# ROUTE 38 CORRIDOR TRAFFIC STUDY

## Draft Existing Conditions Report

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## INTRODUCTION

The Northern Middlesex Council of Governments (NMCOG), under its current contract with MassHighway, has undertaken a study of existing and future traffic conditions along the 6.3 mile Route 38/Main Street corridor in the Town of Tewksbury from the City of Lowell line to the Town of Wilmington line. The planning area is shown on Map 1. The study is designed to identify appropriate strategies for improving travel conditions along the corridor. This study will help the Town of Tewksbury make informed development and land-use decisions based on the capacity of existing and planned transportation infrastructure.

There is consensus in the Town of Tewksbury that a traffic study of Route 38 is very much needed due to increasing congestion, multiple conflicting movements as vehicles enter and leave commercial establishments and neighborhood collector streets, and increased development of new businesses and redevelopment of already occupied sites. Some residents and officials believe that facilitating traffic flow through increasing roadway capacity and intersection improvements is all that is needed. Others believe that a more comprehensive approach to land use and transportation capacity linkages along Route 38 is preferable, not only to manage existing congestion and expected traffic increases in the near future, but also to help the Town preserve and enhance the attractiveness of the corridor for commercial businesses over the long term.

## PROBLEM STATEMENT

The potential exists for a substantial increase in traffic volume along the Route 38 Corridor based on the traffic generation potential of proposed future development. The Corridor currently suffers from traffic congestion as a result of uncoordinated development and high traffic volumes along this major regional transportation route. Projects currently in the permitting process, along

with the available undeveloped land and vacant properties have the potential, when developed, to generate several thousand additional trips per day to an already overburdened road.

This traffic study will assess current operating conditions along the corridor, define the development thresholds at which it becomes necessary to implement specific levels of traffic mitigation in order to accommodate anticipated development: and project traffic conditions along the corridor over twenty years based on high, medium and low development scenario. The ultimate goal in conducting capacity-based planning is to co-ordinate development with planned or available transportation capacity.

The first phase of this traffic study focused on data collection and analysis in order to assess the existing traffic demand on Route 38 and its major intersections. The data collection included ATR counts, turning movement counts, accident data collection, geometrics, travel time/speed runs, and identification of pedestrian activity locations. A level of service analysis was conducted for each roadway segment and major intersection along the corridor using the highway capacity software and high accident locations were identified.

## ROADWAY CHARACTERISTICS

Beginning at the Wilmington town line, Route 38 in Tewksbury, also known as Main Street, runs 6.3 miles to the Lowell City line. Main Street is the principal commercial corridor characterized predominantly by low-density strip development and scattered residential uses. The entire corridor is zoned for commercial uses except for a small transitional district where non-residential uses are required to maintain a residential appearance.

Because of the multiplicity of commercial and residential uses at a variety of scales, the road has numerous curb cuts and intersecting roadways. It serves both town residents and regional traffic, providing access to 1-495. Except for a small portion of the route near the 1-495 interchange, the

route consists of two travel lanes and is striped with double yellow center line and edge lines. Posted speed varies between 35 and 40 miles per hour. There are eleven signals along Route 38; several grouped primarily around the Town Center:

- Main Street and Clark Road
- Main Street and 1-495 southbound ramps
- Main Street and 1-495 northbound ramps.
- Main Street and Old Main Street
- Main Street and Wal-Mart site driveway
- Main Street and Pike and Castle Streets
- Main Street and Pleasant and East Streets
- Main Street and Chandler Street
- Main Street and Post Office site driveway
- Main Street and Shawsheen Street
- Main Street and South Street

Presently, the intersection of Main Street and South Street has been slated for a signal upgrade and the unsignalized intersection of Main Street and Livingston has been scheduled for signalization. Traffic volumes along the corridor range from 37,600 vehicles per day near the 1-495 ramps to 14,300 per day near South Street

INTERSECTION CHARACTERISTICS

Main Street and the 1-495 Southbound Ramps form a modified four-way, signalized intersection. At this point, Main Street is a four-lane bi-directional road, 65 feet wide with a double yellow centerline. The 1-495 southbound off-ramp is a one way approach divided by a traffic

island into an exclusive right turn and left turn lane onto Main Street. Access to Main Street southbound is stop controlled and northbound access is controlled by a traffic signal. The 1-495 southbound on ramp is a one way access point to 1-495. This approach is divided by a traffic island into two separate access points; one dedicated to southbound traffic on Main Street and the other to northbound traffic

