TOWN OF GLASTONBURY
PROFESSIONAL SERVICES PROCUREMENT NOTICE
REQUEST FOR QUALIFICATIONS FOR
ENGINEERING SERVICES RELATED TO
DOUGLAS ROAD REALIGNMENT
AT NEW LONDON TURNPIKE AND SYCAMORE STREET
RPGL-2019-12

The Town of Glastonbury is seeking to engage the services of a Consulting Engineering firm for Engineering Services related to the realignment of Douglas Road with the intersection of New London Turnpike and Sycamore Street. The initial phase of this work consists of a preliminary engineering study that will evaluate various alternatives for realignment of the intersection including an evaluation of traffic operations for each alternative and estimated construction cost. The study shall also include such items as a traffic signal warrants analysis, consideration of various roundabout options, evaluation of intersection sight distances, traffic modeling of the realigned intersection with consideration of new and revised traffic signals at adjacent New London Turnpike intersections as proposed by ConnDOT under State Project 53-189, recommendations for traffic calming on Douglas Road, and accommodations for pedestrians and bicycles at the intersection.

The Consulting Engineering firm selected will perform the initial engineering study and will make presentations at public meetings regarding recommended alternatives. The initial fee for this preliminary engineering study will be negotiated on a Lump Sum basis. Firms responding to this request should be of adequate size and sufficiently staffed to perform the assignment described above, as well as future phases if required by the Town.

The selected firm must meet all Municipal, State, and Federal affirmative action and equal employment opportunity practices. The Town of Glastonbury is an Affirmative Action/Equal Opportunity Employer. Minority/Women/Disadvantaged Business Enterprises are encouraged to submit a proposal.

Interested individuals and firms should request the instructions for submitting a Qualifications Statement from the Office of the Purchasing Agent, 2155 Main Street, Glastonbury, CT 06033-6523 or via the Town's website at www.glastonbury-ct.gov. Responses to the Request for Qualifications must be submitted to the Purchasing Agent no later than **11:00 A.M. on August 28, 2018. LATE SUBMITTALS WILL NOT BE CONSIDERED.**

Mary F. Visone
Purchasing Agent

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Attachments

SECTION I – GENERAL INFORMATION

BACKGROUND INFORMATION

The Town of Glastonbury is considering the realignment of Douglas Road at its intersection with New London Turnpike in order to create a four-way intersection with Sycamore Street. Douglas Road is local residential road with an ADT of 1,015 that connects Main Street and New London Turnpike. New London Turnpike is an arterial road with an ADT of 11,497 that connects Hebron Avenue in the Town Center with Route 17, Route 2, and the residential areas of southeast Glastonbury. Sycamore Street is a collector road with an ADT of 2,000 that connects Hebron Avenue with New London Turnpike.

The intersections of these town-owned roads are currently offset by approximately 50 feet, and each intersection functions as a separate two-way stop controlled intersection. Left turns from both Douglas Road and Sycamore Street onto New London Turnpike are problematic due to limited site distance, heavy traffic volumes, and relatively high vehicle speeds on New London Turnpike.

A 2008 traffic study entitled “Envisioning Town Center 2027” prepared by Fuss and O’Neill recommended realignment of this intersection and installation of a new traffic signal to address poor levels of service at the existing intersections and to encourage use of Sycamore Street and Douglas Road as a viable alternative route between Hebron Avenue and Main Street / South Glastonbury. The Town has purchased property at 125 Douglas Road in order to allow for this roadway realignment.

The Connecticut Department of Transportation (ConnDOT) is simultaneously pursuing the removal of the Route 17 southbound off-ramp to East Glastonbury / New London Turnpike and realignment of the Route 17 southbound off-ramp to Glastonbury Town Center at New London Turnpike to a four-way intersection under State Project 53-189. This project is scheduled for construction in 2020 and directly abuts the subject project area.

The Town of Glastonbury is requesting a preliminary engineering study of alternatives for the realignment of Douglas Road with New London Turnpike and Sycamore Street including the consideration of a new traffic signal or roundabout at this location to improve traffic operations and reduce delay. It is expected that if this project is to move forward, it would be designed and constructed in conjunction with the improvements under State Project 53-189. As such, considerable interaction with the Connecticut Department of Transportation (ConnDOT) is expected both for the preliminary engineering study and for future design phase services.

SPECIAL CONSIDERATIONS

- Excerpts of a report entitled “Envisioning Town Center 2027” prepared by Fuss & O’Neill dated March 2008 are included with this document as Attachment C; This report may serve as a reference for this project.

- Selected ConnDOT presentation materials and a Report of Meeting for Public Information Meeting held June 7, 2018 regarding State Project 53-189, Removal of Route 17 SB off-ramp to East Glastonbury / New London Turnpike, State Route 17, Town of Glastonbury, are included with this document as Attachment D.

- Traffic Signal Study (30% Design), Removal of Bridge Nos. 00388 and 00389 and Route 17 SB Off-Ramp 007 Glastonbury CT, October 2017, Prepared for Connecticut Department of Transportation State Project 53-189 by VN Engineers, Inc., are included with this document as Attachment E (not including Appendices).

GENERAL SCOPE

The Town of Glastonbury is seeking to engage the services of a Consulting Engineering Firm for the preparation of a preliminary engineering study for this project. The preliminary study should address various conceptual designs of the realigned four-way intersection and shall include the following items:

- Prepare conceptual designs and evaluate feasibility of both traffic signal and roundabout design options for this intersection realignment, including a double roundabout that incorporates the adjacent intersection with the Route 17 southbound ramps;
- Conduct traffic signal warrants analysis for the existing intersections and the realigned intersection;
- Perform traffic operations analysis of the corridor using the VISSIM computer model for each realignment alternative to determine the operational effectiveness as it relates to the improvements in the corridor proposed by ConnDOT. The computer model developed by ConnDOT's Consultant for the proposed improvements to this corridor under State Project 53-189 was developed using Synchro 9 which can serve as a reference for the proposed operational analysis;
- Verify roundabout operational analyses using an alternative roundabout specific modeling software such as Sidra.
- Assess ability to coordinate a new traffic signal with the existing and proposed traffic signals on New London Turnpike;
- Assess impact of proposed State Project 53-189 on the existing unsignalized intersections of New London Turnpike with Douglas Road and Sycamore Street to determine potential outcomes at these locations if the Town were not to proceed with intersection realignment. Evaluation shall include review and confirmation of ConnDOT's traffic impact study along with completion of any additional analysis that may be required;
- Evaluate intersection sight distances for the realigned intersection including the vertical curve to the west of the intersection;
- Provide recommendations for traffic calming on Douglas Road to address resident concerns of increased traffic volumes and speeds;
- Evaluate accommodations for pedestrians and bicycles at the realigned intersection and throughout the corridor;
- Determine the needs for right of way acquisition and utility relocation related to each design alternative;
- Prepare opinions of probable construction cost shall be provided for each alternative.

Funding for the project is derived from Town funds. The design fee for the preliminary engineering study will be negotiated on a Lump Sum basis. There is no guarantee of work on future phases, however, if required, future phases of work for this project for design and construction phase services may be negotiated separately with the awarded firm or put out for solicitation at the Town's option.

Additional requirements for the preliminary engineering study are as follows:

- The Town of Glastonbury Engineering Division will be performing all required topographic and boundary surveys and will be preparing any property maps necessary for right-of-way and easement acquisition under future phases of this contract.

- Engineering services related to the proposed intersection improvements shall meet the requirements of the Connecticut Department of Transportation "Consultant Administration and Project Development" Manual, and "Traffic Signal Design Manual", latest revisions, and other applicable Department of Transportation guidance documents.

- The chosen Consultant shall have experience using VISSIM, Synchro, and Sidra traffic modeling software. Traffic operational analyses shall predict peak period Levels of Service, average queue, and 95th percentile queue lengths on all approaches to both subject intersections for each design alternative. The Consultant shall perform additional analysis as necessary to ensure that resultant construction will not adversely impact adjacent intersections with Hebron Avenue, Route 17 Off-ramps, and Oak Street / Williams Street East.

- The Consultant will be required to interact with the Connecticut Department of Transportation in order to gain concurrence on design concepts such that the Department is satisfied that implementation would not adversely affect the proposed Route 17 southbound off-ramp signalized intersection.

SECTION II – CONSULTANT'S SERVICES

- The Consultant shall perform professional services as stated and according to instructions received from the Town. The Consultant's services shall include all study phase and design related incidental services.

- All drawings, reports, and other documents prepared by the Consultant according to this Agreement shall be submitted to the Town for its review and approval.

- No such approval shall in any way be construed to relieve the Consultant of responsibility for technical adequacy or operate as a waiver of any of the Town's rights under this Agreement. The Consultant shall remain liable to the Town according to applicable laws and practices for all damages to the Town caused by the Consultant's negligent performance of any of the services furnished under this Agreement.

- The Consultant shall conduct regular meetings with the Town, and other appropriate parties, at a location established by the Town to review progress. The Consultant will provide written notes of each meeting to all attending parties before the next meeting. The Consultant shall attend and make presentations at public meetings for the purpose of gaining necessary regulatory approval and providing information to Town Policymakers and the general public.

- The Consultant's services under agreements reached shall be as described above. The Town does not guarantee future design or construction phase work.

SECTION III - SUBMISSION OF QUALIFICATIONS STATEMENT

MINIMUM REQUIREMENTS

- Firm/Individual shall be registered with the Secretary of the State of Connecticut, the State of Connecticut Board of Examiners for Professional Engineers and Land Surveyors, or other appropriate State of Connecticut licensing boards.

- Firm/Individual shall have demonstrated experience using VISSIM, Synchro, and Sidra traffic modeling software.

- Firm/Individual shall have demonstrated successful experience with similar signalized intersection and roundabout design projects within the past five (5) years.

- Firm/Individual must meet all Municipal, State, and Federal affirmative action and equal employment opportunity practices.

TERM OF SERVICE

The selected firm will be expected to commence services within 15 days of contract execution or on such other schedule as may be agreed to with the Town. The Town anticipates allocating up to five (5) months for the design project described herein, including data collection, meetings, consultant design, and preparation of bid documents, etc.

PROPOSAL INSTRUCTIONS

<u>By submitting a Qualifications Statement, you represent that you have thoroughly examined and become familiar with the Scope of Services outlined in this RFQ and you are capable of performing the work to achieve the Town's objectives.</u>

- All firms are required to submit an original and seven (7) copies of their Qualifications Statement to Mary F. Visone, Purchasing Agent, 2155 Main Street, Glastonbury, CT by the date and time listed in the proposal response page. All Qualifications Statements will be opened publicly and recorded as received. Respondents may be present at the

opening; however, there will be no public reading of proposals. Qualification Statements received later than the time and date specified will not be considered. The Qualifications Statement must be submitted in a sealed envelope or package and the outside shall be clearly marked with the Respondent's Company Name, Address and the following:

SEALED REQUEST FOR QUALIFICATIONS
PROFESSIONAL SERVICES PROCUREMENT NOTICE
DOUGLAS ROAD REALIGNMENT AT
NEW LONDON TURNPIKE AND SYCAMORE STREET
RPGL- 2019-12
DATE – AUGUST 28, 2018
TIME – 11:00 A.M.

- All respondents are required to submit the information detailed below. **Responses shall be organized and presented in the order listed below to assist the Town in reviewing and rating proposals.** Responses should be presented in appropriate detail to thoroughly respond to the requirements and expected services described herein.

1. Table of Contents to include clear identification of the material provided by section and number.
2. A letter of transmittal indicating the firm's interest in providing the service and any other information that would assist the Town in making a selection. This letter must be signed by a person legally authorized to bind the firm to a contract.
3. Name and telephone number of person(s) to be contacted for further information or clarification.
4. A background statement including a description of the firm/individual submitting the proposal and any sub-consultants.
5. A detailed statement describing the organizational structure under which the firm proposes to conduct business. Proposed sub-consultants should be clearly identified, and their relationship to any "parent" firm or subsidiary firm, with any of the parties concerned, must be clearly defined.
6. A list of key staff members who would be involved with the project, including their assigned roles and a description of their background and experience.
7. A description of relevant engineering experience of the firm, including specific reference to similar services as required by the Town under this proposal. Qualification statements should include examples of projects completed within agreed upon time frames thereby demonstrating the capacity and the capability to perform the work within the time allotted.
8. List of similar projects completed over the past five (5) years with the contact name, address, and telephone number of the owners' representative in each project. Projects sited should detail past record of performance on similar

contracts with the Town or other municipal clients with respect to such factors as control of costs, quality of work, and cooperation with the client; including knowledge of Federal, State and Municipal procedures.

9. Overall approach to the engineering needs of the Town for evaluation of intersection realignment alternatives.

10. Proposed schedule for completion of engineering services as required to meet the Town's intended schedule.

11. A concluding statement as to why the respondent is best qualified to meet the needs of the Town.

12. Proposal Response Form (**ATTACHMENT A**).

13. Respondent is required to review the Town of Glastonbury Code of Ethics adopted July 8, 2003 and effective August 1, 2003. Respondent shall acknowledge that they have reviewed the document in the area provided on the attached Ethics Acknowledgement form included on **ATTACHMENT A.** The selected respondent will also be required to complete and sign a Consultant Acknowledgement Form prior to award. The Code of Ethics and the Consultant Acknowledgment Form can be accessed on the Town of Glastonbury website at http://www.glastonbury-ct.gov. Upon entering the website, click on General Information, then Bids and Quotes which will bring you to the links for the Code of Ethics and the Consultant Acknowledgement Form. If the respondent does not have access to the internet, a copy of these documents can be obtained through the Purchasing Department at the address listed within this proposal.

14. Statement of Non-Collusion (**ATTACHMENT B**).

15. The Town of Glastonbury is dedicated to waste reduction and the practice of using and promoting the use of recycled and environmentally preferable products. Respondents are encouraged to submit RFQ responses that are printed double-sided (except for the signed proposal page) on recycled paper, and to use paper dividers to organize the RFQ for review. All proposal pages should be secured with a binder clip, staple or elastic band, and shall not be submitted in plastic binders or covers, nor shall the proposal contain any plastic inserts or pages. We appreciate your efforts towards a greener environment.

16. Any technical questions regarding this RFQ shall be made in writing and directed to Daniel A. Pennington, Town Engineer/Manager of Physical Services, 2155 Main Street, Glastonbury, CT 06033 or by email to daniel.pennington@glastonbury-ct.gov. For administrative questions concerning this proposal, please contact Mary F. Visone, Purchasing Agent, via email: purchasing@glastonbury-ct.gov. All questions, answers, and/or addenda, as applicable, will be posted on the Town's website at www.glastonbury-ct.gov. (Upon entering the website, click on Bids & RFPs).

It is the respondent's responsibility to check the website for addenda prior to submission of any proposal. Note: Responses to requests for more specific contract information than is contained in the RFQ shall be limited to information that is available to all respondents and that is necessary to complete this process. The request must be received at least five (5) business days prior to the advertised response deadline.

17. Failure to include any of the above-referenced items in the submitted proposal may be grounds for disqualifying said proposal.

EVALUATION CRITERIA

- A Selection Committee, appointed by the Town Manager, will evaluate all proposals received for completeness and the respondent's ability to meet all requirements as outlined in this Request for Qualifications. The Selection Committee will then short list the specific firms whose proposals best meet all criteria required.

- The following factors will be considered by the Town when evaluating the proposals:

  - Specialized design and technical competence of individuals assigned to the project, including past experience with signalized intersection and roundabout evaluation and design.

  - Capacity and the capability to perform the work within the time allotted. Specific examples of past projects completed within agreed upon timeframes should be noted in the Consultant's submittal.

  - Firm/Individual shall be registered with the Secretary of the State of Connecticut, the State of Connecticut Board of Examiners for Professional Engineers and Land Surveyors, or other appropriate State of Connecticut licensing boards.

  - Firm/Individual shall have experience using VISSIM, Sidra, and Synchro traffic modeling software.

  - Past record of performance on similar contracts with the Town or other clients with respect to such factors as control of costs, quality of work, and cooperation with the client.

