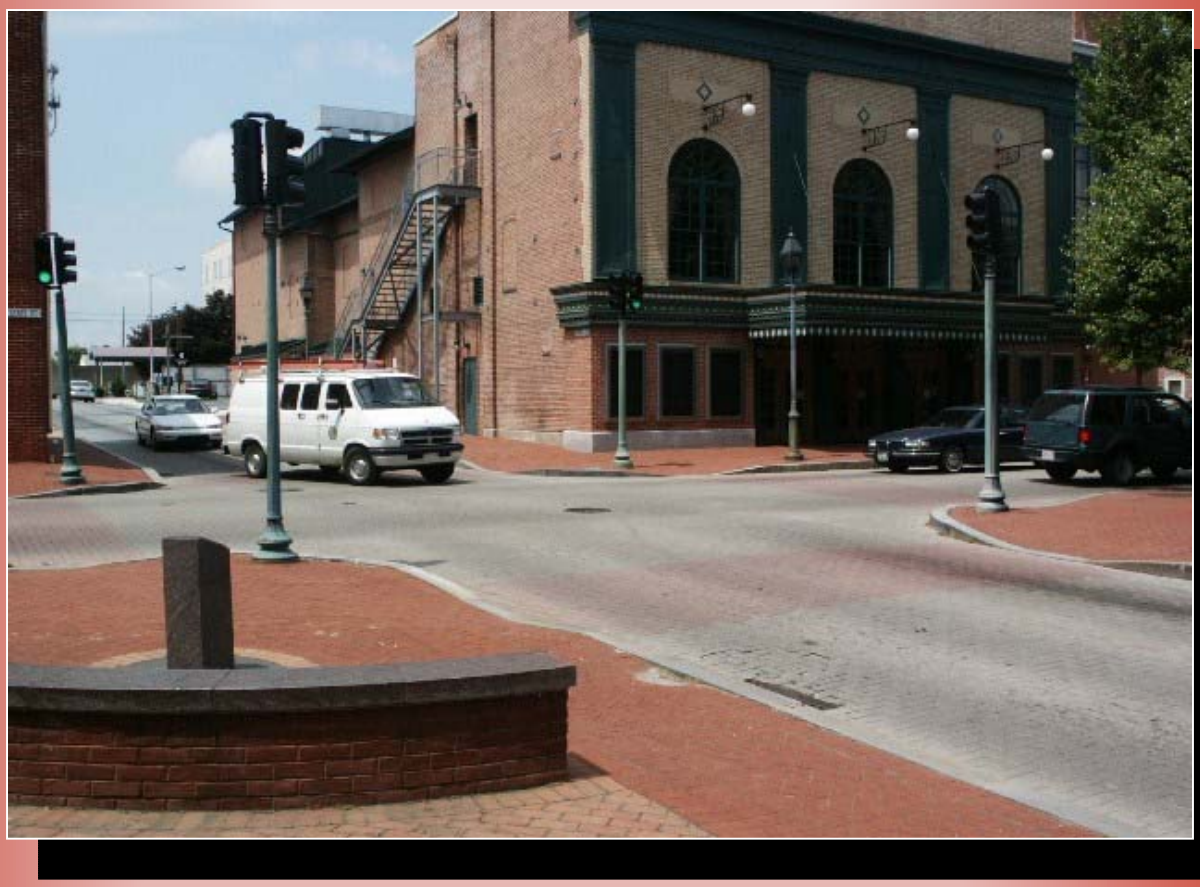
Dover/Kent County MPO
Metropolitan Planning Organization

TRAFFIC ENGINEERING STUDY

North St. At State St.
Dover, Delaware



Rummel, Klepper & Kahl, LLP
Consulting Engineers
1206 Forrest Avenue
Dover, DE 19904
302-672-7800

July 2004

SUMMARY

The purpose of this traffic engineering study is to evaluate the effects of left turn movements at the intersection of North Street and State Street in the City of Dover, Delaware. The City of Dover has received requests for left turns to be restricted for the State Street approaches at this intersection. The complaints are likely the result of drivers experiencing delays caused by someone waiting to turn left from State Street onto North Street. The intersection also experiences a high frequency of accidents, ranking it number one on the City of Dover's list of intersections to be considered for red light running cameras.

The approach to this study includes evaluating the safety of the intersection and also the intersection's capacity. To do this, a study area consisting of several intersections surrounding the intersection in question had to be determined. Existing data, including accident data and traffic operational data, were then gathered and analyzed. The software package, SYNCHRO/SimTraffic, was utilized to evaluate the existing traffic operations, as well as, to evaluate the effects of restricting left turns on some or all of the intersection approaches. Accident data was analyzed to determine the extent of the safety problem at the intersection and to assist in developing improvement options.

Based on the results of the safety and capacity analyses presented in Sections V and VII, RK&K has developed several improvement options for consideration by the City of Dover, for the intersection of North Street and State Street. The advantages and disadvantages of each are outlined below:

- Option 1: Maintain the existing left turns at the intersection of North Street and State Street.

  Currently, the traffic analysis results do not show a need for left turns to be restricted at this intersection. The analyses indicate that the intersection is currently operating at an acceptable Level of Service (B) in all three peak periods with corresponding average delays of 16 seconds/vehicle or less. Left turns do not appear to contribute to the accident problem and the left turns provide access to the North Street parking lots for Downtown businesses.

- Option 2: Install mast arm poles for the traffic signals at the intersection.

  Accident statistics show that the major cause of accidents at the intersection of North Street and State Street is a failure to obey the existing traffic signals. The primary reason for disregarding the traffic signal appears to be poor visibility of the signals from all approaches to the intersection. To address concerns about aesthetics, colonial style mast arm poles could be used within this historic area of Downtown Dover.

- Option 3: Install traffic signals with oversized lenses.

  This recommendation can be incorporated alone or with the installation of mast arms.

- Option 4: Install light emitting diode (LED) traffic signal lenses on the existing signals.

  LED lenses are much brighter than standard traffic signal light bulbs, which are currently in use at the intersection of North Street and State Street. The State has already converted all of its red and green traffic lights to LED signal lenses.

- Option 5: Provide new or updated signage displaying left turn restrictions for trucks, especially on State Street.

  Currently, there are signs on North Street approaching the intersection, but there are no signs on State Street. If the mast arms are installed, signs can be installed directly on the mast arm indicating the turning restriction for trucks.

Finally, it is also recommended that this traffic study be revisited in the future. Increases in traffic over time appear to warrant a second look at this study to determine if increased left turn volumes combined with increased through volumes result in greater delay/queues in the future. Additionally, if mast arms are installed, a follow-up accident study should be completed to determine if the accident rate decreases. The follow-up studies could be completed as part of DelDOT's traffic signal upgrade project being undertaken during the next two-year period.

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I. Introduction

The purpose of this traffic engineering study is to evaluate the effects of left turn movements at the intersection of North Street and State Street in the City of Dover, Delaware. The City of Dover has received requests for left turns to be restricted for the State Street approaches at this intersection. The complaints are likely the result of drivers experiencing delays caused by someone waiting to turn left from State Street onto North Street and blocking traffic proceeding through the intersection. The city is also concerned, however, that restricting left turns at the intersection of North Street and State Street will impact local businesses.

Currently, the intersection is ranked number one by the City of Dover on the list of intersections to be considered for red-light running cameras. This is based on the number of accidents that have been observed as a result of red light running. However, according to the City of Dover, the intersection is located in a historic district and red light running detection equipment is not being considered at this intersection because it would add numerous camera poles and detract from the aesthetics of the district. The intersection was also noted as having safety problems through the Delaware Department of Transportation's Highway Safety Improvement Program.

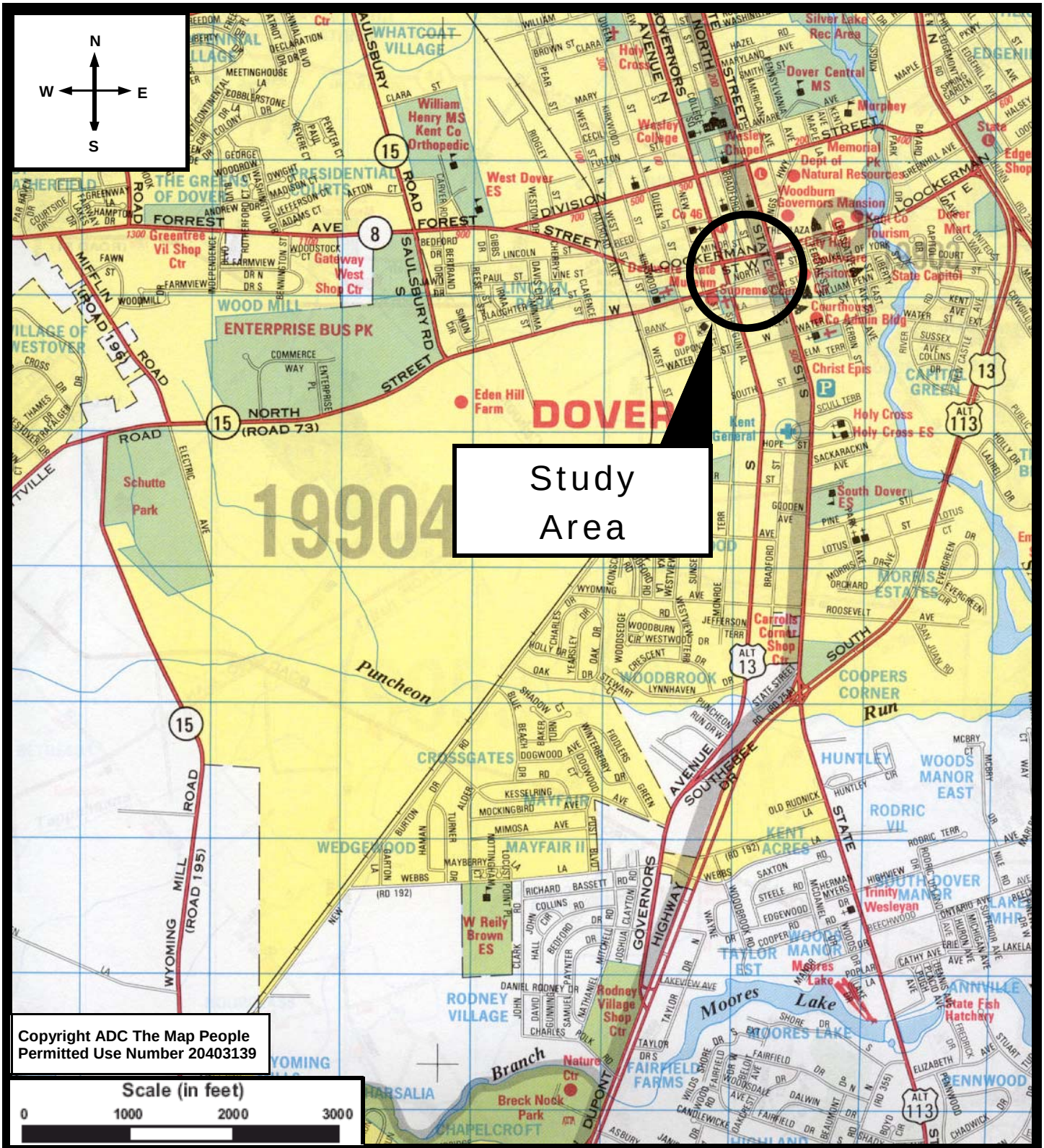
Upon speaking with officials from the City of Dover, it was determined that their most obvious concern regarding the intersection of North Street and State Street is the number of angle collisions at this intersection. As a consequence of these crashes, an attorney's office on the northeast corner of the intersection has been hit a number of times by vehicles being redirected off of the road. The city has given the attorney's office approval to install iron bollards in front of their office to prevent further damage to the structure.

II. Study Approach

In order to evaluate the impacts of left turn movements at the intersection of North Street and State Street and to analyze the effects of restricting the left turn movements at this intersection, a study area was established consisting of several intersections surrounding the intersection (see Figure 1):

- North Street @ State Street – ***Study Intersection***
- North Street @ Federal Street
- North Street @ Governor's Avenue
- Loockerman Street @ Governor's Avenue
- Loockerman Street @ Bradford Street
- Loockerman Street @ State Street
- Loockerman Street @ Federal Street

Next, existing traffic data was gathered, including geometric data, traffic operational data, signal timing data, accident data and peak hour turning movement volumes for each of the intersections. A traffic model was developed using the SYNCHRO traffic modeling software, which incorporated all of the traffic data described previously. The existing data for the study area and the resulting SYNCHRO models that were developed are discussed in greater detail in the following sections.



Key Map of Kent County, Delaware

TRAFFIC ENGINEERING STUDY

NORTH STREET AT STATE STREET

RUMMEL, KLEPPER & KAHL, LLP

Date
July 2004

Figure
1

III. Existing Site Characteristics

The North Street / State Street intersection, located in the City of Dover, Delaware, is situated in a historic district among commercial and governmental land uses. The roadways within the study area are laid out in a typical city grid pattern. All roadways provide bidirectional travel. Existing traffic operational data and geometric data were gathered for each of the study intersections within the study area. Photographs of the study intersection are included in Appendix A. Detailed information for the North Street / State Street intersection is included below:

- **Geometric Features**

The horizontal alignment of both State Street and North Street is relatively straight. There is a slight downgrade on the eastbound approach of North Street. All of the other approaches to the North Street / State Street intersection are relatively flat. The lanes on the North Street approaches are 10 feet wide in each direction. The lanes on the State Street approaches are 13 feet wide in each direction. Curbs line each side of the street. The pavement that makes up the intersection is constructed of granite block pavers. There are sidewalks adjacent to all approaches of the intersection that are constructed with red brick pavers.

- **Existing Traffic Restrictions**

Currently, heavy vehicles are prohibited from making left turns at this intersection. There are signs displaying this restriction on the North Street approaches to the intersection. However, there are no signs on the State Street approaches to the intersection because signs are prohibited in this historic area due to a streetscape policy that was established under a previous Delaware Department of Transportation (DelDOT) / City of Dover project.

