



BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Richard A. Davey, MassDOT Secretary and CEO and MPO Chairman
Karl H. Quackenbush, Executive Director, MPO Staff

MEMORANDUM

DATE October 4, 2012
TO Joseph Frawley, P.E.
District 3 Traffic Engineer
MassDOT Highway Division
FROM Mark Abbott, P.E.
Boston Region MPO Staff
RE Safety and Operations Analyses at Selected Intersections, FFY 2012:
Turnpike Road (Route 9) at Central Street/Oak Hill Road in Southborough

Introduction

This memorandum summarizes safety and operations analyses and proposes improvement strategies for the intersections of Turnpike Road (Route 9) at Central Street/Oak Hill Road in Southborough, shown in Figure 1. It contains the following sections:

- Intersection Layout and Traffic Control
- Issues and Concerns
- Crash Data Analysis
- Intersection Capacity Analysis
- Potential Improvements
- Results and Recommendations

The memorandum also includes a collection of technical appendices that contain methods and data applied in the study and detailed reports of the intersection capacity analyses.

Intersection Layout and Traffic Control

The intersection, shown in Figure 1, is owned by the Massachusetts Department of Transportation (MassDOT) Highway Division and is located in the Fayville section of Southborough. It is the easternmost Route 9 intersection in Southborough. Route 9 is under MassDOT's jurisdiction and Central Street and Oak Hill Road are under Southborough's jurisdiction. Route 9 is classified as a principal arterial and Central Street and Oak Hill Road are urban minor arterials.

Figure 1 also provides a view of the intersection layout and the area nearby. The lane configuration of the intersection is described below.



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FIGURE 1
Turnpike Road (Route 9) at Central Street/Oak Hill Road
And Woodland Road, Southborough

*Safety and Operations
Analyses at
Selected Intersections*

Route 9 Eastbound

- Widens from two approach lanes to three approach lanes, 350 feet before the intersection
- One 350-foot exclusive left-turn lane
- Two through lanes
- One shared-use right-and-through lane
- Three departure lanes that narrow to two lanes, dropping the right lane approximately 200 feet past the intersection

Route 9 Westbound

- Three approach lanes
- One 220-foot exclusive left-turn lane
- Two through lanes
- One shared-use right-and-through lane
- Three departure lanes that narrow to two lanes, dropping the right lane approximately 150 feet past the intersection

Central Street Southbound

- One approach lane
- Lane widens approximately 100 feet before the intersection
- Single approach lane used as two lanes at the intersection
- One departure lane

Oak Hill Road:

- Widens from single approach lane to three approach lanes, approximately 150 feet from the intersection
- One exclusive left-turn lane
- One through lane
- One right-turn lane
- One departure lane

Traffic operations at the intersection are under fully actuated signal control, with three-phase signal operations. An exclusive pedestrian phase is provided upon activation. Route 9, in both directions, is provided with exclusive protected left-turn phases, followed by the through movements. The Central Street and Oak Hill Road approaches run concurrently.

The land use at the four corners of the intersection is a mix of retail and office. In the northeast corner of the intersection, there is a small building that provides office space to several small businesses. The northwest corner of the intersection has a similar building, which also provides office space to several small businesses. The southeast corner has a Mobil gas station. In the southwest corner of the intersection is a

Walgreens, which was constructed in 2008. The construction of the Walgreens store also included widening (from one to three approach lanes) of the Oak Hill Road approach to the intersection. Figures 2 and 3 provide a “before and after” look this approach. Before Walgreens was constructed, Oak Hill Road was a single-lane approach that flared at the intersection for the right turns. After it was constructed, the approach was widened to three lanes, providing an exclusive lane for each movement.

Pedestrian accommodations are provided at the intersection. There is a sidewalk along the northern side of Route 9. However, on the southern side of Route 9, there is a sidewalk only from the corner of the intersection to Walgreens store. A sidewalk is present along the eastern side of both Central Street and Oak Hill Road. The intersection has crosswalks across all four approaches, and pedestrian push buttons and signal heads are provided on each corner for crossing. An audio alert is also provided during the pedestrian phase of the signal.

Woodland Road Intersection

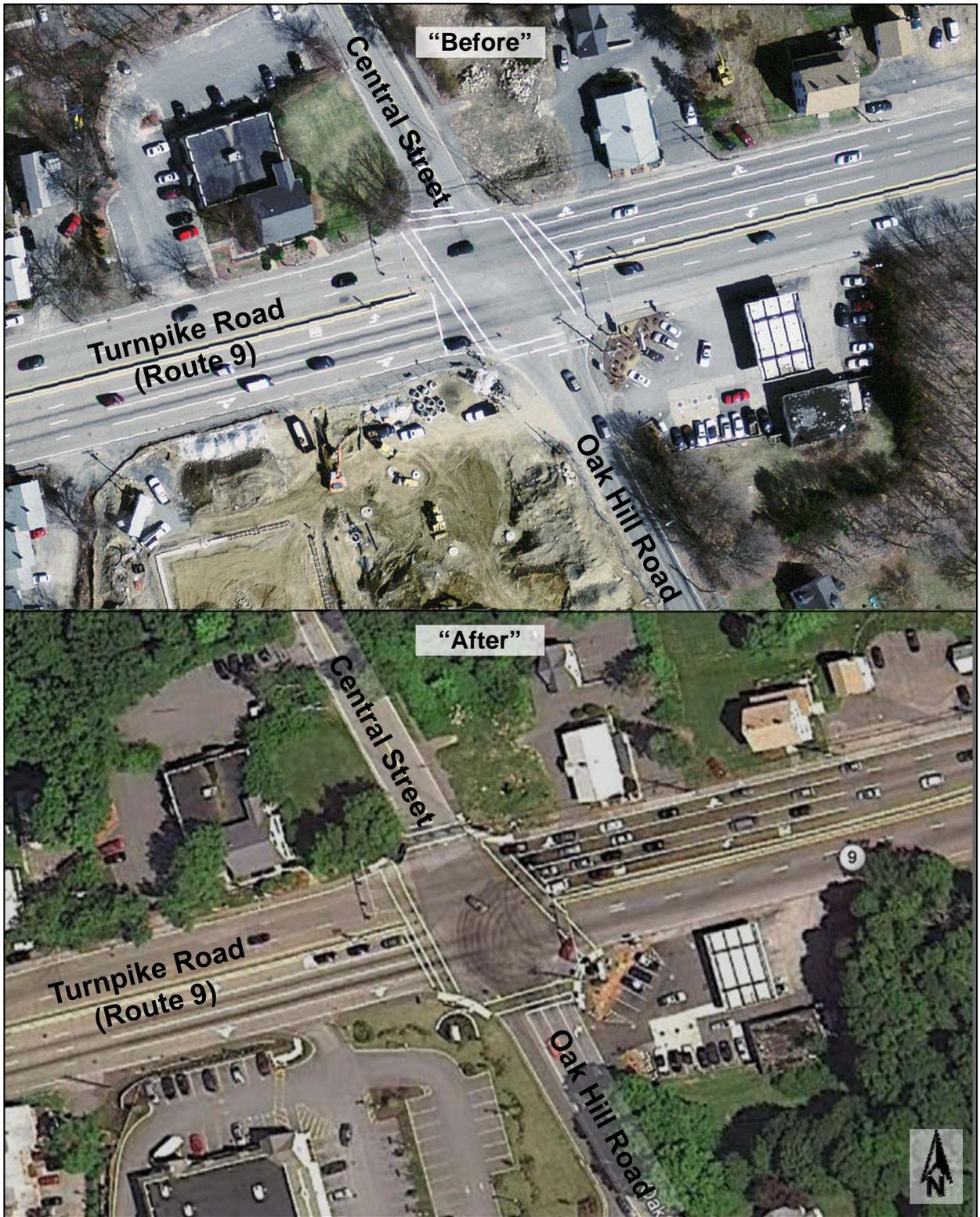
The Woodland Road intersection is one of two unsignalized median breaks on Route 9 in Southborough. This three-way intersection, which has left and right turns onto Woodland Road from Route 9 and a right-turn-only lane from Woodland Road, provides access to residential properties. Woodland Road is currently the direct route for residents to and from Route 9. There is no access from Oak Hill Road; the only other access to Woodland is from Breakneck Hill Road, which is located further west.

