

NATURAL ENVIRONMENTAL PRINCIPLES

OBJECTIVE	RATIONALE	ASSUMPTIONS	DEFINITION
<p>Avoid or minimize impacts to (encroachment, removal, fragmentation) natural areas by either following the edges of natural areas and/or the crossing of natural areas at the narrowest location, through/along existing corridors or openings or through more disturbed portions.</p>	<p>Natural areas have various levels of regulatory status and public interest. They are relatively large and intact and are sensitive to encroachment and disturbance, and may support 'significant' species and habitats. These areas include valley lands, wetlands and wooded areas that provide habitat to a number of species.</p>	<p>The 'most significant' natural areas and significant wildlife habitats have been identified and classified/ designated by provincial or local agencies/authorities (Ministry of Natural Resources, Toronto and Region Conservation Authority, municipalities).</p>	<p>Natural areas include:</p> <ul style="list-style-type: none"> • Provincially Significant Wetlands; • Environmentally Significant Areas; • Areas of Natural and Scientific Interest; • Parks or Conservation Areas; and • Areas identified as Species at Risk habitat.
<p>Avoid or minimize impacts to (direct encroachment, crossings, and realignment) rivers and streams that support fish habitat and aquatic biota.</p> <p>Avoid known or potential areas of critical habitat where possible (e.g., spawning, 'significant' species).</p> <p>Cross on straight reaches where possible: and avoid potential need to realign/ channelize watercourse.</p>	<p>Water crossings have the potential to alter the watercourse and associated fish habitat, and may in turn harm the fish habitat or fish/aquatic biota that the watercourse supports either directly or indirectly (e.g., loss of habitat, realignment, channelization and harmful alteration, enclosure, introduction of sediment or other potential contaminants, removal of riparian vegetation).</p>	<p>Important watercourses are mapped and critical habitat features and fisheries are known.</p>	<p>Water crossings include rivers and streams and their associated tributaries.</p>
<p>Avoid or minimize severance of corridors/ important linkages between natural areas.</p>	<p>Corridors and linkages between/among natural areas are important passages for the movement of wildlife; as well as the dissemination and propagation of plants, which is in turn important for maintaining genetic diversity and integrity of local populations.</p>	<p>Existing local roads and land uses presently do not pose as impassable barriers to the movement of animals.</p>	<p>Greenland or natural heritage systems are comprised of important natural areas (e.g., designated or core wetlands or forest areas) and the linkages among them (e.g., typically linear wooded features or may be successional field areas for some species), as may be defined by the municipalities and/or Conservation Authority. Also watercourses and valley lands.</p>

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<p>Avoid or minimize cuts in areas with shallow groundwater.</p> <p>Avoid groundwater recharge areas consisting of permeable deposits, where possible.</p>	<p>Cutting into shallow groundwater has the potential to impact both the quality and quantity of groundwater.</p> <p>Potential for surface contamination to rapidly infiltrate in groundwater recharge areas.</p>	<p>Existing groundwater conditions have been defined.</p>	<p>Shallow groundwater is identified as groundwater that is close to the surface and may support riparian vegetation, baseflow to surface water courses, and drinking water resources.</p> <p>Groundwater recharge is the process of water infiltration from land areas through permeable soils into underground aquifers.</p>

SOCIO-ECONOMIC ENVIRONMENT PRINCIPLES

OBJECTIVE	RATIONALE	ASSUMPTIONS	DEFINITION
<p>Avoid or minimize direct impacts to existing and future residential areas.</p> <p>Avoid or minimize direct impacts to existing and future businesses.</p>	<p>Avoidance of residential areas will decrease the number of people displaced by the highway and reduces potential nuisance effects (e.g., noise, air quality, and aesthetics).</p>	<p>The majority of people that live in the study area reside in either of these settlement areas.</p>	<p>Residential areas represent existing or future highly developed areas of human settlement.</p>
<p>Avoid or minimize direct impacts to property by following lot/concession/field lines or existing rights-of-way.</p>	<p>Following property lines minimizes the amount of property required from each property owner, minimizes impacts to existing agricultural operations and future development plans.</p>	<p>Back lot impacts will minimize social impacts at the individual level.</p>	<p>Individual properties identified by municipal tax assessment roles. Field lines identified by aerial photography.</p>
<p>Generate alignments and interchange locations to provide service to major traffic generators including CPR Vaughan Intermodal Facility.</p>	<p>Providing service to major traffic generators minimizes impacts on the local road system and users that access it.</p> <p>Providing interchanges with key crossing roads relieves local traffic capacity issues.</p>	<p>Future land use plans have been developed by the local municipalities.</p>	<p>Major traffic generators are those existing and future industrial and commercial developments identified on municipal plans.</p>

