TO:	Brian Brewer, Kimley-Horn & Associates	DATE:	August 31, 2020
FROM:	Keri Pyke, P.E., PTOE Melissa Restrepo	HSH PROJECT NO.:	2020124.00
SUBJECT:	Traffic Impact Assessment – 194 Lowland Street, Holliston, MA		

Overview

This memorandum, prepared by ***Howard Stein Hudson (HSH),*** describes the traffic impacts of the 194 Lowland Street development in Holliston, MA. The proposed Project consists of a parking lot that will be used for storage of cars, which will be transported to the Proponent's main site, ADESA, located at 63 Western Avenue in Framingham, MA. This traffic impact assessment includes an evaluation of the future trip generation, truck access and route analysis, and any impacts to the Complete Streets initiative the Town of Holliston has adopted.

Project Trip Generation

The study team calculated the trip generation for a by-right industrial development on the Site and compared it with the trip generation of the proposed car storage facility.

Trip Generation Methodology

To estimate the number of trips expected to be generated by a by-right industrial development, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[1] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In a suburban setting, no adjustments are necessary to account for other travel modes, therefore, all trips reflect vehicle trips. To estimate the number of vehicular trips for the Project, the following ITE land use code (LUC) was used:

Land Use Code 110 – General Light Industrial. A light industrial facility is a free-standing facility devoted to a single use. The facility has an emphasis on activities other than manufacturing and typically has minimal office space. Typical light industrial activities include printing, material testing, and assembly of data processing equipment. Note that for the car storage facility trip

[1] Trip Generation Manual, 10th Edition; Institute of Transportation Engineers; Washington, D.C.; 2017

generation, the study team was provided with an estimate of 8-10 large vehicles taking cars to be stored on the Site and up to 75 vehicles being moved from the site from the Site on an average day.

Trip Generation Comparison

Table 1 presents the trip generation of two different by-right industrial developments as well as for the proposed car storage facility.

Table 1. Trip Generation Comparison

Time Period/ Direction		Vehicle Trip Generation						
		ITE LUC 110: General Light Industrial[1]						Car Storage Facility[3]
		Size: 130,000 sf[2]			Size: 80,000 sf			
		Vehicles	Trucks	Total Trips	Vehicles	Trucks	Total Trips	
Daily	In	322	16	338	198	10	208	66
	Out	322	16	338	198	10	208	66
	Total	644	32	676	396	20	416	132
a.m. Peak Hour	In	80	1	81	49	1	50	5
	Out	11	0	11	7	0	7	6
	Total	91	1	92	56	1	57	11
p.m. Peak Hour	In	11	1	12	7	0	7	5
	Out	71	1	72	44	0	44	6
	Total	82	2	84	51	0	51	11

1. *As-of-right industrial development.*
2. *Based on the Town of Holliston Zoning Guidelines, the maximum floor area ratio for developments in an Industrial Zone is 0.5. The Site is approximately six (6) acres which will result in an approximately 130,000 square-foot development.*
3. *Daily trips based on the proposed facility operation provided by Proponent.*

The by-right use of the parcel would result in significantly more trips, and particularly more truck trips. The proposed project will generate a similar number of truck trips (16-20) as the smaller by-right light industrial use. Full use of the parcel by-right at an FAR of 0.5 would result in significantly more overall trips as well as more truck trips.

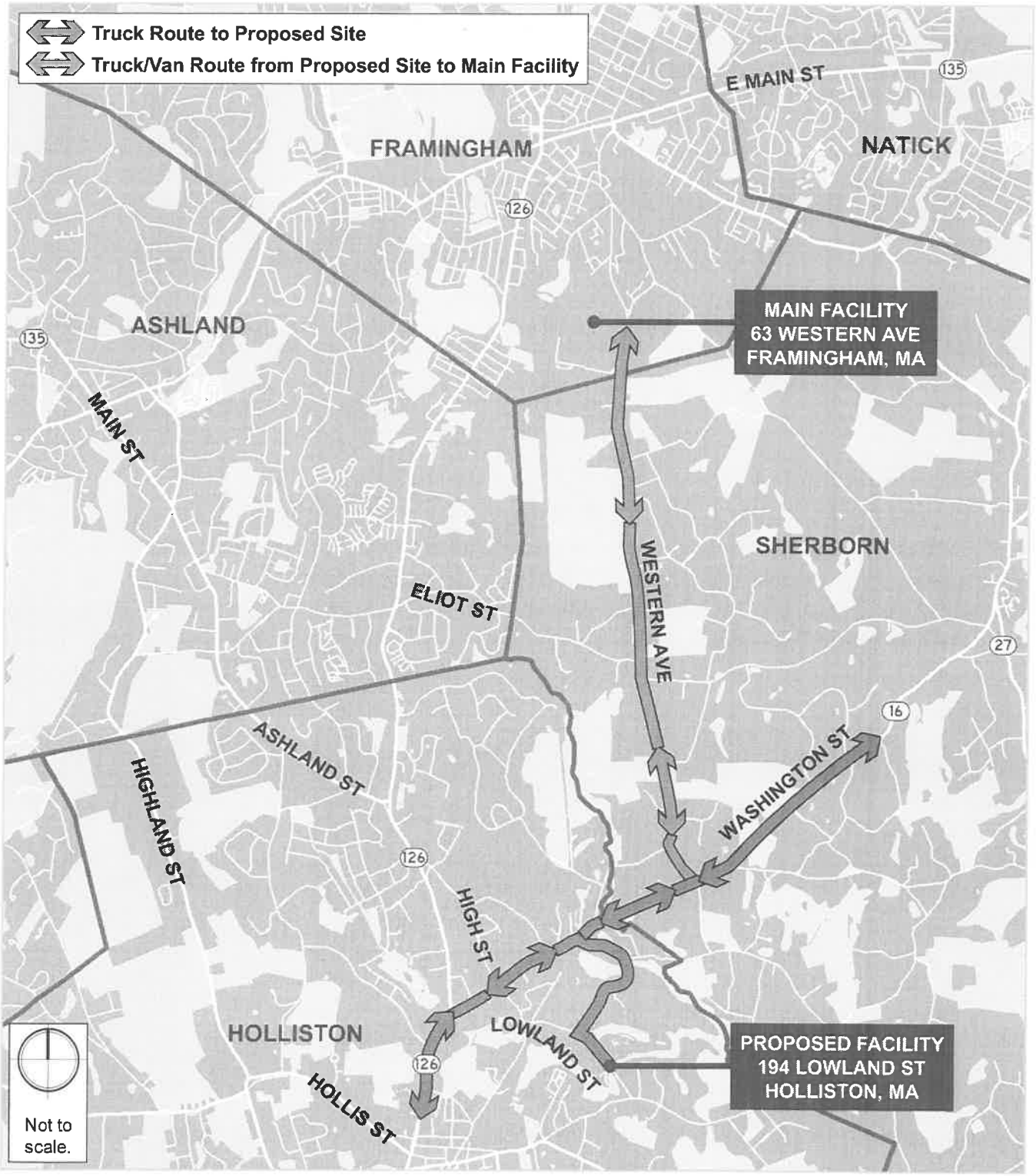
Truck Access and Route Analysis

The proposed Site is intended to be used as an overflow lot for the ADESA's facility in Framingham, and it will receive local and long-distance deliveries. Local deliveries use small car-carriers (two to six vehicles) and will use the local roadway system. Long distance deliveries include up to eight-car

carriers which will use the interstate system (I-495, I-95, I-90) and then local roadway system (Route 126, Route 16) to the Site in Holliston. The ADESA-established truck route to the proposed Site follows Route 126 and Route 16 as the primary access to Whitney Street (which is a Town-designated truck route), to Jeffrey Avenue and Lowland Street, as shown in **Figure 1.**

Additionally, the study team analyzed two-car carrier trucks turning right onto Washington Street (Route 16 eastbound) from Whitney Street then taking a left onto Western Avenue, heading north towards the main facility in Framingham. Vehicles on the proposed Site would be delivered to the Framingham facility on Western Avenue by ADESA personnel. The route will be used by ADESA two-car carriers and by individual vehicle delivery. ADESA would use vans to drive personnel to the Site who then would drive vehicles to the Framingham facility via Western Avenue as show in **Figure 1**.