  - Overall approach to meeting the technical needs of the Town for both the study and design phases of the intersection realignment project.

  - Ability to meet the schedule proposed by the Town.

  - Overall quality, thoroughness, and responsiveness to the Town's requirements as summarized herein.

SELECTION PROCESS

This request for qualifications does not commit the Town of Glastonbury to award a contract or to pay any costs incurred in the preparation of a proposal to this request. All proposals submitted in response to this request become the property of the Town of Glastonbury. The Town of Glastonbury reserves the right to accept or reject any or all proposals received as a result of this request, to negotiate with the selected respondents, the right to extend the contract for an additional services, or to cancel in part or in its entirety the request for qualifications, and to waive any informality if it is in the best interests of the Town to do so.

- A Selection Committee, appointed by the Town Manager, will evaluate all submittals received for completeness and the respondent's ability to meet all requirements as outlined in this RFQ. The Committee will then short list the specific firms whose statements best meet all criteria required and may conduct interviews with these firms. Upon completion of interviews, the Selection Committee will forward to the Town Manager, a list of firms recommended for further consideration.

- Top rated firms will be asked to submit a specific Scope of Services and associated fee proposal along with any exceptions taken to the Town's form of agreement. The Town Manager shall review said proposals and negotiate an agreement based on those discussions.

- Additional technical information may be requested from any respondent for clarification purposes, but in no way changes the original qualification statement submitted.

TIMELINE

The Town intends to adhere to the schedule listed below as closely as possible, but reserves the right to modify the schedule in the best interest of the Town as required.

Publicize RFQ	**August 13, 2018**
RFQ Due Date	**August 28, 2018 @ 11:00 AM**
Shortlist of Proposals Received	**August 31, 2018**
Interviews with Top Respondents	**Week of September 3, 2018**
Fee Proposal and Scope of Services	**Week of September 15, 2018**
Contract Effective Date	**October 15, 2018**
Completion of Contract Work	**December 15, 2018**

INSURANCE

The following insurance requirements are the Town's general requirements. Insurance requirements with the awarded respondent are subject to final negotiations.

The Respondent shall, at its own expense and cost, obtain and keep in force during the entire duration of the Project or Work the following insurance coverage covering

the Respondent and all of its agents, employees, sub-contractors and other providers of services and shall name the Town of Glastonbury, its employees and agents as an Additional Insured on a primary and non- contributory basis to the Respondent's Commercial General Liability and Automobile Liability policies. **These requirements shall be clearly stated in the remarks section on the Respondent's Certificate of Insurance**. Insurance shall be written with Carriers approved in the State of Connecticut and with a minimum Best's Rating of A-VIII. In addition, all Carriers are subject to approval by the Town. Minimum limits and requirements are stated below:

1) Worker's Compensation Insurance:

- Statutory Coverage
- Employer's Liability
- $500,000 each accident/$500,000 disease-policy limit/$500,000 disease each employee
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

2) Commercial General Liability:

- Including Premises & Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors.
- Limits of Liability for Bodily Injury and Building Damage Each Occurrence $1,000,000
  Aggregate $2,000,000 (The Aggregate Limit shall apply separately to each job.)
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

3) Automobile Insurance:

- Including all owned, hired, borrowed and non-owned vehicles
  Limit of Liability for Bodily Injury and Building Damage: Per Accident $1,000,000
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

4) Errors and Omissions Liability or Professional Services Liability Policy:

- Provide Errors and Omissions Liability or Professional Services Liability Policy for a minimum Limit of Liability $2,000,000 each occurrence or per claim. The Town, its employees and agents shall be named Additional Insured for this specific Project. The certificate shall specify that the Town shall receive 60 days advance written notice of cancellation or non-renewal specific to this Project.

- The Respondent agrees to maintain continuous professional liability coverage for the entire duration of this Project, and shall provide for an Extended Reporting Period in which to report claims for five (5) years following the conclusion of the Project.

The Respondent shall provide a Certificate of Insurance as "evidence" of General Liability, Auto Liability including all owned, hired, borrowed and non-owned vehicles, and statutory Worker's Compensation and Employer's Liability coverage.

The Respondent shall direct its Insurer to provide a Certificate of Insurance to the Town before any work is performed. The Certificate shall specify that the Town shall receive 30 days advance written notice of cancellation or non-renewal. The Certificate shall evidence all required coverage including the Additional Insured and Waiver of Subrogation. The Respondent shall provide the Town copies of any such Policies upon request.

INDEMNIFICATION

To the fullest extent permitted by law, the Respondent shall indemnify and hold harmless the Town and their respective consultants, agents, and employees from and against all claims, damages, losses, and expenses, direct, indirect or consequential (including, but not limited to, fees and charges of engineers, attorneys and other professionals, and court and arbitration costs) arising out of or resulting from the performance of the Respondent's work, provided that such claim, damage, loss, or expense is caused in whole or in part by any negligent act or omission by the Respondent, or breach of its obligations herein or by any person or organization directly or indirectly employed or engaged by the Respondent to perform or furnish either of the services, or anyone for whose acts the Respondent may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

As to any and all claims against the Town or any of its consultants, agents, or employees by any employee of the Respondent, by any person or organization directly or indirectly employed by Respondent to perform or furnish any of the work, or by anyone for whose acts Respondent may be liable, the indemnification obligation stated herein shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Respondent under worker's or workman's compensation acts, disability benefit acts, or other employee benefit acts.

The above insurance requirements are the Towns' general requirement. Insurance requirements with the awarded respondent are subject to final negotiations.

ATTACHMENT A
PROPOSAL RESPONSE PAGE

TOWN OF GLASTONBURY			
PROPOSAL		**RPGL #**	**2019-12**
DATE ADVERTISED	**August 13, 2018**	**DATE / TIME DUE**	**August 28, 2018 @ 11:00 A.M.**

NAME OF PROJECT **DOUGLAS ROAD INTERSECTION REALIGNMENT AT NEW LONDON TURNPIKE AND SYCAMORE STREET ENGINEERING SERVICES REQUEST FOR QUALIFICATIONS**

CODE OF ETHICS:
I/We have reviewed a copy of the Town of Glastonbury's Code of Ethics and agree to submit a Consultant Acknowledgement Form if I/we are selected. Yes _____ No _____ *

***Respondent is advised that effective August 1, 2003, the Town of Glastonbury cannot consider any proposal where the respondent has not agreed to the above statement.**

The Respondent acknowledges receipt of the following Addenda:

Addendum #1_____(Initial/Date) **Addendum #2**_____ (Initial/Date) **Addendum #3**_____(Initial/Date)

Type or Print Name of Individual	**Doing Business as (Trade Name)**
Signature of Individual	**Street Address**
Title	**City, State, Zip Code**
Date	**Telephone Number / Fax Number**
E-Mail Address	**SS # or TIN#**

(Seal – If proposal is by a Corporation)

Attest

ATTACHMENT B
NON-COLLUSION STATEMENT

The company submitting this proposal certifies that it is being submitted without any collusion, communication, or agreement as to any matter relating to it with any other respondent or competitor. We understand that this proposal must be signed by an authorized agent of our company to constitute a valid proposal.

Date: _____

Name of Company: _____

Name and Title of Agent: _____

By (SIGNATURE): _____

Address: _____

_____

_____

Telephone Number: _____

ATTACHMENT C – EXERPTS FROM "ENVISIONING TOWN CENTER 2027"

Traffic Analysis – Projection of Future Conditions

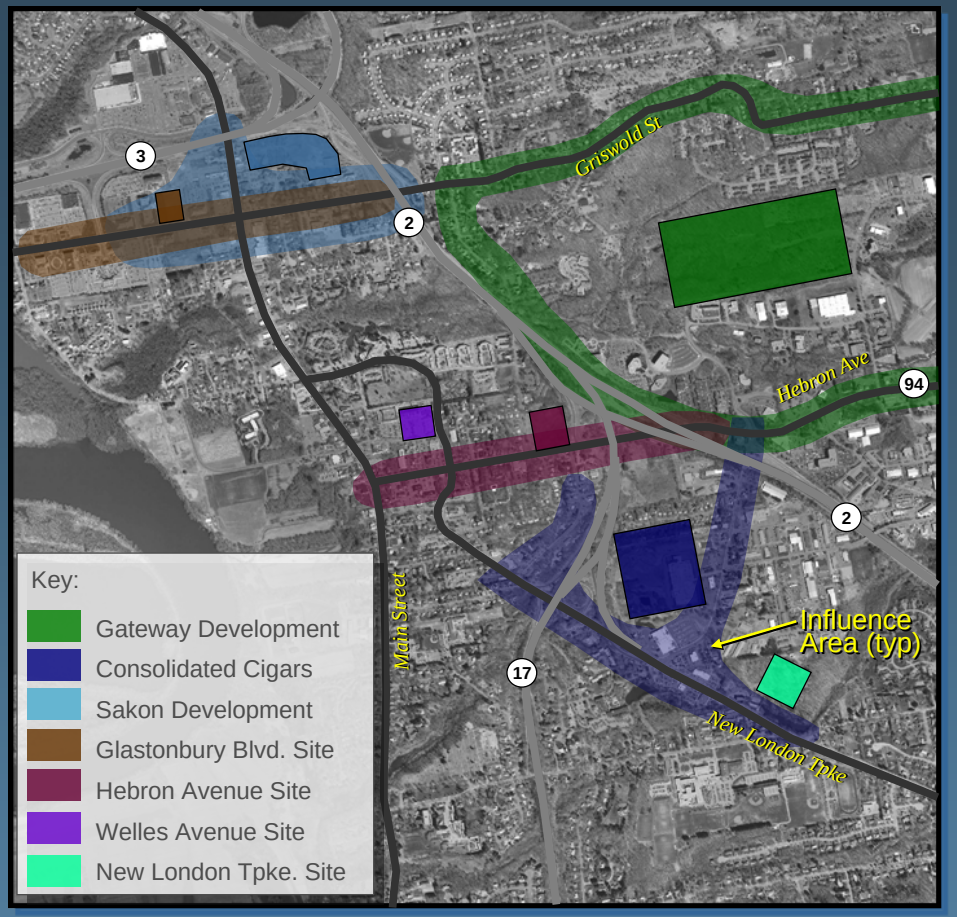
Traffic Growth

- A background traffic growth rate of 0.5% per year was used based on historical traffic count data
- Key development parcels were identified and development programs were assumed based on the Plan of Conservation and Development
- Primary influence areas were identified
- Trip generation, distribution and assignment of trips was performed for the local roadway network

Key Development Parcels

Parcel Name	Future Use	Size
New London Turnpike Site	Age Restricted Housing	100 Units
Consolidated Cigars (Oak Street)	Office/Light Industrial/ Manufacturing	170,000 SF (Split Evenly Between Uses)
Gateway Office Park	General Office Space	300,000 SF
Hebron Avenue/Route 2 - Mixed Use	Residential	75 Units
	Specialty Retail	10,000 SF
	General Office Space	40-50,000 SF
Sakon Property	Retail	50,000 - 60,000 SF
	Residential	50 – 75 Units
Somerset Square	Class-A Office	100,000 SF
Whole Foods Market*	Supermarket	37,000 S.F.

** Under Construction, not included in traffic counts*



Study Area Development Parcels

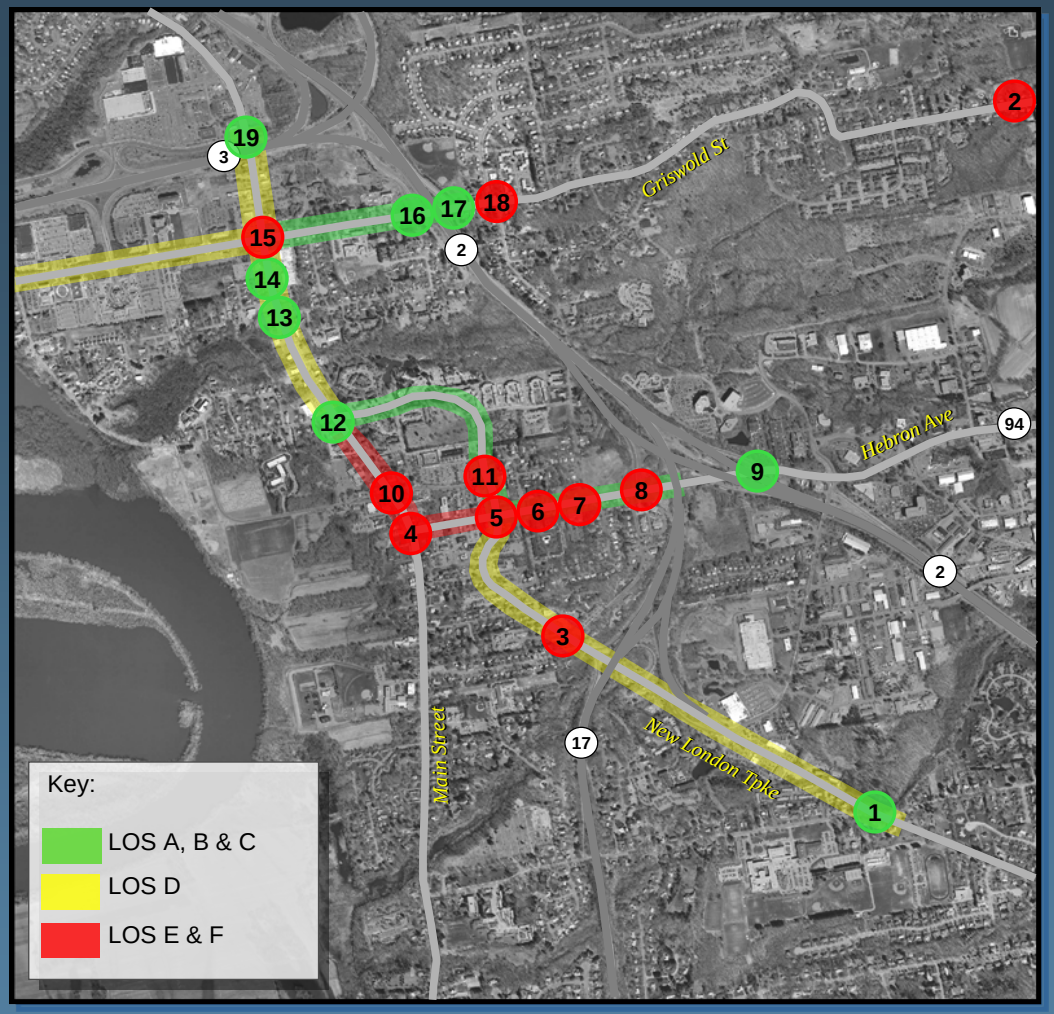
Traffic Analysis – Projection of Future Conditions (cont)

Capacity Analysis

- No significant reductions in Levels of Service are expected due to traffic growth in the Study Area
- Traffic conditions in 2027 will not dictate significant roadway improvements such as new roadways of major roadway widening

