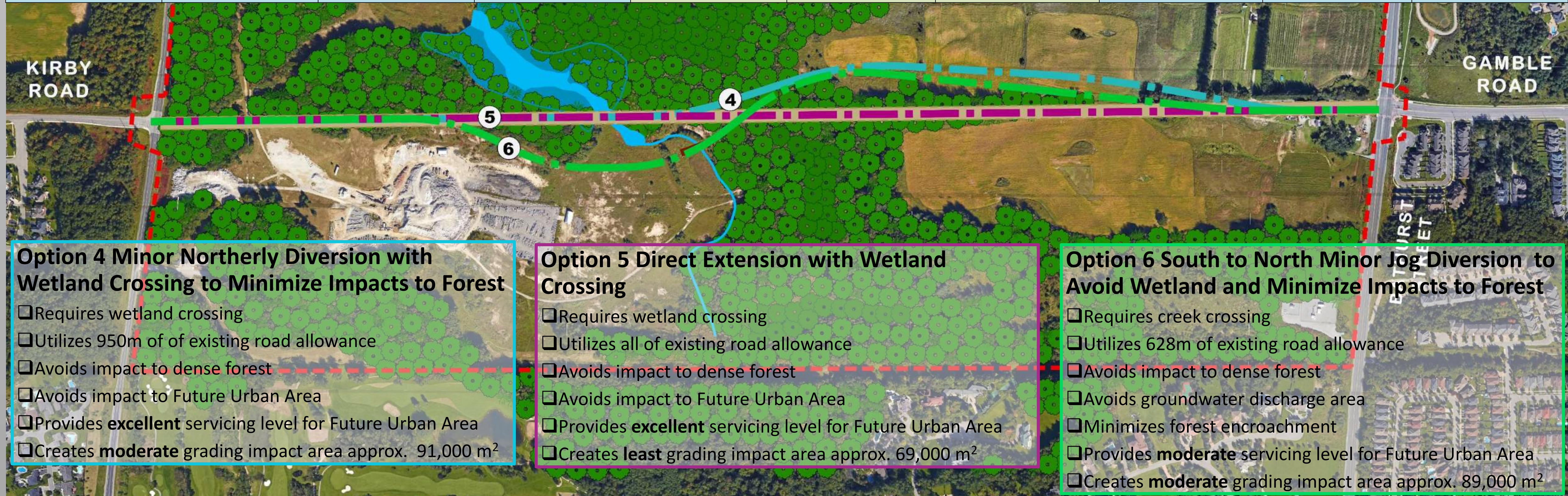
SCREENING CRITERIA	Option 1 Major Northerly Diversion to Avoid Wetland and Dense Forest	Option 2 Moderate Northerly Diversion to Avoid Wetland and Groundwater Discharge Area	Option 3 Minor Northerly Diversion with Wetland Crossing and Avoid Dense Forest	Option 4 Minor Northerly Diversion with Wetland Crossing to Minimize Impacts to Forest	Option 5 Direct Extension with Wetland Crossing	Option 6 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 7 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 8 Minor Southerly Diversion to Avoid Wetland	Option 9 Moderate Southerly Diversion to Avoid Wetland and Minimize Impacts to Dense Forest
Need and extent of alterations to the existing unopened Right of Way (RoW)	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major alterations to existing right of way. ➤ Alignment follows 500m of already dedicated RoW with approximately 1815m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Minor to Moderate alterations to existing right of way. ➤ Alignment follows 1000m of already dedicated RoW with approximately 1130m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Moderate alterations to existing right of way. ➤ Alignment follows 800m of already dedicated RoW with approximately 1260m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Minor to Moderate alterations to existing right of way. ➤ Alignment follows 950m of already dedicated RoW with approximately 1100m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Least extent of alterations to the existing RoW. ➤ Alignment fully follows along lands already dedicated as RoW. ➤ Additional 16m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">✓</p> <ul style="list-style-type: none"> ➤ Moderate alterations to existing right of way. ➤ Alignment follows 628m of already dedicated RoW with approximately 1448m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major alterations to existing right of way. ➤ Alignment follows 250m of already dedicated RoW with approximately 1830m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major alterations to existing RoW. ➤ Alignment follows 400m of already dedicated RoW with approximately 1660m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes. 	<p style="text-align: center;">X</p> <ul style="list-style-type: none"> ➤ Major alterations to existing right of way. ➤ Alignment follows 400m of already dedicated RoW with approximately 1760m of linear new RoW required. ➤ Additional 36m of cross sectional new RoW required with varied encroachment beyond available RoW for grading purposes.