OBJECTIVE	RATIONALE	ASSUMPTIONS	DEFINITION
Avoid or minimize impacts to known landfills and hazardous waste sites.	Impacting landfills and hazardous waste sites adds significant cost to alternatives and result in potential health impacts.	Landfills and hazardous waste sites have been identified by MOE and the Municipalities.	

CULTURAL ENVIRONMENT PRINCIPLES

OBJECTIVE	RATIONALE	ASSUMPTIONS	DEFINITION
Avoid or minimize impacts to registered and unregistered cemeteries.	Cemeteries have high social and cultural values and therefore should be avoided.	Known cemeteries are recorded in official documents or have been identified and documented.	Cemeteries known through secondary source information.
Avoid or minimize impacts to known heritage features of high and moderate significance.	Heritage features of high and moderate significance are important cultural resources and may be designated under the <i>Ontario Heritage Act</i> .	Heritage features have been identified and documented.	Designated or listed built heritage features.
Avoid or minimize impacts to archaeological features.	Archaeological features are important non-renewable cultural resources.	Archaeological features have been identified and documented.	Properties containing archaeological material.

ENGINEERING PRINCIPLES

OBJECTIVE	RATIONALE	ASSUMPTIONS	DEFINITION
Horizontal and vertical alignments to be consistent with a 120-km/h controlled access freeway.	MTO standards require a 120-km/h design speed to provide sufficient roadway capacity and reduce potential for accidents.	MTO standards will govern the design of route alternatives.	<p>A Controlled Access designation imposes strict controls on permits and the use of frontage lands abutting highways.</p> <p>Design Speed is the speed used to identify the necessary geometric criteria for a safe roadway design. Design Speed is generally in excess of the posted speed limit, thus affording a factor of safety in roadway design.</p>

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Generate horizontal and vertical alignments so as to produce an efficient design which considers crossing angles of roads, railways, rivers, cut/fill balance, etc., and directness of route.	<p>Minimizing route length reduces overall impacts, and improves transportation service by reducing travel time.</p> <p>Large skew angles between two grade-separated roadways, especially those with a connecting interchange, are not desirable and sometimes, are not viable.</p>	<p>Route length directly relates to the amount of overall impact.</p> <p>Reducing travel time improves level of transportation service.</p>	Level of Service is the Ministry of Transportation's classification system for Ontario roadways which describes the type of traffic service being provided to the traveling public. The classifications are defined in terms of traffic volume, speed and manoeuvrability.
Generate alignments that would not preclude or predetermine planning for other transportation corridors.	Allowing for a complete transportation network for the long-term future is important to the success of the provincial <i>Growth Plan for the Greater Golden Horseshoe</i> .	<p>Further extension of the ultimate 427 Transportation Corridor.</p> <p>Potential connection with the planned GTA-West Transportation Corridor.</p>	The <i>Growth Plan for the Greater Golden Horseshoe</i> was developed under the <i>Places to Grow Act</i> and sets standards for growth and development in the region over the next 25 years. Conceptual future transportation and transit corridors are included in the plan.
Ensure proper spacing, geometrics and location of interchanges at major arterials.	<p>Minimum urban interchange spacing is about 2–3 km in general.</p> <p>The 'standard' interchange configuration is a 'Parclo A4', unless site conditions/ constraints dictate otherwise.</p>	MTO standards will govern the location and design of interchanges.	Interchanges on controlled access highways must be designed and configured so that traffic can access and egress the highway in a safe manner. They must also be safe for other users (pedestrians, cyclists) travelling on the crossing roads.