Figure 1. *Truck Routes*



Truck Turning Movements

In order to confirm that a nine-car carrier truck (see **Figure 2**) can safely make the required turning movements throughout the preferred and alternative truck routes, the study team analyzed the turning movements by using AutoTURN at the following key intersections in Holliston to confirm the routes will work with the existing infrastructure:

- Concord Street (Route 126)/ Washington Street (Route 16);
- Washington Street (Route 16)/ Whitney Street;
- Washington Street (Route 16)/Western Avenue; and
- Lowland Street/Jeffrey Avenue.

The turning movements for the nine-car carrier truck at the four intersections are shown in **Figure 3** through **Figure 12.** Based on the turning movement assessments, at the intersection of Washington Street (Route 16)/Whitney Street, the truck will encroach over the adjacent travel lane when taking the right turn from Whitney Street onto Washington Street as shown in **Figure 8.** At the intersection of Washington Street (Route 16)/Western Avenue, the truck takes up the two travel lanes when making the turns as shown in **Figure 9** and **Figure 10.** At the intersection of Lowland Street/Jeffrey Avenue, the truck will take up most of the two travel lanes when making the turn as shown in **Figure 11** and **Figure 12.** All other truck maneuvers can make the required turning movements within their respective lanes. The encroachments described and shown in the figures are allowed on collector and local roads, as described in the *American Association of State Highway Transportation Officials' (AASHTO's) A Policy on Geometric Design of Highways and Streets (the Green Book),* most recently updated in 2018.

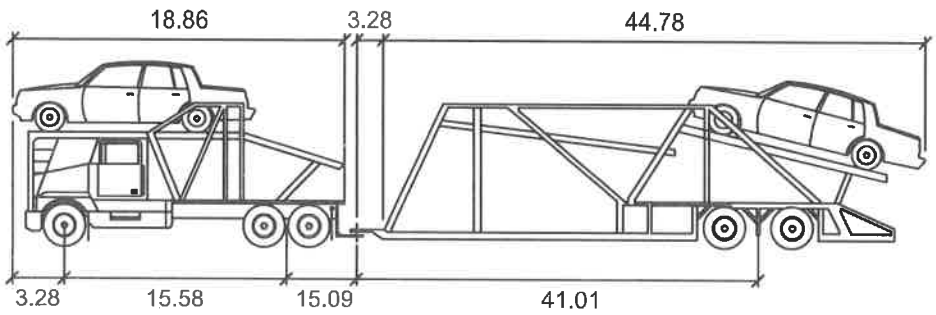
TWO-CAR CARRIER TRUCK MOVEMENTS

In addition to a nine-car carrier truck, the study team analyzed the operations from the proposed Site to the ADESA facility with a two-car carrier truck as seen in **Figure 2** at the following three intersections:

- Washington Street (Route 16)/ Whitney Street;
- Washington Street (Route 16)/Western Avenue; and
- Lowland Street/Jeffrey Avenue.

The turning maneuvers at the three intersections are shown in **Figure 13** through **Figure 18.** Based on the turning movements, the two-car carrier truck can safely make the required turning movements without impacting the adjacent travel lanes and sidewalks/curbs.

Figure 2. *Vehicle Profile: Auto Carrier Trucks*

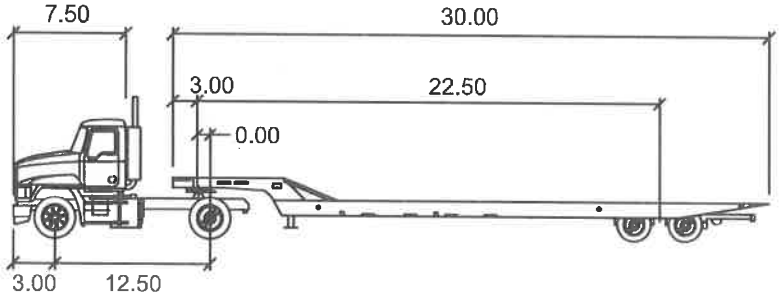


Auto Carrier HSH

feet

Tractor Width	: 8.53	Lock to Lock Time	: 6.0
Trailer Width	: 8.53	Steering Angle	: 40.0
Tractor Track	: 8.53	Articulating Angle	: 70.0
Trailer Track	: 8.53		

Note: All maneuvers shown in Figure 3 to Figure 14 were analyzed using this auto carrier.



Flatbed

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.00	Steering Angle	: 20.3
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.00		

Note: All maneuvers shown in Figure 15 to Figure 20 were analyzed using this auto carrier.

Figure 3. *Concord Street (Route 126) at Washington Street (Route16) – Nine-Car Carrier Truck Traveling EB via Washington Street*

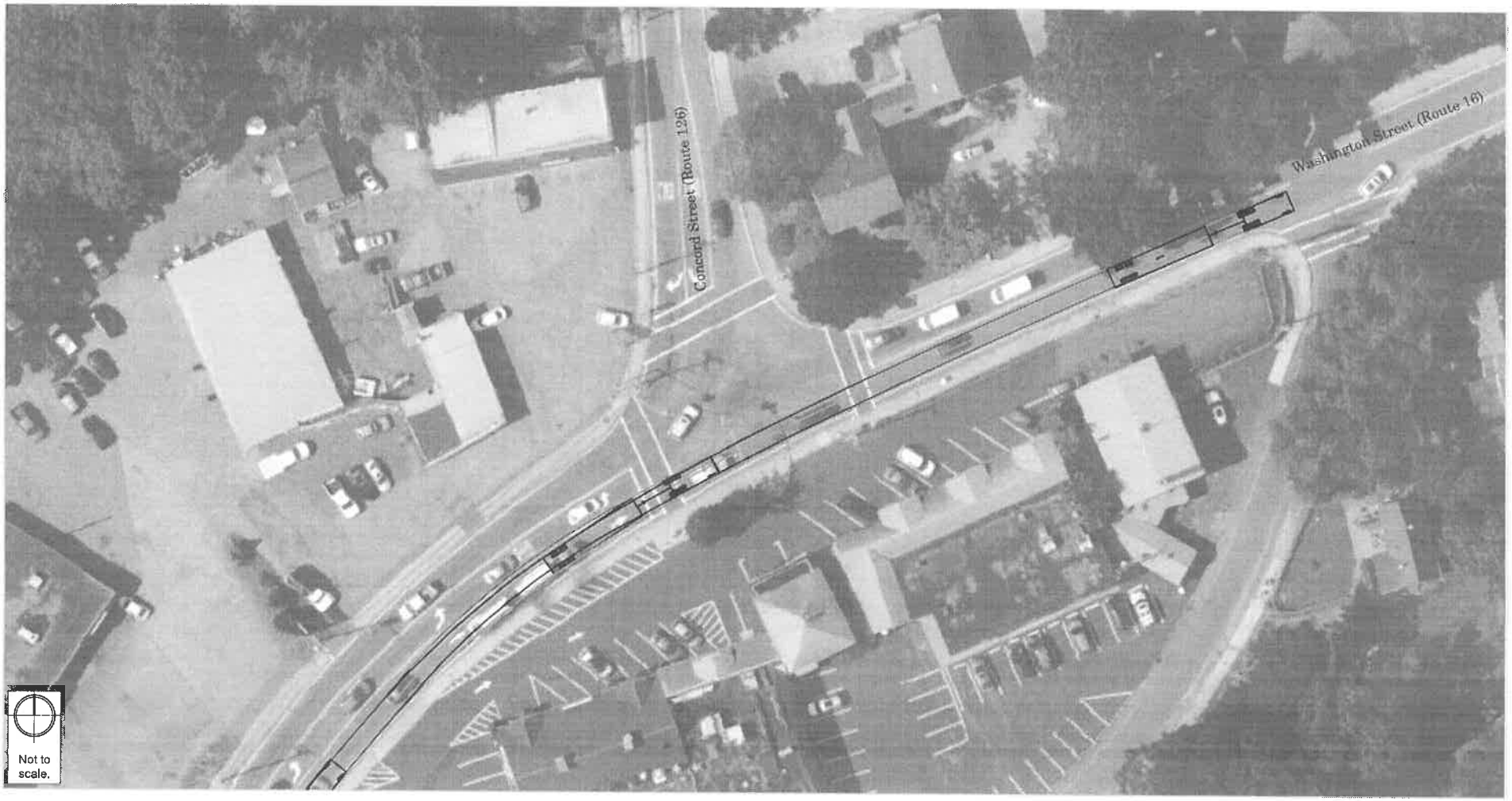


Figure 4. *Concord Street (Route 126) at Washington Street (Route16) – Nine-Car Carrier Truck Traveling WB via Washington Street*