Screening Matrix: Natural Environment

SCREENING CRITERIA	Option 1 Major Northerly Diversion to Avoid Wetland and Dense Forest	Option 2 Moderate Northerly Diversion to Avoid Wetland and Groundwater Discharge Area	Option 3 Minor Northerly Diversion with Wetland Crossing and Avoid Dense Forest	Option 4 Minor Northerly Diversion with Wetland Crossing to Minimize Impacts to Forest	Option 5 Direct Extension with Wetland Crossing	Option 6 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 7 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 8 Minor Southerly Diversion to Avoid Wetland	Option 9 Moderate Southerly Diversion to Avoid Wetland and Minimize Impacts to Dense Forest
<i>Gross impacts to aquatic resources</i>	✓ ➤ Least or no aquatic impacts.	✓ ➤ Least or no aquatic impacts.	✗ ➤ Greatest aquatic impacts to groundwater discharge areas.	✓ ➤ Moderate aquatic impacts to groundwater discharge areas.	✓ ➤ Moderate aquatic impacts to groundwater discharge areas.	✓ ➤ Moderate aquatic impacts from watercourse crossing can be mitigated.	✓ ➤ Moderate aquatic impacts from watercourse crossing can be mitigated.	✓ ➤ Moderate aquatic impacts from watercourse crossing can be mitigated.	✓ ➤ Moderate aquatic impacts from watercourse crossing can be mitigated.
<i>Gross impacts to terrestrial resources</i>	✗ ➤ Large impacts to terrestrial resources. ➤ Moderate footprint impacts to Provincially Significant ANSI, headwater drainage feature to the PSW, Significant Woodlands and SWH.	✗ ➤ Greatest impacts to terrestrial resources. ➤ Large footprint impacts to Provincially Significant ANSI, headwater drainage feature to the PSW, Significant Woodlands and associated SWH.	✗ ➤ Greatest impacts to terrestrial resources. ➤ PSW crossing can likely be mitigated through engineering design. ➤ Large footprint impacts to Provincially Significant ANSI, Significant Woodlands and associated SWH.	✓ ➤ Moderate impacts to terrestrial resources. ➤ PSW crossing can likely be mitigated through engineering design. ➤ Moderate woodland footprint, primarily along existing woodland edge. ➤ Moderate impacts to Provincially Significant ANSI, Significant Woodlands and associated SWH. ➤ No direct impacts to dense forest.	✓ ➤ Moderate impacts to terrestrial resources. ➤ PSW crossing can likely be mitigated through engineering design. ➤ Moderate woodland footprint, primarily along existing woodland edge. ➤ Moderate impacts to Provincially Significant ANSI, Significant Woodlands and associated SWH. ➤ No direct impacts to dense forest.	✓ ➤ Moderate impacts to terrestrial resources. ➤ Potential crossing of PSW, may encroach into PSW buffer. Can likely be mitigated through engineering design. ➤ Moderate woodland footprint, primarily along existing woodland edge can likely be mitigated through compensatory tree planting. ➤ Bisects woodland at narrowest point. ➤ Minor impacts along the edge of the Provincially Significant ANSI. ➤ No direct impacts to dense forest.	✓ ➤ Moderate impacts to terrestrial resources. ➤ Potential crossing of PSW, may encroach into PSW buffer. Can likely be mitigated through engineering design. ➤ Bisects woodland at narrow point. ➤ Minor impacts along the edge of the Provincially Significant ANSI. ➤ No direct impacts to dense forest.	✓ ➤ Moderate impacts to terrestrial resources. ➤ Avoids Provincially Significant ANSI and PSW. ➤ Bisects woodland at narrow point. ➤ Direct crossing/impacts to dense forest.	✓ ➤ Least impacts to terrestrial resources. ➤ Avoids Provincially Significant ANSI and PSW. ➤ Bisects woodland at a wider point. ➤ Avoids impacts to dense forest.

