

Fort Monmouth Reuse and Redevelopment Plan

Technical Memorandum: Traffic and Transportation

Prepared for: Fort Monmouth Economic Revitalization Planning Authority

Prepared by: STV, Inc.

April 10, 2008, modified June 25, 2008

3.0 Traffic and Transportation

The analysis of future conditions with the base reuse project in place involves the determination of the volume of trips expected to be generated by the proposed development by travel mode, the assignment of these vehicle trips to the roadway network approaching the site, and the determination of projected levels of service at the critical locations analyzed.

3.1 Future No Action Conditions

The analysis of future traffic conditions without the proposed base reuse plan in place (i.e., typically referred to as the future No Build condition) serves as the baseline against which the potential impacts of the project will be compared. The future No Action analysis includes background traffic volume increases to reflect expected growth in overall travel through and within the area, major roadway operational system changes, and major real-estate developments (in this case, *other* than reuse of Fort Monmouth) scheduled to be occupied or implemented by the future Build-Out year 2028.

Two factors have major effect on moving these traffic analyses forward. The first is identifying an appropriate background growth factor. Discussions with and information provided by Monmouth County Planning Board (MCPB) representatives as part of an examination of the Route 33 corridor west of the GSP indicated an average growth rate of about 0.9 percent per year, which would translate to a total compounded growth factor of about 20 percent over today's traffic volumes (a multiplicative factor of 1.2). This rate matches well with the historical decade-by-decade population growth trends for Monmouth County since 1930, and is consistent with more recent U.S. Census trends of the neighboring counties of Ocean and Middlesex.

The second major factor to consider relates to activities on the Fort properties that will no longer operate when the reuse plan commences. For these analyses, all active uses on the Fort today are assumed to be eliminated when the reuse plan commences, so vehicle trips associated with these uses will be eliminated from ("credited to") the traffic network. These tripmaking activities were detailed by Fort Monmouth security and army personnel for each of the six active gates as of December 2007 for a typical weekday. The activities are composed of civilian, contractor, visitor, and military personnel; most of these are civilian trips. The Fort-related vehicle trips were further broken down into the AM and PM weekday peak hour using the ratio of peak-hour-to-daily trip activities issued in the Institute of Transportation Engineers' *Trip Generation* reference; in this case, military uses typically exhibit a pattern that has about 22 percent of their trips occurring in each of the AM and PM peak hours. Directionally, military trips, per ITE, are highly peaked by peak hour, with 88 percent entering a military facility in the morning and about 75 percent leaving in the late afternoon. Overall, using these trip generation data and factors, about 2,200 vehicles enter and 300 exit in the AM peak hour, while in the PM peak

hour, 625 would enter and 1,875 depart.

Finally these trips were then deducted from existing traffic flows based on the existing pattern of arrivals and departures at each gate. Of the six gates, the main access point (West Gate on Route 35) is busiest with about one-third of all vehicles entering and leaving the Fort, followed by between 15 and 20 percent using the gates designated as Nicodemus (Broad Street), 400 (east side of Oceanport Avenue), and Corregidor (Pearl Harbor Road). Between five and ten percent were assigned to East Gate on the west side of Oceanport Avenue and Bataan Gate on Tinton Avenue. The trip credits were then refined to general directions based on the prevailing traffic volumes entering and departing the overall study area. No Action traffic volumes are illustrated in Figures 3-1 and 3-2 below.

As with analyses for existing conditions, each of the signalized intersections studied in the traffic study area was analyzed in terms of its capacity to accommodate existing traffic volumes and their resulting LOS. A summary of the findings is presented in Table 3-1 below.

For the most traffic movements would experience a worsening in level of service as compared to the existing condition, although there would be some individual approaches and movements that would have a slightly better LOS if the Fort-related trip credit outweighed the background growth rate.

In terms of overall intersection operations (a weighted average of all approaches), two locations would worsen into congested conditions. These locations include Tinton Avenue/Hope Road during both the AM and PM peak hours and the Sycamore Avenue/Branch Avenue near the NJT Little Silver rail station in the PM peak. In each case, overall LOS would worsen into E or F from an existing LOS C or D.

The Route 36/Hope Road intersection would benefit from the Fort trip credit, although not enough to result in acceptable conditions. All approaches would remain characterized as within failure LOS F conditions, and the overall intersection would continue to function as LOS F. Further east, both the Broadway and Monmouth Road individual movements at Route 36 would continue to have LOS F conditions, although the Broadway intersection would improve slightly (due to Fort trip credits) from an existing LOS E for the overall intersection to LOS D in the Future No Action scenario its overall intersection operation.

Overall, while the Fort trip credit would provide for some congestion relief (most notably at the existing Fort entrances), the roadways surrounding Fort Monmouth routinely would continue to experience some significant congestion, particularly on Route 36. These findings point to the need for some additional roadway capacity and/or intersection reconfiguration should the county continue on its forecasted growth trends.

Figure 3-1: 2028 No Action AM Peak Hour Traffic Volumes
 (accounts for trip credits for existing Fort Monmouth vehicles)

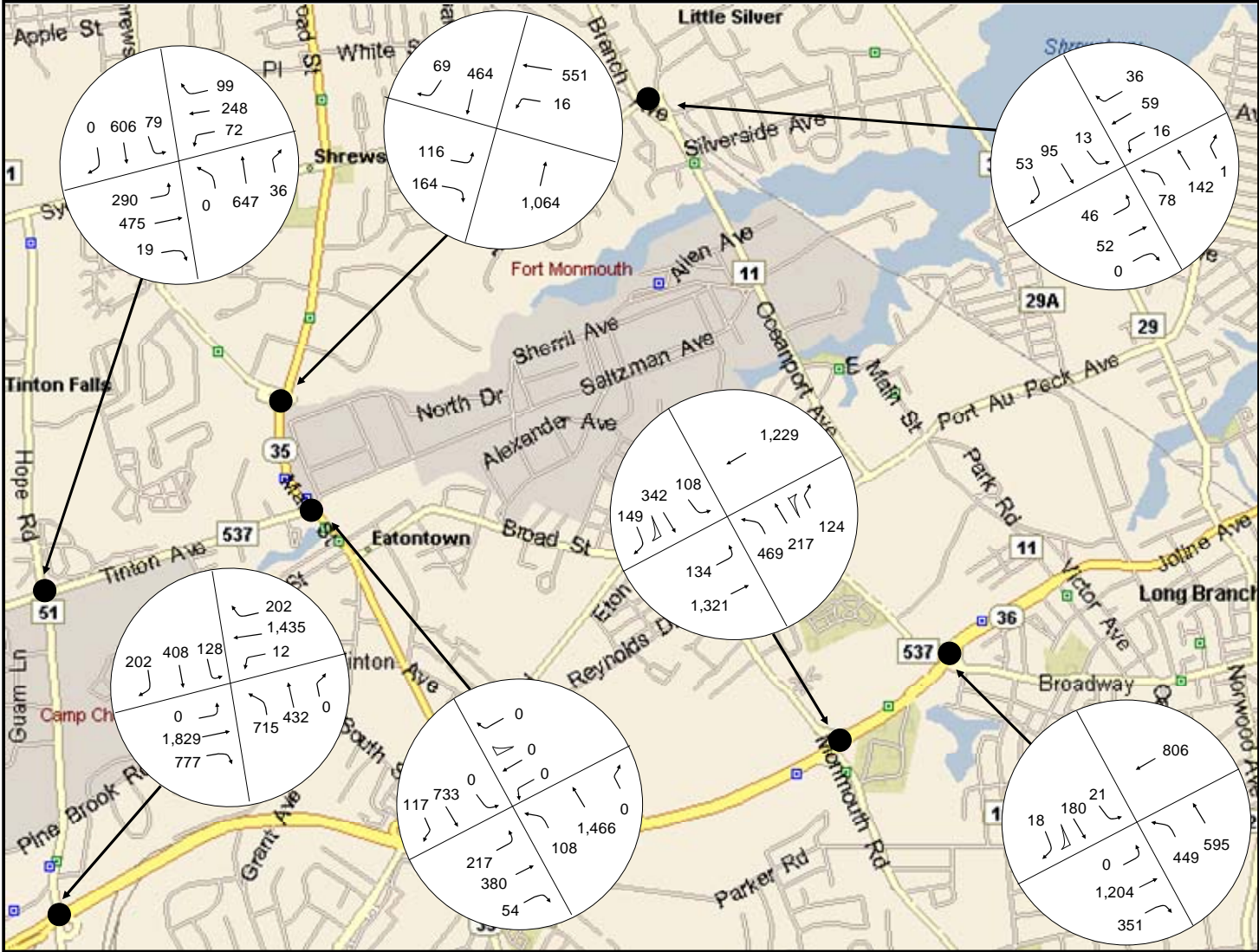


Figure 3-2: 2028 No Action PM Peak Hour Traffic Volumes
 (accounts for trip credits for existing Fort Monmouth vehicles)