- **Signing and Pavement Markings**

The pavement markings at the study intersection are depicted using red block pavers, which act as an accent color to the granite block pavers that make up the pavement for the intersection. The red color is partially worn away from vehicles driving over them, however, they are still clear enough to be visible to the average driver. Signing on the approaches to the study intersection is minimal; there are street signs mounted on the corner of the building located in the southwest quadrant of the intersection. There is no other signing at the intersection due to provisions in the City/State agreement on the streetscape program that does not allow signing in this area (on State Street between Loockerman Street and Water Street).

- **Street Lighting**

Street lighting is present on all approaches to the study intersection. The street lighting consists of a colonial style light post and luminaire. The post mounted luminaires on all of the roadways within the study area work properly.

- **Traffic Control Devices**

The intersection of North Street and State Street is controlled by a traffic control signal. Traffic signals are located on pedestal mounted signal poles on each corner of the intersection. The traffic signals can be difficult to see when approaching the intersection due to their location (mounted on either side of the street rather than over the lanes) and the size of the traffic signal lenses (8 inches in diameter). Traffic signal timing data was obtained from the City of Dover, Public Works Department, for use in the SYNCHRO model to accurately model the existing traffic within the study area. This data can be seen in Appendix B at the end of this report.

- **Adjacent Land Use**

Three of the four quadrants of the intersection are comprised of law offices located in historic buildings. In the northwest quadrant, there is a restored historic theater.

- **Future Transportation Projects**

DelDOT is beginning a project to redesign the City of Dover traffic signal system. This project will consist of upgrading all of the traffic signal systems within the city limits and coordinating the signals. The project is expected to be completed over the next two years. DelDOT is also in the process of designing a traffic-calming roundabout west of the study area on Loockerman Street.

IV. Observation of Traffic Operations

The following observations were recorded during various visits to the study area during peak and off-peak periods.

- Tight curb radii at the intersection of North Street and State Street causes vehicles making right turns to "rub" the curb, drive over the curb or swing wide into oncoming traffic.
- Traffic signals are not visible from long distances due to their location. This comment applies to all intersections within the study area where traffic signals are mounted on pedestal supports at the corners of the intersections.
- Left turning vehicles represented a small percentage of the total traffic at the intersection of North Street and State Street.
- An occasional truck was observed making the left turn at the intersection of North Street and State Street.

V. Accident Trend Analysis

The most recent accident data for the study area covers the period between January 2001 and December 2003. This data was provided by DelDOT and includes data for the following:

- Governor's Avenue from 3/10 mile north of Loockerman Street to 3/10 mile south of North Street.
- Loockerman Street from 3/10 mile west of Governor's Avenue to 3/10 mile east of State Street.
- State Street from 3/10 mile north of Loockerman Street to 3/10 mile south of North Street.
- North Street from 3/10 mile west of Governor's Avenue to 3/10 mile east of State Street.

This data, which is included in Appendix C, shows that there were 66 reported collisions within the study area during a 3-year period (Note: this dataset includes the North Street / State Street intersection plus several other roads within the study area). A summary of reported collisions is provided in Table 1. The following trends were identified in the accident data:

- No fatalities have occurred during the analysis time period within the study area.
- Angle and left-turn collisions account for 76% of the total amount of reported collisions within the study area.
- 33% of the reported collisions resulted in bodily injury.
- 14% of the reported collisions were a result of drivers under the influence of alcohol.
- The primary contributing factor of the reported collisions was a failure to obey the traffic signals, which accounts for 67% of the reported collisions.

Traffic Engineering Study **July, 2004**
North Street @ State Street **RK&K Engineers, LLP**

Table 1
Reported Accident Summary
Governor's Ave. / Loockerman St. / State St. / North St.

Roadway	Property Damage/ Injury/Fatal			Head-On/Rear End/Sideswipe/ Angle & Left-Turn/Other					Alcohol Involved?		Total
	P	I	F	H	R	S	A/L	O	Y	N	
Loockerman Street	19	8	0	1	3	0	22	1	5	22	**27**
North Street	6	4	0	0	4	0	5	1	0	10	**10**
Governor's Avenue	8	4	0	0	2	1	8	1	2	10	**12**
State Street	11	6	0	0	2	0	15	0	2	15	**17**
Total	**44**	**22**	**0**	**1**	**11**	**1**	**50**	**3**	**9**	**57**	**66**

To further evaluate the potential safety problem at the intersection of North Street and State Street, accidents occurring directly at this intersection were extracted from the accident data set. Of the 66 total reported collisions that occurred within the study area, 16 of these collisions occurred at the intersection of North Street and State Street (24% of the total reported collisions). Of these 16 reported collisions at the study intersection, the following trends were identified:

- Angle and left-turn collisions account for 88% of the reported collisions at the study intersection.
- 25% of the reported collisions at the study intersection resulted in bodily injury.
- 88% of the reported collisions at the study intersection were a result of someone disregarding a traffic signal.

VI. Traffic Volumes

Peak hour volume turning movement counts were performed for each of the seven intersections noted in Section 2 of this report. It was determined, from analyzing counts previously performed within the study area that three peak periods needed to be analyzed. These peak periods include an AM peak period (morning rush), a Midday peak period (lunchtime rush) and a PM peak period (evening rush). The exact hours that were counted are as follows:

- AM Peak Period: 7:15 AM – 8:45 AM
- Midday Peak Period: 11:45 AM – 1:15 PM
- PM Peak Period: 3:45 PM – 5:15 PM

The peak hours for each time period were determined and are summarized in Table 2.

Traffic Engineering Study **July, 2004**
North Street @ State Street **Rummel, Klepper & Kahl, LLP**

Table 2
Peak Hour Summary

Intersection	AM	Midday	PM
Loockerman Street @ Governor's Avenue	7:45 AM - 8:45 AM	11:45 AM - 12:45 PM	4:15 PM - 5:15 PM
Loockerman Street @ Bradford Street	7:45 AM - 8:45 AM	12:15 PM - 1:15 PM	3:45 PM - 4:45 PM
Loockerman Street @ State Street	7:30 AM - 8:30 AM	12:00 PM - 1:00 PM	3:45 PM - 4:45 PM
Loockerman Street @ Federal Street	7:30 AM - 8:30 AM	12:15 PM - 1:15 PM	3:45 PM - 4:45 PM
North Street @ Governor's Avenue	7:45 AM - 8:45 AM	12:00 PM - 1:00 PM	4:15 PM - 5:15 PM
North Street @ State Street	7:30 AM - 8:30 AM	12:00 PM - 1:00 PM	4:15 PM - 5:15 PM
North Street @ Federal Street	7:45 AM - 8:45 AM	12:00 PM - 1:00 PM	4:15 PM - 5:15 PM

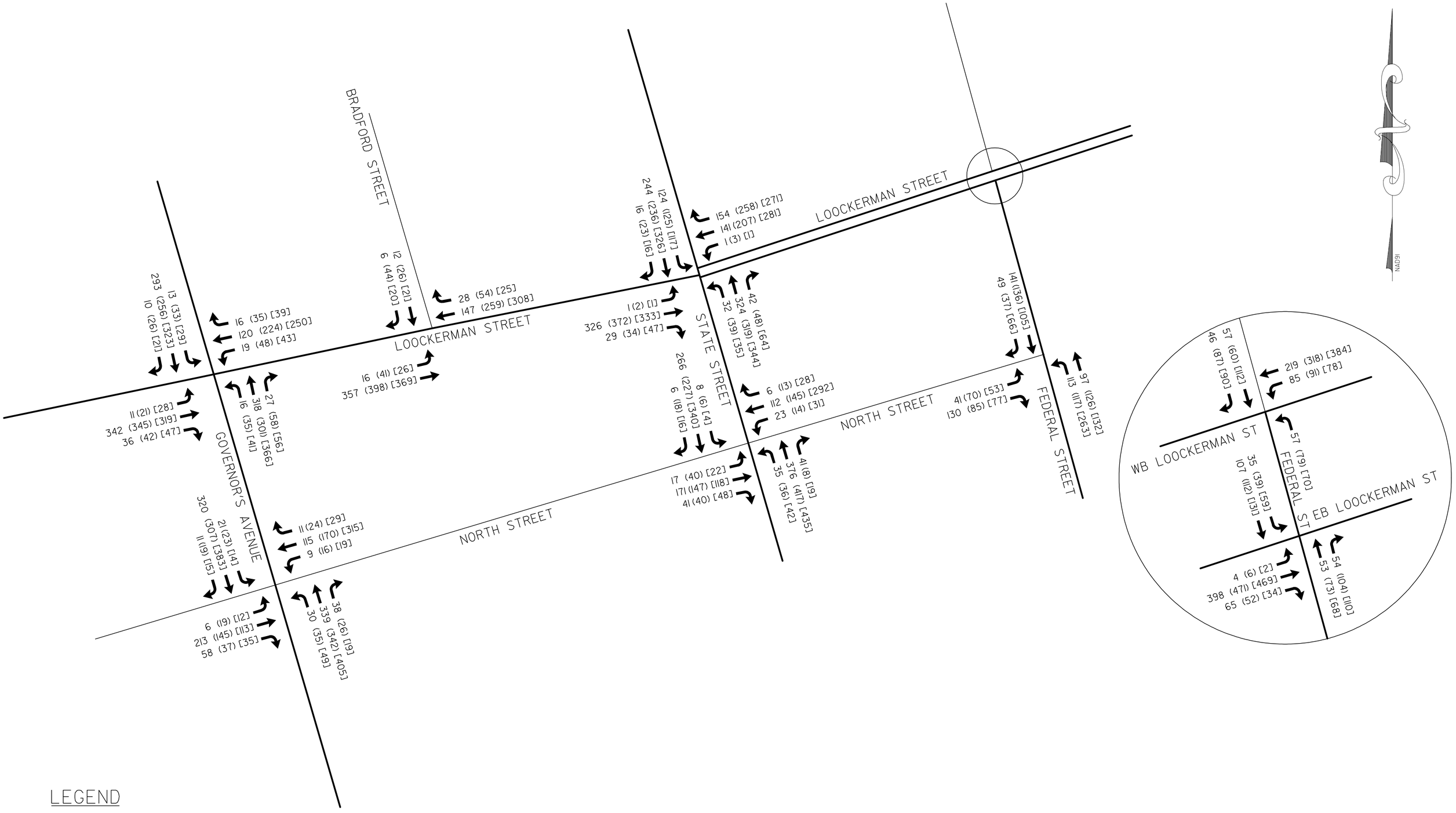
In order to develop a simulation model to analyze the capacity of the intersections within the study area and to model traffic flow conditions, the worst-case peak hour for each time period (AM, Midday and PM) was determined. From the data shown in Table 2, the peak hours for the entire study area were determined to be:

AM: 7:45 AM – 8:45 AM
Midday: 12:00 PM – 1:00 PM
PM: 4:15 PM – 5:15 PM

Data from the peak hour turning movement counts showed that on average, left-turn movements account for only 8% of the total traffic volume at the intersection of North Street and State Street. A summary of the peak hour turning movement volumes for the study area is shown in Figure 2. The complete data for these turning movement counts is provided in Appendix D.

VII. Capacity Analysis

The software package, SYNCHRO and SimTraffic, was utilized to perform capacity analyses and traffic simulation modeling for the study area. SYNCHRO is a traffic analysis tool that utilizes the methods from the Year 2000 edition of the Highway Capacity Manual to determine capacity for signalized and unsignalized intersections. SYNCHRO is also used as a tool to determine the optimum traffic signal timings for a single intersection or for a series of coordinated or uncoordinated signalized intersections. SimTraffic is a microscopic traffic simulation program, which utilizes the information that is entered into the SYNCHRO program to build a model of traffic conditions for a given area. SYNCHRO and SimTraffic both measure traffic operations based on average stop delay and Level of Service for signalized and unsignalized intersections. Level of Service (LOS) is represented by a range of letter grades (A through F), which describe the quality of traffic flow. Level of Service A generally represents free flowing conditions with very little delay for motorists. Conversely, Level of Service F represents conditions where the demand (volume) exceeds the roadway or intersection capacity, resulting in high delay for motorists. Tables 3 and 4, on the next page, show the Levels of Service that correspond to average stop delay values, measured in seconds per vehicle, for signalized and unsignalized intersections, respectively.



LEGEND

339 (342) [405] — AM (MIDDAY) [PM]

DIRECTION OF TURNING MOVEMENT

PREPARED FOR:

Dover/Kent County MPO

DOVER/KENT COUNTY METROPOLITAN PLANNING ORGANIZATION

P.O. BOX 383
DOVER, DELAWARE 19903
302-760-2713

PREPARED BY:

RK&K

Rummel, Klepper & Kahl, LLP

Consulting Engineers

1206 Forrest Avenue
Dover, Delaware 19904
302-672-7800

NORTH STREET @ STATE STREET TRAFFIC STUDY
EXISTING TRAFFIC VOLUMES

CITY OF DOVER, DELAWARE

FIGURE 2

Traffic Engineering Study	**July, 2004**
North Street @ State Street	**Rummel, Klepper & Kahl, LLP**

Table 3
LOS Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds/vehicle)
A	≤ 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Traffic Engineering Study	**July, 2004**
North Street @ State Street	**Rummel, Klepper & Kahl, LLP**

Table 4
LOS Criteria for Unsignalized (Two-Way Stop Control) Intersections

Level of Service	Control Delay per Vehicle (seconds/vehicle)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Several scenarios were analyzed using the SYNCHRO/SimTraffic software package. These scenarios are described below:

Scenario 1: Existing conditions
Scenario 2: State Street left turn restrictions
Scenario 3: North Street and State Street left turn restrictions
Scenario 4: Future traffic (no restrictions)
Scenario 5: Future traffic with PM left turn restrictions

Scenario 1 was evaluated in order to determine the existing Levels of Service for each of the study area intersections. The SYNCHRO/SimTraffic results are shown in Table 5, on the next page.