Figure 5. *Washington Street (Route 16) at Whitney Street – Nine-Car Carrier Truck Traveling EB Turning Right onto Whitney Street*

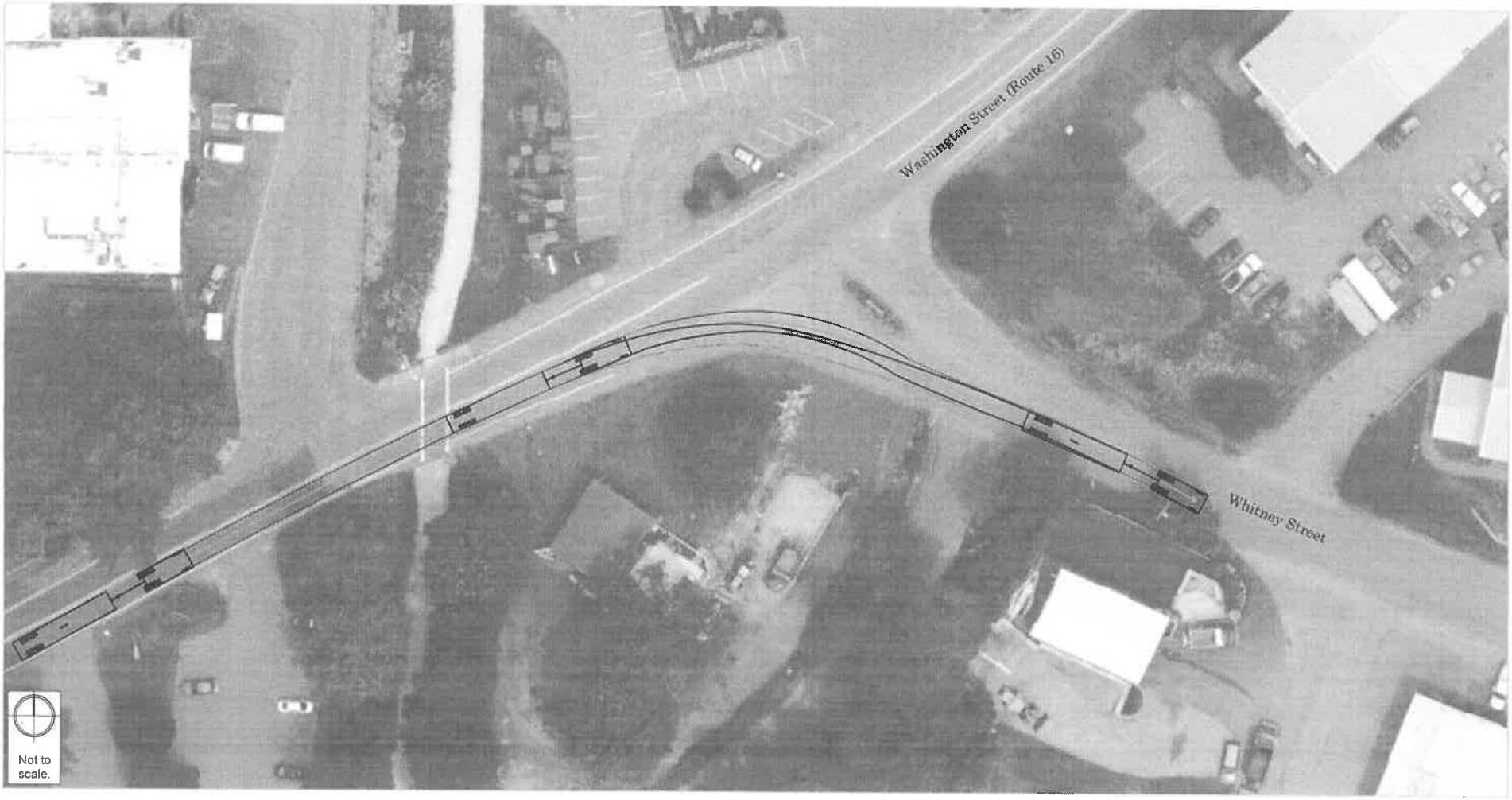


Figure 6. *Washington Street (Route 16) at Whitney Street – Nine-Car Carrier Truck Traveling NWB Turning Left onto Washington Street*

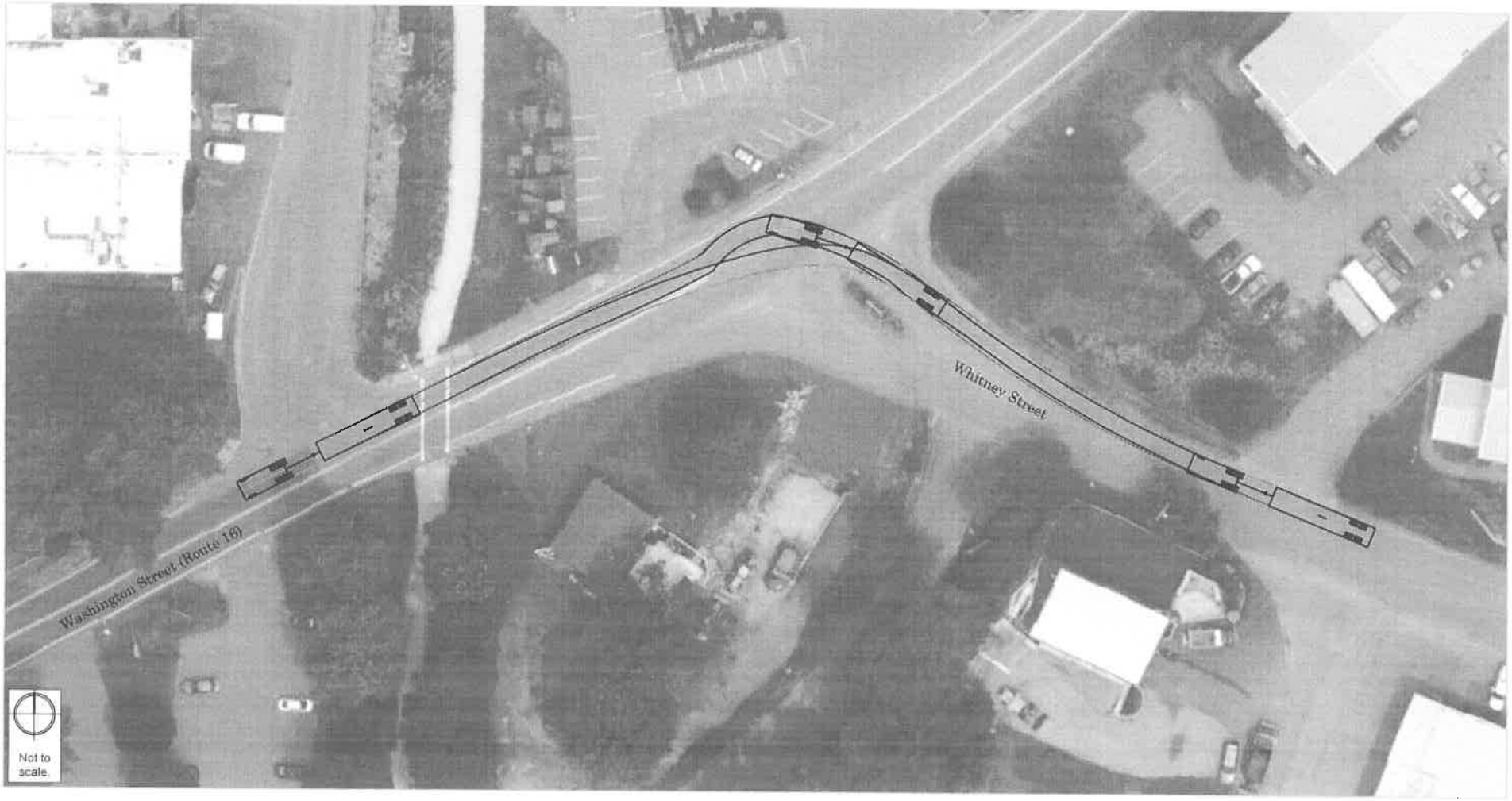


Figure 7. *Washington Street (Route 16) at Whitney Street – Nine-Car Carrier Truck Traveling WB Turning Left onto Whitney Street*