Main Street and the 1-495 Northbound Ramps form a signalized four-way intersection with the Home Depot Plaza with all turns permitted. Main Street at this point is a four-lane, bi-directional road 65 feet wide. The off ramp is divided into four lanes and separated by a traffic island. Vehicles exiting 1-495 and going north on MainStreet have a dedicated right turn lane separated by a traffic island. Two lanes are designated for vehicles crossing the intersection and entering the Home Depot Plaza. An exclusive left turn lane provides access to vehicles turning left onto Main Street and travelling southbound. The two most southern access points serve as approaches to 1-495 northbound. The southernmost point is dedicated to vehicles travelling northbound on Main Street, while the other is dedicated to vehicles travelling southbound on Main Street. All stop lines and lane designations are painted on the road. Traffic flow is controlled by the traffic signal and vehicles in the designated left turn lanes are signalled with an exclusive left turn only arrow.

Main Street and Old Main Street form a signalized, three-way perpendicular "T' intersection with all turns permitted. Main Street is 65 feet wide and consists of three southbound lanes and two northbound lanes. A traffic signal controls the flow of traffic, and stop lines are painted at each intersection. One of the southbound lanes on Main Street is an exclusive left turn only lane onto Old Main Street. This lane configuration is painted on the road and depicted on a sign above the intersection. However: this lane does not get a protected left turn phase. Vehicles wishing to make

a left hand turn onto Old Main Street receive a green light and must wait for a gap before proceeding across Main Street. The northbound approach to the intersection from Main Street is on a downgrade side of a vertical curve that crests only a few hundred feet from the intersection, therefore, vehicles travelling northbound cannot view the intersection until they have crested the hill. A traffic sign has been installed to warn motorists that they are approaching the intersection and specifically warns them when the signal is in the red phase.

Old Main Street is 24 feet wide and access to Main Street from Old Main Street is controlled by the traffic signal. Vehicles at Old Main Street may make a right turn on red onto Main Street. At this time, the painted centerline on Old Main Street is worn and faded. Because it has faded, vehicles making a left-hand turn onto Main Street tend to center themselves within the road rather than keeping to the right as the centerline once dictated. This leaves room for vehicles turning right to maneuver around them and onto Main Street.

Main Street and Pike/Astle Streets, along with Old Main Street and Veranda Avenue form a five-approach intersection. All roads are bi-directional except for Old Main Street, which is one-way and only open to traffic travelling in a northbound direction. Main Street is 60 feet wide and consists of two southbound lanes and two northbound lanes. One of the southbound lanes is an exclusive left turn only lane (onto Veranda Avenue) and is appropriately marked. There is also a designated left turn lane onto Pike/ Astle streets from Main Street. However, this lane is not left turn exclusive but rather shared with northbound through traffic. A traffic signal controls the flow of traffic at all intersections except for Astle Street, which is stopped controlled. Stop lines are painted on the street at all approaches and there is a designated crosswalk at the Pike/ Astle and Main Street intersection. Right turns on red onto Pike and Astle Streets, from Main Street, are not permitted.

Minor approaches to the intersection have the following widths: Pike Street, 18 feet, Astle Street, 20 feet, Old Main Street, 24 feet, and Veranda Avenue, 20 feet. Access into the intersection from Veranda is controlled by the traffic light. The signal at this approach is demand actuated. At this point, the light will turn green and all other lights turn red allowing vehicles on Veranda to proceed. The complexity of the geometry of the intersection at Pike and Astle Streets requires vehicles wishing to enter the main intersection from Astle Street to first stop at a designated stop sign and then proceed onto Pike Street, where they are than channeled into the intersection. Because Pike and Astle meet so close to the main intersection, it is often difficult for vehicles to merge onto Pike without blocking the intersection

Main Street and Pleasant/East Streets form a modified four-way, signalized intersection with all turns permitted. Main Street, at the intersection, is four lanes and 28 feet wide approaching the intersection. There are designated left turn lanes onto both Pleasant and East Streets from Main Street. Pavement at this point is painted to designate the lane separation. The minor approaches are 24 feet wide. The approach to Main Street from East Street is divided by a traffic island into an exclusive right turn lane and a left turn/through lane. Access to Main Street northbound from East Street is stop controlled. Access to Pleasant Street and Main Street southbound is controlled by the traffic signal. When approaching the intersection from Pleasant Street, there is only one lane used for all turns. Vehicles travelling south on Main Street have a protected left turn phase onto East Street. The left turn onto Pleasant from the south does not have a protected left phase. Stop lines are painted at all approaches and crosswalks have been designated at all four approaches. Each approach also contains a pedestrian actuated signal so those pedestrians may cross without interference from vehicles. A small park with war memorials, a gazebo, and park benches may generate some pedestrian activity at this intersection.