STV Incorporated

Table 3-1: 2028 No Action Traffic Conditions
(accounts for trip credits for existing Fort Monmouth vehicles)



STV Incorporated

Signalized Intersection & Approach	Mvt.	AM Peak Hour			PM Peak Hour			
		V/C	Control Delay	LOS	V/C	Control Delay	LOS	
Route 35 at Schrewsbury Avenue								
Schrewsbury Avenue	EB	L	0.76	63.9	E	0.66	46.8	D
		R	0.32	35.2	D	0.54	31.6	C
	WB	L	0.11	42.7	D	0.14	36.3	D
		T	0.87	51.3	D	0.88	44.7	D
Broad Street	NB	T	0.66	18.6	B	0.50	16.1	B
		SB	0.35	14.4	B	0.77	21.1	C
		Overall Intersection	-	28.2	C	26.6	C	
Route 35 at Tinton Avenue								
Tinton Avenue	EB	DeFL			-	0.27	22.7	C
		(L)TR	0.84	38.6	D	0.22	22.4	C
	WB	L	0.01	30.5	C	0.00	27.2	C
		T	0.00	30.4	C	0.00	27.2	C
Route 35	NB	L	0.35	10.8	B	1.35	216.5	F
		TR	1.02	53.2	D	0.93	33.9	C
	SB	L	0.00	16.0	B	0.01	15.8	B
		TR	0.63	20.3	C	1.03	55.8	E
		Overall Intersection	-	39.5	D	54.2	D	
Route 36 at Monmouth Road								
Route 36	EB	L	0.25	17.8	B	0.36	24.7	C
		T	0.58	20.4	C	0.62	21.8	C
	WB	T	0.65	29.9	C	1.01	63.1	E
		NB	0.89	75.1	E	1.07	120.8	F
Monmouth Road	SB	LT	0.77	54.1	D	0.96	75.6	E
		L	0.47	48.8	D	0.95	92.5	F
		Overall Intersection	-	34.0	C	53.3	D	
Route 36 at Broadway								
Route 36	EB	TR	0.69	25.4	C	0.77	28.1	C
		WB	0.49	22.6	C	0.67	26.4	C
Broadway	NB	L	0.88	44.8	D	0.89	53.7	D
		T	1.10	100.9	F	0.94	62.8	E
	SB	L	0.09	33.4	C	0.00	26.3	C
		T	0.77	50.8	D	0.47	30.2	C
		Overall Intersection	-	40.9	D	33.5	C	
Branch Avenue at Sycamore Avenue								
Sycamore Avenue	EB	L	0.19	19.4	B	0.55	36.1	D
		TR	0.14	18.6	B	0.54	23.0	C
	WB	L	0.11	29.0	C	1.23	197.7	F
		T	0.29	30.7	C	0.87	51.6	D
Branch Avenue	NB	R	0.10	28.9	C	0.03	28.1	C
		L	0.34	17.1	B	1.31	197.5	F
	SB	TR	0.32	17.4	B	0.46	18.7	B
		L	0.08	23.8	C	0.18	24.0	C
		T	0.31	26.0	C	0.74	34.3	C
		R	0.18	24.7	C	0.26	24.6	C
		Overall Intersection	-	22.0	C	60.1	E	
Route 36 at Hope Road								
NJ 36	EB	T	1.15	108.5	F	1.26	161.2	F
		R	0.53	0.4	A	0.54	0.4	A
	WB	L	0.20	65.2	E	0.00	60.7	E
		T	0.80	26.2	C	0.92	38.2	D
Hope Road	NB	R	0.14	0.0	A	0.09	0.0	A
		LTR	1.70	373.9	F	1.93	476.4	F
	SB	LTR	1.63	350.6	F	1.57	321.2	F
			-	149.1	F		194.3	F
		Overall Intersection	-	149.1	F	194.3	F	
Tinton Avenue at Hope Road								
Tinton Avenue	EB	L	1.08	113.1	F	0.38	33.8	C
		TR	0.99	67.8	E	0.88	43.2	D
	WB	L	0.96	131.5	F	0.77	49.3	D
		TR	1.17	143.7	F	0.72	30.9	C
Hope Road	NB	L	0.00	39.1	D	0.46	43.2	D
		TR	0.64	23.1	C	0.69	25.6	C
	SB	L	0.80	71.6	E	0.87	104.4	F
		TR	1.00	59.2	E	1.02	66.0	E
		Overall Intersection	-	67.0	E	43.1	D	



STV Incorporated

3.2 Future Action Conditions

There were a number of concerns to address in the course of assessing future traffic conditions with the base reconfigured with new land uses. Among these include the inclusion of: 1) a New Jersey Transit rail station at the west end of the Charles Wood properties (presumably on the Red Bank alternative of the agency's ongoing Monmouth-Ocean-Middlesex (MOM) rail study); 2) whether to relocate the existing Little Silver rail station south to Oceanport directly to create a true transit-oriented development (TOD) area on the east side of the project; 3) the creation of a new GSP Interchange 107 in the area where the parkway bridges over Tinton Avenue; 4) a reconfiguration of the Route 36 / Hope Road intersection; and 5) the scale of traffic improvements required at other locations to allow for traffic operations below roadway capacity. Discussions of each of these items follows.

1) Possible New Jersey Transit rail station at the west end of the Charles Wood properties – A number of meetings were held with New Jersey Transit planning staff to discuss the influence of a new rail station at Eatontown/Tinton Falls on the south side of the Charles Wood area would have on tripmaking activities generated by the reuse plan. Such a new station would actually have a dual effect for the area. First, a new station along the Red Bank line of the MOM could serve as an intermodal draw between this new rail station and express bus connections onto the GSP, and draw about 625 daily riders (1,250 round trips) each day to these connections. The station itself would attract 2,400 regional riders which would require a large parking space demand of upwards of 2,000 spaces. In terms of development on the base, a new station could affect a shift of between 280 (AM peak hour) and 380 (PM peak hour) out of vehicles to the rail mode. These are modest vehicle trip reductions of between five and seven percent versus the overall in and outbound trip generation calculations based on ITE figures; however, providing such transit connections is in keeping with project goals of providing transportation services of many modes (in this case, rail and regional bus services).

For the analysis of the future build-out Action plan, the analyses examined both a condition with and without a new rail station, with the latter condition having the vehicle trips referred to above as part of the aggregate trip generation.

2) Possible Relocation of NJT Little Silver rail station south to Oceanport – Discussions also involved the practicality of relocating the Little Silver station south adjacent to the Fort in Oceanport. One key reason that spurred this discussion was that related to traffic congestion in and around the Little Silver station caused by vehicles parking and dropping off in the area. In this case, moving the existing station would not garner much benefit, at least in terms of station reconstruction and parking space construction. A relocated Little Silver station would attract only 100 to 125 new riders should it be moved southward. Also, to accommodate a new station, Oceanport Avenue would likely have to be widened between Little Silver and the Fort, perhaps southward to Main Street. Such a measure would also entail widening two roadway bridges over Parkers and Oceanport creeks. Thus, this measure was not included within these analyses.