Issues and Concerns

MPO staff met with MassDOT Highway Division District 3 personnel to discuss their concerns about the intersection. MassDOT’s concerns and comments received from the public deal with the problem of congestion during the peak periods in the morning and afternoon commuting hours. This intersection is near several office developments, both in Southborough and Framingham, as well as near the Mass Turnpike Framingham interchange.

In addition to the congestion concerns, there appears to be some driver confusion related to the lane assignments on the southbound Central Street approach. Even though the approach is striped as a single lane, there is sufficient width to allow vehicles to queue side by side in the single lane, making a de facto two-lane approach. However, the lane assignments were not clear to drivers—staff repeatedly observed two vehicles making the same through movement to Oak Hill Road, narrowly avoiding side-swipe crashes.

Another issue that MassDOT brought up in the discussion was the median break and access to Woodland Road, located approximately 770 feet west of the Central Street/Oak Hill Road intersection. Eastbound queuing during the AM peak hour consistently extends past Woodland Road. MassDOT was interested in finding out if this intersection affects the operations of the Central Street/Oak Hill Road intersection and if it is a dangerous situation that needs to be improved.



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FIGURE 2
Before and After the Construction
of Walgreens Pharmacy in 2008

*Safety and Operations
Analyses at
Selected Intersections*





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FIGURE 3
Before and After the Construction
of Walgreens Pharmacy in 2008

Safety and Operations
Analyses at
Selected Intersections

Crash Data Analysis

Staff collected crash data from the MassDOT Registry of Motor Vehicles Division for the most recent five years available, 2005 to 2009. Tables 1 and 2 provide a summary of the crashes at the Central Street/Oak Hill Road intersection and the Woodland Road intersection, respectively, for the most recent five years.

An average of 16 crashes occurred at the Central Street/Oak Hill Road intersection each year. In total, about 70 percent of the crashes resulted in property damage only, and 22 percent in personal injuries. However in one of the reported crashes, a fatality occurred. The fatality, which occurred in the spring of 2009, involved a pedestrian and single vehicle and occurred at 10:00 PM; no other information about weather conditions, pavement conditions, or lighting was reported. The majority of the collision types were rear-end collisions (50 percent), followed by angle collisions (22 percent); both collision types are common at signalized intersections. There were no crashes that involved cyclists in that period.

A total of 32 crashes occurred on the Woodland Road intersection for the same five-year period, averaging just over six crashes a year. Over half of the crashes (56 percent) were classified as property damage only, with only 15 percent involving personal injury. Based on the crash data, 44 percent of the collision types were angle crashes, the majority of which involved Route 9 westbound vehicles turning left onto Woodland Road, and a few crashes involved vehicles that were exiting from Woodland Road to turn onto Route 9 eastbound. Many of these crashes occurred during peak periods (7:00 to 9:00 AM and 4:00 to 6:00 PM), when Route 9 traffic is at or near its peak.

Crash rate is another effective tool for examining the relative safety of a particular location.¹ Based on the 2005–09 crash data and the recently collected (in 2012) traffic volume data, the crash rate for the Central Street/Oak Hill Road intersection is 0.76 (see Appendix A for MassDOT intersection crash rate worksheets). The crash rate at the intersection is less than the average rate for signalized intersections in MassDOT Highway Division District 3, which is estimated to be 0.90 crashes per million entering vehicles. The crash rate for the Woodland Road intersection is 0.33, which is also below the District 3 average for unsignalized intersections— 0.66 crashes per million entering vehicles.

¹ Crash rates are estimated based on crash frequency (crashes per year) and vehicle exposure (traffic volumes or miles traveled). Crash rates are expressed as “crashes per million entering vehicles” for intersection locations and as “crashes per million miles traveled” for roadway segments.

TABLE 1
Summary of MassDOT Crash Data (2005–09):
Turnpike Road (Route 9) at Central Street/Oak Hill Road

		2005	2006	2007	2008	2009	2005–09	
							Total	Average
Total Number of Crashes		12	17	14	21	18	82	16.4
Crash Severity	Property damage	9	9	11	16	12	57	11.4
	Personal injury	2	5	1	4	5	17	3.4
	Fatality	0	0	0	0	1	1	0.2
	Not reported	1	3	2	1	0	7	1.4
Collision Type	Angle	3	2	4	5	4	18	3.6
	Rear-end	8	11	3	9	10	41	8.2
	Sideswipe	0	2	3	4	2	11	2.2
	Head-on	0	0	0	0	0	0	0.0
	Single vehicle	0	1	4	1	2	8	1.6
	Not reported	1	1	0	2	0	4	0.8
Roadway Conditions	Wet or icy pavement	2	7	3	3	5	20	4.0
	Dark/lighted	2	5	6	2	4	19	3.8
Weather Conditions	Clear	11	11	7	15	9	53	10.6
	Cloudy	1	3	4	4	4	16	3.2
	Rain	0	2	2	1	3	8	1.6
	Snow	0	1	1	1	1	4	0.8
Crashes during weekday peak periods*		8	6	5	12	5	36	7.2
Crashes involving pedestrian(s)		0	0	0	0	1	1	0.2
Crashes involving bicyclist(s)		0	0	0	0	0	0	0.0

* Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

TABLE 2
Summary of MassDOT Crash Data (2005–09):
Turnpike Road (Route 9) at Woodland Road

		2005	2006	2007	2008	2009	2005–09	
							Total	Average
Total Number of Crashes		10	8	5	6	3	32	6.4
Crash Severity	Property damage	6	5	2	2	3	18	3.6
	Personal injury	2	1	2	0	0	5	1.0
	Fatality	0	0	0	0	0	0	0.0
	Not reported	2	2	1	4	0	9	1.8
Collision Type	Angle	3	5	2	2	2	14	2.8
	Rear-end	4	2	3	2	1	12	2.4
	Sideswipe	1	0	0	1	0	2	0.4
	Head-on	0	0	0	0	0	0	0.0
	Single vehicle	2	1	0	1	0	4	0.8
	Not reported	0	0	0	0	0	0	0.8
Roadway Conditions	Wet or icy pavement	6	2	1	3	1	13	2.6
	Dark/lighted	2	1	1	3	0	7	1.4
Weather Conditions	Clear	4	5	4	3	2	18	3.6
	Cloudy	1	1	0	1	0	3	0.6
	Rain	3	2	1	2	0	8	1.6
	Snow	2	0	0	0	1	3	0.6
Crashes during weekday peak periods*		4	3	3	5	2	17	3.4
Crashes involving pedestrian(s)		0	0	0	0	0	0	0.0
Crashes involving bicyclist(s)		0	0	0	0	0	0	0.0

* Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM

Traffic Volumes

MPO staff collected turning-movement counts (TMC) at the intersection on March 2 and 22, 2012. The data were recorded in 15-minute intervals for the peak traffic periods in the morning, from 7:00 to 9:00 AM, and in the evening, from 4:00 to 6:00 PM. The peak hours occurred between 7:45 and 8:45 AM and between 4:45 and 5:45 PM. The peak-hour traffic volumes are shown in Figure 4.

The only pedestrian activity occurred during the PM peak period, when three pedestrians were observed crossing Route 9 from the Walgreens store to the northern side of the intersection.