Traffic Engineering Study **July, 2004**
North Street @ State Street **Rummel, Klepper & Kahl, LLP**

Table 5
SYNCHRO/SimTraffic Results - Existing Conditions (Scenario 1)

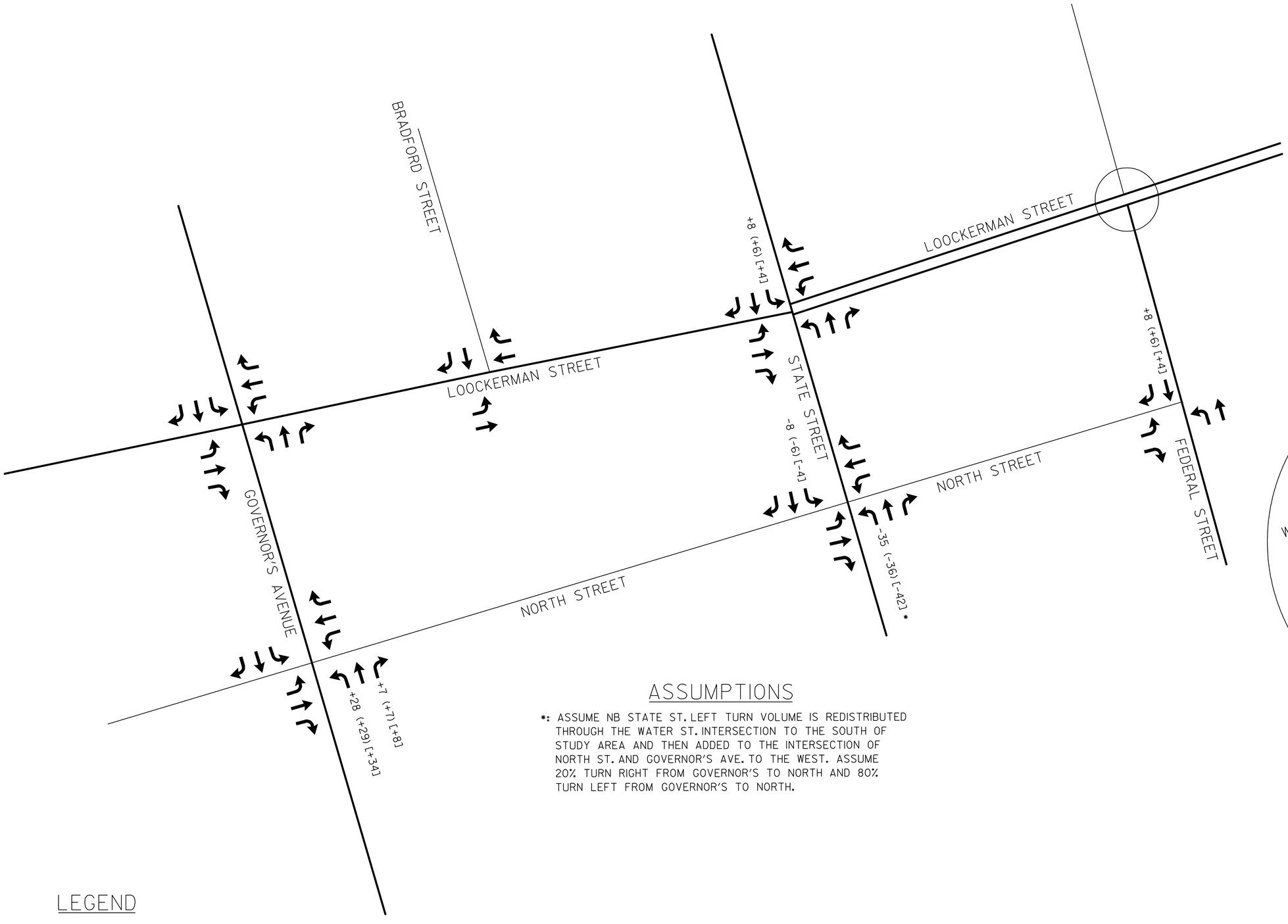
Intersection		AM Peak				Midday Peak				PM Peak			
		Delay		LOS		Delay		LOS		Delay		LOS	
Signalized	***North St. & State St.***	***11.2***		***B***		***12.5***		***B***		***16.3***		***B***	
	North St. & Governor's Ave.	11.1		B		11.5		B		14.2		B	
	Loockerman St. & State St.	13.2		B		14.0		B		14.3		B	
	Loockerman St. & Governor's Ave.	16.5		B		18.8		B		19.0		B	
2-Way Stop	Loockerman St. & Bradford St.	4.6		A		12.9		B		9.0		A	
	North St. & Federal St.	5.1		A		6.7		A		8.1		A	
		NB	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**
	Loockerman St. WB & Parking Lot	5.7	6.8	A	A	6.9	7.9	A	A	10.8	22.8	B	C
	Loockerman St. EB & Federal St.	5.2	5.9	A	A	10.2	7.3	B	A	15.2	6.8	C	A

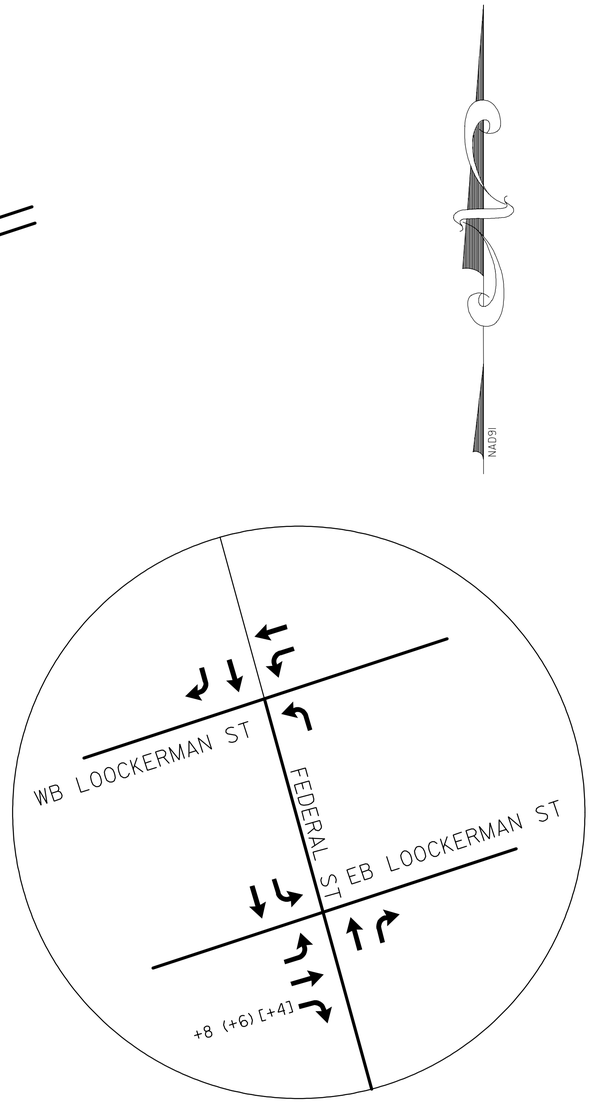
**Note: Results above represent the average of three SimTraffic simulation runs.*

Based on these results, the intersection of North Street and State Street is currently operating at LOS "B" for the AM, Midday and PM peak hours. This corresponds to a relatively low stop delay, indicating that left turns are not causing significant disruption to traffic flow at this intersection.

Next, the effects of restricting left turns at the intersection of North Street and State Street were analyzed to determine if removing left turns would decrease the amount of stop delay that is experienced by drivers. Scenario 2 analyzes the effects of restricting northbound and southbound left turns turning State Street onto eastbound and westbound North Street, respectively. The restricted left turn volumes were then redistributed throughout the study area. The assignment assumptions for the redistribution of traffic volumes are shown in Figure 3. The capacity analysis results for this scenario are shown in Table 6 on the next page.

To further analyze the effects of restricting left turns, Scenario 3 was developed, which restricts left turns from all four approaches at the intersection of North Street and State Street. This traffic was then redistributed throughout the study area. The assignment assumptions for the redistribution of traffic volumes are shown in Figure 4. The capacity analysis results for this scenario are shown in Table 7 on the next page.





NAD91

ASSUMPTIONS

*: ASSUME NB STATE ST. LEFT TURN VOLUME IS REDISTRIBUTED THROUGH THE WATER ST. INTERSECTION TO THE SOUTH OF STUDY AREA AND THEN ADDED TO THE INTERSECTION OF NORTH ST. AND GOVERNOR'S AVE. TO THE WEST. ASSUME 20% TURN RIGHT FROM GOVERNOR'S TO NORTH AND 80% TURN LEFT FROM GOVERNOR'S TO NORTH.

LEGEND

339 (342) [405] AM (MIDDAY) [PM]

DIRECTION OF TURNING MOVEMENT

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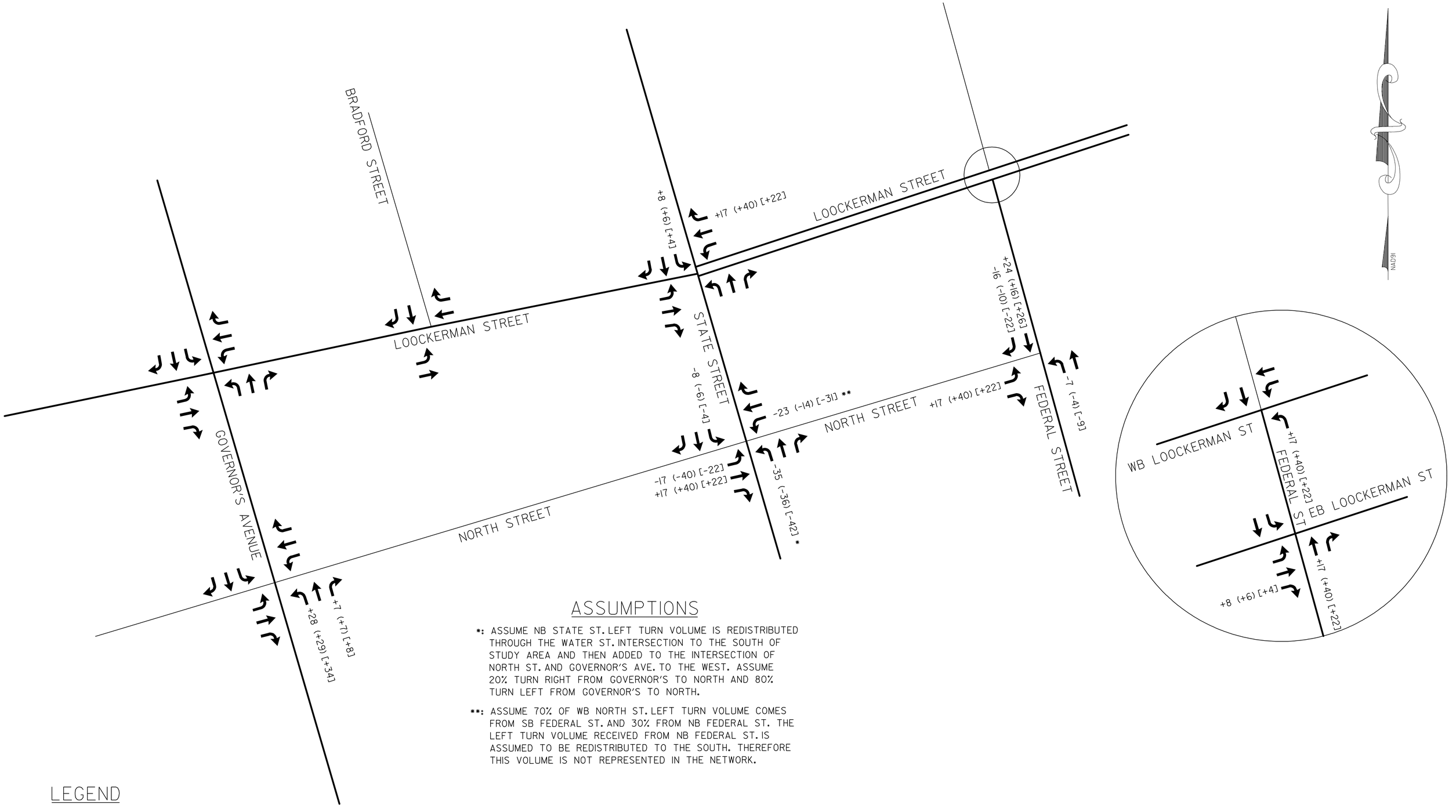
NORTH STREET @ STATE STREET TRAFFIC STUDY LEFT TURN REDISTRIBUTION STATE ST. RESTRICTIONS

FIGURE 3



ASSUMPTIONS

*: ASSUME NB STATE ST. LEFT TURN VOLUME IS REDISTRIBUTED THROUGH THE WATER ST. INTERSECTION TO THE SOUTH OF STUDY AREA AND THEN ADDED TO THE INTERSECTION OF NORTH ST. AND GOVERNOR'S AVE. TO THE WEST. ASSUME 20% TURN RIGHT FROM GOVERNOR'S TO NORTH AND 80% TURN LEFT FROM GOVERNOR'S TO NORTH.

**: ASSUME 70% OF WB NORTH ST. LEFT TURN VOLUME COMES FROM SB FEDERAL ST. AND 30% FROM NB FEDERAL ST. THE LEFT TURN VOLUME RECEIVED FROM NB FEDERAL ST. IS ASSUMED TO BE REDISTRIBUTED TO THE SOUTH. THEREFORE THIS VOLUME IS NOT REPRESENTED IN THE NETWORK.