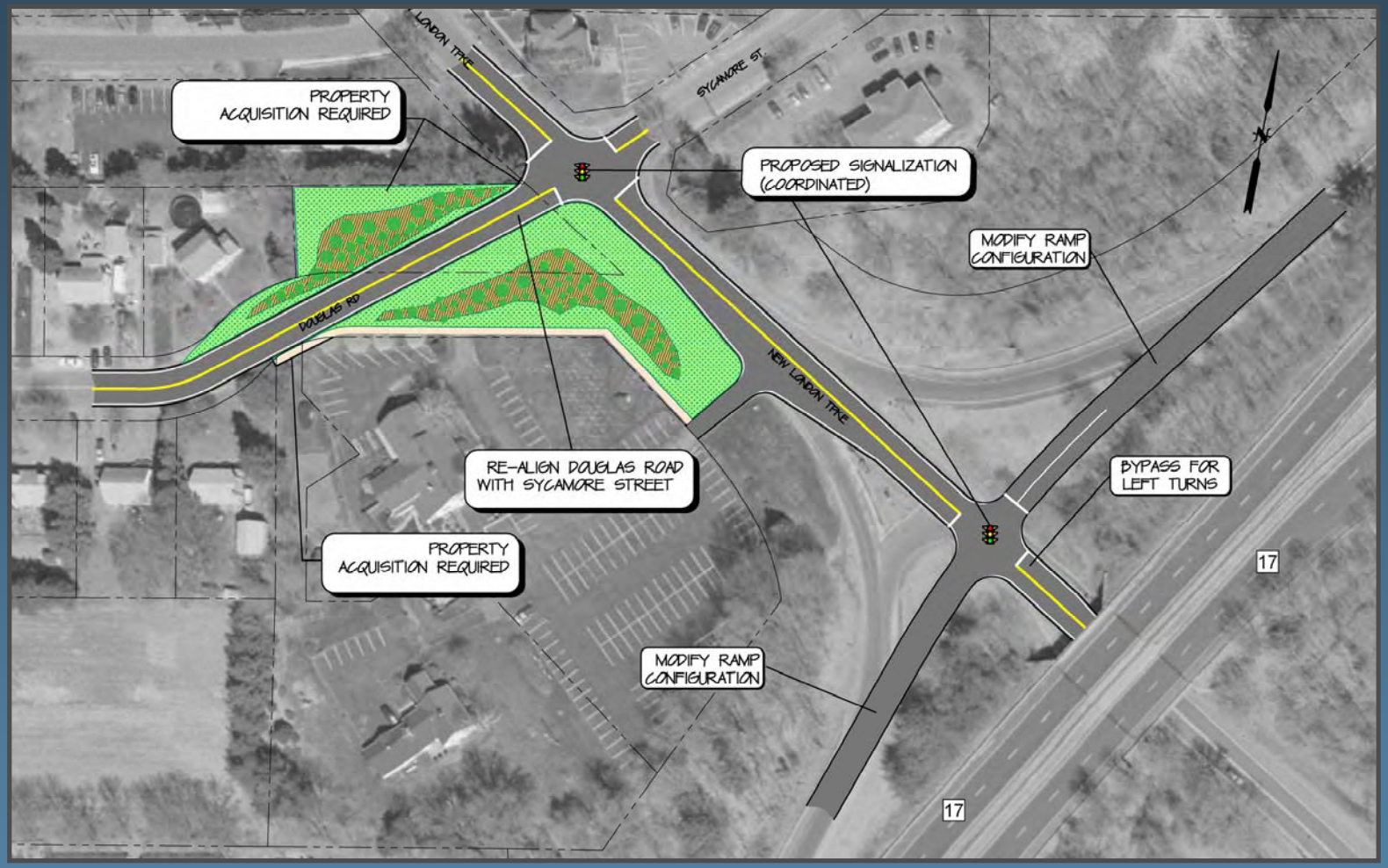
LOC	Intersection		AM	MD	PM	Sat
1	New London Tpke. at Hubbard St.		C	B	C	
2	Griswold St. at Addison St.		F		F	
3	New London Tpke. at Sycamore St.	EB	E	F	F	
		WB	F	F	F	
4	Hebron Ave. at Main St.	WB	C	F	F	F
5	Hebron Ave. at New London Tpke.		B	E	D	C
6	Hebron Ave. at Concord St.	SB	D	F	F	
7	Hebron Ave. at House St.	SB	F	F	F	
8	Hebron Ave. at Route 2 EB Off-Ramp		D	C	E	C
9	Hebron Ave. at Route 2 WB On-Ramp		B	B	C	A
10	Main St. at Welles St.		B	F	F	
11	New London Tpke. at Welles St.	EB	C	F	F	C
12	Main St. at New London Tpke.		B	C	C	C
13	Main St. at Spring St.		B	B	B	
14	Main St. at Chili's Drive		B	C	C	
15	Main St. at Griswold St/Glastonbury Blvd.		C	D	E	D
16	Griswold St. at Route 2 EB Off-Ramp		D		C	C
17	Griswold St. at Route 2 WB On-Ramp	WB	A		A	A
18	Griswold St. at House Street		D		F	D
19	Main St. at Putnam Blvd.		B	B	B	

Study Area Intersections LOS Without Improvements



2027 Levels of Service Without Improvements

Intersection Improvement Plans



Douglas Road/Sycamore Street/ New London Turnpike
Modification of Route 17 Ramps

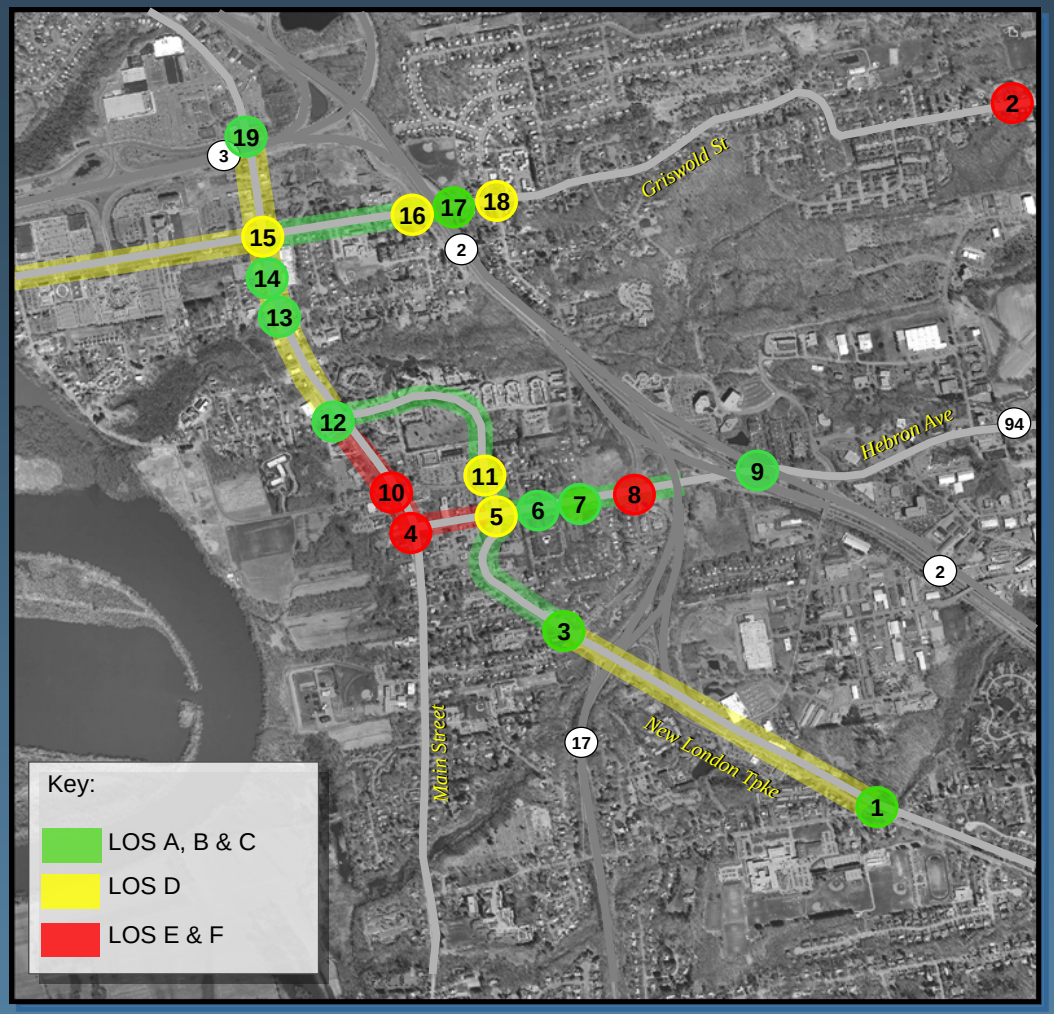
Traffic Analysis – Future Target Conditions with Improvements

Capacity Analysis

The tabulation below provides Levels of Service for the Study Area intersections with the implementation of proposed improvements. As illustrated, the improvements planned will be successful in achieving 2027 target traffic operating conditions.

LOC	Intersection		AM	MD	PM	Sat
1	New London Tpke. at Hubbard St.		C	B	C	
2	Griswold St. at Addison St.		F		F	
3	New London Tpke. at Sycamore St.		A	B	B	
4	Hebron Ave. at Main St.	WB	C	F	F	F
5	Hebron Ave. at New London Tpke.		B	D	D	C
6	Hebron Ave. at Concord St.	SB	C	C	C	
7	Hebron Ave. at House St.	SB	B	B	C	
8	Hebron Ave. at Route 2 EB Off-Ramp		D	C	E	C
9	Hebron Ave. at Route 2 WB On-Ramp		B	B	C	A
10	Main St. at Welles St.		B	F	F	
11	New London Tpke. at Welles St.	EB	B	D	D	B
12	Main St. at New London Tpke.		B	B	B	C
13	Main St. at Spring St.		B	B	B	
14	Main St. at Chili's Drive		B	C	C	
15	Main St. at Griswold St/Glastonbury Blvd.		C	D	C	C
16	Griswold St. at Route 2 EB Off-Ramp		D		C	C
17	Griswold St. at Route 2 WB On-Ramp	WB	A		A	A
18	Griswold St. at House Street		C		D	C
19	Main St. at Putnam Blvd.		B	B	B	

Study Area Intersections – Levels of Service with Improvements



2027 Levels of Service with Improvements

ATTACHMENT D – EXCERPTS FROM CONNDOT PROJECT 53-189 PUBLIC INFORMATION MEETING

Connecticut Department of Transportation

State Project No. 53-189
Federal-Aid Project No. TBD
Removal of Route 17 SB Off-Ramp to East Glastonbury/New London Turnpike (Including Removal of Bridge Nos. 00388 and 00389)
State Route 17
Town of Glastonbury

June 7, 2018 at 7:00 PM
Council Chambers Room, 2th Floor, Glastonbury Town Hall
2155 Main Street, Glastonbury, Connecticut

Minutes of Public Informational Meeting

Present:
Theodore Nezames – CTDOT Bridge, Bridge Division Chief
Rabih Barakat – CTDOT CLE Design, Transportation Principal Engineer
Andrew Cardinali – CTDOT CLE Design, Transportation Supervising Engineer
Dobieslawa Kania – CTDOT CLE Design, Transportation Project Engineer
Colin Baummer – CTDOT Traffic, Transportation Supervising Engineer
Donald Wurst – CME Associates
Tracey Brais – CME Associates
Aaron Foster – CME Associates
Joseph Tyros – Louis Berger Group
Thirty to Forty public attendees

Presentation:
Ms. Kania opened the meeting with a brief introduction of the Department of Transportation (Department) and the Consultant Liaison Engineer, CME Associates (CME) personnel. She then stated the role of the Department and the role of CME as liaison engineers and continued with an introduction of the subject project and its goals. Ms. Brais stated that the purpose of this Public Information Meeting is to present the proposed design and discuss any questions, comments, or concerns that the public or Town officials may have.

Mr. Brais continued with the technical portion of the presentation. She explained the bridge's current deficiencies, proposed rehabilitation measures, proposed scheme to maintain and protect traffic during construction, traffic studies and travel times, funding source for the project, project schedule, and the anticipated utility, rights-of-way, and environmental impacts. The proposed project will permanently eliminate the current left exit off-ramp (referred to as Ramp 007) from Route 17 SB that ends at the Oak Street intersection and the two bridges along the ramp. The project will also modify the right exist off-ramp (referred to as Ramp 005) from Route 17 SB that merges with New London Turnpike (abbreviated as NLT) WB so that both a right turn and left turn movement onto New London Turnpike WB and EB, respectively, is possible along with a new signal at the end of the ramp.

Public Comments and Questions:

Comments included:

- A representative of a local business asked:
  - Would the sewer connections be extended as part of this project?
    - Response: The sanitary sewer lines and expansion of sewers are not part of this State project. Any work on the sanitary sewers would be an independent Town project.
  - Would the widening of New London Turnpike, for the additional EB lane, occur on the north or south side of the existing highway, and would additional Right-of-Way (ROW) be required?
    - Response: Most of the widening for the new lane would be south of the existing road, and the DOT and Town currently own land both to the north and south of the road, and will likely not require additional ROW to be acquired.
  - Would the timing of the existing signal at the Rt. 17 NB off ramp be improved?
    - Response: The timing of all of the traffic signals will be modified to account for the revised traffic flows and volumes to optimize traffic flow through the each signal.
- A resident asked:
  - With the widening of southbound (EB) and northbound (WB) (of New London Turnpike), what will be the cross section of the roadway, and specifically will there be enough room underneath the Rt. 17 SB/NB bridge?
    - Response: New London Turnpike will include two lanes in the EB direction (if approved by the Town) and one lane WB. Underneath the Rt. 17 SB/NB bridge there will be two EB lanes (if approved by the Town), one WB lane, a WB left turning lane, and a single sidewalk on the south side. The width of the existing bridge will allow for this proposed lane configuration and two narrow shoulders on either side of the road.
  - What would be the cost of only rehabilitating the bridge?
    - Response: The total cost to only rehabilitate Bridge No. 00388, under this project, and provide continued maintenance on the existing ramp (007) and both bridges for a 75-year life span, is much more expensive that the proposal to eliminate the ramp. The estimated cost for rehabilitation and future maintenance, over a 75-year cycle, is over $14 million and the cost for removing and relocating the off-ramp is approximately $4 million, with essentially no future maintenance costs.

  - A recommendation to install a round-a-bout at the Douglas/Sycamore/New London Turnpike intersection was noted. The resident provided a marked-up map with the potential improvements. The document is attached to these minutes.
    - Response: Any projects outside of the current project scope could be completed by the Town. The Town would be responsible for the design and construction costs, however the State would be willing include any adjacent Town projects as part of the State construction project to save on mobilization costs for the Town. This would also allow for construction to be completed as part of one project instead of it occurring over a number of years and impacting traffic for a longer term.
- Several residents made statements and had questions in regards to Douglas Rd and Sycamore St:
  - Coordination with the Town for the Douglas/Sycamore/New London Turnpike should take place.
  - Concerns for the amount of traffic that is currently on Douglas as well as the speeding along that road.
  - Request that the Sycamore/Douglas intersection project be completed at the same time as the State project.
  - Request that the vertical curve/profile on New London Turnpike just west of the Sycamore/Douglas intersection be investigated for sub-standard conditions, as sight distance to the new signalized intersection is a concern.
  - It was noted that there was concern that this project was not investigating current problems in the area of the site.
    - Response for all: The State is and will continue to be in discussion with the Town on potential local projects. New London Turnpike is a Town road and the DOT is not responsible for modifying or correcting local issues that are outside the scope of the projects impacts.
- Several residents had questions and requests in regards to the traffic study prepared for this project:
  - Several residents requested new updated traffic counts.
  - A representative of the apartment complex “the Tannery” noted that the complex is almost at capacity and a new restaurant will be online soon. It was recommended to confirm traffic counts after completion of the restaurant.
    - Response: The DOT would obtain updated traffic counts as the project progresses.
  - Concern that traffic will use alternate exits on Route 17 or Route 2, as a result of this project, putting more traffic on Hebron Avenue and Oak Street.
    - Response: The DOT does not anticipate major changes in traffic habits nor increased traffic on these routes, as a result of this project.

  - A resident asked if traffic was being evaluated at nearby exit-ramps and roads.
    - Response: The DOT is not completing a regional traffic study as part of this project.
  - Several residents requested that the traffic lights be connected and synchronized in order to improve traffic flow.
    - Response: All of the traffic lights are owned by the Town of Glastonbury, and the DOT will work with the Town to synchronize them, if that results in the most efficient traffic flows. The use of detection devices will be evaluated at the off-ramp (005) to help convey traffic.
- Several residents had questions and statements about the modified ramp (005):
  - It was inquired if the modified off-ramp 005 would be long enough to keep traffic queue at peak hours from backing up onto Route 17 SB, with the new signal in place.
    - Responses: The ramp will be designed to maximize vehicular storage on the ramp and the traffic models show that queued traffic will not back up onto Route 17 SB.
  - It was noted that truck traffic will have a difficult time turning left from the modified off-ramp with the one lane (on the ramp 005 and New London Turnpike) build option, and that the two lane build option would be better.
    - Response: Both options would be designed for standard truck turning movements. It is noted that the two lane build option is preferred.
  - One individual inquired as to the Level of Service (LOS) for the modified SB 17 off-ramp (005).
    - Response: At the meeting the LOS was not known for this intersection as it is currently a merge condition and is not signalized. It was noted that it would be designed to be as efficient as possible. Subsequent to the meeting it is noted that the LOS at this intersection is estimated to have a grade of a “C”. Signal phasing at this intersection will be further evaluated during the final design process and may change.
- Several residents had questions and statements about the two different build options (Option 1: current New London Turnpike configuration with one lane in each direction. Option 2: 1 WB lane and 2 EB lanes on New London Turnpike):
  - One individual noted that the second build option should be the only option moving forward.
  - One individual noted that truck traffic would prefer the second build option due to truck turning radiuses.
  - One individual noted their disappointment in the projects scope. He had specific concern that this project was not addressing additional issues nearby on Town roads.