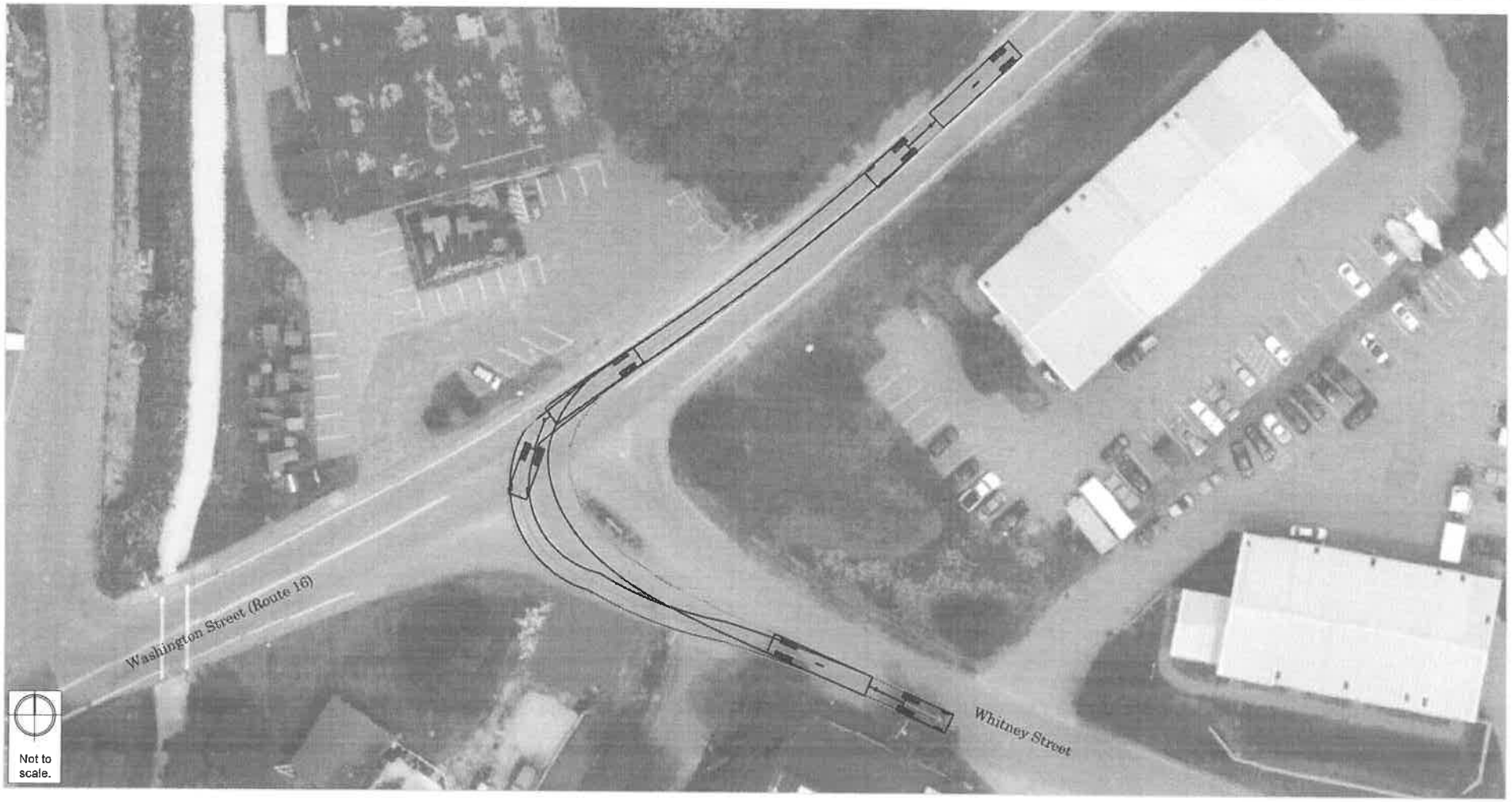


Figure 8. *Washington Street (Route 16) at Whitney Street – Nine-Car Carrier Truck Traveling NWB Turning Right onto Washington Street*

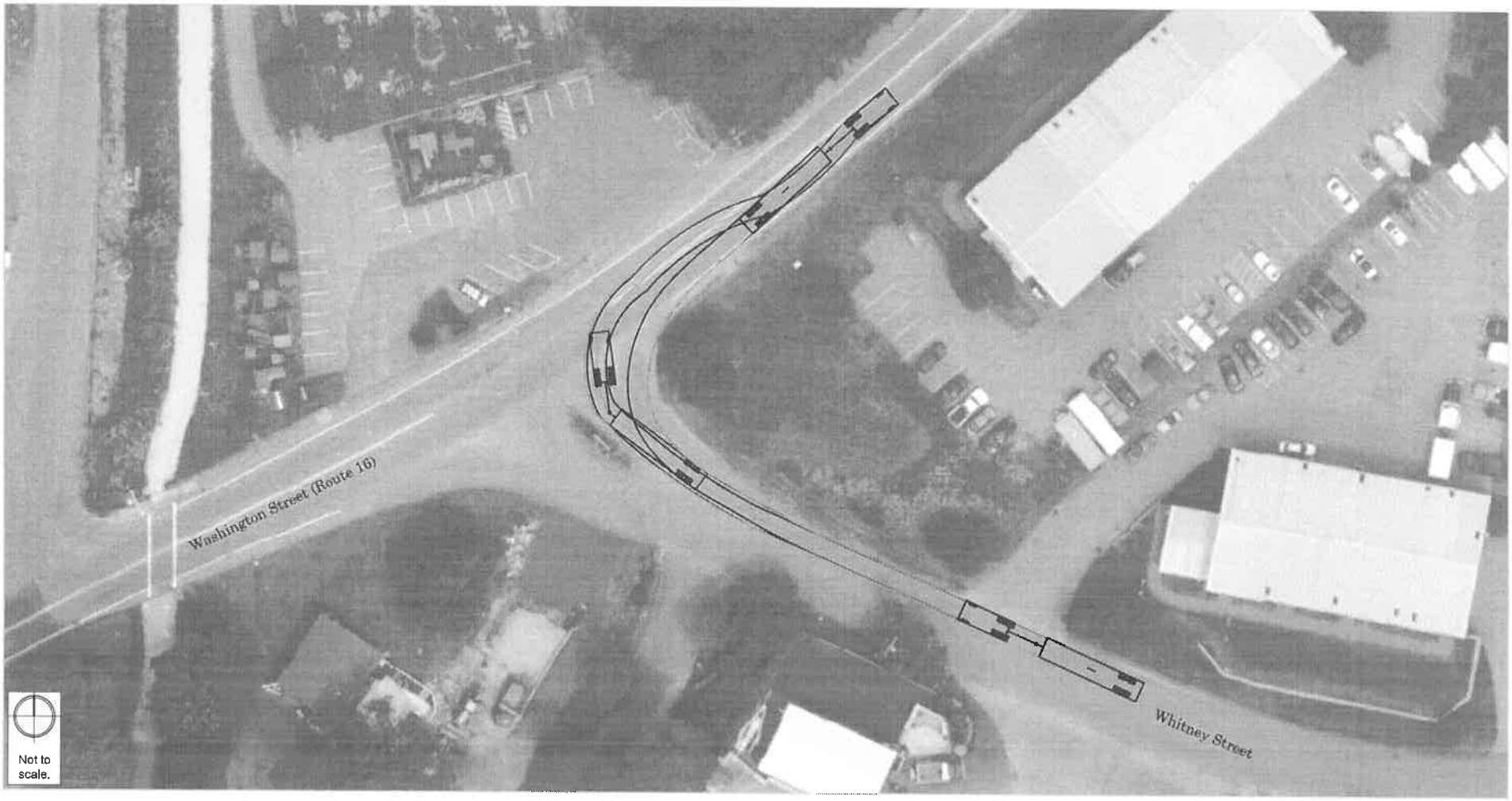


Figure 9. *Washington Street (Route 16) at Western Avenue – Nine-Car Carrier Truck traveling SB Turning Right onto Washington Street*