Main Street and Chandler Street form a four-way intersection with all turns permitted and is controlled by a traffic signal. A crosswalk is painted on Main Street south of Chandler Street. Main Street is comprised of two northbound lanes and one southbound lane and road width is 28 feet. One northbound lane on Main Street is a designated left turn lane only. Pavement is striped to designate the lane separation. Right turns on red onto Chandler are not permitted. Travelling southbound on Main Street, there is only one lane and it is used for all directions. Chandler Street is 26 feet wide east of Main and 30 feet wide west of Main. The minor approach has one westbound lane and two eastbound lanes. One of the eastbound lanes is an exclusive left-turn only lane and is striped appropriately. Right turns from Chandler Street onto Main Street are controlled by small traffic islands and yield signs.

Main Street and Livingston Street form a "T" intersection with all turns permitted. Main Street is two lanes and 30 feet wide. There is no designated left turn lane for vehicles wishing to make a left onto Livingston Street. Access to Main Street from the minor approach is stop controlled. Livingston Street is approximately 30 feet wide approaching the intersection with two lanes providing access to Main Street. There is a sign on Livingston Street stating that the left lane must turn left, however, no lane markings are painted on Livingston Street. Vehicles wishing to enter Main Street southbound experience difficulty due to high traffic volumes, the lack of a signal, and the need to cross traffic.

Main Street and Shawsheen Street form a four-way, signalized intersection with all turns permitted. Main Street is 30 feet wide and each approach contains two lanes. One of these is a designated left turn only lane and the other is used for right turns and through traffic. Main Street is painted appropriately to show these designated lanes, and signs are also posted stating that the left lane must turn left. Stop lines are painted on the road at all approaches and there are designated

cross walks. Shawsheen Street is approximately 26 feet wide approaching the intersection. The approach to Main Street from Shawsheen Street is single lane and there is no room to maneuver around a vehicle attempting to make a left turn onto Main Street.

Main Street and South Street form a four-way, signalized intersection with all turns permitted. Main Street is two lanes, bi-directional and is 30 feet wide. There are no designated left turn lanes, however, there is room to maneuver around vehicles attempting to make a left turn. Stop lines are painted at each approach of the intersection. Approaching the intersection, South Street is approximately 22 feet wide west of Main Street and 24 feet wide east of Main Street. There is a small traffic island on South Street, which controls access to southbound Main Street. However, there is not enough room to maneuver around a vehicle attempting to make a left turn onto Main Street or going straight through the intersection. At this time, a Walgreen's Pharmacy is being constructed on the' corner south of South Street.

TRAFFIC COUNTS

A series of automatic traffic recorder counts were conducted at eleven locations along the Route 38 corridor. Traffic volumes ranged from a high of 37,600 vehicles per day to a low of 14,300 per day along the Corridor. The results of these counts is as follows:

| LOCATION | ADT |
|---|---|
| Rte. 38 at Lowell City Line | 24,200 |
| Rte. 38 north of I-495 ramps | 37,600 |
| Rte. 38 under I-495 | 31,500 |
| Rte. 38 south of I-495 | 28,100 |
| Rte. 38 north of Capitol Ave. | 22,200 |
| Rte. 38 north of Dewey St. | 21,100 |

| | |
|---|---|
| Rte. 38 south of Kelly Terrace | 19,300 |
| Rte. 38 south of Villa Roma Dr. | 19,200 |
| Rte. 38 north of Shawsheen St. | 21400 |
| Rte. 38 south of Decarlois Dr. | 18,800 |
| Rte. 38 north of Hoover/south of South St. | 14,400 |

