Attachment A: Markham Centre EA Study Area

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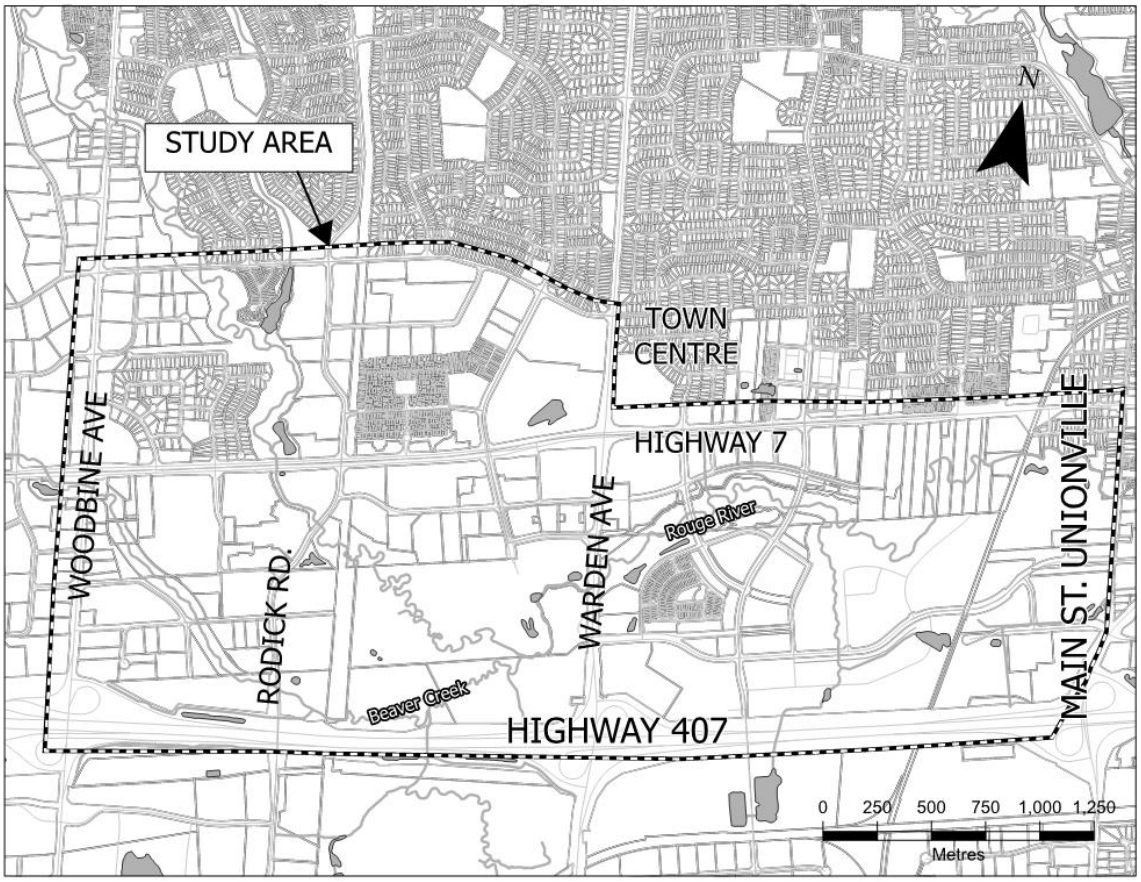
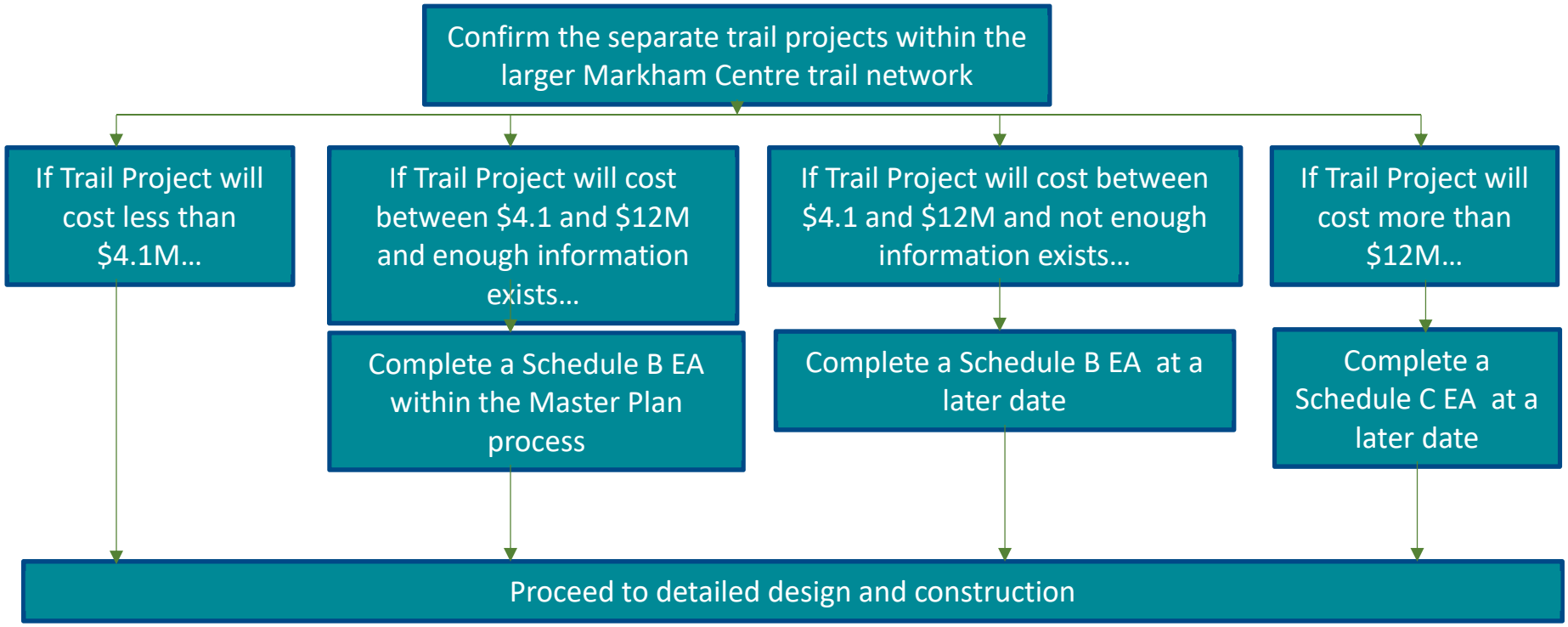


