



TO:	Nicole Freedman, City of Newton	DATE:	April 19, 2022
FROM:	Kayla Sousa, P.E., HSH Jessica Lizza, P.E., HSH	HSH PROJECT NO.:	2019063.01
SUBJECT:	#610674 Newton Carriageway Response to City Council Comments		

Howard Stein Hudson (HSH) has prepared this Technical Memorandum to respond to comments from the City of Newton City Council related to the Commonwealth Avenue (Route 30) Newton Carriageway Reconstruction Project. A Public Facilities meeting was held on April 6, 2022, to vote on the proposed design at the Ash Street intersection and the following questions arose from Councilors both during and following the meeting.

Response to Comments

GENERAL COMMENTS

1) *Explain the timeline of traffic data and COVID.*

Traffic data was taken twice for this project. The first data collection occurred before COVID as follows:

- Thursday, February 27, 2020, and on Saturday, February 29, 2020: 13-hour intersection turning movement counts at Commonwealth Avenue and Islington Road (fair weather was confirmed prior to counts being collected).
- Thursday, February 27, 2020, Saturday, March 7, 2020: 13-hour intersection turning movement counts at Commonwealth Avenue and Ash Street (fair weather was confirmed prior to counts being collected).
- Automatic Traffic Recorder (ATRs) were recorded for seven days at five locations between February 25, 2020, and March 2, 2020.

The Governor declared a state of emergency in Massachusetts on March 10, 2020. Newton Public Schools closed on March 13, 2020. All traffic count data is grown seasonally to reflect the average month per Massachusetts Department of Transportation (MassDOT) Traffic Guidelines. All 2020 traffic data was taken before the declared state of emergency or school closures in Massachusetts.

The next time traffic counts were taken were in June 2021 after working closely with the Parks and Recreation Department to ensure that traffic count data was collected when activity had resumed at Lyon's Field to pre-pandemic levels. June 2021 coincides with the lowest seven-day average of COVID cases in Massachusetts. Analysis of the data showed that vehicular volumes at the



intersection were approximately 10% lower overall with less pronounced peaks. Pedestrian activity was significantly higher than the March 2020 data, but the crossing of Commonwealth Avenue at Ash Street still did not meet any warrants for a signal or a pedestrian-activated hybrid beacon. This was true even if the pedestrian volumes were paired with the higher vehicular volumes from February 2020 that were seasonally adjusted.

- 2) *Can the circulation of the Carriageway be adjusted so that it is eastbound until Melrose Street, allowing Islington residents to use that signal?*

Switching the circulation to Melrose Street provided an option that could alleviate the concern residents have for turning left at an unsignalized intersection. In response, the team evaluated the option which would send all left-turning traffic from Islington Road to turn at Melrose Street. The preliminary analysis showed that the increase in traffic to the Melrose Street approach would create additional delay at a signal which is already approaching its capacity.

- 3) *Can a signal be installed at Islington Road?*

A signal warrant analysis was performed at Islington Road under existing conditions, as well as using the projected volumes under the preferred alternative where more traffic is re-routed here due to the closure of the Carriageway approach at Ash Street. The analysis shows that a signal at Islington Road is not warranted per the *Manual on Uniform Traffic Control Devices (MUTCD)*.

- 4) *What are the delay comparisons like at Ash Street under the 3 concepts now under consideration?*

To compare delay at Ash Street under the three concepts, estimated delay and queue lengths are summarized. The future traffic analysis accounts for any traffic re-routing anticipated plus the additional traffic projected from the Ash Street development and a background traffic growth of 0.5% per year for 10 years.