3) Possible new GSP Interchange 107 – A number of discussions and analyses were conducted by the New Jersey Turnpike Authority (NJTA), on behalf of FMERPA, to assess the viability of a new GSP interchange in the vicinity of Tinton Avenue. A new interchange would redirect a



STV Incorporated

large proportion of Fort-generated away from Interchange 105 and Route 36 to a path that would flow directly into the development. A number of possible interchange configurations were explored, including cloverleaf and diamond types, full and partial ramps, and service road layouts. This concept of a new interchange was dismissed by the Authority for a number of reasons, chief being its close proximity to the existing Interchange 105 and the presence of wetlands in the area to the immediate north and west of the Charles Wood area.

4) Reconfiguration of the Route 36 / Hope Road intersection – During those same discussions, the exclusion of a new GSP interchange would shift focus to roadway improvements and reconfigurations to the existing Interchange 105 and its main intersection Route 36/Hope Road connection to points east of the parkway. These discussions brought to rise the criticality of separating some turning movements away (but nearby to) this intersection by creating new ramps within the immediate vicinity. A schematic drawing of a reconfiguration is included in the discussion of overall traffic mitigation for the project. For analysis purposes, a reconstructed, reconfigured Route 36/Hope Road was included given the level congestion experienced at this location both now and forecasted for a future No Action condition.

5) Scale of traffic improvements in study area – The level of mitigation required for all other analysis locations was expected to range from basic low-cost and easily implemented Transportation System Management (TSM) measures including traffic signal timing and phasing adjustments and curb parking restrictions, before proceeding to more capital-intensive measures such as intersection approach widenings that would require property acquisitions to accommodate added pavement.

One additional discussion point is the relationship of where and how people reside and work. Current technologies are in place to allow people to work at or from home as satellite or remote offices away from a central or main business center. Residentially oriented joint live work quarters (JLWQ) are intended to reduce overall trip-making activities associated with traditional developments that have a one or two predominant major land use that, by themselves, force people to either work or live on the site but not both. Beyond strict JLWQ uses, the sheer size of the base area and the intended mixture of a diverse and complementary group of land uses appears to allow for a nature synergy of living in one area remote from another employment center. For these analyses, a modest five percent reduction on the overall trip generation figures was included, and although it is far too early in the eventual land use and zoning initiatives, it may be able to achieve higher trip reductions with, say, housing tax abatement incentives. Moreover, the planning of the Fort area involved active discussions of adding east-west transit connections to support living and working on the base properties and keep people out of their vehicles to complete the short trip of traveling from one area to the next.

3.1.1 Trip Generation

Vehicle trip generation was estimated using the ITE *Trip Generation* manual for office, hotel, retail, and residential uses. In developing the figures, the project team worked with planning staff of New Jersey Transit since the credit for a possible new rail stations relied on the agency's ridership forecasting modeling tools. Those calculations categorized the various distinct land uses into broad classes, such as residential, retail, office, etc. given that the project is in the very



STV Incorporated

early stages of eventual development.

Comparing AM with PM hourly figures, vehicle trip making tends to be higher later in the day since a sizeable portion of the development will be commercial and retail in nature. These uses, combined with residential activities, which tend to rise with homebound trips and subsequent personal shopping trips after work, all combine to show PM peak hour trip generation to be about 20 percent higher than the AM peak hour counterpart.

Overall, about 5,680 and 6,780 vehicles would enter and exit in the respective AM and PM peak hours should a new NJT MOM station be included in the development. Without the new rail station in place, about 6,030 and 7,140 vehicles would enter and exit in the respective AM and PM peak hours. Details of trip generation are listed in Table 3-2.

Table 3-2: 2028 Build-Out Vehicle Trip Generation

<u>Area</u>	AM Pk Hr Vehicle Trips		PM Pk Hr Vehicle Trips	
	In	Out	In	Out
<u>land use</u>				
<u>Little Silver Cluster</u>				
residential	76	226	259	128
retail / hotel	444	361	524	484
office / R&D	<u>527</u>	<u>86</u>	<u>99</u>	<u>485</u>
totals	1,048	672	882	1,097
<u>Eatontown Cluster</u>				
retail / hotel	1,278	1,038	1,508	1,392
office / municipal	95	12	23	115
residential	<u>12</u>	<u>35</u>	<u>40</u>	<u>20</u>
totals	1,385	1,085	1,571	1,527
<u>Tinton Falls Cluster</u>				
residential	52	154	177	87
retail	244	201	379	350
hotel	60	38	51	54
office / R&D	<u>1,213</u>	<u>197</u>	<u>228</u>	<u>1,115</u>
totals	1,568	590	835	1,606
sum	4,001	2,348	3,288	4,230
transit credit for NJT MOM rail station	287	78	236	141
<i>final sum <u>with</u> new NJT MOM station</i>	3,528	2,156	2,899	3,885
<i>final sum <u>without</u> new NJT MOM station</i>	3,801	2,230	3,124	4,019

During the agency review process of transportation issues, NJDOT expressed concern that trip generation results should adhere closer to the closer-defined uses in the draft plan. The consultant team did perform a second set of analyses for comparative purposes, again using the



STV Incorporated

ITE rates but using land uses that better matched to those being proposed herein. The results of those analyses indicated that the revised overall trip generation was about four to five percent lower than those cited above, which is not a significant variance. Therefore, at this stage of the reuse plan, the use of figures in Table 3-2 above present a slightly conservative depiction of traffic conditions in the full build-out scenario.

3.1.2 Trip Assignments

For such early preliminary assessments as these, vehicle trips can be reasonably assigned to the roadway network based on prevailing traffic volumes entering and departing the periphery of the overall study area. Broadly for the weekday AM peak hour, about 75% of all vehicles entering the area originate from points south, although this includes movements from the GSP from both north and south ramps, with the remaining portion of drivers from northern destinations. This pattern changes slightly in the PM peak hour with origins from southern points composing about 60 percent of all traffic and 40 percent from the north. For these figures, the GSP Interchange represents the most important source of entry into the study area, with between 40 (PM) and 55 (AM) percent of all entries utilizing this key travel node. For outbound trips, similar travel patterns are seen in traffic data, with about 65-70 percent of all vehicles destined south of the Fort area, and 30-35 percent traveling northward. Also, the GSP remains an important travel node, being used by about 35 percent of outbound drivers during both the AM and PM peak hours. Of interest is deriving these travel assignments is that the pattern of existing traffic volumes closely matches patterns within labor shed reports used by NJT in their ridership modeling forecasts.

A sampling of the incremental volumes at key intersection approaches follows:

For the scenario with a new NJT MOM rail station...

For inbound trips,

- Eastbound Rte 35 (GSP Int. 105 exit) to Hope Road: would have an increase of 1,000 vehicles per hour (vph) in the AM peak hour and 700 in the PM peak hour.
- Northbound Hope Road at Route 35 would have an increase of about 700 vph in the through movement for the AM and PM peaks.
- Northbound Monmouth Road and Broadway to Route 36 would have between 100 and 150 vph in the AM peak.
- Between 450 (AM) and 550 (PM) vph would travel southward on Route 35 from Shrewsbury and between 350 (PM) and 850 (AM) northward on Route 35 from points south of the Fort.
- Southbound Hope Road, from north of Tinton Avenue, would carry an additional 200 (PM) and 300 (AM).
- Oceanport Avenue would carry an additional 70 (AM) to 170 (PM) vph south toward the Fort

For outbound trips,

- The westbound main egress point from the Fort at Route 36 and Tinton Avenue would be used by between 700 (AM) and 1,100 (PM) vph.



