

ConnDOT's CMAQ Application

All information requested below must be furnished by the project sponsor to ensure complete processing of the application. If the information requested below does not apply to your project, indicate so by writing "NA" next to the question being asked. Submit four copies of your completed application to the following address:

**Jennifer Carrier
Capitol Region Council of Governments
241 Main Street
Hartford, CT 06106**

by 10:00 a.m. January 9, 2012

Attach additional sheets of paper if you are unable to fit the information on the application.

1. Project Title : **Griswold St/House St/Harris St Intersection Realignment**

Provide a descriptive title for the project that provides enough information to identify the project.

2. Project Sponsor: **Town of Glastonbury, Connecticut**

Provide the name of the group or agency requesting the CMAQ activity or project.

3. Date: **January 6, 2012**

Provide the application submittal date.

4. Contact Information: **Daniel A. Pennington P.E.**

Town Engineer/Manager of Physical Services

Town of Glastonbury

2155 Main St

Glastonbury, CT 06033

Telephone 860-652-7736

Fax 860-652-7734

Email Daniel.pennington@glastonbury-ct.gov

Include name, title, agency, address, telephone, FAX number and email address of the individual who will be responsible for directing this project on a daily basis.

5. Town: [Town of Glastonbury CT](#)

Provide the name of the town where the project is located.

6. Regional Planning Organization (RPO) : [Capitol Region Council of Governments \(CROG\)](#)

Provide the name of the RPO(s) that serves the area where the project will be located.

7. County : [Hartford County](#)

Provide the name of the County where the project will be located.

8. CMAQ Eligible Activities

Identify the category under which the proposed project qualifies for CMAQ funding. Indicate the category for CMAQ Eligibility from the following list. Reference FHWA's October 2008 Final Program Guidance for qualifying information for each of the headings listed below. Not all possible requests for CMAQ funding are covered. To be eligible, projects must demonstrate air quality benefits.

- a. Transportation Control Measures
- b. Extreme Low-Temperature Cold Start Programs
- c. Alternative Fuels and Vehicles
- d. [Congestion Reduction and Traffic Flow Improvements](#)**
- e. Transit Improvements (new/ expanded service)
- f. Bicycle and Pedestrian Facilities and Programs
- g. Travel Demand Management (TDM)
- h. Public Education and Outreach Activities
- i. Transportation management Associations
- j. Carpooling and Vanpooling
- k. Freight/ Intermodal
- l. Diesel Engine Retrofits & Other Advanced Truck Technologies
- m. Idle Reduction
- n. Training
- o. Inspection and Maintenance (I/M) new/expanded programs
- p. Experimental Pilot Projects

Additional information regarding project eligibility may also be found on-line in the federal Highway Administration's (FHWA) Final Program Guidance located here:

http://www.fhwa.dot.gov/environment/air_quality/cmaq/policy_and_guidance

9. Project Description : [See Attached Description](#)

Provide a written description of the proposed project that identifies (as appropriate):

- a. Project Location: Indicate the street or facility name and also the project limits. For roadway projects indicate the northernmost/southernmost and/or westernmost/easternmost point of the project. For transit station, transfer center or parking projects indicate the nearest intersections. Accurate descriptions are extremely important since the emissions benefits depend on the location.
- b. Identify project objectives, and why the project is needed.

- c. If the project will require operation and maintenance three years after initial construction, submit a "systems engineering analysis" indicating how the project will be maintained and operated.

Additionally, on a separate sheet(s), provide a map of the project area that shows the proposed project location.

10. Project Schedule: See Attached Schedule

Provide the project schedule for all phases, including the start and completion dates, and project milestones. Also, provide the federal fiscal year in which each phase will begin.

11. Estimated Budget : \$ 1,455,600 (See attached detailed estimate)

Provide the total cost of the project with a breakdown by phases – Preliminary Engineering, Right-of-Way and Construction/Implementation. This includes, for example, construction estimates, equipment purchases, in-house services, and consultant services. Please use "implementation" to denote the completion of a non-construction project (e.g., purchasing buses). Good cost estimating is critical because the project sponsors will be responsible for cost overruns on selected projects. Utilize the latest ConnDOT weighted unit bid prices for project cost. The Department's cost estimating guidelines can be located at the following website: <http://www.ct.gov/dot/cwp/view.asp?a=3886&q=459664>

12. Documentation of Local Match: See transmittal letter from Town Manager Richard J. Johnson

Provide the source of the local match. This cannot be other federal funds. **If the local government will be providing the match, complete and attach a Resolution of Intent to Provide a Local Match. The local match must be a cash match.**

13. Project Assessment

To facilitate the air quality emission analysis and scoping for the proposed project, please provide the information requested below (as appropriate):