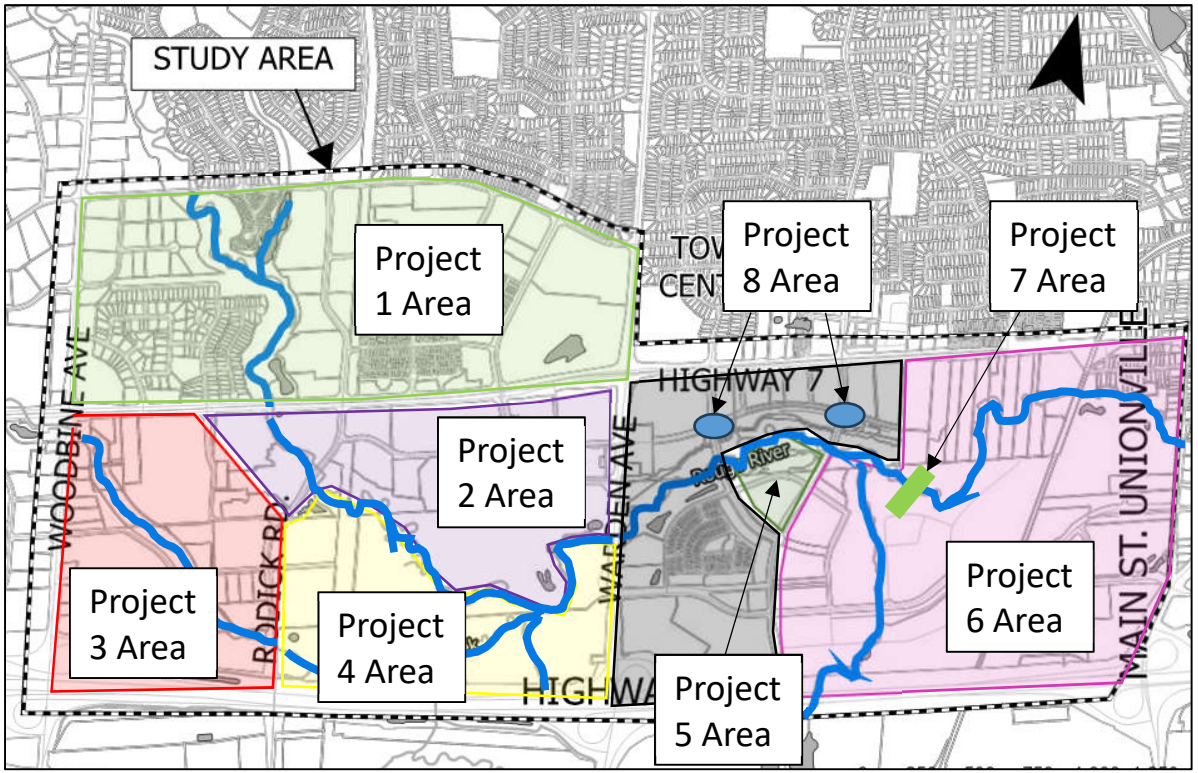
Attachment B: Master Plan Process

Attachment B: Master Plan Process



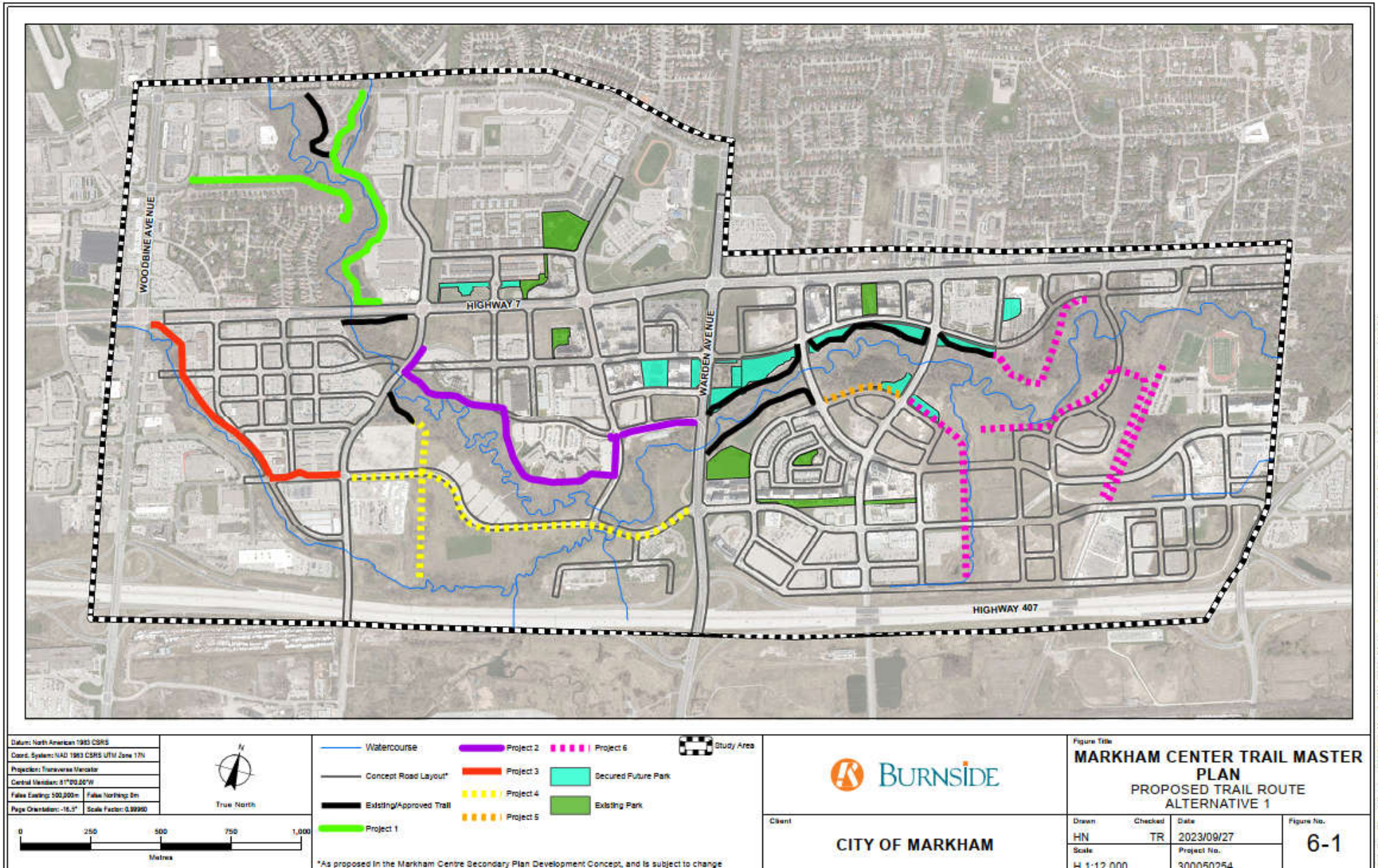
Attachment C: Master Plan Project Areas

Attachment C: Master Plan Project Areas

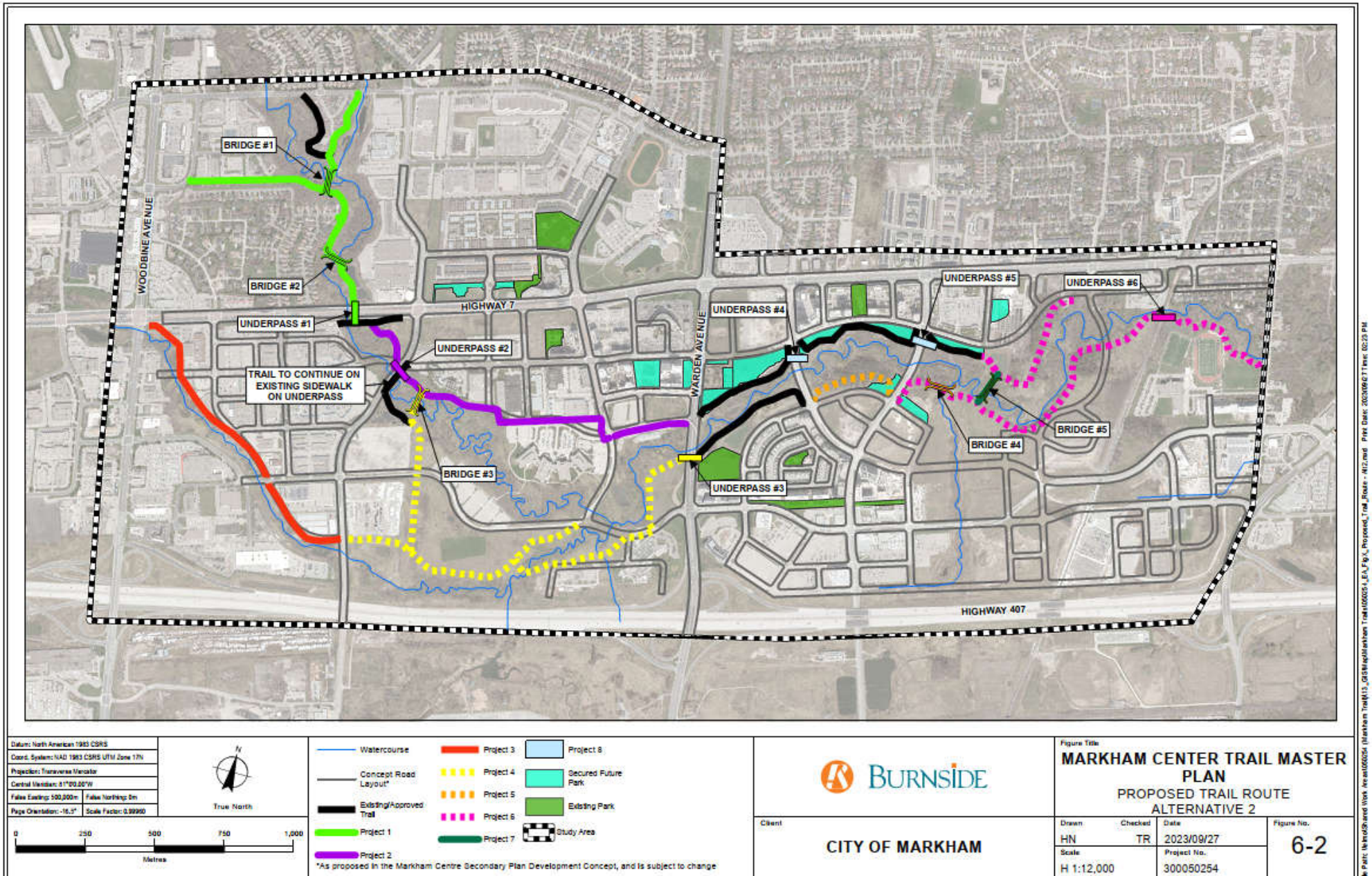


Attachment D: Alternative Trail Routes

Attachment D: Alternate Trail Routes
Alternative No. 1 – Minimum Connectivity



Attachment D: Alternative Trail Routes
Alternative No. 2 – Maximum Connectivity



Attachment E: Evaluation Criteria

Attachment E: Evaluation Criteria

Category	Criteria	Indicator
Natural Environment	Wetlands	Does the Alternative maintain or enhance wetland functions?
	Woodlands	Does the Alternative maintain or enhance woodland functions?
	Significant Wildlife Habitats	Does the Alternative maintain or enhance Significant Wildlife Habitat?
	Species at Risk	Does the Alternative maintain or enhance the habitat of Endangered and Threatened species?
	Aquatic Habitat	Does the Alternative maintain or enhance aquatic habitat?
	Flood Risk	Does the Alternative increase the risk of flooding?
	Slope Stability	Does the Alternative increase the risk of erosion or slope failure?
Social Environment	Private property	Does the Alternative require the use of private property?
	Continuity	Is a continuous route provided?
	Comfort (Safety and Security)	Are appropriate grade-separated crossings provided? Number of points of vehicle interaction (i.e., number of roads crossed at-grade)
	Accessible design criteria	Can the Alternative meet accessible design standards? Are there accessibility concerns?