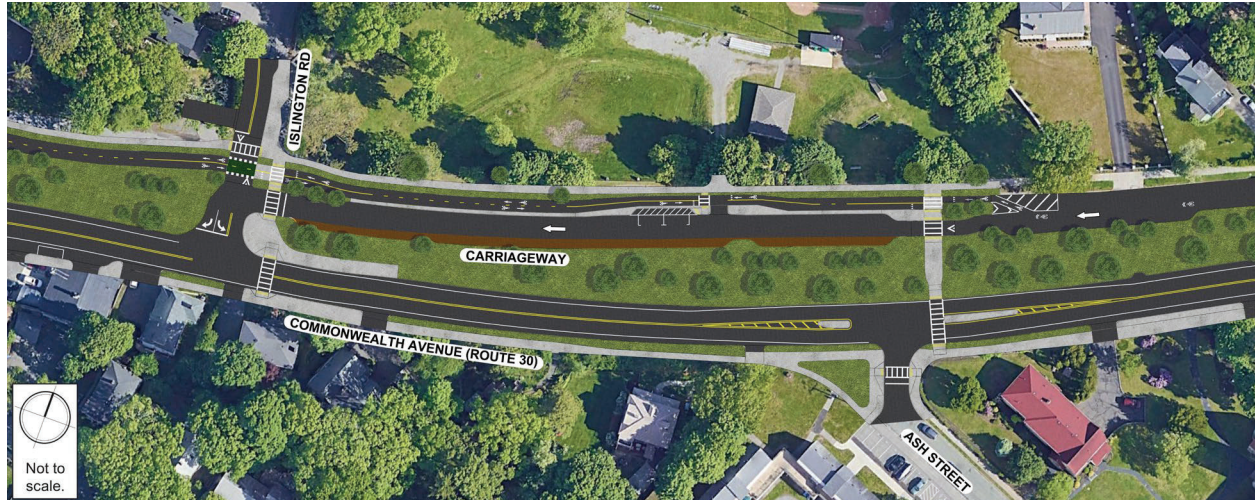
Below is a description of the concepts being considered, since the Preferred Alternative has been updated since the City Council meeting last week to include a right-turn lane and a left-turn lane, and a third option has been added, as well.

Following the descriptions, summary tables are provided to compare intersection delay at Ash Street and Islington Road for each concept. **Table 3** includes a full summary of the analysis, including queues and level of service (LOS) in comparison to No Build.

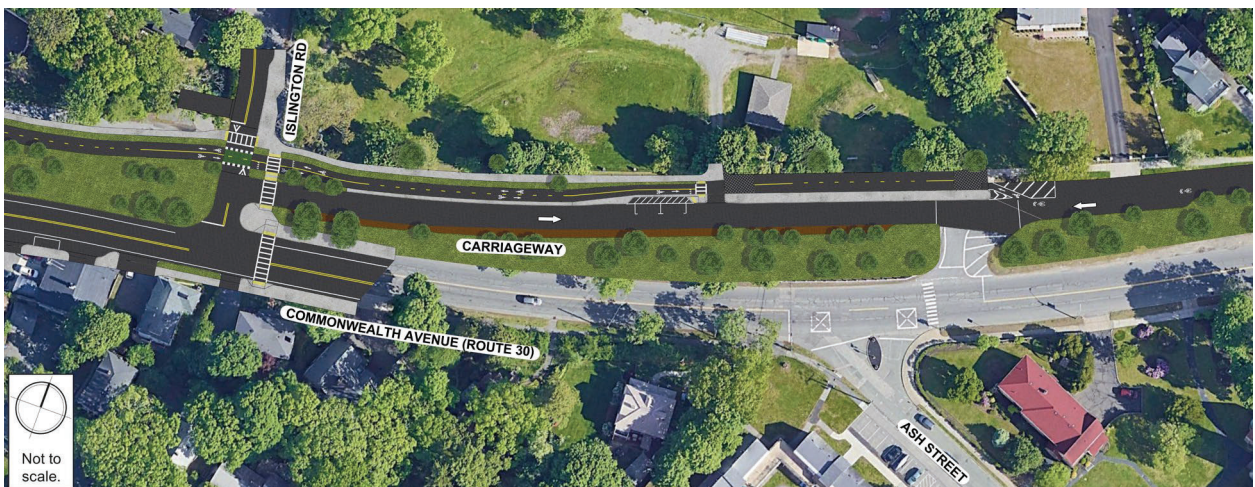


BRIEF DESCRIPTION OF THE THREE CONCEPTS

Alternative 1, referred to in the Islington Public Meeting as “Preferred Design (with Ash),” proposes to convert the Carriage Road to be one-way westbound and close the Carriageway approach opposite Ash Street. The Commonwealth Avenue at Ash Street intersection would be three legs with Ash Street stop controlled. The intersection of Islington Road at Commonwealth Avenue would continue to be stop controlled and Islington would be provided a left-turn lane and a right-turn lane.



Alternative 2, referred to in the Islington Public Meeting as “Alt Design (w/out Ash),” excludes the Ash Street intersection from the Project limits. The existing signal at Ash Street and circulation of the Carriage Road would remain. The only change in movements at the Islington Road intersection would be that west of Islington Road, the Carriage Road would still be closed. Therefore, vehicles turning right from Islington Road onto the Carriage Road today would need to turn right onto Commonwealth Avenue in the future condition.





Alternative 3 proposes to maintain existing circulation and keep open the Carriage Road approach to Commonwealth Avenue opposite Ash Street. However, the existing signal would be removed and a four-legged intersection with Ash Street and the Carriage Road connection would be provided with Ash Street and Carriage Road both being stop-controlled.