LEGEND

339 (342) [405] — AM (MIDDAY) [PM]

↰ — DIRECTION OF TURNING MOVEMENT

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NORTH STREET @ STATE STREET TRAFFIC STUDY LEFT TURN REDISTRIBUTION NORTH ST. & STATE ST. RESTRICTIONS

FIGURE 4

Traffic Engineering Study **July, 2004**
North Street @ State Street **Rummel, Klepper & Kahl, LLP**

Table 6
SYNCHRO/SimTraffic Results
Left Turns Restricted on Northbound and Southbound State Street (Scenario 2)

Intersection		AM Peak				Midday Peak				PM Peak			
		Delay		LOS		Delay		LOS		Delay		LOS	
Signalized	***North St. & State St.***	***9.4***		***A***		***11.3***		***B***		***13.4***		***B***	
	North St. & Governor's Ave.	12.6		B		13.2		B		22.6		C	
	Loockerman St. & State St.	13.5		B		13.1		B		15.1		B	
	Loockerman St. & Governor's Ave.	16.1		B		20.4		C		23.8		C	
2-Way Stop	Loockerman St. & Bradford St.	5.6		A		12.3		B		12.8		B	
	North St. & Federal St.	6.0		A		9.0		A		17.9		C	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
	Loockerman St. WB & Parking Lot	5.3	7.1	A	A	6.9	10.8	A	B	11.7	44.7	B	E
	Loockerman St. EB & Federal St.	4.9	6.2	A	A	10.2	6.9	B	A	17.5	7.4	C	A

**Note: Results above represent the average of three SimTraffic simulation runs.*

Traffic Engineering Study **July, 2004**
North Street @ State Street **Rummel, Klepper & Kahl, LLP**

Table 7
SYNCHRO/SimTraffic Results
NB, SB, EB, & WB Left Turn Restrictions on North Street and State Street (Scenario 3)

Intersection		AM Peak				Midday Peak				PM Peak			
		Delay		LOS		Delay		LOS		Delay		LOS	
Signalized	***North St. & State St.***	***8.9***		***A***		***10.4***		***B***		***11.4***		***B***	
	North St. & Governor's Ave.	12.5		B		12.7		B		15.5		B	
	Loockerman St. & State St.	12.8		B		14.0		B		13.1		B	
	Loockerman St. & Governor's Ave.	16.8		B		19.0		B		18.6		B	
2-Way Stop	Loockerman St. & Bradford St.	5.6		A		14.3		B		7.3		A	
	North St. & Federal St.	6.8		A		10.1		B		14.7		B	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
	Loockerman St. WB & Parking Lot	5.5	6.7	A	A	7.2	9.0	A	A	9.0	15.9	A	C
	Loockerman St. EB & Federal St.	5.2	6.4	A	A	10.2	7.6	B	A	9.7	4.8	A	A

**Note: Results above represent the average of three SimTraffic simulation runs.*

Both Tables 6 and 7 show that restricting left turns at the intersection of North Street and State Street decreases the overall stop delay by 2 to 3 seconds at this intersection. This decrease in delay is not very significant, indicating that left turns do not have a large effect on the overall delay of the study intersection. However, at some of the other intersections within the study area, the stop delay increases, resulting, in some cases, in a lower Level of Service. Scenario 2 results in more than 20 seconds of additional delay at the Loockerman St. / Parking Lot intersection.

To further evaluate the traffic conditions at the intersection of North Street and State Street, as well as the entire study area, future traffic conditions (Scenario 4) were analyzed. A base assumption was made to increase all of the traffic volumes within the study area by 10%. Based on historic growth rates, this would be considered equivalent to a condition five to ten years into the future. These peak hour volumes, which are shown in Figure 5, were incorporated into the SYNCHRO/SimTraffic software package and the results of the capacity analyses are shown in Table 8, below.

Traffic Engineering Study **July, 2004**
North Street @ State Street **Rummel, Klepper & Kahl, LLP**

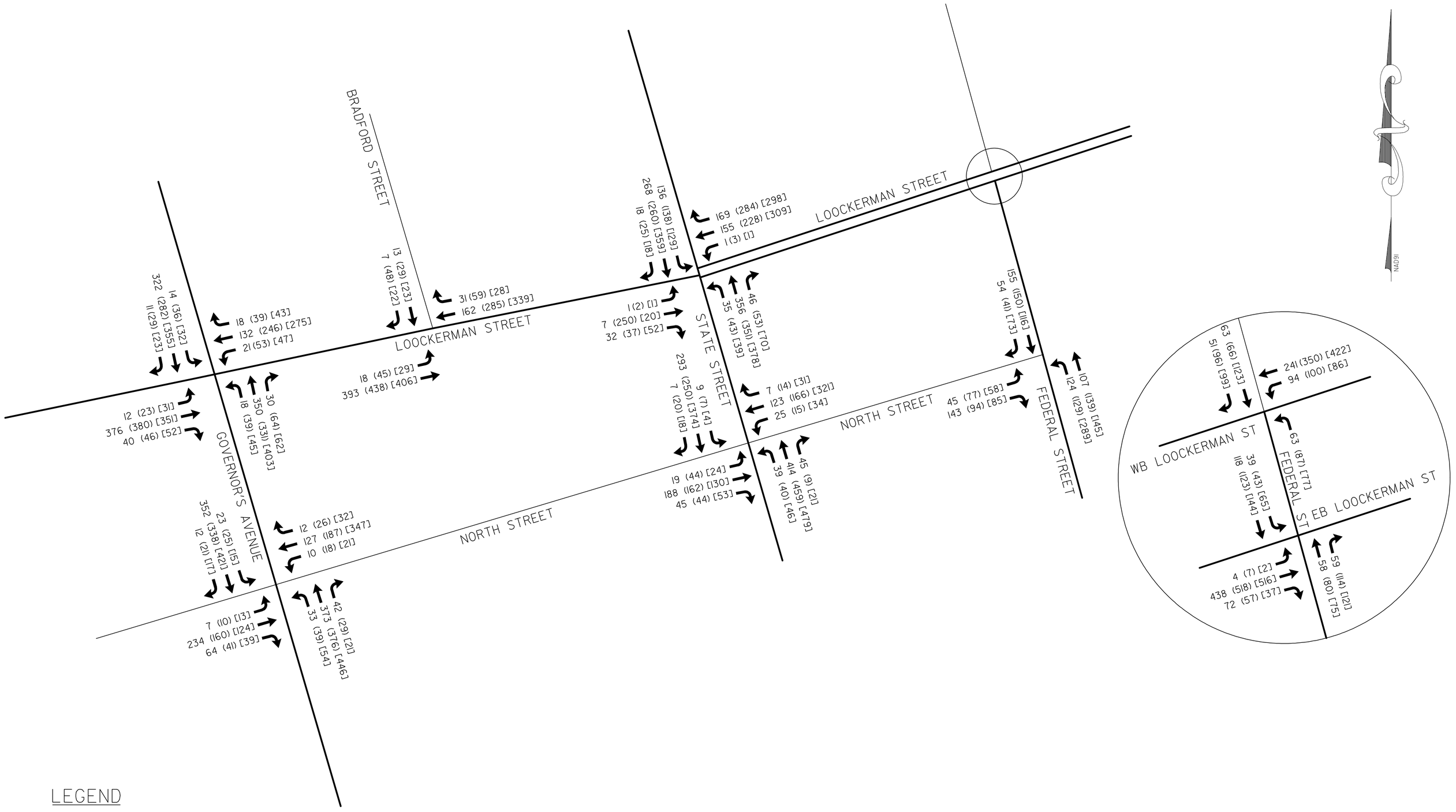
Table 8
SYNCHRO/SimTraffic Results
Future Traffic (+10%) – (Scenario 4)

Intersection		AM Peak				Midday Peak				PM Peak			
		Delay		LOS		Delay		LOS		Delay		LOS	
Signalized	***North St. & State St.***	***11.7***		***B***		***14.5***		***B***		***70.4***		***E***	
	North St. & Governor's Ave.	12.5		B		12.3		B		25.1		C	
	Loockerman St. & State St.	15.0		B		14.9		B		16.0		B	
	Loockerman St. & Governor's Ave.	17.5		B		21.1		C		24.6		C	
2-Way Stop	Loockerman St. & Bradford St.	7.3		A		15.8		C		12.0		B	
	North St. & Federal St.	5.3		A		6.8		A		88.6		F	
		NB	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**
	Loockerman St. WB & Parking Lot	5.7	9.2	A	A	9.5	12.4	A	B	20.5	32.2	C	D
	Loockerman St. EB & Federal St.	6.2	6.3	A	A	15.7	9.1	C	A	101.9	8.5	F	A

**Note: Results above represent the average of three SimTraffic simulation runs.*

It is apparent from the data in Table 8 that the delay (and corresponding Levels of Service) does not increase dramatically in the future at the intersection of North Street and State Street except during the PM peak hour. The reason for this significant increase in delay is due to the amount of traffic that is trying to move through the City during the peak fifteen minute period between 4:30 PM and 4:45 PM.

Due to the large amount of delay being experienced at this intersection, RK&K evaluated the effects of restricting left turns from all four (4) intersection approaches during the PM peak hour only (Scenario 5) using the future traffic volumes generated from Scenario 4. The assignment assumptions for the redistribution of the restricted left turn volumes can be seen in Figure 6 and the capacity analysis results generated by the SYNCHRO/SimTraffic software package for Scenario 5 are shown in Table 9 on the next page.



LEGEND

339 (342) [405] AM (MIDDAY) [PM]

DIRECTION OF TURNING MOVEMENT

PREPARED FOR:

Dover/Kent County MPO

DOVER/KENT COUNTY METROPOLITAN PLANNING ORGANIZATION

P.O. BOX 383
DOVER, DELAWARE 19903
302-760-2713

PREPARED BY:

RK&K

Rummel, Klepper & Kahl, LLP

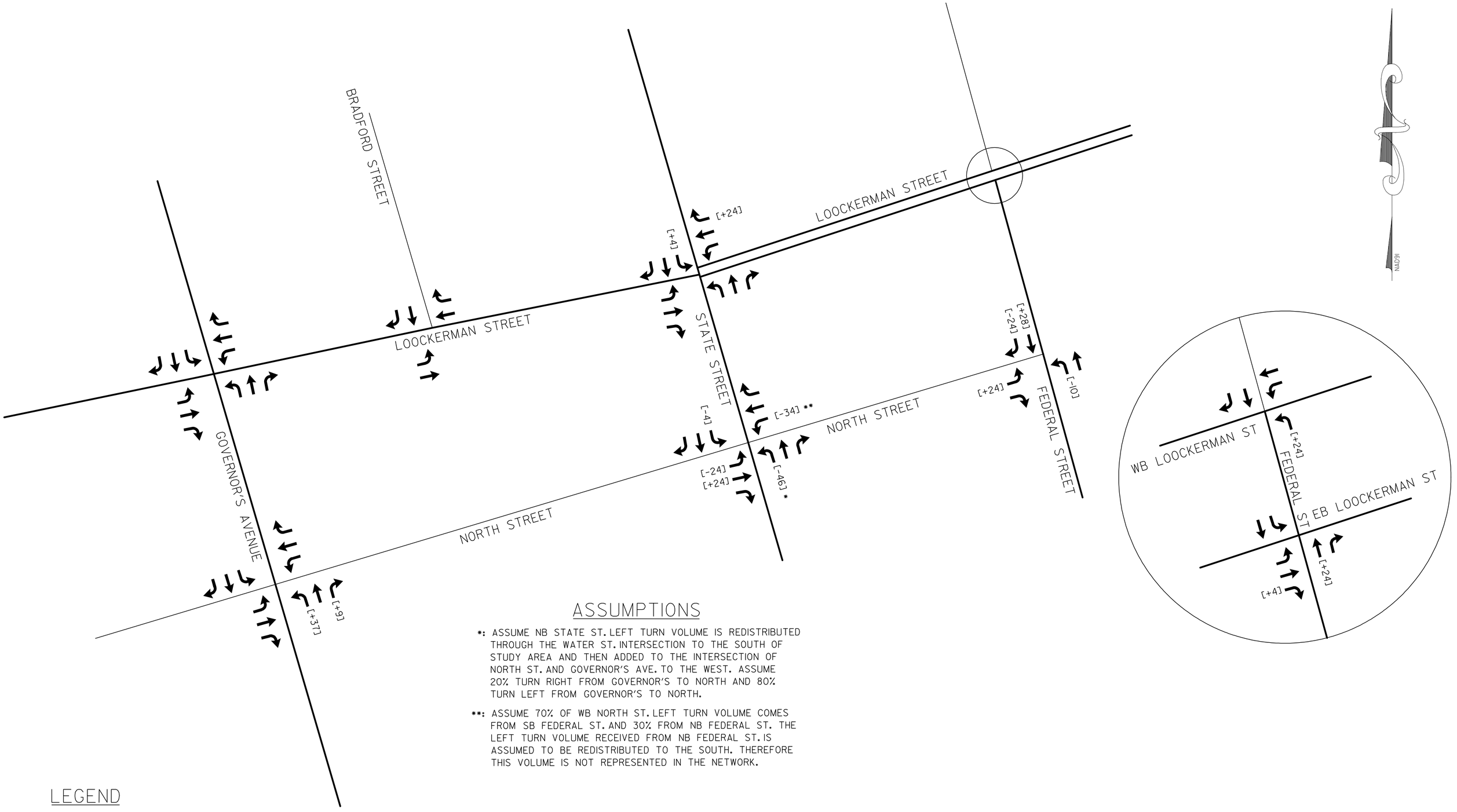
Consulting Engineers

1206 Forrest Avenue
Dover, Delaware 19904
302-672-7800

NORTH STREET @ STATE STREET TRAFFIC STUDY FUTURE TRAFFIC VOLUMES

CITY OF DOVER, DELAWARE

FIGURE 5



ASSUMPTIONS

*: ASSUME NB STATE ST. LEFT TURN VOLUME IS REDISTRIBUTED THROUGH THE WATER ST. INTERSECTION TO THE SOUTH OF STUDY AREA AND THEN ADDED TO THE INTERSECTION OF NORTH ST. AND GOVERNOR'S AVE. TO THE WEST. ASSUME 20% TURN RIGHT FROM GOVERNOR'S TO NORTH AND 80% TURN LEFT FROM GOVERNOR'S TO NORTH.

**: ASSUME 70% OF WB NORTH ST. LEFT TURN VOLUME COMES FROM SB FEDERAL ST. AND 30% FROM NB FEDERAL ST. THE LEFT TURN VOLUME RECEIVED FROM NB FEDERAL ST. IS ASSUMED TO BE REDISTRIBUTED TO THE SOUTH. THEREFORE THIS VOLUME IS NOT REPRESENTED IN THE NETWORK.

