DASH-MASH: A cross city active transportation superhighway for Hamilton, Ontario.

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Summary Points

- The DASH-MASH plan is for a 108 km multi-use path intersecting 13 of the 15 Hamilton Wards.
- 78 km of existing multi-use path is included in the DASH-MASH plan.
- 22 km of existing trail and sidewalk will require conversion.
- 7.8 km of multi-use path is required where no paths currently exist.
- 125,000 Hamilton residents are within a ten-minute walk of the proposed DASH-MASH.
- 370,000 Hamilton residents are within a ten-minute bike ride of the proposed DASH-MASH.
- Within the 10-minute biking radius of the DASH-MASH, there are 518 kilometers of bikeways.
- 113 of the 115 Social Bicycle Hubs are within the ten-minute cycling distance of the DASH-MASH.

1 Introduction

In 2019, construction is scheduled to begin on a cross city Light Rail Transit project in Hamilton. This LRT will provide economic, health, environmental and social benefits to the city of Hamilton (Topalovic et al., 2012). The LRT will not function alone in the city because transportation systems work as a network; a connection of links and nodes with various modes that can be used to travel between destinations. In North America, cycling and transit comprise a useful combination of modes and when they are available the demand typically exceeds the supply (Pucher and Buehler, 2009). With light rail public transportation on Hamilton's horizon, it is an excellent time to develop additional cycling infrastructure that will complement the existing and future transportation infrastructure.

In this overview, we examine a potential multi-use trail network that would parallel the Niagara Escarpment connecting Hamilton from Stoney Creek to Dundas, which is termed the Downtown Active Super Highway and the Mountain Active Super Highway (DASH-MASH). A commuter trail network across Hamilton can provide benefits to members the Hamilton community including:

- Reduced on-street cycling, which will reduce the competition between vehicles and cyclists on the roads.
- Improved connection between the upper and lower city.
- Increased opportunities for physical recreation.

Cycling provides health benefits that have been demonstrated in the urban environment to outweigh the potential negative effects (Rojas-Rueda et al., 2011). Rojas-Rueda and colleagues demonstrated in a city of 181 thousand residents, when people travel via a bike share program

opposed to travel by car they would avoid 12.28 deaths annually. This early mortality included effects from air pollution exposure and traffic incidences.

North Americans who choose to cycle occur in the greatest numbers in central cities near universities and gentrified neighborhoods near the city center (Pucher et al., 2011). Hamilton is currently undergoing gentrification in its city centre and has both McMaster University and Mohawk College, which are less than a 5 km walk between each other. However, separated cycling infrastructure does not exist to connect any of downtown, McMaster University, or Mohawk College.

The intention of the DASH-MASH is to provide separated infrastructure routed along the escarpment, both above and below, to allow for cross city commuting.

2 Trail Maps

In the map series attached in Appendix A of this report, we present the detailed DASH-MASH routing across Hamilton aligned to the Niagara Escarpment. In Figure 1, we present the DASH-MASH corridor along the escarpment. In Table 1, we present information on the trail lengths by type.

Table 1: Trail Lengths

Trail Type	Trail Changes Required	Length (meters)
Existing Multi-use Path	None	77,969
Existing Trail	Upgrade to Multi-use	21,847
Existing Sidewalk	Upgrade to Multi-use	572
New Multi-use Path Required	Complete Build Required	7,882
	Total Length	**108,270**

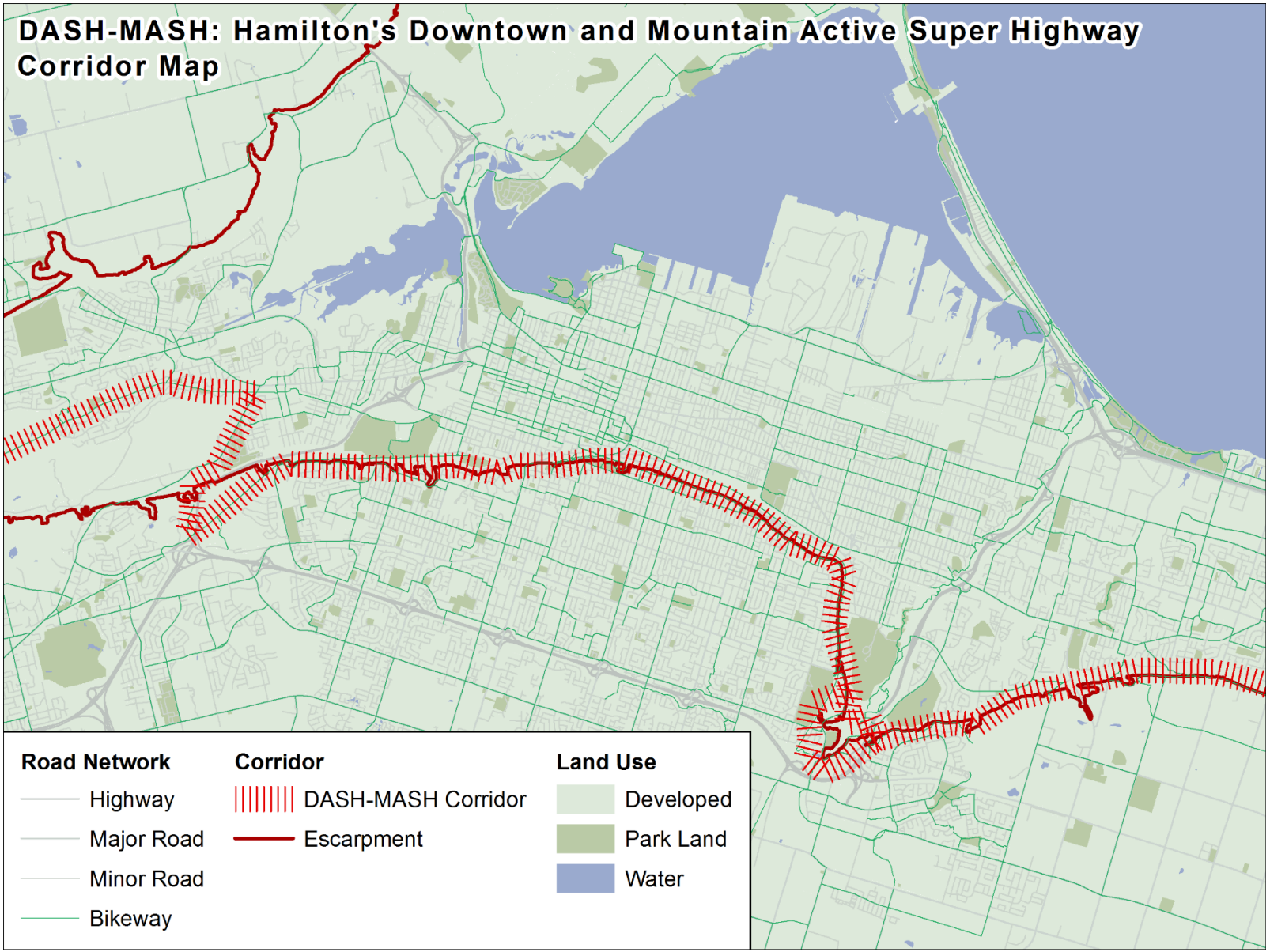

Figure 1: DASH-MASH Corridor Map

The estimated total length of the DASH-MASH to cross Hamilton is about 108 km, and 72% of this distance is already constructed and managed as multi-use paths. Upgrades to existing trails will be required for 9.7 km of existing trail and sidewalk to convert these to multi-use pathways. This infrastructure indicates there is an existing need for these pathways and upgrades will incorporate them into the network. The remaining 7.9 kilometers of the network, i.e., only 7% of the entire system, will require a complete build to complete the DASH-MASH. The DASH-MASH trail network intersects 13 of Hamilton's 15 Wards.

2.1 DASH-MASH Description

In this section, we will discuss the DASH-MASH, following the path from west to east. We will discuss each map in the map series that is found in Appendix A.

Map 1: The DASH-MASH will utilize the existing multi-use infrastructure of the Hamilton-Brantford Rail Trail. Existing development occurs adjacent to this trail and provides a great link to the Dundas Valley and further on to Brantford. Additionally, the urban portion of the Hamilton-Brantford Rail Trail provides access for McMaster Students as it is only a few hundred meters from the University.

The DASH-MASH will head south on Main Street towards Ancaster from the Main St. and Osler intersection. This road has existing painted bike lanes and sidewalks, which should allow for the development of separated infrastructure.

Map 2: The DASH-MASH heading south on Main Street will exit onto Filman Road. At the end of Filman road it will continue along an existing road allowance, where an existing trail connects the upper and lower portions of Filman road. This section will provide a link above and below the escarpment.

Map 3: The DASH-MASH meets back up with Filman road when it begins again above the escarpment. Where Filman road heads west, the DASH-MASH will follow the existing multi-use path east, that the Bruce Trail currently follows. There is a pedestrian bridge to cross the 403, see Figure 2.

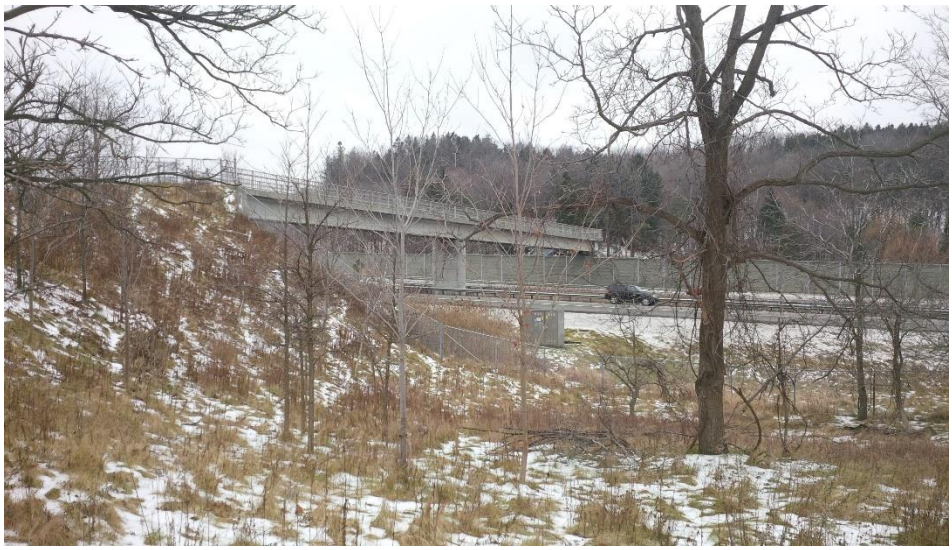

Figure 2: Pedestrian Bridge Across the 403.

Map 4: Below the escarpment the DASH-MASH will follow the Hamilton-Brantford Rail Trail to Chedoke Park. See Figure 3 for urban section of Hamilton-Brantford Rail Trail.

Figure 3: Urban section of Hamilton-Brantford Rail Trail

Map 5: A new trail will need to be constructed that will allow safe access to the Chedoke stairs and the Chedoke Radial Trail. The Chedoke Radial Trail to the west provides an access point to the DASH-MASH above the mountain and to the east forms the lower section of the DASH-MASH. A new trail will need to be developed along Scenic Drive that will connect the existing sections of multi-use path.

Map 6: Below the escarpment new trail will need to be constructed from Highlands Gardens Park and continue east across Beckett Dr. Above the escarpment the new trail section from Scenic Drive will need further development following Fennell. As it passes Hillfield Strathallan College the trail will head north through a forested corridor (Figure 4) and travel east to the Claremont Access following the top of the escarpment.

Figure 4: Forest corridor off Fennell Road.

Map 7: Below the escarpment at the Claremont Access the new trail that would be developed joins up with the Escarpment Rail Trail heading east. Above the escarpment, short sections of multi-use path exist, but will require additional trail linkages to be constructed. The route requires new trail

on Rosedene Ave, Belvidere Ave, and Concession St. East of the Jolley Cut a link between the upper and lower DASH-MASH exists, which consists of a staircase and multi-use path.