LEVEL OF SERVICE ANALYSIS

The level of service rating methodology found in the Transportation Research Board's "Highway Capacity Manual" is used for the analysis of the existing and proposed traffic conditions at signalized intersections, unsignalized intersection, or road segments. The methodology uses a simple A to F rating system to rate the traffic conditions for the hour, or peak 15-minute period of the hour being analyzed. The following table explains the general meaning of A to F ratings use in the "Highway Capacity Manual."

| RATING | EXPECTED DELAY |
|---|---|
| A | Little or no delay |
| B | Short traffic delays |
| C | Average traffic delays D Long traffic delays |
| E | Very long traffic delays |
| F | Severe traffic congestion, demand exceeds capacity |

Signalized Intersection Level of Service

The level of service for a signalized intersection is defined in terms of delay. This term is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The specific level of service rating is stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. Variables such as the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question all contribute to the measure of delay. These criteria are summarized in the following table.

Level-Of-Service Criteria For Signalized Intersections

| Level of Service | Stopped Delay Per Vehicle (sec.) |
|---|---|
| A | ≤ 10.0 |
| B | > 10.0 and ≤ 20.0 |
| C | > 20.0 and ≤ 35.0 |
| D | > 35.0 and ≤ 55.0 |
| E | > 55.0 and ≤ 80.0 |
| F | > 80.0 |

Level-of-Service A describes operations with very low delay, up to ten seconds per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay

Level-of-Service B describes operations with delay greater than five and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

Level-of-Service C describes operations with delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

Level-of-Service D describes operations with delay greater than 35 and up to 55 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level-of-Service E describes operations with delay greater than 55 and up to 80 seconds per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences in LOS E.

Level-of-Service F describes operations with delay in excess of 80 seconds per vehicle. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels The existing levels of service for all of the intersections investigated in this report are outlined below. Intersection levels of service are based

on field turning movements and were calculated using software developed from the Highway Capacity Manual.

Intersection Level of Service during Peak Hour Flow

| **Signalized Intersection** | **AM** | **PM** |
|---|---|---|
| I-495 Southbound | B | C |
| I-495 Northbound | D | C |
| Old Main Street | A | B |
| Pike/Astle/Veranda Streets | E | F |
| Pleasant/East Streets | D | F |
| Chandler Street | C | C |
| Shawsheen Street | * | * |
| South Street | C | N/A |

* An intersection level of service can not be computed as intersection is operating over capacity.

Unsignalized Intersection Level of Service

The level of service for unsignalized intersections is based on the average vehicle delay per second to the vehicles that must stop or slow down before proceeding through the intersection. The following table shows the average vehicle delay ranges for the level of service ratings A to F at unsignalized intersections.

Level-0f-Service Criteria For Unsignalized Intersections

| Rating | Average Total Delay (Sec./Vehicle) |
|---|---|
| A | $ 10 |
| B | > 10 and ≤ 15 |
| C | > 15 and ≤ 25 |
| D | > 25 and ≤ 35 |

| | |
|---|---|
| E | >35 and ≤ 50 |
| F | > 50 |

The only unsignalized intersection investigated for this study was the intersection of Livingston Street with Main Street. The AM level of service was D and the PM level of service was E.

Roadway Level of Service

Like intersections, road segments can also be analyzed. For the purpose of this study, Main Street was divided into eight roadway segments of about the same length. The first segment begins at the Lowell town line and continues 0.9 miles to the intersection of Pike. Astle, and Main Street. Main Street is 65 feet wide and is four lanes and bi-directional. Of all eight segments, this segment has the highest average daily traffic volume with 37,600 vehicles. Access to and from Main Street is limited to a few points and these are controlled by traffic signals. These include the 1-495 ramps, the Home Depot Plaza, and the Wal-Mart Plaza. Along with these two large retailers, there is also a Burger King, an Applebee's Bar and Grill, a Motel 6, and a car dealership.

The second segment begins at the intersection of Pike, Astle, Veranda, and Old Main with Main Street and continues 0.8 miles to Marshall Street. Main Street, at this point, has been reduced to a two lane bi-directional road. Average daily traffic volume along this segment is 22,200 vehicles. The beginning of this segment contains two plazas, a gas station, Dunkin Donuts, a florist, two restaurants, a gym, and a motel all within close proximity to one another. Therefore, there are many access points to and from Main Street within this segment.