  - One individual inquired as to the major differences between the two build options.
    - Response: The major differences between the two build options were the cost of adding an additional lane of traffic EB on NLT, the size of the shoulders on NLT beneath the RT 17 NB/SB bridge and the travel time from ramp 005 to the Oak Street intersection.
- Several residents inquired as to other alternatives:
  - Two residents asked if the bridge (00389) carrying Route 17 SB off-ramp (007) over NLT could be removed and the off-ramp realigned to bring the off-ramp next to the Route 17 NB off-ramp at NLT.
    - Response: This would not provide as significant an amount of cost savings, as the two build options that are presented, because Bridge 00388 would remain in service and would need future maintenance along with the remaining realigned ramp 007. This alternative was investigated and it was also found that it would not fix the functionally obsolete/sub-standard vertical clearance of the existing bridge.
- Several residents inquired about the merge going EB on New London Turnpike past the Oak Street Intersection:
  - One resident noted that the traffic entering this merge is currently split into two groups: RT 17 SB off-ramp (007) and NLT EB traffic with two different traffic signal cycles. It was noted that this allows for splitting of the traffic between two cycles whereas the proposed build will have all of the traffic focused during one cycle, making a larger volume of traffic enter the merge at the same time.
  - An additional resident questioned if the merge as shown would work.
  - A resident requested that the two lanes be extended past “The Tannery” apartment complex and then the merge could occur.
    - Response: The DOT will investigate a functional end to the two lanes and merge, with one possibility being a left hand turn into the Tanner complex. The design for the merge will be completed during final design.
- Several questions were asked about project communication and signage for local businesses:
  - One representative of a local business asked if new signage would be placed to help bring vehicular traffic to the businesses, because the businesses at the Oak Street intersection will no longer be visible to vehicles exiting Route 17 SB.
    - Response: The DOT stated that the Department has a program in-place that allows local qualified businesses to apply and erect their business signs and logos on limited access highways. Application, costs and criterial are available on the DOT website. The DOT encouraged business owners to read about the program and contact the DOT about installing attraction signs.

- It was asked if the public would be notified about the major construction activities of the project.
  - Response: The DOT will provide press releases, install variable message signs, and be in contact with the Town to allow for the most amount of coordination as possible.
- It was asked if the PIM presentation would be available online.
  - Response: The DOT noted that the presentation would be posted online. It was also noted that the Town of Glastonbury is recording the meeting and the video would be available online.

Adjournment:
At the conclusion of the meeting, it was determined that there was no significant opposition to the proposed project and the Build Option 2 (two EB NLT lanes) should be included in the proposed project scope moving forward.

The recommended plan provides a design for permanently removing a structurally deficient and functionally obsolete bridge from service, along with another bridge and over 2000 feet of ramp, and improving traffic flow and safety at the intersection of Route 17 SB Ramp 005 and New London Turnpike and at the intersection of Oak Street, Williams Street East and New London Turnpike. Accordingly, the Department intends to seek design approval for the proposed plan. The Department will continue to keep the Town informed of any changes that may occur as the design is being completed and will notify the Town as the project transitions into the construction phase.

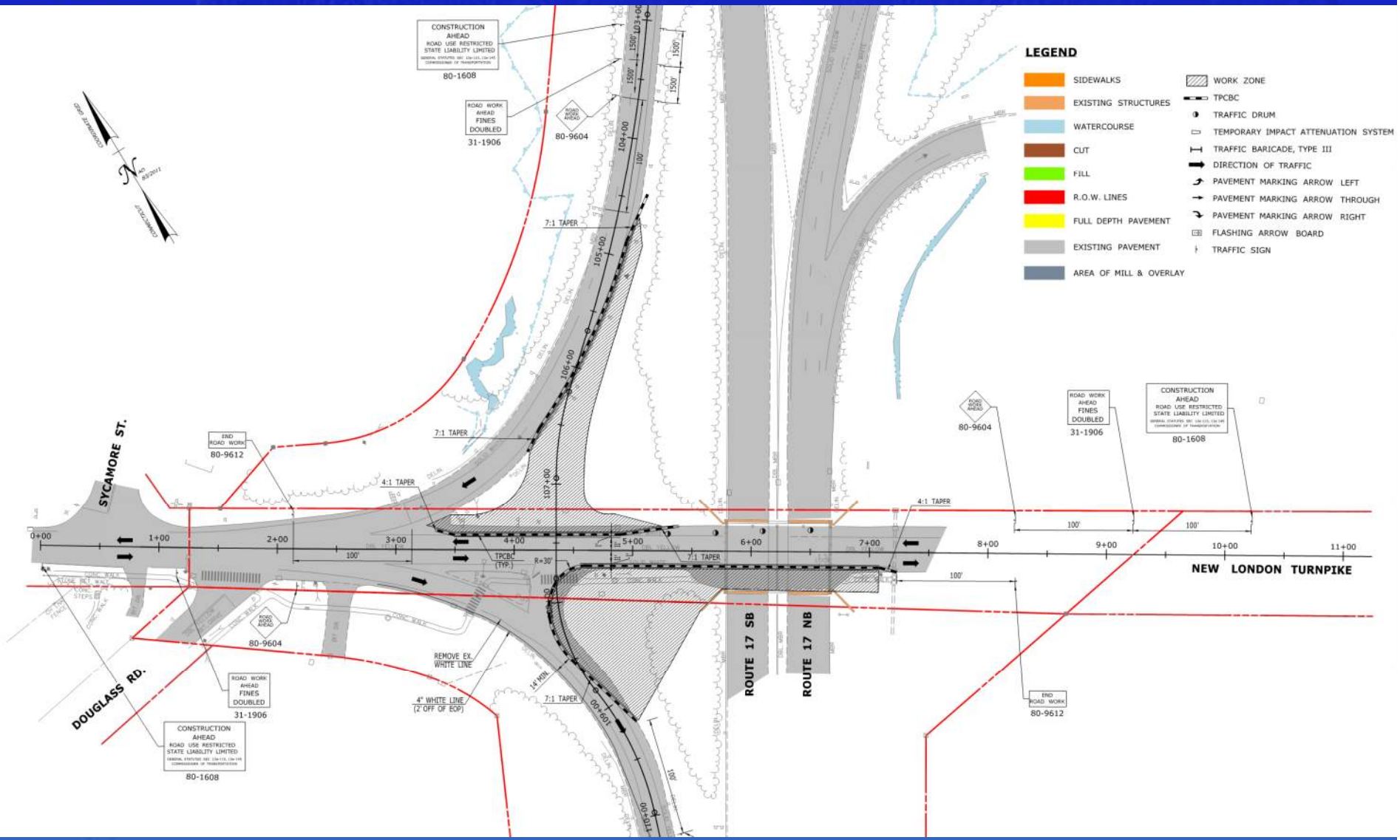
The meeting was adjourned at approximately 9:15 PM.

Proposed Limits of Project No. 53-189
Build Option 2

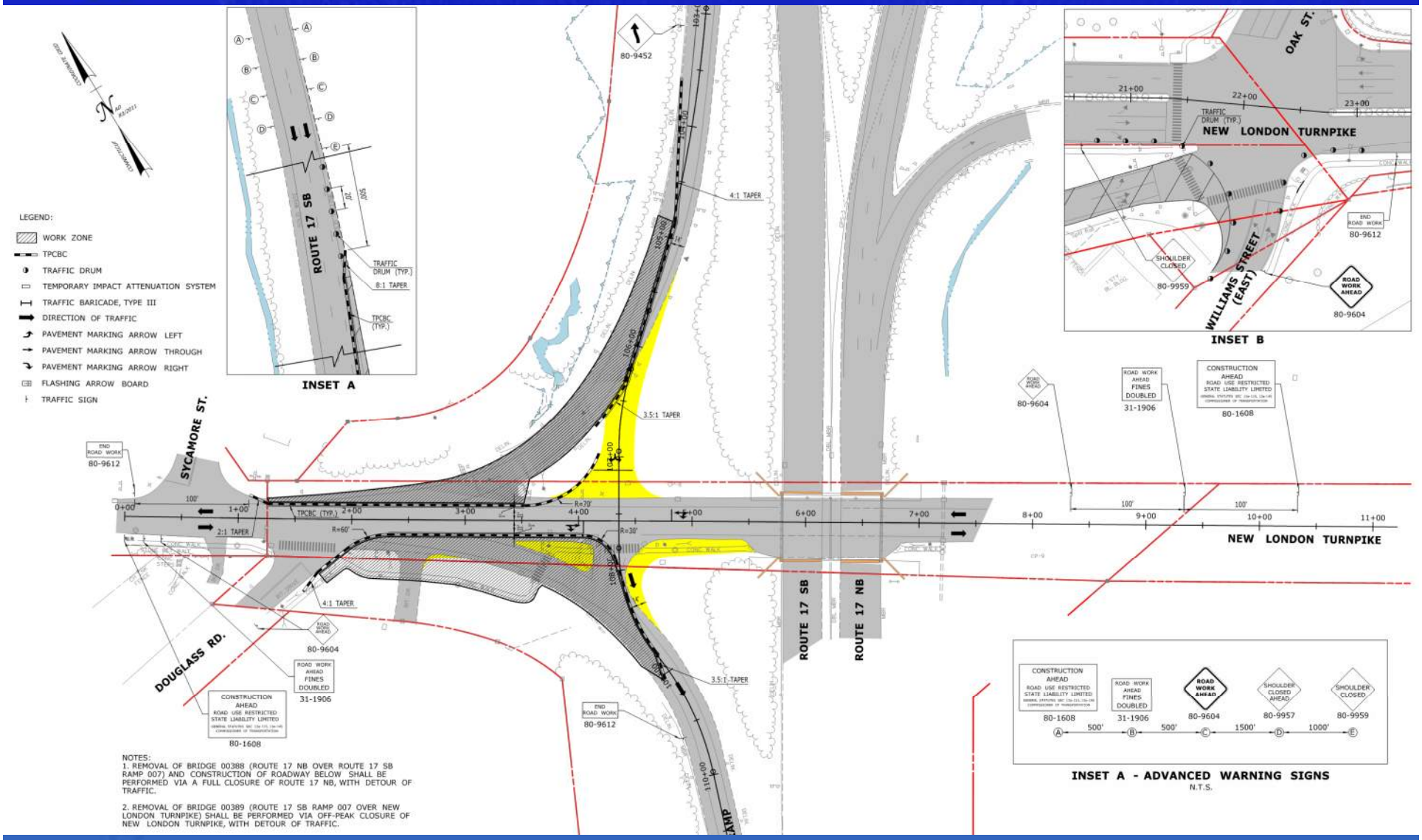
Project No. 53-189: Construction Stage 1

Project No. 53-189: Construction Stage 2

Project No. 53-189: Construction Stage 1



Project No. 53-189: Construction Stage 2



ATTACHMENT E – TRAFFIC SIGNAL STUDY
30% DESIGN, STATE PROJECT 53-189

Removal of Bridge Nos. 00388 and 00389 and Route 17 SB Off-Ramp 007 Glastonbury, CT

TRAFFIC SIGNAL STUDY

OCTOBER 2017

Connecticut Department of Transportation
Project No. 053-0189

Prepared by: **VN Engineers, Inc.**
116 Washington Avenue
North Haven, CT 06473
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2500 Westchester Avenue
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TRAFFIC SIGNAL STUDY

REMOVAL OF BRIDGE NOS. 00388 AND 00389 AND ROUTE 17 SB OFF-RAMP 007

GLASTONBURY, CONNECTICUT

STATE PROJECT NO. 053-0189

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1.0 SCOPE

This report was prepared for the removal of the superstructure of Bridge No. 00388 (Route 17 Northbound over Route 17 Southbound Ramp 007), as well as the removal of the superstructure and substructure of bridge No. 00389 (Route 17 Southbound off-ramp 007 over New London Turnpike). As part of the removal of these bridges and the off-ramp, the Route 17 southbound off-ramp 005 will align the Route 17 southbound on- and off-ramps at one signalized intersection. This project includes the addition of a traffic signal at the reconfigured Route 17 Southbound off-ramp 005 at New London Turnpike and installation of new traffic signal equipment at the intersection of New London Turnpike, Williams Street East, and Oak Street. The traffic conditions within the study area were analyzed for the 2015 existing conditions, the 2019 build-year, and the 2039 design-year. The 2019 and 2039 no-build conditions were studied as a basis for comparison.

2.0 INTRODUCTION

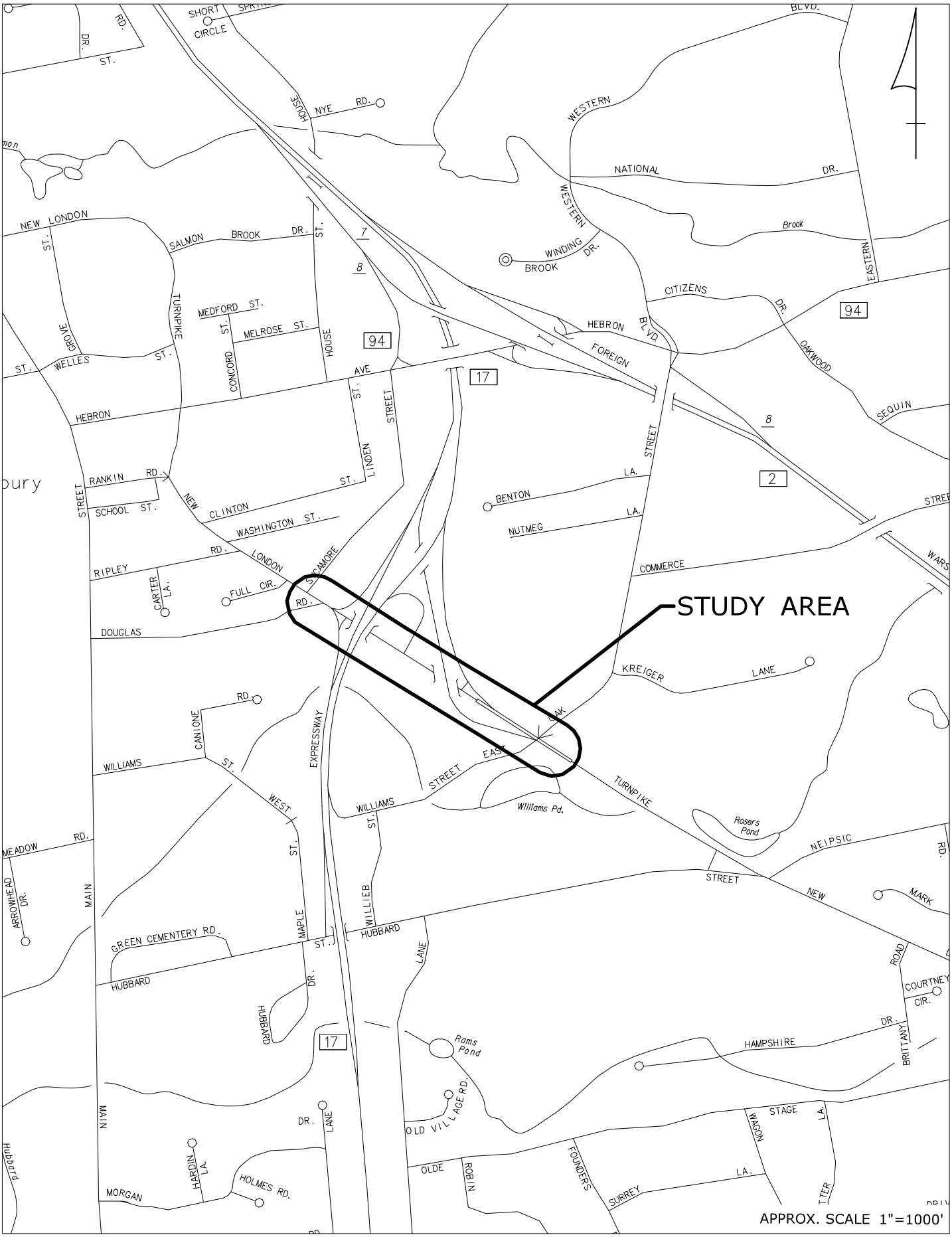
The study area presented in **Figure 1** includes the existing intersections listed in **Table 1**.