Map 8: Below the escarpment the DASH-MASH continues along the Escarpment Rail Trail. Above the escarpment, the DASH-MASH continues along the existing multi-use path that parallels Mountain Park Ave and Mountain Brow Blvd.

Map 9: Above and below the escarpment the DASH-MASH continues along the existing multi-use paths.

Map 10: Both trails above and below the escarpment head south. There is a staircase connecting the DASH-MASH east of Margate Ave.

Map 11: The DASH-MASH trails continue south until they intersect at Mohawk Rd. E. Above the escarpment the trail follows the existing Escarpment Rail Trail. Below the escarpment it follows existing trail and multi-use paths.

Map 12: The DASH-MASH combines after it passes through King's Forest and follows an existing multi-use path towards Felker's Falls.

Map 13: The DASH-MASH past Felker's Fall continues along an existing trail that would require upgrading to a multi-use path.

Map 14-18: The DASH-MASH travels along the escarpment at its base. At Devils Punch Bowl there is a trail to the top of the escarpment. These sections of trail will require upgrading to multi-use paths.

3 Demographic Analysis

The utility of trails increases with their accessibility. To calculate accessibility we measured the number of people who are within 800 m (representing a ten-minute walk) of the trail and people who are within a 2,550 m (representing a 10-minute bike ride) of the DASH-MASH. These distances were based on accepted average walking and cycling speeds of 5 km/hr and 15.5 km/h, respectively. Using Census Canada Population Data, we calculated how many Hamilton residents are within these two distances.

Within the 10-minute walking distance of the DASH-MASH 125,000 Hamilton residents reside. The number of residents within a 10-minute bike ride of the DASH is 370,000, which is a significant portion of our population. In Figure 5, we present the DASH corridor and the corresponding 10-minute walking and 10-minute cycling buffers.

Hamilton has spent considerable resources to develop its current cycling infrastructure. Within the 10-minute bike buffer, 518 kilometers of cycling infrastructure exists, which includes on-road cycling routes connecting major attractions within Hamilton. The DASH-MASH will help to support the use of this existing infrastructure.

Hamilton has a burgeoning bike share program, SOBI. The existing bike hub network consists of 115 hubs, 113 of these hubs are within the 10-minute cycling buffer of the DASH-MASH. The proximity of the bike hubs to the DASH-MASH should be a mutually beneficial development, and provide people with an accessible cycling path.

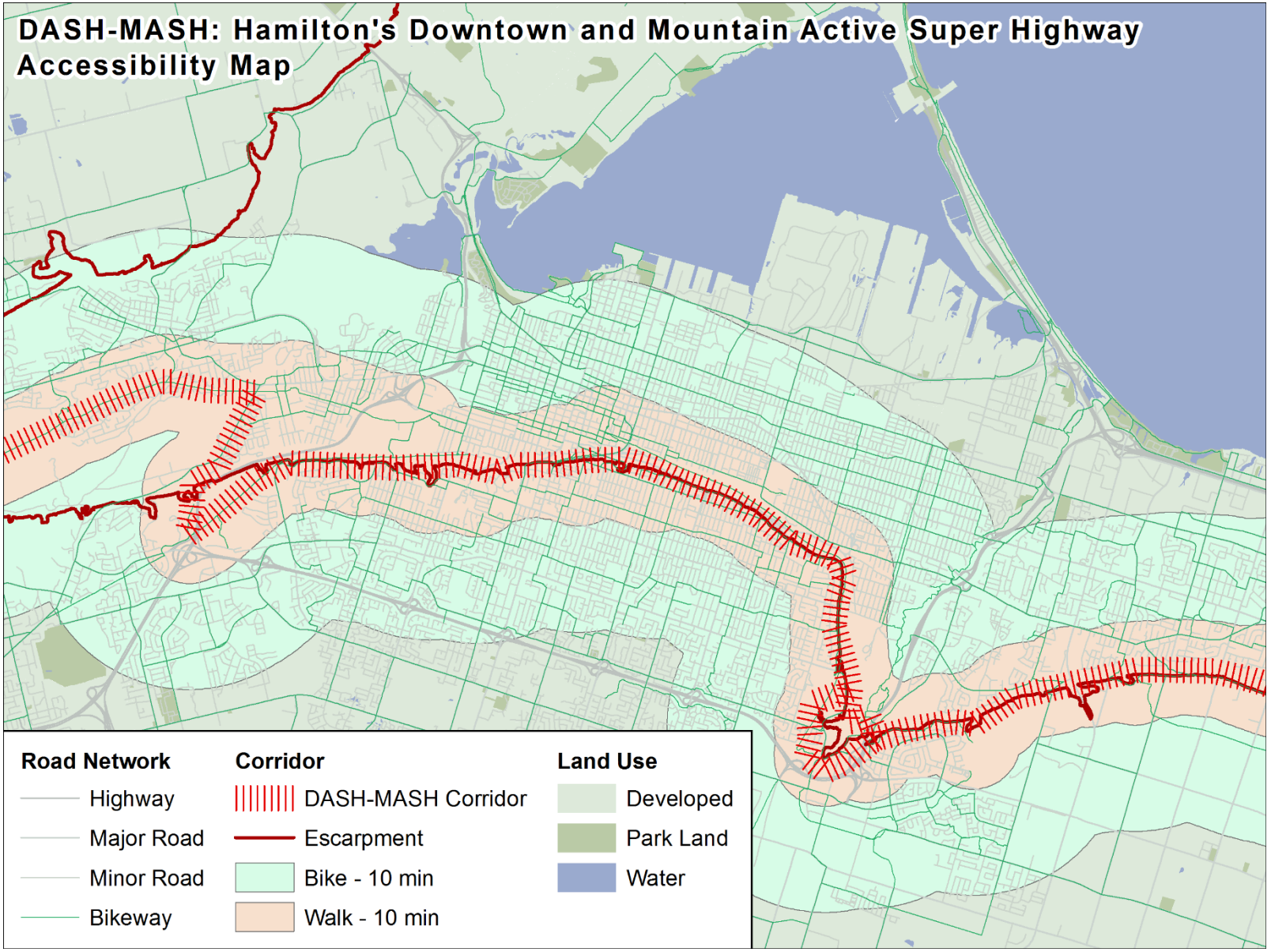

Figure 5: DASH-MASH Accessibility Map

References

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Rojas-Rueda, D., de Nazelle, A., Tainio, M., Nieuwenhuijsen, M.J., 2011. The health risks and benefits of cycling in urban environments compared with car use: health impact assessment study. *Bmj* 343, d4521–d4521.

Topalovic, P., Carter, J., Topalovic, M., Krantzberg, G., 2012. Light Rail Transit in Hamilton: Health, Environmental and Economic Impact Analysis. *Social Indicators Research* 108, 329–350.

Appendix A

DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
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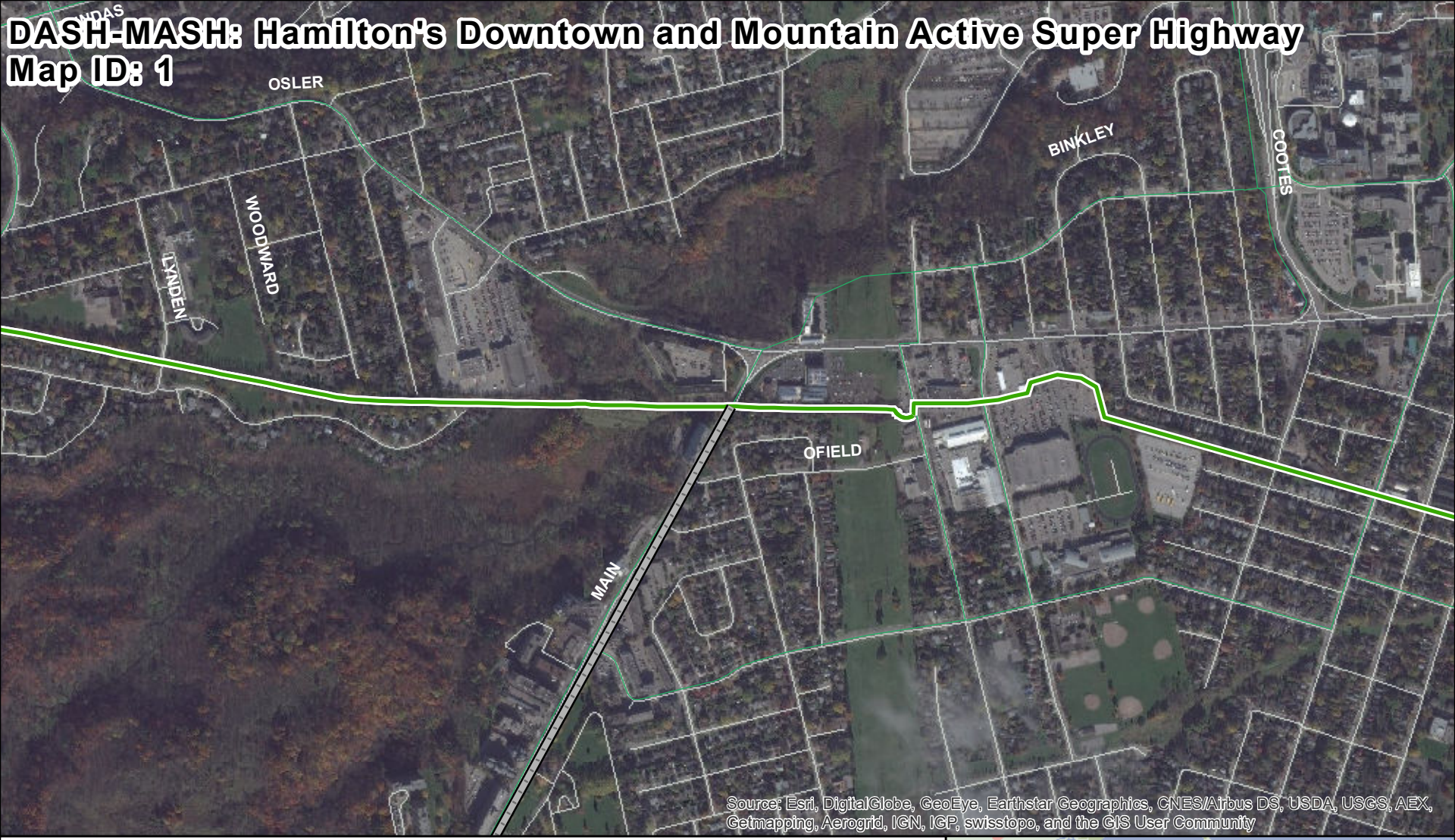
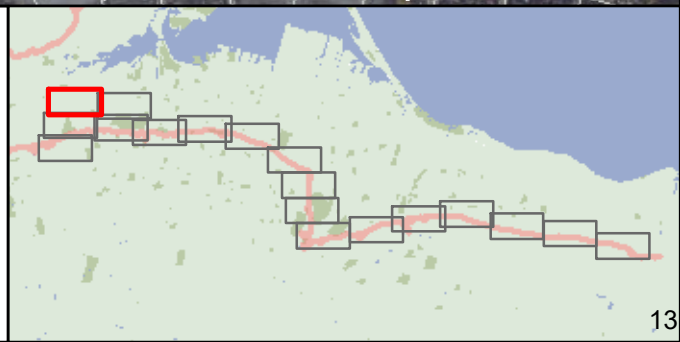