In addition to the pedestrian counts, MassDOT provided automated traffic recorder (ATR) counts for the study area between March 12, 2012, and March 15, 2012. These counts were used to estimate the turning volumes at the Woodland Road intersection.

The ATR count data are provided in Appendix B, and TMC count data are provided in Appendix C.

Intersection Capacity Analysis

Based on the turning-movement counts and the signal timing data provided by MassDOT District 3, the intersection capacity and operations were analyzed using an intersection analysis program, Synchro.² The existing conditions analysis for the AM and PM peak hours is provided in Table 3.

² Synchro Version 7 was used for these analyses. This software is developed and distributed by Trafficware Ltd. It can perform capacity analysis and traffic simulation (when combined with SimTraffic) for an individual intersection or a series of intersections.

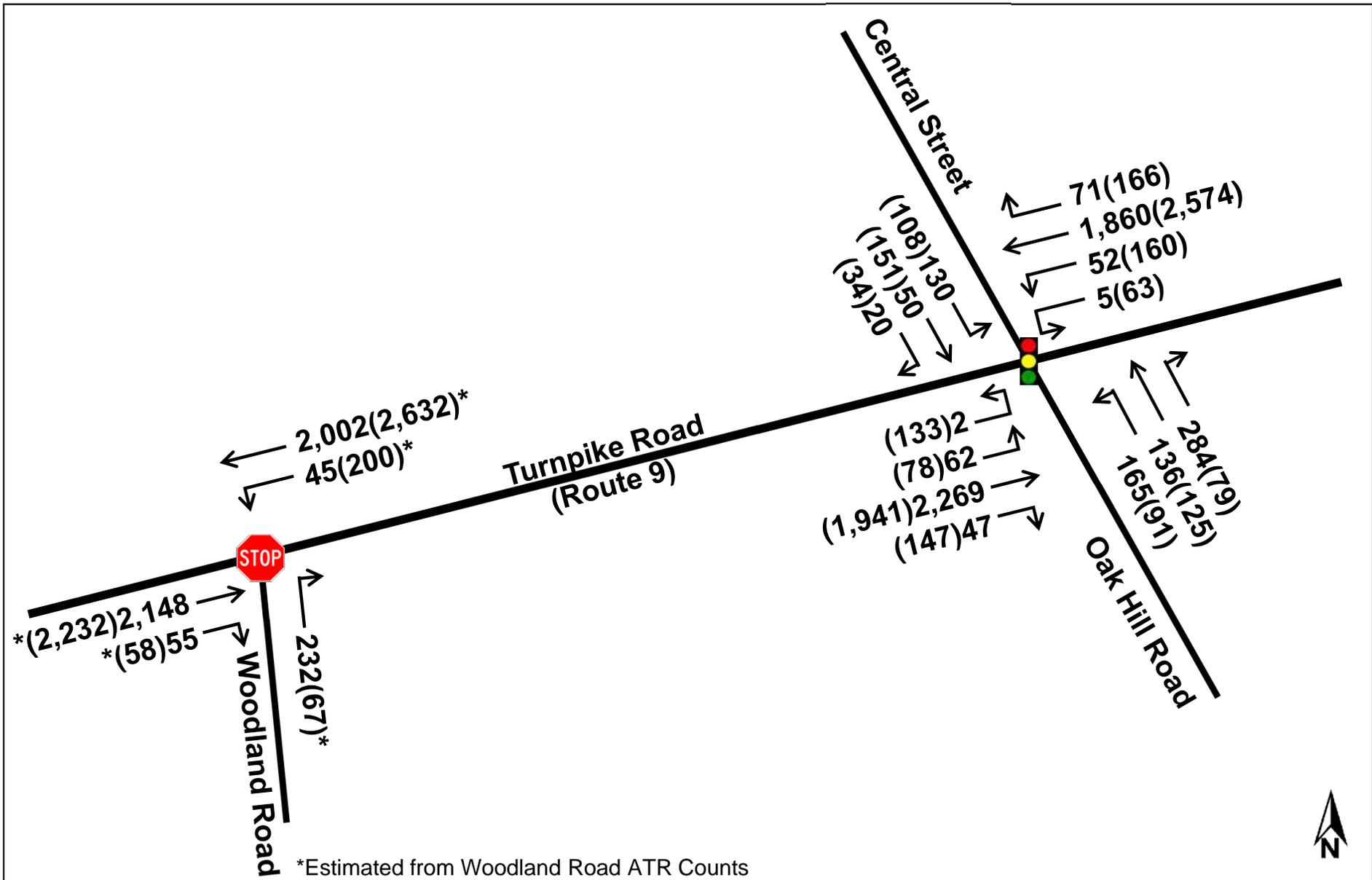


FIGURE 4
Turnpike Road (Route 9) at Central Street/Oak Hill Road
Southborough

TABLE 3
2012 Intersection Analysis

Approach	Mvmt	AM Peak Hour				PM Peak Hour			
		LOS	Delay ¹	V/C ²	Q ³	LOS	Delay ¹	V/C ²	Q ³
Existing Conditions									
Route 9 – EB	U ⁴ L	D	54.4	0.5	98	F	169.4	1.1	333
	TR	C	27.3	0.8	695	C	24.6	0.8	605
Route 9 – WB	U ⁴ L	E	58.3	0.5	83	F	189.5	1.2	412
	TR	C	25.3	0.8	573	E	72.2	1.0	1106
Oak Hill Road – NB	L	E	60.6	0.8	209	F	108.2	0.9	172
	T	D	40.7	0.3	165	D	49.7	0.5	168
	R	D	38.9	0.2	66	D	45.1	0.0	38
Central Street – SB	L ⁵	D	48.0	0.6	175	E	66.8	0.7	186
	TR	D	39.4	0.2	96	E	64.8	0.7	279
Overall		C	30.5	0.7	-	E	63.2	1.0	-
Signal Timing Optimization									
Route 9 – EB	U ⁴ L	E	62.0	0.6	95	F	144.1	0.5	294
	TR	C	21.6	0.8	542	C	30.1	0.9	600
Route 9 – WB	U ⁴ L	F	102.1	0.8	101	F	132.5	0.4	348
	TR	C	20.9	0.7	465	F	112.4	0.8	1036
Oak Hill Road – NB	L	E	71.5	0.8	213	E	58.3	0.8	133
	T	D	39.4	0.4	155	D	41.4	0.3	147
	R	D	37.3	0.2	65	D	37.7	0.2	36
Central Street – SB	L ⁶	D	49.2	0.6	174	D	47.9	0.6	142
	TR	D	37.9	0.2	90	D	50.3	0.2	231
Overall		C	27.5	0.8	-	E	78.6	1.0	-

¹ Delay in seconds per vehicle.

² V/C is the volume-to-capacity ratio.

³ 95% queue in feet.

⁴ U-turn movements.

⁵ De facto left-turn lane.

⁶ Analyzed with dedicated left-turn lane.

Potential Improvements

Discussions with District 3 personnel and analysis of the intersection led to the determination that no major improvements for the intersection could be justified. Signal visibility is adequate, with signal heads located overhead on mast arms, and pedestrian accommodations are provided for the few pedestrians present. Existing signage is adequate for Route 9 and the side streets. As mentioned previously, the intersection was partially reconstructed during the construction of the Walgreens store, when the Oak Hill Road approach to the intersection was widened to three approach lanes.