Cultural Environment	Cultural heritage resources	Does the Alternative affect cultural heritage resources?
	Archaeological resources	Does the Alternative affect archaeological resources?

Economic Environment	Comparative capital costs	High level estimates of capital costs
	Comparative operational / maintenance costs	High level estimates of operational costs
Consistency with Problem Statement	Qualitative assessment of the Solution's ability to address the Problem Statement	Comparative analysis of key project goals.

Attachment F: Matrix Evaluation - Alternative Trail Routes

Markham Centre Trails EA- Evaluation of Alternative Solutions

	Criteria for Evaluating Alternatives	Indicators	Do Nothing	ALT 1: Minimal Trail Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using existing crossing infrastructure only without the addition of new bridges, underpasses or overpasses.	ALT 2: Maximum Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using a full suite of new bridges, underpasses or overpasses to maximize off-road trail connectivity.
A	**Natural Environment**				
1	**Wetlands**	Does the Alternative maintain or enhance wetland functions?	All wetlands functions maintained in current condition.	All wetlands functions maintained in current condition.	Small portion of shallow marsh between Rodick Rd. and Hwy 7 may be affected. Replacement/enhancement using TRCA Guideline for Determining Ecosystem Compensation will ensure no net loss of wetland function.
	Rating		○	○	○
2	**Woodlands**	Does the Alternative maintain or enhance woodland functions?	All woodland functions remain in current condition.	Some tree removal will be required. Replacement/enhancement using TRCA Guideline for Determining Ecosystem Compensation will ensure no net loss of woodland function.	Some tree removal will be required. Replacement/enhancement using TRCA Guideline for Determining Ecosystem Compensation will ensure no net loss of woodland function.
	Rating		○	○	○
3	**Significant Wildlife Habitats**	Does the Alternative maintain or enhance Significant Wildlife Habitat?	All wildlife habitats maintained in current condition.	Several locally rare species are located within the woodlands south of IBM and could potentially be affected. Tree removal that bisects, or creates new gaps in woodlands may affect woodland bird species.	Several locally rare species are located within the hedgerow on the northern edge of the IBM property and could potentially be affected. Tree removal that bisects, or creates new gaps in woodlands may affect woodland bird species.
	Rating		○	◑	◑
4	**Species at Risk**	Does the Alternative maintain or enhance the habitat of Endangered and Threatened species?	All species at risk populations and habitats maintained in current condition.	Trail is located within, and will cause disturbance to, regulated redside dace habitat. A butternut tree is located close to the trail on IBM lands and may be affected. It's current health condition is unknown. Woodlands may provide habitat for at risk bat species. Removal of maternity roosting trees could impact these species.	Trail is located within, and will cause disturbance to, regulated redside dace habitat. Woodlands may provide habitat for at risk bat species. Removal of maternity roosting trees could impact these species.
	Rating		○	◑	◔
5	**Aquatic Habitat**	Does the Alternative maintain or enhance aquatic habitat?	All aquatic habitats maintained in current condition.	No in-water work is planned. With erosion and sediment control and other mitigation, outlined in Section 5.2.1, aquatic habitat will be maintained in its current condition.	No in-water work is planned. With erosion and sediment control and other mitigation, outlined in Section 5.2.1, aquatic habitat will be maintained in its current condition.
	Rating		○	○	○
6	**Flood Risk**	Does the Alternative increase the risk of flooding?	No change in flood risk over current condition.	Trail to be designed to avoid significant changes to floodplain. No change in flood risk over current condition.	Hydraulic modeling shows that bridges can be constructed with no significant increase in flood risk. Trail to be designed to avoid significant changes to floodplain. No change in flood risk over current condition.
	Rating		○	○	○
7	**Slope Stability**	Does the Alternative increase the risk of erosion or slope failure?	No change to slope stability.	Some trail sections located along steep slopes. With appropriate slope stabilization, there will be no increased risk of slope failure or erosion.	Some trail sections located along steep slopes. With appropriate slope stabilization, there will be no increased risk of slope failure or erosion.
	Rating		○	○	○
	Summary Natural Environment		○	○	○

