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Preliminary Traffic Assessment Memo

To: Village of Hastings-on-Hudson
From: Sam Schwartz Engineering, DPC
Date: January 31, 2020
Re: Preliminary Traffic Assessment of U-Turn Closure at Devon Way
Village of Hastings-on-Hudson, Westchester County, New York 10706
Project No: 17-01-2680

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1. Introduction

Sam Schwartz Engineering, DPC ("*Sam Schwartz*") has prepared this preliminary traffic assessment for a proposed U-Turn closure at the intersection of Broadway (US 9) and Devon Way in the Village of Hastings-on-Hudson, New York. The U-Turn at Devon Way is a stop-controlled roadway that provides a connection from northbound US 9 to southbound US 9. This memorandum documents the existing conditions, potential alternative route selection, and impacts to the surrounding roadway network if the U-Turn movement is closed.

This report concludes that there are four potential alternative routes that could support displaced motorists following the closure of the U-Turn at Devon Way. All alternate routes are anticipated to add less than 5 minutes to the travel time of motorists depending on the chosen alternate route. The U-Turn is used by 71 motorists travelling along US 9 northbound (27%) during the AM peak, and it is anticipated 48 of the motorists using the U-Turn (18%) would use Windsor Road to navigate onto US 9 southbound. Further, this report concludes that this dispersion of motorists following the removal of the U-Turn would not have significant traffic impacts.

2. Existing Conditions

2.1 Site Characteristics

US 9 is a divided highway between Devon Way and Tompkins Avenue for 0.65 miles. According to New York Department of Transportation traffic counts performed in June 2009, US 9 northbound had an AM peak of 263 cars between 8am- 9am. There are no connection points between US 9 Northbound and US 9 Southbound except for the U-Turn at Devon Way to the north and Tompkins Avenue to the south. The west side of the site has access to the southbound US 9 and is commercial in its land use, particularly along Warburton Avenue. The east side of US 9 is primarily residential. The first opportunity to access US 9 southbound is the U-Turn at Devon Way. Barring this route, there are several alternative routes motorists may use to access US 9 southbound. These alternatives include using the local roadway network of Hastings-on-Hudson. **FIGURE 1** depicts the site location.

FIGURE 1: Aerial map of US 9 in the Village of Hastings-on-Hudson, New York

2.2 U-Turn at Devon Way Motorists

For this analysis, motorists using the U-Turn at Devon Way are categorized based on their entrance point onto US 9 northbound and their exit point on US 9 southbound. These categories have been defined by the anticipated behavioral patterns that may come from these motorists in their route selection. The only way to access the U-Turn at Devon Way is to head northbound on US 9. For the motorists using the Devon Way U-Turn, the main destinations are Hastings Landing, Pinecrest Drive, and Tompkins Avenue and points south. It is also important to note that there are several homes along US 9 Southbound with direct access to the roadway.

Pinecrest Drive is one of the main residential areas in the Village of Hastings-on-Hudson. Pinecrest Drive is a two-way road that connects to the larger Hastings-on-Hudson roadway network. Motorists who would typically use the U-Turn at Devon Way to access the Pinecrest exit point may choose an alternative route that does not require merging back onto US 9 Southbound. Conversely, the motorists that access the residential areas in Hastings Landing, as well as other residences along US 9 Southbound, can either do so by making the U-Turn at Devon Way or navigating through the roadways north of Devon Way to get back onto US 9 Southbound. Motorists attempting to travel south of Tompkins Avenue may either use alternative routes that navigate onto US 9 Southbound north of Devon Way, like motorists going to Hastings Landing and to the homes along US 9 Southbound, but it is unlikely that those motorists would use the local roadway network to navigate on US 9 Southbound via Pinecrest Drive.

2.3 Existing Traffic Volumes

As a part of the preliminary traffic assessment, *Sam Schwartz* analyzed trips that traveled along US 9 Northbound in the proximity of the U-Turn at Devon Way and navigated back onto US 9 Southbound during the AM Peak Hour. This study is part of an effort to deter motorists that come from the Saw Mill River Parkway to travel through the Village of Hastings-on-Hudson during the morning peak hour commute. This demand was determined using Streetlight data to analyze the movements of vehicles traveling from US 9 Northbound to locations in the diagram in **FIGURE 2.** The Streetlight data recorded the individual journeys of motorists in order to gather trip destination data through a series of strategically placed data collection points or “gates” determined by *Sam Schwartz.* The data collection gate at US 9 Northbound just north of Windsor Road (Gate 1) was designated as the origin point. Vehicles were recorded as they passed through Gate 1 and were recorded again as they passed through Gates 2, 3, and 4. For Gate 4 on Pinecrest Drive, eastbound and westbound movements were counted independently. Note that the network flows were balanced so that all vehicles were recorded entering and leaving the system and that all movements have a critical volume of at least 6 vehicles per hour.