Road Network
- Highway
- Major Road
- Minor Road
- Bikeway

Existing Trails
- Multiuse Path
- Sidewalk
- Stairs
- Trail

New Trail
- Multiuse Path

Corridor
- Escarpment



DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
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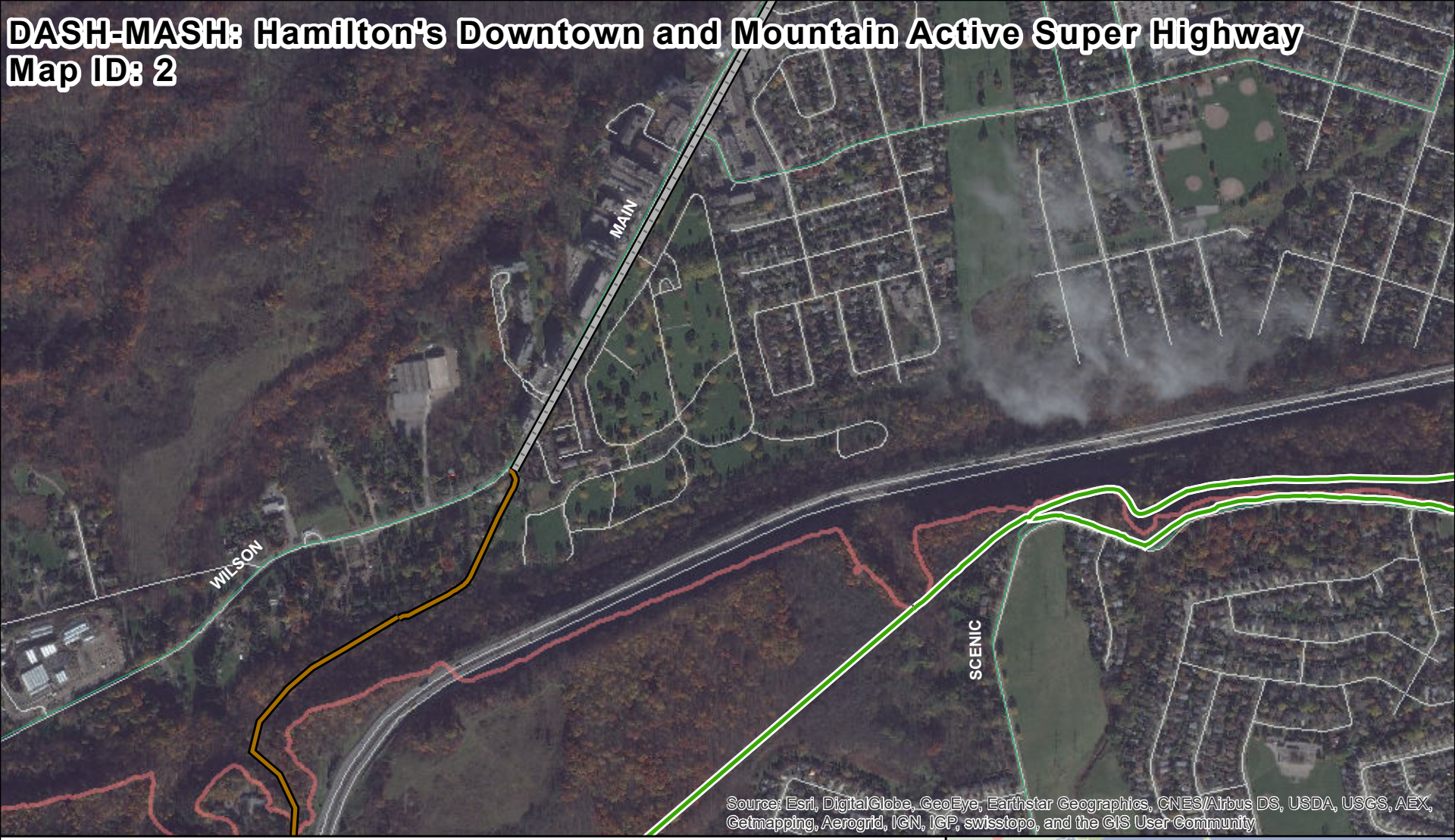

Road Network
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Existing Trails
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- Trail

New Trail
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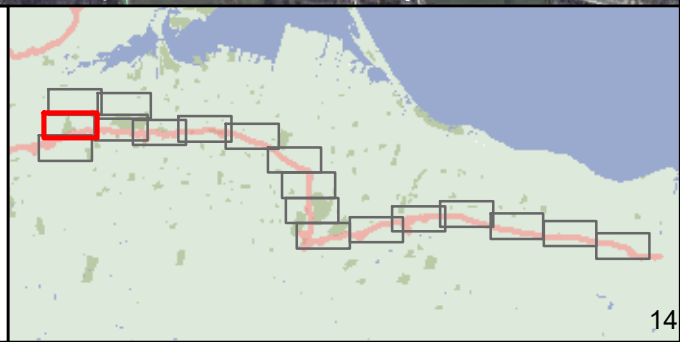
Corridor
- Escarpment



DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
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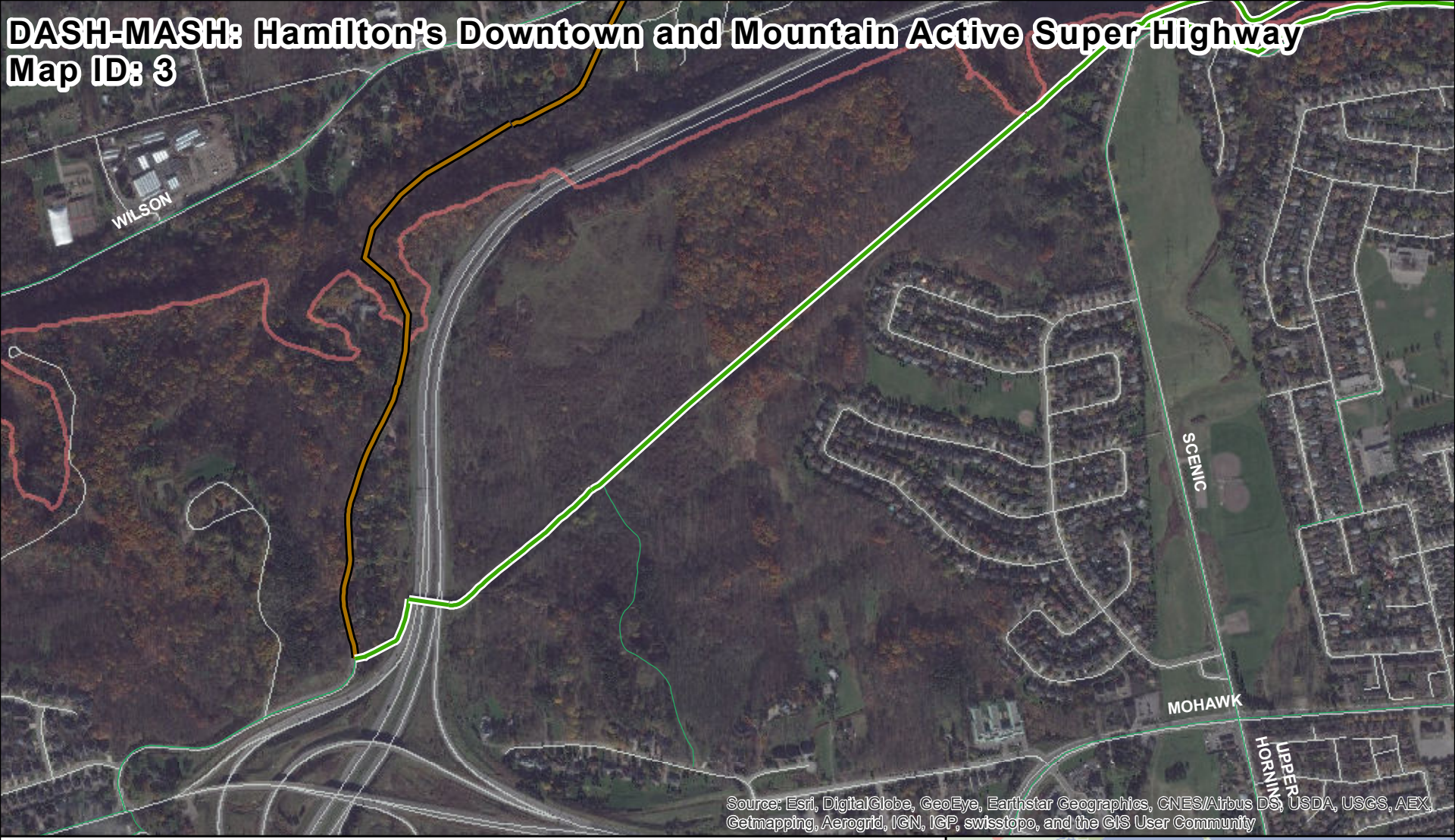

Road Network
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- Bikeway

Existing Trails
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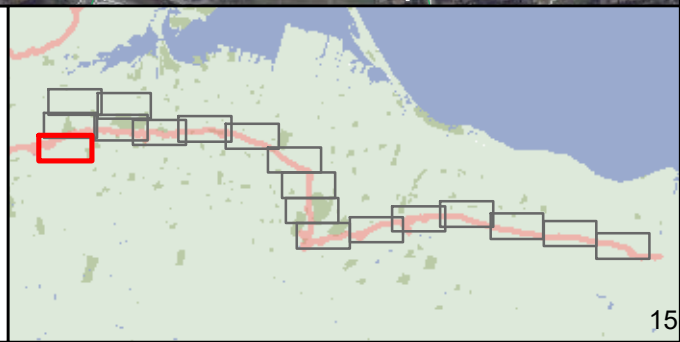
- Sidewalk
- Stairs
- Trail

New Trail
- Multiuse Path

Corridor
- Escarpment



DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
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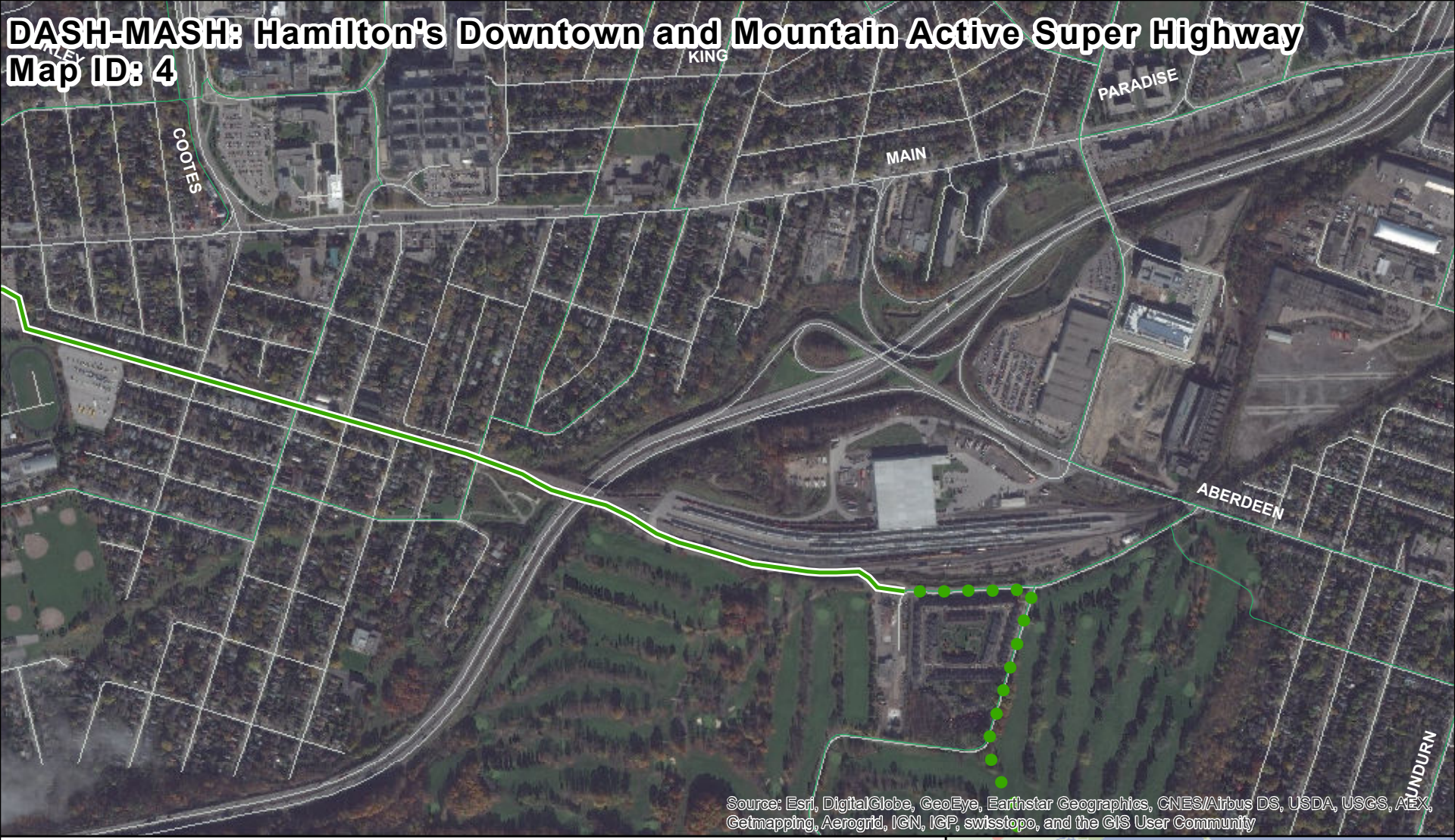