With a length of 0.7 miles, the third segment runs from Marshall Street to the intersection of Pleasant and East Streets with Main Street. Again, Main Street is two lane and bi-directional. The average daily traffic volume along this segment is 21,000 vehicles. There are three restaurants, a

gas station, two banks, and a commercial plaza with various businesses, the town police headquarters, and the town hall. Again, these developments along Main Street create many access points to and from Main Street.

The fourth segment is 0.5 miles long and stretches from the intersection of Pleasant and East Street to the intersection of Chandler Street. Main Street is two lanes and bi-directional. This segment is composed primarily of residences but does contain a gas station, a news room and a liquor store near the town center.

The fifth segment stretches from Chandler Street to Villa Roma Drive, is 0.8 miles long, and is two-lane bi-directional. This segment contains a variety of uses having access to Main Street including offices, apartments, businesses, a garden center, and three commercial plazas and professional condos. Average daily traffic along this segment is 19,200 vehicles.

Continuing from here for one mile to Shawsheen Street is the sixth segment. Main Street is two lane and bi-directional and has an average daily traffic volume of 21,400 vehicles. This segment of Main Street has numerous access points to Main Street. Businesses along this segment include a post office, three commercial plazas, two restaurants, four fast food establishments, two banks, a gas station, and a supermarket.

Another 0.8 miles segment extends between Shawsheen Street and South Street. This segment of Main Street has an average daily traffic volume of 18,800 vehicles and is two lane and bi-directional. A commercial plaza, a bank, a car wash, a restaurant, a car dealership, a hardware store, and other business all require access to Main Street along this segment.

The most undeveloped segment of Main Street is between South Street and the Wilmington town line. This segment is 0.7 miles long and is two lane and bi-directional. Except for a

Walgreen's Pharmacy that is being constructed, a small commercial plaza, and a few residences, this segment contains very few access points to and from Main Street.

The operating condition of a roadway or intersection is defined in terms of level of service Level of service estimates the maximum amount of traffic that can be accommodated by a facility while maintaining efficient traffic flow. It is also used to measure changes in operating conditions produced by improvement projects. There are six levels of service; the highest quality of service is LOS A and the lowest is LOS F. The fundamental hypothesis is that as the amount of traffic increases the level of service decreases.

The Level-of-Service criteria for two-lane highway segments address both mobility and accessibility concerns. Percent time delay is the primary measure of service quality, with speed and capacity utilization used as secondary measures. Level-of-Service criteria are defined for peak 15-minute flow periods, and are intended for application to road segments. The Highway Capacity Manual defines these levels-of-service in the following way:

Level-of-Service A (v/c ratio ≤ .04 and percent time delay ≤ 30) represents the highest quality of traffic service as motorists may travel at their desired speed. Without strict enforcement, speeds in LOS A would reach 60 mph and the passing frequency required to maintain these speeds has not reached a demanding level. Here, passing demand is well below passing capacity, and almost no platoons of three or more vehicles are observed. Drivers would be delayed no more than 30 percent of the time by slow moving vehicles.

Level-of-Service B (v/c ratio ≤ .16 and percent time delay ≤ 45) characterizes the region of traffic flow wherein speeds of 55 mph or slightly higher are expected on level

terrain. Passing demand needed to maintain desired speeds becomes significant and approximately equals the passing capacity at the lower boundary of LOS B. Drivers are delayed up to 45 percent of the time on the average.

Level-of-Service C (v/c ratio ≤ .32 and percent time delay ≤ 60) is characterized by increased size and formation and the increased frequency of passing impediment. Average speed still exceeds 52 mph on level terrain, even though unrestricted passing demand exceeds passing capacity. At higher volume levels, chaining of platoons and significant reductions in passing capacity begin to occur. While traffic flow is stable, it is becoming susceptible to congestion due to turning traffic and slow moving vehicles. The percentage of time motorists are delayed approaches 60 percent.

Level-of-Service D (v/c ratio ≤ .57 and percent time delay ≤ 75) is characterized by unstable traffic flow. In LOS D, the passing demand is extremely high although it is very difficult and the capacity to do so approaches zero. Mean platoon sizes of 5 to 10 vehicles are common, although speeds of 50 mph can still be maintained under ideal conditions. The fraction of no passing zones along the roadway section usually has little influence on passing. Turning vehicles and/or roadside distraction cause major shock waves in the traffic stream. The percentage of time motorists are delayed approaches 75 percent.