- a. If the project involves the **purchase of vehicles** the following must be included:
 - I. Number of vehicle
 - II. Type of vehicles (passenger car, school bus, truck [weight, type])
 - III. Annual average mileage anticipated per vehicle
 - IV. Average number of days per week in service
 - V. Type of alternative fuel (if applicable)
 - VI. Percent time such fuel will be used (hybrids)
 - VII. Type and fuel of vehicles being replaced if known
 - VIII. Length of route in miles (one-way)
 - IX. Number of new riders anticipated.
- b. **For signal system updates, please provide:**
 - I. The number of signals : one signal replaced , one signal modified (coordinated)

- II.** The locations : Intersection Realignment and signal replacement at Griswold St/House St/Harris St . Coordination of existing signal at Griswold St/Bantle Rd /RT 2 off ramp
- III.** Length of roadway segment : Approximately 925' between intersections
Approximately 3400' of roadway directly affected
- IV.** Roadway ADT and year of ADT: 2008 Traffic Counts
12,900 ADT west of Harris St
7500 ADT east of House St
- V.** Current speed on route and the new anticipated speed as a result of signalization
- VI.** Estimated reduction in vehicular delay. : Overall intersectional delay reduced from 156 seconds to 44 seconds. Detailed Operation Summary provided in Table 1 attached.

c. For **Diesel fuel particulate filters** and other **diesel retrofit** devices, please provide:

- I.** The type of filter
- II.** Number of vehicles
- III.** Type of vehicles (bus, tractor trailer)
- IV.** Annual mileage per vehicle
- V.** Percent of idle time.

d. Alternative Fuel Vehicles:

- I.** Number of vehicles
- II.** Type of fuel
- III.** Type of Vehicles (passenger car, school bus, truck (weight, type)
- IV.** Percentage of time if hybrid of each fuel usage
- V.** Number of annual average miles per vehicle
- VI.** Average number of days per week vehicle will be used

e. If **additional parking spaces** or **new parking lots** are constructed near mass transit stations, provide:

- I.** The number of parking spaces or new spaces (if an existing lot)
- II.** Any existing survey data which would provide O/D data from station area.

f. Incident Management:

- I.** Length of roadway where equipment will be used (in miles)
- II.** Estimated savings in Vehicle hours
- III.** VMT without an incident management system in place.

g. For **bicycle lockers or paths:**

- I.** Length of facility
- II.** Number of potential users
- III.** Number of lockers
- IV.** Survey results if available

V. Does facility have an end point in a Central Business Area?

h. Transit Projects:

- I. Project type (System start-up, service and equipment, facility improvement)
- II. Auto trips eliminated per day (round trips)

Keep in mind, the following types of projects do not historically provide enough data to prepare a quantitative analysis; therefore they will require some subjective judgments about their potential benefits, hence they are analyzed qualitatively:

- o Marketing of Transit Services
- o Telecommuting
- o Research and Support programs
- o Variable Message Signs

In all cases, please provide all necessary data (even if not listed above) to facilitate emission analysis procedures. The nature of the project defines what is needed to complete an analysis.

14. Congestion: See Attached

Indicate how the project contributes to a reduction in congestion, i.e. reduction in vehicular delay, increased travel speeds, etc.


15. Emissions Benefit: See Attached Emission Summary Report

Project sponsors can provide assumptions and related information needed to calculate a project's emissions benefit; therefore, in addition to the information requested above, if available, provide a written description of the expected air quality benefits, and attach an air quality assessment prepared by the project sponsor, including analysis of the following:

- a. • Estimate of VMT reduction
- b. • Estimate of NOX reduction
- c. • Estimate of VOC reduction
- d. • Estimate of PM reduction (for PM Non-Attainment Areas)
- e. • Expected qualitative benefits / other benefits when the above is unquantifiable

This information could be used by the Department in its air quality assessment of selected projects.

16.