During the study, the following potential safety and operations improvements were analyzed:

- **Signal timing and phasing optimization:** Signal phasing and optimal phase times to improve overall intersection operations.
- **Protected/permitted phasing:** Protected/permitted phasing for Central Street and Oak Hill Road left-turn movements to improve the left-turn movements.
- **Split phasing:** Split phasing for Central Street and Oak Hill Road to improve the side street operations.
- **Restriping of the Central Street approach:** The southbound Central Street approach is currently being used de facto as a two-lanes based on AM and PM peak-period observations. A safety improvement for this approach would be to restripe Central Street for an 11-foot left-turn lane and an 11-foot right-and-through lane. Figure 5 is a conceptual plan of the restriping of this approach.
- **“Do Not Block Intersection” signs at Woodland Road:** A painted “Do Not Block Intersection” box would be placed on the eastbound side of Route 9 at the Woodland Road intersection. Two R10-7 (“Do Not Block Intersection”) signs would be placed in the eastbound lanes of Route 9 before the Woodland Road intersection. Figure 6 is a conceptual plan of the proposed improvement.

The best results of the optimization of the signal timings for the AM and PM peak hours are shown in Table 3. These results indicate that a slight improvement for the Central Street and Oak Hill Road approaches can be accomplished at the expense of the Route 9 operations. Results of the protected/permitted-left-turn phasing and phase times for Central Street and Oak Hill Road did not improve overall operations of the intersection or the operations for the side streets.

Results and Recommendations

Central Street/Oak Hill Road Intersection

The above safety and operations analyses indicate that the only significant improvement to the intersection that is recommended is the restriping of the

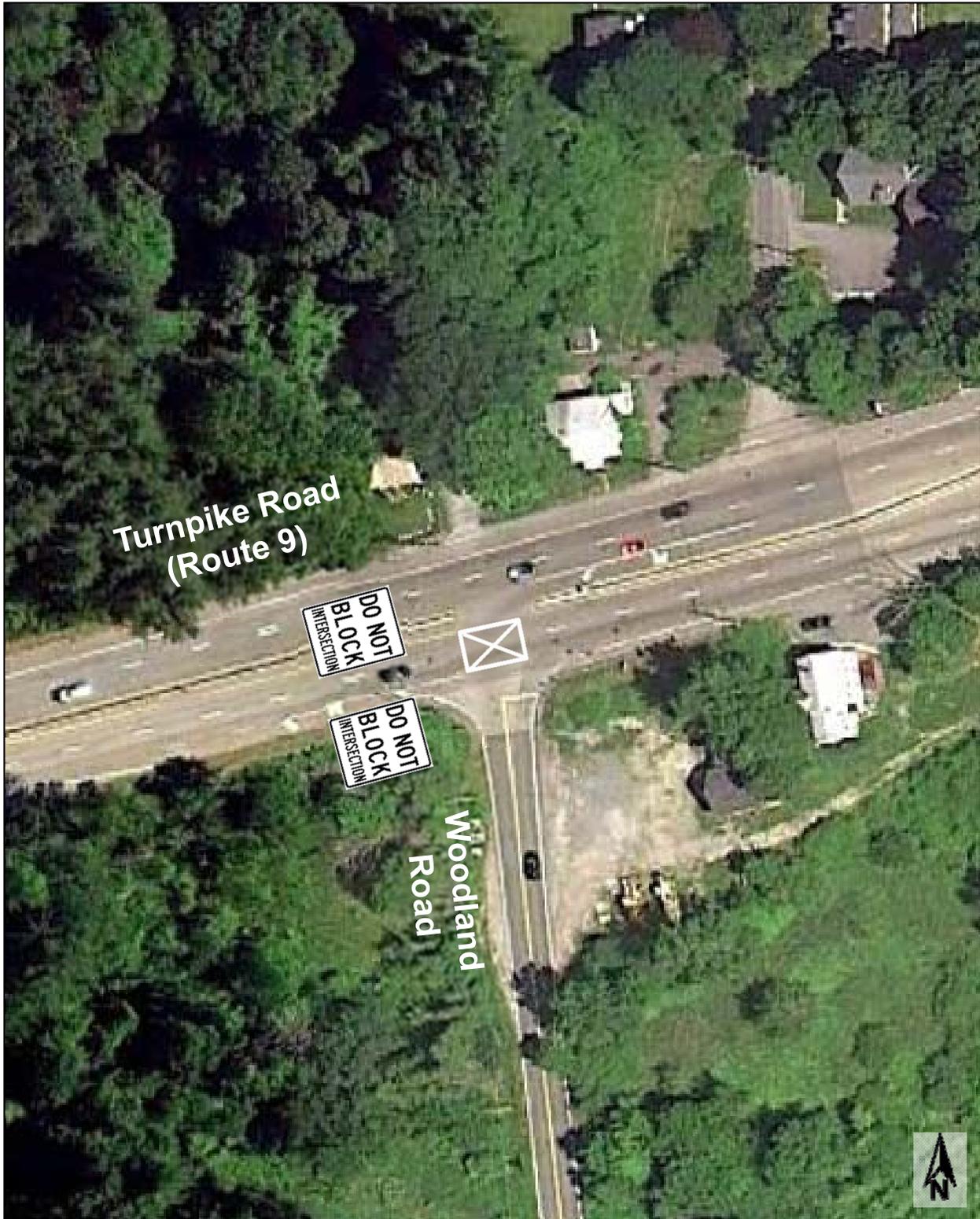


Legend
 — Existing pavement markings
 — Proposed pavement markings

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FIGURE 5
Proposed Restriping of
Central Street

Safety and Operations
Improvements at
Selected Intersections



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FIGURE 6
Proposed “Do Not Block Intersection”
Signs on Route 9 at Woodland Road

Safety and Operations
Improvements at
Selected Intersections

Central Street approach. Staff observed vehicles continually using the wide approach as two lanes, with the left lane predominately used by left-turning vehicles. However, occasionally a through vehicle would line up in the left lane and make the through movement with a vehicle lined up in the right lane, nearly causing a side-swipe crash, since there is only a single departure lane on Oak Hill Road.

The recommendation is to provide two delineated approach lanes. There is currently about 33 feet of total roadway width available to accommodate the proposed lanes. The existing double yellow center line would need to be removed and replaced to allow the following new proposed lane widths:

- 11-foot shared right-and-through lane
- 11-foot left-turn lane
- 11-foot departure lane

The optimization of the timings, protected/permitted phasing, and split phasing are not recommended. As shown in Table 3, the signal timing optimization does not improve the overall operations (in the simulation). Slight improvement is shown for the Central Street and Oak Hill Road approaches, but there are increased delays on Route 9. The same problem occurs when the protected/permitted phasing and split phasing operations are simulated.

Woodland Road Intersection

During the peak periods, it was observed that the Route 9 eastbound queue regularly backs up to and through the Woodland Road intersection. However, this does not seem to affect the operations of the Central Street/Oak Hill Road intersection. The safety analysis of the Woodland Road intersection indicates that this intersection has a crash rate of 0.33, which is half the average rate for District 3 unsignalized intersections, despite the high Route 9 traffic volumes. It was also observed that queuing Route 9 eastbound vehicles regularly provided gaps for both Route 9 westbound left-turning vehicles and for the right turns from Woodland Road.

However, to ensure that gaps exist for turning vehicles, it is recommended that a "Do Not Block Intersection" box and signage be installed on the eastbound side of Route 9. In addition, if this results in an increase in the number of crashes or personal injury crashes in the future, after the proposed improvement, the possibilities of closing the median and prohibiting left-turns onto Woodland Road from Route 9 westbound must be considered.