STV Incorporated

- Southbound Hope Road at Route 35 would have an increase of about between 500 (AM) and 1,000 (PM) vph; most of these vehicles turn right to enter the GSP.
- Southbound Monmouth Road and Broadway to Route 36 would carry an additional 100 (AM) to 250 (PM) vph.
- Between 400 (AM) and 450 (PM) vph would travel northward on Route 35 into Shrewsbury and between 260 (AM) and 450 (PM) southward on Route 35 to points south of the Fort.
- Northbound Hope Road, north of Tinton Avenue, would carry an additional 200 (AM) and 300 (PM).
- Oceanport Avenue would carry an additional 40 (AM) to 270 (PM) vph north into Little Silver

These volumes are illustrated in Figures 3-3 and 3-4.



STV Incorporated

Figure 3-3: 2028 Build-Out AM Peak Hour Traffic Volumes
(accounts for new NJT MOM station within Charles Wood Area)



STV Incorporated



Figure 3-4: 2028 Build-Out PM Peak Hour Traffic Volumes



STV Incorporated

(accounts for new NJT MOM station within Charles Wood Area)



STV Incorporated





STV Incorporated

The rail station would account for about 365-380 vehicle trips; with no rail station included, these trips are added back into the general traffic population would be overlaid on to the traffic network. Without a new NJT MOM station, traffic volumes would increase, again proportionally based on arriving and departing volumes across the study area periphery. This transit credit is rather modest, so traffic volumes cited in the above bullet listing would increase in a similar modest manner. These volumes are illustrated in Figures 3-5 and 3-6.

3.1.3 Traffic Analysis Results

Signalized intersections studied in the traffic study area were again analyzed in terms of their capacity to accommodate traffic volumes and their resulting LOS. A summary of the capacity analysis findings is presented in Tables 3-3 and 3-4 for the respective with NJT MOM station and without NJT MOM station.

3.1.3a Scenario with a new NJT MOM rail station within Charles Wood area

Route 36 would continue to be subject to significant congestion during both the AM and PM peak hours, particularly at its Hope Road intersection. At this location, all approaches operate at a failure LOS F condition, indicating that multiple green signal phases are needed to pass Route 36. Both the Broadway and Monmouth Road approaches to Route 36 operate at LOS E or F during both peak hours.

The Tinton Avenue/Route 35 intersection, as currently constructed, would operate at an overall LOS F, with most of its individual movements also operating over capacity. This main gate would be a main focal point of the entire development, so it was expected that major intersection reconfiguration would be needed.

At the Hope Road/Tinton Avenue intersection, which is narrow today, would see a significant deterioration in just about all of its individual movements along which traffic will be added. The overall intersection would operate at LOS F.

Each of the aforementioned intersections was expected to become main traffic focal points; given this, their current configurations were expected to be inadequate to process the expected traffic overlays generated by the new Fort Monmouth Reuse and Redevelopment Plan.

Other study locations include the Branch Avenue (Oceanport Avenue) / Sycamore Avenue intersection, where the Sycamore's westbound left and Branch's northbound left and southbound through would operate with some congestion in the PM peak hour (LOS E or F). During this time period, the overall intersection would operate at LOS F, even with a fairly low traffic overlay generated by the project.

The eastbound approach of Shrewsbury Avenue to Route 35 would continue to operate near capacity at LOS E during the AM peak hour, while the westbound through (from the jughandle) would deteriorate from No Action LOS D into LOS F.



STV Incorporated

Figure 3-5: 2028 Build-Out AM Peak Hour Traffic Volumes
(does not include new NJT MOM station within Charles Wood Area)



STV Incorporated

(does not include new NJT MOM station within Charles Wood Area)



STV Incorporated





STV Incorporated

Overall, the roadways surrounding Fort Monmouth routinely experiences some significant congestion, particularly on Routes 35 and 36, on Hope Road, and along Tinton Avenue. There will remain numerous individual intersection approaches operating at a congested LOS E and F, and four (AM) and six (PM) of the seven examined intersections would operate at an overall LOS E or F.

3.1.3b Scenario without a new NJT MOM rail station within Charles Wood area

Levels of service discussed above would not change significantly from those discussed above, again considering that the vehicle diversions (about 400 vehicle trips) would be only modest. The single major change in LOS attributed to not having a new rail station would occur at the northbound Broadway approach to Route 36 during the PM peak hour, which in this case would become a LOS F from LOS E in the scenario with a rail station.

3.1.4 Traffic Improvement Measures

Reviewing the analysis results for either development scenario cited above indicates that basic TSM measures, such traffic signal timing and phasing adjustments, would be very limited in achieving traffic conditions that have volumes operating under roadway capacity limits. Nevertheless, the analysis process begins with such measures before proceeding more involved capital-intensive measures where roadways have to be widened or realigned, along with properties acquired to do so.

The first three intersections discussed below represent the critical locations that require significant roadway and operational improvements since these locations will process the majority of traffic flows.

Route 36 and Hope Road

The main issue with this intersection, even today, is that all vehicles have to converge at one crossing; namely, the intersection itself. Discussions with NJTA indicated that some modifications could be made to separate out nearly all turning movements with the creation of a few new jughandle ramps on the east side of the intersection that would lie in State properties. Also, a new off-ramp from the northbound GSP can be added such that the roadbed would lie between the existing hotel and park-and-ride lot in the intersections southwest quadrant. The addition of the new jughandle ramps would create two additional signalized intersections, one each north and south of the existing intersection (see Figure 3-7).

To examine traffic operations at a new reconfigured set of three intersections, Synchro software was used to model and optimize traffic signal timings. The software itself compares the current volume to the intersections ultimate capacity, and uses *2000 Highway Capacity Manual* methodologies for urban streets and signalized intersections.

The analysis results indicate that the three intersections, examined as a system given that there are no other signals in their vicinity, can function adequately, with all movements operating at LOS E or better.



STV Incorporated



STV Incorporated

Table 3-3: 2028 Build-Out Traffic Conditions
(accounts for new NJT MOM station within Charles Wood Area)



STV Incorporated

Signalized Intersection & Approach	Mvt.	AM Peak Hour			PM Peak Hour			
		V/C	Control Delay	LOS	V/C	Control Delay	LOS	
Route 35 at Schrewsbury Avenue								
Schrewsbury Avenue	EB	L	0.76	63.9	E	0.66	46.8	D
		R	0.59	38.8	D	0.76	37.9	D
	WB	L	0.11	42.7	D	0.14	36.3	D
		T	1.15	122.4	F	1.19	133.0	F
Route 35	NB	T	0.77	21.7	C	0.65	18.2	B
		SB	0.55	16.7	B	1.05	60.5	E
Overall Intersection		-		45.6	D		61.8	E
Route 35 at Tinton Avenue								
Tinton Avenue	EB	DeFL						
		(L)TR	1.20	134.1	F	0.53	25.6	C
	WB	L	3.41	1154.0	F	2.25	613.0	F
		T	0.39	33.5	C	0.48	31.4	C
Route 35	NB	L	0.40	12.3	B	1.35	213.6	F
		TR	1.70	343.2	F	1.20	122.1	F
	SB	L	1.46	256.5	F	3.03	951.8	F
		TR	0.73	22.7	C	1.11	83.5	F
Overall Intersection		-		267.3	F		225.3	F
Route 36 at Monmouth Road								
Route 36	EB	L	0.24	18.2	B	0.34	25.3	C
		T	0.68	22.3	C	0.79	26.1	C
	WB	T	0.69	30.8	C	1.06	79.2	E
		L	0.89	75.1	E	1.07	120.8	F
Monmouth Road	NB	L	0.89	75.1	E	1.07	120.8	F
		LT	0.95	75.7	E	1.11	118.0	F
	SB	L	0.47	48.8	D	0.95	92.5	F
		LT	0.88	66.3	E	1.05	101.1	F
Overall Intersection		-		39.2	D		67.5	E
Route 36 at Broadway								
Route 36	EB	TR	0.79	27.7	C	0.94	36.7	D
		T	0.54	23.1	C	0.72	27.5	C
Broadway	NB	L	0.88	44.8	D	0.89	53.7	D
		T	1.37	206.9	F	1.01	79.9	E
	SB	L	0.20	34.1	C	0.11	27.0	C
		T	1.06	111.0	F	0.97	69.8	E
Overall Intersection		-		65.6	E		42.3	D
Branch Avenue at Sycamore Avenue								
Sycamore Avenue	EB	L	0.19	19.4	B	0.50	32.5	C
		TR	0.14	18.6	B	0.54	23.0	C
	WB	L	0.11	29.0	C	1.35	243.1	F
		T	0.29	30.7	C	0.76	41.7	D
Branch Avenue	NB	R	0.10	28.9	C	0.03	28.1	C
		L	0.45	18.7	B	1.74	379.5	F
	SB	TR	0.40	18.3	B	0.75	25.6	C
		L	0.09	23.9	C	0.53	32.1	C
		T	0.54	29.1	C	0.98	63.4	E
		R	0.18	24.7	C	0.24	24.4	C
Overall Intersection		-		23.3	C		84.2	F
Route 36 at Hope Road								
NJ 36	EB	T	1.79	392.6	F	1.76	380.6	F
		R	0.53	0.4	A	0.54	0.4	A
	WB	L	0.94	155.8	F	0.92	133.0	F
		T	0.83	27.9	C	0.99	50.9	D
Hope Road	NB	R	0.14	0.0	A	0.09	0.0	A
		LTR	2.83	881.6	F	3.06	983.1	F
	SB	LTR	2.80	873.3	F	3.42	1150.0	F
		-		459.1	F		574.1	F
Tinton Avenue at Hope Road								
Tinton Avenue	EB	L	1.08	113.1	F	0.38	33.8	C
		TR	1.88	437.3	F	1.56	288.5	F
	WB	L	0.96	131.5	F	0.77	49.3	D
		TR	1.93	468.7	F	1.45	241.3	F
Hope Road	NB	L	0.73	60.7	E	1.68	400.4	F
		TR	0.80	27.9	C	0.95	41.6	D
	SB	L	0.65	52.0	D	0.70	65.4	E
		TR	1.24	144.5	F	1.16	113.3	F
Overall Intersection		-		217.8	F		155.6	F



