

February 6, 2025

Mr. David K. Dech, PP, Planning Director  
Warren County Planning Department  
Wayne Dumont, Jr. Administration Building  
165 County Route 519 South  
Belvidere, NJ 07823-1949

Subject: Traffic Engineering Evaluation of Truck Circulation Issues  
Columbia, Knowlton Township

Dear Mr. Dech:

In accordance with our proposal to you dated November 1, 2024, this memorandum summarizes our review of the projected positive and negative benefits of modifications to existing approach and/or departure routes into and out of the Columbia section of Knowlton Township, and evaluation of existing truck restriction-related signage on the approaches to the Columbia, in an effort to reduce heavy truck traffic within the area. This evaluation is an outgrowth of traffic/truck volume data collection and other analyses which NV5 has previously completed on behalf of the County.

Review of the configuration of the roadways serving and surrounding Columbia suggests that, in order to construct I-80 through this area, a very complicated network of ramps and connecting roadways was needed to provide connections to and through the Columbia area and the three other major highways that traverse this area: US Route 46, NJ Route 94, and the Portland-Columbia Toll Bridge connecting to PA Route 611. The result is a sprawling, non-intuitive interchange, requiring motorists to pay close attention to posted guide signage to successfully navigate the area. With such care needed to drive the desired route, experience shows that a number of combinations of signage related to truck restrictions often go unheeded. NV5's July 2024 counts in Columbia have demonstrated that dozens of trucks per day fail to heed or observe posted truck restriction signage.

This report presents an evaluation of truck volumes observed in the Columbia area and presents a high-level review of a number of potential intersection, roadway and/or ramp reconfigurations to reduce or prevent heavy truck traffic in Columbia. Many of these options would restrict all vehicle traffic from certain movements, not just trucks. Interim, "short-term" signing improvements to provide better motorist messaging related to truck restrictions are also presented. In general, the improvements reviewed in this report are of a more significant scale than the minor, short-term improvements reviewed and recommended in NV5's April 18, 2024 report evaluating general circulation improvements in this area.

We note that, given the presence of State highways in the vicinity, and the proximity of the area to the I-80 Interchange 4 area, many of the reconfiguration options outlined in this report affect areas under the jurisdiction of the New Jersey Department of Transportation (NJDOT); one reconfiguration option would also affect areas under the jurisdiction of the Delaware River Joint Toll Bridge Commission (DRJTBC). In addition, due to the proximity of an Interstate highway, we anticipate the Federal Highway Administration (FHWA) to also be involved in reviews and approvals. These agencies will have significant input, and review/approval authority, over what improvements are eventually implemented in their respective jurisdictions.

### ***Prior Data Collection***

In July 2024, NV5 collected weeklong vehicle classification counts at four (4) locations in the Columbia area, aimed at capturing all truck traffic entering and exiting the area. The locations, and a summary of the results at each, is presented in Table 1.

The data in Table 1 allowed the summarization of the relative magnitude of traffic entering and exiting Columbia on these roadways. These volumes and relative percentages are summarized in Table 2.

**Table 1. Summary of July 2024 Traffic and Semitrailer Counts in Columbia.**

Site Code	Roadway	Dir.	Entire 7-Day Period*		Average Weekday (Tue-Wed)	
			Total veh.	Semitrailers (pct.)	Total veh.	Semitrailers (pct.)
1	Decatur Street at Susq. Lane	NB	1,595	109 (6.8%)	218	13 (6.0%)
		SB	7,023	64 (0.9%)	855	8 (0.9%)
		Tot	8,618	173 (2.0%)	1,073	21 (2.0%)
2	Decatur Street south of Locust St / Ramp	NB	1,527	105 (6.9%)	218	14 (6.4%)
		SB	2,368	12 (0.5%)	332	1 (0.3%)
		Tot	3,895	117 (3.0%)	550	15 (2.7%)
3	Ramp to I-80 EB / from US 46 WB	NB	3,535	58 (1.6%)	414	11 (2.7%)
		SB	24	0 (0.0%)	5	0 (0.0%)
		Tot	3,559	58 (1.6%)	419	11 (2.6%)
4	Washington Street west of US 46	NB	553	12 (2.2%)	77	3 (3.9%)
		SB	1,566	2 (0.1%)	219	0 (0.0%)
		Tot	2,119	14 (0.7%)	296	3 (1.0%)

\* Exclusive of data gaps.

**Table 2. Summary of July 2024 Traffic and Semitrailer Volumes  
By Approach/Departure Route, Columbia.**

Direction	Approach	Traffic Volumes and Percent of Approach/ Departure Routes, 7-day count period			
		Total vehicles	Percent	Semi-trailers	Percent
Inbound	1. Decatur Street southbound	7,023	76.9%	64	35%
	2. Decatur Street northbound	1,527	16.7%	105	58%
	3. Ramp from US 46 WB	24	0.3%	0	0%
	4. Washington Street northbound	553	6.1%	12	7%
	<b>Total inbound traffic</b>	<b>9,127</b>	<b>—</b>	<b>181</b>	<b>—</b>
Outbound	1. Decatur Street northbound	1,595	17.6%	109	60%
	2. Decatur Street southbound	2,368	26.1%	12	7%
	3. Ramp to I-80 EB	3,535	39.0%	58	32%
	4. Washington Street southbound	1,566	17.3%	2	1%
	<b>Total outbound traffic</b>	<b>9,064</b>	<b>—</b>	<b>181</b>	<b>—</b>

As shown, during a week-long observation period of truck volumes in Columbia, 362 semitrailers entered and exited the neighborhood – 181 entering and 181 exiting. Given that Columbia is home to a relatively small number of residences and very few commercial or other uses that would be expected to generate significant heavy truck traffic, it is assumed that the majority of these heavy trucks are passing through.

For every approach to Columbia, the many ramps of the greater I-80 interchange provide a direct connection to all major highway departure routes without entry into Columbia. Therefore, we assume that the presence of heavy trucks in Columbia can be traced to one or more of the following:

- Real or perceived travel time benefit
- Unclear/insufficient truck restriction signage
- Driver confusion given the non-intuitive I-80 interchange configuration
- Driver apathy regarding restrictions, and/or lack of police enforcement

The data presented in Table 2 will be used in this report to approximate the number of trucks which could be expected to be diverted from the Columbia area through potential roadway reconfiguration options.

### ***Turning Movement Traffic Counts***

As part of this assignment, NV5 conducted turning movement counts at three (3) locations which serve as entry/exit points to and from Columbia, and which were identified as the highest-volume movements for semitrailers during NV5's July 2024 counts:

- Decatur Street, the eastbound I-80 Exit 4A ramp and Simpson Road bridge
- Decatur Street, Locust Street and ramps to eastbound I-80/from eastbound US 46
- Decatur Street at the ramps from eastbound US 46 and to the Portland-Columbia Toll Bridge

These counts were conducted to obtain more detail on the actual routes of approach and departure being used by these large trucks. Count data was obtained using Miovision traffic cameras which recorded video data on Monday and Tuesday, November 18 and 19, 2024. Video data from Monday was processed to obtain traffic count data, since during NV5's July 2024 counts, Monday traffic volumes were higher than Tuesday volumes at three of the four Columbia count locations. Traffic count data was obtained for the period from 9:00 AM to 12:00 noon, and from 3:00 PM to 6:00 PM, again, guided by the peak volume patterns observed during the July 2024 counts. The total turning movement volumes observed during each period are illustrated in **Figure 1**. Note that these are not peak hour volumes, but total volumes for each three-hour period. For each movement, the first number represents the total vehicles, with the number of semitrailers in parentheses.

Observations regarding these traffic volumes:

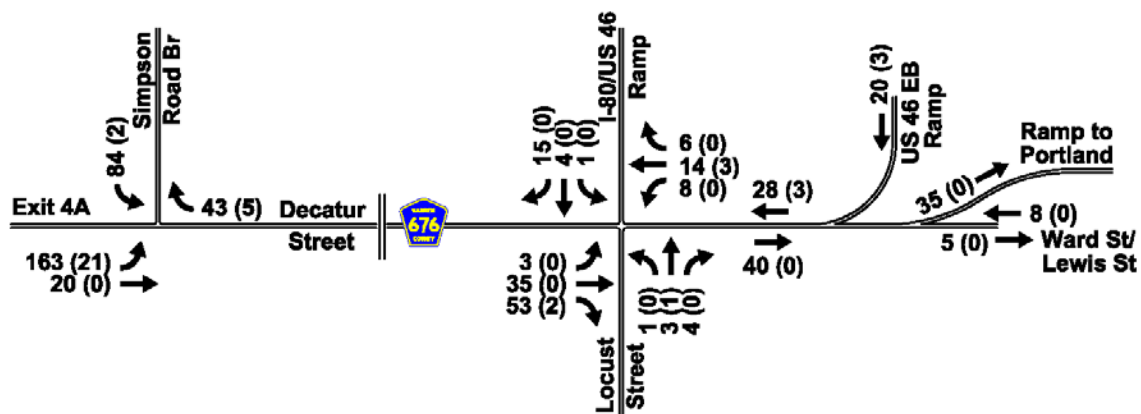
- As noted earlier in this report, Decatur Street eastbound from the Exit 4A/Simpson Road bridge intersection was the highest-volume semitrailer approach to Columbia during NV5's July 2024 counts. As shown in Figure 1, during the six-hour November 2024 turning movement counts, five (5) semitrailers traveled east on Decatur Street, and all five originated from the Simpson Road bridge – none proceeded straight through from the Exit 4A ramp.
- At the Decatur Street/Exit 4A ramp/Simpson Road bridge intersection, the camera positioned to view the intersection was also aimed along the Simpson Road bridge, allowing some view of the far side of the bridge (as well as the mainline I-80 lanes). While reviewing

video footage for spot verification, one semitrailer was observed to make the following movements (at 4:36 PM – during daylight hours):

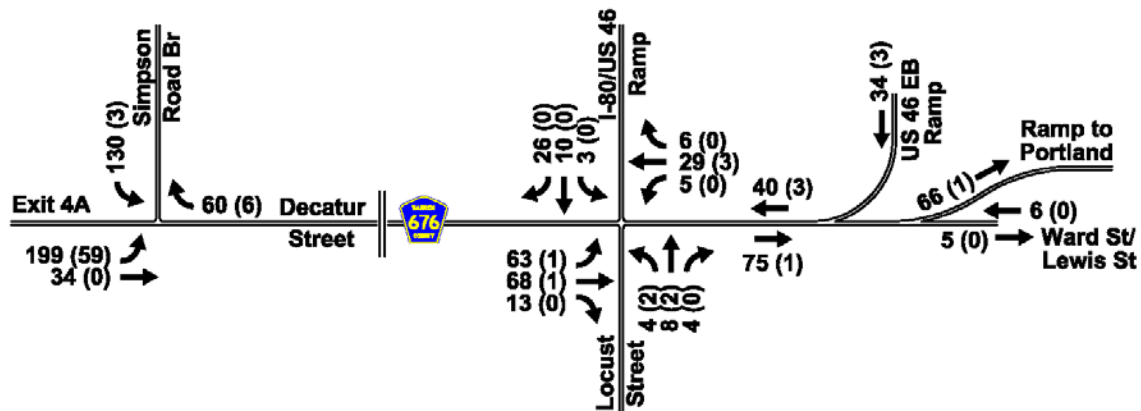
- o Right turn from the easterly truck stop driveway onto Simpson Road westbound;
- o Left turn onto the Simpson Road bridge;
- o Left turn onto Decatur Street eastbound;
- o 20 seconds after the truck disappeared from the camera view, the truck reversed back into the camera view and onto the Exit 4A ramp;
- o Right turn back onto the Simpson Road bridge;
- o Left turn onto Simpson Road westbound.

**Figure 1. Six-Hour Turning Movement Volumes at Columbia Intersections**  
**November 18, 2024**

**WEEKDAY MORNING PERIOD - 9:00 AM TO 12:00 NOON**



**WEEKDAY EVENING PERIOD - 3:00 PM TO 6:00 PM**



- o Another truck which made the left turn from the Simpson Road bridge onto Decatur Street was observed making the right turn from Decatur Street back over the bridge more than two minutes later, having apparently made a U-turn within Columbia (this truck was not observed at the Locust Street intersection).
- o These experiences at least suggest that the truck drivers observed the truck restriction signage on Decatur Street itself, after failing to observe (or heed) signage on westbound Simpson Road.