	Criteria for Evaluating Alternatives		Do Nothing	ALT 1: Minimal Trail Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using existing crossing infrastructure only without the addition of new bridges, underpasses or overpasses.	ALT 2: Maximum Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using a full suite of new bridges, underpasses or overpasses to maximize off-road trail connectivity.
C	**Social Environment**				
1	**Private property**	Does the Alternative require the use of private property?	No impacts to private property.	Use of private property is required along east side of Rouge river, north of Hwy 7 and through IBM property. IBM expressed concern regarding trespassing and the sensitivity of information on site. Trail through Hydro One lands requires permit.	Trail crosses a less sensitive portion of IBM lands. Trail through Hydro One lands requires permit.
	Rating		○	●	◔
2	**Continuity**	Is a continuous route provided?	No trail route is provided.	Trail continuity is compromised at Montgomery Ct., Hwy 7 and Rodick Rd.	A fully continuous trail route is provided.
	Rating		●	◕	○
3	**Comfort (Safety and Security)**	Are appropriate grade-separated crossings provided? Number of points of vehicle interaction (i.e. number of roads crossed at-grade)	Pedestrians and cyclists would use on-road facilities (sidewalk and bike lane use). Higher exposure to interaction with vehicles.	No new grade-separated crossings are provided. At-grade crossings of Hwy 7 and Rodick Rd. are required which bring trail users into high traffic volume areas.	Grade-separated crossings are provided at the busiest road crossings at Hwy 7 and Rodick Rd. Other minor road crossings will occur at grade. A potential grade-separated crossing of Warden Ave. will be developed at a later date.
	Rating		●	◕	◔
4	**Accessible Design Criteria**	Can the Alternative meet accessible design standards? Are there accessibility concerns?	Sidewalks are generally accessible but multiple crossings of major roads is a safety concern from an accessibility perspective.	Steep slopes in sections north of Hwy 7 may be difficult to meet recommended grades. Sidewalks on Hwy 7 and Rodick Rd. are generally accessible but multiple crossings of major roads is a safety concern from an accessibility perspective.	Steep slopes in sections north of Hwy 7 may be difficult to meet recommended grades. Separation of trail from high traffic areas improves safety from an accessibility perspective.
	Rating		●	◕	◔
5	**Place-making**	Does the Alternative provide a high-quality public space?	No unique public space is created.	The quality of the public space is compromised due to the lack of continuity. Sections through IBM lands are not suitable for public gathering due to sensitivity of IBM work and may require fencing or other anti-trespassing measures which could reduce the aesthetics/quality of the space. Section east of IBM lands has limited appeal.	Bridges provide views and a connection to nature. Continuity increases the value and usefulness of the public space. Sections through IBM lands and east of IBM lands have limited appeal.
	Rating		●	◑	◔
	Summary Social Environment		◕	◕	○