Road Network
- Highway
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- Bikeway

Existing Trails
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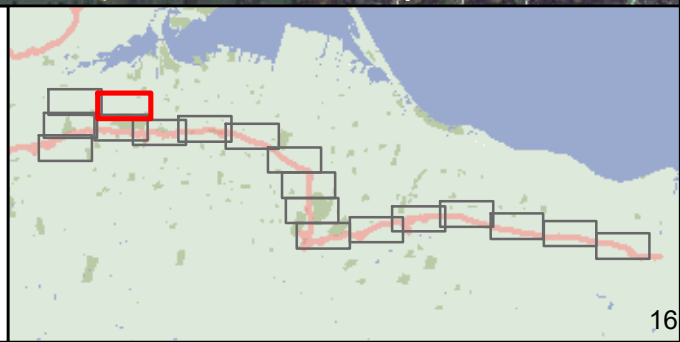
- Sidewalk
- Stairs
- Trail

New Trail
- Multiuse Path

Corridor
- Escarpment



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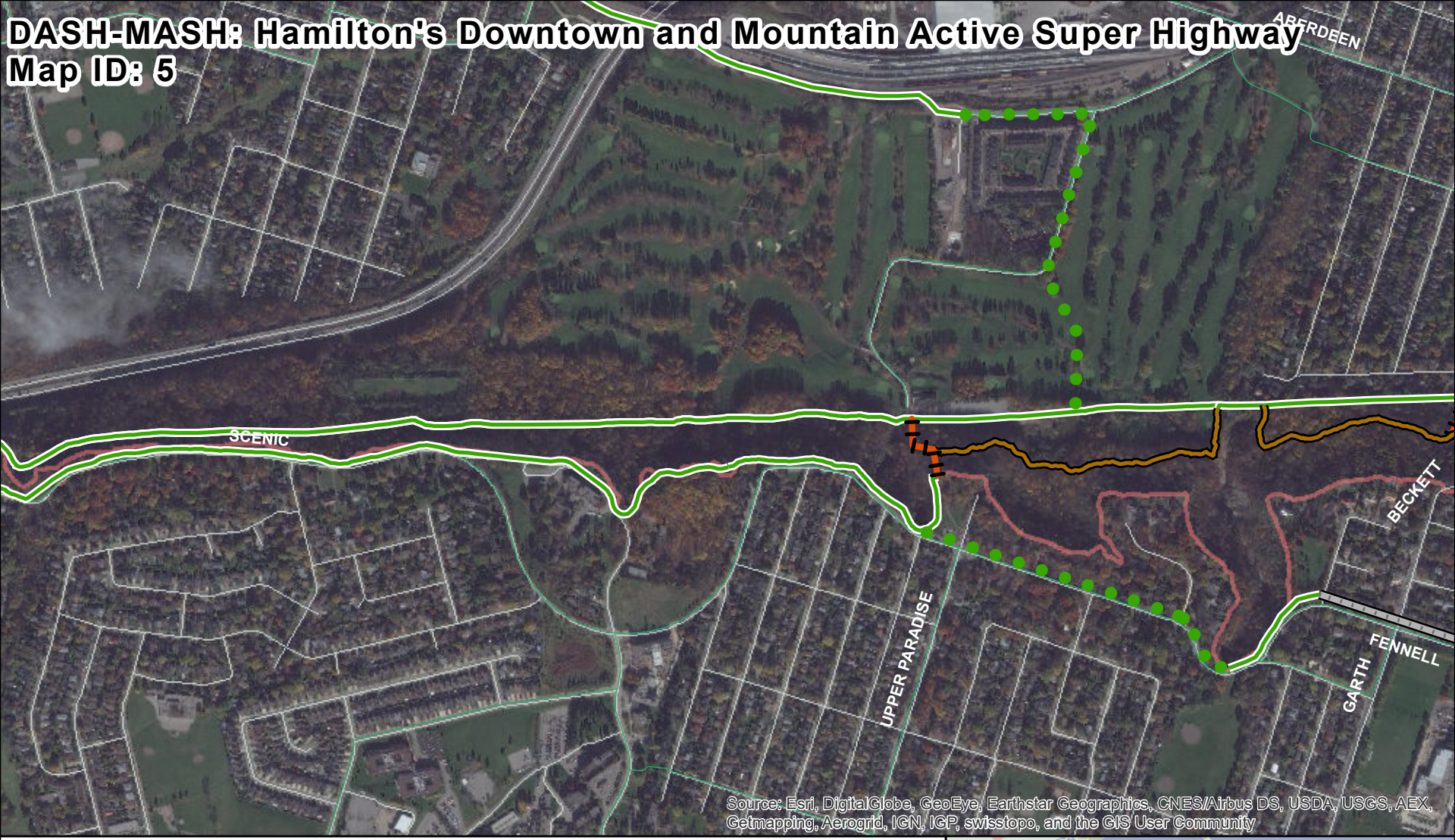

Road Network
- Highway
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- Bikeway

Existing Trails
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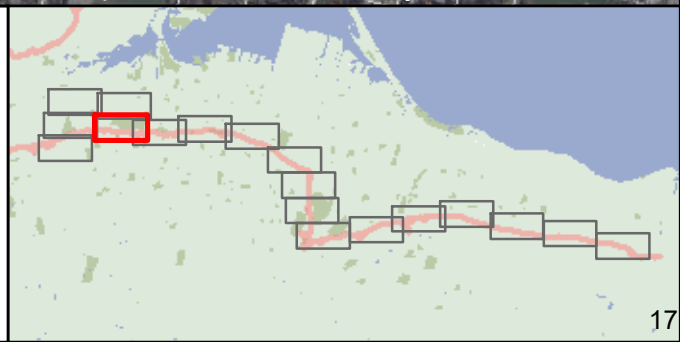
- Trail

New Trail
- Multiuse Path

Corridor
- Escarpment



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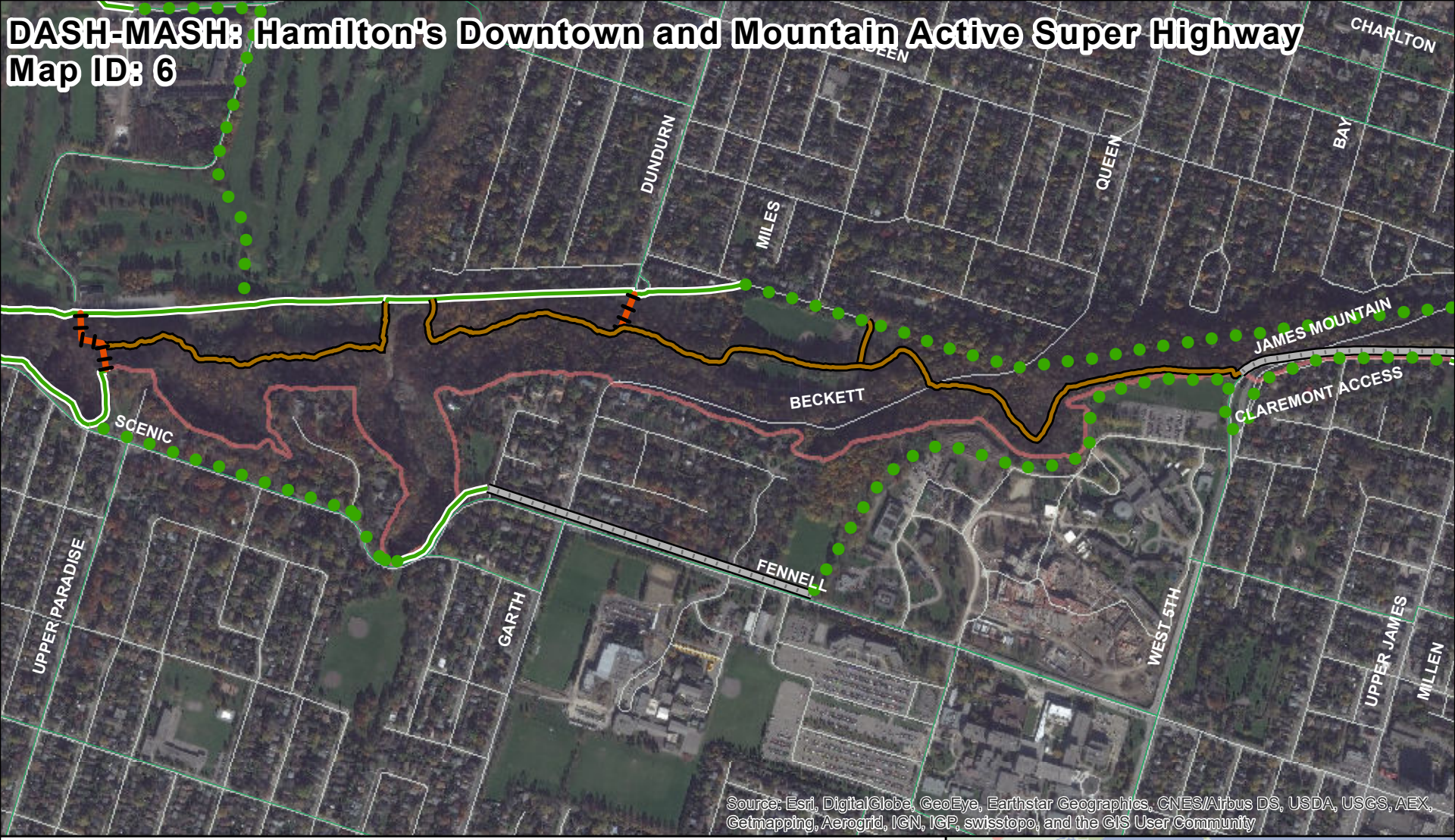
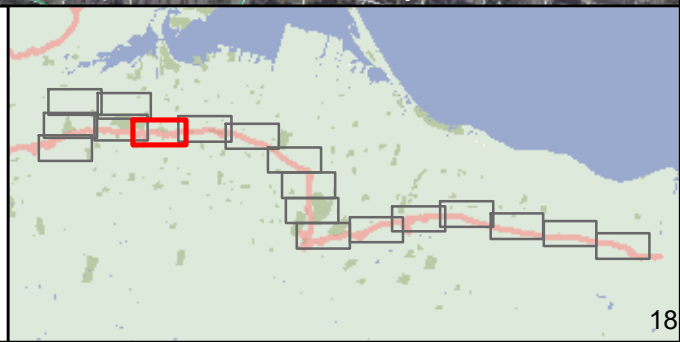