- At the Decatur Street/Locust Street ramp intersection, a three-axle dump truck was observed to turn right from Locust Street northbound onto Decatur Street eastbound, disappear from the camera view, then reappear, reversing in the eastbound travel lane beyond the Locust Street intersection, and turning left onto the ramp to I-80 eastbound.
- During review of the July 2024 count video footage, some trucks that had been classified during processing as semitrailers were in fact other vehicles such as pickup trucks towing RV trailers or landscaping equipment. In this case, most of the trucks in this study were confirmed by visual verification of video footage and virtually all were “typical” highway-type semitrailers, the only exception being a truck tractor assembly towing two similar tractors behind it. In other words, none of these trucks seemed to have an apparent legitimate reason to be in Columbia.
- Review of the video footage also shows that all five of the semitrailers on the northbound Locust Street approach to Decatur Street, approached via Washington Street westbound, apparently having crossed the Portland-Columbia toll bridge. While this was not observed to be a significant Columbia approach route for trucks in our July 2024 counts, it was significant during this observation as five (5) of the 16 total semitrailers (31%) approached Columbia on Washington Street westbound.
- As shown in Figure 1, a total of 80 semitrailers turned left from the Exit 4A ramp onto the Simpson Road bridge toward the truck stop area. Views of Simpson Road across the bridge show significant semitrailer activity, both eastbound and westbound. During the same time period, only 16 semitrailers were observed entering the Columbia area. Therefore, it is apparent that the majority of semitrailer drivers making a local stop (at the truck stop or otherwise) are able to negotiate the area while avoiding Columbia streets.

Tables 1 and 2 summarized the traffic volumes observed entering and exiting Columbia per NV5’s July 2024 two-way traffic counts in the area. Similarly, Table 3 summarizes the inbound traffic volumes entering Columbia at the locations of the manual counts, for the six hours counts were conducted on November 18, 2024; Table 4 summarizes the outbound volumes exiting Columbia at these locations. We note that these counts did not capture every entry/exit point to and from the village; the locations were selected per the highest travel patterns observed in the July 2024 counts.

**Table 3. Summary of November 18, 2024 Inbound Traffic and Semitrailer Volumes  
By Approach Route, Columbia.**

Approach Movement	Traffic Volumes and Percentage of Inbound Traffic, 6-hour count period			
	Total vehicles	Percent	Semi-trailers	Percent
SB Simpson Road Bridge left turn to Decatur St EB	214	51.1%	5	31.3%
EB Exit 4A ramp through mvmt to Decatur Street EB	54	12.9%	0	0%
WB US 46 ramp approach to Decatur Street	59	14.1%	0	0%
NB Locust Street approach to Decatur Street	24	5.7%	5	31.3%
I-80 Exit 4B/US 46 EB ramp to Decatur Street WB	54	12.9%	6	37.5%
Ward Street/Lewis Street to Decatur Street WB	14	3.3%	0	0%
<b><i>Total inbound traffic observed</i></b>	<b><i>419</i></b>	<b><i>—</i></b>	<b><i>16</i></b>	<b><i>—</i></b>

As shown in Table 3, the inbound distribution profile for total traffic in November 2024 closely parallels the distribution per the July 2024 counts. Inbound semitrailer traffic during the November counts was relatively evenly split between three approaches: from the Simpson Road bridge, northbound Locust Street, and the ramp from I-80 Exit 4B/US 46 eastbound. Comparison of the semitrailer approach profiles is not necessarily applicable, because the Locust Street approach was not observed during the July 2024 counts; however, the volume of semitrailers on the Locust Street approach is higher than would be suggested by the July 2024 counts at Washington Street.

**Table 4. Summary of November 18, 2024 Outbound Traffic and Semitrailer Volumes  
By Departure Route, Columbia.**

Departure Movement	Traffic Volumes and Percentage of Outbound Traffic, 6-hour count period			
	Total vehicles	Percent	Semi-trailers	Percent
WB Decatur Street right turn to Simpson Road	103	27.0%	11	61.1%
EB Decatur Street left turn onto I-80 EB ramp	66	17.3%	1	5.6%
EB Decatur Street right turn onto Locust Street	66	17.3%	2	11.1%
WB Decatur Street right turn onto I-80 EB ramp	12	3.1%	0	0%
WB Decatur Street left turn onto Locust Street	13	3.4%	0	0%
NB Locust Street through mvmt onto I-80 EB ramp	11	2.9%	3	16.7%
EB Decatur Street ramp to Toll Bridge	101	26.4%	1	5.6%
Decatur Street EB to Ward Street/Lewis Street	10	2.6%	0	0%
<i>Total outbound traffic observed</i>	<b>382</b>	—	<b>18</b>	—

As shown in Table 4, 61% of all exiting semitrailer traffic did so via a right turn from westbound Decatur Street onto Simpson Road. This value is virtually identical to the outbound semitrailer traffic (60%) observed during the July 2024 counts. During the July 2024 counts, 32% of all semitrailer traffic exited Columbia via the ramp from Decatur Street to I-80 eastbound; the November counts reflect a lower distribution to this ramp (22%). As with the inbound volumes in Table 3, the November counts reflect 11% of semitrailers exiting Columbia via Locust Street, which is higher than would be suggested by the July 2024 counts at Washington Street, where only three (3) semitrailers (and zero outbound semitrailers) were observed over an entire week.

Copies of raw traffic count data reports are attached to the end of this document.

As part of our proposal for this assignment, we anticipated the conduct of intersection capacity analysis to determine the traffic impacts (in terms of delay/level of service) of the potential interchange reconfigurations discussed in the previous sections. However, by observation, these volumes indicate that they are of a low enough magnitude that they would accommodate any of these reconfiguration options without such traffic impacts. Even if these were peak hour volumes, and not three-hour volumes, no “traffic impacts” would be expected.

Therefore, we believe the merits of these options should be considered based primarily on their effectiveness in restricting truck entry/exit routes, their impact on travel time and quality of life for local residents, any impacts to emergency vehicle access, and other regular traffic such as school buses, postal routes, etc.

### ***Existing Columbia Approach and Departure Routes***

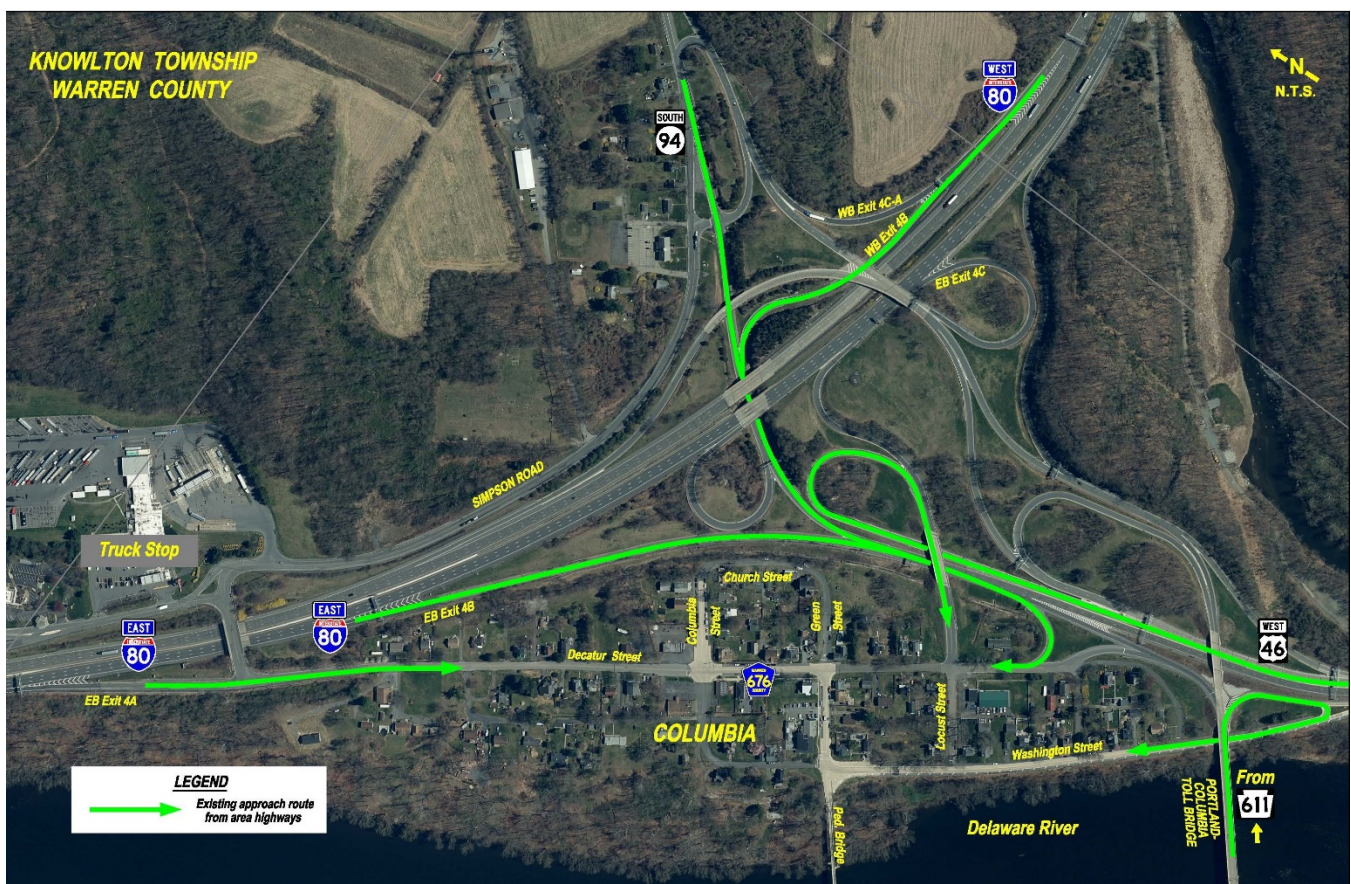
This report focuses on the five (5) major roadway corridors which meet in Columbia: I-80 east and west, US Route 46 east, NJ Route 94 north, and the Portland-Columbia Toll Bridge (to PA Route 611) south.

For traffic approaching the Columbia area the five (5) existing major highway approaches are:

- I-80 eastbound – via either the Exit 4A ramp onto Decatur Street, or via Exit 4B to US Route 46 eastbound and the exit ramp signed “Columbia”
- I-80 westbound Exit 4A-B-C and the exit ramp signed “Columbia”
- US Route 46 westbound, via the exit ramp signed “Columbia”
- NJ Route 94 southbound, via US Route 46 eastbound and the exit ramp signed “Columbia”
- The Portland-Columbia Toll Bridge from Pennsylvania and the exit ramp signed “Columbia”

These existing routes of approach are illustrated in **Figure 2**.