Level-of-Service E (v/c ratio ≤ 1.0 and percent time delay >75) is defined as traffic flow conditions on two-lane highways having a percent time delay of greater than 75 percent. Under ideal conditions, speeds will drop below 50 mph. Passing is virtually impossible under LOS E conditions, and platooning becomes intense when slower vehicles or other interruptions are encouraged. Operating conditions in LOS E are unstable and difficult to predict.

Level-of-Service F (v/c ratio > 1.0 and percent time delay =100) represents heavily congested flow with traffic demand exceeding capacity. Traffic speeds are below capacity speeds and passing is impossible. A LOS of F represents a breakdown and failure of the highway segment.

Using the Highway Capacity Manual software and the data collected, roadway level of service for the AM. and P.M. peak hours were calculated. The following table delineates these results Analysis of this data reveals that all road segments are currently operating at a level of service rating of E which is an inadequate level of service.

Roadway Level of Service During Peak Hour Flow

| Section | A.M. | P.M. |
|---|---|---|
| Wilmington T.L.-South St. | E | E |
| South St.-Shawsheen St. | E | E |
| Shawsheen St.-Villa Roma Dr. | E | E |
| Villa Roma Dr.- Chandler St. | E | E |
| Chandler St.-Pleasant/East St. | E | E |
| Pleasant/East St.-Marshall St. | E | E |
| Marshall St.-Pike/Astle St. | E | E |
| Pike/ Astle St.-Lowell T.L. | N/A | N/ A |

ACCIDENT STATISTICS AND METHODOLOGY

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Accident data for the past three years (1996-1998) was gathered from the Tewksbury Police Department and analyzed in accordance with traffic engineering procedures. Between 1996 and 1998, a total of 987 accidents occurred along Main Street in Tewksbury. Of these, 444 accidents or 45% of the total number of accidents occurred at an intersection. Twenty-six percent of these intersection accidents occurred at one of the nine study intersections. The remaining 543 accidents were classified as roadway segment accidents and accounted for 55% of the total number of accidents.

The use of accident statistics is the most common method of analysis used by traffic engineers to determine if an intersection or a road segment is experiencing an unusually high number of accidents. The analysis is accomplished by calculating the actual accident rate at a given location and comparing it to the expected accident rate for similar facilities using a statistical distribution known as the Poisson Distribution.

Accident rates are calculated in units of million vehicles for intersections or spot highway locations and in million vehicle miles for lengths of highway *Y2* mile in length or greater. When the number of accidents actually occurring are significantly greater than the expected number of accidents at the 99% level of confidence (a 1% chance of error) it is considered to be a high accident location. None of the study intersections are considered high accident locations as none are experiencing an intersection accident rate beyond what would normally be expected at the 99% Level of Confidence.

Two hundred and eighty-one accidents resulted in personal injury representing 28.5 % of the total number of accidents. Personal injuries were reported in 27.5% (122) of all intersection accidents. Ninety-three of these injuries occurred at one of the nine study intersections. No fatalities occurred as a result of any of these accidents. The Poisson Distribution can also be used to

determine whether or not there is an accident severity problem when the number of personal injuries and fatalities is known. Of the nine study intersections, only the intersection of Pike, Astle, and Veranda Streets with Main Street exhibits an accident severity problem as more injury plus fatal accidents are occurring than would be expected at the 99% level of confidence.