LEGEND

[405] [PM]

DIRECTION OF TURNING MOVEMENT

PREPARED FOR:

Dover/Kent County MPO

DOVER/KENT COUNTY METROPOLITAN PLANNING ORGANIZATION

P.O. BOX 383
DOVER, DELAWARE 19903
302-760-2713

PREPARED BY:

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Dover, Delaware 19904
302-672-7800

NORTH STREET @ STATE STREET TRAFFIC STUDY FUTURE LEFT TURN REDISTRIBUTION NORTH ST. & STATE ST. RESTRICTIONS

FIGURE 6

Traffic Engineering Study **July, 2004**
North Street @ State Street **Rummel, Klepper & Kahl, LLP**

Table 9
SYNCHRO/SimTraffic Results
Future Traffic w/ and w/o PM NB, SB, EB & WB Left Turn Restrictions (Scenario 5)

Intersection		PM Peak (w/ LT)				PM Peak (w/o LT)			
		Delay		LOS		Delay		LOS	
Signalized	***North St. & State St.***	***70.4***		***E***		***12.4***		***B***	
	North St. & Governor's Ave.	25.1		C		23.6		C	
	Loockerman St. & State St.	16.0		B		15.6		B	
	Loockerman St. & Governor's Ave.	24.6		C		24.0		C	
2-Way Stop	Loockerman St. & Bradford St.	12.0		B		20.2		C	
	North St. & Federal St.	88.6		F		15.8		C	
		NB	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**
	Loockerman St. WB & Parking Lot	20.5	32.2	C	D	15.8	80.8	C	F
	Loockerman St. EB & Federal St.	101.9	8.5	F	A	39.5	9.1	E	A

**Note: Results above represent the average of three SimTraffic simulation runs.*

For comparison purposes, the future traffic PM peak hour is shown in Table 9 next to the PM peak hour without left turns at the intersection of North Street and State Street. This comparison shows that delay at the study intersection would decrease significantly in the future by removing left turns from this intersection. It can also be seen that removing left turns from the study intersection reduces delay at some of the other intersections within the study area, but also increases delay significantly at one intersection. The improvements at the other intersections are the result of queues being eliminated at the North/State intersection, which had been spilling back into (and congesting) adjacent intersections. Removing the left turns from the study intersection greatly reduces queues at some other intersections resulting in lower delays and improved levels of service.

If traffic volumes get to this point during the PM peak hour in the future, an alternative to removing left turns could be to work with the State to setup alternative working schedules. Alternative working schedules would allow employees to leave work before or after the peak period, providing for a more staggered departure of vehicles leaving State offices, which would normally saturate area intersections due to vehicles leaving at the same time.

The output information that was generated for each scenario by SYNCHRO/SimTraffic for each intersection within the study area can be found in Appendix E.

VIII. Improvement Options

Based on the results of the safety and capacity analyses presented in Sections V and VII, RK&K has developed several improvement options for consideration by the City of Dover, for the intersection of North Street and State Street. The advantages and disadvantages of each are outlined below:

- Option 1: Maintain the existing left turns at the intersection of North Street and State Street.

  Currently, the traffic analysis results do not show a need for left turns to be restricted at this intersection. The analyses indicate that the intersection is currently operating at an acceptable Level of Service (B) in all three peak periods with corresponding average delays of 16 seconds/vehicle or less. Left turns do not appear to contribute to the accident problem and the left turns provide access to the North Street parking lots for Downtown businesses.

  - Advantages: Maintaining left turns will continue to provide access to businesses and parking lots located on State Street and North Street. Maintaining left turns will also prevent citizens from being rerouted through other intersections.
  - Disadvantage: Through vehicles on North Street and State Street will continue to experience minor delays due to vehicles waiting to turn left. Over time as traffic volumes increase, delays due to left turns will need to be reevaluated.

- Option 2: Install mast arm poles for the traffic signals at the intersection.

  Accident statistics show that the major cause of accidents at the intersection of North Street and State Street is a failure to obey the existing traffic signals. The primary reason for disregarding the traffic signal appears to be poor visibility of the signals from all approaches to the intersection. To address concerns about aesthetics, colonial style mast arm poles could be used within this historic area of Downtown Dover.

  - Advantages: Placing traffic signals over the roadway will enhance their visibility to motorists. The enhanced visibility of traffic signals is likely to reduce red light running and, in turn, reduce the number of accidents at this intersection. Mast arm poles can be set back from the intersection minimizing, minimizing the potential for being struck by vehicles trying to negotiate right turns at the intersection.
  - Disadvantages: This option is expensive and will require construction. The cost of installing mast arm poles at this intersection could range from $75,000 to $100,000. However, the costs may be able to be funded by the proposed DelDOT signal project, as discussed previously in this report.

- Option 3: Install traffic signals with oversized lenses.

  This recommendation can be incorporated alone or with the installation of mast arms.

  - Advantages: Oversized lenses will enhance the visibility of the traffic signals. The enhanced visibility of the traffic signals could, to some extent, reduce red light running and, in turn, reduce the number of accidents at this intersection.
  - Disadvantage: If implemented without the installation of mast arm poles, this option is not likely to reduce the number of accidents significantly, since the traffic signals will not be visible over the roadway.

- Option 4: Install light emitting diode (LED) traffic signal lenses on the existing signals.

  LED lenses are much brighter than standard traffic signal light bulbs, which are currently in use at the intersection of North Street and State Street. The State has already converted all of its red and green traffic signals to LED signal lenses.

  - Advantages: LED traffic signal lenses will increase the visibility of the traffic signals. The increased visibility of the existing traffic signals should, to some extent, reduce red light running and, in turn, reduce the number of accidents at this intersection. LED lenses use less electricity and will save the City on energy costs.
  - Disadvantages: The upfront installation cost for the LED traffic signal lenses could range from $150 to $200 per traffic signal. Installation of the lenses without increasing the size of the traffic signal head and/or installing mast arm poles will not, in all likelihood, reduce the number of accidents significantly.

- Option 5: Provide new or updated signage displaying left turn restrictions for trucks, especially on State Street.

  Currently, there are signs on North Street approaching the intersection restricting left turns by trucks, but there are no signs on State Street. If the mast arms are installed, signs can be installed directly on the mast arm indicating the turning restriction for trucks.

  - Advantage: Better signing will clearly state the message that trucks are restricted from making left turns at the intersection of North Street and State Street.
  - Disadvantage: Signs may not be permitted in this historic area due to a streetscape policy that was established under a previous DelDOT / City of Dover project.

Finally, it is also recommended that this traffic study be revisited in the future. Increases in traffic over time appear to warrant a second look at this study to determine if increased left turn volumes combined with increased through volumes result in greater delay/queues in the future. Additionally, if mast arms are installed, a follow-up accident study should be completed to determine if the accident rate decreases. The follow-up studies could be completed as part of DelDOT's traffic signal upgrade project being undertaken during the next two-year period.

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APPENDIX A

Site Photographs

State Street looking north towards North Street

North Street looking west towards State Street

State Street looking south towards North Street

North Street looking east towards State Street

APPENDIX B

Existing Signal Timing Data

CITY OF DOVER TRAFFIC SIGNAL TIMINGS

May 4, 2004
Prepared for RK&K Engineers

LOCATION: LOOCKERMAN STREET & STATE STREET

Phase: Loockerman Street

Time Frame: 6:00 a.m. to 7:00 p.m.		Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	84 sec	Cycle length:	74 sec
Green Time:	29 sec	Green Time:	24 sec
Yellow Time:	3 sec	Yellow Time:	3 sec
Red Time:	2 sec	Red Time:	2 sec

Phase: State Street

Time Frame: 6:00 a.m. to 7:00 p.m.		Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	84 sec	Cycle length:	74 sec
Left Turn Green Time:	12 sec	Left Turn Green Time:	12 sec
Left Turn Yellow Time:	3 sec	Left Turn Yellow Time:	3 sec
Green Time:	30 sec	Green Time:	25 sec
Yellow Time:	3 sec	Yellow Time:	3 sec
Red Time:	2 sec	Red Time:	2 sec

INTERSECTION: LOOCKERMAN STREET & GOVERNERS AVENUE

Phase: Loockerman Street

Time Frame: 6:00 a.m. to 7:00 p.m.		Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	84 sec	Cycle length:	74 sec
Green Time:	37 sec	Green Time:	32 sec
Yellow Time:	3 sec	Yellow Time:	3 sec
Red Time:	2 sec	Red Time:	2 sec

Phase: Governors Avenue

Time Frame: 6:00 a.m. to 7:00 p.m.		Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	84 sec	Cycle length:	74 sec
Left Turn Green Time:	6 sec	Left Turn Green Time:	6 sec
Left Turn Yellow Time:	3 sec	Left Turn Yellow Time:	3 sec
Green Time:	28 sec	Green Time:	23 sec
Yellow Time:	3 sec	Yellow Time:	3 sec
Red Time:	2 sec	Red Time:	2 sec

INTERSECTION: NORTH STREET & STATE STREET

Phase: 4 STATE ST.

Time Frame: 6:00 a.m. to 7:00 p.m.		Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	84 sec	Cycle length:	74 sec
Green Time:	43 sec	Green Time:	37 sec
Yellow Time:	3 sec	Yellow Time:	3 sec
Red Time:	2 sec	Red Time:	2 sec

Phase NORTH ST.

Time Frame: 6:00 a.m. to 7:00 p.m.		Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	84 sec	Cycle length:	74 sec
Green Time:	31 sec	Green Time:	27 sec
Yellow Time:	3 sec	Yellow Time:	3 sec
Red Time:	2 sec	Red Time:	2 sec

CITY OF DOVER TRAFFIC SIGNAL TIMINGS
May 4, 2004
Prepared for RK&K Engineers

INTERSECTION: NORTH STREET & GOVERNERS AVENUE

Phase: North Street

Time Frame: 6:00 a.m. to 7:00 p.m.	
Cycle length:	84 sec
Green Time:	27 sec
Yellow Time:	3 sec
Red Time:	2 sec

Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	74 sec
Green Time:	27 sec
Yellow Time:	3 sec
Red Time:	2 sec

Phase: Governors Avenue

Time Frame: 6:00 a.m. to 7:00 p.m.	
Cycle length:	84 sec
Green Time:	47 sec
Yellow Time:	3 sec
Red Time:	2 sec

Time Frame: 7:00 p.m. to 2:00 a.m.	
Cycle length:	74 sec
Green Time:	37 sec
Yellow Time:	3 sec
Red Time:	2 sec

All lights go to flash between 2:00 a.m. and 6:00 a.m..

APPENDIX C

Accident Data

Summary of Accidents
North Street @ State Street Traffic Study
Intersection of North Street and North State Street

Valid Data from January, 2001 to December, 2003

April 5, 2004

Year	Accidents	%
1999	0	0.0%
2000	0	0.0%
2001	5	31.3%
2002	6	37.5%
2003	5	31.3%
Total	16	100.0%

Month	Accidents	%
JAN	1	6.3%
FEB	3	18.8%
MAR	1	6.3%
APR	2	12.5%
MAY	2	12.5%
JUN	0	0.0%
JUL	1	6.3%
AUG	1	6.3%
SEP	1	6.3%
OCT	0	0.0%
NOV	1	6.3%
DEC	3	18.8%
Total	16	100.0%

Hour	Accidents	%
12AM - 1AM	0	0.0%
1AM - 2AM	0	0.0%
2AM - 3AM	0	0.0%
3AM - 4AM	0	0.0%
4AM - 5AM	0	0.0%
5AM - 6AM	0	0.0%
6AM - 7AM	0	0.0%
7AM - 8AM	2	12.5%
8AM - 9AM	0	0.0%
9AM - 10AM	2	12.5%
10AM - 11AM	2	12.5%
11AM- 12PM	0	0.0%
12PM - 1PM	2	12.5%
1PM - 2PM	2	12.5%
2PM - 3PM	1	6.3%
3PM - 4PM	2	12.5%
4PM - 5PM	1	6.3%
5PM - 6PM	2	12.5%
6PM - 7PM	0	0.0%
7PM - 8PM	0	0.0%
8PM - 9PM	0	0.0%
9PM - 10PM	0	0.0%
10PM - 11PM	0	0.0%
11PM - 12AM	0	0.0%
Unknown	0	0.0%
Total	16	100.0%

Day	Accidents	%
MON	5	31.3%
TUE	3	18.8%
WED	1	6.3%
THU	1	6.3%
FRI	1	6.3%
SAT	3	18.8%
SUN	2	12.5%
Total	16	100.0%

Severity	Accidents	%
Fatal	0	0.0%
Injury	4	25.0%
PDO	12	75.0%
Total	16	100.0%

Drinking	Accidents	%
Yes	0	0.0%
No	16	100.0%
Total	16	100.0%

Light Conditions	Accidents	%
Daylight	16	100.0%
Dawn Dusk	0	0.0%
Dark Lit	0	0.0%
Dark Unlit	0	0.0%
Unknown	0	0.0%
Total	16	100.0%

Weather Conditions	Accidents	%
Clear	11	68.8%
Rain	1	6.3%
Snow Sleet	0	0.0%
Fog	0	0.0%
Cloudy	4	25.0%
Unknown	0	0.0%
Total	16	100.0%

Surface Conditions	Accidents	%
Dry	13	81.3%
Wet	3	18.8%
Snowy	0	0.0%
Icy	0	0.0%
Unknown	0	0.0%
Total	16	100.0%

Type	Accidents	%
No Collision	0	0.0%
Head On	0	0.0%
Rear End	1	6.3%
Sidewipe	0	0.0%
Angle	14	87.5%
Other	1	6.3%
Total	16	100.0%

Primary Contributing Circumstance	Accidents	%
N/A	0	0.0%
Speed to fast	0	0.0%
Fail to yield right-of-way	0	0.0%
Pass stop sign	0	0.0%
Disregard Traffic Signal	14	87.5%
Drove left to center	0	0.0%
Improper passing	0	0.0%
Following too closely	1	6.3%
Made improper turn	1	6.3%
Driving under influence	0	0.0%
Mechanical defects	0	0.0%
Inattentive	0	0.0%
Careless driving	0	0.0%
Reckless driving	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
Total	16	100.0%