Signature of Authorized Representative:  Date: January 6, 2012

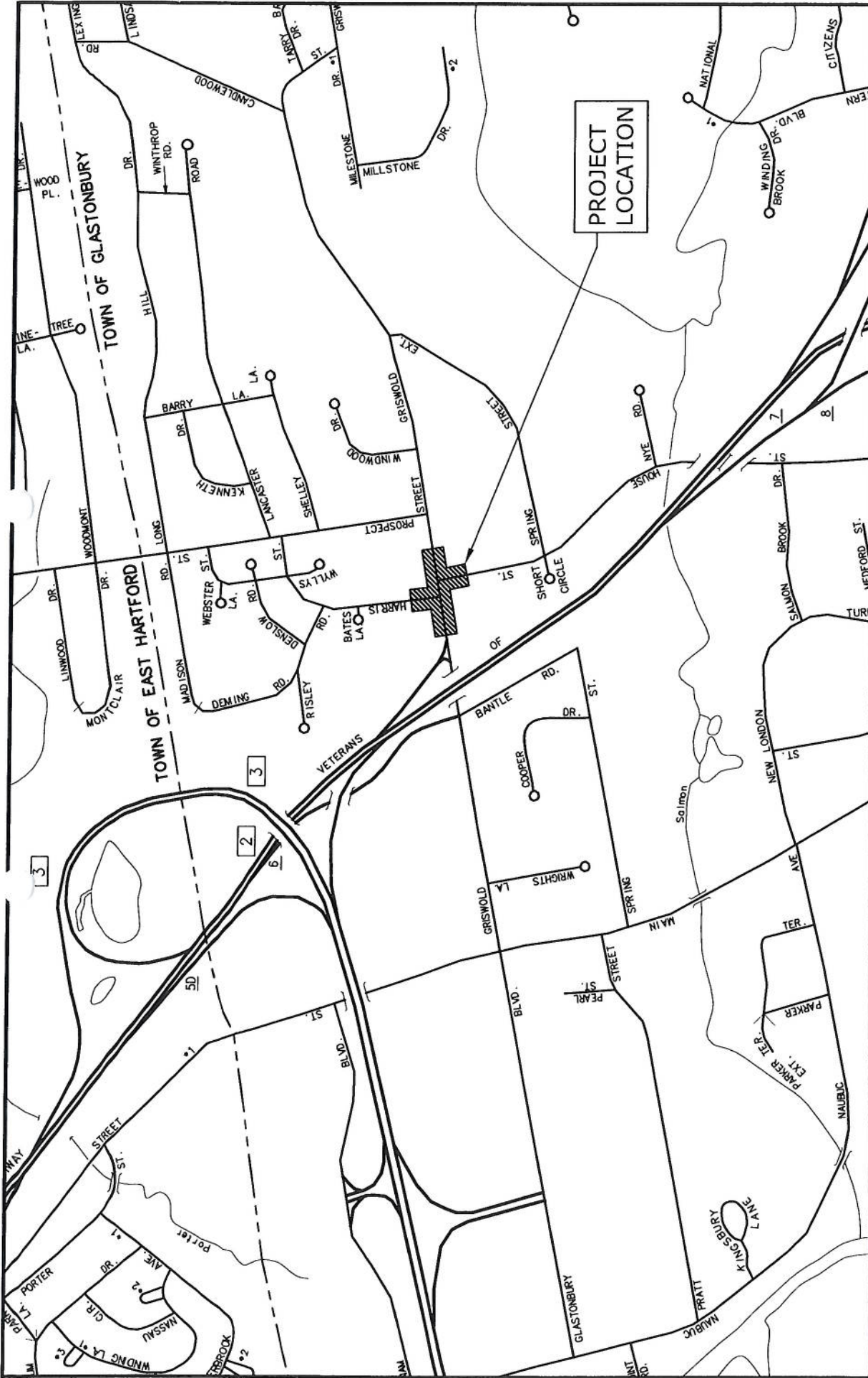
Name: Daniel A. Pennington P.E.

Title: Town Engineer/Manager of Physical Services

Item 9

Project Description

The Griswold Street and House Street/Harris Street Intersection Improvement Project involves the reconstruction of the project intersection in the northern section of the Town of Glastonbury, Connecticut. The intersection reconstruction project will realign the House Street leg to be directly opposite from Harris Street, whereas the House Street approach is currently approximately 75 feet east of Harris Street. Minor sliver widening will be required on all approaches except the westerly leg to maximize the intersection capacity. The project will also upgrade and modernize the existing traffic and pedestrian signal equipment and provide new east-west traffic signal coordination amongst Main Street, Route 2 Eastbound Off-Ramp/Bantle Road, and House Street/Harris Street intersection to enhance traffic flow in the corridor. Minor modifications and signal timing adjustments will be required at the Griswold Street and Route 2 Eastbound Off-Ramp/Bantle Road intersection in order to coordinate the traffic signals. The sidewalks within the project intersection will be widened to five feet and the sidewalk ramps reconstructed to meet current ADA standards. The proposed pedestrian signals will be Accessible Pedestrian Signals equipped with audible signals and countdown signal heads, meeting the 2009 Manual on Uniform Traffic Control Devices. Naubuc School is located 0.3 miles west of the Griswold Street and House Street/Harris Street intersection, within the corridor. Providing the pedestrian accessibility improvements at the project location will benefit the residents along the Griswold Street and House Street/Harris Street intersection, which utilize the facilities at Naubuc School. The project goal is to reduce the existing congestion and vehicle queuing at the intersection during the peak travel hours. Figure 1 shows the project location in relation to the surrounding roadway network area.