Short List of Alternative Road Alignments

SCREENING CRITERIA	Option 1 Major Northerly Diversion to Avoid Wetland and Dense Forest	Option 2 Moderate Northerly Diversion to Avoid Wetland and Groundwater Discharge Area	Option 3 Minor Northerly Diversion with Wetland Crossing and Avoid Dense Forest	Option 4 Minor Northerly Diversion with Wetland Crossing to Minimize Impacts to Forest	Option 5 Direct Extension with Wetland Crossing	Option 6 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 7 South to North Minor Jog Diversion to Avoid Wetland and Minimize Impacts to Forest	Option 8 Minor Southerly Diversion to Avoid Wetland	Option 9 Moderate Southerly Diversion to Avoid Wetland and Minimize Impacts to Dense Forest
Screening Results	<ul style="list-style-type: none"> ➤ Strongly satisfies 2 major components. ➤ Does not satisfy 6 major components. 	<ul style="list-style-type: none"> ➤ Strongly satisfies 3 major components. ➤ Acceptably satisfies 4 components. ➤ Does not satisfy 1 major component. 	<ul style="list-style-type: none"> ➤ Strongly satisfies 2 major components. ➤ Acceptably satisfies 3 components. ➤ Does not satisfy 3 major components. 	<ul style="list-style-type: none"> ➤ Strongly satisfies 3 major components. ➤ Acceptably satisfies 5 components. <p>Carried forward for further consideration.</p>	<ul style="list-style-type: none"> ➤ Strongly satisfies 4 major components. ➤ Acceptably satisfies 4 components. <p>Carried forward for further consideration.</p>	<ul style="list-style-type: none"> ➤ Strongly satisfies 2 major components. ➤ Acceptably satisfies 6 components. <p>Carried forward for further consideration.</p>	<ul style="list-style-type: none"> ➤ Strongly satisfies 1 major component. ➤ Acceptably satisfies 5 components. ➤ Does not satisfy 2 major components. 	<ul style="list-style-type: none"> ➤ Strongly satisfies 1 major component. ➤ Acceptably satisfies 5 components. ➤ Does not satisfy 2 major components. 	<ul style="list-style-type: none"> ➤ Strongly satisfies 1 major component. ➤ Acceptably satisfies 4 components. ➤ Does not satisfy 3 major components.



How are we going to evaluate these 3 alignments?

Key Steps of proposed Evaluation Methodology for Short List of Alternative Road Alignments

The detailed evaluation of short-listed Alternative Road Alignments and Design Concepts during Phase 3B of the EAS will involve the following key activities:

Evaluation criteria and measures

The proposed evaluation criteria have been established having in mind types of environment recommended by MEA MCEA for consideration by municipal road projects. The criteria are grouped by key environmental factors and aspects helping to describe the existing environment that could be affected by the project and to consider potential effects on significant features which comprise each type of environment. Confirmed evaluation criteria will allow to conduct a “Net Effects” analysis.