**Figure 2. Existing Columbia Approach Routes**



Similarly, there are five (5) routes of departure from Columbia:

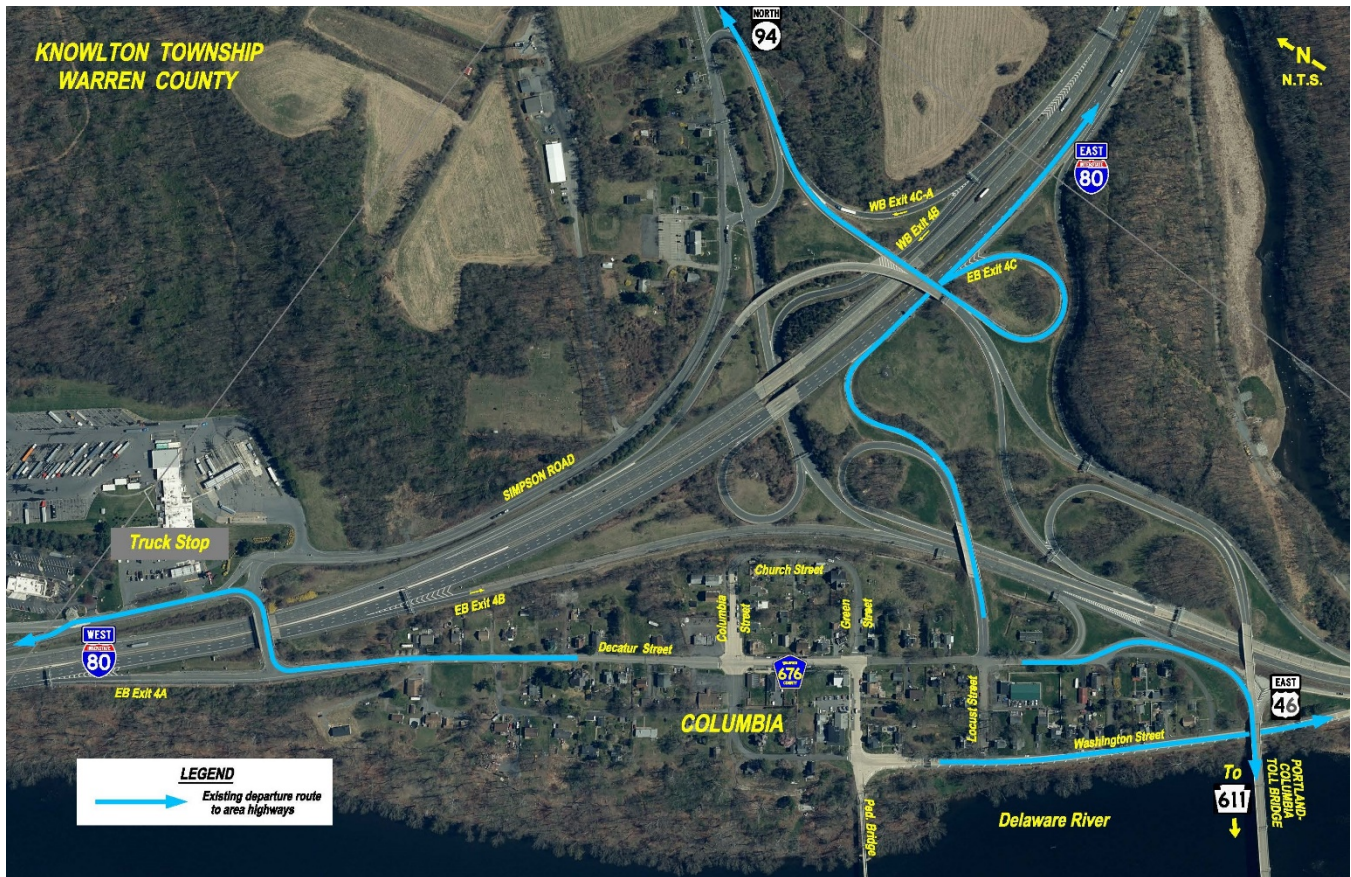
- Decatur Street northbound to the Simpson Road Connector to I-80 westbound



- The ramp to I-80 eastbound from Decatur Street opposite Locust Street
- Decatur Street northbound to the Simpson Road connector, to Simpson Road and to NJ Route 94 northbound
- The ramp from the east end of Washington Street to US Route 46 eastbound
- The ramp from the east end of Decatur Street to the Portland-Columbia Toll Bridge

These existing routes of departure from Columbia are illustrated in **Figure 3**.

**Figure 3. Existing Columbia Departure Routes**



### ***Emergency Services***

Since this study reviews potential revisions to existing traffic patterns approaching and/or departing Columbia from the area's major highways, impacts to emergency vehicle routes (and thus emergency response time) must be considered. Existing police and fire/ambulance stations serving Columbia, and their respective approach routes, are reviewed below.

**Police.** Knowlton Township is served by the New Jersey State Police from the Hope Barracks, located on CR 521 just north of I-80 at Interchange 12, eight miles east of Knowlton. State Police from Hope would approach Columbia on I-80 westbound. Alternately, the Warren County Sheriff's Office is located in Belvidere, eight miles south of Columbia. Traffic from Belvidere would approach Columbia on US 46 westbound.

Fire/ambulance. The nearest fire/ambulance service within Knowlton Township is the Knowlton Fire & Rescue No. 1 off US 46 three miles southeast of Columbia. Emergency vehicles from this location would approach Columbia on US 46 westbound. If response from additional departments is required, other nearby services are listed below.

- The Portland (PA) Hook & Ladder Co. #1 is actually the nearest fire station to Columbia, just across the Portland-Columbia Toll Bridge less than one mile away. Traffic to Columbia would use the “Columbia” ramp signed from the Toll Bridge eastbound.
- The Mount Bethel (PA) Volunteer Fire Company is two miles south of Columbia on PA 611. Traffic to Columbia would use the “Columbia” ramp signed from the Toll Bridge eastbound.
- The Blairstown Hose Co. #1 station is five miles north of Columbia on NJ 94. Traffic from this site would approach Columbia via NJ 94 southbound, merging onto US 46 eastbound and using the easterly ramp to Decatur Street.
- The Delaware Water Gap (PA) Fire Company station is off PA 611, six miles northwest of Columbia. Vehicles from this station would approach Columbia via I-80 eastbound.

### ***Potential Roadway/Ramp Reconfigurations***

Since multiple attempts at correcting this problem through signage have failed to address the issue, this section of this report discusses several more restrictive measures – i.e., elimination of one or more roadway/ramp links serving Columbia, to either eliminate potential through routes, or [indirectly] to make routing through Columbia more circuitous, to eliminate any actual or perceived travel time savings. Four such options are discussed below.

Option 1. Closure of Decatur Street at Simpson Road Bridge (I-80 EB Exit 4A). The northerly segment of Decatur Street saw the highest overall volume of semitrailer traffic during the weeklong observation period, with a total of 173 semitrailers: 64 southbound, representing 35% of all inbound semitrailers, and 109 northbound, representing 60% of all outbound semitrailers.

The first option considered, therefore, is the closure of Decatur Street immediately south of the Exit 4A ramp and Simpson Road connector bridge. As part of this, Decatur Street would become a cul-de-sac north of the northernmost property/driveway, and all eastbound I-80 Exit 4A traffic would be directed left onto the Simpson Road connector bridge, which itself would be reconfigured as one-way northbound up to the Simpson Road intersection across I-80.

While this and other reconfiguration options are intended to force trucks to use the intended interchange ramps, they also affect routes for passenger vehicles, school buses, delivery vehicles and other intended local traffic into and out of Columbia.

**Figure 4** illustrates the revised approach traffic patterns resulting from the proposed Decatur Street closure. As shown, this option would eliminate the existing access to Columbia from the eastbound I-80 Exit 4A ramp. Under this option, eastbound I-80 traffic would divert to the Exit 4B ramp and use the ramp signed “Columbia” to access Decatur Street on the south side of Columbia.

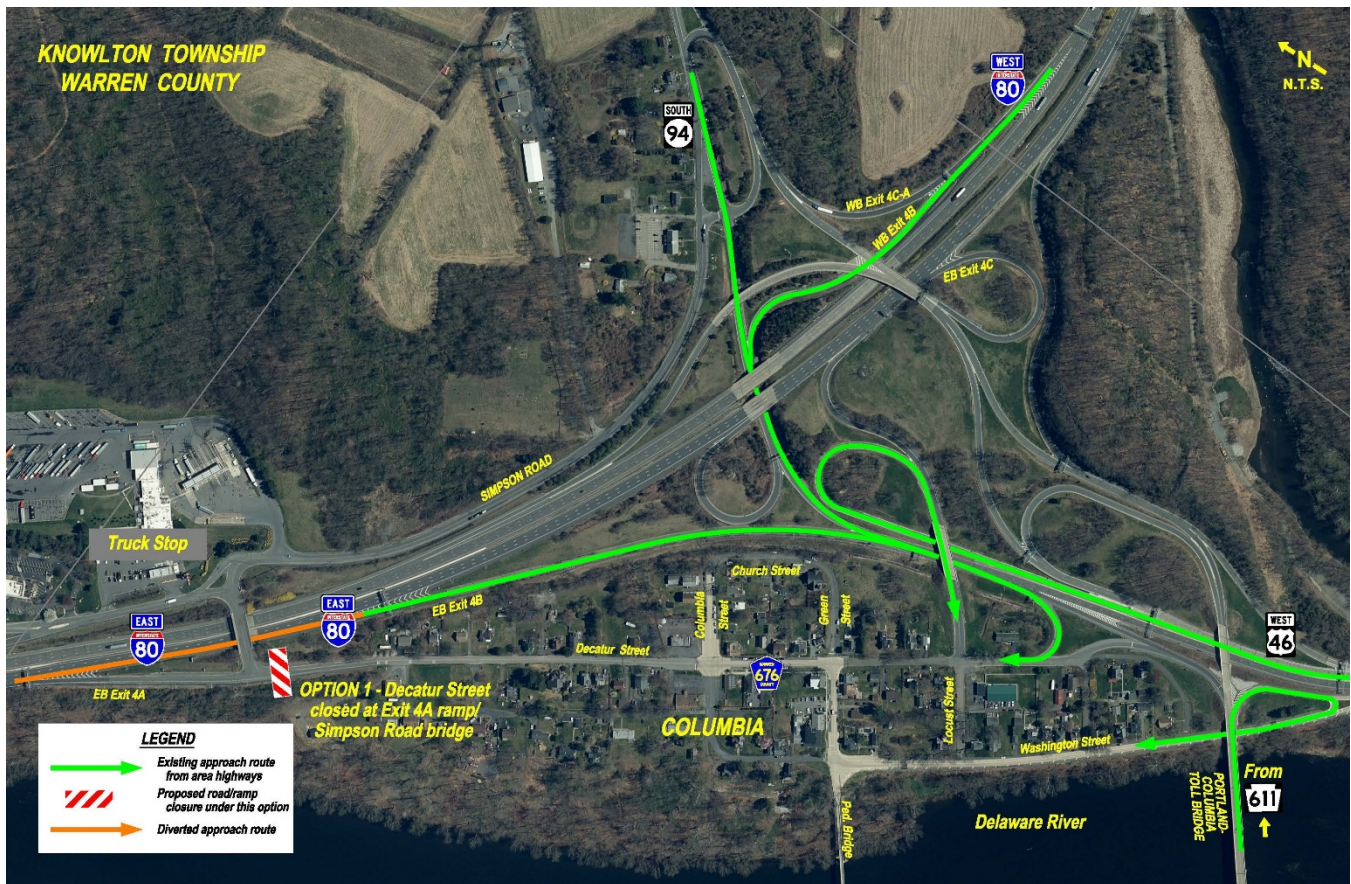
**Figure 5** illustrates the revised departure traffic patterns resulting from this proposed Decatur Street closure, which would affect access from Columbia to I-80 westbound. As shown in Figure 5, under this option, traffic exiting Columbia would need to follow a much longer route, using the ramp from Decatur Street at Locust Street to I-80 eastbound, immediately exiting at Exit 4C onto NJ 94



northbound, then using the left-side U-turn to NJ 94 southbound, to Simpson Road, entering I-80 westbound beyond the truck stop.

Regarding emergency vehicle traffic, Option 1 will not affect primary police approach routes from either the State Police barracks in Hope, or from the County Sheriff's office in Belvidere. Of the fire and/or ambulance departments reviewed previously, only the Delaware Water Gap (PA) station is affected under this option, with traffic approaching Columbia on I-80 eastbound diverted to the Exit 4B ramp.