FIGURE 2: Streetlight Data Collection Gate Map

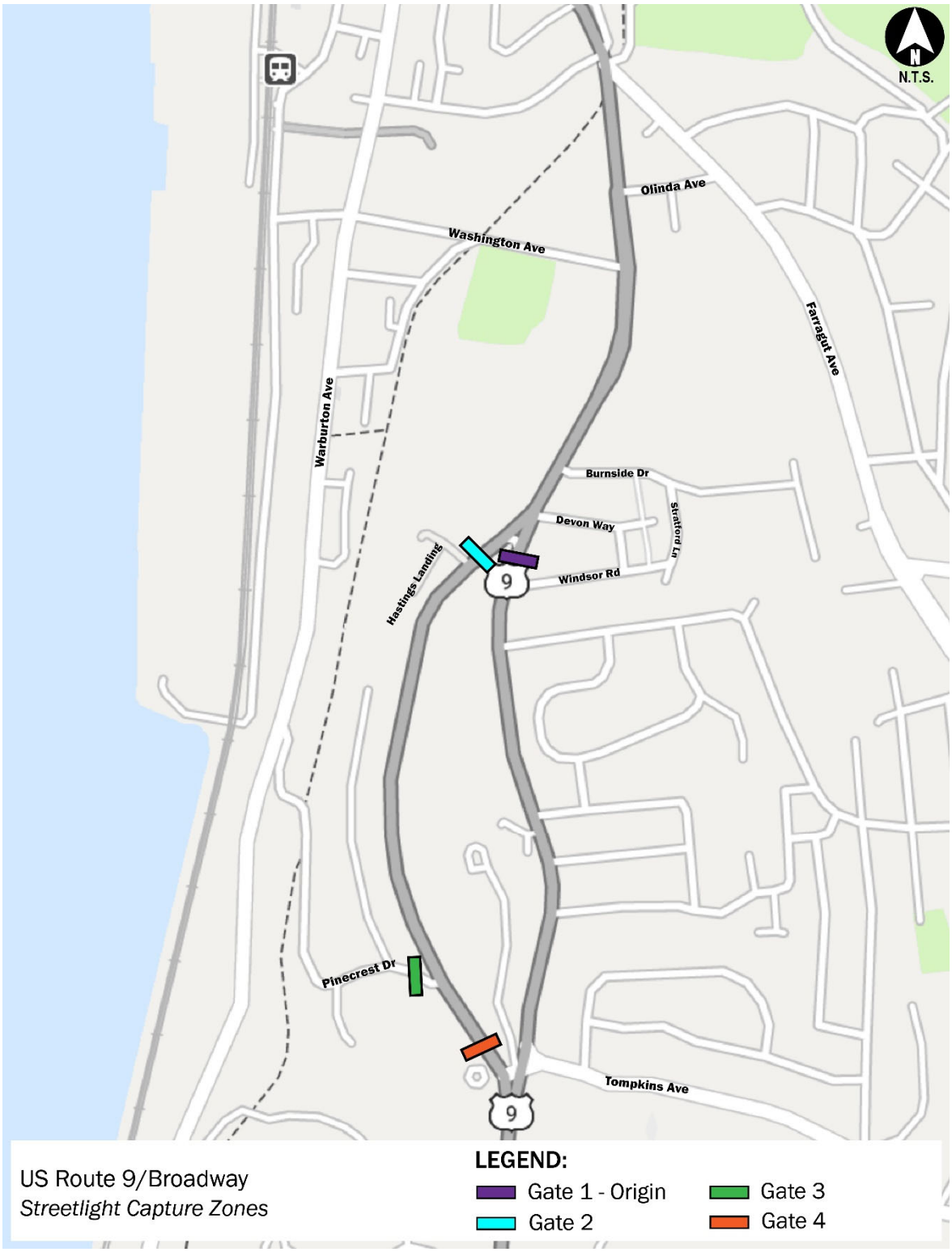


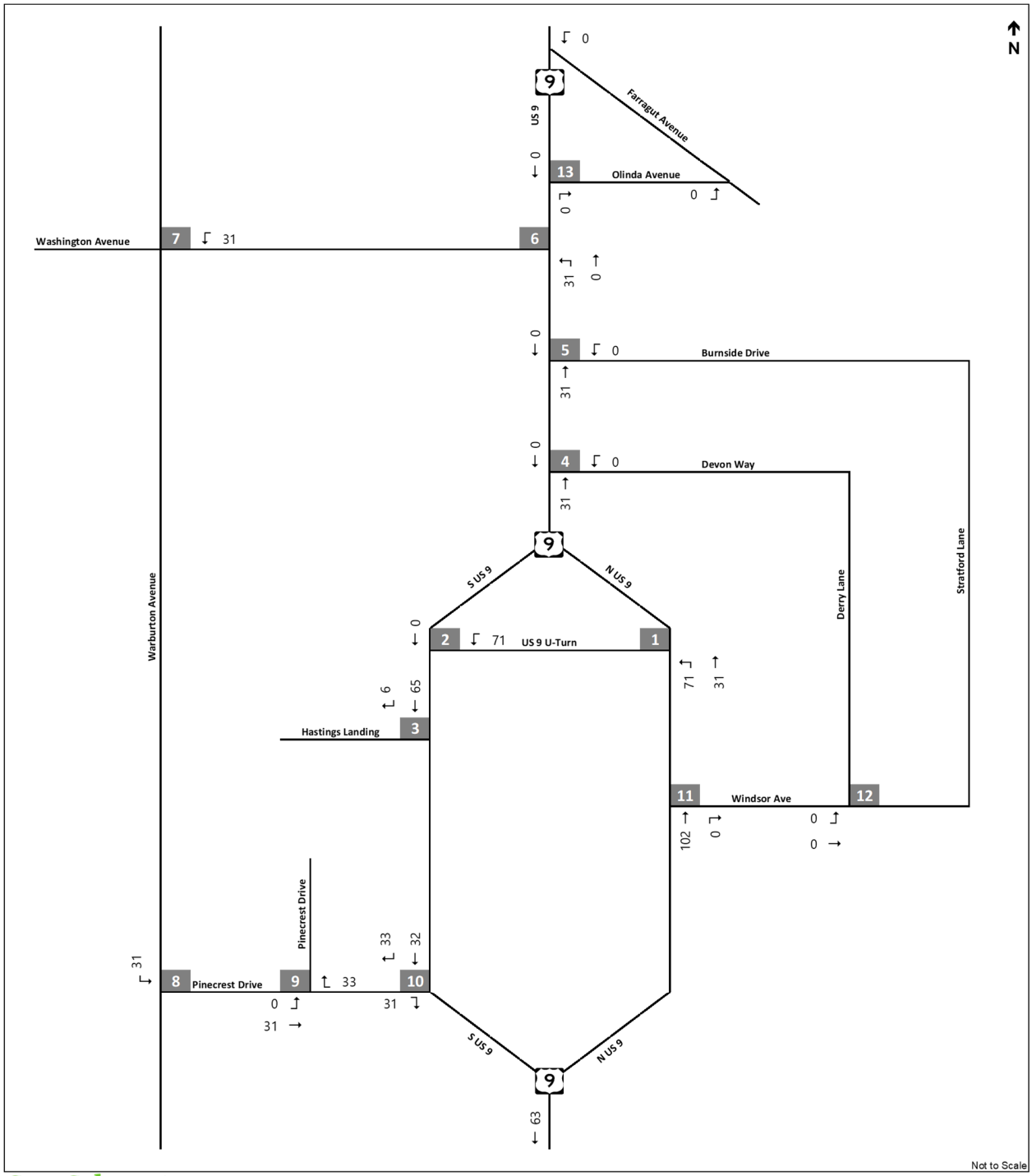
TABLE 1: Number of Vehicles Captured using Streetlight Data