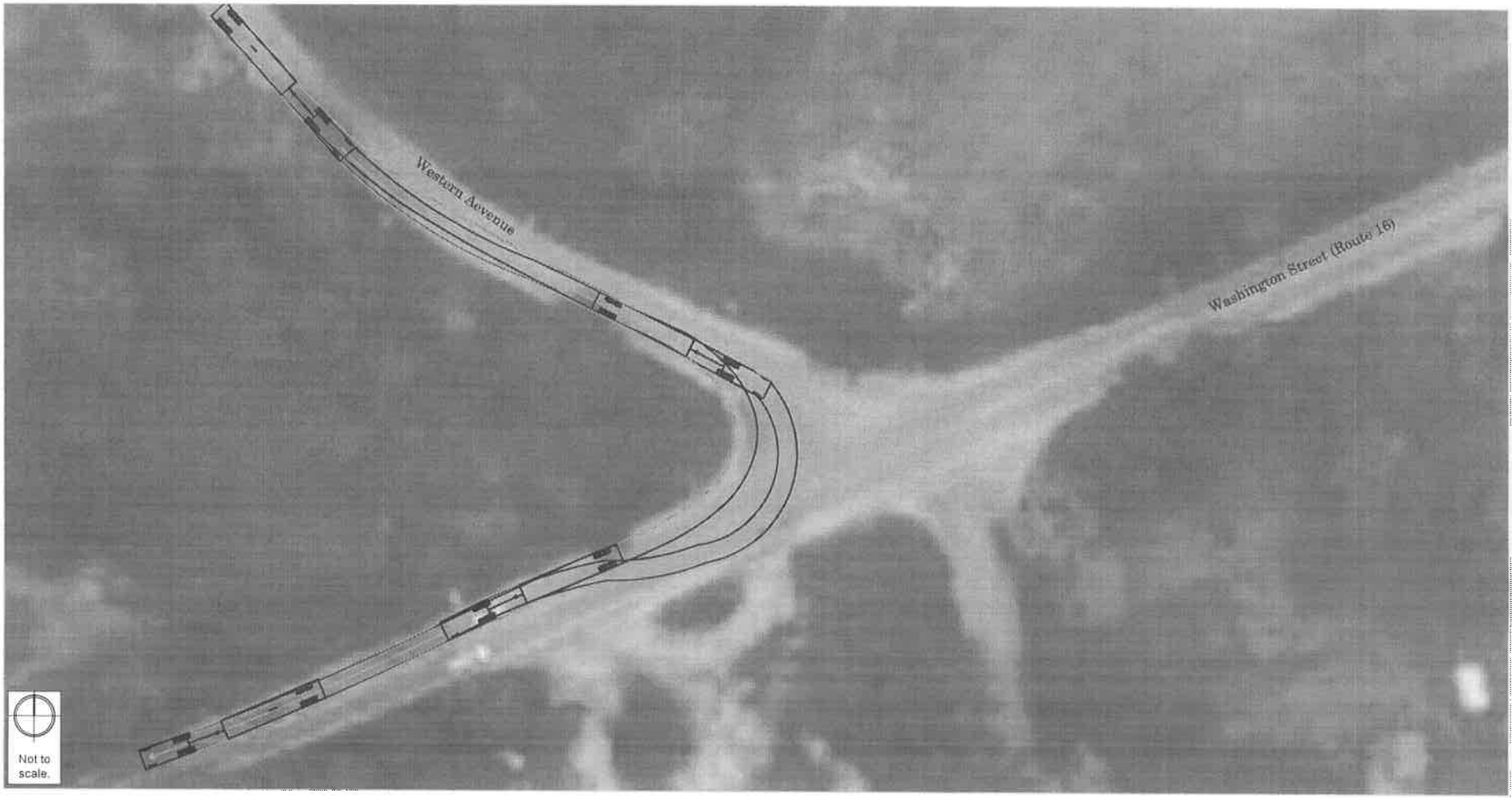


Figure 10. *Washington Street (Route 16) at Western Avenue – Nine-Car Carrier Truck traveling EB Turning Left onto Western Avenue*

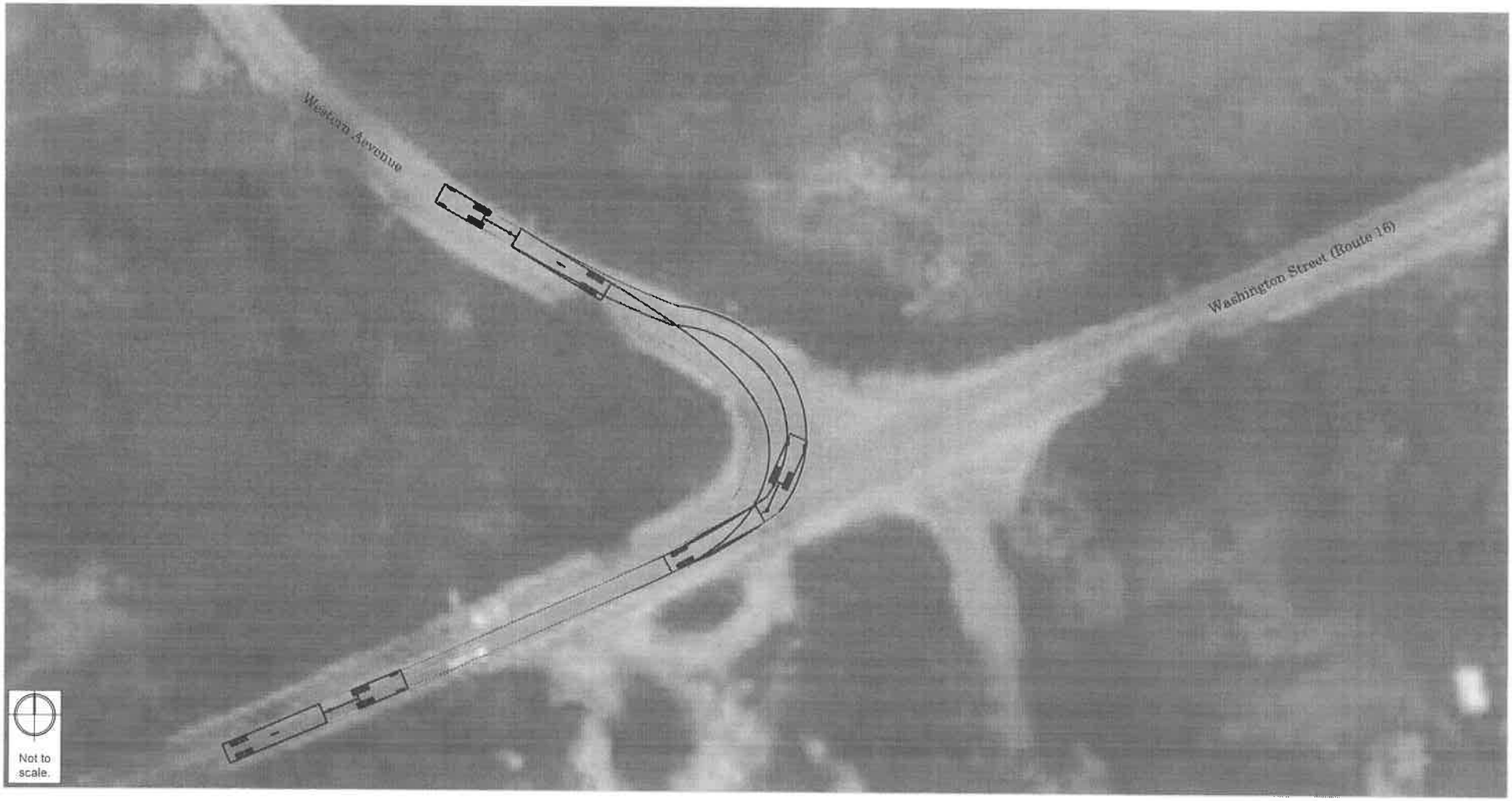


Figure 11. *Lowland Street at Jeffrey Avenue – Nine-Car Carrier Truck Traveling SB Turning Left onto Lowland Street*

Figure 12. *Lowland Street at Jeffrey Avenue – Nine-Car Carrier Truck Traveling WB Turning Right onto Jeffrey Avenue*