**Figure 4. Proposed Revised Columbia Approach Routes under Option 1.**

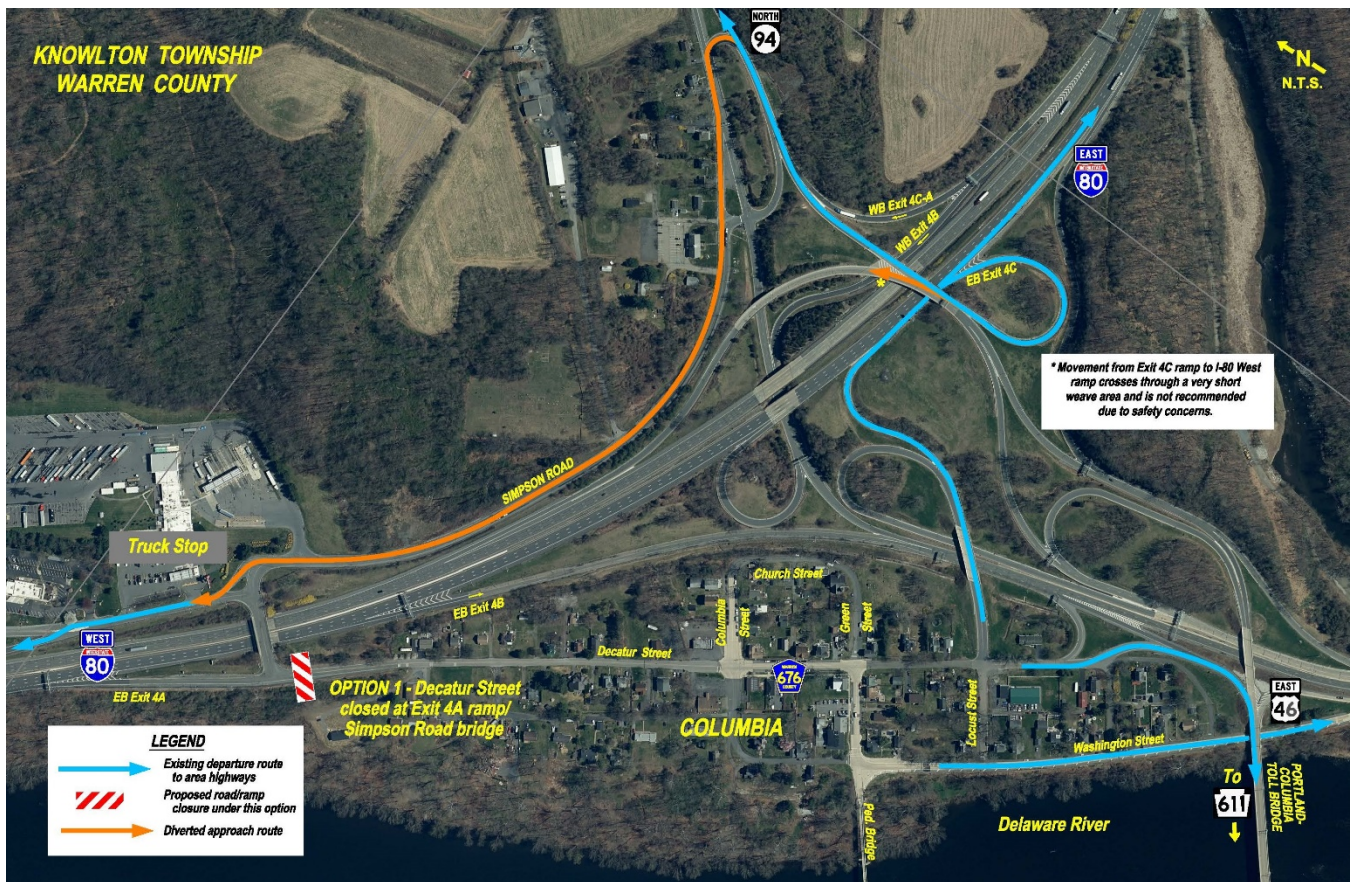


**Option 2. Closure of Decatur Street (southbound only) at Simpson Road Bridge (I-80 EB Exit 4A).**

Review of the proposed Decatur Street closure under Option 1 suggests that the diversion for inbound traffic – via simply using the next downstream exit from I-80 – will not substantially complicate access or increase travel times. However, we note that the diversion route for outbound traffic is somewhat longer and involves the navigation of several complicated movements, including a brief merge and exit onto I-80 eastbound, a movement from right to left across Route 94 northbound, a yield-controlled U-turn movement, and then movement from left to right across Route 94 southbound.



**Figure 5. Proposed Revised Columbia Departure Routes under Option 1.**



Given this, Option 2 considered under this evaluation includes a southbound closure of Decatur Street, which retains the eastbound I-80 Exit 4A restriction of inbound traffic as described under Option 1 (and as illustrated in Figure 4), but leaves Decatur Street open for northbound traffic, so outbound traffic destined to I-80 westbound can use the existing route (as illustrated in Figure 3). While this reduces the additional travel time for I-80 westbound vehicles, it also only restricts the southbound semitrailers from Decatur Street, but maintains access for northbound semitrailers, which outnumbered southbound trucks nearly two-to-one.

As with Option 1, Option 2 has minor impacts on emergency vehicle approach – it only affects vehicles approaching from the Delaware Water Gap (PA) area, which would divert to the I-80 eastbound Exit 4B ramp.

Option 3. Closure of easterly US 46 eastbound ramp to Decatur Street. This one-way ramp will affect only traffic inbound, entering Columbia. However, two of the major highway approaches to Columbia are routed on this ramp, including traffic from I-80 westbound and NJ 94 southbound. I-80 eastbound can also use this ramp as an alternate to Exit 4A (as shown in Figure 4), but this will not be considered as a diversion since, under this option, Decatur Street would still be accessible from Exit 4A. As was presented in Table 2, this ramp was the site of 58% of the semitrailers that entered Columbia during the July 2024 counts.

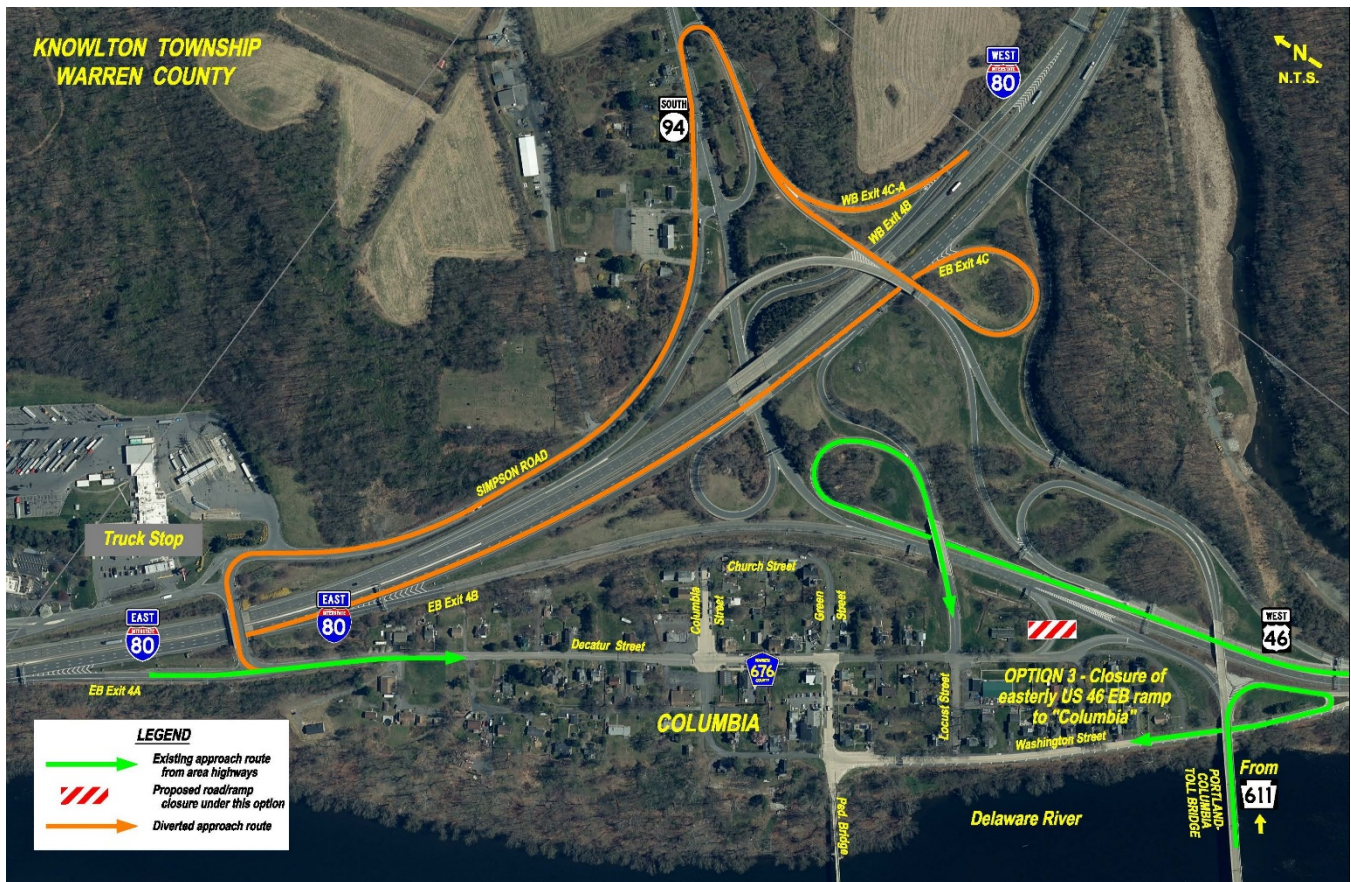


As shown in **Figure 6**, the closure of this ramp will result in the following diversions:

- Southbound NJ 94 traffic will bear right onto Simpson Road in front of the Knowlton Township Municipal Building, turn left onto the Simpson Road connector bridge over I-80, then turn left onto Decatur Street to enter Columbia.
- Westbound I-80 traffic will use the ramp signed as Exit 4C-A to NJ 94 northbound, use the U-turn ramp to NJ 94 southbound, and follow the route described above.

This option would not affect departure routes from Columbia; therefore, those would remain as illustrated previously in Figure 3.

**Figure 6. Proposed Revised Columbia Approach Routes under Option 3.**



Option 3 would not impact fire and ambulance vehicles approaching from the Knowlton Township station, nor from the County Sheriff's office in Belvidere. However, State Police vehicles approaching on I-80 westbound from Hope, and emergency vehicles approaching from Blairstown State Police vehicles on Route 94 southbound, would both be diverted as illustrated in Figure 6.

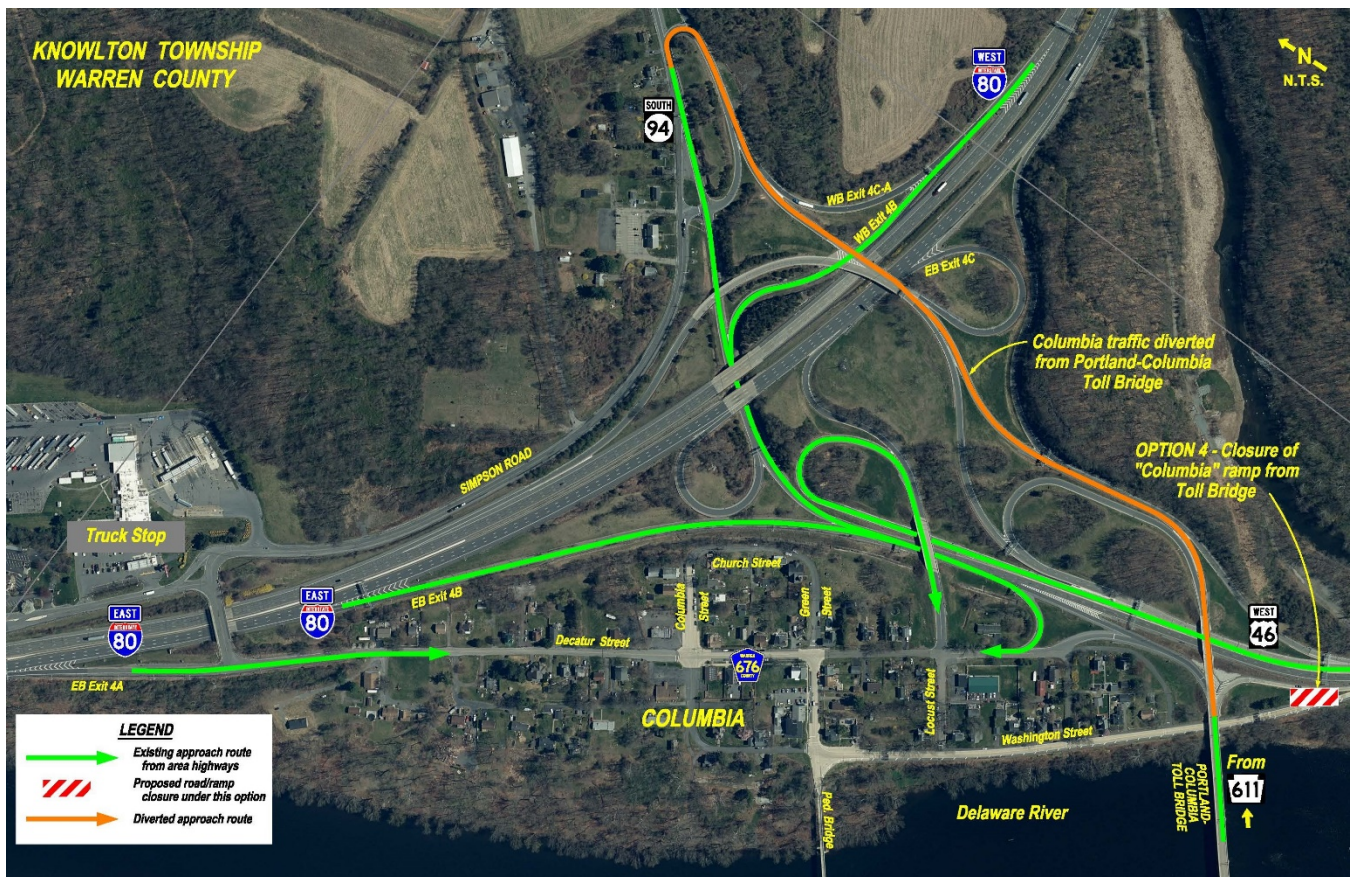
Option 4. Closure of "Columbia" ramp from Portland-Columbia Toll Bridge. This ramp virtually represents a U-turn movement, accessed from the Toll Bridge exit ramp signed for US Route 46. During NV5's July observations, the small number of semitrailers executing this movement were only just able to do so, sweeping across the entire oncoming lane. As discussed previously, NV5's



November counts showed an increased volume of trucks executing this movement (31% of the total approaching semitrailers); therefore, the closure of this ramp was also evaluated.