STV Incorporated

Table 3-4: 2028 Build-Out Traffic Conditions
(does not include new NJT MOM station within Charles Wood Area)



STV Incorporated

Signalized Intersection & Approach	Mvt.	AM Peak Hour			PM Peak Hour			
		V/C	Control Delay	LOS	V/C	Control Delay	LOS	
Route 35 at Schrewsbury Avenue								
Schrewsbury Avenue	EB	L	0.76	63.9	E	0.66	46.8	D
		R	0.61	39.3	D	0.78	38.8	D
	WB	L	0.11	42.7	D	0.14	36.3	D
		T	1.16	126.3	F	1.20	137.9	F
Broad Street	NB	T	0.78	21.9	C	0.65	18.3	B
	SB	TR	0.56	17.0	B	1.08	68.4	E
Overall Intersection	-	-	46.5	D	-	66.0	E	
Route 35 at Tinton Avenue								
Tinton Avenue	EB	DefL						
		(L)TR	1.22	144.8	F	0.55	25.9	C
	WB	L	3.53	1204.0	F	2.35	655.4	F
Route 35	NB	T	0.40	33.6	C	0.50	31.6	C
		L	0.41	12.4	B	1.35	213.6	F
	SB	TR	1.75	367.1	F	1.22	131.4	F
		L	1.57	304.6	F	3.27	1058.0	F
	TR	0.74	22.9	C	1.11	85.9	F	
Overall Intersection	-	-	287.6	F	-	248.3	F	
Route 36 at Monmouth Road								
Route 36	EB	L	0.24	18.2	B	0.34	25.3	C
		T	0.68	22.3	C	0.80	26.3	C
	WB	T	0.69	30.9	C	1.07	80.4	F
Monmouth Road	NB	L	0.89	75.1	E	1.07	120.8	F
		LT	0.97	78.8	E	1.12	122.2	F
	SB	L	0.47	48.8	D	0.95	92.5	F
		LT	0.89	67.3	E	1.06	105.4	F
Overall Intersection	-	-	39.8	D	-	68.9	E	
Route 36 at Broadway								
Route 36	EB	TR	0.80	27.8	C	0.94	37.4	D
		T	0.54	23.2	C	0.73	27.6	C
Broadway	NB	L	0.88	44.8	D	0.89	53.7	D
		T	1.39	215.5	F	1.01	81.8	F
	SB	L	0.20	34.2	C	0.11	27.1	C
		T	1.06	113.4	F	0.99	74.2	E
Overall Intersection	-	-	67.6	E	-	43.3	D	
Branch Avenue at Sycamore Avenue								
Sycamore Avenue	EB	L	0.19	19.4	B	0.50	32.5	C
		TR	0.14	18.6	B	0.54	23.0	C
	WB	L	0.11	29.0	C	1.37	250.4	F
		T	0.29	30.7	C	0.76	41.7	D
Branch Avenue	NB	R	0.10	28.9	C	0.03	28.1	C
		L	0.47	18.9	B	1.74	373.6	F
	SB	TR	0.40	18.3	B	0.76	26.0	C
		L	0.09	23.9	C	0.56	34.8	C
	T	0.56	29.5	C	1.00	68.9	E	
Overall Intersection	-	-	23.5	C	-	85.0	F	
Route 36 at Hope Road								
NJ 36	EB	T	1.84	414.9	F	1.79	397.7	F
		R	0.53	0.4	A	0.54	0.4	A
	WB	L	0.97	166.7	F	0.95	139.7	F
		T	0.83	28.0	C	0.99	51.5	D
Hope Road	NB	R	0.14	0.0	A	0.09	0.0	A
		LTR	2.92	919.4	F	3.15	1022.0	F
	SB	LTR	2.84	891.5	F	3.49	1179.0	F
		-	-	480.8	F	-	597.1	F
Tinton Avenue at Hope Road								
Tinton Avenue	EB	L	1.08	113.1	F	0.38	33.8	C
		TR	1.95	468.6	F	1.61	312.6	F
	WB	L	0.96	131.5	F	0.77	49.3	D
		TR	1.96	480.3	F	1.47	252.3	F
Hope Road	NB	L	0.76	65.1	E	1.74	424.8	F
		TR	0.81	28.1	C	0.96	42.9	D
	SB	L	0.65	52.0	D	0.70	65.4	E
		TR	1.27	158.5	F	1.18	122.3	F
Overall Intersection	-	-	231.3	F	-	166.5	F	



STV Incorporated

Hope Road and Tinton Avenue

At this intersection, the northbound Hope Road approach to Tinton Avenue is configured with two through lanes and one left-turn lane. Testing this lane use setup at the other three approaches (see Figure 3-8) indicates that all approaches would operate at LOS E or better, with the overall intersection functioning at LOS D during both AM and PM peak hours

Route 35 and Tinton Avenue

This location is the current main entry to the Fort, and movements along the roadways serving it have several exclusive turning lanes. However, should this “front door” location continue to serve as the main entry for the Fort Monmouth Reuse and Redevelopment Plan, additional roadway capacity would be required to carry the additional traffic overlay. Specifically, northbound Route 35 would need to have three through lanes, and exclusive left- and right-turn lanes. The southbound Route 35 approach would need a double left-turn lane into the site, one through lane, and one shared through/right-turn lane. Exiting the site, the approach would need to be configured with a double left-turn lane into the site, one through lane, and one right-turn lane. The eastbound Tinton Avenue approach would require two through lanes and one left-turn lane.

The Fort area lines the east side of Route 35, so street widening can be accomplished with little, if any, disturbance to business lining the west side.

Given that Tinton Avenue needs to be widened at their two adjacent intersections on the north side of the base properties, the widening of the entire section of this street should be considered to provide a consistent roadway cross section.

The remaining intersections that are discussed below are situated further away from the Fort, and while traffic volumes are slightly more dispersed, significant traffic improvements will be needed at these locations.