	Criteria for Evaluating Alternatives		Do Nothing	ALT 1: Minimal Trail Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using existing crossing infrastructure only without the addition of new bridges, underpasses or overpasses.	ALT 2: Maximum Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using a full suite of new bridges, underpasses or overpasses to maximize off-road trail connectivity.
D	**Cultural Environment**				
1	**Cultural Heritage Resources**	Does the Alternative affect cultural heritage resources?	No impacts to cultural heritage.	The trail is not located near any designated cultural heritage resources. No impacts to cultural heritage.	The trail is not located near any designated cultural heritage resources. No impacts to cultural heritage.
	Rating		○	○	○
2	**Archaeological Resources**	Does the Alternative affect archaeological resources?	No impacts to areas of high archaeological potential.	Most of the trail is within an area of high archaeological potential. All work required under the Ontario Heritage Act will be completed prior to construction. No net effects are expected.	Most of the trail is within an area of high archaeological potential. All work required under the Ontario Heritage Act will be completed prior to construction. No net effects are expected.
	Rating		○	○	○

	Summary Cultural Environment		○	○	○

	Criteria for Evaluating Alternatives		Do Nothing	ALT 1: Minimal Trail Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using existing crossing infrastructure only without the addition of new bridges, underpasses or overpasses.	ALT 2: Maximum Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using a full suite of new bridges, underpasses or overpasses to maximize off-road trail connectivity.
F	**Economic Environment**				
1	**Comparative capital costs**	High level estimates of capital costs	No capital costs.	Moderate based on length of trail (3,305 m).	Moderate-high based on length of trail (2,796 m), 2 bridges and 2 underpasses.
	Rating		○	◑	◕
2	**Comparative operational/ maintenance costs**	High level estimates of operational costs	No operational costs.	Moderate based on length of trail (3,305 m).	Moderate-high based on length of trail (2,796 m), 2 bridges and 2 underpasses.
	Rating		○	◑	◕
	Summary Economic Environment		○	◑	◕

	Criteria for Evaluating Alternatives		Do Nothing	ALT 1: Minimal Trail Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using existing crossing infrastructure only without the addition of new bridges, underpasses or overpasses.	ALT 2: Maximum Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using a full suite of new bridges, underpasses or overpasses to maximize off-road trail connectivity.
E	**Problem Statement**				
1	**Addresses the overall Problem/ Opportunity Statement**	Comparative analysis of key project goals	No	Yes	Yes
	Summary Problem Statement		**Do Not Move Forward**	**Move Forward**	**Do Not Move Forward**