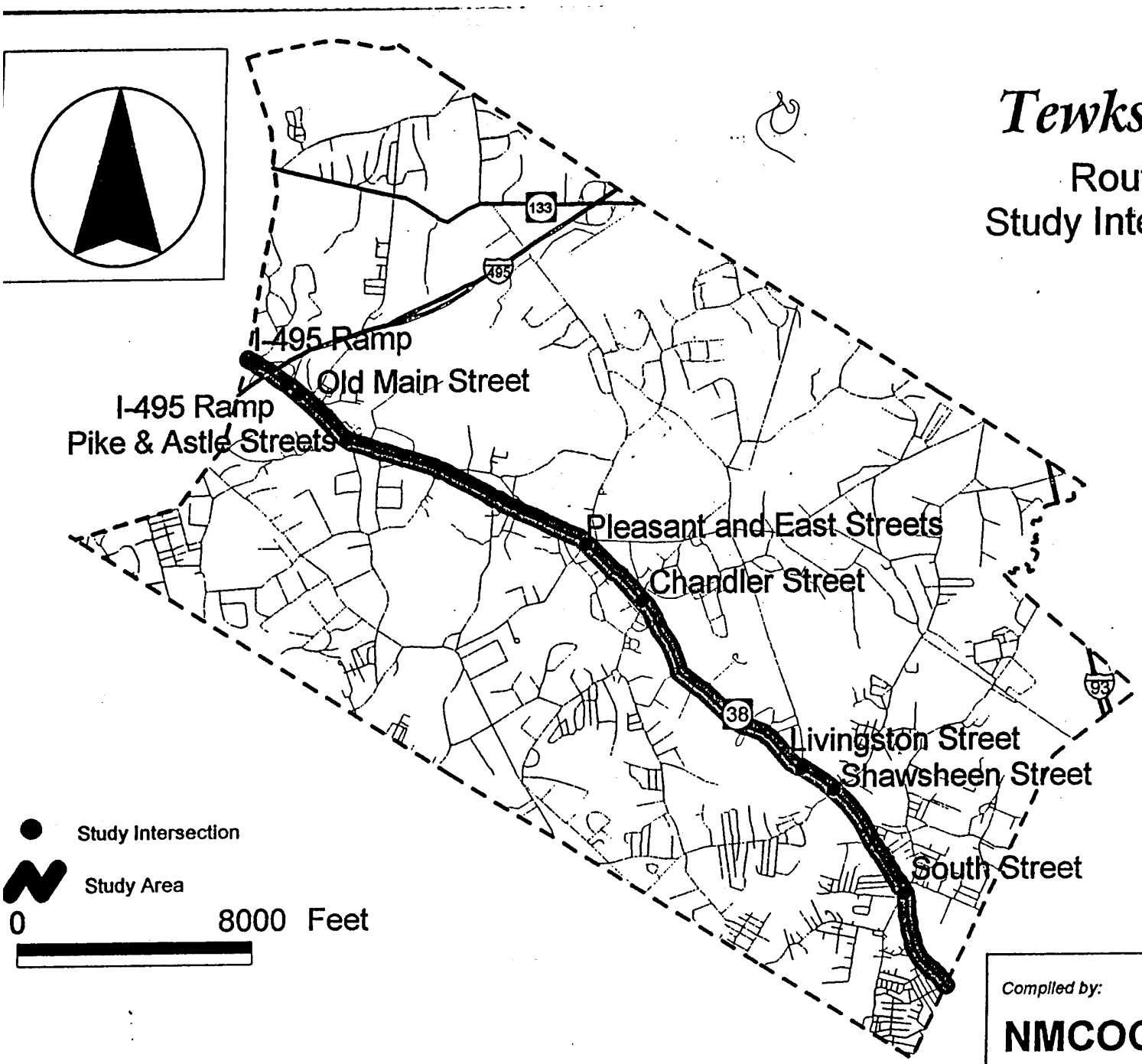
## FUTURE DEVELOPMENT AND CONDITIONS

In order to assess future development potential and its impact along the Corridor, NMCOG staff met with Tewksbury Town Planner, Sean Sullivan. Mr. Sullivan provided a general overview or current development projects in proposal and also provided an assessment of areas available for development in the future. These are outlined below. Projects Underway:

- Weathervane Restaurant and Liquor store -south of the Pike/Astle Intersection.
- Fifty-unit subdivision -in proposal near golf course -Comprehensive housing on a 7.9 Ac. site. Does have frontage on Rogers St. Will be single homes and the plan may include some type of commercial development in the front -lE a convenience store.
- Marshall St. across from friendly's 3 story warehouse storage -self storage A 6 acre parcel, is going through zoning board- has wet lands issues
- Newton Ave.- 200 apts. Being built across from the nursing home. A new road "Towers Drive" will be constructed and lines up with Newton Ave., near the Snack Shack, -will be signalized. 40 acres of land
- Adjacent to Mahonney's there is a plan on file for a 50 unit MFD. Has some wetland

# *Tewksbury*

## Route 38
## Study Intersections




*Compiled by:*

**NMCOG**

*Northern Middlesex Council of Governments*

*Data provided by Massachusetts Executive Office of Environmental Affairs, MassGIS*