	Destination			
Origin	US 9 Southbound (Gate 2)	Pinecrest Drive Westbound (Gate 3)	Pinecrest Drive Eastbound (Gate 3)	Tompkins Avenue (Gate 4)
US 9 Northbound (Gate 1)	71	33	31	62

Based on the data retrieved from Streetlight, a total of 102 motorists travel northbound (pass through Gate 1) on US 9 and have a destination on US 9 Southbound (pass through Gates 2, 3, and 4) during the peak hour of 8:00AM to 9:00AM. **TABLE 1** shows the number of vehicles captured at each gate which had a trip origination at Gate 1. Among these 102 trips, 71 (70%) of them perform the U-Turn at Devon Way while the remainder continue to travel north. Due to the layout of the roadways surrounding the U-Turn at Devon Way, the existing volume network diagram (shown in **FIGURE 3**) has been prepared with the assumption that the 31 vehicles traveling through Gate 3 (Pinecrest Drive) going eastbound are not taking the U-Turn at Devon Way. Instead, they are traveling further north to Washington Avenue and looping back to US 9 Southbound via Warburton Avenue and Pinecrest Drive. Among the motorists taking the U-Turn at Devon Way, 33 vehicles (32%) used US 9 southbound to access Pinecrest Drive, and 32 vehicles (31%) travelled on US 9 southbound to locations south of Tompkins Avenue. Furthermore, *Sam Schwartz* assumed that 6 trips out of the 71 taking the U-Turn would access either Hastings Landing or the properties located along US 9 Southbound.

Sam Schwartz

FIGURE 3: Existing Volume Network of Vehicles Using the U-Turn at Devon Way



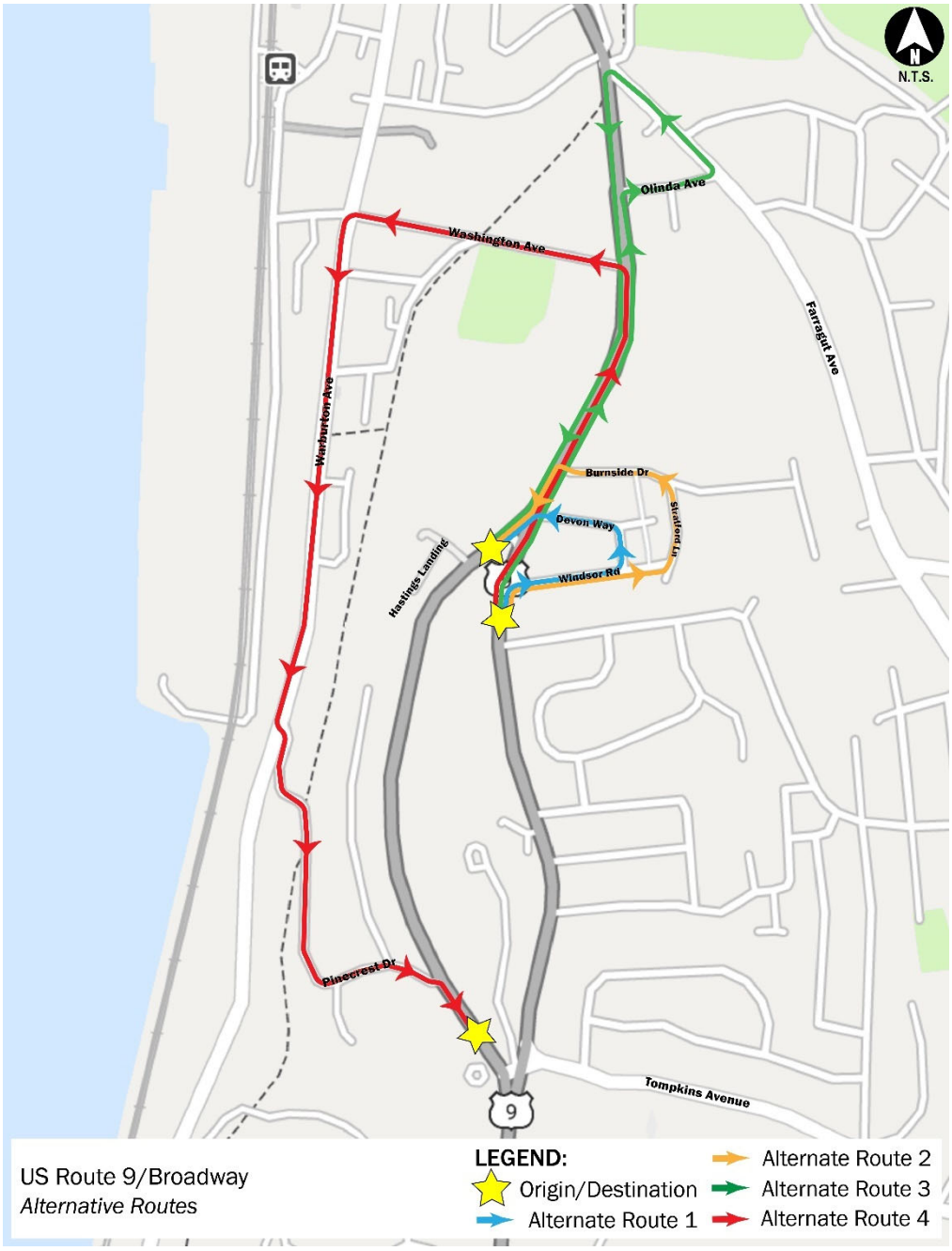
Sam Schwartz
Hastings-on-Hudson Traffic Engineering Services
U-Turn at Devon Way