Route 36 at Monmouth Road and at Eatontown Boulevard/Broadway

The intersecting cross streets of Monmouth Road and Eatontown Boulevard/Broadway each need widening to accommodate added travel lanes. For each approach, one new lane would need to be added. The following list detailed the existing lane configuration and a future lane arrangement needed to provide the necessary approach capacity to carry expected traffic volumes.

- **Northbound Monmouth Road**
Existing: 1 exclusive left-turn, 1 shared left-through, 1 through
Proposed: 2 exclusive left-turn, 2 through
- **Southbound Monmouth Road**
Existing: 1 exclusive left-turn, 1 shared left-through, 1 through, 1 exclusive right-turn
Proposed: 2 exclusive left-turn, 2 through, 1 exclusive right-turn



STV Incorporated

- Northbound Broadway
Existing: 2 unstriped travel lanes
Proposed: 1 exclusive left-turn, 1 shared left/through, 1 through
- Southbound Eatontown Boulevard
Existing: 1 exclusive right-turn, 1 through
Proposed: 1 exclusive left-turn, 2 through

One additional improvement measure would entail the widening (now 2 through lanes; need for 3) of Route 36 eastbound to Monmouth Road.

Figures 3-11 and 3-12 provide aerial photos that indicate the improvements cited above.

Route 35 at Schrewsbury Avenue

This intersection could accommodate future traffic demands generated by the Fort Monmouth Reuse and Redevelopment Plan with the provision of one exclusive southbound right-turn lane on Route 35. This added lane (and its associated additional travel capacity for this approach) can then be combined with traffic signal retimings to reduce vehicle delays to LOS E or better.

Branch Avenue at Sycamore Avenue

This intersection has the advantage of having the northbound approach split to allow northbound right turns to be made along Oceanport Avenue which veers east of Branch Avenue. One operational change that can be made is to prohibit northbound left turns on Branch Avenue to westbound Sycamore Avenue and redirect these movements to Oceanport Avenue. Where Oceanport Avenue intersects with Sycamore Avenue, these redirected left turns can be made onto westbound Sycamore Avenue. The elimination of delay-causing left turns that are now allowed on northbound Branch Avenue allows the green signal timing for all remaining movements to be reallocated to approaches that require additional time to process their vehicle demands.

Tables 3-5 and 3-6 list traffic mitigation improvements discussed above along with resultant levels of service.

3.1.5 Other Considerations

1. The analyses and results conducted for the fort's reuse plan have given FMERPA and other review agencies the sense of the scale of roadway improvements that will be most critically needed in the immediate area studied at this point in the reuse timeline. For now, these capital-intensive improvements are of most appropriate interest to FMERPA given that the agency must identify funding sources for such costly mitigation.
2. Given that the fort reuse plan is simply in draft stages, more exact trip generation figures with other methods (such as the NJTPA NJTMRE model) can be used to offer reviewers a better sense of analysis certitude when the base plan reaches subsequent stages of developer / development proposals.



STV Incorporated

3. Even if later analyses yield *lower* trip generation figures, there will likely remain the need for the reconfiguration of the Route 36/Hope Road intersection (which is needed and acknowledged even today as a measure to alleviate congestion there), the widening of a section of Tinton Avenue, and intersection approach widenings along Route 36 are likely to still be required given the intense nature of the fort development, the inability to add a new GSP Interchange 109 due to roadway geometry limitations, and the lack of a committed (earmarked) new rail transit station(s) that could draw fort-generated motorists out of their private vehicles and into transit.
4. Reducing the size and/or composition of land uses in the Fort Monmouth Reuse and Redevelopment Plan can reduce the overall volume of vehicle traffic generated into the area. The mitigation cited above provides relief to eliminate failure levels-of-service F; however, many movements and intersection would operate at the theoretical capacity limit LOS E. This finding indicates that the roadway network would operate with little excess capacity to handle sharp peaks should they occur during, say, special events. While sensitivity analyses have not been conducted to test reduced land use sizes, it would be reasonable to assume that a reduction in the order of ten to twenty percent would likely allow for better, more acceptable levels of service. It must be mentioned herein that such analyses can be tested more specifically during the subsequent EIS processes when more detailed studies of land mixes and concomitant trip generation and assignments would occur.
5. While the concept of a new GSP Interchange 107 has been dismissed by the NJTA for traffic engineering and environmental reasons, it may be possible to create a northbound service road (as suggested at project meetings with the Authority) could at least allow for traffic to be shifted away from the Route 36/Hope Road intersection.
6. The concept of wider-spread bus connections to the Fort area has not yet been fully explored by NJT, and it may be possible a series of new routes or route extensions may draw another “meaningful” percentage (perhaps five percent) of drivers out of their private vehicles into bus transit modes.
7. The concept of relocating the Little Silver station into Oceanport is not longer being considered because NJT ridership projections that include a new Fort Monmouth Reuse and Redevelopment Plan did not indicate a significant volume of riders using the rail line. Nevertheless, Oceanport Avenue, as it passes through the Fort area, will require widening and other traffic related improvements to accommodate that portion of the Fort Monmouth Reuse and Redevelopment Plan to function acceptably.
8. A preliminary assessment of roadway improvement costs was made for the mitigation measures described in this chapter.
 - Route 36/Hope Road Intersection Reconfiguration: \$14 million