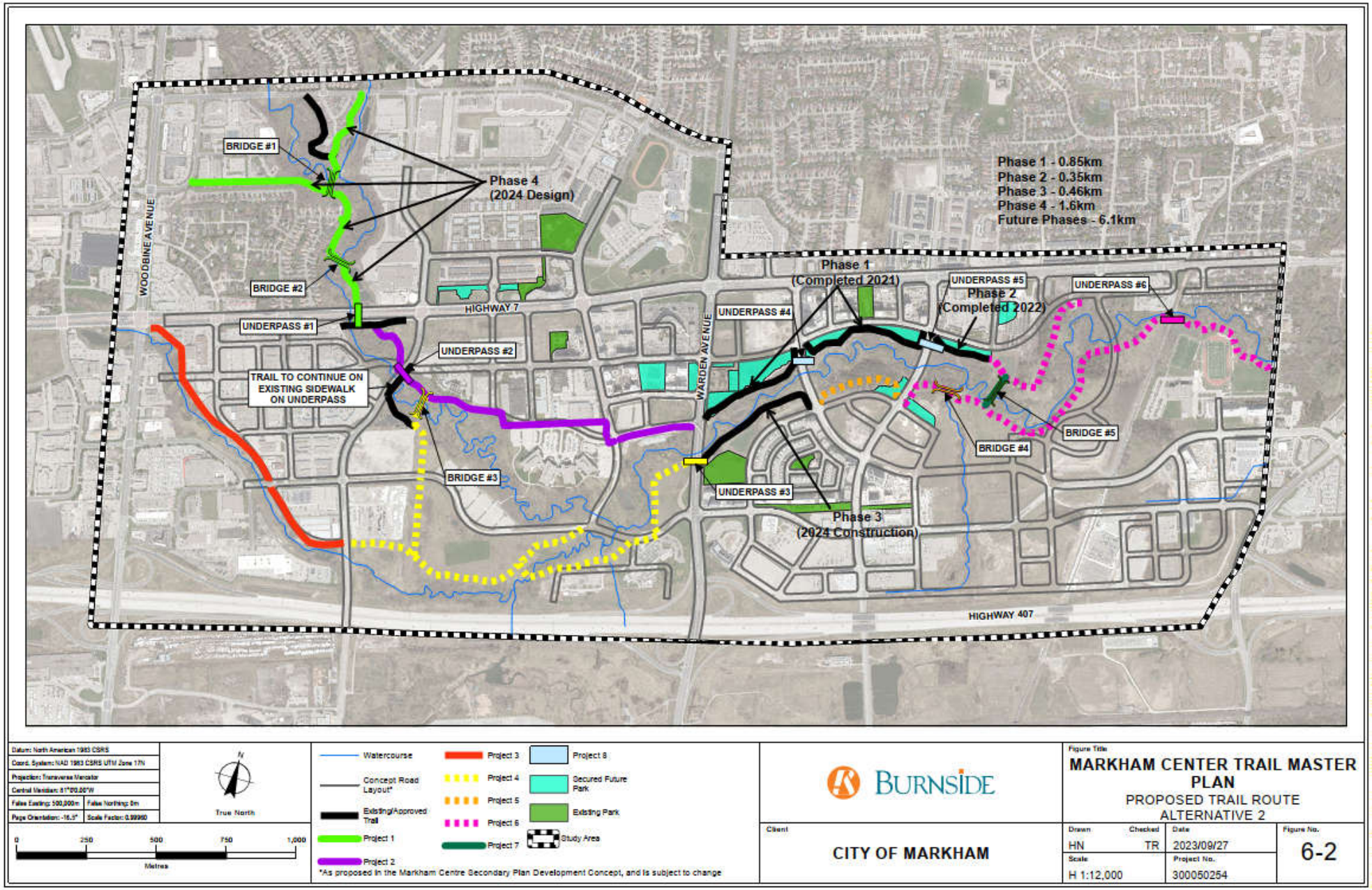
Criteria for Evaluating Alternatives		Do Nothing	ALT 1: Minimal Trail Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using existing crossing infrastructure only without the addition of new bridges, underpasses or overpasses.	ALT 2: Maximum Connectivity: Development of a trail system through Markham Centre with connections across major roads and watercourses using a full suite of new bridges, underpasses or overpasses to maximize off-road trail connectivity.
Overall Summary		**Do Not Move Forward**	**Least Preferred**	**Somewhat Preferred**

Order of Preference

Most Preferred	○
More Preferred	◔
Somewhat Preferred	◑
Less Preferred	◕
Least Preferred	●

Attachment G: Conceptual Preferred Alternative Trail Route

Attachment G: Conceptual Preferred Alternative of Trail Routes



Attachment H: Descriptions of Master Plan Project Areas

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Project Area	*Approx. Length (m)*	*Construction Cost*	*Other Features*
Project 1: Apple Creek Blvd. to Hwy. 7.	1435	$4.3M - $4.9M	Bridge #1 across the Rouge River: 30.5 m in length Bridge #2 across the Rouge River: 24.3 m in length Underpass #1 below Hwy 7: 48 m in length
Project 2: Hwy 7 to Warden Ave. (N. side of Rouge River)	1362	$2.4M - $3.0M	Underpass #2 below Rodick Rd.: 20 m in length
Project 3 Hwy 7 to Rodick Rd.	1100	$2.0M - $2.6M	
Project 4: Rodick Rd. to Warden Ave. (South of Rouge River)	2464	$6.4M - $7.0M	Bridge #3 (19 m in length) across the Rouge River in the Hydro One corridor to connect the trail to the Project 2 trail system north of the river.
Project 5: Verclaire Gate to Birchmount Rd. (South of Rouge River)	349	$1.1M - $1.7M	
Project 6: Birchmount to Main St. Unionville	2408	$5.4M - $6.1M	One 17 m long bridge over Tributary 4 One underpass (5.5 m in length) below the Metrolinx rail bridge
Project 7: Signature Bridge over Rouge River East of Birchmount Rd.	19	$2M	A single signature bridge (19 m in length), located south of the existing Sheridan Nursery SWM pond, along a relatively straight section of the Rouge River
Project 8: Underpasses below Verclaire Gate and Birchmount Rd.	20m (Verclaire) 25m (Birchmount Rd.)	$0.4M	new trail sections below the bridges at Verclaire Gate and Birchmount Rd. to provide a continuous route along the north side of the Rouge River without the need for at-grade crossing of heavily trafficked roads
Total		$24M - $27.7M	