Section Data	
# of Accidents	16
Section Mile	N/A
2002 ADT	N/A
Days	1096

Accident Rate (per Million Vehilce-Mile)
N/A

Rummel, Klepper & Kahl, LLP
Consulting Engineers
1206 Forrest Avenue
Dover, Delaware 19904

Summary of Accidents
North Street @ State Street Traffic Study
North Street (from Governor's Avenue to N. State Street)

Valid Data from January, 2001 to December, 2003

April 5, 2004

Year	Accidents	%
1999	0	0.0%
2000	0	0.0%
2001	4	40.0%
2002	4	40.0%
2003	2	20.0%
Total	10	100.0%

Month	Accidents	%
JAN	2	20.0%
FEB	1	10.0%
MAR	3	30.0%
APR	2	20.0%
MAY	1	10.0%
JUN	0	0.0%
JUL	1	10.0%
AUG	0	0.0%
SEP	0	0.0%
OCT	0	0.0%
NOV	0	0.0%
DEC	0	0.0%
Total	10	100.0%

Hour	Accidents	%
12AM - 1AM	0	0.0%
1AM - 2AM	0	0.0%
2AM - 3AM	0	0.0%
3AM - 4AM	0	0.0%
4AM - 5AM	0	0.0%
5AM - 6AM	0	0.0%
6AM - 7AM	1	10.0%
7AM - 8AM	0	0.0%
8AM - 9AM	0	0.0%
9AM - 10AM	1	10.0%
10AM - 11AM	0	0.0%
11AM- 12PM	0	0.0%
12PM - 1PM	0	0.0%
1PM - 2PM	1	10.0%
2PM - 3PM	1	10.0%
3PM - 4PM	2	20.0%
4PM - 5PM	3	30.0%
5PM - 6PM	0	0.0%
6PM - 7PM	0	0.0%
7PM - 8PM	0	0.0%
8PM - 9PM	1	10.0%
9PM - 10PM	0	0.0%
10PM - 11PM	0	0.0%
11PM - 12AM	0	0.0%
Unknown	0	0.0%
Total	10	100.0%

Day	Accidents	%
MON	2	20.0%
TUE	2	20.0%
WED	2	20.0%
THU	0	0.0%
FRI	2	20.0%
SAT	0	0.0%
SUN	2	20.0%
Total	10	100.0%

Severity	Accidents	%
Fatal	0	0.0%
Injury	4	40.0%
PDO	6	60.0%
Total	10	100.0%

Drinking	Accidents	%
Yes	0	0.0%
No	10	100.0%
Total	10	100.0%

Light Conditions	Accidents	%
Daylight	8	80.0%
Dawn Dusk	0	0.0%
Dark Lit	2	20.0%
Dark Unlit	0	0.0%
Unknown	0	0.0%
Total	10	100.0%

Weather Conditions	Accidents	%
Clear	9	90.0%
Rain	1	10.0%
Snow Sleet	0	0.0%
Fog	0	0.0%
Cloudy	0	0.0%
Unknown	0	0.0%
Total	10	100.0%

Surface Conditions	Accidents	%
Dry	9	90.0%
Wet	1	10.0%
Snowy	0	0.0%
Icy	0	0.0%
Unknown	0	0.0%
Total	10	100.0%

Type	Accidents	%
No Collision	0	0.0%
Head On	0	0.0%
Rear End	4	40.0%
Sidewipe	0	0.0%
Angle	5	50.0%
Other	1	10.0%
Total	10	100.0%

Primary Contributing Circumstance	Accidents	%
N/A	0	0.0%
Speed to fast	0	0.0%
Fail to yield right-of-way	0	0.0%
Pass stop sign	0	0.0%
Disregard Traffic Signal	5	50.0%
Drove left to center	0	0.0%
Improper passing	0	0.0%
Following too closely	1	10.0%
Made improper turn	1	10.0%
Driving under influence	0	0.0%
Mechanical defects	0	0.0%
Inattentive	3	30.0%
Careless driving	0	0.0%
Reckless driving	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
Total	10	100.0%

Section Data	
# of Accidents	10
Section Mile	0.19
2002 ADT	14408
Days	1096

Accident Rate
(per Million Vehilce-Mile)

3.33

Rummel, Klepper & Kahl, LLP
Consulting Engineers
1206 Forrest Avenue
Dover, Delaware 19904

Summary of Accidents
North Street @ State Street Traffic Study
North State Street (from Loockerman Street to North Street)

Valid Data from January, 2001 to December, 2003

April 5, 2004

Year	Accidents	%
1999	0	0.0%
2000	0	0.0%
2001	5	29.4%
2002	5	29.4%
2003	7	41.2%
Total	17	100.0%

Month	Accidents	%
JAN	2	11.8%
FEB	2	11.8%
MAR	1	5.9%
APR	1	5.9%
MAY	2	11.8%
JUN	1	5.9%
JUL	1	5.9%
AUG	1	5.9%
SEP	1	5.9%
OCT	0	0.0%
NOV	1	5.9%
DEC	4	23.5%
Total	17	100.0%

Hour	Accidents	%
12AM - 1AM	0	0.0%
1AM - 2AM	0	0.0%
2AM - 3AM	0	0.0%
3AM - 4AM	0	0.0%
4AM - 5AM	0	0.0%
5AM - 6AM	0	0.0%
6AM - 7AM	0	0.0%
7AM - 8AM	2	11.8%
8AM - 9AM	0	0.0%
9AM - 10AM	2	11.8%
10AM - 11AM	2	11.8%
11AM- 12PM	0	0.0%
12PM - 1PM	2	11.8%
1PM - 2PM	2	11.8%
2PM - 3PM	1	5.9%
3PM - 4PM	1	5.9%
4PM - 5PM	1	5.9%
5PM - 6PM	3	17.6%
6PM - 7PM	0	0.0%
7PM - 8PM	0	0.0%
8PM - 9PM	0	0.0%
9PM - 10PM	1	5.9%
10PM - 11PM	0	0.0%
11PM - 12AM	0	0.0%
Unknown	0	0.0%
Total	17	100.0%

Day	Accidents	%
MON	4	23.5%
TUE	2	11.8%
WED	2	11.8%
THU	1	5.9%
FRI	2	11.8%
SAT	3	17.6%
SUN	3	17.6%
Total	17	100.0%

Severity	Accidents	%
Fatal	0	0.0%
Injury	6	35.3%
PDO	11	64.7%
Total	17	100.0%

Drinking	Accidents	%
Yes	2	11.8%
No	15	88.2%
Total	17	100.0%

Light Conditions	Accidents	%
Daylight	16	94.1%
Dawn Dusk	0	0.0%
Dark Lit	1	5.9%
Dark Unlit	0	0.0%
Unknown	0	0.0%
Total	17	100.0%

Weather Conditions	Accidents	%
Clear	12	70.6%
Rain	1	5.9%
Snow Sleet	0	0.0%
Fog	0	0.0%
Cloudy	4	23.5%
Unknown	0	0.0%
Total	17	100.0%

Surface Conditions	Accidents	%
Dry	14	82.4%
Wet	3	17.6%
Snowy	0	0.0%
Icy	0	0.0%
Unknown	0	0.0%
Total	17	100.0%

Type	Accidents	%
No Collision	0	0.0%
Head On	0	0.0%
Rear End	2	11.8%
Sidewipe	0	0.0%
Angle	15	88.2%
Other	0	0.0%
Total	17	100.0%

Primary Contributing Circumstance	Accidents	%
N/A	0	0.0%
Speed to fast	0	0.0%
Fail to yield right-of-way	0	0.0%
Pass stop sign	1	5.9%
Disregard Traffic Signal	14	82.4%
Drove left to center	0	0.0%
Improper passing	0	0.0%
Following too closely	1	5.9%
Made improper turn	0	0.0%
Driving under influence	1	5.9%
Mechanical defects	0	0.0%
Inattentive	0	0.0%
Careless driving	0	0.0%
Reckless driving	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
Total	17	100.0%

Section Data	
# of Accidents	17
Section Mile	0.16
2002 ADT	7215
Days	1096

Accident Rate (per Million Vehilce-Mile)
13.44

Rummel, Klepper & Kahl, LLP
Consulting Engineers
1206 Forrest Avenue
Dover, Delaware 19904

Summary of Accidents
North Street @ State Street Traffic Study
Loockerman Street (from Governor's Avenue to N. State Street)

Valid Data from January, 2001 to December, 2003

April 5, 2004

Year	Accidents	%
1999	0	0.0%
2000	0	0.0%
2001	8	29.6%
2002	9	33.3%
2003	10	37.0%
Total	27	100.0%

Month	Accidents	%
JAN	1	3.7%
FEB	4	14.8%
MAR	1	3.7%
APR	5	18.5%
MAY	3	11.1%
JUN	2	7.4%
JUL	0	0.0%
AUG	3	11.1%
SEP	1	3.7%
OCT	4	14.8%
NOV	3	11.1%
DEC	0	0.0%
Total	27	100.0%

Hour	Accidents	%
12AM - 1AM	0	0.0%
1AM - 2AM	2	7.4%
2AM - 3AM	1	3.7%
3AM - 4AM	0	0.0%
4AM - 5AM	0	0.0%
5AM - 6AM	0	0.0%
6AM - 7AM	0	0.0%
7AM - 8AM	1	3.7%
8AM - 9AM	2	7.4%
9AM - 10AM	1	3.7%
10AM - 11AM	2	7.4%
11AM- 12PM	2	7.4%
12PM - 1PM	1	3.7%
1PM - 2PM	1	3.7%
2PM - 3PM	2	7.4%
3PM - 4PM	4	14.8%
4PM - 5PM	0	0.0%
5PM - 6PM	4	14.8%
6PM - 7PM	1	3.7%
7PM - 8PM	1	3.7%
8PM - 9PM	0	0.0%
9PM - 10PM	2	7.4%
10PM - 11PM	0	0.0%
11PM - 12AM	0	0.0%
Unknown	0	0.0%
Total	27	100.0%

Day	Accidents	%
MON	4	14.8%
TUE	2	7.4%
WED	6	22.2%
THU	2	7.4%
FRI	8	29.6%
SAT	2	7.4%
SUN	3	11.1%
Total	27	100.0%

Severity	Accidents	%
Fatal	0	0.0%
Injury	8	29.6%
PDO	19	70.4%
Total	27	100.0%

Drinking	Accidents	%
Yes	5	18.5%
No	22	81.5%
Total	27	100.0%

Light Conditions	Accidents	%
Daylight	20	74.1%
Dawn Dusk	1	3.7%
Dark Lit	6	22.2%
Dark Unlit	0	0.0%
Unknown	0	0.0%
Total	27	100.0%

Weather Conditions	Accidents	%
Clear	19	70.4%
Rain	2	7.4%
Snow Sleet	1	3.7%
Fog	0	0.0%
Cloudy	5	18.5%
Unknown	0	0.0%
Total	27	100.0%

Surface Conditions	Accidents	%
Dry	23	85.2%
Wet	3	11.1%
Snowy	1	3.7%
Icy	0	0.0%
Unknown	0	0.0%
Total	27	100.0%

Type	Accidents	%
No Collision	0	0.0%
Head On	1	3.7%
Rear End	3	11.1%
Sidewipe	0	0.0%
Angle	22	81.5%
Other	1	3.7%
Total	27	100.0%

Primary Contributing Circumstance	Accidents	%
N/A	0	0.0%
Speed to fast	0	0.0%
Fail to yield right-of-way	2	7.4%
Pass stop sign	0	0.0%
Disregard Traffic Signal	17	63.0%
Drove left to center	0	0.0%
Improper passing	0	0.0%
Following too closely	0	0.0%
Made improper turn	1	3.7%
Driving under influence	1	3.7%
Mechanical defects	0	0.0%
Inattentive	4	14.8%
Careless driving	2	7.4%
Reckless driving	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
Total	27	100.0%

Section Data	
# of Accidents	27
Section Mile	0.34
2002 ADT	15961
Days	1096

Accident Rate
(per Million Vehilce-Mile)

4.54

Rummel, Klepper & Kahl, LLP
Consulting Engineers
1206 Forrest Avenue
Dover, Delaware 19904

Summary of Accidents
North Street @ State Street Traffic Study
Governor's Avenue (from Loockerman Street to North Street)

Valid Data from January, 2001 to December, 2003

April 5, 2004

Year	Accidents	%
1999	0	0.0%
2000	0	0.0%
2001	7	58.3%
2002	2	16.7%
2003	3	25.0%
Total	12	100.0%

Month	Accidents	%
JAN	0	0.0%
FEB	1	8.3%
MAR	3	25.0%
APR	2	16.7%
MAY	1	8.3%
JUN	1	8.3%
JUL	0	0.0%
AUG	0	0.0%
SEP	4	33.3%
OCT	0	0.0%
NOV	0	0.0%
DEC	0	0.0%
Total	12	100.0%

Hour	Accidents	%
12AM - 1AM	0	0.0%
1AM - 2AM	0	0.0%
2AM - 3AM	1	8.3%
3AM - 4AM	0	0.0%
4AM - 5AM	0	0.0%
5AM - 6AM	0	0.0%
6AM - 7AM	0	0.0%
7AM - 8AM	0	0.0%
8AM - 9AM	0	0.0%
9AM - 10AM	1	8.3%
10AM - 11AM	0	0.0%
11AM- 12PM	3	25.0%
12PM - 1PM	1	8.3%
1PM - 2PM	0	0.0%
2PM - 3PM	2	16.7%
3PM - 4PM	2	16.7%
4PM - 5PM	1	8.3%
5PM - 6PM	0	0.0%
6PM - 7PM	0	0.0%
7PM - 8PM	0	0.0%
8PM - 9PM	0	0.0%
9PM - 10PM	1	8.3%
10PM - 11PM	0	0.0%
11PM - 12AM	0	0.0%
Unknown	0	0.0%
Total	12	100.0%

Day	Accidents	%
MON	1	8.3%
TUE	2	16.7%
WED	1	8.3%
THU	1	8.3%
FRI	2	16.7%
SAT	1	8.3%
SUN	4	33.3%
Total	12	100.0%