1" = 1000'

FIGURE 1

Griswold Street at House Street / Harris Street
Intersection Improvements

GLASTONBURY, CONNECTICUT

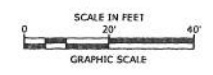
PROJECT LOCATION MAP



www.tighebond.com
 1000 Bridgeport Avenue
 Suite 320
 Shelton, CT 06484
 (203) 712-1100



PRELIMINARY DESIGN



Griswold Street at House Street/Harris Street Intersection Improvements

Town of Glastonbury

Glastonbury, CT

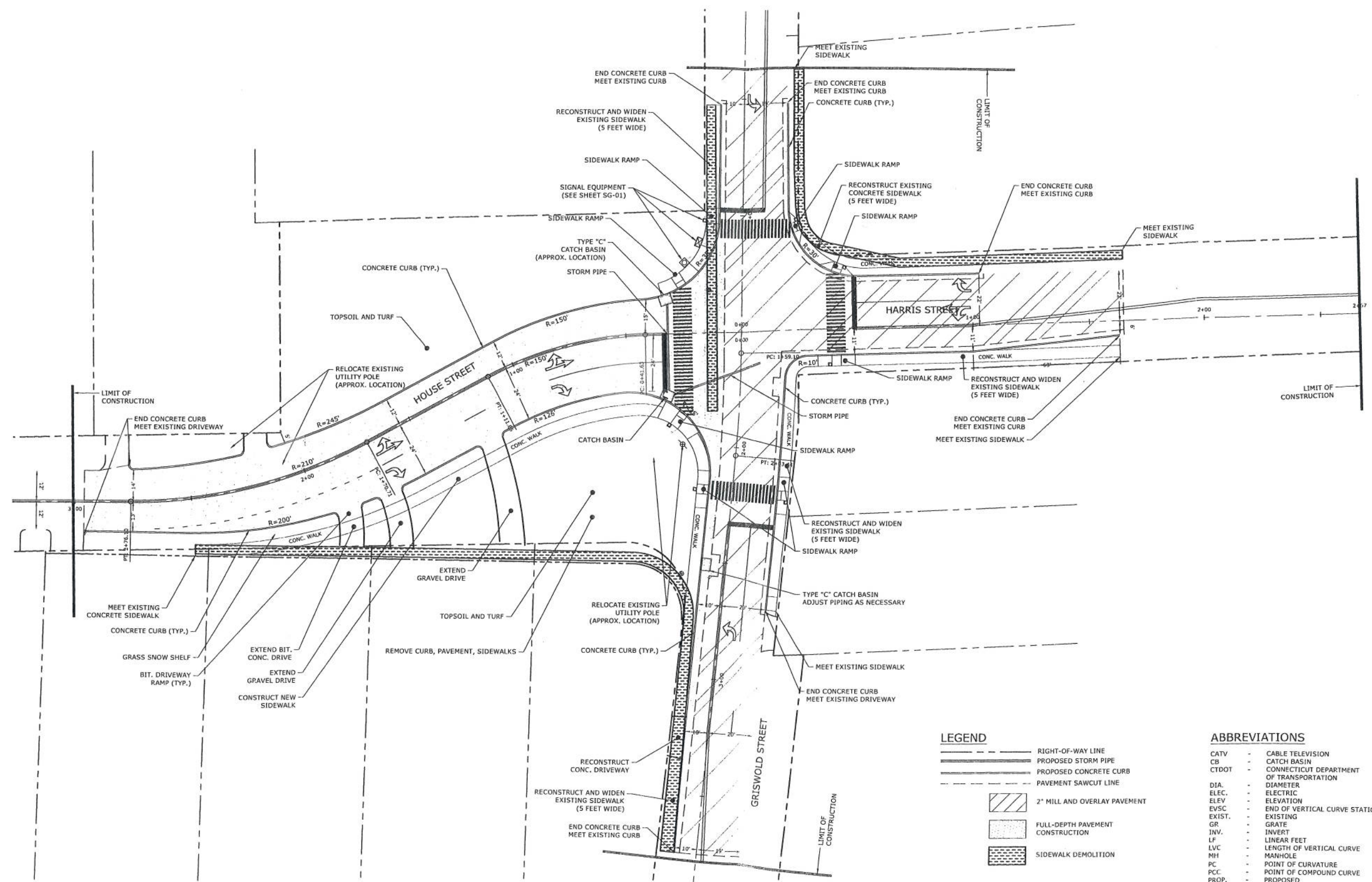
September 19, 2011

MARK	DATE	DESCRIPTION
PROJECT NO:	G-0509	
FILE:	R4-G0509-07.dwg	
DRAWN BY:	ECW	
CHECKED:	COG	
APPROVED:	JCB	

INTERSECTION IMPROVEMENT PLAN
 SCALE: 1" = 20'