Table 1: Study Intersections

Site No.	Location	Signal No.
1	New London Turnpike at Williams Street East, Oak Street, and Route 17 (Glastonbury Expressway) Southbound off-ramp	#053-901
2	New London Turnpike and Sycamore Street	Unsignalized
3	New London Turnpike and Douglas Road	Unsignalized
4	New London Turnpike at Route 17 (Glastonbury Expressway) Southbound on-ramps and off-ramps	Unsignalized
5	New London Turnpike at Route 17 NB off-ramp	#053-902

3.0 PEAK-HOUR VOLUMES

The projections for the 2015 existing, 2019 no-build, 2019 build, 2039 no-build, and 2039 design-year traffic volumes used in this study were provided by the Connecticut Department of Transportation Bureau of Policy and Planning. The 2015 existing traffic volumes are presented in **Figure 2**. The projected 2019 no-build peak-hour volumes are presented in **Figure 3,** the projected 2039 no-build peak-hour volumes are presented in **Figure 4**, the projected 2019 build-year peak-hour volumes are presented in **Figure 5**, and the projected 2039 design-year peak-hour volumes are shown in **Figure 6**. The existing signal plans and timing patterns used for this study were obtained from the Town of Glastonbury.



VN ENGINEERS, Inc.
TRAFFIC INFRASTRUCTURE PLANNING

Figure 1: Study Area
Removal of Bridges Nos. 00388 and 00389
and Route 17 SB Off-Ramp 007
Glastonbury, CT

PROJECT:	053-0189
STUDY:	INTERCHANGE IMPROVEMENTS
ROUTES:	17 @ NEW LONDON TURNPIKE
TOWNS:	GLASTONBURY
ADT:	2015 EXISTING
PEAK:	AM = 000 PM = 000
DATE:	JANUARY 23, 2017 INIT: GJS

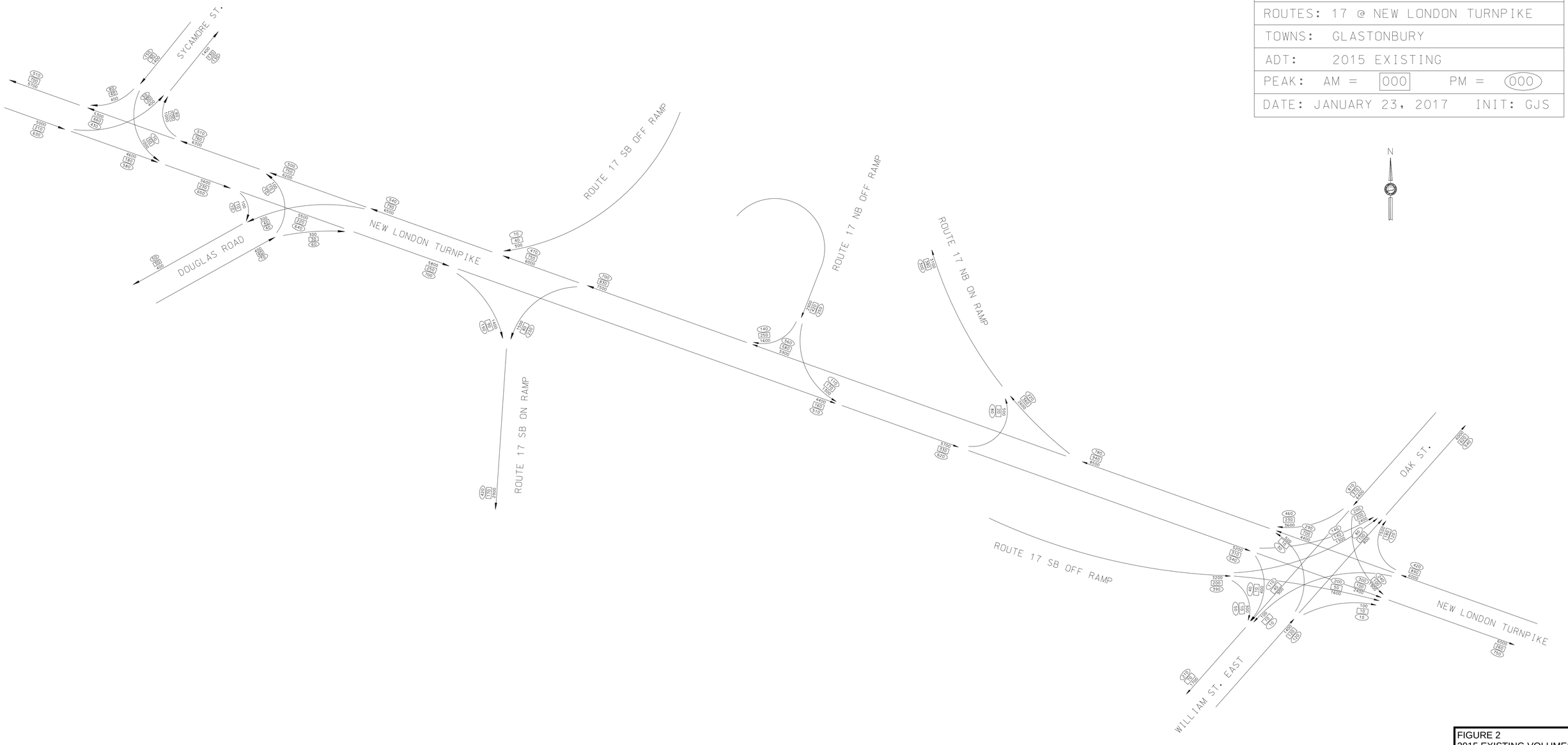


FIGURE 2
2015 EXISTING VOLUMES

PROJECT:	053-0189
STUDY:	INTERCHANGE IMPROVEMENTS
ROUTES:	17 @ NEW LONDON TURNPIKE
TOWNS:	GLASTONBURY
ADT:	2019 NO-BUILD
PEAK:	AM = 000 PM = 000
DATE:	JANUARY 23, 2017 INIT: GJS

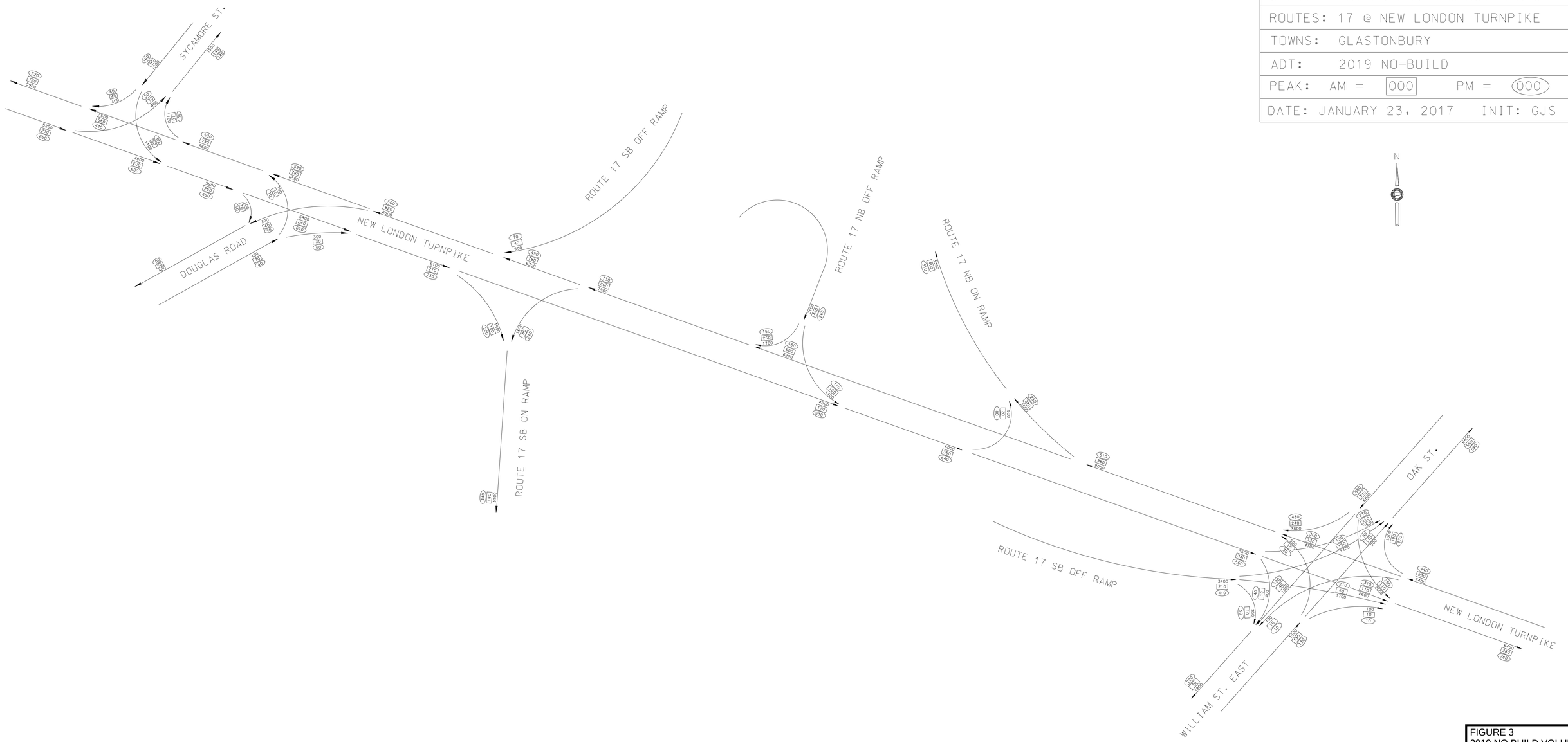


FIGURE 3
2019 NO BUILD VOLUMES

PROJECT:	053-0189
STUDY:	INTERCHANGE IMPROVEMENTS
ROUTES:	17 @ NEW LONDON TURNPIKE
TOWNS:	GLASTONBURY
ADT:	2039 NO BUILD
PEAK:	AM = 000 PM = 000
DATE:	JANUARY 23, 2017 INIT: GJS

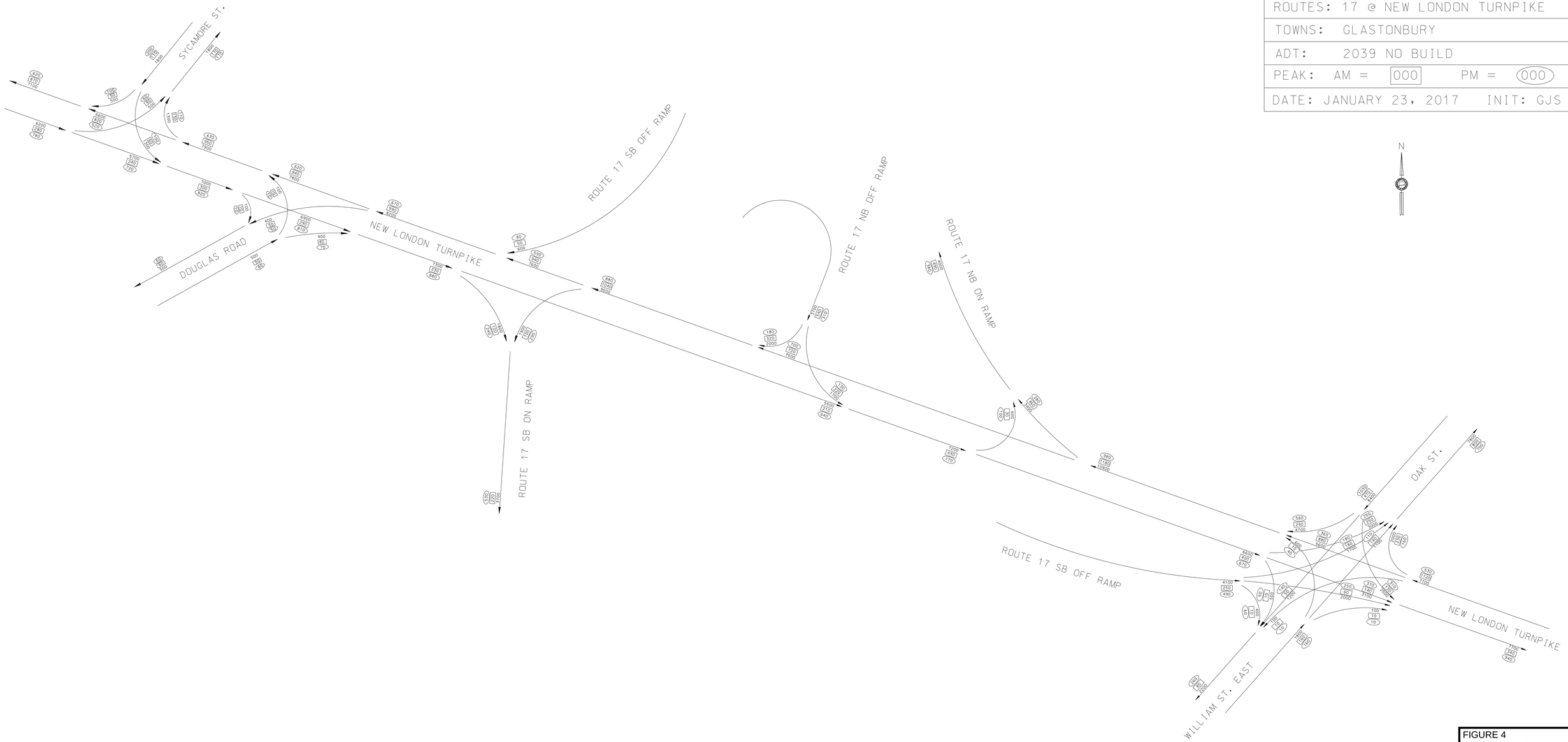


FIGURE 4
2039 NO BUILD VOUMES

PROJECT:	053-0189
STUDY:	INTERCHANGE IMPROVEMENTS
ROUTES:	17 @ NEW LONDON TURNPIKE
TOWNS:	GLASTONBURY
ADT:	2019 BUILD
PEAK:	AM = 000 PM = 000
DATE:	JANUARY 23, 2017 INIT: GJS