Severity	Accidents	%
Fatal	0	0.0%
Injury	4	33.3%
PDO	8	66.7%
Total	12	100.0%

Drinking	Accidents	%
Yes	2	16.7%
No	10	83.3%
Total	12	100.0%

Light Conditions	Accidents	%
Daylight	10	83.3%
Dawn Dusk	0	0.0%
Dark Lit	2	16.7%
Dark Unlit	0	0.0%
Unknown	0	0.0%
Total	12	100.0%

Weather Conditions	Accidents	%
Clear	10	83.3%
Rain	1	8.3%
Snow Sleet	0	0.0%
Fog	0	0.0%
Cloudy	1	8.3%
Unknown	0	0.0%
Total	12	100.0%

Surface Conditions	Accidents	%
Dry	11	91.7%
Wet	1	8.3%
Snowy	0	0.0%
Icy	0	0.0%
Unknown	0	0.0%
Total	12	100.0%

Type	Accidents	%
No Collision	0	0.0%
Head On	0	0.0%
Rear End	2	16.7%
Sidewipe	1	8.3%
Angle	8	66.7%
Other	1	8.3%
Total	12	100.0%

Primary Contributing Circumstance	Accidents	%
N/A	0	0.0%
Speed to fast	0	0.0%
Fail to yield right-of-way	0	0.0%
Pass stop sign	0	0.0%
Disregard Traffic Signal	8	66.7%
Drove left to center	0	0.0%
Improper passing	0	0.0%
Following too closely	0	0.0%
Made improper turn	0	0.0%
Driving under influence	0	0.0%
Mechanical defects	0	0.0%
Inattentive	3	25.0%
Careless driving	0	0.0%
Reckless driving	0	0.0%
Other	1	8.3%
Unknown	0	0.0%
Total	12	100.0%

Section Data	
# of Accidents	12
Section Mile	0.19
2002 ADT	8780
Days	1096

Accident Rate
(per Million Vehilce-Mile)

6.56

Rummel, Klepper & Kahl, LLP
Consulting Engineers
1206 Forrest Avenue
Dover, Delaware 19904

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

NATHAN HAYWARD III
SECRETARY

April 1, 2004

Mr. Adam S. Weiser, E.I.
Rummel, Klepper & Kahl, LLP
1206 Forrest Ave.
Dover, DE 19904

Dear Mr. Weiser:

Enclosed are accident statistics for the following locations in Dover:

1. North Street (K73) from Governors Ave. (K3) to N. State Street (K25)
   Rd. 73 - Milepoint 07.15 - 07.34

2. Loockerman Street (K23) from Governors Ave. (K3) to N. State Street (K25)
   Rd. 23 - Milepoint 00.57 - 00.81

3. N. State Street (N25) from Loockerman Street (K23) to North Street (K73)
   Rd. 25 - Milepoint 01.13 - 01.29

4. Governors Ave. (N3) from Loockerman Street (K23) to North Street (K73)
   Rd. 3 - Milepoint 02.07 - 02.26

This study is for the period of January 2001 through December 2003. Also enclosed is a copy of the Accident Study Documentation that will translate the computer-generated data into meaningful information. If you have any questions, please call me at (302) 760-2140.

Sincerely,

Joy A. Hall
Accident Data Coordinator

/jah
Enclosure(s)
cc: Gregory P. Oliver, Assistant Director of Planning
Tyrone Crittenden, Manager, Statistics, Research & Special Program

DelDOT

From: 01/03 Thru: 12/03 County: KENT Maint Rd: 23 Dir: EAST Mile: 0.47 Thru 0.81

ALCOHOL RELATED ACCIDENTS BY SEVERITY

	Fatal	Injury	Property	Total
Alcohol Related	0	0	2	2
Non-Alcohol Related	0	3	5	8
Total	0	3	7	10

COLLISION TYPE BY SEVERITY

	Fatal	Injury	Property	Total
Unknown	0	0	0	0
Head On	0	0	1	1
Rear End	0	0	0	0
Side Swipe	0	0	0	0
Angle	0	3	6	9
Other	0	0	0	0
Total	0	3	7	10

SURFACE CONDITIONS

	Nmbr of Accdnts	Pctg of Accdnts
Dry	8	0.80
Wet	1	0.10
Snowy	1	0.10
Icy	0	0.00
Unknown	0	0.00
Total	10	

LIGHTING CONDITIONS

	Nmbr Of Accdnts	Pctg Of Accdnts
Daylight	6	0.60
Dawn/Dusk	1	0.10
Dark/Lit	3	0.30
Dark/Unlit	0	0.00
Unknown	0	0.00
Total	10	

PRIMARY CONTRIBUTING CIRCUMSTANCES

	Nmbr Of Accdnts	Pctg Of Accdnts
N/A	0	0.00
Speed To Fast	0	0.00
Fail To Yield Right-Of_Way	1	0.10
Pass Stop Sign	0	0.00
Disregard Traffic Signal	6	0.60
Drove Left To Center	0	0.00
Improper Passing	0	0.00
Following Too Closely	0	0.00
Made Improper Turn	0	0.00
Driving Uner Influence	0	0.00
Mechanical Defects	0	0.00
Inattentive	2	0.20
Careless Driving	1	0.10
Reckless Driving	0	0.00
Other	0	0.00
Unknown	0	0.00
Total	10	

From: 01/03 Thru: 12/03 County: KENT Maint Rd: 23 Dir: EAST Mile: 0.47 Thru 0.81

CY	ROAD	TP	SUB	D	MILE	INTERSECT ROAD	INTERSECT SUB	TN	SC	YR MO ACC	TIME	D	PRPRTY DAMAGE	SI	F	MJ	MN	PF	PI	DI	LC	WC	SC	CT	CI	DA	VEHICLES 1	2	3	4	TCT	TF	PC
2	23	1		5	.48	212		14	3	03-02-3166	02:15	5	2800	3						Y	20	24	29	4	37	45	57	56			32	1	19
2	23	1		5	.48	212		14	3	03-03-3537	12:40	5	2500	2			1			N	18	22	27	4	37	40	58	56			32	1	11
2	23	1		5	.48	212		14	3	03-04-3277	13:44	1	950	2			1			N	18	22	27	4	37	47	56	56			32	1	18
2	23	1		5	.48	212		14	3	03-04-3502	17:11	3	4500	3						N	18	22	27	4	37	45	56	56	56		32	1	11
2	23	1		5	.48	212		14	3	03-06-3173	11:59	1	900	2			1			N	18	22	27	4	37	45	56	56			32	1	11
2	23	1		5	.48	212		14	3	03-08-3449	07:55	3	4200	3						N	18	22	27	4	37	45	58	56			32	1	11
2	23	1		5	.48	212		14	3	03-11-3199	15:30	5	1300	3						N	18	22	27	4	37	45	56	56			32	1	11
2	23	1		5	.55	193		14	3	03-11-3208	19:00	7	1500	3						N	20	22	27	4	37	46	57	56			32	1	09
2	23	1		5	.76	25		14	3	03-04-3548	21:34	5	2000	3						N	20	23	28	4	37	45	56	56			32	1	11
2	23	1		5	.80			14	3	03-10-3728	18:38	7	5500	3						Y	19	22	27	1	41	52	56	98				0	18

TOTAL NUMBER OF ACCIDENTS: 10

THIS ACCIDENT STUDY WAS GENERATED BY JHALL

SEPARATED YEAR STUDY RUN FOR: 01/01-12/03

From: 01/02 Thru: 12/02 County: KENT Maint Rd: 23 Dir: EAST Mile: 0.47 Thru 0.81

ALCOHOL RELATED ACCIDENTS BY SEVERITY

	Fatal	Injury	Property	Total
Alcohol Related	0	0	0	0
Non-Alcohol Related	0	4	5	9
Total	0	4	5	9

COLLISION TYPE BY SEVERITY

	Fatal	Injury	Property	Total
Unknown	0	0	0	0
Head On	0	0	0	0
Rear End	0	1	0	1
Side Swipe	0	0	0	0
Angle	0	3	4	7
Other	0	0	1	1
Total	0	4	5	9

SURFACE CONDITIONS

	Nmbr of Accdnts	Pctg of Accdnts
Dry	8	0.89
Wet	1	0.11
Snowy	0	0.00
Icy	0	0.00
Unknown	0	0.00
Total	9	

LIGHTING CONDITIONS

	Nmbr Of Accdnts	Pctg Of Accdnts
Daylight	8	0.88
Dawn/Dusk	0	0.00
Dark/Lit	1	0.11
Dark/Unlit	0	0.00
Unknown	0	0.00
Total	9	

PRIMARY CONTRIBUTING CIRCUMSTANCES

	Nmbr Of Accdnts	Pctg Of Accdnts
N/A	0	0.00
Speed To Fast	0	0.00
Fail To Yield Right-Of_Way	1	0.11
Pass Stop Sign	0	0.00
Disregard Traffic Signal	6	0.66
Drove Left To Center	0	0.00
Improper Passing	0	0.00
Following Too Closely	0	0.00
Made Improper Turn	1	0.11
Driving Uner Influence	0	0.00
Mechanical Defects	0	0.00
Inattentive	1	0.11
Careless Driving	0	0.00
Reckless Driving	0	0.00
Other	0	0.00
Unknown	0	0.00
Total	9	

From: 01/02 Thru: 12/02 County: KENT Maint Rd: 23 Dir: EAST Mile: 0.47 Thru 0.81

CY	ROAD	TP	SUB	D	MILE	INTERSECT ROAD	INTERSECT SUB	TN	SC	YR MO ACC	TIME	D	PRPRTY DAMAGE	SI	F	MJ	MN	PF	PI	DI	LC	WC	SC	CT	CI	DA	VEHICLES 1	2	3	4	TCT	TF	PC
2	23	1		5	.47			14	3	02-10-3784	15:20	4	2500	3						N	18	22	27	4	37	56	56	58			35	1	09
2	23	1		5	.48	212		14	3	02-01-3130	08:04	4	2500	3						N	18	26	27	4	37	45	56	56			32	1	11
2	23	1		5	.48	212		14	3	02-02-3528	15:14	7	8500	2			3			N	18	22	27	4	37	45	56	56	56		32	1	11
2	23	1		5	.48	212		14	3	02-08-3584	10:27	3	3100	2			1			N	18	26	27	4	37	45	56	58			32	1	11
2	23	1		5	.48	212		14	3	02-10-3039	17:13	2	3500	3						N	18	22	27	4	37	45	58	56			32	1	11
2	23	1		5	.48	212		14	3	02-10-3678	17:42	3	7000	2			2			N	18	26	27	4	37	45	56	56			32	1	11
2	23	1		5	.48	212		14	3	02-11-3358	14:27	5	1500	3						N	18	22	27	4	37	45	56	56			32	1	11
2	23	1		5	.55	193		14	3	02-02-3284	01:41	5	1500	3						N	20	23	28	5	45	61	65				32	1	15
2	23	1		5	.72			14	3	02-02-3381	15:56	6	575	2			1			N	18	22	27	2	37	53	58	56			32	1	18

TOTAL NUMBER OF ACCIDENTS: 9

THIS ACCIDENT STUDY WAS GENERATED BY JHALL

SEPARATED YEAR STUDY RUN FOR: 01/01-12/03

From: 01/01 Thru: 12/01 County: KENT Maint Rd: 23 Dir: EAST Mile: 0.47 Thru 0.81

ALCOHOL RELATED ACCIDENTS BY SEVERITY

	Fatal	Injury	Property	Total
Alcohol Related	0	1	1	2
Non-Alcohol Related	0	0	6	6
Total	0	1	7	8

COLLISION TYPE BY SEVERITY

	Fatal	Injury	Property	Total
Unknown	0	0	0	0
Head On	0	0	0	0
Rear End	0	0	2	2
Side Swipe	0	0	0	0
Angle	0	1	5	6
Other	0	0	0	0
Total	0	1	7	8

SURFACE CONDITIONS

	Nmbr of Accdnts	Pctg of Accdnts
Dry	7	0.88
Wet	1	0.13
Snowy	0	0.00
Icy	0	0.00
Unknown	0	0.00
Total	8	

LIGHTING CONDITIONS

	Nmbr Of Accdnts	Pctg Of Accdnts
Daylight	6	0.75
Dawn/Dusk	0	0.00
Dark/Lit	2	0.25
Dark/Unlit	0	0.00
Unknown	0	0.00
Total	8	

PRIMARY CONTRIBUTING CIRCUMSTANCES

	Nmbr Of Accdnts	Pctg Of Accdnts
N/A	0	0.00
Speed To Fast	0	0.00
Fail To Yield Right-Of_Way	0	0.00
Pass Stop Sign	0	0.00
Disregard Traffic Signal	5	0.62
Drove Left To Center	0	0.00
Improper Passing	0	0.00
Following Too Closely	0	0.00
Made Improper Turn	0	0.00
Driving Uner Influence	1	0.12
Mechanical Defects	0	0.00
Inattentive	1	0.12
Careless Driving	1	0.12
Reckless Driving	0	0.00
Other	0	0.00
Unknown	0	0.00
Total	8	

From: 01/01 Thru: 12/01 County: KENT Maint Rd: 23 Dir: EAST Mile: 0.47 Thru 0.81

CY	ROAD	TP	SUB	D	MILE	INTERSECT ROAD	INTERSECT SUB	TN	SC	YR MO ACC	TIME	D	PRPRTY DAMAGE	SI	F	MJ	MN	PF	PI	DI	LC	WC	SC	CT	CI	DA	VEHICLES 1	2	3	4	TCT	TF	PC
2	23	1		5	.48	212		14	3	01-04-3469	17:04	3	1200	3						N	18	26	27	4	37	45	56	56			32	1	11
2	23	1		5	.48	212		14	3	01-05-3117	14:35	1	1100	3						N	18	22	27	4	37	45	56	56			32	1	11
2	23	1		5	.48	212		14	3	01-05-3471	09:55	2	5000	3						N	18	22	27	4	37	45	56	56			32	1	11
2	23	1		5	.48	212		14	3	01-05-3603	11:55	3	2000	3						N	18	22	27	4	37	45	56	56			32	1	11
2	23	1		5	.48	212		14	3	01-08-3367	08:22	5	5800	3						N	18	22	27	4	37	45	56	56			32	1	11
2	23	1		5	.62	3		14	3	01-09-3510	01:29	6	5500	3						Y	20	22	27	2	37	43	56	56			32	1	18
2	23	1		5	.68			14	3	01-06-3555	10:37	5	2800	3						N	18	26	28	2	37	53	58	56			35	1	19
2	23	1		5	.76	25		14	3	01-04-3464	21:15	1	1500	2			1			Y	20	22	27	4	37	46	56	56			32	1	16