As shown in **Figure 7**, this movement (approaching from Pennsylvania) is the only movement affected by this closure, with a diversion route that follows NJ 94 northbound to the median U-turn ramp, then NJ 94 southbound to US 46 eastbound and the “Columbia” ramp to Decatur Street. Alternatively, once on southbound NJ 94, traffic could use Simpson Road to the west end of Decatur Street; however, that reflects a longer travel distance.

**Figure 7. Proposed Revised Columbia Approach Routes under Option 4.**



As noted previously, the two closest fire stations to Columbia are across the river in Pennsylvania, in Portland and Mount Bethel. The ramp closure under Option 4 would increase the response time to Columbia from these stations; however, we assume primary fire response to Columbia is from the Knowlton station. Option 4 would not impact approach routes from the State Police barracks in Hope nor from the County Sheriff's Office in Belvidere.

### **Summary**

All the reconfiguration options discussed above would virtually guarantee some restriction in the level of heavy truck traffic in Columbia. Elimination of entry and/or exit ramps as detailed herein

would complicate some of the significant entry movements to the community, and/or would eliminate its consideration as part of a through route.

Option 1 would have the most significant effect on reducing truck traffic in Columbia, as trucks would no longer be able to enter the north end of the community, and trucks entering from southern areas would not be able to exit in this direction. This option would restrict the path used by as much as 35% of inbound semitrailers, and 60% of outbound.

With any of these options, there would likely be some “learning curve” as drivers (including both those who are, and are not, familiar with the current configuration) realize these routes no longer serve their former purpose.

All the reconfiguration options reviewed in this report would affect roadways under the jurisdiction of other agencies. While Warren County and Knowlton Township should be provided the opportunity to review and approve the signage, the NJDOT would have ultimate approval authority for modifications to its roadways, and the Federal Highway Administration (FHWA) may also review modifications to exit ramps from an Interstate highway. In addition, Option 4 may involve Delaware River Joint Toll Bridge Commission (DRJTBC) facilities, and that agency would also have approval authority for modifications (including revised signage as detailed in the following section).

As such, the approval of the proposed reconfiguration concept(s) could be on a long timeline, and funding for the improvements would need to be secured, designs for the improvements would need to be developed, with bidding and construction (i.e., pavement removal, barrier curbs, guide signage) to follow.

### ***Potential Truck Restriction Signage Improvements***

Since the potential ramp/roadway reconfigurations discussed above could be on a very long approval timeline, NV5 has reviewed potential short-term, “interim” measures to improve existing truck restriction-related signage in an effort to achieve some increased compliance with the posted restrictions. We have conducted an inventory of the existing truck-related signing provided on all five of the major roadway approaches to this area, generally beginning at the first guide or trailblazer sign related to the Columbia interchange/area, as outlined below and as illustrated in **Figure 8**.

#### **From I-80 eastbound and Exit 4A:**

- Mainline white-on-green guide signage does not reference the Decatur Street truck restriction
- A variable message sign on the left side of the Exit 4A ramp, 150 feet beyond the ramp gore, displays the messages “TRUCK STOP TRAFFIC” and an arrow pointing left (NV5 staff also observed this sign to be present in prior field investigations dating to February 2023)
- A square white-on-blue sign reading “TRUCK STOP” with a left arrow is posted on the left side of the ramp near the Simpson Road Bridge/Decatur Street intersection
- As noted in prior studies prepared by NV5 for this area, truck restriction signs, including square “No Trucks” symbol signs with “Over 4 Tons” plaques, and a “No 102” symbol sign (referencing 8.5-foot-wide trucks) are posted on Decatur Street just beyond this intersection, and require drivers to observe and obey them prior to the decision point at the end of the ramp



**Figure 8. Existing and Proposed Truck Restriction-Related Signage (existing roadway conditions).**



From I-80 eastbound Exit 4B to US Route 46 eastbound and the exit ramp signed “Columbia”:

- As with Exit 4A, mainline white-on-green guide signage does not reference the Decatur Street truck restriction
- A white-on-green overhead sign reading “Columbia”, with a black-on-white “No Trucks Over 4 Tons” panel is posted at the exit ramp to Decatur Street.
- A 30” square “No Trucks” symbol sign with an “Over 4 Tons” plaque underneath is post-mounted on the “Columbia” ramp, 50 feet beyond the ramp gore (this sign is not clearly visible from the decision point)

From I-80 westbound Exit 4A-B-C and the exit ramp signed “Columbia”, and From NJ Route 94 southbound) and the exit ramp signed “Columbia”:

- For entry into Columbia, traffic uses the same ramp to Decatur Street as noted for US Route 46 eastbound, above, and views the same signs. No upstream truck-related signage is posted on either approach.

From US Route 46 westbound:

- A white-on-blue logo sign reading “Truck Stop Next Right” is posted 1,000 feet in advance of the ramp to I-80 eastbound/NJ 94 northbound

- At the ramp to I-80 eastbound/NJ 94 northbound, a white-on-green sign for the Columbia exit is mounted on the sign bridge, including a black-on-white panel reading “No Trucks Over 4 Tons”
- A similar “Columbia” sign, with the “No Trucks Over 4 Tons” panel, is present on the next downstream sign bridge, at the ramps to I-80 westbound and PA 611/Portland
- A 30” square “No Trucks” symbol sign with an “Over 4 Tons” plaque underneath is post-mounted on the “Columbia” ramp, 300 feet beyond the ramp gore (well beyond the decision point – at this point trucks have no choice but to continue to the end of the ramp)

From the Portland-Columbia Toll Bridge from Pennsylvania and the exit ramp signed “Columbia”:

- From the bridge, on the ramp signed for US Route 46, a 30”x36” black-on-white text sign reading “TRUCKS OVER 4 TONS NO RIGHT TURN” is mounted underneath a small green “COLUMBIA” sign on a street light standard at the U-turn ramp to Washington Street

In addition, although it is not a major approach roadway to the area, we note that eastbound Simpson Road serves trucks exiting the truck stop looking to return to the area highways. Eastbound Simpson Road provides the following signage:

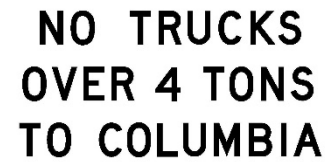
- A 30”x36” “Trucks Over 4 Tons No Right Turn” sign which NV5 observed during prior field investigations in 2023, is no longer present. It may have been removed when other yellow truck restriction signs were removed (these signs were discussed in detail in a previous NV5 report).
- A 30” square “No Trucks” symbol sign with a “No Right Turn” text sign underneath is posted on the far side of the intersection at the Simpson Road bridge, installed underneath a white-on-green directional sign for I-80, US 46 and NJ 94 with a left arrow.
- A 30” square “No Trucks” symbol sign with an “Over 4 Tons” plaque underneath is post-mounted on the southbound Simpson Road bridge. Drivers at the stop bar would need to turn their heads to the right to view this sign.
- A VMS is present reinforcing the direction to turn left for access to I-80, US 46 and NJ 94. IN 2023 field investigations, NV5 observed this VMS near the other signage at the intersection, but it has since been relocated slightly further east on Simpson Road, putting it farther outside the field of vision for motorists on this approach.

A large yellow highway-size sign is posted on I-80 eastbound between the Exit 4A and 4B ramps, advising of 10-ton truck weight limits on New York Route 94 and several other connecting NY routes. Via NJ 94, the New York state line is roughly 50 miles from this point. While this sign is obviously encouraging truck drivers to remain on I-80 for access to this area of New York, the signage related to truck restrictions in Columbia – located at this interchange – is much less clear or conspicuous by comparison.

On many of these roadways, truck restriction signage is only provided at the decision point and may not give motorists time to react if they are already following guidance to travel in that direction. Some of the signage is also small and may fail to draw motorists’ attention especially given the complexity of the interchange and the need to pay close attention at merge and diverge points.



As a short-term, interim measure, we believe that larger supplemental regulatory signs should be installed on several of the major roadway approaches. An example of such a sign is shown at right; this black-on-white is sized at approximately 72" wide by 36" high and uses six-inch high characters, and could be supplemented by a "No Trucks" symbol sign. Since most of the approaches to this area are simply signed "Columbia", the reference to the village on the sign should be easily comprehensible. Proposed locations for these signs are as follows:



**NO TRUCKS  
OVER 4 TONS  
TO COLUMBIA**

- On the I-80 eastbound mainline in advance of the Exit 4A ramp
- On US 46 eastbound (from I-80 Exit 4B) ±500 feet beyond the ramp gore point
- On NJ Route 94 southbound approaching the I-80 overpass
- On the ramp from the Toll Bridge to US 46 westbound, in the infield beyond the gore. For clarity, a larger "Columbia" guide sign at the ramp diverge would help clarify the location of the truck restriction.

On the eastbound Simpson Road approach to the Simpson Road bridge intersection, a smaller, modified version of this sign could be installed reading "ALL TRUCKS OVER 4 TONS MUST TURN LEFT", to replace the similar sign that was formerly posted here. This sign could also be considered in addition to the proposed improvement scheme for the I-80 eastbound Exit 4A ramp which was developed as part of a prior study. These signs are illustrated, along with the existing truck-related signs, in **Figure 8**.

### ***Additional Long-Term Improvement Concepts***

Through the conduct of this evaluation, several additional roadway/interchange reconfiguration options were identified as potential long-term strategies to address circulation concerns in the area.

Reconfiguration of Simpson Road/Simpson Road Bridge intersection. This intersection has an unusual configuration, as illustrated in **Figure 9**. It is effectively a T-intersection, but the east and west legs of Simpson Road are offset from each other by roughly 50 feet. The Simpson Road bridge across I-80 extends south from Simpson Road at the offset point. However, it is the westerly (eastbound) Simpson Road approach that is stop-controlled. Westbound Simpson Road traffic encounters a splitter island in the curvature at the intersection approach, dividing traffic continuing west on Simpson Road from traffic making an effective left turn onto the Simpson Road bridge. The northbound approach from the bridge is also uncontrolled.

Our investigations have shown that semitrailers have been observed turning right from the stop-controlled eastbound Simpson Road approach to this intersection, despite existing and/or prior signage (recommendations for improved signage on this approach have been described previously).