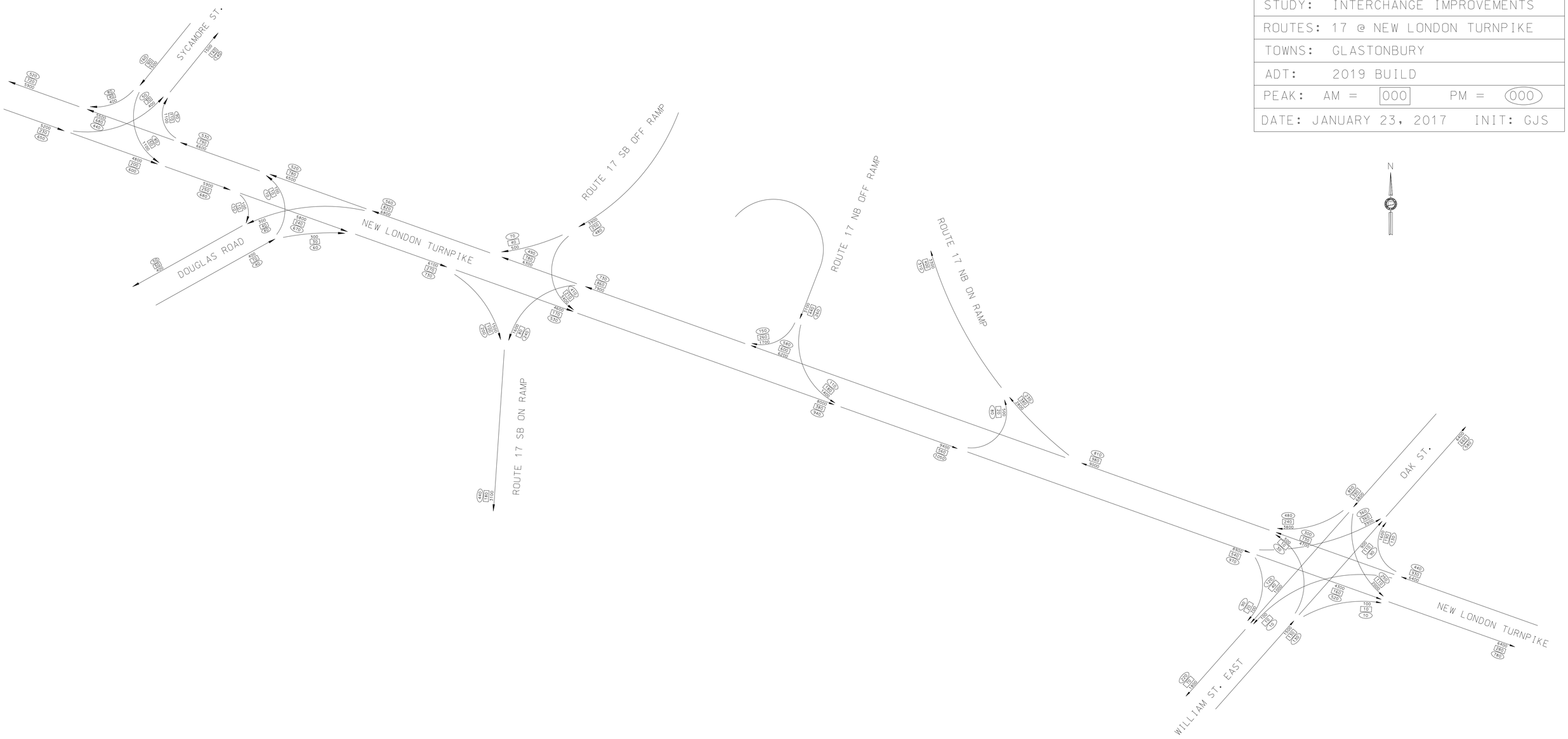


FIGURE 5
2019 BUILD VOLUMES

PROJECT:	053-0189
STUDY:	INTERCHANGE IMPROVEMENTS
ROUTES:	17 @ NEW LONDON TURNPIKE
TOWNS:	GLASTONBURY
ADT:	2039 BUILD
PEAK:	AM = 000 PM = 000
DATE:	JANUARY 23, 2017 INIT: GJS

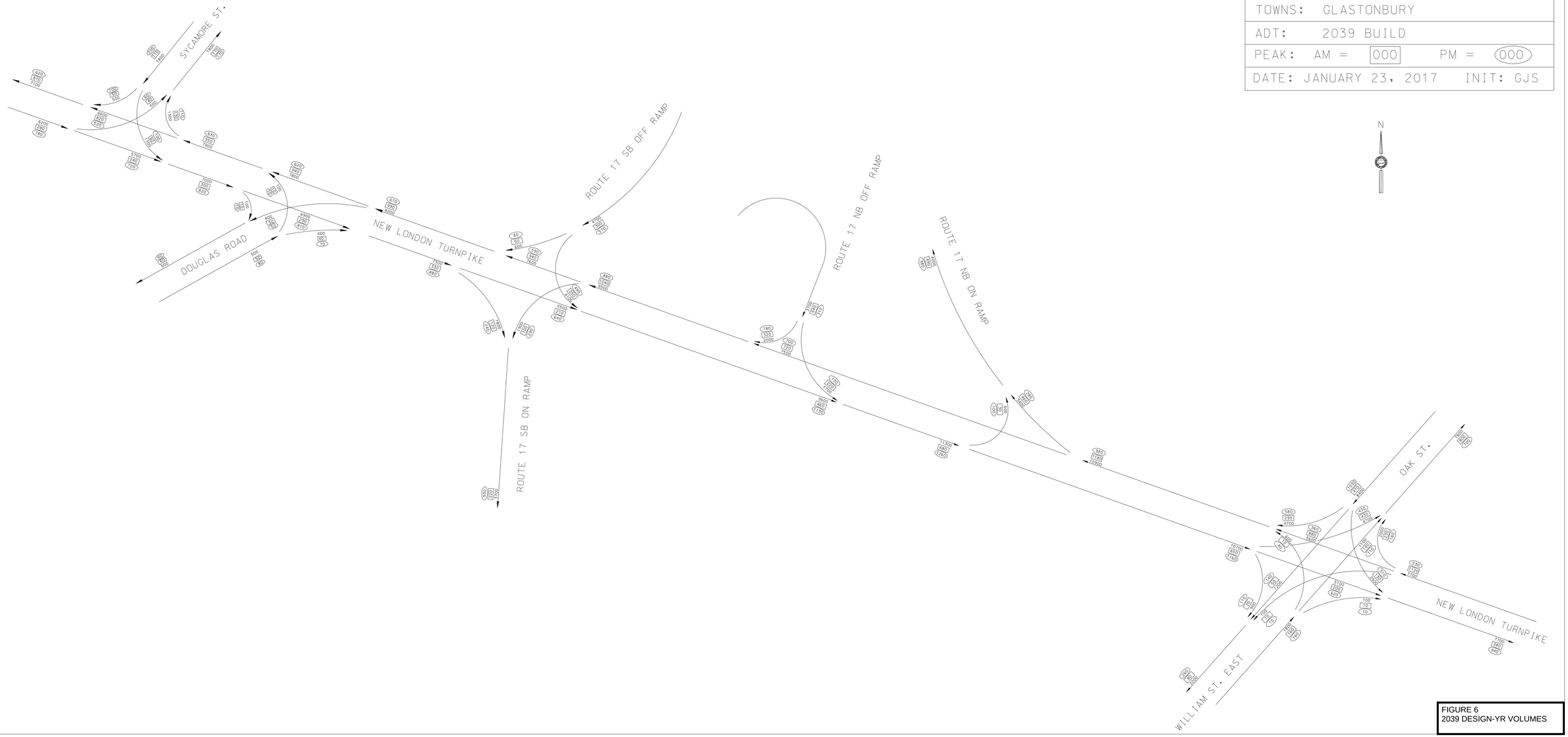


FIGURE 6
2039 DESIGN-YR VOLUMES

4.0 LEVELS OF SERVICE AND QUEUE ANALYSES

This study uses established procedures for estimating traffic capacity and queue lengths at each of the study intersections. The capacity analysis determined a Level of Service (LOS) for each intersection's lane groups using an alphanumeric rating system that is like the common academic grading methodology (A, B, C, D, E, and F). It should be noted that LOS C or better is commonly considered to be a "desirable" traffic operation, while LOS D is commonly considered to be "acceptable" in urban areas.

A queuing evaluation was also performed for each lane at the study intersections to evaluate the available storage to accommodate the anticipated traffic demand. The 95th percentile queue length, which represents the queue length that is exceeded only five percent of the peak-hour, was compared to the available lane storage to identify areas where queues may potentially block traffic operation in other lanes. The capacity analysis and queuing evaluation was performed using SYNCHRO 9 Traffic Signal Coordination Software (Build 909, Rev. 20).

5.0 EXISTING AND NO-BUILD CONDITIONS

The study area includes the analysis of the roadway intersections between Sycamore Street and Oak/Williams Street along New London Turnpike. Within the study area, New London Turnpike is a 35 mile-per-hour two-lane principal arterial, with variable width shoulders and turn-lanes provided at intersections. Guiderail exists along the north side of New London Turnpike between the two intersections. Emergency vehicle pre-emption equipment is currently in place at the signalized intersection of Oak and Williams Street.

There is a sidewalk currently on the south side of New London Turnpike for the entirety of the study area. There are crosswalks across Williams Street East, Route 17 southbound off-ramp and the west side of New London Turnpike at signal #053-901. Pedestrian push-buttons are provided at these crosswalks with an associated pedestrian phase. At the new signalized intersection, crosswalks exist at both entrances for the Route 17 Southbound on-ramp.

New London Turnpike and Williams Street East/ Oak Street/ Route 17 (Glastonbury Expressway) Southbound Off-ramp

The intersection of New London Turnpike, Williams Street East, and Oak Street, and Route 17 (Glastonbury Expressway) is a signalized five-way intersection with the following lane arrangements:

- Eastbound (New London Turnpike): a through-lane with exclusive left-turn and right-turn lanes
- Northeastbound (Route 17 Southbound off-ramp): a shared through/right-turn lane with an exclusive left-turn lane
- Westbound (New London Turnpike): two through-lanes with exclusive left-turn and right-turn lanes
- Northbound (Williams Street East): a shared right-turn/through lane with an exclusive left-turn lane
- Southbound (Oak Street): a through-lane with exclusive left-turn and right-turn lanes

The northeastbound approach to the intersection is on an uphill slope of approximately one percent and the southbound approach is on an uphill slope of about 2 percent. The westbound approach is also on an uphill slope of about one percent. The northbound approach from Williams Street East is on an uphill slope of roughly one percent and the southbound approach from Oak Street is at an approximate three percent downhill grade.

New London Turnpike and Sycamore Street

The intersection of New London Turnpike and Sycamore Street is an unsignalized three-way intersection with the following lane arrangements:

- Eastbound (New London Turnpike): a free flow through-lane
- Westbound (New London Turnpike): a free flow through-lane
- Southbound (Sycamore Street): a stop-controlled approach with a shared right and left-turn lane

The Sycamore Street approach to the intersection is on level grade.

New London Turnpike and Douglas Road

The intersection of New London Turnpike and Douglas Road is an unsignalized three-way intersection with the following lane arrangements:

- Eastbound (New London Turnpike): a free flow through-lane
- Westbound (New London Turnpike): a free flow through-lane
- Northeastbound (Douglas Road): a stop-controlled approach with a shared right and left-turn lane

The northeastbound approach from Douglas Road has a downhill grade of approximately ten percent.

New London Turnpike and Route 17 (Glastonbury Expressway) Southbound On- and Off-ramps

The intersection of New London Turnpike and the Route 17 (Glastonbury Expressway) southbound on- and off-ramps is an unsignalized three-way intersection with the following lane arrangements:

- Eastbound (New London Turnpike): a free flow through-lane
- Westbound (New London Turnpike): a free flow through-lane
- Southwestbound (Route 17 Southbound – Glastonbury off-ramp): a stop-controlled channelized right-turn lane

The southwestbound approach from the Route 17 southbound off-ramp is on a downhill grade of approximately three percent,

The results of the existing conditions capacity analysis, which includes the levels of service (LOS), volume to capacity (v/c) ratios, and 95th percentile queue lengths, are provided in **Table 2**. The available storage represents either the length of a turn-lane, the distance to an adjacent

major intersection, or the distance to the gore for a freeway off-ramp, as appropriate. The queue lengths were calculated assuming an average vehicle length of 25 feet. The full details of the existing conditions analysis are included in **Appendix A**.

Table 2: Existing Conditions (2015) Capacity Analysis Summary

	AM				PM				
Intersection/Movement	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Available Storage (feet)**
New London Turnpike at Williams St East, Oak Street, and Route 17 SB off-ramp									
Route 17 SB Exit NEB L	48.9	D	0.53	214	36.4	D	0.36	177	1950
Route 17 SB Exit NEB TR	44.1	D	0.25	104	47.8	D	0.71	#374	1950
New London Tpke EB L	37.0	D	0.77	#204	26.8	C	0.50	195	400
New London Tpke EB T	16.5	B	0.13	98	25.6	C	0.46	294	1080
New London Tpke EB R	16.5	B	0.02	18	21.0	C	0.07	49	290
New London Tpke WB L	29.1	C	0.03	23	38.0	D	0.06	25	90
New London Tpke WB T	38.2	D	0.77	411	39.7	D	0.48	168	1900
New London Tpke WB R	33.4	C	0.44	224	43.0	D	0.45	159	190
Williams St NB L	46.5	D	0.05	30	42.4	D	0.17	57	60
Williams St NB TR	47.0	D	0.39	182	43.5	D	0.34	130	580
Oak St SB L	52.5	D	0.52	#218	198.8	F	1.29	#471	365
Oak St SB T	44.6	D	0.14	79	44.8	D	0.41	154	705
Oak St SB R	6.3	A	0.37	72	5.6	A	0.57	87	260
Overall	34.9	C			47.6	D			
New London Turnpike at Sycamore Street									
New London Tpke EB LT	1.8	A	0.04	3	1.4	A	0.05	4	185
New London Tpke WB TR	0.0	A	0.49	0	0	A	0.33	0	125
Sycamore St SB LR	23.7	C	0.34	36	33.5	D	0.57	83	2045
Overall	2.4	A			4.6	A			
New London Turnpike at Douglas Road and Route 17 SB off-ramp									
Douglas Rd NEB LR	16.0	C	0.12	10	20.6	C	0.25	24	1795
Route 17 SB Exit SWB R	15.0	B	0.11	9	11.9	B	0.13	11	835
New London Tpke EB RT	0.0	A	0.15	0	0.0	A	0.42	0	125
New London Tpke WB LT	0.9	A	0.03	3	1.3	A	0.05	4	180
Overall	1.8	A			2.3	A			
New London Turnpike at Route 17 SB on-ramp (West)									
New London Tpke EB TR	0.0	A	0.16	0	0.0	A	0.45	0	65
New London Tpke WB T	0.0	A	0.48	0	0.0	A	0.30	0	140
Overall	0.0	A			0.0	A			
New London Turnpike at Route 17 SB on-ramp (East)									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	140
New London Tpke WB LT	0.0	A	0.00	0	0.0	A	0.00	0	490
Overall	0.0	A			0.0	A			

New London Turnpike at Route 17 NB off-ramp									
New London Tpke EB T	5.0	A	0.16	42	5.6	A	0.42	126	490
New London Tpke WB T	8.5	A	0.58	176	6.0	A	0.46	145	445
Route 17 NB Exit SWB L	18.6	B	0.48	94	19.4	B	0.37	74	215
Route 17 NB Exit SWB R	5.9	A	0.49	45	7.0	A	0.37	38	625
Overall	9.0	A			7.1	A			
New London Turnpike at Route 17 NB on-ramp									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	335
New London Tpke WB R	0.0	A	0.00	0	0.0	A	0.00	0	335
Overall	0.0	A			0.0	A			
Route 17 NB on-ramp at Connector									
Connector NB L	11.9	B	0.04	3	11.3	B	0.13	11	65
Rte. 17 NB on-ramp NWBT	0.0	A	0.12	0	0.0	A	0.07	0	640
Overall	0.6	A			3.0	A			
New London Turnpike at Connector to Route 17 NB on-ramp									
New London Tpke EB LT	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	640
Overall	0.0	A			0.0	A			

95th percentile volume exceeds capacity, queue may be longer. Queue shown is max after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

The existing conditions analysis presented in **Table 2** shows that New London Turnpike at Williams Street East, Oak Street, and Route 17 southbound off-ramp have approaches that are operating with 95th percentile queues that exceed the available storages. The Oak Street exclusive left-turn lane operates at LOS F during the PM peak, with 95th percentile queues that exceed the available storage. The other approaches analyzed operate at LOS D or better with 95th percentile queues that are contained within the available storage.

The results of the 2019 no-build conditions capacity analysis, which includes the levels of service (LOS), volume to capacity (v/c) ratios, and 95th percentile queue lengths, are provided in **Table 3**. The full details of the existing conditions analysis are included in **Appendix A**.