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APPENDIX A

Calculation of Crash Rates for:

Route 9 at Central Street/Oak Street

and

Route 9 at Woodland Road

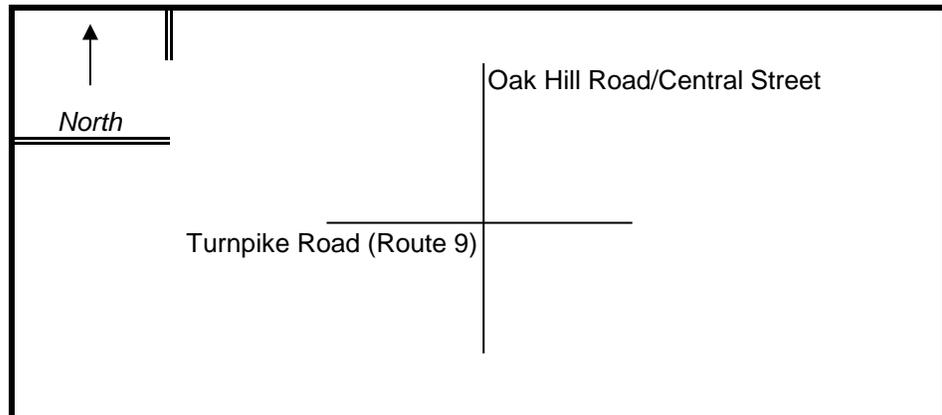
INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Southborough COUNT DATE : 3/272012
 DISTRICT : 3 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Turnpike Road (Route 9)
 MINOR STREET(S) : Oak Hill Road/Central Street

**INTERSECTION
 DIAGRAM
 (Label Approaches)**



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	295	293	2,299	2,963		5,850

" K " FACTOR : INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION : RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : MassDOT District 3 Average Rate = 0.90 Signalized Intersections (July 7, 2011)
 Project Title & Date: Safety and Operations Analyses at Selected Intersections

APPENDIX B

Average Daily Traffic (ADT) of the Study Area Roadways

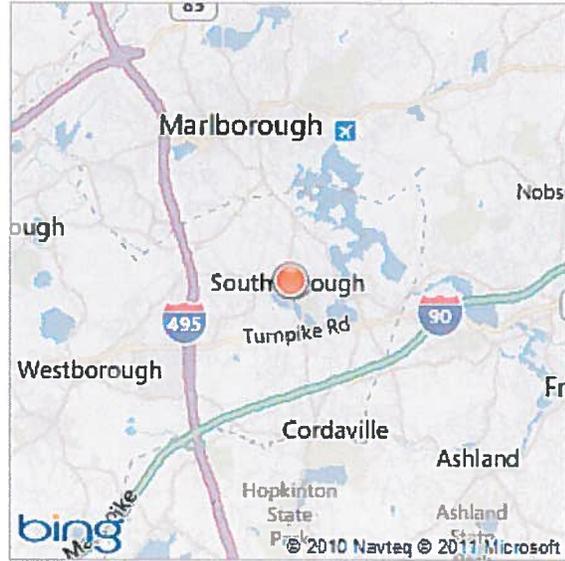
bing Maps

Southborough, MA

My Notes

TDC PROJECT #
S12-017
SOUTHBOROUGH

On the go? Use m.bing.com to find maps, directions, businesses, and more



Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

Site Reference: 000000000103
 Site ID: 120170000682
 Location: RTE. 9, WEST OF WOODLAND RD.
 Direction: EAST

STA. 1 EB

File: 103.prn
 City: SOUTHBOROUGH
 County: VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		117	107	132		118			118	356
02:00		49	50	67		55			55	166
03:00		50	28	57		45			45	135
04:00		80	100	90		90			90	270
05:00		178	148	164		163			163	490
06:00		579	561	595		578			578	1735
07:00		1784	1780	1793		1785			1785	5357
08:00		2023	2106	2170		2099			2099	6299
09:00		1868	2016	1974		1952			1952	5858
10:00		1620	1504			1562			1562	3124
11:00	1052	1120	1132			1101			1101	3304
12:00	1085	1167	1247			1166			1166	3499
13:00	1225	1353	1388			1322			1322	3966
14:00	1178	1216	1239			1211			1211	3633
15:00	1167	1241	1318			1242			1242	3726
16:00	1364	1412	1428			1401			1401	4204
17:00	1624	1627	1707			1652			1652	4958
18:00	2060	2142	2205			2135			2135	6407
19:00	1500	1569	1604			1557			1557	4673
20:00	884	926	988			932			932	2798
21:00	652	802	772			742			742	2226
22:00	488	555	581			541			541	1624
23:00	337	370	404			370			370	1111
24:00	188	216	217			207			207	621
TOTALS	14804	24064	24630	7042	0	24026	0	0	24026	70540
% AVG WKDY	61.6	100.1	102.5	29.3						
% AVG WEEK	61.6	100.1	102.5	29.3						
AM Times	12:00	08:00	08:00	08:00		08:00			08:00	
AM Peaks	1085	2023	2106	2170		2099			2099	
PM Times	18:00	18:00	18:00			18:00			18:00	
PM Peaks	2060	2142	2205			2135			2135	

u2

EB 24026
 WB 25798

 Comb AWD 49824
 FAC .96(.98)
 Comb ADT 46,900

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

Page: 1

STA. 1WB

Site Reference: 000000000104
 Site ID: 120170000487
 Location: RTE. 9, WEST OF WOODLAND RD.
 Direction: WEST

File: 104.prn
 City: SOUTHBOROUGH
 County: VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		165	187	206		186			186	558
02:00		73	105	107		95			95	285
03:00		52	62	50		54			54	164
04:00		49	55	58		54			54	162
05:00		102	87	87		92			92	276
06:00		259	286	265		270			270	810
07:00		814	796	875		828			828	2485
08:00		1819	1794	1745		1786			1786	5358
09:00		2050	2107	2031		2062			2062	6188
10:00		1489	1390			1439			1439	2879
11:00	910	1005	1074			996			996	2989
12:00	1031	1071	1139			1080			1080	3241
13:00	1256	1244	1313			1271			1271	3813
14:00	1206	1302	1353			1287			1287	3861
15:00	1448	1576	1468			1497			1497	4492
16:00	1920	1992	1968			1960			1960	5880
17:00	2449	2461	2591			2500			2500	7501
18:00	2422	2539	2556			2505			2505	7517
19:00	1779	2028	1893			1900			1900	5700
20:00	1215	1306	1280			1267			1267	3801
21:00	833	1016	935			928			928	2784
22:00	748	913	922			861			861	2583
23:00	486	548	556			530			530	1590
24:00	320	354	377			350			350	1051
TOTALS	18023	26227	26294	5424	0	25798	0	0	25798	75968
% AVG WKDY	69.8	101.6	101.9	21						
% AVG WEEK	69.8	101.6	101.9	21						
AM Times	12:00	09:00	09:00	09:00		09:00			09:00	
AM Peaks	1031	2050	2107	2031		2062			2062	
PM Times	17:00	18:00	17:00			18:00			18:00	
PM Peaks	2449	2539	2591			2505			2505	

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

STA. 2EB

Site Reference: 000000000203
 Site ID: 120170000602
 Location: RTE. 9, BTWN WOODLAND RD. & WINTER ST.
 Direction: EAST

File: 203.prn
 City: SOUTHBOROUGH
 County: VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		121	112	136		123			123	369
02:00		56	51	67		58			58	174
03:00		53	29	61		47			47	143
04:00		81	107	95		94			94	283
05:00		189	160	181		176			176	530
06:00		650	624	647		640			640	1921
07:00		2020	2001	1997		2006			2006	6018
08:00		2329	2394	2458		2393			2393	7181
09:00		2265	2324	2295		2294			2294	6884
10:00		1883	1671			1777			1777	3554
11:00	1166	1237	1212			1205			1205	3615
12:00	1147	1246	1320			1237			1237	3713
13:00	1295	1428	1467			1396			1396	4190
14:00	1240	1281	1281			1267			1267	3802
15:00	1242	1306	1415			1321			1321	3963
16:00	1437	1479	1477			1464			1464	4393
17:00	1685	1690	1747			1707			1707	5122
18:00	2088	2188	2209			2161			2161	6485
19:00	1553	1598	1652			1601			1601	4803
20:00	917	969	1026			970			970	2912
21:00	690	826	796			770			770	2312
22:00	512	572	598			560			560	1682
23:00	351	368	415			378			378	1134
24:00	194	220	221			211			211	635
TOTALS	15517	26055	26309	7937	0	25856	0	0	25856	75818
% AVG WKDY	60	100.7	101.7	30.6						
% AVG WEEK	60	100.7	101.7	30.6						
AM Times	11:00	08:00	08:00	08:00		08:00			08:00	
AM Peaks	1166	2329	2394	2458		2393			2393	
PM Times	18:00	18:00	18:00			18:00			18:00	
PM Peaks	2088	2188	2209			2161			2161	