Existing Traffic Volumes
AM Peak Hour (8:00 AM - 9:00 AM)
Based on data collected from Streetlight

3.1 Alternative Routes

Following a potential closure of the U-Turn at Devon Way, it is anticipated that there are four potential alternative routes that could potentially support the demand of motorists attempting to navigate from northbound US 9 to southbound US 9. These routes have been assigned distribution ratios based on the entrance and exit points of motorists, varying distances, travel times, and difficulty for the average motorist. **FIGURE 4** shows these routes with respect to each other.

FIGURE 4: Potential Alternative Routes of the U-Turn at Devon Way



Summary tables are provided to show the travel time and distance comparison between motorists using the U-Turn at Devon Way and using one of the alternative routes. A few considerations were made to determine the best, feasible alternatives. Among those considerations were the number of signalized and unsignalized intersections in each route, as well as the physical and operational roadway conditions of these routes. These alternative routes have minimal differences in time and distance when compared to their existing counterparts.

TABLE 2: Travel Times and Distances to Hastings Landing

Route	Time (minutes)	Distance (miles)	No. of signalized intersections	No. of unsignalized intersections
using U-Turn at Devon Way	**1**	**0.1**		
using Alternative Route 1	3	0.4	0	4
using Alternative Route 2	3	0.5	0	4
using Alternative Route 3				
using Alternative Route 4	5	1.1	1	2

TABLE 3: Travel Times and Distances to Pinecrest Drive

Route	Time (minutes)	Distance (miles)	No. of signalized intersections	No. of unsignalized intersections
using U-Turn at Devon Way	**2**	**0.5**		
using Alternative Route 1	4	0.8	0	4
using Alternative Route 2	4	0.9	0	4
using Alternative Route 3	5	1.5	1	3
using Alternative Route 4	6	1.5	1	2

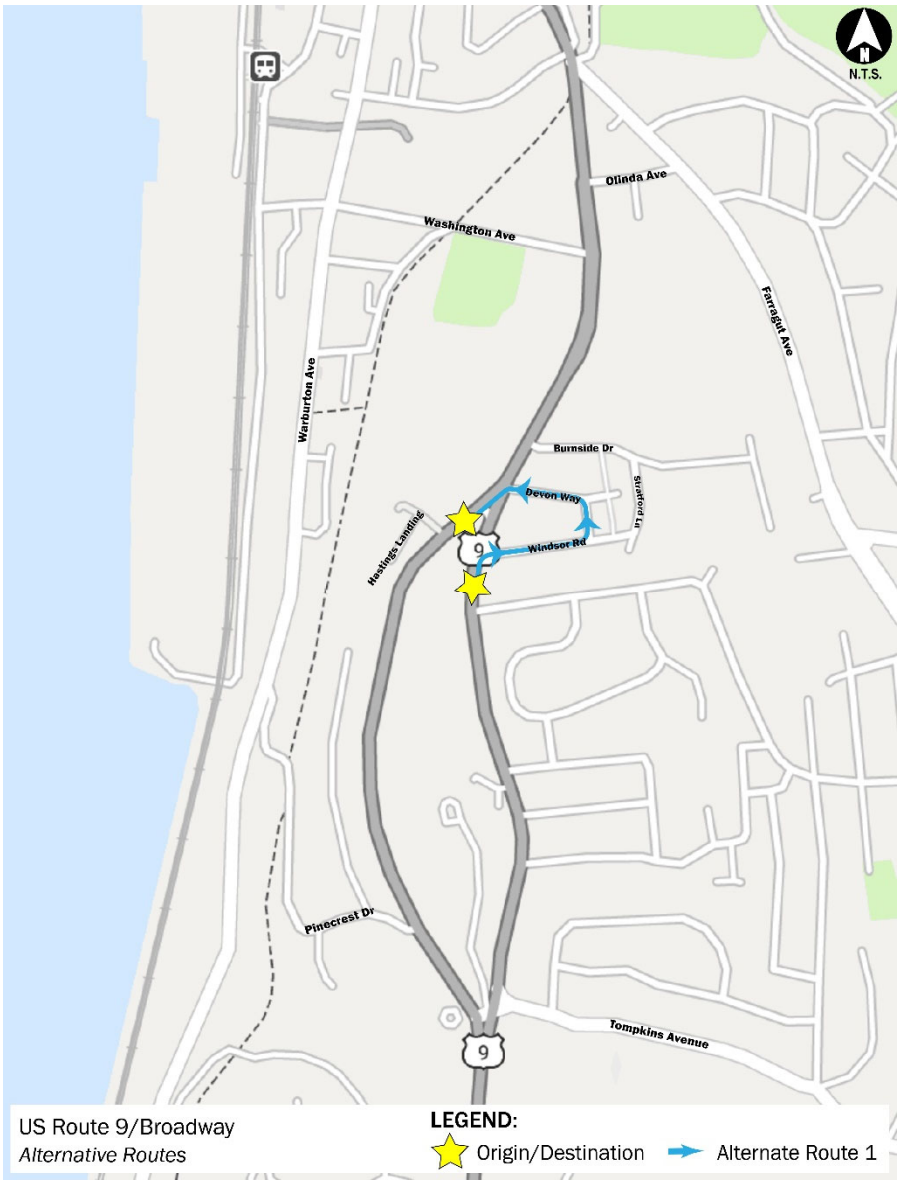
TABLE 4: Travel Times and Distances to Tompkins Avenue