TOTAL NUMBER OF ACCIDENTS: 8

THIS ACCIDENT STUDY WAS GENERATED BY JHALL

SEPARATED YEAR STUDY RUN FOR: 01/01-12/03

From: 01/03 Thru: 12/03 County: KENT Maint Rd: 3 Dir: NORTH Mile: 2.07 Thru 2.26

ALCOHOL RELATED ACCIDENTS BY SEVERITY

	Fatal	Injury	Property	Total
Alcohol Related	0	0	0	0
Non-Alcohol Related	0	0	3	3
Total	0	0	3	3

COLLISION TYPE BY SEVERITY

	Fatal	Injury	Property	Total
Unknown	0	0	0	0
Head On	0	0	0	0
Rear End	0	0	0	0
Side Swipe	0	0	0	0
Angle	0	0	3	3
Other	0	0	0	0
Total	0	0	3	3

SURFACE CONDITIONS

	Nmbr of Accdnts	Pctg of Accdnts
Dry	3	1.00
Wet	0	0.00
Snowy	0	0.00
Icy	0	0.00
Unknown	0	0.00
Total	3	

LIGHTING CONDITIONS

	Nmbr Of Accdnts	Pctg Of Accdnts
Daylight	3	1.00
Dawn/Dusk	0	0.00
Dark/Lit	0	0.00
Dark/Unlit	0	0.00
Unknown	0	0.00
Total	3	

PRIMARY CONTRIBUTING CIRCUMSTANCES

	Nmbr Of Accdnts	Pctg Of Accdnts
N/A	0	0.00
Speed To Fast	0	0.00
Fail To Yield Right-Of_Way	0	0.00
Pass Stop Sign	0	0.00
Disregard Traffic Signal	3	1.00
Drove Left To Center	0	0.00
Improper Passing	0	0.00
Following Too Closely	0	0.00
Made Improper Turn	0	0.00
Driving Uner Influence	0	0.00
Mechanical Defects	0	0.00
Inattentive	0	0.00
Careless Driving	0	0.00
Reckless Driving	0	0.00
Other	0	0.00
Unknown	0	0.00
Total	3	

From: 01/03 Thru: 12/03 County: KENT Maint Rd: 3 Dir: NORTH Mile: 2.07 Thru 2.26

CY	ROAD	TP	SUB	D	MILE	INTERSECT ROAD	INTERSECT SUB	TN	SC	YR MO ACC	TIME	D	PRPRTY DAMAGE	SI	F	MJ	MN	PF	PI	DI	LC	WC	SC	CT	CI	DA	VEHICLES 1	2	3	4	TCT	TF	PC
2	3	1		5	2.12	73		14	3	03-09-3241	09:20	3	4000	3						N	18	22	27	4	37	45	56	56			32	1	11
2	3	1		5	2.12	73		14	3	03-09-3226	16:20	5	3300	3						N	18	22	27	4	37	45	56	56			32	1	11
2	3	1		5	2.12	73		14	3	03-09-3408	11:42	1	2100	3						N	18	26	27	4	37	45	56	56			32	1	11

TOTAL NUMBER OF ACCIDENTS: 3

THIS ACCIDENT STUDY WAS GENERATED BY JHALL

SEPARATED YEAR STUDY RUN FOR: 01/01-12/03

From: 01/02 Thru: 12/02 County: KENT Maint Rd: 3 Dir: NORTH Mile: 2.07 Thru 2.26

ALCOHOL RELATED ACCIDENTS BY SEVERITY

	Fatal	Injury	Property	Total
Alcohol Related	0	0	0	0
Non-Alcohol Related	0	1	1	2
Total	0	1	1	2

COLLISION TYPE BY SEVERITY

	Fatal	Injury	Property	Total
Unknown	0	0	0	0
Head On	0	0	0	0
Rear End	0	0	0	0
Side Swipe	0	0	0	0
Angle	0	1	1	2
Other	0	0	0	0
Total	0	1	1	2

SURFACE CONDITIONS

	Nmbr of Accdnts	Pctg of Accdnts
Dry	1	0.50
Wet	1	0.50
Snowy	0	0.00
Icy	0	0.00
Unknown	0	0.00
Total	2	

LIGHTING CONDITIONS

	Nmbr Of Accdnts	Pctg Of Accdnts
Daylight	2	1.00
Dawn/Dusk	0	0.00
Dark/Lit	0	0.00
Dark/Unlit	0	0.00
Unknown	0	0.00
Total	2	

PRIMARY CONTRIBUTING CIRCUMSTANCES

	Nmbr Of Accdnts	Pctg Of Accdnts
N/A	0	0.00
Speed To Fast	0	0.00
Fail To Yield Right-Of_Way	0	0.00
Pass Stop Sign	0	0.00
Disregard Traffic Signal	2	1.00
Drove Left To Center	0	0.00
Improper Passing	0	0.00
Following Too Closely	0	0.00
Made Improper Turn	0	0.00
Driving Uner Influence	0	0.00
Mechanical Defects	0	0.00
Inattentive	0	0.00
Careless Driving	0	0.00
Reckless Driving	0	0.00
Other	0	0.00
Unknown	0	0.00
Total	2	

From: 01/02 Thru: 12/02 County: KENT Maint Rd: 3 Dir: NORTH Mile: 2.07 Thru 2.26

CY	ROAD	TP	SUB	D	MILE	INTERSECT ROAD	INTERSECT SUB	TN	SC	YR MO ACC	TIME	D	PRPRTY DAMAGE	SI	F	MJ	MN	PF	PI	DI	LC	WC	SC	CT	CI	DA	VEHICLES 1	2	3	4	TCT	TF	PC
2	3	1		5	2.12	73		14	3	02-04-3446	11:50	5	2900	2			1			N	18	22	27	4	37	45	58	56			32	1	11
2	3	1		5	2.12	197		14	3	02-09-3265	15:35	7	6000	3						N	18	23	28	4	37	45	56	65			32	1	11

TOTAL NUMBER OF ACCIDENTS: 2

THIS ACCIDENT STUDY WAS GENERATED BY JHALL

SEPARATED YEAR STUDY RUN FOR: 01/01-12/03

From: 01/01 Thru: 12/01 County: KENT Maint Rd: 3 Dir: NORTH Mile: 2.07 Thru 2.26

ALCOHOL RELATED ACCIDENTS BY SEVERITY

	Fatal	Injury	Property	Total
Alcohol Related	0	1	1	2
Non-Alcohol Related	0	2	3	5
Total	0	3	4	7

COLLISION TYPE BY SEVERITY

	Fatal	Injury	Property	Total
Unknown	0	0	0	0
Head On	0	0	0	0
Rear End	0	2	0	2
Side Swipe	0	0	1	1
Angle	0	0	3	3
Other	0	1	0	1
Total	0	3	4	7

SURFACE CONDITIONS

	Nmbr of Accdnts	Pctg of Accdnts
Dry	7	1.00
Wet	0	0.00
Snowy	0	0.00
Icy	0	0.00
Unknown	0	0.00
Total	7	

LIGHTING CONDITIONS

	Nmbr Of Accdnts	Pctg Of Accdnts
Daylight	5	0.71
Dawn/Dusk	0	0.00
Dark/Lit	2	0.28
Dark/Unlit	0	0.00
Unknown	0	0.00
Total	7	

PRIMARY CONTRIBUTING CIRCUMSTANCES

	Nmbr Of Accdnts	Pctg Of Accdnts
N/A	0	0.00
Speed To Fast	0	0.00
Fail To Yield Right-Of_Way	0	0.00
Pass Stop Sign	0	0.00
Disregard Traffic Signal	3	0.42
Drove Left To Center	0	0.00
Improper Passing	0	0.00
Following Too Closely	0	0.00
Made Improper Turn	0	0.00
Driving Uner Influence	0	0.00
Mechanical Defects	0	0.00
Inattentive	3	0.42
Careless Driving	0	0.00
Reckless Driving	0	0.00
Other	1	0.14
Unknown	0	0.00
Total	7	

From: 01/01 Thru: 12/01 County: KENT Maint Rd: 3 Dir: NORTH Mile: 2.07 Thru 2.26

CY	ROAD	TP	SUB	D	MILE	INTERSECT ROAD	INTERSECT SUB	TN	SC	YR MO ACC	TIME	D	PRPRTY DAMAGE	SI	F	MJ	MN	PF	PI	DI	LC	WC	SC	CT	CI	DA	VEHICLES 1	VEHICLES 2	VEHICLES 3	VEHICLES 4	TCT	TF	PC
2	3	1		5	2.12	73		14	3	01-03-3583	11:05	2	1100	2			1			N	18	22	27	2	37	43	56	56	56		32	1	18
2	3	1		5	2.12	73		14	3	01-06-3275	15:06	7	2800	3						N	18	22	27	4	37	45	57	56			32	1	11
2	3	1		5	2.13	73		14	3	01-03-3585	12:24	6	3400	3						N	18	22	27	4	37	45	63	56			32	0	11
2	3	1		5	2.18			14	3	01-03-3125	14:15	4	6200	2			3			N	18	22	27	2	37	53	56	56	56	56	32	1	18
2	3	1		5	2.19	23		14	3	01-04-3613	02:20	7	1500	3						Y	20	22	27	4	37	45	58	56			36	1	11
2	3	1		5	2.21			14	3	01-02-3309	21:39	7	10	2			1		1	Y	20	22	27	5	40	20	56				35	1	98
2	3	1		5	2.25			14	3	01-05-3606	14:00	2	3200	3						N	18	22	27	3	41	52	56	58			35	1	18

TOTAL NUMBER OF ACCIDENTS: 7

THIS ACCIDENT STUDY WAS GENERATED BY JHALL

SEPARATED YEAR STUDY RUN FOR: 01/01-12/03

From: 01/03 Thru: 12/03 County: KENT Maint Rd: 25 Dir: NORTH Mile: 1.13 Thru 1.29

ALCOHOL RELATED ACCIDENTS BY SEVERITY

	Fatal	Injury	Property	Total
Alcohol Related	0	0	1	1
Non-Alcohol Related	0	2	4	6
Total	0	2	5	7

COLLISION TYPE BY SEVERITY

	Fatal	Injury	Property	Total
Unknown	0	0	0	0
Head On	0	0	0	0
Rear End	0	1	1	2
Side Swipe	0	0	0	0
Angle	0	1	4	5
Other	0	0	0	0
Total	0	2	5	7

SURFACE CONDITIONS

	Nmbr of Accdnts	Pctg of Accdnts
Dry	7	1.00
Wet	0	0.00
Snowy	0	0.00
Icy	0	0.00
Unknown	0	0.00
Total	7	

LIGHTING CONDITIONS

	Nmbr Of Accdnts	Pctg Of Accdnts
Daylight	7	1.00
Dawn/Dusk	0	0.00
Dark/Lit	0	0.00
Dark/Unlit	0	0.00
Unknown	0	0.00
Total	7	

PRIMARY CONTRIBUTING CIRCUMSTANCES

	Nmbr Of Accdnts	Pctg Of Accdnts
N/A	0	0.00
Speed To Fast	0	0.00
Fail To Yield Right-Of_Way	0	0.00
Pass Stop Sign	0	0.00
Disregard Traffic Signal	5	0.71
Drove Left To Center	0	0.00
Improper Passing	0	0.00
Following Too Closely	1	0.14
Made Improper Turn	0	0.00
Driving Uner Influence	1	0.14
Mechanical Defects	0	0.00
Inattentive	0	0.00
Careless Driving	0	0.00
Reckless Driving	0	0.00
Other	0	0.00
Unknown	0	0.00
Total	7	

STATE OF DELAWARE
Accident Study

From: 01/03 Thru: 12/03 County: KENT Maint Rd: 25 Dir: NORTH Mile: 1.13 Thru 1.29

CY	ROAD	TP	SUB	D	MILE	INTERSECT ROAD	INTERSECT SUB	TN	SC	YR MO ACC	TIME	D	PRPRTY DAMAGE	SI	F	MJ	MN	PF	PI	DI	LC	WC	SC	CT	CI	DA	VEHICLES 1	VEHICLES 2	VEHICLES 3	VEHICLES 4	TCT	TF	PC
2	25	1		5	1.17			14	3	03-07-3105	12:20	2	20	2			1			N	18	22	27	2	37	51	56	56			35	1	14
2	25	1		5	1.18	73		14	3	03-05-3556	13:15	1	9000	3						N	18	26	27	4	37	45	57	56			32	1	11
2	25	1		5	1.18	73		14	3	03-09-3675	17:59	7	4000	2			1			N	18	22	27	4	37	45	56	56			32	1	11
2	25	1		5	1.18	73		14	3	03-12-3538	13:26	6	2400	3						N	18	22	27	4	37	45	56	56	56		32	1	11
2	25	1		5	1.18	73		14	3	03-12-3303	12:45	1	6500	3						N	18	22	27	4	37	45	56	56			32	1	11
2	25	1		5	1.24			14	3	03-01-3471	15:16	3	2100	3						Y	18	22	27	2	37	53	57	56	56		32	1	16
2	25	1		5	1.24	23		14	3	03-06-3200	17:30	7	2500	3						N	18	22	27	4	37	45	56	57			32	1	11

TOTAL NUMBER OF ACCIDENTS: 7

THIS ACCIDENT STUDY WAS GENERATED BY JHALL

SEPARATED YEAR STUDY RUN FOR: 01/01-12/03