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EB 25856
 WB 27463

 COMB AWD 53319
 FAC .96(.98)
 COMB ADT 50,200

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

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STA. 2 WB

Site Reference: 000000000204
 Site ID: 120170000426
 Location: RTE. 9, BTWN WOODLAND RD. & WINTER ST.
 Direction: WEST

File: 204.prn
 City: SOUTHBOROUGH
 County: VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		176	205	218		199			199	599
02:00		79	114	115		102			102	308
03:00		54	66	53		57			57	173
04:00		50	56	60		55			55	166
05:00		106	88	93		95			95	287
06:00		269	300	268		279			279	837
07:00		838	817	901		852			852	2556
08:00		1867	1837	1793		1832			1832	5497
09:00		2074	2173	2071		2106			2106	6318
10:00		1520	1420			1470			1470	2940
11:00	953	1043	1118			1038			1038	3114
12:00	1089	1140	1200			1143			1143	3429
13:00	1344	1328	1379			1350			1350	4051
14:00	1281	1370	1449			1366			1366	4100
15:00	1538	1680	1579			1599			1599	4797
16:00	2069	2142	2081			2097			2097	6292
17:00	2651	2642	2772			2688			2688	8065
18:00	2606	2764	2778			2716			2716	8148
19:00	1959	2210	2079			2082			2082	6248
20:00	1358	1451	1412			1407			1407	4221
21:00	924	1108	1035			1022			1022	3067
22:00	837	983	996			938			938	2816
23:00	533	603	615			583			583	1751
24:00	351	398	412			387			387	1161
TOTALS	19493	27895	27981	5572	0	27463	0	0	27463	80941
% AVG WKDY	70.9	101.5	101.8	20.2						
% AVG WEEK	70.9	101.5	101.8	20.2						
AM Times	12:00	09:00	09:00	09:00		09:00			09:00	
AM Peaks	1089	2074	2173	2071		2106			2106	
PM Times	17:00	18:00	18:00			18:00			18:00	
PM Peaks	2651	2764	2778			2716			2716	

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

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Site Reference: 000000000303
 Site ID: 120170000555
 Location: RTE. 9, EAST OF PLEASANT ST.
 Direction: EAST

STA. 3 EB

File: 303.prn
 City: SOUTHBOROUGH
 County: VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		128	122	150		133			133	400
02:00		53	60	68		60			60	181
03:00		52	34	64		50			50	150
04:00		84	106	94		94			94	284
05:00		198	169	196		187			187	563
06:00		696	662	681		679			679	2039
07:00		2110	2123	2125		2119			2119	6358
08:00		2494	2562	2643		2566			2566	7699
09:00		2492	2599	2561		2550			2550	7652
10:00		1969	1769			1869			1869	3738
11:00		1342	1292			1317			1317	2634
12:00	1168	1282	1319			1256			1256	3769
13:00	1256	1460	1495			1403			1403	4211
14:00	1286	1346	1346			1326			1326	3978
15:00	1257	1282	1374			1304			1304	3913
16:00	1407	1459	1432			1432			1432	4298
17:00	1541	1576	1649			1588			1588	4766
18:00	1824	1869	1944			1879			1879	5637
19:00	1368	1486	1548			1467			1467	4402
20:00	947	988	1006			980			980	2941
21:00	662	813	760			745			745	2235
22:00	531	610	625			588			588	1766
23:00	379	397	432			402			402	1208
24:00	209	218	229			218			218	656

TOTALS	13835	26404	26657	8582	0	26212	0	0	26212	75478
% AVG WKDY	52.7	100.7	101.6	32.7						
% AVG WEEK	52.7	100.7	101.6	32.7						
AM Times	12:00	08:00	09:00	08:00		08:00			08:00	
AM Peaks	1168	2494	2599	2643		2566			2566	
PM Times	18:00	18:00	18:00			18:00			18:00	
PM Peaks	1824	1869	1944			1879			1879	

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EB 26212
 WB 27969
 COMB AWD 54181
 FAC ,96(.98)
 COMB ADT 51,000

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

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STA. 3WB

Site Reference: 000000000304
 Site ID: 120170000403
 Location: RTE. 9, EAST OF PLEASANT ST.
 Direction: WEST

File: 304.prn
 City: SOUTHBOROUGH
 County: VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		189	223	228		213			213	640
02:00		85	113	115		104			104	313
03:00		50	66	54		56			56	170
04:00		55	58	64		59			59	177
05:00		97	91	93		93			93	281
06:00		263	276	262		267			267	801
07:00		785	763	844		797			797	2392
08:00		1753	1754	1719		1742			1742	5226
09:00		1967	2031	1936		1978			1978	5934
10:00		1494	1381			1437			1437	2875
11:00		1091	1135			1113			1113	2226
12:00	1118	1194	1243			1185			1185	3555
13:00	1367	1366	1426			1386			1386	4159
14:00	1324	1488	1497			1436			1436	4309
15:00	1584	1659	1549			1597			1597	4792
16:00	2143	2207	2145			2165			2165	6495
17:00	2740	2725	2811			2758			2758	8276
18:00	2717	2808	2885			2803			2803	8410
19:00	2013	2299	2091			2134			2134	6403
20:00	1433	1573	1505			1503			1503	4511
21:00	1009	1191	1145			1115			1115	3345
22:00	905	1062	1075			1014			1014	3042
23:00	586	652	638			625			625	1876
24:00	339	403	425			389			389	1167
TOTALS	19278	28456	28326	5315	0	27969	0	0	27969	81375
% AVG WKDY	68.9	101.7	101.2	19						
% AVG WEEK	68.9	101.7	101.2	19						
AM Times	12:00	09:00	09:00	09:00		09:00			09:00	
AM Peaks	1118	1967	2031	1936		1978			1978	
PM Times	17:00	18:00	18:00			18:00			18:00	
PM Peaks	2740	2808	2885			2803			2803	

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

STA. 4 NB

Site Reference: 000000040102
 Site ID: 120170000853
 Location: CENTRAL ST., NORTH OF WINTER ST.
 Direction: EAST

File: 40102.prn
 City: SOUTHBOROUGH
 County: DIR VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		18	23	22		21			21	63
02:00		9	10	14		11			11	33
03:00		9	5	5		6			6	19
04:00		3	6	8		5			5	17
05:00		7	12	8		9			9	27
06:00		27	27	26		26			26	80
07:00		88	109	103		100			100	300
08:00		238	263	284		261			261	785
09:00		260	281	250		263			263	791
10:00		218	206			212			212	424
11:00	161	177	174			170			170	512
12:00	162	174	198			178			178	534
13:00	205	196	199			200			200	600
14:00	226	222	200			216			216	648
15:00	251	244	252			249			249	747
16:00	353	321	317			330			330	991
17:00	474	405	410			429			429	1289
18:00	489	476	522			495			495	1487
19:00	337	342	331			336			336	1010
20:00	185	204	211			200			200	600
21:00	124	142	163			143			143	429
22:00	140	136	125			133			133	401
23:00	67	68	82			72			72	217
24:00	32	38	49			39			39	119