Route	Time (minutes)	Distance (miles)	No. of signalized intersections	No. of unsignalized intersections
using U-Turn at Devon Way	**2**	**0.6**		
using Alternative Route 1	4	0.9	0	4
using Alternative Route 2	4	1.0	0	4
using Alternative Route 3	5	1.6	1	3
using Alternative Route 4	6	1.6	1	2

3.1.1 Alternative Route 1 – Windsor Road/ Derry Lane/ Devon Way

Alternative Route 1 could feasibly be utilized by all motorists of the U-Turn on Broadway because it begins immediately to the south of the U-turn on US 9 Northbound and navigates back onto US 9 Southbound at Devon Way. This alternative route requires a right turn from US 9 northbound onto Windsor Road, a left turn onto Derry Lane, another left onto Devon Way, and left one final left onto US 9 southbound. This alternative route is shown in **FIGURE 5.**

FIGURE 5: Alternative Route 1

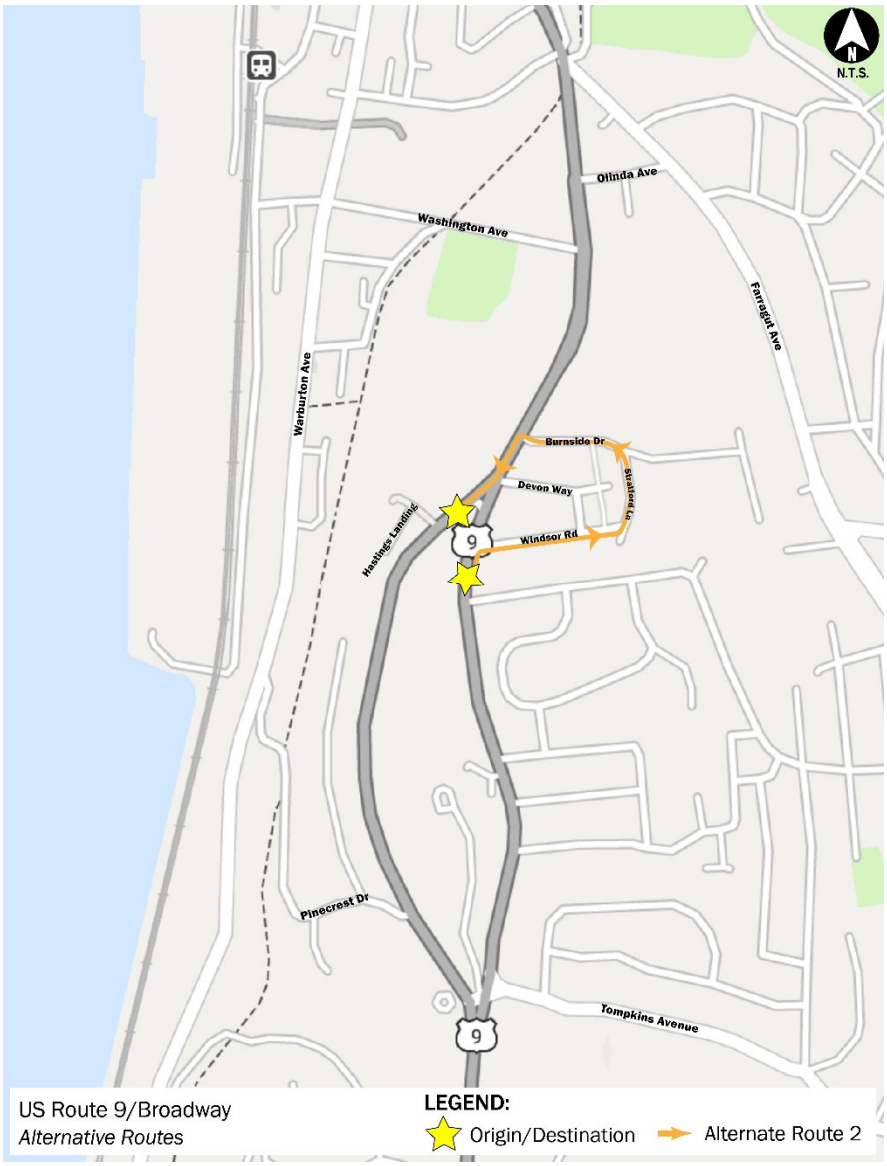


All the intersections in this alternative route are unsignalized except for the intersection of US 9 and Devon Way, which is stop controlled. This route is estimated to take an additional 2 minutes and is 0.3 miles long. This route also requires navigating through narrow two-way residential streets and may require motorists to yield to oncoming traffic on Windsor Road and Derry Lane.