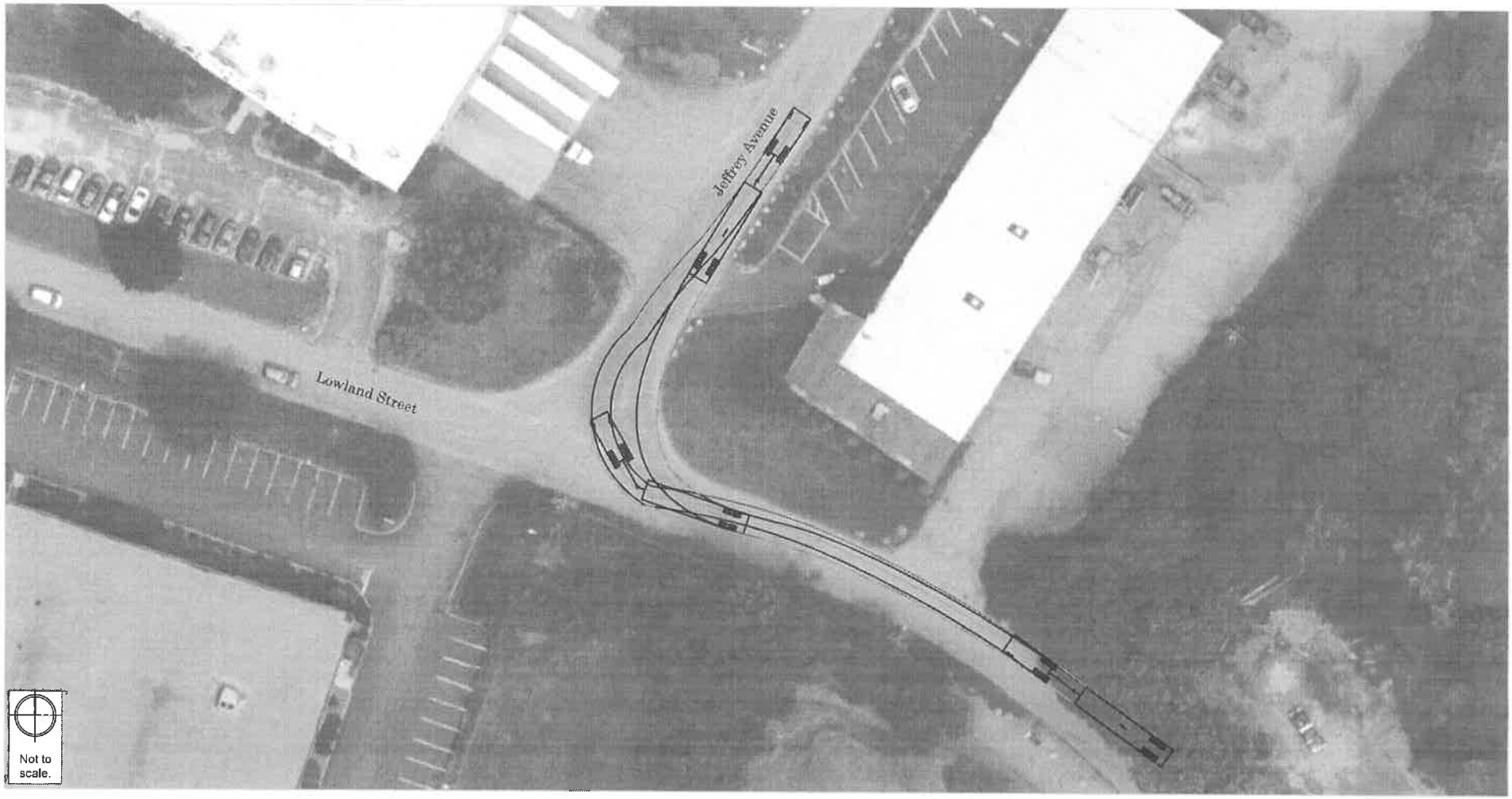


Figure 13. *Washington Street (Route 16) at Whitney Street – Two-Car Carrier Truck Traveling WB Turning Left onto Whitney Street*

Figure 14. *Washington Street (Route 16) at Whitney Street – Two-Car Carrier Truck Traveling NWB Turning Right onto Washington Street*

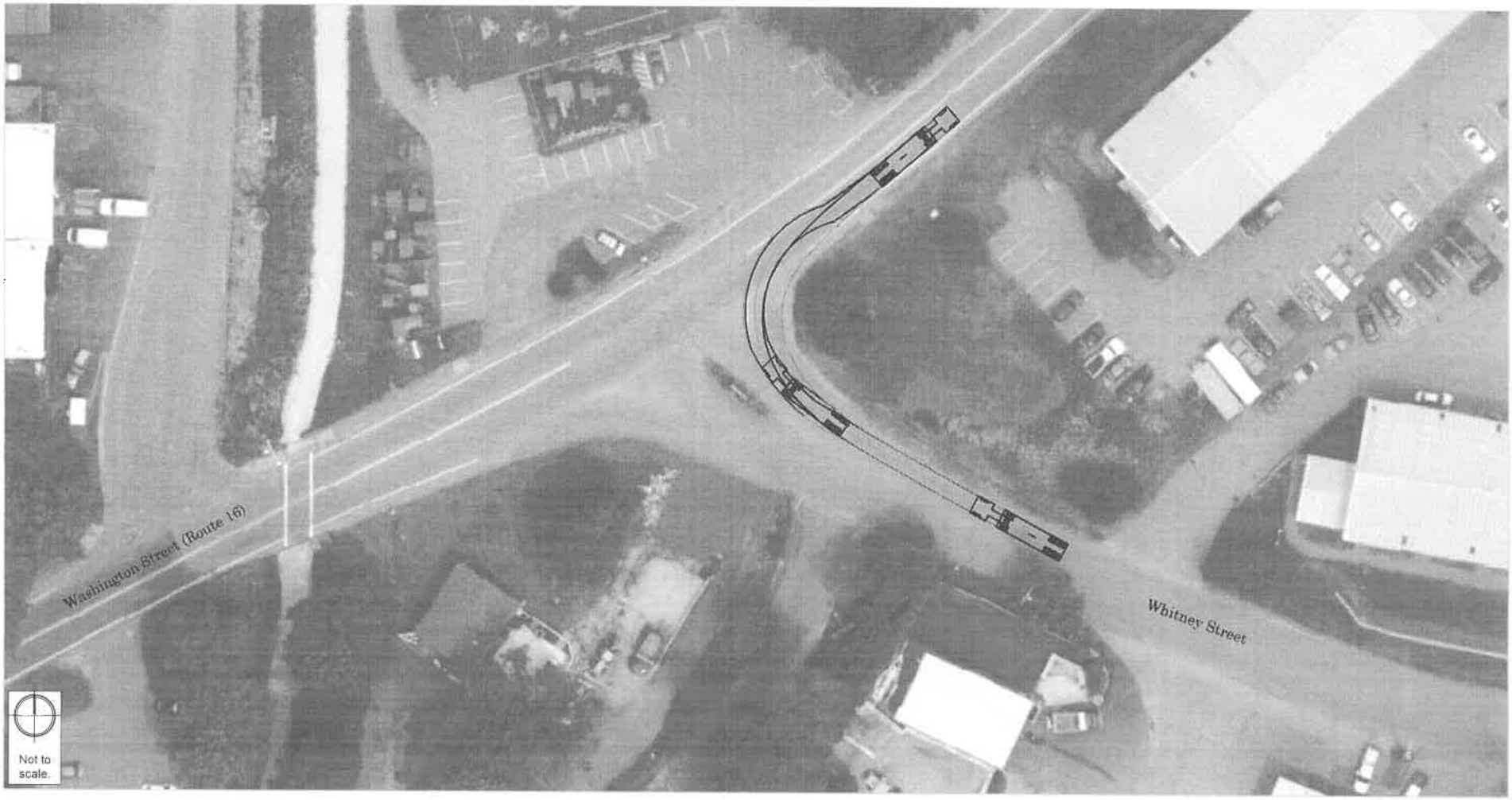


Figure 15. *Washington Street (Route 16) at Western Avenue – Two-Car Carrier Truck Traveling SB Turning Right onto Washington Street*