RW-01

Sep 16, 2011, 11:01am Plotted By: rjm
 T:\p\11\1109\110907\Glastonbury\Signal\Drawings\110907-Harris-House-PME DESIGN\Sheets\RW-C0509-07.dwg



LEGEND

	RIGHT-OF-WAY LINE
	PROPOSED STORM PIPE
	PROPOSED CONCRETE CURB
	PAVEMENT SAWCUT LINE
	2" MILL AND OVERLAY PAVEMENT
	FULL-DEPTH PAVEMENT CONSTRUCTION
	SIDEWALK DEMOLITION

ABBREVIATIONS

CATV	- CABLE TELEVISION
CB	- CATCH BASIN
CTDOT	- CONNECTICUT DEPARTMENT OF TRANSPORTATION
DIA.	- DIAMETER
ELEC.	- ELECTRIC
ELEV.	- ELEVATION
EVSC	- END OF VERTICAL CURVE STATION
EXIST.	- EXISTING
GR	- GRATE
INV.	- INVERT
LF	- LINEAR FEET
LVC	- LENGTH OF VERTICAL CURVE
MH	- MANHOLE
PC	- POINT OF CURVATURE
PCC	- POINT OF COMPOUND CURVE
PROP.	- PROPOSED
PT	- POINT OF TANGENCY
PVC	- POLYVINYL CHLORIDE PIPE
PVI	- POINT OF VERTICAL INFLECTION
RCP	- REINFORCED CONCRETE PIPE
RF	- ROOF LEADER
SAN	- SANITARY
STA	- STATION
STD.	- STANDARD
TEL	- TELEPHONE
TD	- TRENCH DRAIN

Item 10 Project Schedule

- Award Date:
- Project Scope Development and Consultant Selection Process: 5 months
Includes CONNDOT Project Concept Unit review, consultant selection via quality-based selection criteria, consultant fee negotiation, development of Town/State design agreement, etc.
- Design Process: 6 months
Includes Town and CONNDOT review at preliminary and final design stages. Includes consultant response to comments, specification development, and public hearing/public notification requirements.
- Advertising/Bid Award: 2 months
Includes obtaining permission to advertise, bid review, reference verification, obtaining permission to award, issuance of notice to proceed, etc.
- Construction: 6 months
Includes lead time on ordered signal equipment, mobilization, signal coordination, etc.

Item 11
Estimated Budget

Cost Summary: Construction Costs

Town: Glastonbury

Project: Griswold St/House St/Harris St Intersection Realignment

1. Construction Items (from your itemized estimate)	\$684,414
2. Minor Items (25% or less) 15%	102,662
3. SUM of 1 and 2	787,076

Lump sum items (estimate as % of line 3 using percentages suggested below)

4. Clearing & Grubbing	2%	15,742
5. Mobilization	7.5%	59,031
6. Maintenance & protection of traffic	4%	31,483
7. Construction Staking	1%	7,871
8. Environmental Considerations	12%	0
9. Inflation (5% per year - assume 4 years)	20%	157,415
10. SUM of 4 thru 9		271,542

11. Total contract items (Add lines 3 & 10)	1,058,618
12. Contingencies (10 % of line 11)	105,862

13. Contract items & contingencies (Add lines 11 & 12)	1,164,480
14. Incidentals (25% or 30% of line 13) (30% for projects under \$1,000,000) 25%	291,120
15. Trafficperson (included in construction items)	0
16. Utilities (enter only if on State roads or MDC)	0
17. Railroad force account	0

18. TOTAL CONSTRUCTION COST (sum of lines 13 thru 17)	\$1,455,600
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OPINION OF PROBABLE COST**Intersection Improvements****Griswold Street at House Street / Harris Street****Town of Glastonbury, Connecticut**