TOTALS	3206	4022	4175	720	0	4104	0	0	4104	12123

% AVG WKDY	78.1	98	101.7	17.5						
% AVG WEEK	78.1	98	101.7	17.5						

AM Times	12:00	09:00	09:00	08:00		09:00			09:00	
AM Peaks	162	260	281	284		263			263	

PM Times	18:00	18:00	18:00			18:00			18:00	
PM Peaks	489	476	522			495			495	

US

NB 4104
 SB 3001

 COMB AWD 7105
 FAC .96(.98)
 COMB ADT 6,700

Mass Highway Department
WEEKLY SUMMARY FOR LANE 2
Starting: 3/12/2012

Page: 2

STA. 4 SB

Site Reference: 000000040102
Site ID: 120170000853
Location: CENTRAL ST., NORTH OF WINTER ST.
Direction: SOUTH

File: 40102.prn
City: SOUTHBOROUGH
County: DIR VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		12	11	15		12			12	38
02:00		7	9	3		6			6	19
03:00		4	6	5		5			5	15
04:00		3	6	4		4			4	13
05:00		16	13	18		15			15	47
06:00		51	54	52		52			52	157
07:00		135	154	164		151			151	453
08:00		201	210	225		212			212	636
09:00		208	212	212		210			210	632
10:00		193	206			199			199	399
11:00	167	173	162			167			167	502
12:00	170	167	155			164			164	492
13:00	171	169	158			166			166	498
14:00	173	169	175			172			172	517
15:00	210	175	207			197			197	592
16:00	246	226	261			244			244	733
17:00	247	277	242			255			255	766
18:00	246	219	240			235			235	705
19:00	174	177	195			182			182	546
20:00	121	135	127			127			127	383
21:00	78	89	90			85			85	257
22:00	73	71	73			72			72	217
23:00	38	39	52			43			43	129
24:00	26	22	31			26			26	79
TOTALS	2140	2938	3049	698	0	3001	0	0	3001	8825
% AVG WKDY	71.3	97.9	101.5	23.2						
% AVG WEEK	71.3	97.9	101.5	23.2						
AM Times	12:00	09:00	09:00	08:00		08:00			08:00	
AM Peaks	170	208	212	225		212			212	
PM Times	17:00	17:00	16:00			17:00			17:00	
PM Peaks	247	277	261			255			255	

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

STA. 5 NB

Site Reference: 000000050102
 Site ID: 120170000594
 Location: WOODLAND RD., SOUTH OF RTE. 9
 Direction: NORTH

File: 50102.prn
 City: SOUTHBOROUGH
 County: DIR VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		3	4	2		3			3	9
02:00		1	0	0		0			0	1
03:00		2	0	2		1			1	4
04:00		0	5	2		2			2	7
05:00		6	8	10		8			8	24
06:00		60	56	53		56			56	169
07:00		219	219	218		218			218	656
08:00		295	289	314		299			299	898
09:00		305	288	265		286			286	858
10:00		198	159			178			178	357
11:00	96	95	72			87			87	263
12:00	63	95	78			78			78	236
13:00	79	82	81			80			80	242
14:00	65	60	55			60			60	180
15:00	76	73	84			77			77	233
16:00	76	77	62			71			71	215
17:00	66	75	63			68			68	204
18:00	64	64	68			65			65	196
19:00	56	65	67			62			62	188
20:00	41	49	34			41			41	124
21:00	33	30	21			28			28	84
22:00	20	17	21			19			19	58
23:00	11	1	10			7			7	22
24:00	3	1	5			3			3	9
TOTALS	749	1873	1749	866	0	1797	0	0	1797	5237
% AVG WKDY	41.6	104.2	97.3	48.1						
% AVG WEEK	41.6	104.2	97.3	48.1						
AM Times	11:00	09:00	08:00	08:00		08:00			08:00	
AM Peaks	96	305	289	314		299			299	
PM Times	13:00	13:00	15:00			13:00			13:00	
PM Peaks	79	82	84			80			80	

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 NB 1797
 SB 1985
 COMB AWD 3782
 FAC .96(.99)
 COMB ADT 3,600

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/12/2012

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STA. 5 SB

Site Reference: 000000050102
 Site ID: 120170000594
 Location: WOODLAND RD., SOUTH OF RTE. 9
 Direction: SOUTH

File: 50102.prn
 City: SOUTHBOROUGH
 County: DIR VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		8	16	12		12			12	36
02:00		6	8	7		7			7	21
03:00		1	4	2		2			2	7
04:00		1	0	1		0			0	2
05:00		1	2	4		2			2	7
06:00		7	10	8		8			8	25
07:00		28	21	21		23			23	70
08:00		134	115	61		103			103	310
09:00		159	88	46		97			97	293
10:00		54	34			44			44	88
11:00	39	38	43			40			40	120
12:00	58	65	60			61			61	183
13:00	83	82	60			75			75	225
14:00	81	74	92			82			82	247
15:00	99	113	113			108			108	325
16:00	161	169	140			156			156	470
17:00	244	204	236			228			228	684
18:00	294	293	277			288			288	864
19:00	222	260	225			235			235	707
20:00	155	156	145			152			152	456
21:00	90	108	96			98			98	294
22:00	83	78	74			78			78	235
23:00	46	62	57			55			55	165
24:00	24	38	31			31			31	93
TOTALS	1679	2139	1947	162	0	1985	0	0	1985	5927
% AVG WKDY	84.5	107.7	98	8.1						
% AVG WEEK	84.5	107.7	98	8.1						
AM Times	12:00	09:00	08:00	08:00		08:00			08:00	
AM Peaks	58	159	115	61		103			103	
PM Times	18:00	18:00	18:00			18:00			18:00	
PM Peaks	294	293	277			288			288	

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 1
 Starting: 3/12/2012

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STA. 6 NB

Site Reference: 000000060102
 Site ID: 120170000563
 Location: OAK HILL RD., SOUTH OF RTE. 9
 Direction: NORTH

File: 60102.prn
 City: SOUTHBOROUGH
 County: DIR VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		5	11	7		7			7	23
02:00		4	11	13		9			9	28
03:00		7	2	9		6			6	18
04:00		3	6	5		4			4	14
05:00		29	17	19		21			21	65
06:00		80	85	80		81			81	245
07:00		250	268	276		264			264	794
08:00		530	512	541		527			527	1583
09:00		591	595	529		571			571	1715
10:00		293	278			285			285	571
11:00	213	178	173			188			188	564
12:00	153	159	172			161			161	484
13:00	179	171	174			174			174	524
14:00	185	185	175			181			181	545
15:00	213	207	219			213			213	639
16:00	271	239	292			267			267	802
17:00	273	280	294			282			282	847
18:00	280	263	258			267			267	801
19:00	186	209	239			211			211	634
20:00	126	131	151			136			136	408
21:00	89	113	86			96			96	288
22:00	98	89	99			95			95	286
23:00	31	43	48			40			40	122
24:00	28	27	31			28			28	86
TOTALS	2325	4086	4196	1479	0	4114	0	0	4114	12086
% AVG WKDY	56.5	99.3	101.9	35.9						
% AVG WEEK	56.5	99.3	101.9	35.9						
AM Times	11:00	09:00	09:00	08:00		09:00			09:00	
AM Peaks	213	591	595	541		571			571	
PM Times	18:00	17:00	17:00			17:00			17:00	
PM Peaks	280	280	294			282			282	

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 NB 4114
 SB 3430
 COMB AWD 7544
 FAC .96(.98)
 COMB ADT 7,100

Mass Highway Department
 WEEKLY SUMMARY FOR LANE 2
 Starting: 3/12/2012

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STA. 65B

Site Reference: 000000060102
 Site ID: 120170000563
 Location: OAK HILL RD., SOUTH OF RTE. 9
 Direction: SOUTH