3.1.2 Alternative Route 2 – Windsor Road/ Stratford Lane/ Burnside Drive

Alternative Route 2 also could feasibly be utilized by all motorists of the U-Turn on Broadway. It is nearly identical to Alternative Route 1 as it begins by turning right onto Windsor Road and uses the local road to navigate back to US 9 southbound immediately north of Devon Way. This alternative route requires a right turn from US 9 northbound onto Windsor Road, and instead of turning left onto Derry Lane, motorists turn left onto Stratford Lane. Then motorists would turn left onto Burnside Drive and left again onto US 9 southbound. This alternative route is shown in **FIGURE 6.**

FIGURE 6: Alternative Route 2

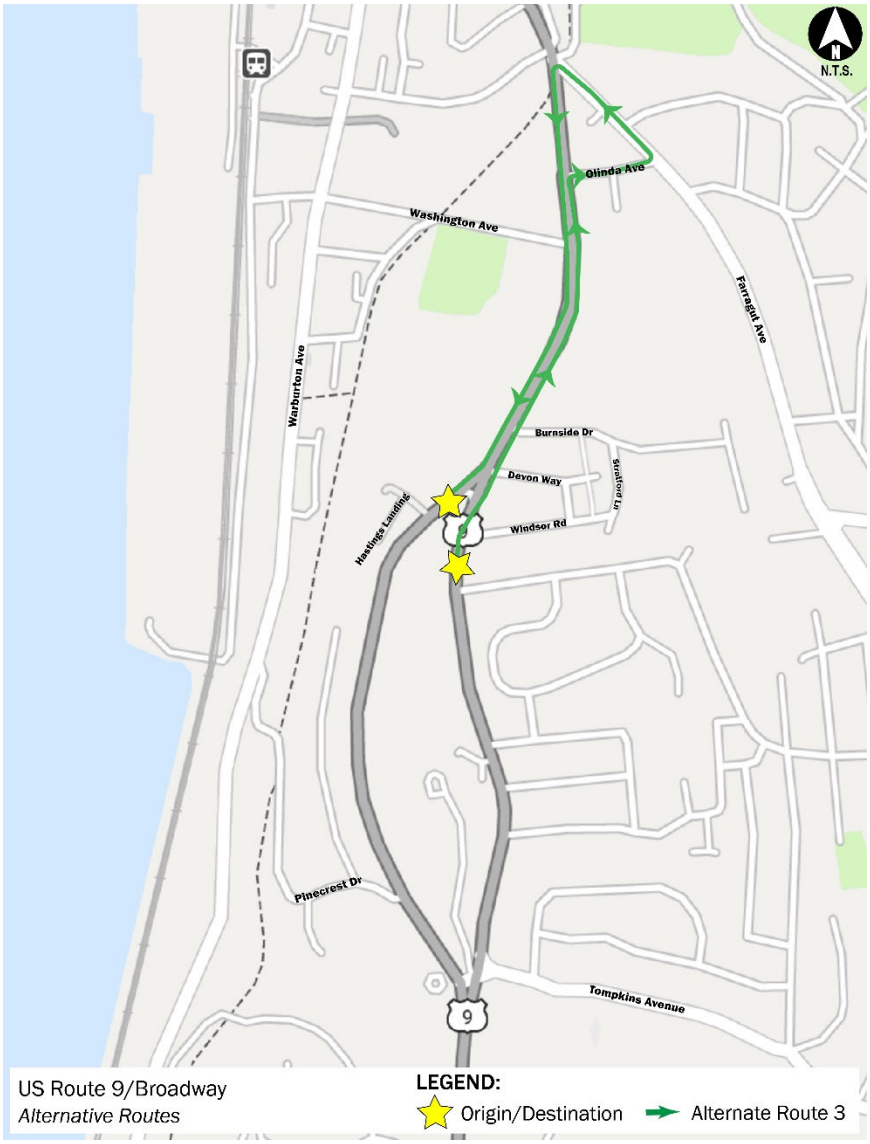


All the intersections in this alternative route are unsignalized except for the intersection of US 9 and Burnside Drive, which is stop controlled. This route is estimated to take an additional 2 minutes and is 0.4 miles long. This route also requires navigating through narrow two-way residential streets and may require motorists to yield to oncoming traffic on Windsor Road.