Because the desired movement for semitrailers on this approach is a "straight through" movement on Simpson Road, to NJ Route 94 near the Knowlton Township municipal building, we believe that reconfiguration of this intersection to smooth out the angles involved in the Simpson Road "through movements" would help encourage traffic to continue eastbound on Simpson Road in accordance with the posted signage. This improvement is reflected in the concept improvement diagram presented at the end of this report in **Figure 11**. We note that the potential Option 1 reconfiguration

(closure of Decatur Street beyond the Exit 4A ramp) is reflected in this figure; however, this could also be implemented

**Figure 9. Existing Intersection Conditions – Simpson Road and Simpson Road Bridge.**



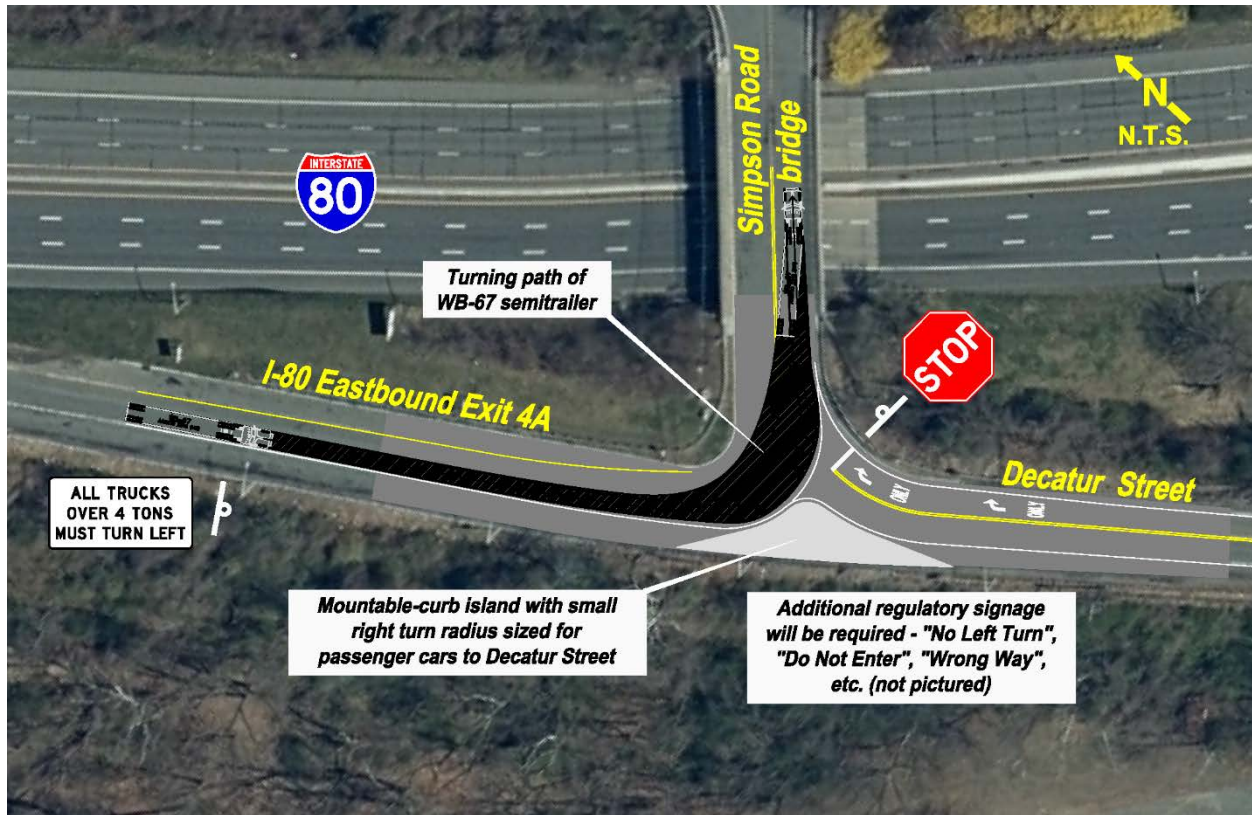
independent of any other potential improvements. The radius of the southwest corner of the intersection (adjacent to the eastbound right turn onto the Simpson Road bridge) could be designed so that the geometry discourages large trucks from executing this movement. The reduced intersection angles would also simplify the posting of regulatory and guide signage on all approaches to the intersection.

We note that a roundabout was also identified as a potential reconfiguration option at this intersection. However, the proximity of truck stop access driveways along both the east and west legs of Simpson Road, and the need to maintain access to these driveways, would complicate the design of a roundabout here, and especially at the easterly driveway, stopped left-turning traffic into the truck stop could queue into the roundabout causing “gridlock” conditions.

Mountable island at I-80 eastbound Exit 4A/Decatur Street intersection. As a less restrictive reconfiguration of this intersection. NV5 has reviewed a concept which implements a mountable island along the south side of the eastbound Exit 4A ramp to eliminate the “straight through” movement onto Decatur Street. The island would be configured to direct all traffic (trucks and passenger vehicles) to begin to curve to the left at the top of the ramp. Midway through this curve,

passenger car traffic will be able to turn right into Decatur Street; however, the near-side corner radius for this movement will be sized so as to discourage semitrailers from executing this movement, since their trailers would ride up over this median. This concept is illustrated in Figure 10.

**Figure 10. Mountable island reconfiguration of eastbound Exit 4A ramp at Decatur Street.**



Under existing conditions, vehicles on the Exit 4A ramp will proceed straight unless they choose to turn left. The strategy behind this proposed reconfiguration, therefore, is that the island will direct all traffic to the left, toward the Simpson Road bridge, unless they choose to turn right; and the geometry provided for this right turn will go further to discourage semitrailers from choosing this movement. The mountable island is proposed so as to still permit the occasional entry to Decatur Street of legitimate trucks (fire trucks, deliveries, moving vans). Because passenger car traffic will still be able to continue to enter Columbia via this ramp, the impacts of traffic diversions/rerouting, as evaluated for other reconfiguration options, do not apply to this option.

Interchange reconfiguration with roundabouts. We have noted that the I-80 interchange with Routes 46 and 94, the Portland-Columbia Toll Bridge and local Columbia streets is complex and non-intuitive. This was specifically demonstrated through video evidence of truck drivers entering Columbia and then reversing course.

In addition, the interchange almost exclusively involves high-speed ramps, which reduce travel times through the interchange, but which also reduce the length of time that traffic signs are within a



driver's line-of-sight. We believe that the multiple truck movements observed entering Columbia, despite posted signage, are a result of drivers focusing their attention on navigating this complex intersection at speed and failing to observe other traffic control devices.

As an experiment, NV5 developed a concept for a wholesale reconfiguration of the interchange, using three (3) modern roundabouts to address vehicle conflict points. This concept is illustrated in **Figure 11** at the end of this report. Included in this concept is the "Option 1" closure of Decatur Street east of the Exit 4A ramp and the Simpson Road bridge (which is then reconfigured as one-way northbound). It provides at least one option for all movements between all the major roadways in the area.

The benefits of this potential interchange reconfiguration include the following:

- Replacement of the existing complex ramp network with a more straightforward arrangement, allowing for better guide signage and truck restriction signage, and potential "gateway" treatments at Columbia entry points (vegetation, colored pavement, street furniture), reflecting residential "small town" neighborhood and discouraging truck entry
- Reduction of travel speeds through the area, reducing severity of crashes
- With reduced speeds, additional time for drivers to comprehend posted signage
- Improved "Complete Streets" compliance, including a pedestrian- and bicycle-compatible crossing of I-80 which is not provided today
- Elimination of three (3) existing bridge structures, reducing inspection and maintenance efforts (NJDOT)
- Elimination of a significant amount of pavement, reducing impervious area and stormwater impacts
- New or existing ramps providing "bypass" of roundabouts could improve roundabout capacity by reducing circulating volume
- With the Option 1 closure of Decatur Street, elimination of local Columbia streets as an efficient route for trucks

Drawbacks and/or design challenges associated with this reconfiguration include:

- All traffic moving from one side of I-80 to the other will use the existing southbound NJ Route 94 roadway underneath I-80, which would be reconfigured for bidirectional traffic. The existing roadway width under this overpass may not be sufficient for two travel lanes plus shoulders (per current NJDOT design standards). If this underpass needs to be widened, the complexity and cost of the project will increase substantially.
- Single-lane roundabouts are shown for illustrative purposes; however, detailed traffic engineering analysis of peak-season traffic volumes would need to be conducted to determine whether these roadway configurations would address demands. This includes summer and winter weekend traffic to and from the Poconos region.
- Based on Google Earth data, NJ Route 94 traverses an elevation change of approximately 35 feet between the I-80 underpass and the existing U-turn ramp north of the Municipal Building. Inclusion of a roundabout on the north side of I-80 could effectively reduce the length of roadway to address this elevation change, increasing roadway grades.
- A reconfiguration of this magnitude will be complex in terms of maintenance and protection of traffic and constructability.

- All concepts will involve significant coordination with, and approvals from, outside agencies, including the NJDOT, DRJTBC and/or FHWA.
- We do not believe the interchange is the site of current, significant safety/crash issues, nor of traffic congestion/delays. As such, improvements of this magnitude at this interchange are not likely to be high on NJDOT's priority list.

Please contact this office with any questions or comments on this analysis. Thank you.

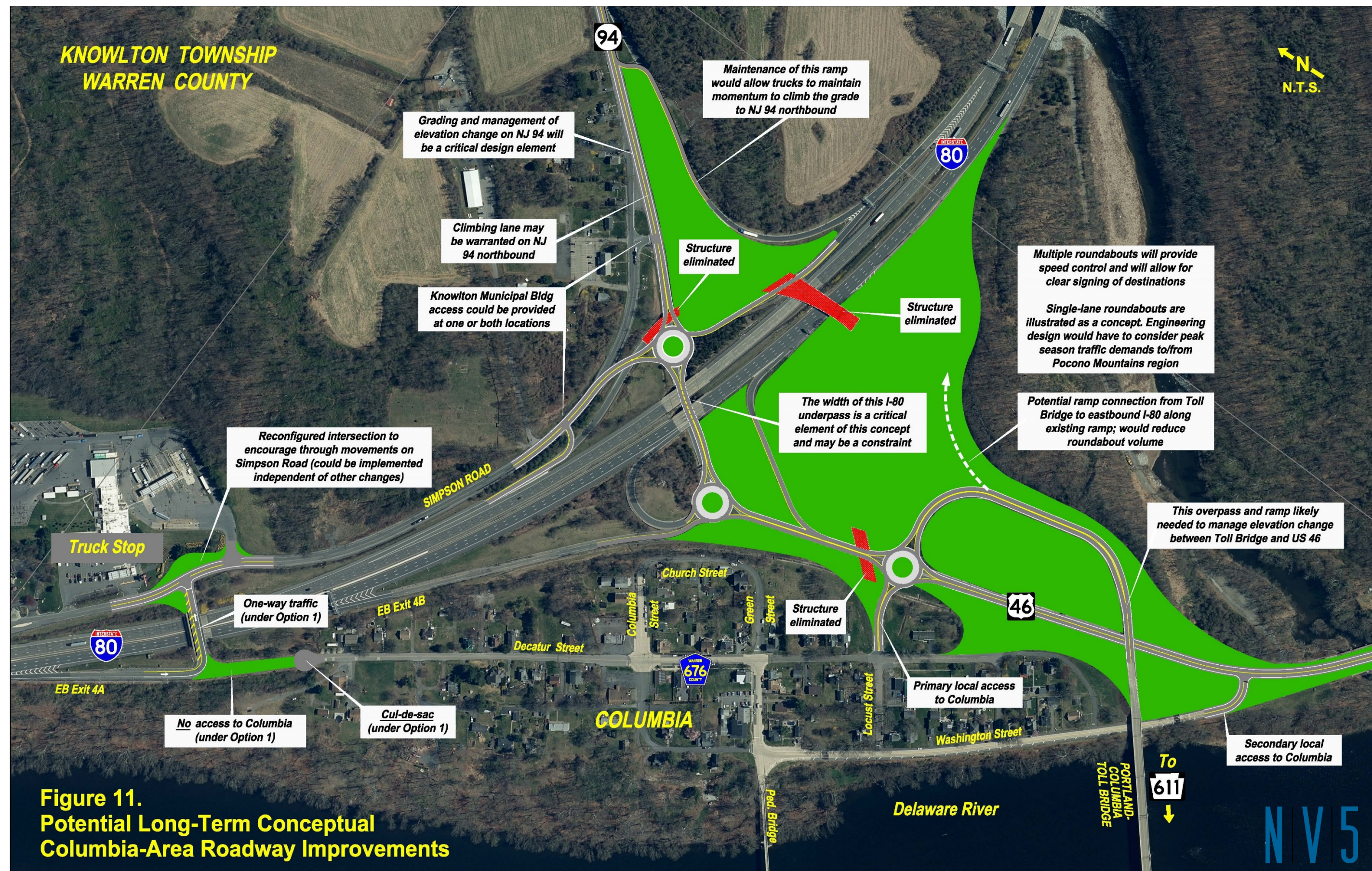
Very truly yours,  
NV5



Brian M. Stankus, P.E., PTOE  
Senior Traffic Engineer

cc: Nigel Newton, NV5





**Figure 11.  
Potential Long-Term Conceptual  
Columbia-Area Roadway Improvements**





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Site Code:  
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## Turning Movement Data