Road Network
- Highway
- Major Road
- Minor Road
- Bikeway

Existing Trails
- Multiuse Path
- Sidewalk
- Stairs
- Trail

New Trail
- Multiuse Path

Corridor
- Escarpment



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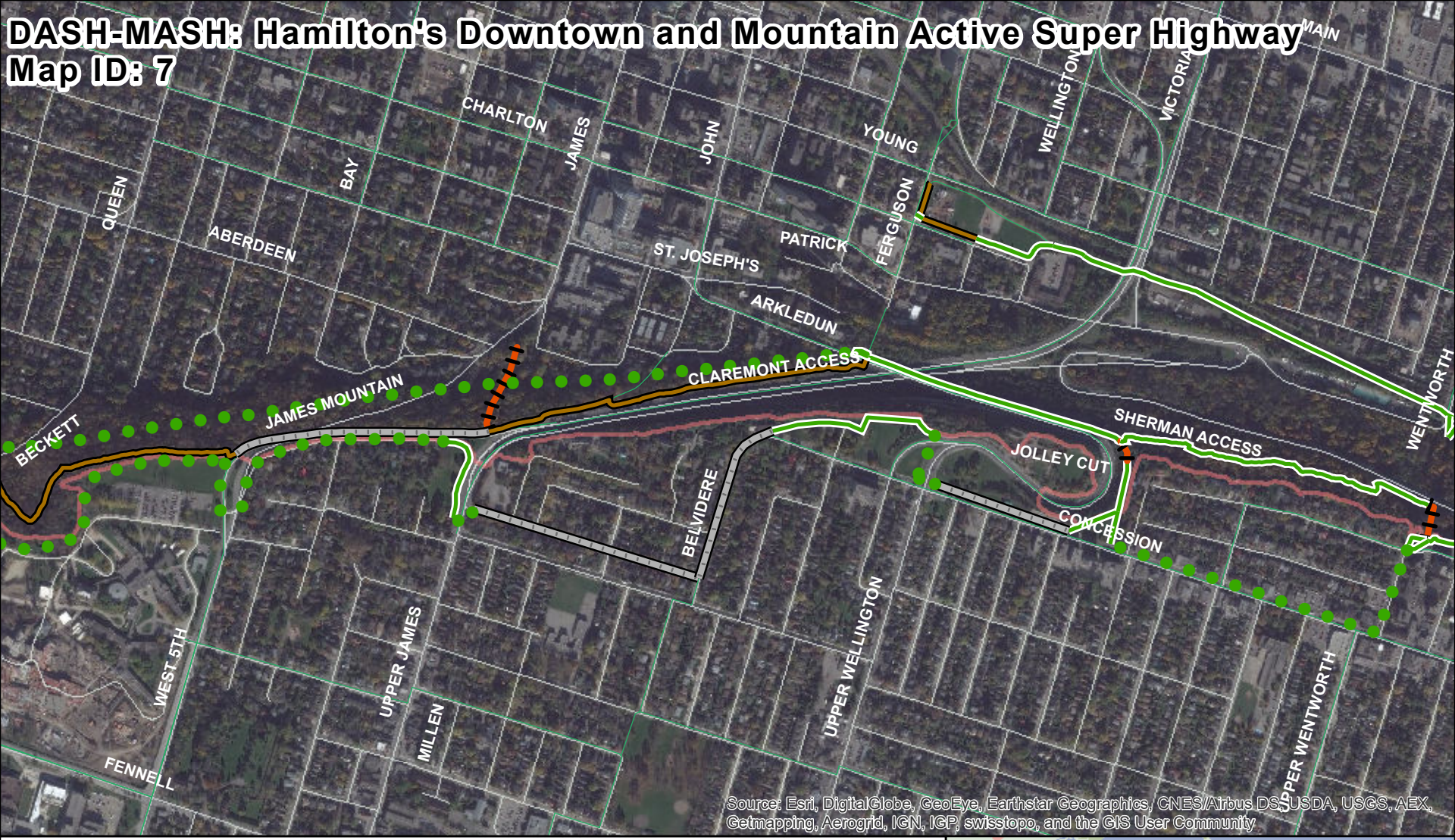

Road Network
- Highway
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Existing Trails
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Corridor
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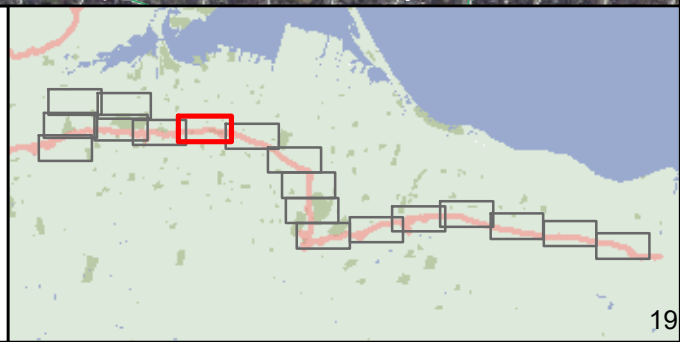

DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
Map ID: 8

Road Network
- Highway
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Existing Trails
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- Trail

New Trail
- Multiuse Path

Corridor
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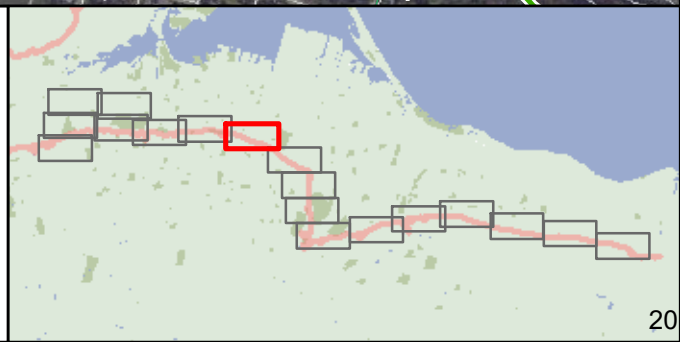

DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
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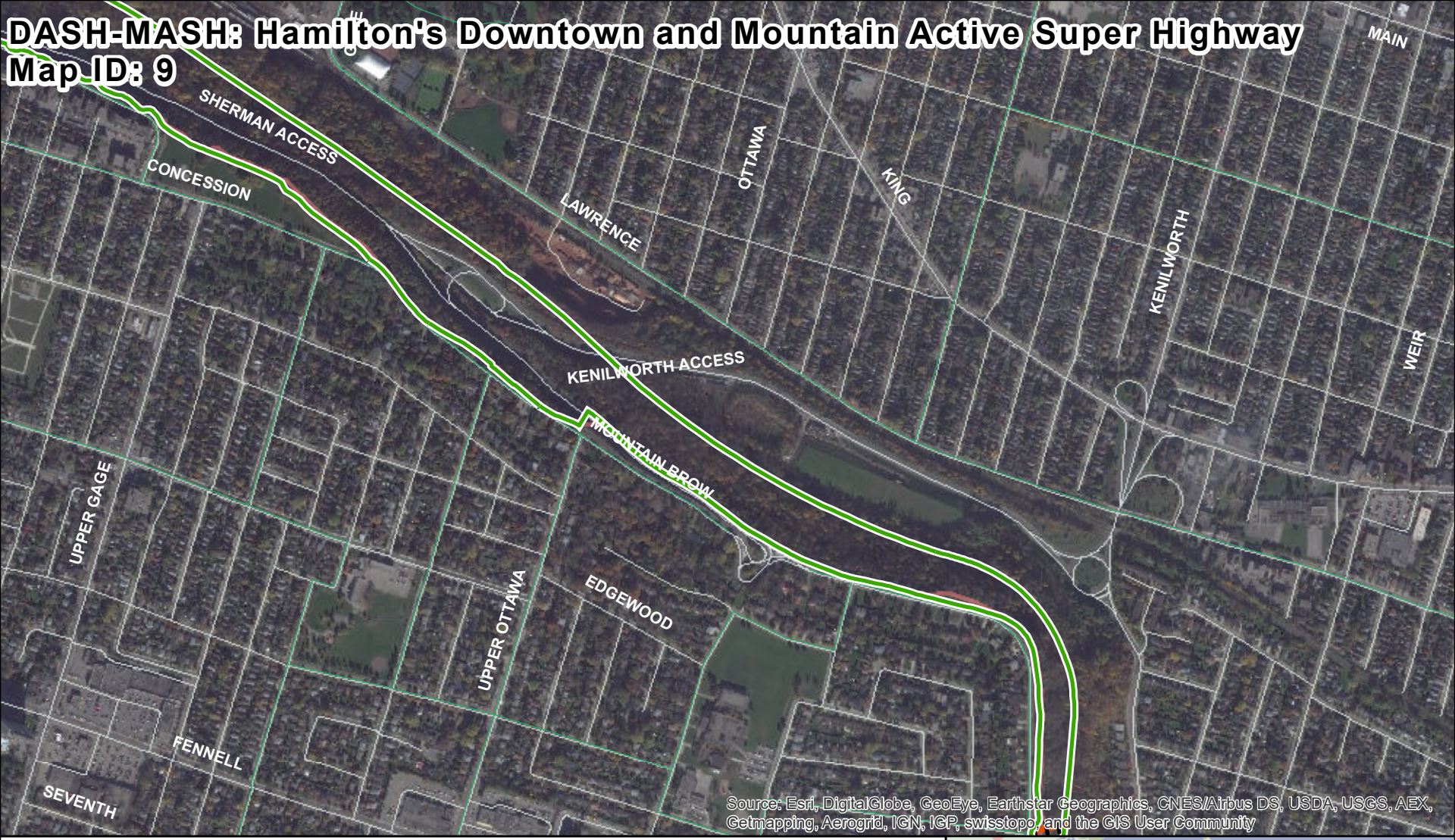

Road Network

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Existing Trails

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- Trail

New Trail

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Corridor

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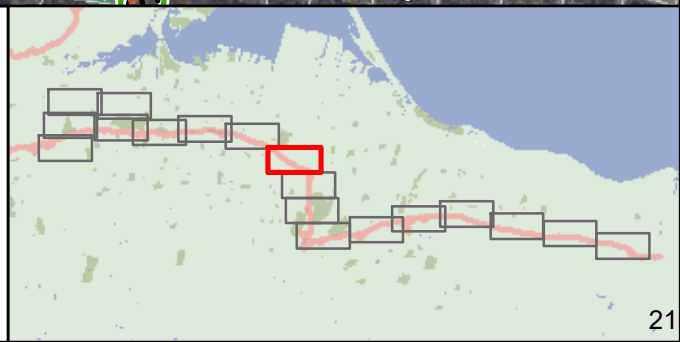

DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
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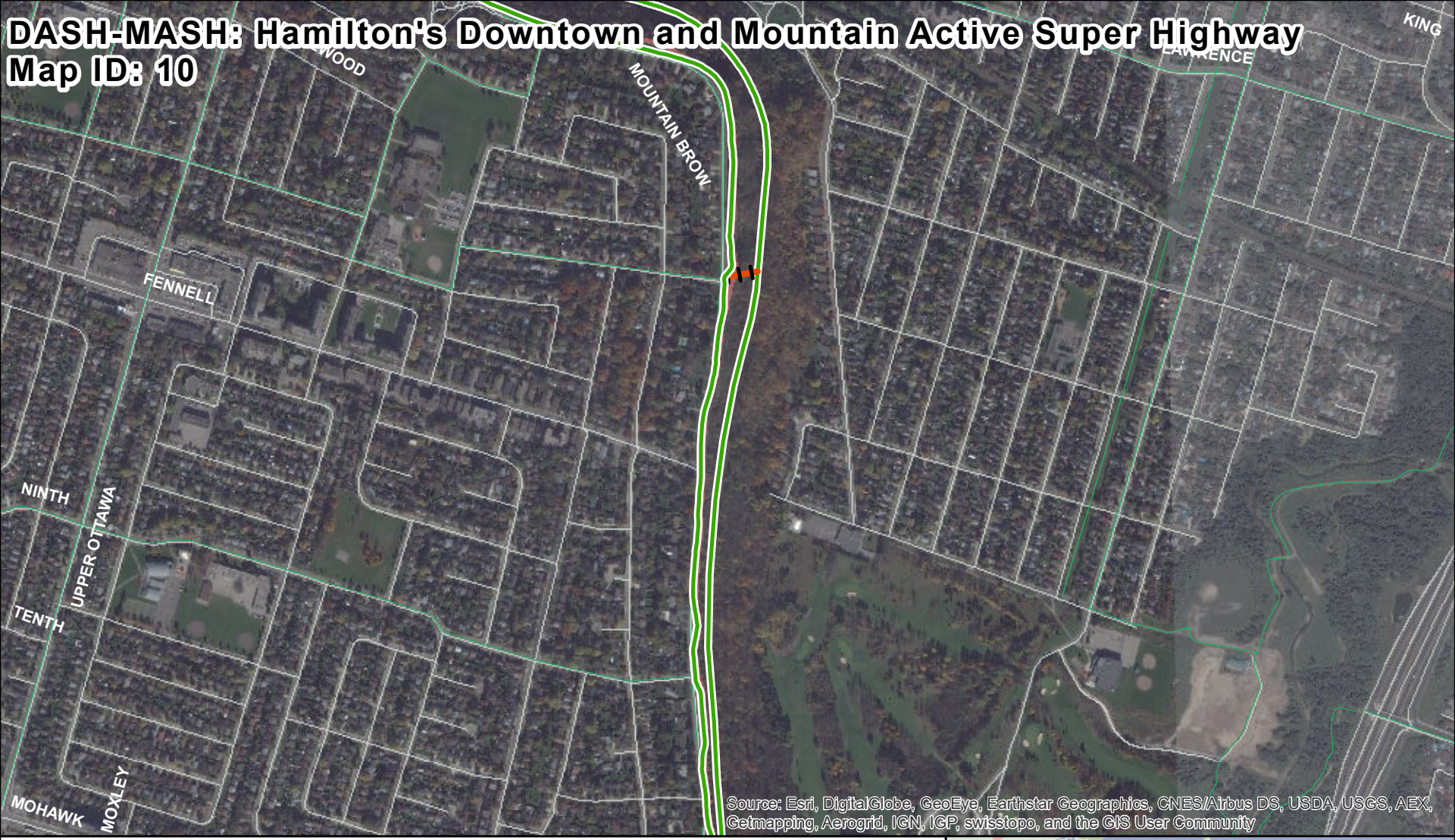

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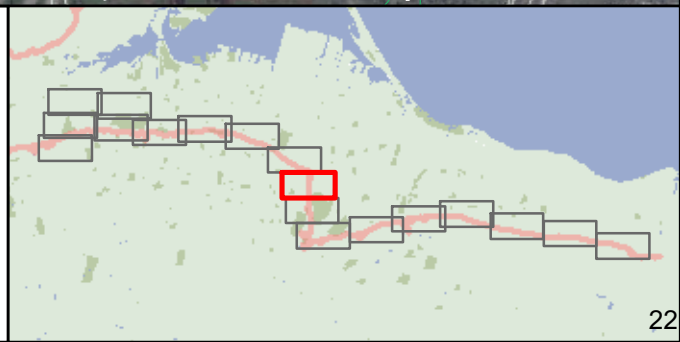

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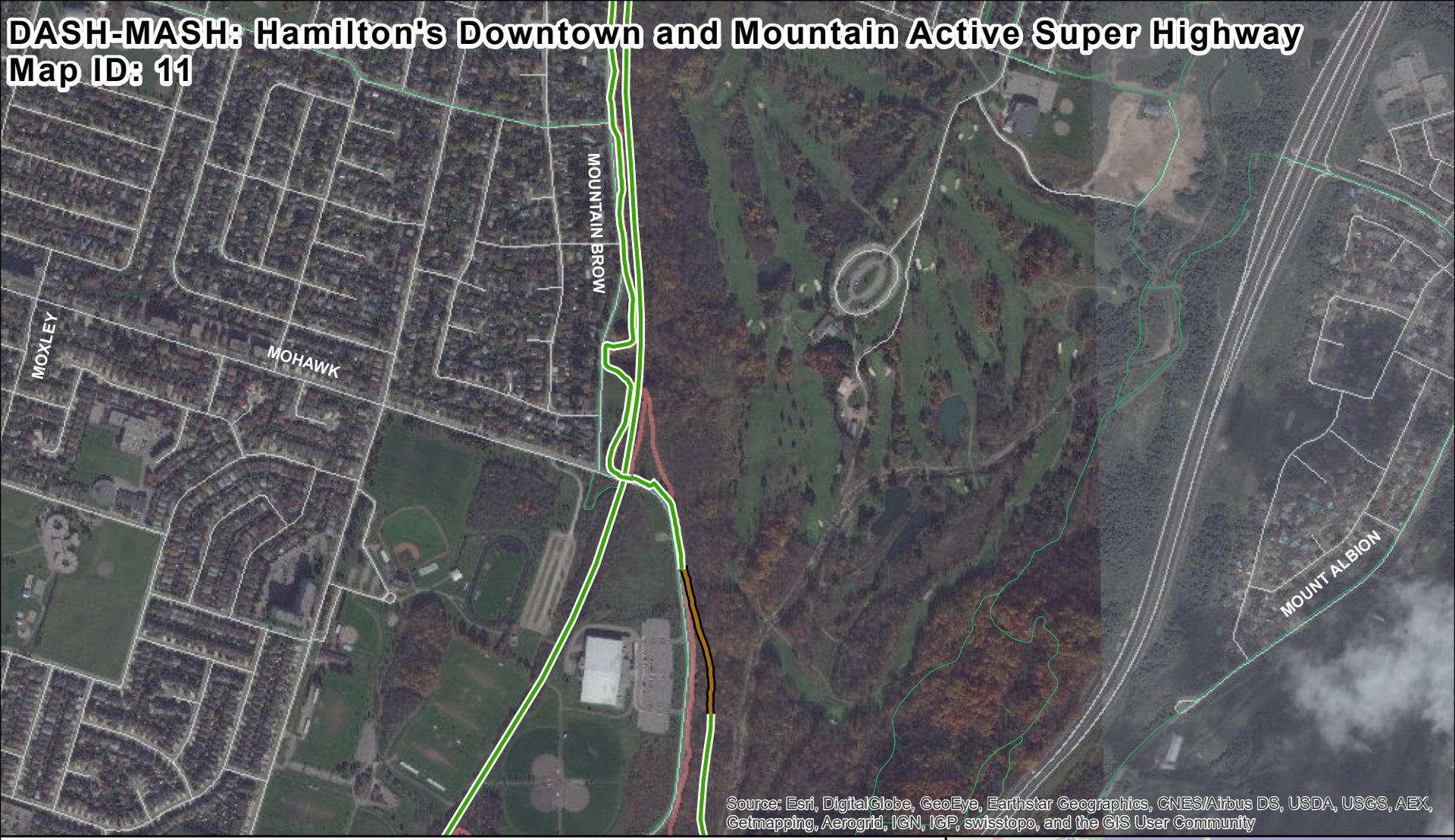

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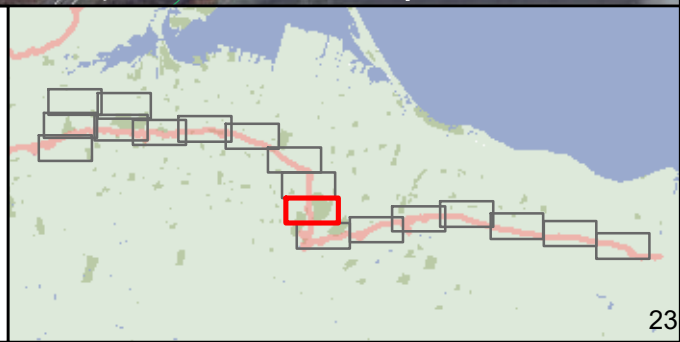

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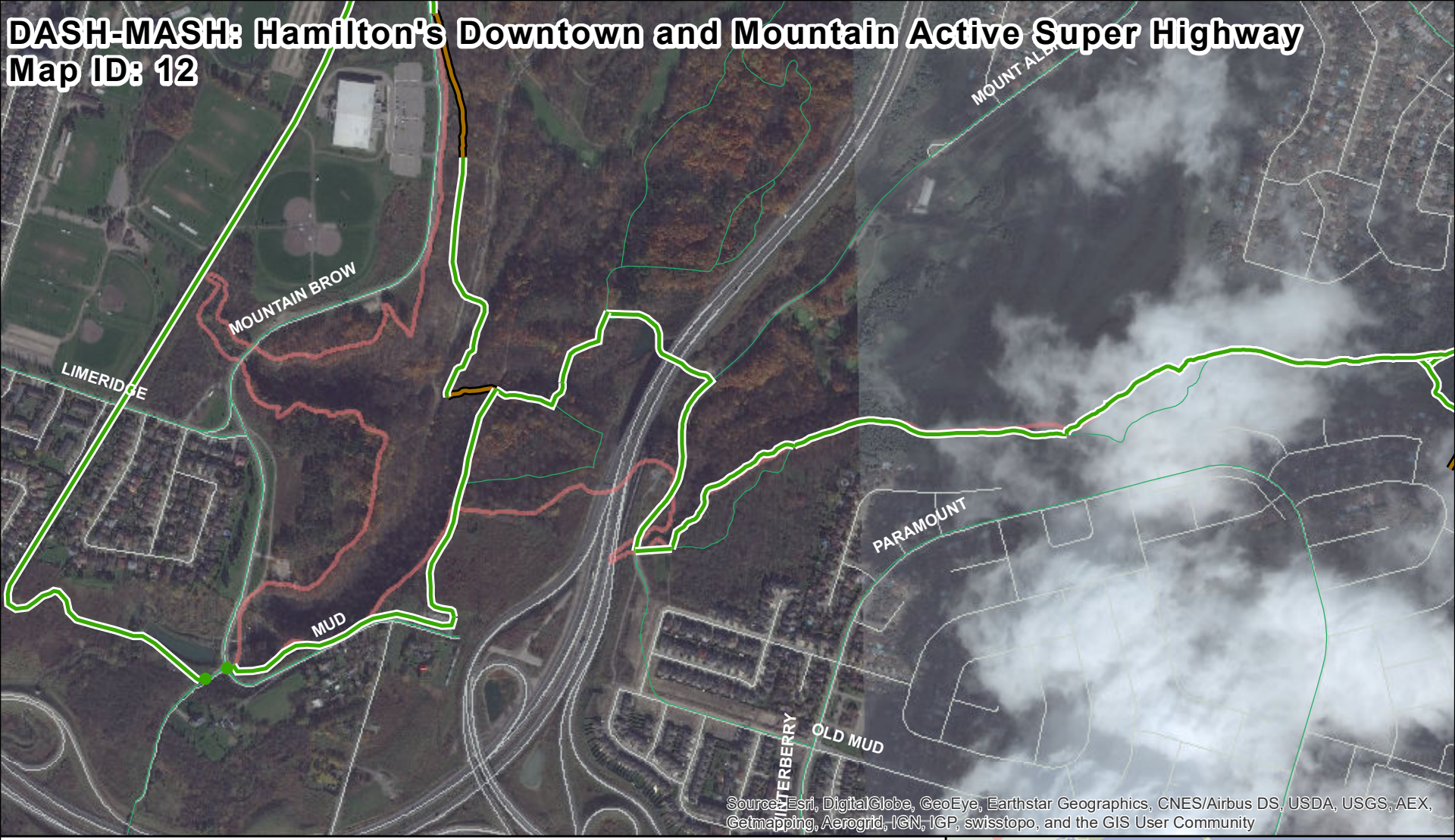

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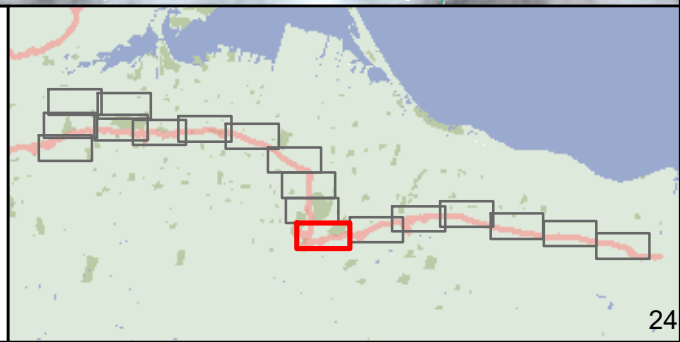