3.1.3 Alternative Route 3 – Broadway/ Olinda Avenue/ Farragut Avenue

Alternative Route 3 is an alternative route that uses local roads north of the intersection of US 9 and Devon Way to navigate back onto US 9 southbound north of Devon Way. This route travels north on US 9 past Devon Way and turns right at the intersection of Olinda Avenue and US 9. Motorists then turn left at the intersection of Farragut Avenue and Olinda Avenue, and then turn left at the intersection of US 9 and Farragut Avenue onto US 9 southbound. This detour route is shown in **FIGURE 7.**

FIGURE 7: Alternative Route 3

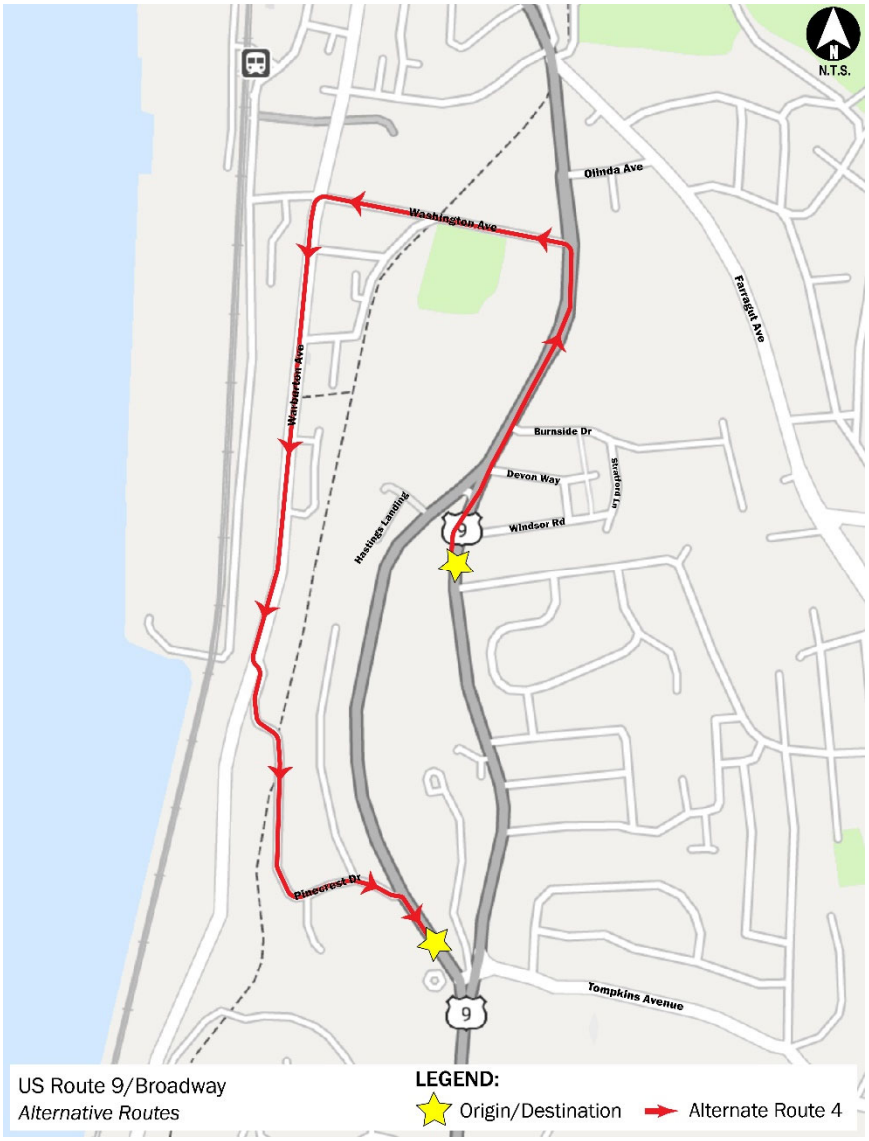


All intersections are unsignalized except for the intersection of US 9 and Farragut Avenue, which is signalized. The intersection of Farragut Avenue and US 9 is a six-leg intersection and the route requires a sharp left turn. This route would detour motorists for one mile and 3 minutes. Since this detour navigates to US 9 southbound north of Devon Way, all motorists of the U-turn at Devon Way could potentially use this route. This is the only identified detour route that does not require turning left across lanes of oncoming traffic, which may be appealing to motorists.

3.1.4 Alternative Route 4 – Broadway/ Washington Avenue/ Warburton Avenue/ Pinecrest Drive

Alternative Route 4 is an alternative route that uses local roads north of the intersection and west of US 9 to navigate onto US 9 southbound through Pinecrest Drive. This route travels farther north than Devon Way, turns left at the intersection of US 9 and Washington Avenue, turns left again onto Warburton Avenue, turns left onto Pinecrest Drive at the intersection of Pinecrest Drive and Warburton Avenue, and then turns right onto US 9 southbound. The detour route is shown in **FIGURE 8.**

FIGURE 8: Alternative Route 4



All the intersections are unsignalized except for the intersection of Washington Avenue and Warburton Avenue, which is signalized. This route typically takes four additional minutes during peak hour and detours motorists by one mile. This detour navigates motorists to back onto US 9 south of Devon Way, so this route would not be viable for motorists attempting to reach residences at Hastings Landing. Motorists who use the U-Turn at Devon way to access the area west of US 9 via Pinecrest Drive may use this alternative route and circumvent the need to drive on US 9 southbound

entirely. It is also unlikely motorists attempting to go to locations south of Tompkins Avenue would use this route in favor of other potential alternative routes presented in this memorandum.

3.2 Alternative Route Distribution

Motorists are likely to have varying preferences based on their origin and destination. Because of this, the origin and eventual destination of the motorist would be the determining factor in the distribution of the alternative routes used. See **TABLE 5, TABLE 6,** and **TABLE 7** for the approximation of the alternative route used based on location and origin of the motorist. **FIGURE 9** shows the resultant traffic flow diagram given these distributions.