Calculated By: ECW

Checked By: COG

Date: September 15, 2011

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
0202001	Earth Excavation	C.Y.	90	\$37.50	\$3,375.00
0202513	Removal of Existing Concrete Sidewalk	S.Y.	415	\$15.00	\$6,225.00
0202522	Removal of Bituminous Pavement	S.Y.	135	\$6.75	\$911.25
0202529	Cut Bituminous Concrete Pavement	L.F.	870	\$4.00	\$3,480.00
0207004	Borrow	C.Y.	3,095	\$14.00	\$43,330.00
0406267	Milling of Bituminous Pavement	S.Y.	1,455	\$7.50	\$10,912.50
	Bituminous Concrete Overlay	S.F.	14,115	\$1.58	\$22,301.70
	Pavement Structure (Arterial-Griswold)*	S.F.	2,213	\$12.00	\$26,556.00
	Pavement Structure (Collector- House/Harris)*	S.F.	10,110	\$8.75	\$88,462.50
0507001	Type "C" - CB	EA	3	\$3,000.00	\$9,000.00
0651011	12" Rigid Concrete Pipe	L.F.	90	\$52.00	\$4,680.00
0811001	Concrete Curb	L.F.	1,180	\$35.00	\$41,300.00
0815091	Removal of Bituminous Concrete Curb	L.F.	1,210	\$3.00	\$3,630.00
0921001	Concrete Sidewalk	S.F.	4,820	\$12.50	\$60,250.00
0921011	Concrete Driveway	S.F.	100	\$15.00	\$1,500.00
0922501	Bituminous Concrete Driveway	S.Y.	20	\$36.00	\$720.00
0922503	Gravel Driveway	S.Y.	60	\$22.00	\$1,320.00
0944002	Furnishing and Placing Topsoil	S.Y.	1,925	\$6.50	\$12,512.50
0950005	Turf Establishment	S.Y.	1,925	\$2.50	\$4,812.50
0970006	Trafficperson (Police)	\$/HR	800	\$75.00	\$60,000.00
0970007	Trafficperson (Uniformed Flagger)	\$/HR	800	\$55.00	\$44,000.00
	New Traffic Signal	L.S.	1	\$200,000.00	\$200,000.00
1118010	Removal of Existing Traffic Signal Equipment	L.S.	1	\$3,000.00	\$3,000.00
1208928	Signage	S.F.	80	\$65.00	\$5,200.00
1208996	Metal Sign Post	EA	9	\$73.00	\$657.00
1210101	Epoxy Paint - 4" White	L.F.	275	\$0.50	\$137.50
1210102	Epoxy Paint - 4" Yellow	L.F.	1,460	\$0.50	\$730.00
1210104	Epoxy Paint - 8" White	L.F.	850	\$0.75	\$637.50
1210105	Epoxy Paint - Symbols And Legends	S.F.	160	\$4.09	\$654.40
1210106	Epoxy Paint - 12" White	L.F.	95	\$1.25	\$118.75
	Relocation of Existing Utility Pole	EA	3	\$8,000.00	\$24,000.00

Unit Price Subtotal \$684,414.10**NOTE:**

- * Pavement composite includes HMA lifts, subbase course, tack coat, and formation of subgrade
 Arterial - 4" HMA 0.5 inch, 6" HMA 1.0 inch on 14" Subbase
 Collector - 3" HMA 0.5 inch, 6" HMA 1.0 inch on 10" Subbase

Item 14 Congestion

The Griswold Street and House Street/Harris Street intersection operates at overall LOS F during the weekday afternoon peak hours and at an overall LOS D during the Saturday midday peak hours. The intersection overall LOS is expected to remain in the 2030 No-Build conditions with increased average delays.

Within the proposed improvements, the intersection overall LOS will be improved to LOS D during the weekday afternoon peak hours, and LOS C during the Saturday midday peak hours. The intersection average delays will be reduced from 156 seconds per vehicle to 44 seconds per vehicle during the afternoon peak hours, and from 48 seconds per vehicle to 26 seconds per vehicle during the Saturday midday peak hours. The Griswold Street eastbound approach will be improved to operate at LOS E, with average delays reduced from 297 seconds per vehicle to 56 seconds per vehicle, a significant 81% reduction with resulting decreases in queue lengths.

The Griswold Street and Route 2 Eastbound Off-Ramp/Battle Road traffic signal operates at overall LOS B during both study peak hours currently, and will continue to operate at overall LOS B during the 2030 No-Build, and 2030 Building conditions. Because the coordinated signal will be less traffic responsive to serve the demand coming off Route 2, the southbound approach, therefore, will be impacted to operate at reduced LOS in order to improve the traffic flow on Griswold Street and the operation at the House Street/Harris Street intersection. However, the Off-Ramp has significant storage for queued vehicles to accommodate this reduced operation.