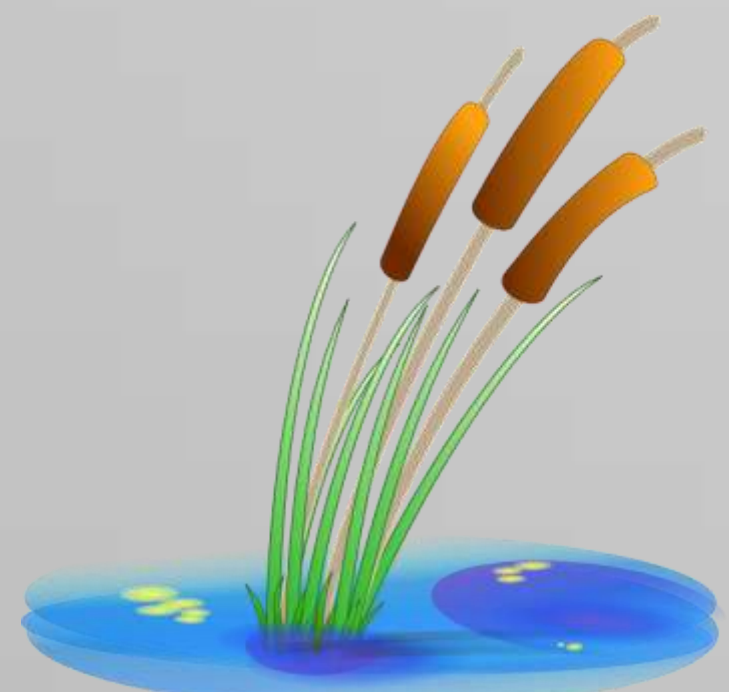
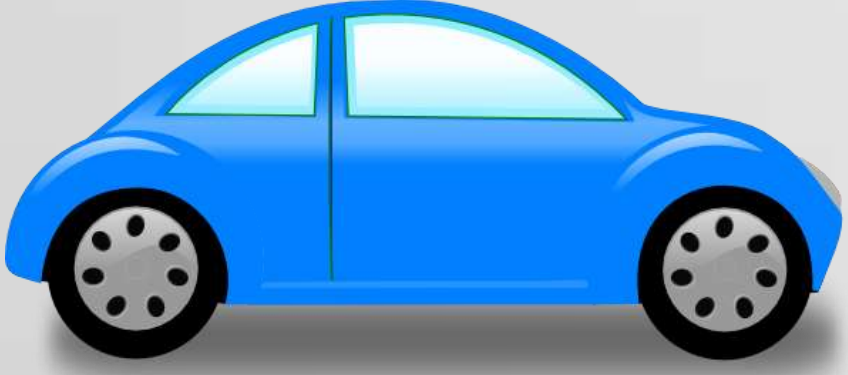
Net Effects Analysis

The Class EA process is intended to identify potential impacts on the environment and where possible to avoid them. In some cases this may not be possible and measures will have to be taken to minimize or offset negative effects. The remaining impacts (both positive and negative) of the project after mitigation measures have been applied are called “Net Effects”.

Comparative Evaluation

The net effects identified for each short-listed Alternative Road Alignments and Design Concept will be compared to one another in order to identify a Recommended Road Alignment and Design Concept(s). The comparison of net effects will be completed using two consecutive steps: (1) identifying advantages or disadvantages and (2) establishing rankings.