Table 3: No-Build Conditions (2019) Capacity Analysis Summary

	AM				PM				
Intersection/Movement	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Available Storage (feet)**
New London Turnpike at Williams St East, Oak Street, and Route 17 SB off-ramp									
Route 17 SB Exit NEB L	51.3	D	0.58	229	37.2	D	0.39	190	1950
Route 17 SB Exit NEB TR	45.1	D	0.26	105	50.0	D	0.75	#401	1950
New London Tpke EB L	39.4	D	0.80	#249	27.3	C	0.53	205	400
New London Tpke EB T	16.4	B	0.14	107	25.7	C	0.47	305	1080
New London Tpke EB R	16.4	B	0.02	18	20.8	C	0.07	49	290
New London Tpke WB L	29.1	C	0.03	23	37.8	D	0.06	25	90
New London Tpke WB T	39.3	D	0.79	431	40.0	D	0.50	173	1900
New London Tpke WB R	33.9	C	0.46	237	43.8	D	0.48	170	190
Williams St NB L	47.9	D	0.05	31	43.1	D	0.18	58	60
Williams St NB TR	49.0	D	0.44	#219	44.6	D	0.38	144	580
Oak St SB L	58.9	E	0.62	#256	228.0	F	1.37	#496	365
Oak St SB T	46.0	D	0.14	80	45.9	D	0.45	167	705
Oak St SB R	6.3	A	0.38	75	5.7	A	0.59	92	260
Overall	34.4	C			54.0	D			
New London Turnpike at Sycamore Street									
New London Tpke EB LT	1.8	A	0.05	4	1.4	A	0.05	4	185
New London Tpke WB TR	0.0	A	0.51	0	0	A	0.34	0	125
Sycamore St SB LR	25.8	D	0.36	40	42.5	D	0.67	107	2045
Overall	2.4	A			5.7	A			
New London Turnpike at Douglas Road and Route 17 SB off-ramp									
Douglas Rd NEB LR	17.2	C	0.13	11	22.0	C	0.26	26	1795
Route 17 SB Exit SWB R	15.5	C	0.11	9	12.1	B	0.13	11	835
New London Tpke EB RT	0.0	A	0.16	0	0.0	A	0.43	0	125
New London Tpke WB LT	0.9	A	0.03	3	1.4	A	0.05	4	180
Overall	1.8	A			2.3	A			
New London Turnpike at Route 17 SB on-ramp (West)									
New London Tpke EB TR	0.0	A	0.17	0	0.0	A	0.47	0	65
New London Tpke WB T	0.0	A	0.50	0	0.0	A	0.31	0	140
Overall	0.0	A			0.0	A			
New London Turnpike at Route 17 SB on-ramp (East)									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	140
New London Tpke WB LT	0.0	A	0.00	0	0.0	A	0.00	0	490
Overall	0.0	A			0.0	A			

New London Turnpike at Route 17 NB off-ramp									
New London Tpke EB T	5.1	A	0.17	46	6.1	A	0.48	135	490
New London Tpke WB T	8.9	A	0.60	193	6.6	A	0.52	153	445
Route 17 NB Exit SWB L	19.5	B	0.50	103	20.5	C	0.39	78	215
Route 17 NB Exit SWB R	6.0	A	0.50	47	7.3	A	0.40	41	625
Overall	8.6	A			7.6	A			
New London Turnpike at Route 17 NB on-ramp									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	335
New London Tpke WB R	0.0	A	0.00	0	0.0	A	0.00	0	335
Overall	0.0	A			0.0	A			
Route 17 NB on-ramp at Connector									
Connector NB L	12.1	B	0.04	3	11.4	B	0.13	11	65
Rte. 17 NB on-ramp NWB T	0.0	A	0.12	0	0.0	A	0.07	0	640
Overall	0.6	A			2.9	A			
New London Turnpike at Connector to Route 17 NB on-ramp									
New London Tpke EB LT	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	640
Overall	0.0	A			0.0	A			

95th percentile volume exceeds capacity, queue may be longer. Queue shown is max after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

The 2019 no-build conditions analysis presented in **Table 3** shows that the Oak Street left-turn lane operates at LOS E during the AM peak and LOS F during the PM peak, with 95th percentile queues that extend beyond the available storage. The LOS and queues at the Route 17 southbound off-ramp, New London Turnpike, Williams Street East, and Oak Street approaches will operate similar to existing conditions. The other approaches are expected to operate at LOS D or better with 95th percentile queues that are contained within the available storage.

The results of the 2039 no-build conditions capacity analysis, which includes the levels of service (LOS), volume to capacity (v/c) ratios, and 95th percentile queue lengths, are provided in **Table 4**. The full details of the existing conditions analysis are included in **Appendix A**.

Table 4: No-Build Conditions (2039) Capacity Analysis Summary

	AM				PM				
Intersection/Movement	Avg. Delay (sec/veh)	LOS	V/C	95th %ile Queue (feet)	Avg. Delay (sec/veh)	LOS	V/C	95th %ile Queue (feet)	Available Storage (feet)
New London Turnpike at Williams St East, Oak Street, and Route 17 SB Exit									
Route 17 SB Exit NEB L	62.6	E	0.71	#291	40.4	D	0.47	239	1950
Route 17 SB Exit NEB TR	50.0	D	0.31	121	68.5	E	0.91	#536	1950
New London Tpke EB L	59.6	E	0.89	#430	31.2	C	0.65	243	400
New London Tpke EB T	16.0	B	0.16	131	26.7	C	0.54	369	1080
New London Tpke EB R	16.3	B	0.01	18	20.2	C	0.09	58	290
New London Tpke WB L	29.3	C	0.03	23	36.6	D	0.06	25	90
New London Tpke WB T	43.9	D	0.84	543	41.0	D	0.57	205	1900
New London Tpke WB R	35.5	D	0.49	285	45.8	D	0.57	204	190
Williams St NB L	53.3	D	0.06	32	47.1	D	0.27	75	60
Williams St NB TR	61.6	E	0.64	#301	48.0	D	0.47	177	580
Oak St SB L	162.5	F	1.12	#341	445.2	F	1.88	#663	365
Oak St SB T	52.4	D	0.21	98	49.7	D	0.54	#220	705
Oak St SB R	6.5	A	0.44	83	6.3	A	0.66	107	260
Overall	48.0	D			78.5	E			
New London Turnpike at Sycamore Street									
New London Tpke EB LT	2.6	A	0.08	6	1.8	A	0.07	6	185
New London Tpke WB TR	0.0	A	0.61	0	0	A	0.40	0	125
Sycamore St SB LR	60.3	F	0.68	101	161.1	F	1.15	274	2045
Overall	5.5	A			21.0	C			
New London Turnpike at Douglas Road and Route 17 SB Exit									
Douglas Rd NEB LR	25.7	D	0.24	22	35.6	C	0.43	50	1795
Route 17 SB Exit SWB R	20.1	C	0.18	17	13.2	B	0.17	15	835
New London Tpke EB RT	0.0	A	0.19	0	0.0	A	0.52	0	125
New London Tpke WB LT	1.2	A	0.04	3	1.9	A	0.07	6	180
Overall	2.5	A			3.2	A			
New London Turnpike at Route 17 SB on-ramp									
New London Tpke EB TR	0.0	A	0.21	0	0.0	A	0.56	0	65
New London Tpke WB T	0.0	A	0.60	0	0.0	A	0.38	0	140
Overall	0.0	A			0.0	A			
New London Turnpike at Route 17 SB on-ramp									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	140
New London Tpke WB LT	0.0	A	0.00	0	0.0	A	0.00	0	490
Overall	0.0	A			0.0	A			

New London Turnpike at Route 17 NB off-ramp									
New London Tpke EB T	5.1	A	0.20	55	7.3	A	0.57	195	490
New London Tpke WB T	10.6	B	0.69	255	8.2	A	0.63	226	445
Route 17 NB Exit SWB L	25.6	C	0.61	157	24.5	C	0.44	98	215
Route 17 NB Exit SWB R	13.9	B	0.66	121	7.6	A	0.44	48	625
Overall	12.8	B			9.1	A			
New London Turnpike at Route 17 NB on-ramp									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	335
New London Tpke WB R	0.0	A	0.00	0	0.0	A	0.00	0	335
Overall	0.0	A			0.0	A			
Route 17 NB on-ramp at Connector									
Connector NB L	13.2	B	0.07	6	12.2	B	0.18	16	65
Rte. 17 NB on-ramp NWB T	0.0	A	0.15	0	0.0	A	0.09	0	640
Overall	0.8	A			3.2	A			
New London Turnpike at Connector to Route 17 NB on-ramp									
New London Tpke EB LT	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	640
Overall	0.0	A			0.0	A			

95th percentile volume exceeds capacity, queue may be longer. Queue shown is max after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Under 2039 no-build conditions (**Table 4**), there are several additional occurrences where the 95th percentile queues exceed the available storage. The Oak Street exclusive left-turn lane will operate at LOS F during both the AM and PM peaks with 95th percentile queues that exceed the available storage length, with the PM peak queue being nearly double the storage available. During the AM peak, the Williams Street northbound through/right-turn lane and the New London Turnpike eastbound exclusive left-turn lane will both operate at LOS E with the queues in the exclusive left-turn lane on New London Turnpike queues overflowing into the eastbound through lane. The Route 17 Southbound off-ramp will operate at LOS E during the PM peak, with the intersection operating at overall LOS E. During the 2039 no-build conditions, the Sycamore Street approach at the intersection with New London Turnpike will degrade to a LOS F during both the AM and PM peaks, with a calculated delay of over 160 seconds per vehicle during the PM peak. The other approaches analyzed are expected to operate at LOS D or better with 95th percentile queues that are contained within the available storage.

6.0 BUILD-YEAR AND DESIGN-YEAR ANALYSES

The proposed improvements for this project include the installation of a new signal on New London Turnpike at the new intersection with the Route 17 southbound on- and off-ramps. In addition, the geometry at the intersection of New London Turnpike with Williams Street East and Oak Street will be modified to eliminate the Route 17 southbound off-ramp approach. The geometric improvements to the intersection of New London turnpike with Oak Street and Williams Street east will include new curb radii where the Route 17 southbound off-ramp

approach is being eliminated as well as the relocation of the stop bar at the Williams Street East approach by approximately 25 feet to the north to increase the signal head visibility. New signal equipment and accessible sidewalk ramps will be installed at this intersection. This signal is presently installed in a Y-span configuration and operates with an advance green phase for eastbound New London Turnpike Traffic with a right-turn overlap for southbound Oak Street traffic. This signal also operates with split phasing for the Route 17 southbound off-ramp approach. To minimize conflicts with the existing utilities and improve the efficiency at the intersection, the new signal will be installed in a diagonal straight span configuration with dual-quad phasing and video detection at each approach. The yellow and all-red clearance intervals were calculated and timing adjustments are included with the new design.

The new signal at the intersection of New London Turnpike with the Route 17 southbound on- and off-ramps will be installed to provide traffic control where the channelized Route 17 southbound off-ramp is being realigned to a three-way intersection, with exclusive left- and right-turn lanes. New London Turnpike will be widened to provide an exclusive eastbound right-turn lane and an exclusive westbound left-turn lane. New sidewalk will be provided along the south side of New London Turnpike between Douglas Road and the construction limits to the east. Accessible sidewalk ramps, crosswalk, and pedestrian equipment will be provided to facilitate the crossing of the Route 17 southbound on-ramp. The new signal will be installed in a box-span configuration to promote far side signal head placement. This signal will include video detection and an advance green phase for the westbound through and left-turning traffic on New London Turnpike.

Currently, no coordination is in place between the signalized intersections along New London Turnpike within the study area. The addition of signal coordination between these signals was investigated for the build scenarios, however, based on the Synchro analysis, the coordinated system operated with additional delay and queues when compared with the three signals each operating uncoordinated. This is likely attributed to the varying optimal cycle lengths for each of the signalized intersections under build conditions.

The results of the 2019 build-year capacity analyses, are shown in **Table 5** and the results of the 2039 design-year analysis are shown in **Table 6**. These results reflect the adjustments to the signal timing as part of the SYNCHRO analysis. The calculated levels of service (LOS), volume to capacity (v/c) ratios, and 95th percentile queue lengths are provided in each of the tables. The available storage provided represents either the length of a turn-lane, the distance to an adjacent major intersection, or the distance to the gore for a freeway off-ramp, as appropriate. The queue lengths were calculated assuming an average vehicle length of 25 feet. **Appendix B** contains details of the 2019 build-year capacity analysis and the 2039 design-year capacity analysis

Table 5: Build-Year Conditions (2019) Capacity Analysis Summary

	AM				PM				
Intersection/Movement	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Available Storage (feet)**
New London Turnpike at Williams St East, Oak Street									
New London Tpke EB L	21.1	C	0.73	212	17.6	B	0.66	176	400
New London Tpke EB T	9.6	A	0.17	89	23.2	C	0.70	382	1080
New London Tpke EB R	0.1	A	0.02	0	1.2	A	0.13	10	290
New London Tpke WB L	8.4	A	0.02	8	10.9	B	0.03	10	95
New London Tpke WB T	28.2	C	0.67	285	26.5	C	0.38	115	1900
New London Tpke WB R	25.5	C	0.39	162	28.5	C	0.36	115	190
Williams St NB L	26.0	C	0.03	19	19.3	B	0.10	34	60
Williams St NB TR	44.0	D	0.53	133	42.6	D	0.49	119	580
Oak St SB L	32.1	C	0.40	106	23.6	C	0.53	205	365
Oak St SB T	31.6	C	0.10	55	27.3	C	0.24	122	705
Oak St SB R	7.9	A	0.47	72	7.0	A	0.63	95	260
Overall	23.6	C			19.9	B			
New London Turnpike at Sycamore Street									
New London Tpke EB LT	1.9	A	0.05	4	1.4	A	0.06	4	185
New London Tpke WB TR	0.0	A	0.51	0	0.0	A	0.34	0	125
Sycamore St SB LR	26.7	D	0.37	41	51.7	F	0.73	124	2045
Overall	2.5	A			6.9	A			
New London Turnpike at Douglas Road									
Douglas Rd NEB LR	0.0	A	0.16	0	0.0	A	0.43	0	1795
New London Tpke EB RT	0.9	A	0.03	3	1.3	A	0.05	4	125
New London Tpke WB LT	15.2	C	0.11	9	20.0	C	0.24	23	245
Overall	1.2	A			1.6	A			
New London Turnpike at Route 17 SB on- and off-ramps									
New London Tpke EB T	22.1	C	0.35	117	42.8	D	0.89	#452	245
New London Tpke EB R	5.1	A	0.20	31	8.9	A	0.34	74	245
New London Tpke WB L	5.2	A	0.10	27	27.5	C	0.73	#176	555
New London Tpke WB T	12.2	B	0.70	348	12.4	B	0.50	229	555
Route 17 SB off- SWB L	39.6	D	0.69	#195	47.7	D	0.88	#371	560
Route 17 SB off- SWB R	0.4	A	0.09	0	0.3	A	0.11	0	560
Overall	16.4	B			29.2	C			
New London Turnpike at Route 17 NB off-ramp									
New London Tpke EB T	6.3	A	0.37	107	7.3	A	0.68	257	555
New London Tpke WB T	8.7	A	0.59	197	3.8	A	0.42	102	445
Route 17 NB Exit SWB L	21.1	C	0.51	112	35.2	D	0.54	#100	215
Route 17 NB Exit SWB R	6.9	A	0.51	54	10.5	B	0.48	46	625
Overall	9.3	A			8.1	A			

New London Turnpike at Route 17 NB on-ramp									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	335
New London Tpke WB R	0.0	A	0.00	0	0.0	A	0.00	0	335
Overall	0.0	A			0.0	A			
Route 17 NB on-ramp at Connector									
Connector NB L	12.1	B	0.04	3	11.4	B	0.13	11	65
Rte. 17 NB on-ramp NWB T	0.0	A	0.12	0	0.0	A	0.07	0	640
Overall	0.6	A			2.9	A			
New London Turnpike at Connector to Route 17 NB on-ramp									
New London Tpke EB LT	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	640
Overall	0.0	A			0.0	A			

95th percentile volume exceeds capacity, queue may be longer. Queue shown is max after two cycles.
m Volume for 95th percentile queue is
metered by upstream signal.