Queue Analyses

The Griswold Street and House Street/Harris Street intersection currently operates with significant 95th percentile queues on all approaches except the Harris Street southbound during both study peak hours. This condition is expected to worsen in the 2030 No-Build condition. Under the 2030 No-Build condition, the Griswold Street eastbound will operate with 50th percentile queue of 790 feet, and 95th percentile queue of 1,335 feet. The westbound approach will operate with 50th percentile queue of 395 feet, and 95th percentile queue of 815 feet. The House Street northbound approach will operate with 50th percentile queue of 260 feet, and 95th percentile queue of 615 feet.

With the proposed improvements, the Griswold Street eastbound 50th and 95th percentile queues will reduce to 640 feet and 1,210 feet respectively. The Griswold Street westbound 50th and 95th percentile queues will reduce to 280 feet and 710 feet respectively. The House Street northbound 50th and 95th percentile queues will reduce to 140 feet and 245 feet respectively. These are significant reductions in queuing on House Street during the peak hours.

The 95th percentile queue on Griswold Street will remain longer than desired, primarily due to the longer pedestrian crossing phase as required by the current standards. This 95th percentile queues during the peak hours will likely occur only when the pedestrian phase is actuated, reducing the capacity of the intersection. The queue calculations assumed a minimum number of ten pedestrian actuations per hour. If these actuations are less, then the vehicle queuing will be potentially less than 1,000 feet. In addition, the 50th percentile vehicle queues will be significantly reduced by a minimum of 20 percent, in addition to the aforementioned reduction in average delays.

TABLE 1
Intersection Operation Summary - Vehicular Levels of Service / Average Delay (sec/veh)

Lane Use	Weekday Afternoon Peak Hour			Saturday Midday Peak Hour		
	2010 Existing	2030 No-Build	2030 Build	2010 Existing	2030 No-Build	2030 Build
Traffic Signal - Griswold Street at Route 2 Eastbound Off Ramp / Bentle Street						
Overall	B / 15.5	B / 17.8	B / 18.6	B / 10.8	B / 13.3	B / 12.0
Griswold St	EBT B / 19.8	C / 23.8	B / 14.9	B / 12.3	B / 15.0	A / 5.5
Griswold St	WBT A / 9.9	B / 11.8	B / 14.5	A / 9.8	B / 10.5	A / 5.1
Bentle St	NBT A / 0.2	A / 0.2	A / 0.3	A / 7.0	B / 16.6	D / 37.3
Rt 2 EB Off Ramp	SBT C / 24.3	C / 24.8	E / 55.8	B / 17.0	C / 22.4	E / 56.0
Rt 2 EB Off Ramp	SBR A / 4.4	A / 4.3	A / 6.2	A / 5.0	A / 5.3	A / 8.9
Traffic Signal - Griswold Street at Harris Street / House Street						
Overall	F / 136.6	F / 155.6	D / 43.6	D / 39.2	D / 48.4	C / 25.6
Griswold St	EBL C / 20.7	C / 21.6	A / 6.9	B / 17.7	B / 18.5	B / 11.0
Griswold St	EBT F / 261.4	F / 297.1	E / 55.7	D / 45.7	E / 66.0	C / 23.4
Griswold St	WBL C / 26.8	C / 29.6	D / 42.7	C / 26.0	C / 30.3	B / 12.9
Griswold St	WBT D / 45.2	E / 58.4	C / 23.2	C / 32.6	D / 35.9	B / 19.9
House St	NBL --/--	--/--	--/--	--/--	--/--	--/--
House St	NBT D / 54.5	E / 70.0	--/--	D / 44.0	D / 48.1	--/--
House St	<NBT --/--	--/--	E / 64.9	--/--	--/--	D / 47.4
House St	NBR --/--	--/--	D / 35.8	--/--	--/--	C / 29.5
Harris St	SBT D / 48.0	D / 48.4	--/--	D / 47.2	D / 47.9	--/--
Harris St	<SBT --/--	--/--	D / 50.4	--/--	--/--	D / 43.8
Harris St	SBR --/--	--/--	E / 60.9	--/--	--/--	E / 55.3

NOTE:

- < Shared left and through lane
- > Shared right and through lane

TABLE 2

Intersection Operation Summary - Vehicular 50th / 95th Percentile Queue (In Feet)