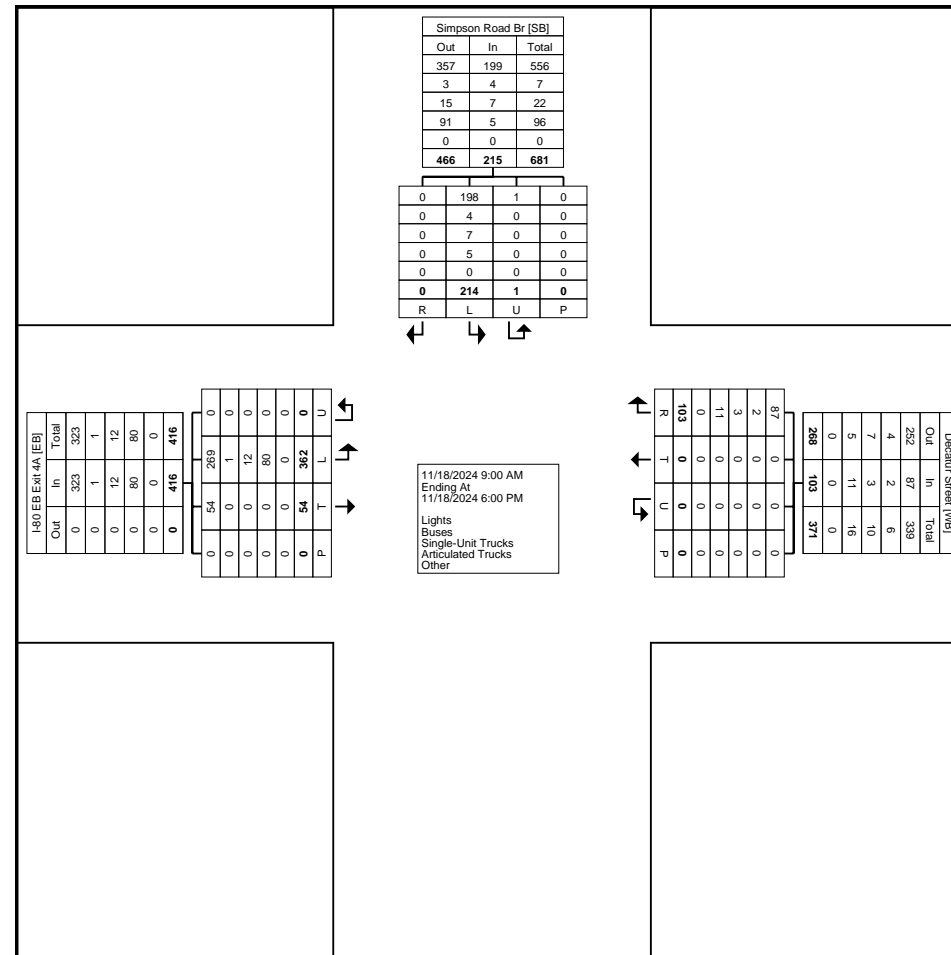
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Total %	0.0	29.2	0.1	-	29.3	14.0	0.0	0.0	-	14.0	7.4	49.3	0.0	-	56.7	-
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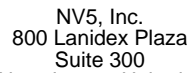
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## Turning Movement Data Plot

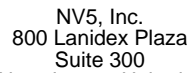


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Page No: 4

### Turning Movement Peak Hour Data (11:00 AM)

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Start Date: 11/18/2024  
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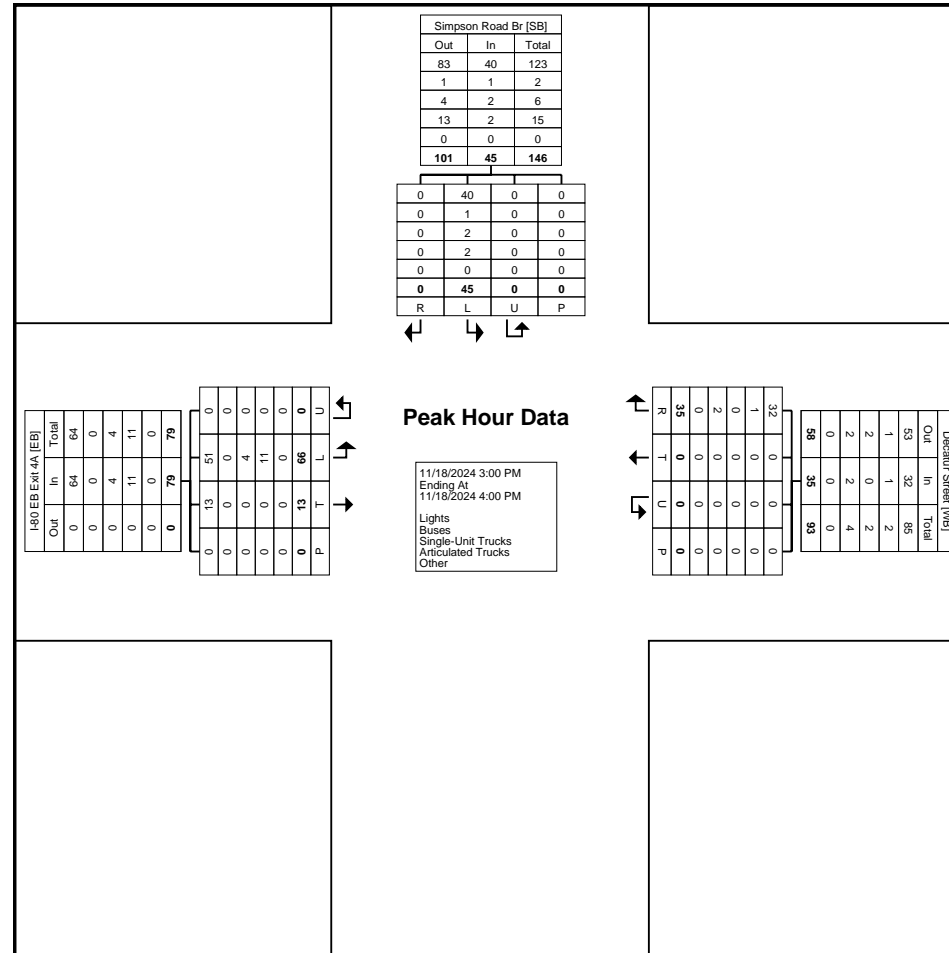
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Turning Movement Peak Hour Data Plot (3:00 PM)



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Count Name: DecaturSt & LocustSt & Ramp  
Site Code:  
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## Turning Movement Data

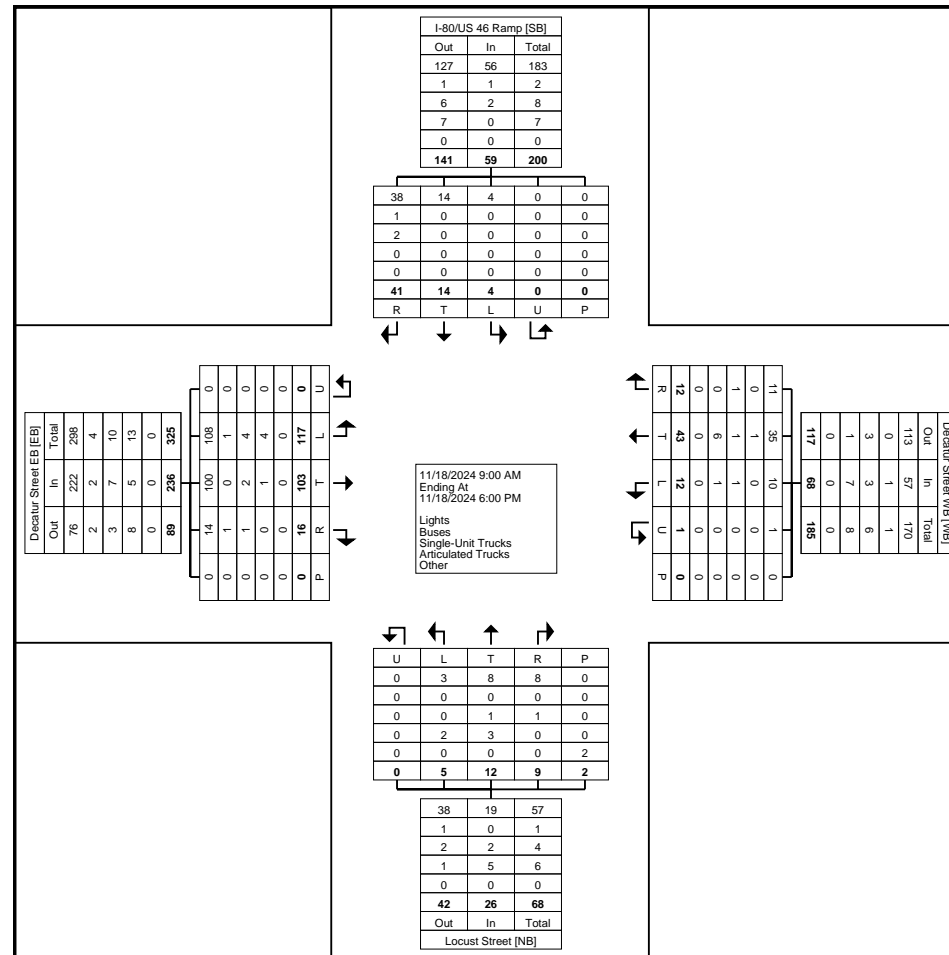
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Grand Total	41	14	4	0	0	59	12	43	12	1	0	68	9	12	5	0	2	26	16	103	117	0	0	236	389
Approach %	69.5	23.7	6.8	0.0	-	-	17.6	63.2	17.6	1.5	-	-	34.6	46.2	19.2	0.0	-	-	6.8	43.6	49.6	0.0	-	-	-
Total %	10.5	3.6	1.0	0.0	-	15.2	3.1	11.1	3.1	0.3	-	17.5	2.3	3.1	1.3	0.0	-	6.7	4.1	26.5	30.1	0.0	-	60.7	-

Lights	38	14	4	0	-	56	11	35	10	1	-	57	8	8	3	0	-	19	14	100	108	0	-	222	354
% Lights	92.7	100.0	100.0	-	-	94.9	91.7	81.4	83.3	100.0	-	83.8	88.9	66.7	60.0	-	-	73.1	87.5	97.1	92.3	-	-	94.1	91.0
Buses	1	0	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	1	0	1	0	-	2	4
% Buses	2.4	0.0	0.0	-	-	1.7	0.0	2.3	0.0	0.0	-	1.5	0.0	0.0	0.0	-	-	0.0	6.3	0.0	0.9	-	-	0.8	1.0
Single-Unit Trucks	2	0	0	0	-	2	1	1	1	0	-	3	1	1	0	0	-	2	1	2	4	0	-	7	14
% Single-Unit Trucks	4.9	0.0	0.0	-	-	3.4	8.3	2.3	8.3	0.0	-	4.4	11.1	8.3	0.0	-	-	7.7	6.3	1.9	3.4	-	-	3.0	3.6
Articulated Trucks	0	0	0	0	-	0	0	6	1	0	-	7	0	3	2	0	-	5	0	1	4	0	-	5	17
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	14.0	8.3	0.0	-	10.3	0.0	25.0	40.0	-	-	19.2	0.0	1.0	3.4	-	-	2.1	4.4
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