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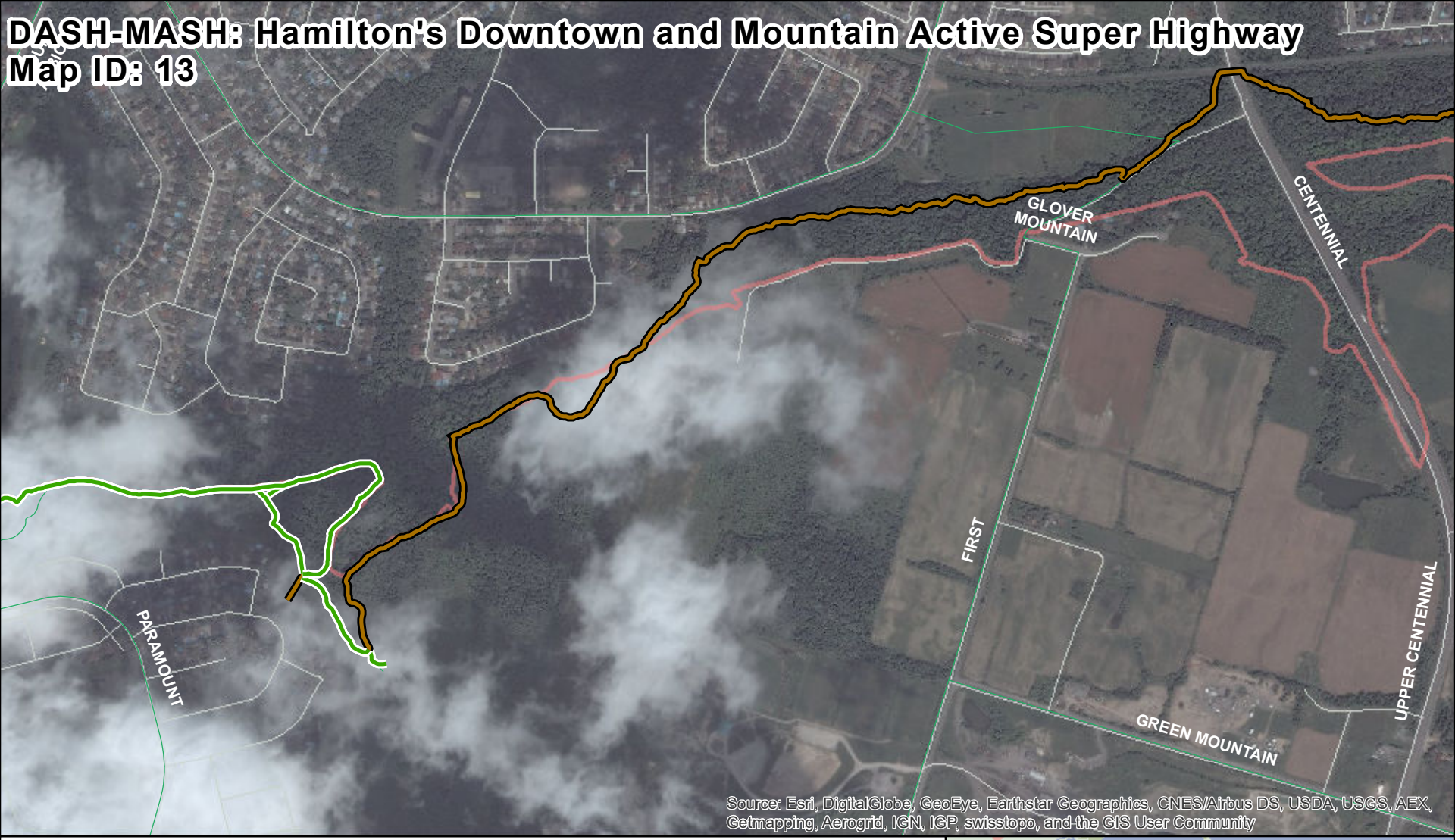

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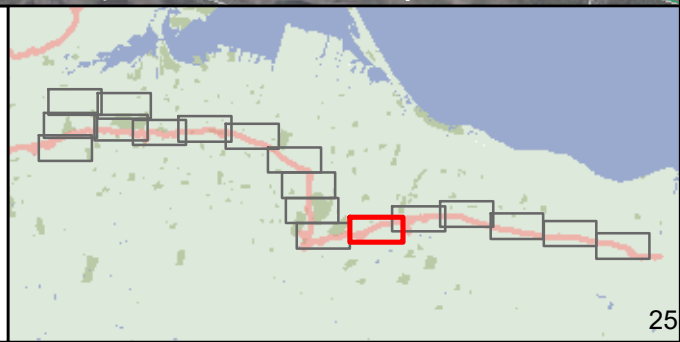

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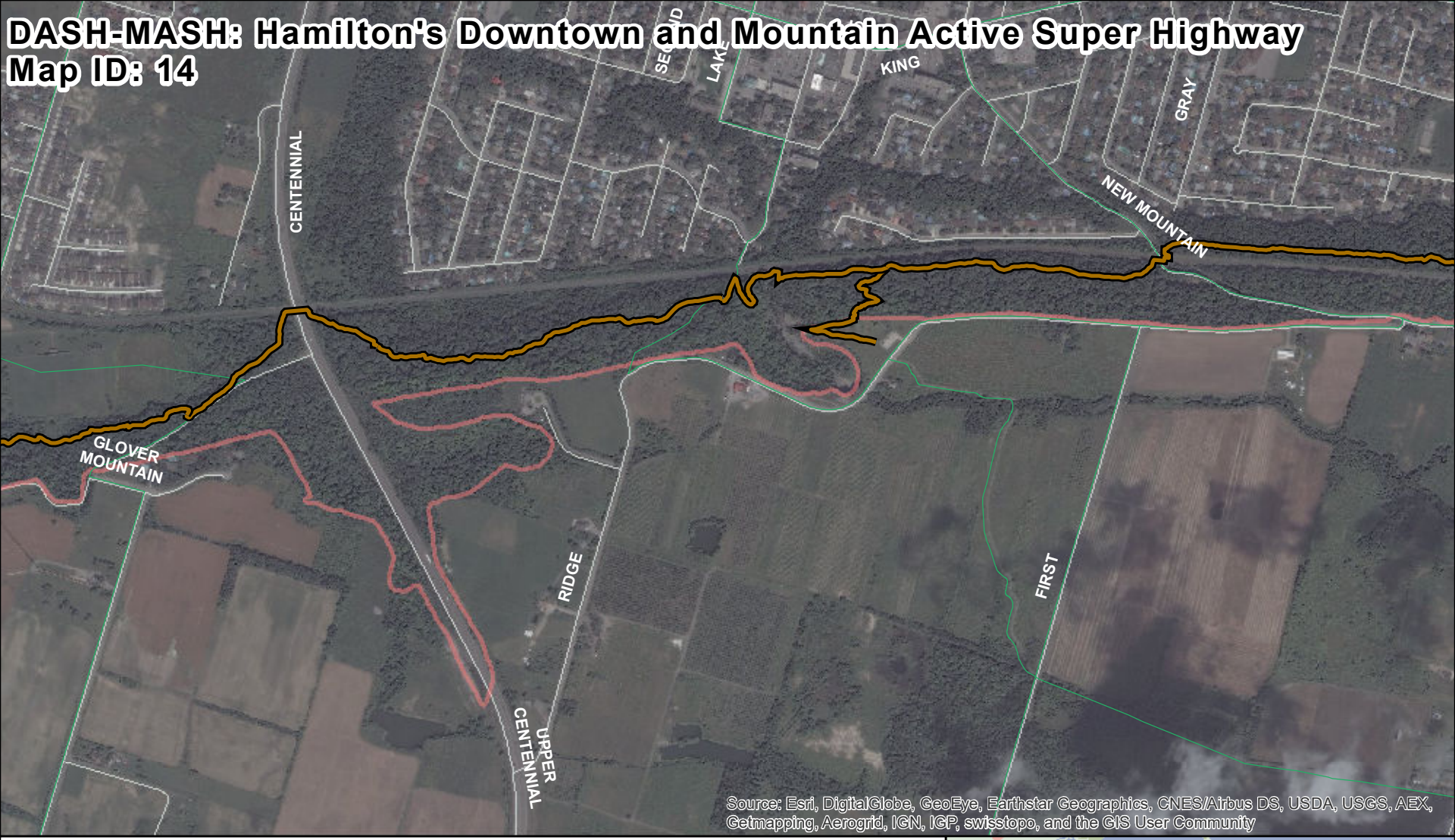

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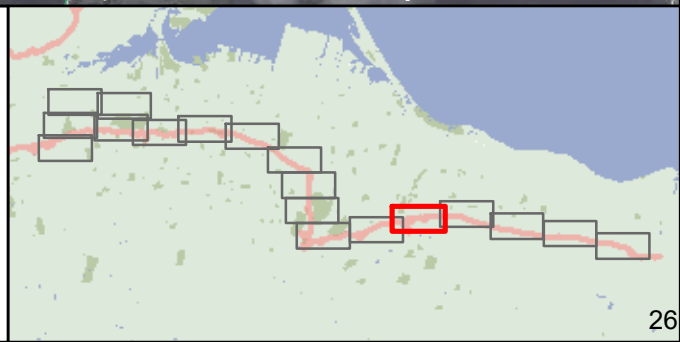

DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
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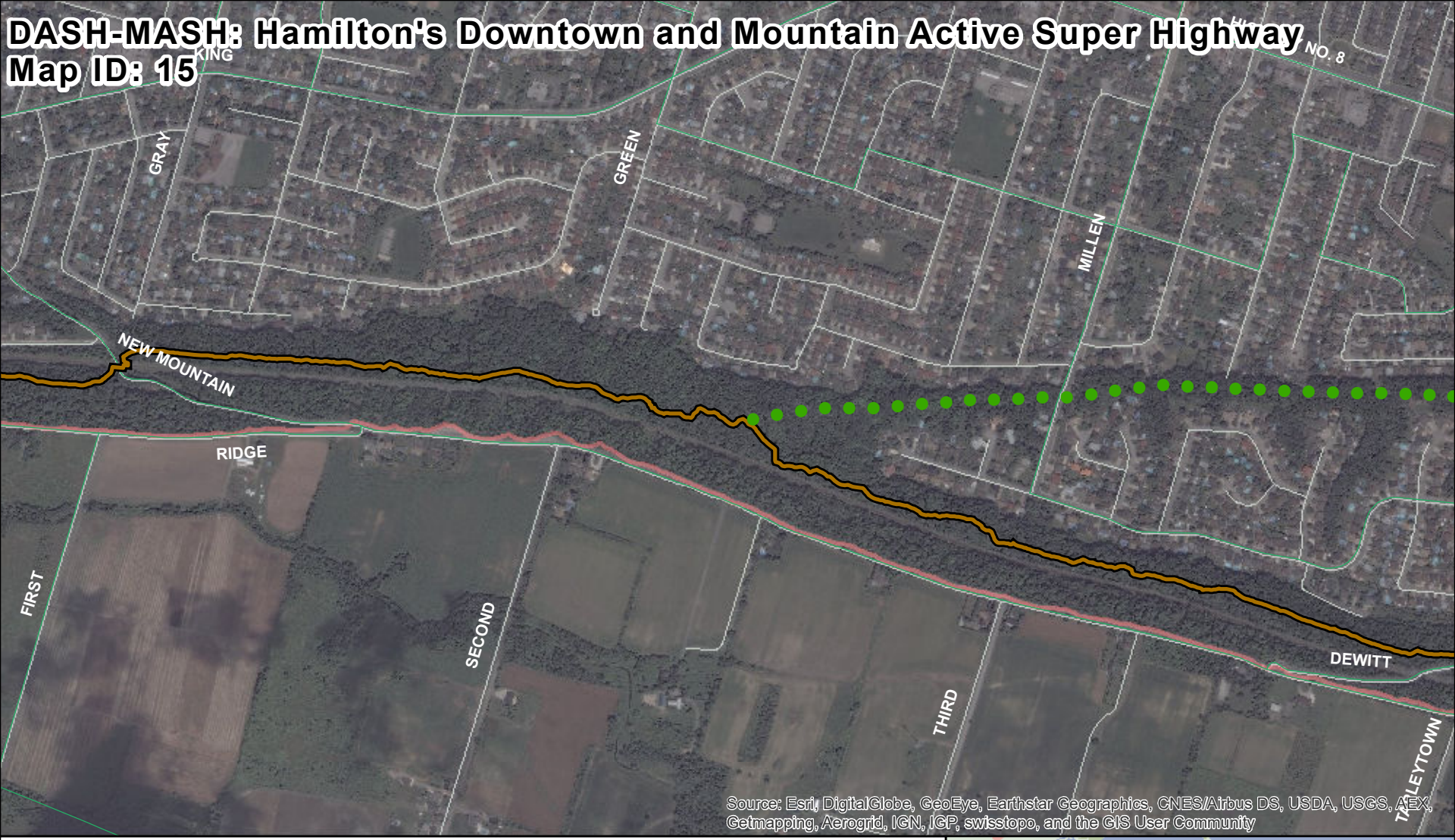