Table 6: Design-Year Conditions (2039) Capacity Analysis Summary

	AM				PM				
Intersection/Movement	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Avg. Delay (sec/veh)**	**LOS**	**V/C**	**95th %ile Queue (feet)**	**Available Storage (feet)**
New London Turnpike at Williams St East, Oak Street									
New London Tpke EB L	34.8	C	0.82	#373	19.0	B	0.73	220	400
New London Tpke EB T	9.5	A	0.20	110	24.6	C	0.74	#515	1080
New London Tpke EB R	0.1	A	0.02	0	2.0	A	0.14	20	290
New London Tpke WB L	8.8	A	0.02	8	12.0	B	0.04	10	90
New London Tpke WB T	37.9	D	0.84	#366	30.5	C	0.44	152	1900
New London Tpke WB R	29.9	C	0.49	196	33.2	C	0.44	155	190
Williams St NB L	26.9	C	0.03	19	22.0	C	0.14	42	60
Williams St NB TR	52.8	D	0.67	#165	52.2	D	0.62	#155	580
Oak St SB L	42.0	D	0.59	#143	35.1	D	0.73	#293	365
Oak St SB T	33.4	C	0.14	66	31.0	C	0.31	140	705
Oak St SB R	8.3	A	0.54	80	8.2	A	0.72	110	260
Overall	31.2	C			23.3	C			
New London Turnpike at Sycamore Street									
New London Tpke EB LT	3.0	A	0.09	7	2.0	A	0.08	6	185
New London Tpke WB TR	0.0	A	0.61	0	0	A	0.40	0	125
Sycamore St SB LR	89.4	F	0.81	128	289.2	F	1.45	354	2045
Overall	7.9	A			37.0	E			

New London Turnpike at Douglas Road									
Douglas Rd NEB LR	0.0	A	0.19	0	0.0	A	0.52	0	1795
New London Tpke EB RT	1.2	A	0.04	3	1.8	A	0.07	6	125
New London Tpke WB LT	27.2	D	0.25	24	30.2	D	0.38	42	245
Overall	1.9	A			2.3	A			
New London Turnpike at Route 17 SB on- and off-ramp									
New London Tpke EB T	22.4	C	0.39	143	78.6	E	1.06	#590	245
New London Tpke EB R	4.9	A	0.22	35	11.0	B	0.40	100	245
New London Tpke WB L	5.4	A	0.13	33	50.7	D	0.91	#253	555
New London Tpke WB T	19.8	B	0.83	532	15.2	B	0.61	298	555
Route 17 SB off- SWB L	50.0	D	0.80	#251	77.1	E	1.03	#474	560
Route 17 SB off- SWB R	0.6	A	0.13	0	0.4	A	0.14	0	560
Overall	22.2	C			49.1	D			
New London Turnpike at Route 17 NB off-ramp									
New London Tpke EB T	7.1	A	0.44	136	15.8	B	0.86	#618	555
New London Tpke WB T	10.9	B	0.69	268	5.0	A	0.53	139	445
Route 17 NB Exit SWB L	25.0	C	0.60	136	44.4	D	0.68	#122	215
Route 17 NB Exit SWB R	15.7	B	0.68	118	11.0	B	0.55	50	625
Overall	12.6	B			13.6	B			
New London Turnpike at Route 17 NB on-ramp									
New London Tpke EB T	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	335
New London Tpke WB R	0.0	A	0.00	0	0.0	A	0.00	0	335
Overall	0.0	A			0.0	A			
Route 17 NB on-ramp at Connector									
Connector NB L	13.2	B	0.07	6	12.2	B	0.18	16	65
Rte. 17 NB on-ramp NWB T	0.0	A	0.15	0	0.0	A	0.09	0	640
Overall	0.8	A			3.2	A			
New London Turnpike at Connector to Route 17 NB on-ramp									
New London Tpke EB LT	0.0	A	0.00	0	0.0	A	0.00	0	445
New London Tpke WB T	0.0	A	0.00	0	0.0	A	0.00	0	640
Overall	0.0	A			0.0	A			

95th percentile volume exceeds capacity, queue may be longer. Queue shown is max after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

The 2019 build-year and 2039 design-year analyses presented in **Table 5** and **Table 6** show that all approaches to the intersection of New London Turnpike with Williams Street East and Oak Street will generally operate at improved levels of service with shorter queues and delay. As would be expected, the introduction of a new signal at the intersection of New London Turnpike with the Route 17 southbound on and off-ramps, where traffic currently operates freely, will increase the delay at this location. During the PM peak under the 2039 design-year scenario, the New London Turnpike eastbound approach to the intersection with the Route 17 southbound ramps will operate at LOS E with queues that are expected to extend past the adjacent intersections with Douglas Road and Sycamore Street. Similarly, the queues at the eastbound

New London Turnpike approach to the intersection with the Route 17 northbound off-ramps are expected to extend into the adjacent intersection with the Route 17 southbound ramps. During both the AM and PM peaks, the Sycamore Street approach to the intersection with New London Turnpike will operate at LOS F with longer delays and queues than those calculated in the no-2039 build scenario.

7.0 SAFETY ANALYSIS

Historical crash data was evaluated for each of the study intersections. The latest available data was obtained from the UCONN Crash Data Repository for the period between January 1, 2014 and December 31, 2016, between mile marker 3.85 and 4.32 on New London Turnpike and between mile marker 35.7 and 35.84 on Route 17.

A total of 24 crashes were reported: 1 from January 2014 to December 2014, 12 from January 2015 to December 2015, and 11 from January 2016 to December 2016. Over half of these crashes involved only property damage with 10 injuries reported. The predominant crash types occurring in the study area included rear-end crashes (16) and angle crashes (7). There was also one pedalcycle crash involving a cyclist. Nineteen of the 24 total crashes occurred during the week and 16 occurred during the hours between 10 a.m. to 4 p.m. Twenty of the crashes involved two vehicles, with the remaining four involving three vehicles. There were a total of 51 vehicles involved, which included 10 SUVs, four pick-up trucks, two medium/light trucks, and one motorcycle. Fourteen of the 24 crashes involved at least one non-passenger car vehicle. Of the total crashes that noted a contributing factor, following too closely was cited in 15 of the them. A summary of the accident data is provided in **Table 5** and a crash diagram for the study area is presented in **Figure 7**.

Table 7: Accident Summary

Accident Type	# of Accidents/Injuries
Rear-end	16/6
Angle	7/3
Pedalcycle	1/1

Accident Severity	# of Accidents
Injury	10
Property Damage Only	14

Contributing Factors	# of Accidents
Following Too Closely	15
Improper Passing	1
Failure to Grant R.O.W.	2
Failure to Keep in Proper Lane	1
Ran Red Light	2
Wrong Side or Wrong Way	1
No Contributing Action	27
Other Contributing Action	1
Not Applicable	4

Pavement Conditions	# of Accidents
Dry	18
Wet	6

Light Condition	# of Accidents
Daylight	22
Dark-Lighted	2

Vehicle Operator Age	# of Accidents
30 & Under	28
31-50	23
Over 50	17
Not Reported	1

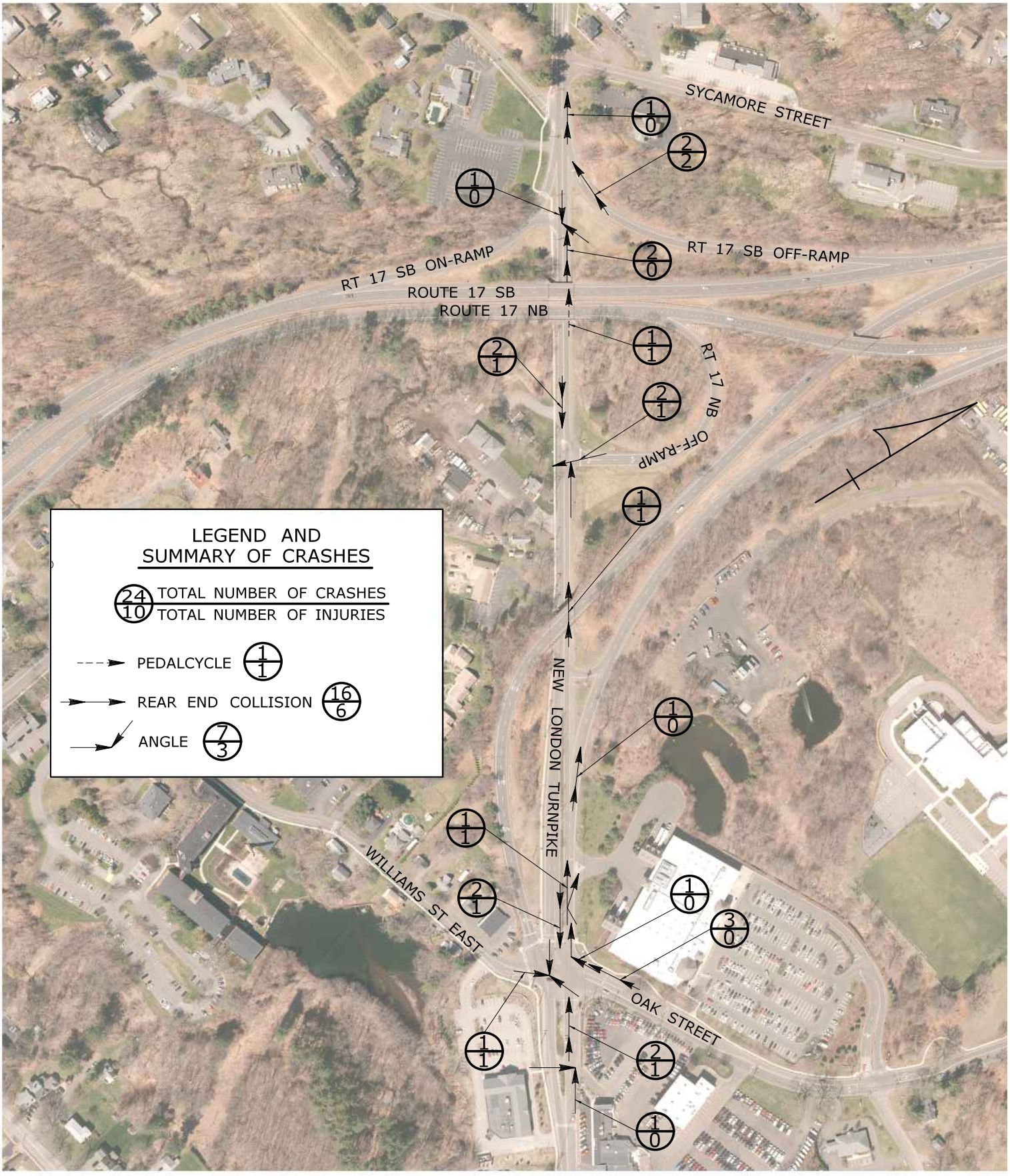
Time of Day	# of Accidents
6:00 AM - 10:00 AM	4
10:00 AM - 4:00 PM	16
4:00 PM - 7:00 PM	2
7:00 PM - 12:00 Mid	2
12:00 Mid – 6:00 AM	0

Day of Week	# of Accidents
Sunday	3
Monday	2
Tuesday	6
Wednesday	7
Thursday	2
Friday	2
Saturday	2

Vehicle Type	# of Vehicles
Passenger Can	31
Passenger Van	3
Motorcycle	1
(Sport) Utility Vehicle	10
Medium/Heavy Trucks	1
Other Light Trucks	1
Pick Up	4

Direction of All Vehicles	# of Vehicles
NB (New London Turnpike)	16
SB (New London Turnpike)	7
Eastbound (Williams St East)	1

Time of Year	# of Accidents
December - February	6
March - May	6
June - August	7
September - November	5



STATE OF CONNECTICUT

DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
DIVISION OF TRAFFIC ENGINEERING

COLLISION DIAGRAM

PERIOD COVERED
01/01/14 TO 12/31/16

SCALE - NONE

TOWN OF GLASTONBURY

LOCATION - NEW LONDON TURNPIKE AT WILLIAMS STREET EAST, OAK STREET, AND ROUTE 17 (GLASTONBURY EXPRESSWAY) ON- AND OFF-RAMPS

COMPILED BY: SMU 10/02/17

DRAWN BY: SNB 08/11/17

A closer examination of the crash data shows a trend in crashes on the New London Turnpike. At the Oak Street and Williams Street East signalized intersection, there is a predominance of rear-end crashes taking a right onto Oak Street. There is also a predominance of angle crashes by left-turn movements throughout given the increased width of roadway due to the median. At the unsignalized intersection with the Route 17 southbound on- and off-ramps, there is a predominance of rear-end crashes due to congestion on the channelized right-turn at the Route 17 Southbound off-ramp. The majority of the crashes at the Route 17 southbound on- and off-ramps intersection occurred during the AM and PM traffic peaks. On average, a third of the total injuries occurred at one of each of the three major intersections in the study area. The right-turn rear end crash trends warranted an investigation into the yellow change and all red clearance intervals at the signalized intersection of New London Turnpike with Oak Street and Williams Street East, which were being recalculated as part of the new signal design.

8.0 INTERSECTION DESIGN STATEMENT

Preliminary Engineering
Intersection Design Statement
State Project #053-0189

Intersections #053-901 and #053-XXX
New London Turnpike at Williams Street East and Oak Street
New London Turnpike at Route 17 Southbound On- and Off-Ramps
Glastonbury, CT

State Project #053-0189 will include the realignment of the Route 17 southbound off-ramp to form a new signalized intersection with New London Turnpike and the Route 17 southbound on-ramp. This realignment will allow for the removal of the Route 17 southbound off-ramp approach from the intersection of New London Turnpike with Williams Street East and Oak Street. New signal equipment will be installed at both of these intersections, which includes provisions for emergency vehicle pre-emption and video detection at all approaches. New pedestrian push-buttons and accessible ramps will be provided at both intersections to promote pedestrian connectivity along New London Turnpike and the associated side streets.

The geometric improvements to the intersection of New London Turnpike with Oak Street and Williams Street East will include new curb radii where the Route 17 southbound off-ramp approach is being eliminated as well as the relocation of the stop bar at the Williams Street East approach by approximately 25 feet to the north to increase the signal head visibility. This signal is presently installed in a Y-span configuration and operates with an advance green phase for eastbound New London Turnpike Traffic with a right-turn overlap for southbound Oak Street traffic. This signal also operates with split phasing for the Route 17 Southbound off-ramp approach. To minimize conflicts with the existing utilities and improve the efficiency at the intersection, the new signal will be installed in a diagonal straight span configuration with dual-quad phasing. The yellow and all-red clearance intervals were recalculated based on the proposed geometric improvements and timing adjustments are included with the new design.

The new signal at the intersection of New London Turnpike with the Route 17 Southbound on- and off-ramps will be installed to provide traffic control where the channelized Route 17 Southbound off-ramp is being realigned to form the new intersection. New London Turnpike will be widened to provide an exclusive eastbound right-turn lane and an exclusive westbound left-turn lane. The new signal will be installed in a box-span configuration to promote far side signal head placement. This signal will include an advance green phase for the westbound through and left-turning traffic on New London Turnpike.

The new span pole foundations will be placed outside of the clear zone, where possible, and within the right-of-way. Utility relocations may be necessary for this project and coordination with the local utility companies will be needed to provide power to the new signals and attain the minimum clearances.

9.0 CONCLUSIONS

The 2015 existing conditions, 2019 no-build conditions, 2039 no-build conditions, 2019 build-year conditions, and 2039 design-year conditions were evaluated for the study area. The levels of service, queue, and delay within the study area are generally expected to improve with the realignment of the Route 17 southbound on and off-ramps and the enhancements along New London Turnpike. While the introduction of a new signal at the intersection of New London Turnpike and the Route 17 southbound on- and off-ramps will increase the delay at this location, the proposed changes are expected to improve the efficiency at the intersection of New London Turnpike with Williams Street East and Oak Street, where the split phasing to accommodate a fifth leg of traffic from the Route 17 southbound off-ramp will be eliminated.