Proposed Evaluation Criteria



FACTOR/Aspect/Criterion	Measure
TRANSPORTATION	
<i>Planning</i>	
Network Connectivity	<ul style="list-style-type: none"> - Improvement in Network Connectivity - Capability to support municipal and regional policy initiatives (transit, active transportation, roundabouts, etc.)
Network Capacity	<ul style="list-style-type: none"> - Improvement in Future Congestion (meets projected travel demands) - Improvement in Traffic Operations for commuters, local businesses (reduced congestion)
<i>Engineering</i>	
Design Complexity	<ul style="list-style-type: none"> - Use of substandard design components (i.e. horizontal/vertical curves) - Improvement in roadway geometry
Construction Complexity	<ul style="list-style-type: none"> - Constructability (i.e. structural requirements, retaining walls, earth balance) - Construction staging challenges - Geotechnical challenges (i.e. soil/ground conditions)
Operation	<ul style="list-style-type: none"> - Improvement in road safety and accessibility (sight distance; turning movements) - Reduction in maintenance requirements
NATURAL ENVIRONMENT	
<i>Terrestrial Features</i>	
Vegetation	<ul style="list-style-type: none"> - Encroachment on Designated Environmentally Sensitive Areas / Areas of Natural and Scientific Interest - Impacts to Significant Natural Heritage Features (woodland, wetland) - Impacts to Terrestrial Environment (woodland, wetland) - measure footprint - Opportunities for enhancement
Wildlife Habitat	<ul style="list-style-type: none"> - Impacts to Significant Wildlife Habitat, including Species at Risk - Impacts to Terrestrial Environment (woodland, wetland) - measure footprint impacts - Opportunities for enhancement
<i>Aquatic Features</i>	
Surface Water Quantity and Quality	- Degree of interference with water quality, thermal regime or baseflow
Aquatic Habitat	- Extent (area) and function of riparian habitat removed
<i>Surface Drainage</i>	
Watercourses	- Need for diversion/channelization of East Patterson Creek (length) and catchment area impacts (area)
Stormwater Management	- Opportunities to enhance roadway stormwater management measures, including coordination with/use of adjacent future development facilities
<i>Groundwater</i>	
Recharge Areas	- Degree of interference with known groundwater discharge areas that contribute to creek baseflow
Groundwater Quality	- Potential for impacts to vulnerable areas (area)
SOCIAL ENVIRONMENT	
<i>Land Use</i>	
Resource Designations and Policies	- Degree of compatibility with provincial, regional and municipal growth/development goals/objectives (high, moderate, low)
Agricultural Operations	<ul style="list-style-type: none"> - Physical resource consumption - Facility resource consumption - Operational impacts
Approved Development Proposals	- Accommodates Existing and Proposed Development (incl. Rizmi Holdings Subdivision)
<i>Community</i>	
Quality of Life	<ul style="list-style-type: none"> - Changes (+/-) in community access to recreational/interpretive areas - Encroachment on individual properties (number/area) - Improves traffic operations for commuters, local businesses (reduced congestion)
Effects of existing wells	<ul style="list-style-type: none"> - Change in water quality and quantity - Number of affected wells
Noise	- Change in sound levels over pre-existing conditions
CULTURAL ENVIRONMENT	
Archaeological Resources	- Number/type/significance of direct/indirect impacts to registered archaeological sites
Built Heritage Resources	- Number/type/significance of direct/indirect impacts to cultural heritage features
ECONOMIC ENVIRONMENT	
Cost Estimates	<ul style="list-style-type: none"> - Capital Costs - Operation/Maintenance Costs

Next steps

PHASE 3B

Evaluation

- ❑ Confirm Short List of Alternative Road Alignments and identify Alternative Design Concepts
- ❑ Conduct necessary additional studies and prepare detailed inventory of Transportation, Natural, Social, Cultural Economic Environments for short-listed options
- ❑ Identify Potential Impacts on the Environment and develop Mitigation Measures
- ❑ Select and confirm Preferred Design Concept(s)

Public Information Centre (PIC) #2

PIC #2 is currently being planned for the end of **September 2017**.

PHASE 4

Environmental Study Report (ESR)

Submission of ESR to review agencies and the City of Vaughan is planned for **late Fall 2017**.

Notice of Study Completion

Placement of ESR on public record for a 30 day mandatory public review is planned for **early Spring 2018**.

How can you help us?

- Please share your valuable input and fill the Response Form
- Response Forms can be returned to the project team members or sent by email / mail by July 14, 2017 to:
Leonid Groysman, Class EA Lead,
Schaeffers Consulting Engineers,
6 Ronrose Drive, Concord, ON L4K 4R3
Phone: 905-738-6100 x 245
Fax : 905-738-6875
E-mail: KirbyRdEA@schaeffers.com

Any Questions ?

- Please talk with one of the members of the project team to address your issues/concerns
- More details about the study can also be found at:
<http://www.schaeffers.com/kirbyroadextension.asp>