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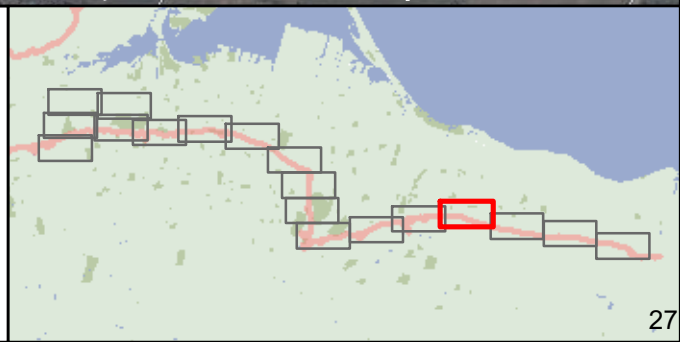
New Trail
- Multiuse Path

Corridor
- Escarpment



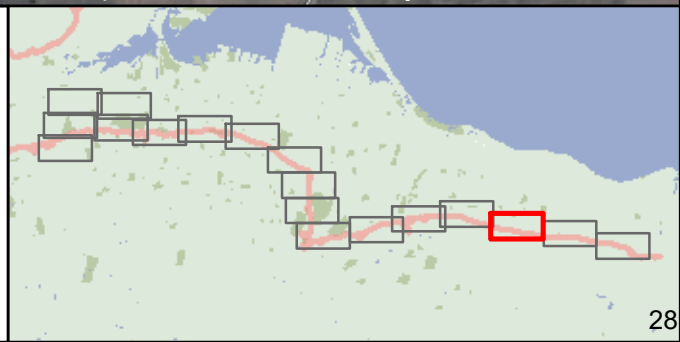
DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
Map ID: 16

Road Network
- Highway
- Major Road
- Minor Road
- Bikeway

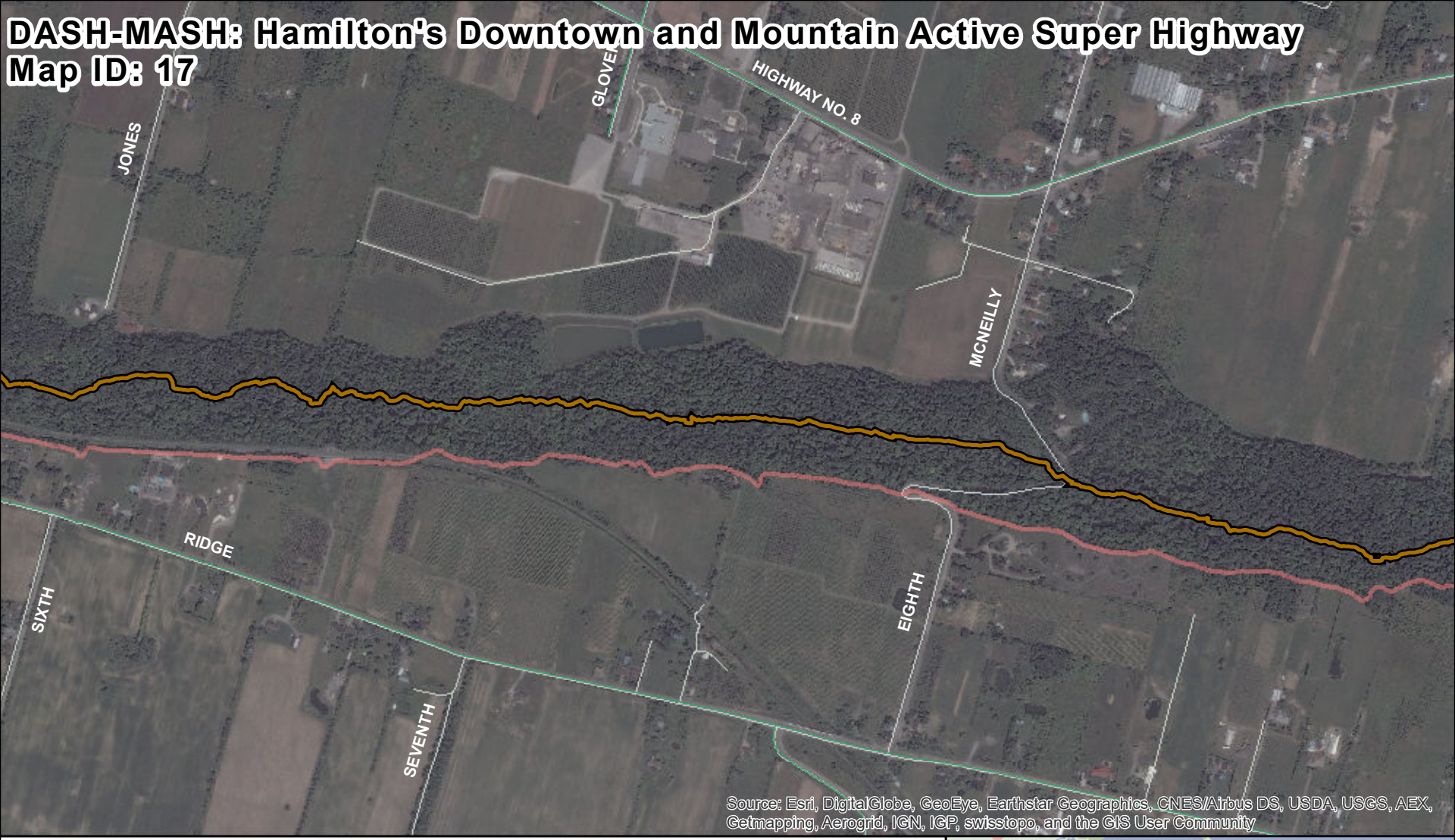
Existing Trails
- Multiuse Path
- Sidewalk
- Stairs
- Trail

New Trail
- Multiuse Path

Corridor
- Escarpment



DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
Map ID: 17



Road Network
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- Minor Road
- Bikeway

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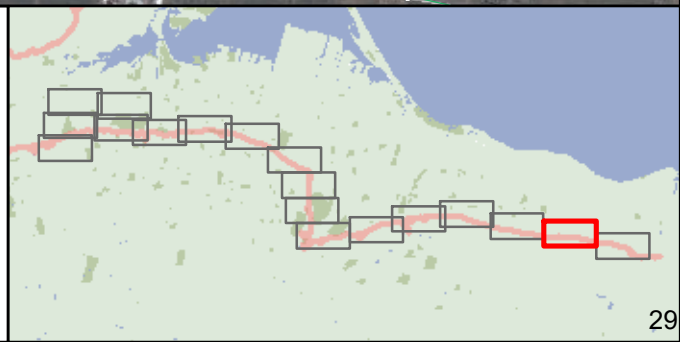
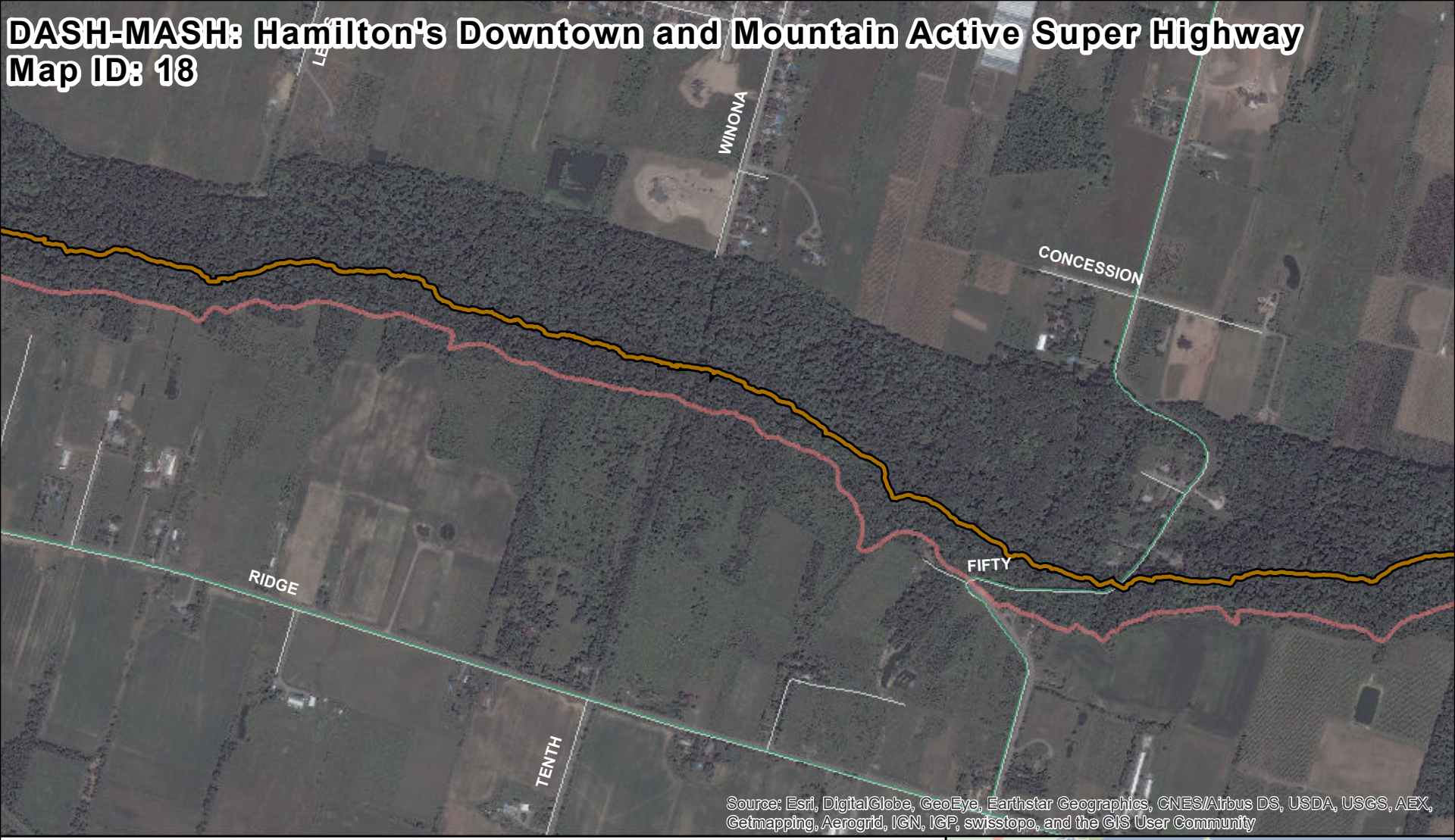
- Sidewalk
- Stairs
- Trail

New Trail
- Multiuse Path

Corridor
- Escarpment



DASH-MASH: Hamilton's Downtown and Mountain Active Super Highway
Map ID: 18



Road Network
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