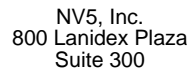


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Turning Movement Data Plot

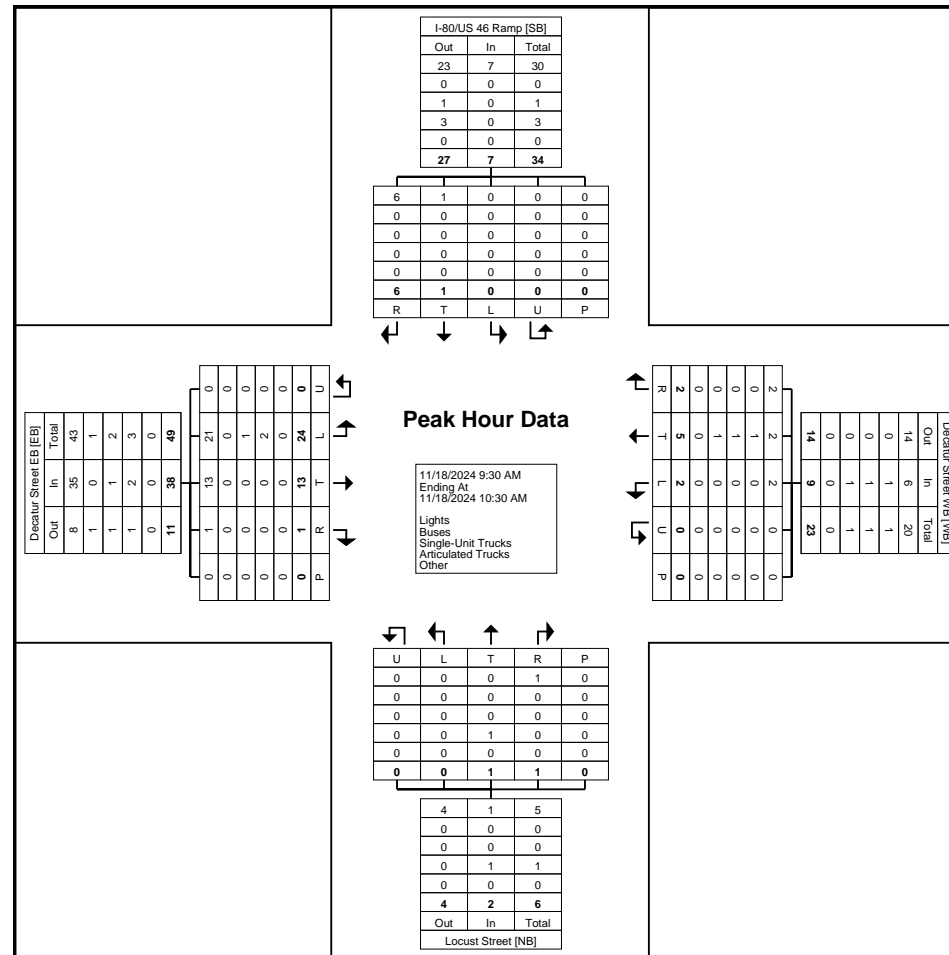


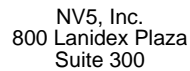
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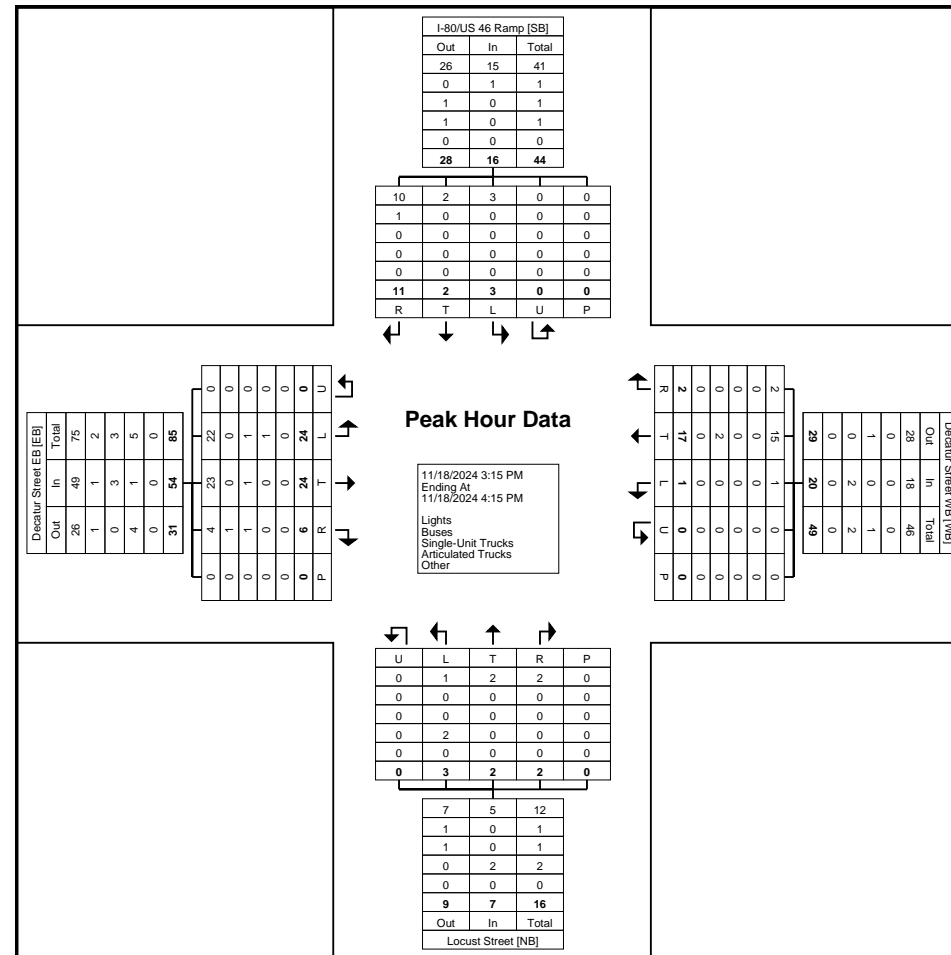


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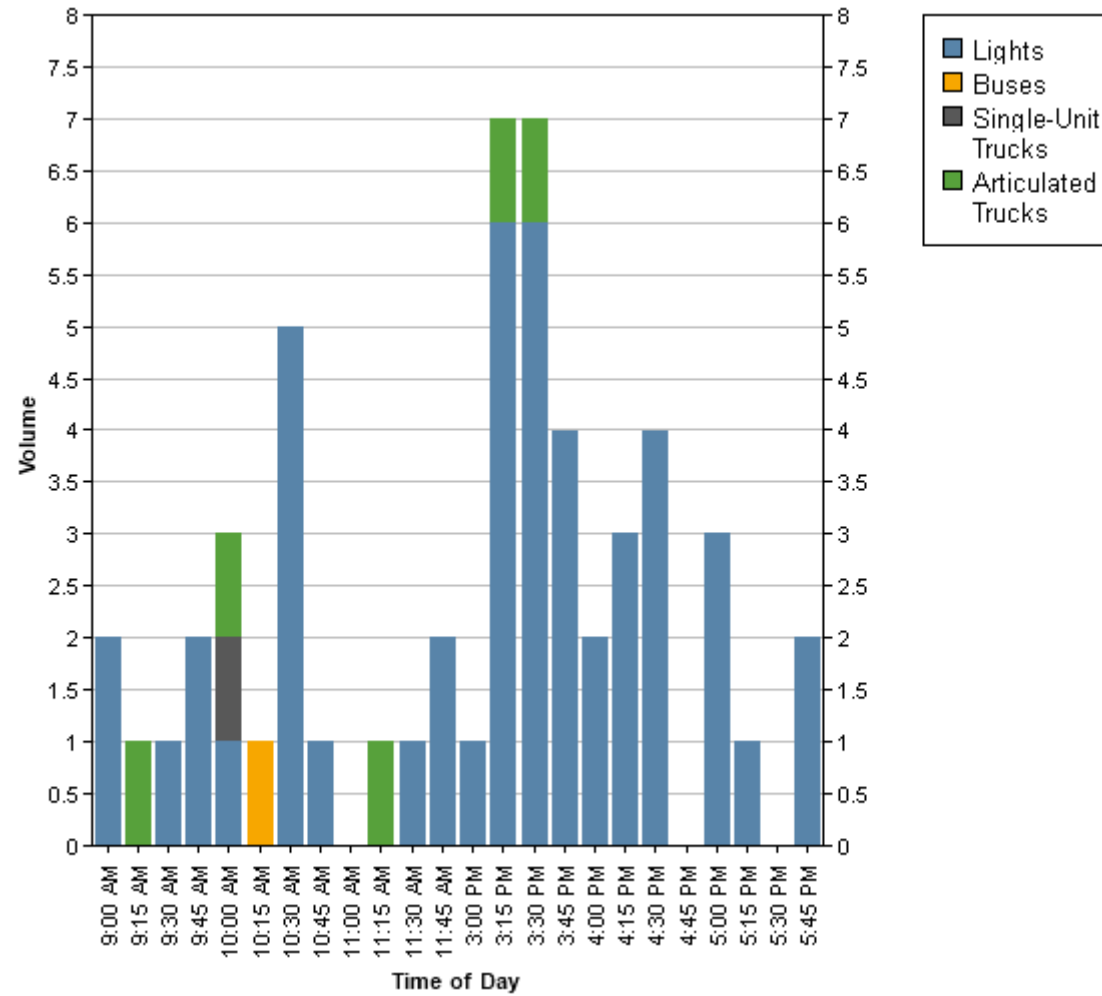
**Direction (Northbound)**

Start Time	Lights	Buses	Single-Unit Trucks	Articulated Trucks	Total
9:00 AM	2	0	0	0	2
9:15 AM	0	0	0	1	1
9:30 AM	1	0	0	0	1
9:45 AM	2	0	0	0	2
10:00 AM	1	0	1	1	3
10:15 AM	0	1	0	0	1
10:30 AM	5	0	0	0	5
10:45 AM	1	0	0	0	1
11:00 AM	0	0	0	0	0
11:15 AM	0	0	0	1	1
11:30 AM	1	0	0	0	1
11:45 AM	2	0	0	0	2
3:00 PM	1	0	0	0	1
3:15 PM	6	0	0	1	7
3:30 PM	6	0	0	1	7
3:45 PM	4	0	0	0	4
4:00 PM	2	0	0	0	2
4:15 PM	3	0	0	0	3
4:30 PM	4	0	0	0	4
4:45 PM	0	0	0	0	0
5:00 PM	3	0	0	0	3
5:15 PM	1	0	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	2	0	0	0	2
Total	47	1	1	5	54
Total %	87.0	1.9	1.9	9.3	100.0
AM Times	9:45 AM	9:30 AM	9:15 AM	9:15 AM	9:45 AM
AM Peaks	8	1	1	2	11
PM Times	3:15 PM	3:00 PM	3:00 PM	3:00 PM	3:15 PM
PM Peaks	18	0	0	2	20



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**Direction (Southbound)**

Start Time	Lights	Buses	Single-Unit Trucks	Articulated Trucks	Total
9:00 AM	3	0	0	0	3
9:15 AM	5	0	0	0	5
9:30 AM	2	0	0	0	2
9:45 AM	5	0	0	0	5
10:00 AM	1	0	0	0	1
10:15 AM	4	0	0	0	4
10:30 AM	4	0	0	0	4
10:45 AM	1	0	0	0	1
11:00 AM	3	0	0	0	3
11:15 AM	3	0	0	0	3
11:30 AM	4	0	0	0	4
11:45 AM	0	0	0	0	0
3:00 PM	6	0	0	1	7
3:15 PM	8	0	0	0	8
3:30 PM	3	0	1	0	4
3:45 PM	7	0	0	0	7
4:00 PM	7	0	0	0	7
4:15 PM	6	0	0	0	6
4:30 PM	5	0	0	0	5
4:45 PM	4	0	0	0	4
5:00 PM	4	0	0	0	4
5:15 PM	6	0	0	0	6
5:30 PM	5	0	0	0	5
5:45 PM	2	0	1	0	3
Total	98	0	2	1	101
Total %	97.0	0.0	2.0	1.0	100.0
AM Times	9:00 AM	9:00 AM	9:00 AM	9:00 AM	9:00 AM
AM Peaks	15	0	0	0	15
PM Times	3:15 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM
PM Peaks	25	0	1	1	26





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