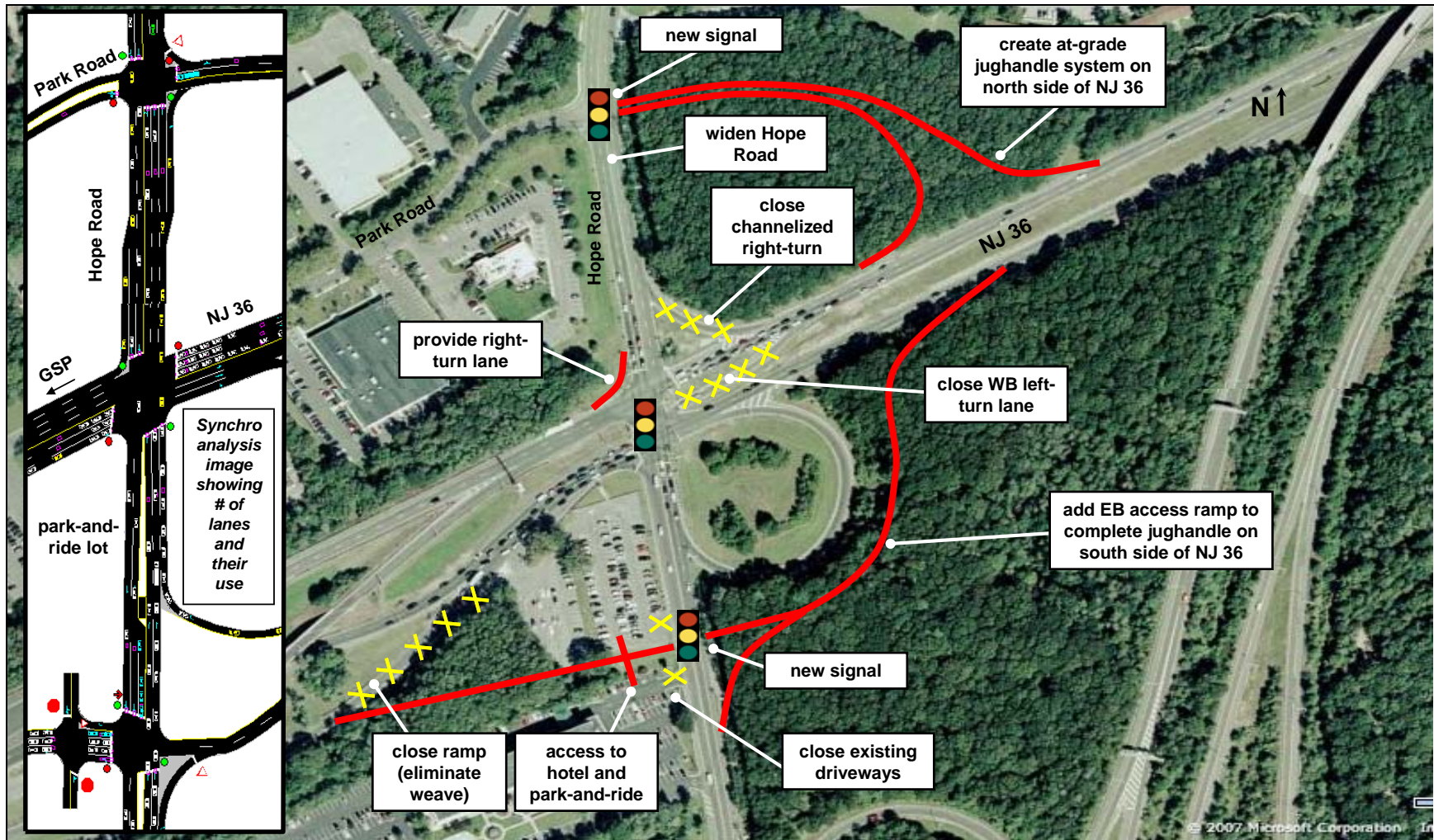
STV Incorporated

- Widen Tinton Avenue between Hope Road and Route 36: \$20 million
- Tinton Avenue/Route 35 Intersection Reconfiguration: \$12 million
- Route 36 at Monmouth Road and at Eatontown Road/Broadway: \$1.5-2.5 million each



STV Incorporated

Figure 3-7: Route 36 and Hope Road Traffic Improvement Measures





STV Incorporated

Figure 3-8: Hope Road and Tinton Avenue Traffic Improvement Measures



STV Incorporated

Figure 3-9: Route 35 and Tinton Avenue Traffic Improvement Measures



STV Incorporated

Figure 3-10: Route 36 and Monmouth Road Traffic Improvement Measures



STV Incorporated

Figure 3-11: Route 36 and Eatontown Boulevard/Broadway Traffic Improvement Measures



STV Incorporated

Table 3-5: 2028 Mitigated Build-Out Traffic Conditions
 (accounts for new NJT MOM station within Charles Wood Area)

Signalized Intersection & Approach	Mvt.	AM Peak Hour			PM Peak Hour			Mitigated Improvements	
		V/C	Control Delay	LOS	V/C	Control Delay	LOS		
Route 35 at Schrewsbury Avenue									
Schrewsbury Avenue	EB	L	0.76	63.9	E	0.66	46.8	D	- Widened SB Route 35 to provide an exclusive RT lane - Signal timing adjustments
		R	0.46	32.4	C	0.63	30.4	C	
	WB	L	0.11	42.7	D	0.14	36.3	D	
		T	0.89	47.5	D	0.98	57.8	E	
Route 35	NB	T	0.87	30.1	C	0.71	22.1	C	
		T	0.56	20.3	C	1.03	55.5	E	
	SB	R	0.11	15.6	B	0.27	16.3	B	
		-	-	32.6	C	-	42.9	D	
Route 35 at Tinton Avenue									
Tinton Avenue	EB	L	0.49	21.8	C	0.71	42.7	D	
		TR	0.99	69.5	E	0.56	36.4	D	
	WB	L	0.59	38.8	D	0.97	68.0	E	
		T	0.35	33.1	C	0.73	44.9	D	
Route 35	NB	L	0.71	40.0	D	0.89	55.8	E	
		T	0.77	25.8	C	0.60	17.3	B	
	SB	R	0.89	25.3	C	0.47	16.0	B	
		L	0.49	24.4	C	0.55	10.6	B	
	TR	TR	0.80	27.9	C	1.03	53.9	D	
		-	-	32.6	C	-	37.3	D	
Route 36 at Monmouth Road									
Route 36	EB	L	0.23	19.5	B	0.40	21.0	C	- Widened NB and SB Monmouth Rd to provide two LT lanes - Signal timing adjustments
		T	0.73	24.5	C	0.83	28.4	C	
	WB	T	0.76	33.3	C	1.01	59.0	E	
		L	0.80	51.0	D	0.97	74.3	E	
Monmouth Road	NB	T	0.51	41.8	D	0.60	43.9	D	
		L	0.22	41.4	D	0.53	44.1	D	
	SB	T	0.82	54.5	D	0.94	68.7	E	
		-	-	34.4	C	-	47.3	D	
Route 36 at Broadway									
Route 36	EB	TR	0.97	46.1	D	0.94	36.7	D	
		T	0.66	28.4	C	0.72	27.5	C	
Broadway	NB	L	0.73	28.5	C	0.89	53.7	D	
		LT	0.59	23.6	C	0.53	30.5	C	
	SB	L	0.19	33.6	C	0.11	27.0	C	
		T	0.55	36.3	D	0.51	30.3	C	
	TR	TR	0.48	21.3	C	0.94	43.2	D	
		-	-	35.6	D	-	34.4	C	
Branch Avenue at Sycamore Avenue									
Sycamore Avenue	EB	L	0.20	17.8	B	0.89	52.3	D	- Prohibit NB left turns from Branch Avenue - Direct NB left turns to NB Oceanport Avenue and WB Sycamore Avenue - Signal timing/phasing adjustments
		TR	0.12	12.7	B	0.59	20.2	C	
	WB	L	0.10	22.4	C	0.36	20.6	C	
		T	0.58	27.7	C	1.02	63.3	E	
Branch Avenue	NB	R	0.09	22.3	C	0.02	15.5	B	
		TR	0.48	21.3	C	0.94	43.2	D	
	SB	L	0.11	17.9	B	0.57	27.4	C	
		T	0.47	21.2	C	0.89	35.9	D	
	R	R	0.15	18.1	B	0.22	16.9	B	
		-	-	21.5	C	-	40.6	D	



STV Incorporated

Table 3-5: 2028 Mitigated Build-Out Traffic Conditions (continued)
 (accounts for new NJT MOM station within Charles Wood Area)

Signalized Intersection & Approach	Mvt.	AM Peak Hour			PM Peak Hour			Mitigated Improvements	
		V/C	Control Delay	LOS	V/C	Control Delay	LOS		
Route 36 WB Ramps at Hope Road								- Reconfigure the NJ 36/Hope Road intersection such that 1.) WB Route 36 to NB Hope Road intersects Hope Road at Park Road 2.) Provide a NB Hope Road to WB Route 36 jughandle in the NE quadrant of intersection 3.) Eliminate the WB Route 36 left-turn lane 4.) Prohibit NB and SB left-turns from Hope Road at NJ 36 5.) Relocate the NB GSP exit ramps such that they intersection Hope Road just south of the existing jughandle in the southeast quadrant of intersection - see above	
NJ 36 WB Ramps	EB	LTR	0.07	24.4	C	0.10	26.3		C
	WB	L	0.12	14.5	B	0.18	15.9		B
		TR	0.43	16.7	B	0.31	16.8		B
Hope Road	NB	LT	0.45	7.6	A	0.54	7.7		A
		R	0.46	8.8	A	0.46	8.0		A
	SB	TR	0.65	10.1	B	0.94	20.9		C
Overall Intersection	-			9.6	A		14.7		B
SB Garden State Parkway Exit at Hope Road									
NJ 36	EB	TR	0.79	20.4	C	0.97	33.4		C
	WB	T	0.95	30.2	C	1.01	43.4		D
Hope Road	NB	T	0.92	31.4	C	1.01	47.1		D
	SB	T	0.62	21.6	C	0.82	27.4		C
		R	0.29	0.1	A	0.54	0.4	A	
Overall Intersection	-			25.2	C		35.6	D	
Route 36 EB Ramps at Hope Road									
NJ 36 EB Ramps	EB	L	0.57	18.7	B	0.59	24.3	C	
		T	0.90	29.0	C	0.65	24.6	C	
		R	0.66	21.0	C	0.61	25.2	C	
Hope Road	NB	T	0.87	26.3	C	0.86	21.7	C	
		R	0.07	12.7	B	0.04	9.5	A	
	SB	L	0.67	37.8	D	0.71	36.9	D	
		TR	0.65	12.9	B	0.71	9.9	A	
Overall Intersection	-			22.6	C		18.7	B	
Tinton Avenue at Hope Road									
Tinton Avenue	EB	L	0.91	60.0	E	0.40	36.5	D	
		TR	0.94	45.0	D	0.87	38.6	D	
	WB	L	0.61	47.7	D	0.81	57.8	E	
		TR	0.97	63.1	E	0.80	34.7	C	
Hope Road	NB	L	0.70	54.0	D	0.71	51.2	D	
		TR	0.92	38.1	D	1.01	56.2	E	
	SB	L	0.62	47.2	D	0.30	37.6	D	
		TR	0.74	27.8	C	0.64	27.1	C	
Overall Intersection	-			43.1	D		42.1	D	