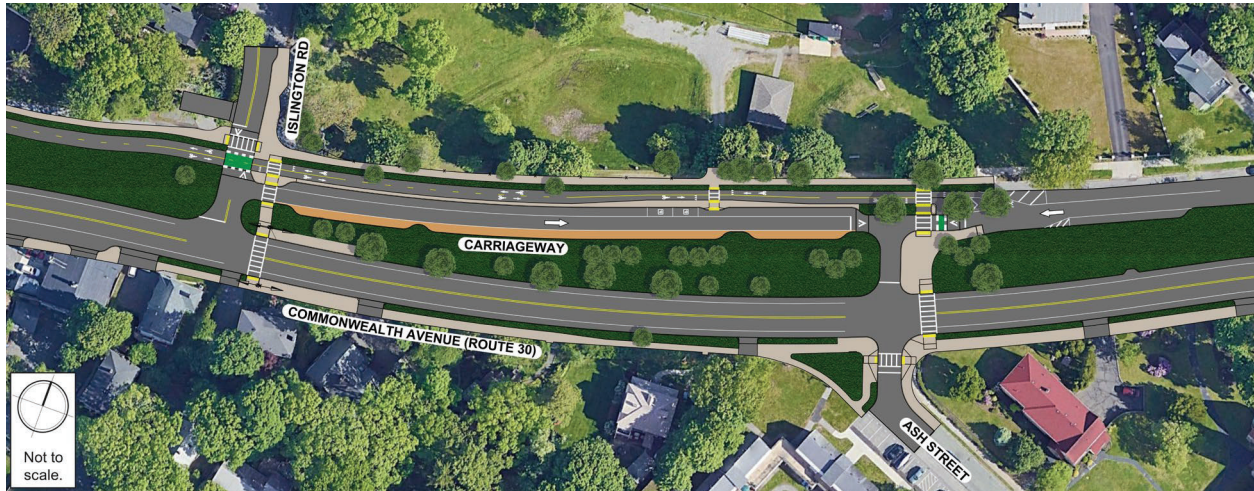


Table 1. Ash Street Approach Comparison of Control Delay (NB left/right)

Time Period	#1 Preferred Design (stop-controlled, Carriageway approach closed)	#2 Alternative Design (signalized, existing circulation)	#3 New “Option 3” (stop-controlled, Carriageway approach open)
a.m. Peak Hour	72 seconds	36 seconds	126 seconds
p.m. Peak Hour	45 seconds	48 seconds	66 seconds
Saturday Peak	36 seconds	45 seconds	51 seconds

The delay experienced by drivers on Ash Street during the p.m. and Saturday peak hours is similar in Alternatives 1 and Alternatives 2 because the existing signal does not respond to the Ash Street demand as quickly as there may be gaps in Commonwealth Avenue traffic for drivers to turn off Ash Street. The a.m. peak hour has the worst operations for Alternatives 1 and 3 due to fewer available gaps in traffic along Commonwealth Avenue during this period. Outside of the a.m. peak hour, however, operations for the stop-controlled and signalized Ash Street intersection options are similar, and drivers along Commonwealth Avenue will experience less delay at the intersection under the stop-controlled option.



Table 2. Islington Road Approach Comparison of Control Delay (SB left/right)

Time Period	#1 Preferred Design (stop-controlled, Carriageway approach closed)	#2 Alternative Design (signalized, existing circulation)	#3 New "Option 3" (stop-controlled, Carriageway approach open)
a.m. Peak Hour	106 seconds	50 seconds	75 seconds
p.m. Peak Hour	48 seconds	35 seconds	46 seconds
Saturday Peak	32 seconds	32 seconds	32 seconds

It is important to note that the delays listed are based on approach delays. This delay is calculated as a weighted average of the movements. Because Alternative 1 provides separated turning lanes, the detailed delay by specific movement is provided in **Table 3**. Due to the additional volume rerouted to Islington Road under Alternative 1, this results in the largest delay for motorists out of the alternatives.



TECHNICAL MEMORANDUM
 Newton Carriageway City Council Responses
 April 19, 2022

Table 3. Traffic Operation Comparison of Alternatives (2030)