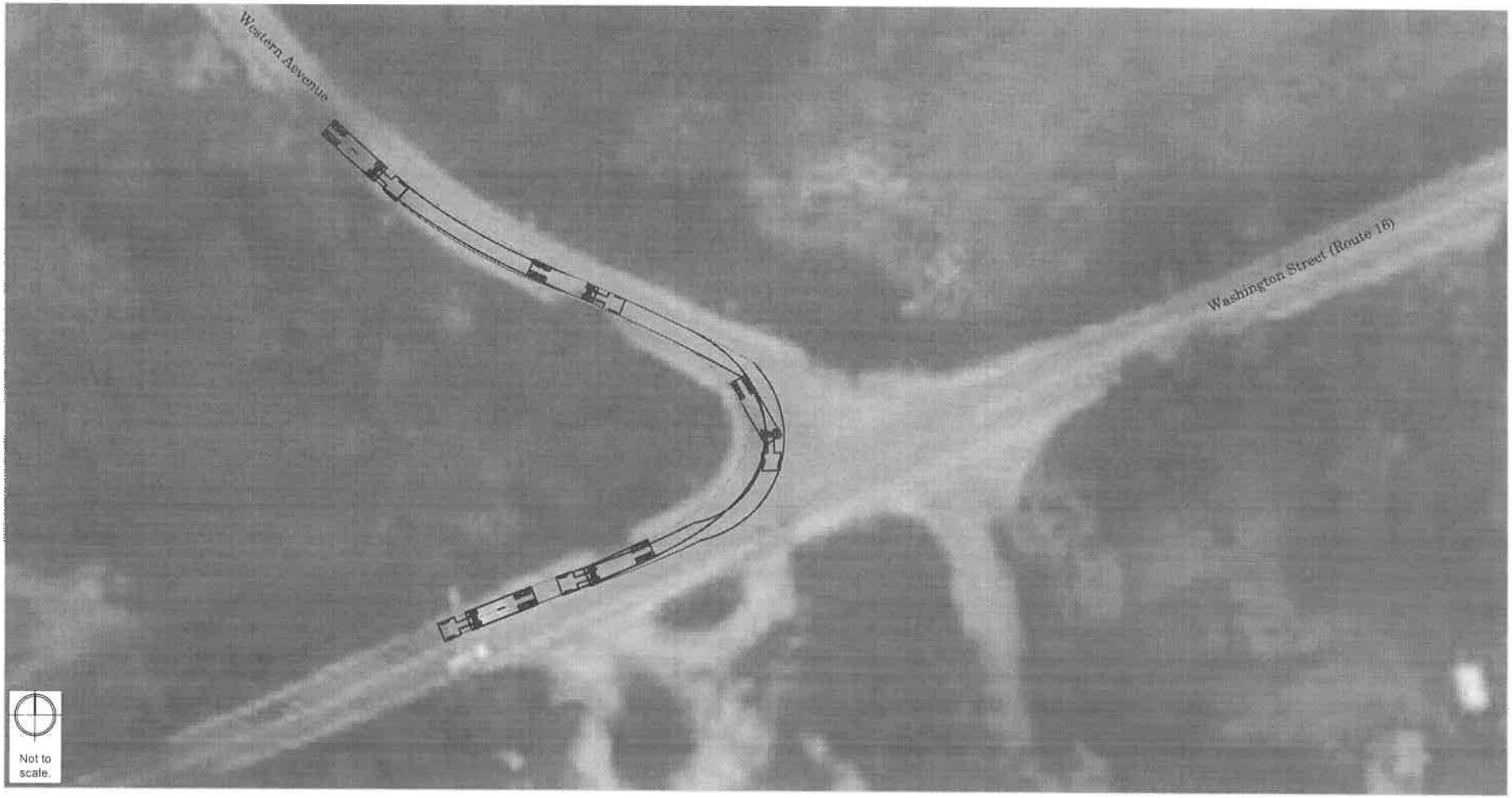


Figure 16. *Washington Street (Route 16) at Western Avenue – Two-Car Carrier Truck Traveling EB Turning Left onto Western Avenue*

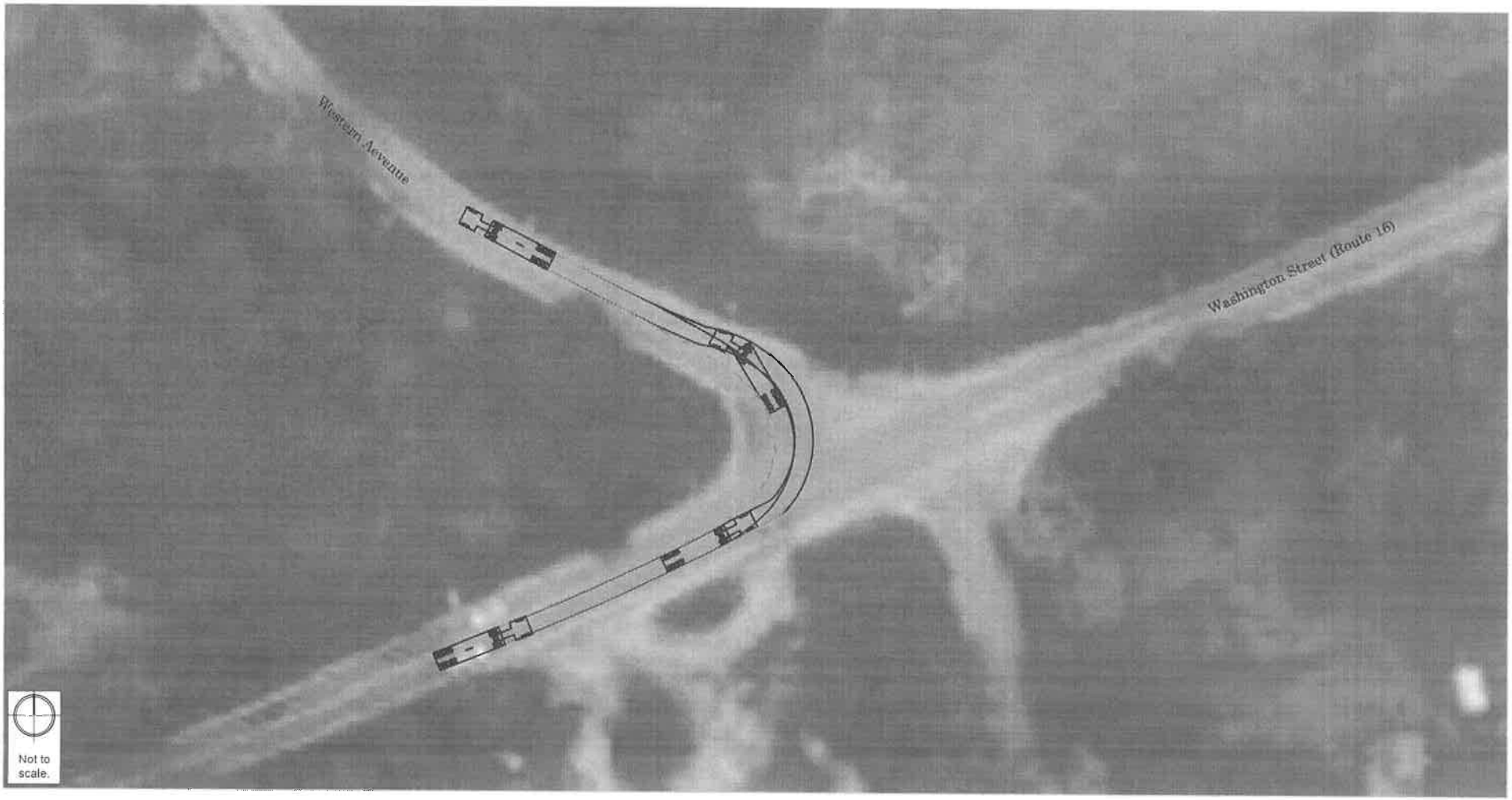


Figure 17. *Lowland Street at Jeffrey Avenue – Two-Car Carrier Truck Traveling SB Turning Left onto Lowland Street*