TABLE 5: Alternative Route Distribution for Vehicles Going to Hastings Landing

Alternate Route No.	Splits
1	50%
2	50%
3	0%
4	0%

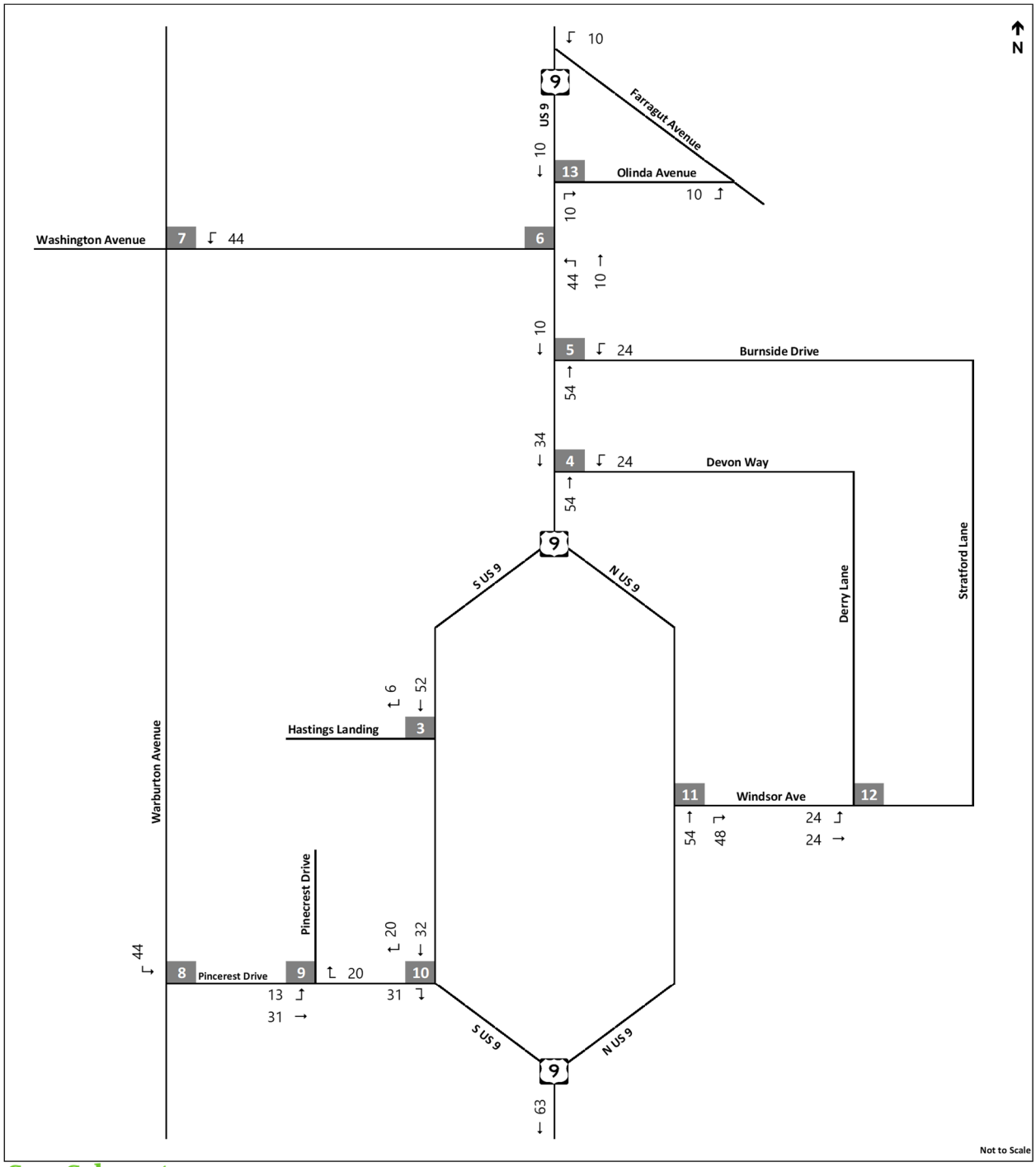
TABLE 6: Alternative Route Distribution for Vehicles Going to Pinecrest Drive

Alternate Route No.	Splits
1	25%
2	25%
3	40%
4	10%

TABLE 7: Alternative Route Distribution for Vehicles Going towards Tompkins Avenue

Alternate Route No.	Splits
1	40%
2	40%
3	0%
4	20%

FIGURE 9: Resultant Volume Network Distribution



4.1 Traffic Impacts and Key Findings

The resultant traffic flow diagram, **FIGURE 9 (see above)**, shows the added vehicles during the peak hour from 8AM – 9AM. The diagram shows that no individual intersection is in excess of an additional 60 vehicles per hour, or one car per minute, during the peak hour. Furthermore, Alternative Routes 1, 2, and 4 all have a right turn off US 9 northbound as the first turning movement, which has minimal impact to queuing on US 9. Alternative Routes 1, 2, and 4 also have queue storage to support more vehicles than anticipated in any 15-minute period simultaneously on their respective routes. Alternative 3 would require an unsignalized left turn across oncoming traffic from US 9, however, there is available queue storage for at least 15 passenger vehicles in the form of a left-turn only lane at the intersection of US 9 and Washington Avenue. Based on the current traffic conditions, the closure of the U-Turn at Devon Way would increase travel times by 4 minutes and travel distance by one mile, depending on the origin and destination of each trip. Due to the low volumes rerouted onto neighboring local roads and the anticipated dispersion of those volumes across several potential routes.

This Preliminary Traffic Assessment concludes that the neighboring roads of Hastings-on-Hudson would adequately support rerouted vehicular traffic following the closure of the U-Turn at the intersection of US 9 and Devon Way. For a precise analysis of the queueing delays and Level of Service changes, *Sam Schwartz* recommends a traffic simulation to be completed with vehicular turning movement counts, 7-day ATR counts, and an accompanying Synchro or Vissim Model.