Lane Use	Available Storage	Weekday Afternoon Peak Hour			Saturday Midday Peak Hour			
		2010 Existing	2030 No-Build	2030 Build	2010 Existing	2030 No-Build	2030 Build	
Traffic Signal - Griswold Street at Route 2 Eastbound Off Ramp / Bentle Street								
Griswold St	EBT>	1800	170 / #453	195 / #505	88 / #922	99 / 202	136 / 310	220 / 57
Griswold St	<WBT	230	60 / 143	72 / 176	65 / m321	66 / 136	78 / 180	97 / 126
Bentle St	<NB>	>1000	0 / 0	0 / 0	0 / 0	1 / 24	12 / 45	30 / 67
Rt 2 EB Off Ramp	<SBT	>1000	61 / 118	65 / 125	159 / 223	21 / 68	39 / 109	97 / 162
Rt 2 EB Off Ramp	SBR	500	0 / 36	0 / 37	0 / 53	0 / 36	0 / 42	0 / 56
Traffic Signal - Griswold Street at Harris Street / House Street								
Griswold St	EBL	200	20 / 60	22 / 66	12 / m23	12 / 42	14 / 46	5 / m36
Griswold St	EBT>	750	~728 / #1251	~791 / #1336	638 / #1207	279 / #636	333 / #749	148 / #643
Griswold St	WBL	170	35 / #107	39 / #128	33 / #164	39 / #109	40 / #138	25 / 84
Griswold St	WBT>	>1000	314 / #710	~396 / #815	280 / #712	245 / #557	281 / #639	201 / #528
House St	<NBT>	>1000	228 / #538	260 / #612	-- / --	180 / #420	206 / #484	-- / --
House St	<NBT	>1000	-- / --	-- / --	141 / #244	-- / --	-- / --	99 / 166
House St	NBR	200	-- / --	-- / --	136 / 212	-- / --	-- / --	105 / 172
Harris St	SBT	>1000	43 / 102	48 / 110	-- / --	36 / 89	40 / 97	-- / --
Harris St	<SBT	>500	-- / --	-- / --	19 / 49	-- / --	-- / --	10 / 30
Harris St	SBR	100	-- / --	-- / --	40 / 83	-- / --	-- / --	36 / 77

NOTE:

- < Shared left and through lane
- > Shared right and through lane
- ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Griswold / Harris / House Street Intersection Improvement Emission Summary Report Town of Glastonbury

January 2012

Project Description

The intersection of Griswold Street, Harris Street, and House Street in Glastonbury is currently an offset intersection with separate signal times for Harris Street and House Street. This project will realign the intersection such that it will function as a standard four way junction, as well as coordinating signals with existing intersections along Griswold Street. These improvements are intended to ease congestion and improve air quality.

Emission Analysis

Realignment of an offset intersection for the purpose of reduced queuing is comparable to other signal system improvements in regards to air quality analysis. Therefore, similar assumptions for changes in average speed can be made for emission reduction calculations.

Assuming the initial average congested speed of 20 mph, vehicular speeds would increase to 21.8 mph¹. VOC and NOx factors were computed for each of these speeds using model year 2012 and then multiplied by the VMT accrued in the project area to determine emission production. The results have been tabulated and are shown below using the following Mobile 6.2 emission factors:

<u>Greater CT Area:</u>	<u>VOC</u>	<u>NOx</u>
Base 20.0 mph	0.505 g/mi	0.504 g/mi
Upgrade 21.8 mph	0.489 g/mi	0.491 g/mi

The section of Griswold Street in Glastonbury impacted by this project is broken down into segments between Main Street and the Harris / House Street intersection. The following table lists the segment descriptions and their corresponding segment numbers for use in the attached emission calculation spreadsheet.

1. This work is documented in the report "Before and After Evaluation of Computerized Urban Traffic Control Systems in the Greater Hartford Area".

<u>Segment Description</u>	<u>#</u>
Main St to Brewster Rd	1
Brewster Rd to Bantle Rd	2
Bantle Rd to Route 2 Onramp	3
Route 2 Onramp to Harris St / House St	4

Glastonbury Griswold St / Harris St / House St Intersection Improvement Emission Summary Report

January 2012

Traffic Flow Improvements

Proj No.	Segment	Start Mile	End Mile	Segment Length (miles)	2011 ADT**	2011 VMT	VOC Base (Kg)	VOC Upgrade (Kg)	VOC Change (Kg)	NOx Base (Kg)	NOx Upgrade (Kg)	NOx Change (Kg)
Griswold St (Gtr CT Area)	1	0.00	0.08	0.08	12,665	1,013	0.51	0.50	-0.02	0.51	0.50	-0.01
	2	0.08	0.35	0.27	12,534	3,384	1.71	1.65	-0.05	1.71	1.66	-0.04
Glastonbury	3	0.35	0.41	0.06	11,706	702	0.35	0.34	-0.01	0.35	0.34	-0.01
	4	0.41	0.51	0.10	14,205	1,421	0.72	0.69	-0.02	0.72	0.70	-0.02
Subtotal							3.29	3.19	-0.10	3.29	3.20	-0.08

** 2011 ADT acquired from the Town of Glastonbury

The emission reductions for the year 2012 are:

VOC: 0.10 kg/day
NOx: 0.08 kg/day

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