File: 60102.prn
 City: SOUTHBOROUGH
 County: DIR VOL

TIME	MON 12	TUE 13	WED 14	THU 15	FRI	WKDAY AVG	SAT	SUN	WEEK AVG	TOTAL
01:00		23	19	28		23			23	70
02:00		10	7	9		8			8	26
03:00		2	3	6		3			3	11
04:00		7	7	6		6			6	20
05:00		6	6	9		7			7	21
06:00		44	42	50		45			45	136
07:00		97	95	104		98			98	296
08:00		132	169	156		152			152	457
09:00		134	169	155		152			152	458
10:00		160	139			149			149	299
11:00	118	117	126			120			120	361
12:00	143	126	154			141			141	423
13:00	163	174	145			160			160	482
14:00	170	175	151			165			165	496
15:00	216	184	225			208			208	625
16:00	287	294	307			296			296	888
17:00	362	384	344			363			363	1090
18:00	467	428	440			445			445	1335
19:00	304	335	315			318			318	954
20:00	159	196	247			200			200	602
21:00	132	181	169			160			160	482
22:00	95	111	132			112			112	338
23:00	61	66	70			65			65	197
24:00	29	40	34			34			34	103
TOTALS	2706	3426	3515	523	0	3430	0	0	3430	10170
% AVG WKDY	78.8	99.8	102.4	15.2						
% AVG WEEK	78.8	99.8	102.4	15.2						
AM Times	12:00	10:00	08:00	08:00		08:00			08:00	
AM Peaks	143	160	169	156		152			152	
PM Times	18:00	18:00	18:00			18:00			18:00	
PM Peaks	467	428	440			445			445	

APPENDIX C

Turning Movement Counts (TMCs) for the Study Area Roadways

File Name: J:\Traffic Counts\TMC's\Rte 9 at Central Street - PM.ppd
 Start Date: 3/22/2012
 Start Time: 4:15:00 PM
 Site Code: 00032212

Total Vehicles: PM Peak Period

Start Time	Route 9 Eastbound					Route 9 Westbound					Oak Hill Rd Northbound				Central Street Southbound					
	U-turn	Left	Thru	Right	Peds	U-turn	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
4:15 PM	20	23	385	49	2	13	35	667	20	0	38	34	17	0	26	32	10	0	1371	-
4:30 PM	35	12	416	26	0	12	33	739	33	0	30	36	16	0	23	24	13	0	1448	-
4:45 PM	38	25	434	39	0	19	41	617	42	0	17	33	22	0	31	43	11	0	1412	-
5:00 PM	36	16	502	36	0	13	34	716	38	0	27	23	13	0	27	31	10	0	1522	5753
5:15 PM	27	22	467	35	1	18	39	560	36	0	29	32	24	0	19	41	8	0	1358	5740
5:30 PM	32	15	538	37	0	13	46	681	50	0	18	37	20	0	31	36	5	0	1559	5851
5:45 PM	25	19	440	25	0	19	30	658	45	0	26	20	12	0	22	16	5	0	1362	5801
	213	132	3182	247	3	107	258	4638	264	0	185	215	124	0	179	223	62	0	10032	

Total Vehicles: PM Peak Hour

Start Time	Route 9 Eastbound					Route 9 Westbound					Oak Hill Rd Northbound				Central Street Southbound					
	U-turn	Left	Thru	Right	Peds	U-turn	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
4:45 PM	38	25	434	39	0	19	41	617	42	0	17	33	22	0	31	43	11	0	1412	-
5:00 PM	36	16	502	36	0	13	34	716	38	0	27	23	13	0	27	31	10	0	1522	2934
5:15 PM	27	22	467	35	1	18	39	560	36	0	29	32	24	0	19	41	8	0	1358	4292
5:30 PM	32	15	538	37	0	13	46	681	50	0	18	37	20	0	31	36	5	0	1559	5851
	133	78	1941	147	1	63	160	2574	166	0	91	125	79	0	108	151	34	0	5851	
PHF:	0.88	0.78	0.90	0.94		0.83	0.87	0.90	0.83		0.78	0.84	0.82		0.87	0.88	0.77			

PM Peak Hour Trucks

Start Time	Route 9 Eastbound					Route 9 Westbound					Oak Hill Rd Northbound				Central Street Southbound					
	U-turn	Left	Thru	Right	Peds	U-turn	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
4:45 PM	0	0	5	0		0	1	10	0		0	0	0		1	1	0		18	-
5:00 PM	0	0	2	0		0	0	10	1		0	1	1		2	0	0		17	35
5:15 PM	0	0	4	1		0	1	5	1		0	0	1		0	0	0		13	48
5:30 PM	0	0	3	0		0	0	2	1		0	0	1		0	0	1		8	56
	0	0	14	1		0	2	27	3		0	1	3		3	1	1		56	
Truck %:	0.00%	0.00%	0.72%	0.68%		0.00%	1.25%	1.05%	1.81%		0.00%	0.80%	3.80%		2.78%	0.66%	2.94%			

File Name: j:\traffic counts\tmc's\rte 9 at central street - am.ppd

Start Date: 3/2/2012

Start Time: 7:00:00 AM

Site Code: 00030212

Total Vehicles: Peak Period

Total:	Rte 9 EB Eastbound				Rte 9 WB Westbound				Oak Hill Rd Northbound				Central St Southbound					
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
07:00 AM	18	512	5	0	8	281	12	0	36	20	40	0	26	18	4	0	980	
07:15 AM	13	551	8	0	3	387	10	0	48	28	39	0	38	13	6	0	1144	
07:30 AM	10	555	10	0	10	425	12	0	46	30	45	0	27	21	5	0	1196	
07:45 AM	13	574	15	0	18	478	16	0	55	28	64	0	25	14	6	0	1306	4626
08:00 AM	19	559	6	0	12	445	19	0	45	37	81	0	38	12	1	0	1274	4920
08:15 AM	9	578	13	0	7	431	20	0	41	37	82	0	36	9	3	0	1266	5042
08:30 AM	21	558	13	0	15	506	16	0	24	34	57	0	31	15	10	0	1300	5146
08:45 AM	21	513	15	0	11	384	19	0	35	27	43	0	34	16	9	0	1127	4967
Total:	124	4400	85	0	84	3337	124	0	330	241	451	0	255	118	44	0		

Total Vehicles: Peak Hour

	Rte 9 EB Eastbound				Rte 9 WB Westbound				Oak Hill Rd Northbound				Central St Southbound				
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:45 AM	13	574	15	0	18	478	16	0	55	28	64	0	25	14	6	0	1306
08:00 AM	19	559	6	0	12	445	19	0	45	37	81	0	38	12	1	0	1274
08:15 AM	9	578	13	0	7	431	20	0	41	37	82	0	36	9	3	0	1266
08:30 AM	21	558	13	0	15	506	16	0	24	34	57	0	31	15	10	0	1300
Total:	62	2269	47	0	52	1860	71	0	165	136	284	0	130	50	20	0	5146
PHF:	0.74	0.98	0.78		0.72	0.92	0.89		0.75	0.92	0.87		0.86	0.83	0.50		

AM Peak Hour Trucks

	Rte 9 EB Eastbound				Rte 9 WB Westbound				Oak Hill Rd Northbound				Central St Southbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:45 AM	0	5	0	0	1	14	2	0	6	1	1	0	0	0	0	0
08:00 AM	0	11	0	0	2	17	1	0	3	1	2	0	0	0	0	0
08:15 AM	1	10	1	0	2	14	1	0	1	0	2	0	0	0	0	0
08:30 AM	0	12	0	0	2	11	0	0	1	0	1	0	1	0	1	0
	1	38	1	0	7	56	4	0	11	2	6	0	1	0	1	0
Truck %:	1.61%	1.67%	2.13%		13.46%	3.01%	5.63%		6.67%	1.47%	2.11%		0.77%	0.00%	5.00%	