STV Incorporated

Table 3-6: 2028 Mitigated Build-Out Traffic Conditions
 (does not include new NJT MOM station within Charles Wood Area)

Signalized Intersection & Approach	Mvt.	AM Peak Hour			PM Peak Hour			Mitigated Improvements		
		V/C	Control Delay	LOS	V/C	Control Delay	LOS			
Route 35 at Schrewsbury Avenue										
Schrewsbury Avenue	EB	L	0.76	63.9	E	0.66	46.8	D	- Widened SB Route 35 to provide an exclusive RT lane - Signal timing adjustments	
		R	0.48	32.6	C	0.64	30.7	C		
	WB	L	0.11	42.7	D	0.14	36.3	D		
		T	0.90	48.3	D	0.99	60.3	E		
Route 35	NB	T	0.88	30.4	C	0.72	22.2	C		
		T	0.58	20.6	C	1.05	63.5	E		
	R	0.11	15.6	B	0.27	16.3	B			
Overall Intersection		-	33.0	C		46.5	D			
Route 35 at Tinton Avenue										
Tinton Avenue	EB	L	0.50	21.9	C	0.71	42.9	D		- Widened EB Tinton Ave to provide an exclusive LT lane - Widened WB Tinton Ave to provide two LT lanes - Widened NB Route 35 to provide three through lanes - Widened SB Route 35 to provide two LT lanes - Signal timing/phasing adjustments
		TR	1.01	75.5	E	0.59	36.9	D		
	WB	L	0.61	39.3	D	1.00	74.1	E		
		T	0.37	33.2	C	0.75	47.0	D		
Route 35	NB	L	0.72	41.9	D	0.89	55.9	E		
		T	0.77	25.8	C	0.60	17.3	B		
	R	0.96	36.5	D	0.51	16.4	B			
	SB	L	0.53	25.5	C	0.60	11.1	B		
		TR	0.81	28.3	C	1.04	55.6	E		
Overall Intersection		-	35.5	D		38.5	D			
Route 36 at Monmouth Road										
Route 36	EB	L	0.23	19.5	B	0.40	21.0	C	- Widened NB and SB Monmouth Rd to provide two LT lanes - Signal timing adjustments	
		T	0.73	24.6	C	0.84	28.7	C		
	WB	T	0.76	33.4	C	1.01	59.9	E		
		L	0.80	51.0	D	0.97	74.3	E		
Monmouth Road	NB	T	0.53	42.0	D	0.61	44.2	D		
		L	0.22	41.4	D	0.53	44.1	D		
	T	0.82	55.0	E	0.95	71.3	E			
Overall Intersection		-	34.6	C		47.9	D			
Route 36 at Broadway										
Route 36	EB	TR	0.98	47.1	D	0.94	37.4	D		- Widened NB and SB Broadway to provide two through lanes - Signal timing adjustments
		T	0.66	28.5	C	0.73	27.6	C		
Broadway	NB	L	0.73	28.5	C	0.89	53.7	D		
		LT	0.60	23.8	C	0.53	30.6	C		
	SB	L	0.20	33.6	C	0.11	27.1	C		
		T	0.55	36.4	D	0.52	30.4	C		
Overall Intersection		-	36.0	D		34.8	C			
Branch Avenue at Sycamore Avenue										
Sycamore Avenue	EB	L	0.20	17.8	B	0.89	52.3	D	- Prohibit NB left turns from Branch Avenue - Direct NB left turns to NB Oceanport Avenue and WB Sycamore Avenue - Signal timing/phasing adjustments	
		TR	0.12	12.7	B	0.59	20.2	C		
	WB	L	0.10	22.4	C	0.36	20.7	C		
		T	0.58	27.7	C	1.02	63.3	E		
Branch Avenue	NB	R	0.09	22.3	C	0.02	15.5	B		
		TR	0.49	21.4	C	0.96	45.7	D		
	L	0.11	17.9	B	0.57	27.4	C			
	T	0.48	21.4	C	0.91	38.3	D			
	R	0.15	18.1	B	0.22	16.9	B			
Overall Intersection		-	21.6	C		41.7	D			



STV Incorporated

Table 3-6: 2028 Mitigated Build-Out Traffic Conditions (continued)
 (does not include new NJT MOM station within Charles Wood Area)

Signalized Intersection & Approach	Mvt.	AM Peak Hour			PM Peak Hour			Mitigated Improvements	
		V/C	Control Delay	LOS	V/C	Control Delay	LOS		
Route 36 WB Ramps at Hope Road									
NJ 36 WB Ramps	EB	LTR	0.07	24.4	C	0.10	26.3	C	- Reconfigure the NJ 36/Hope Road intersection such that 1.) WB Route 36 to NB Hope Road intersects Hope Road at Park Road 2.) Provide a NB Hope Road to WB Route 36 jughandle in the NE quadrant of intersection 3.) Eliminate the WB Route 36 left-turn lane 4.) Prohibit NB and SB left-turns from Hope Road at NJ 36 5.) Relocate the NB GSP exit ramps such that they intersection Hope Road just south of the existing jughandle in the southeast quadrant of intersection
	WB	L	0.12	14.6	B	0.18	15.9	B	
Hope Road	TR		0.43	16.7	B	0.31	16.8	B	
	NB	LT	0.47	7.8	A	0.57	8.0	A	
	R		0.46	8.8	A	0.46	8.0	A	
	SB	TR	0.66	10.2	B	0.96	23.2	C	
Overall Intersection		-		9.7	A		15.9	B	
SB Garden State Parkway Exit at Hope Road									
NJ 36	EB	TR	0.82	21.5	C	0.98	36.6	D	
	WB	T	0.97	33.7	C	1.01	44.0	D	
Hope Road	NB	T	0.96	37.1	D	1.04	55.2	E	
	SB	T	0.64	22.1	C	0.83	27.9	C	
	R		0.30	0.1	A	0.55	0.4	A	
Overall Intersection		-		28.2	C		38.6	D	
Route 36 EB Ramps at Hope Road									
NJ 36 EB Ramps	EB	L	0.59	19.2	B	0.62	25.1	C	- see above
	T		0.91	31.0	C	0.68	25.0	C	
	R		0.66	21.0	C	0.61	25.2	C	
Hope Road	NB	T	0.89	27.5	C	0.87	22.3	C	
	R		0.08	12.7	B	0.04	9.6	A	
	SB	L	0.67	37.8	D	0.71	36.9	D	
Overall Intersection	TR		0.65	13.1	B	0.72	10.1	B	
	-			23.5	C		19.1	B	
Tinton Avenue at Hope Road									
Tinton Avenue	EB	L	0.91	60.0	E	0.40	36.5	D	
	TR		0.98	51.8	D	0.90	41.5	D	
	WB	L	0.61	47.7	D	0.81	57.8	E	
Hope Road	TR		0.98	66.3	E	0.82	35.4	D	
	NB	L	0.73	57.4	E	0.73	53.6	D	
	TR		0.93	38.9	D	1.01	58.6	E	
	SB	L	0.62	47.2	D	0.30	37.6	D	
	TR		0.76	28.5	C	0.66	27.4	C	
Overall Intersection		-		45.5	D		43.6	D	