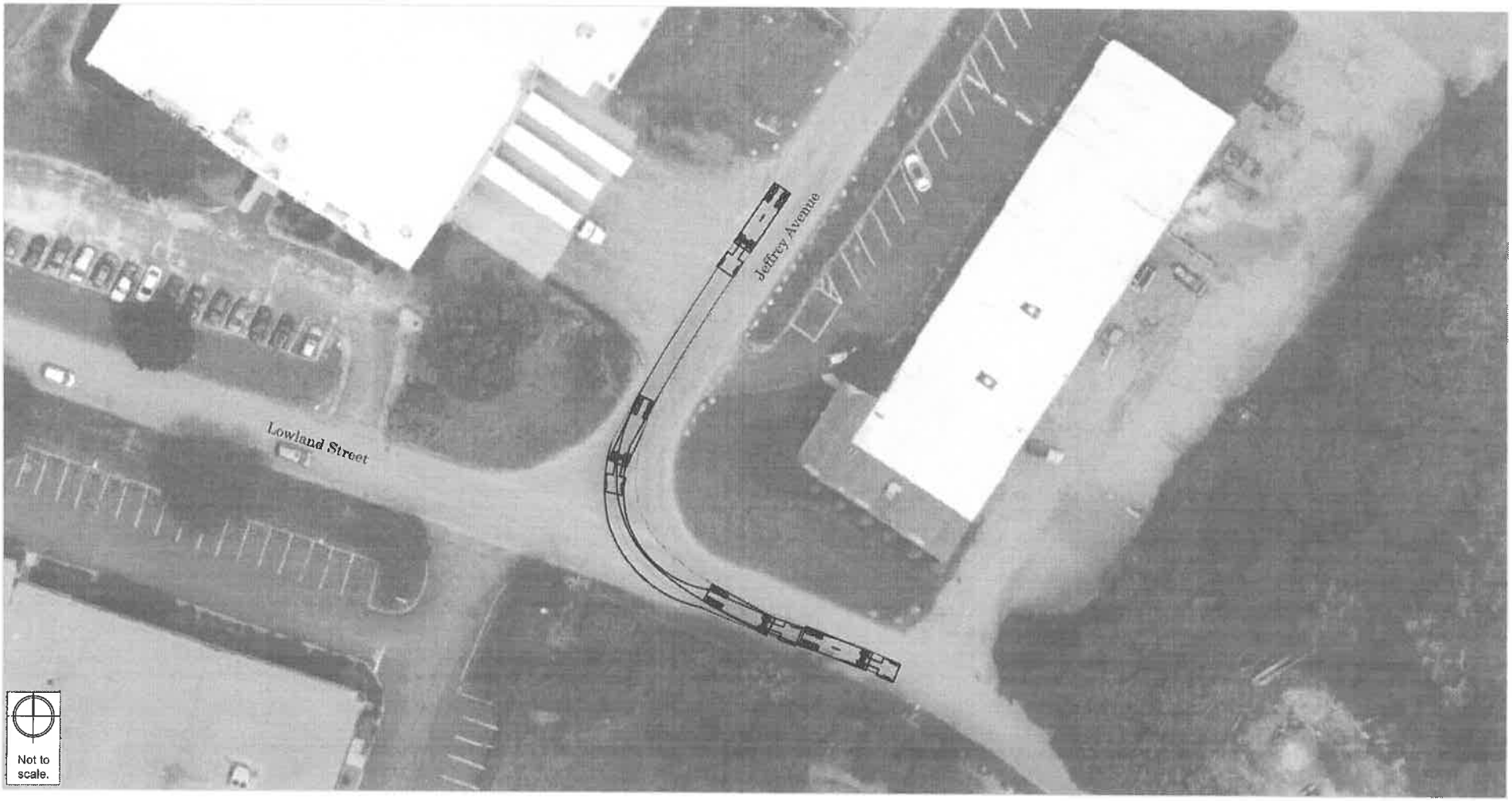
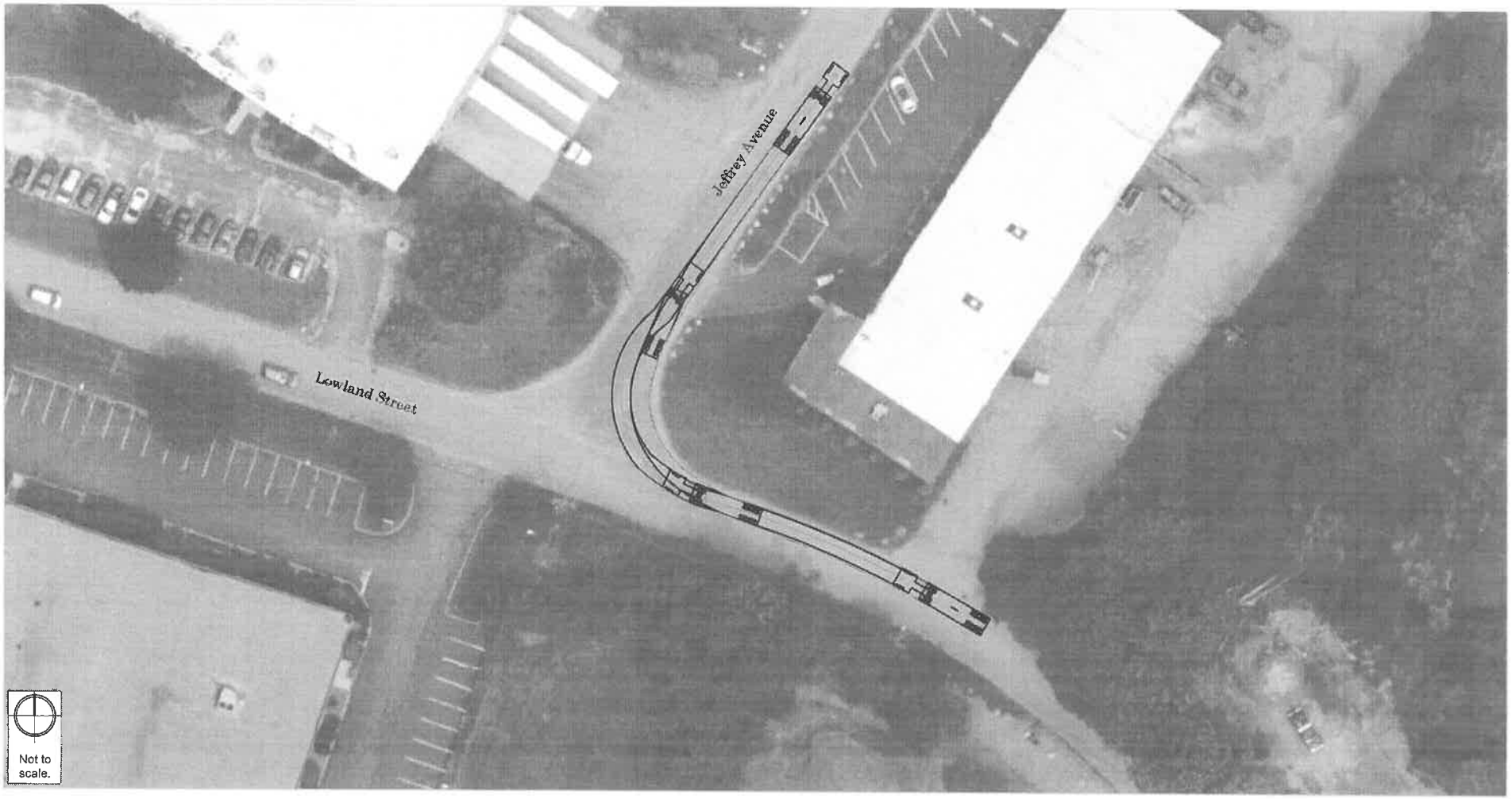


Figure 18. *Lowland Street at Jeffrey Avenue – Two-Car Carrier Truck Traveling WB Turning Right onto Jeffrey Avenue*



Complete Streets Assessment

The Town of Holliston has adopted a Complete Streets policy to provide safety and accessibility for all users of the Town's roadways, rails, and transit systems. **Table 2** summarizes the existing conditions for bicycling, walking, and transit along the preferred car carrier truck route that fall under Town of Holliston jurisdiction.

Table 2. Existing Condition – Complete Streets Assessment

Roadway	Bicycle	Pedestrian	Transit
Washington Street (Route 16)	n/a	Sidewalks provided along north side of road	n/a
Whitney Street/Jeffrey Avenue	n/a	n/a	n/a
Lowland Street	n/a	n/a	n/a

Based on the AutoTURN assessment, the trucks can safely make the turns without affecting the sidewalks and/or curbs, and minimal impact to the adjacent travel lanes. The preferred truck route also includes the following roadways that fall under different jurisdictions: Route 126, between Winthrop Street and Washington Street, is under Massachusetts Department of Transportation (MassDOT) jurisdiction. The trucks traveling along the preferred truck route will cause minimal to no impact to the Complete Streets initiative the Town of Holliston has adopted.

Conclusions

The proposed project will generate fewer overall trips and few truck trips than a by-right development on the parcel. The proposed truck routes to and from the site can accommodate the truck trips without difficulty. The proposed project will not negatively impact the Town's adopted Complete Streets policy. Overall, the traffic impacts of the project would be less than those of a by-right development.