Intersection/Movement	LOS	Delay (Seconds) ¹	95 th Queue Length (# Cars)	LOS	Delay (Seconds) ¹	95 th Queue Length (# Cars)	LOS	Delay (Seconds) ¹	95 th Percentile Queue Length (# Cars)	LOS	Delay (Seconds)	95 th Percentile Queue Length (# Cars)
	No-Build (Existing Circulation and Signal Remains)			Alternative 1 (WB Circulation on Carriageway and Closing Carriageway access opposite Ash St)			Alternative 2 (Remove Ash St Intersection from Project Limits)			Alternative 3 (Maintain Circulation, Stop Controlled)		
a.m. Peak Hour												
Commonwealth Avenue/Islington Road	-	-	-	-	-	-	-	-	-	-	-	-
Commonwealth EB left/thru	B	11	0	B	10	0	B	11	0	B	11	0
Commonwealth WB thru/right	A	0	0	A	0	0	A	0	0	A	0	0
Islington SB left	F	66	1	F	153	3-4	E	50	1	F	75	1-2
Islington SB right				C	18	0-1						
Commonwealth Avenue/Ash Street	C	25	-	-	-	-	C	25	-	-	-	-
Commonwealth EB thru	B	17	35	A	0	0	B	17	35	A	0	0
Commonwealth WB thru	C	32	40	A	0	0	C	32	40	A	0	0
Ash NB left/right	D	36	1-2	F	72	1-2	D	36	1-2	F	126	2
Carriageway SB left/right	C	34	0	-	-	-	C	34	0	F	113	2-3
p.m. Peak Hour												
Commonwealth Avenue/Islington Road	-	-	-	-	-	-	-	-	-	-	-	-
Commonwealth EB left/thru	A	10	0	A	10	0	A	10	0	A	10	0
Commonwealth WB thru/right	A	0	0	A	0	0	A	0	0	A	0	0
Islington SB left	E	42	0-1	F	64	1	E	35	0-1	E	46	1
Islington SB right				C	18	0						
Commonwealth Avenue/Ash Street	B	13	-	-	-	-	B	13	-	-	-	-
Commonwealth EB thru	B	11	28	A	0	0	B	11	28	A	0	0
Commonwealth WB thru	B	13	36	A	0	0	B	13	36	A	0	0
Ash NB left/right	D	48	1-2	E	45	1	D	48	1-2	F	66	1-2
Carriageway SB left/right	D	45	0	-	-	-	D	45	0	E	48	1
Saturday Peak Hour												
Commonwealth Avenue/Islington Road	-	-	-	-	-	-	-	-	-	-	-	-
Commonwealth EB left/thru	A	10	0	A	10	0	A	10	0	A	10	0
Commonwealth WB thru/right	A	0	0	A	0	0	A	0	0	A	0	0



Intersection/Movement	LOS	Delay (Seconds) ¹	95 th Queue Length (# Cars)	LOS	Delay (Seconds) ¹	95 th Queue Length (# Cars)	LOS	Delay (Seconds) ¹	95 th Percentile Queue Length (# Cars)	LOS	Delay (Seconds)	95 th Percentile Queue Length (# Cars)
	No-Build (Existing Circulation and Signal Remains)			Alternative 1 (WB Circulation on Carriageway and Closing Carriageway access opposite Ash St)			Alternative 2 (Remove Ash St Intersection from Project Limits)			Alternative 3 (Maintain Circulation, Stop Controlled)		
Islington SB left	D	33	0-1	E	45	1	D	32	0-1	D	32	0-1
Islington SB right				C	17	0-1						
Commonwealth Avenue/Ash Street	B	14	-	-	-	-	B	14	-	-	-	-
Commonwealth EB thru	B	10	22	A	0	0	B	10	22	A	0	0
Commonwealth WB thru	B	15	35	A	0	0	B	15	35	A	0	0
Ash NB left/right	D	45	2	E	36	1	D	45	2	F	51	1-2
Carriageway SB left/right	D	45	0	-	-	-	D	45	0	E	36	0-1

1. The Delay for an approach is calculated as the average of the delay for each lane/movement at the approach, weighted by the volume for each lane/movement.



5) *Is a roundabout at Islington Road or Ash Street a feasible solution?*

HSH has evaluated a modern roundabout at Islington Road at the request of the Complete Streets Working Group. As part of the 25% design process, a roundabout at Ash Street was evaluated and deemed infeasible as discussed in the Functional Design Report (FDR) due to safety and geometric concerns. To make up the elevation difference between the Carriageway and Ash Street, a steep approach profile would be needed that would create sight distance issues and increase the difficulty of vehicles navigating into the intersection from the carriageway.

Single lane roundabouts and mini-roundabouts were both evaluated at Islington Road. Single-lane roundabouts require a larger circle diameter to allow for a raised center island with truck turns navigating around that island. A mini-roundabout requires less space by maintaining a mountable center island that trucks can drive over to navigate in and out of Islington Road. A compact roundabout is described in the MassDOT *Roundabout Design Guide* as an alternative option to a single-lane roundabout for a constrained location that still includes a smaller raised center island with a mountable apron that is mountable.

COMPACT SINGLE LANE ROUNDABOUT

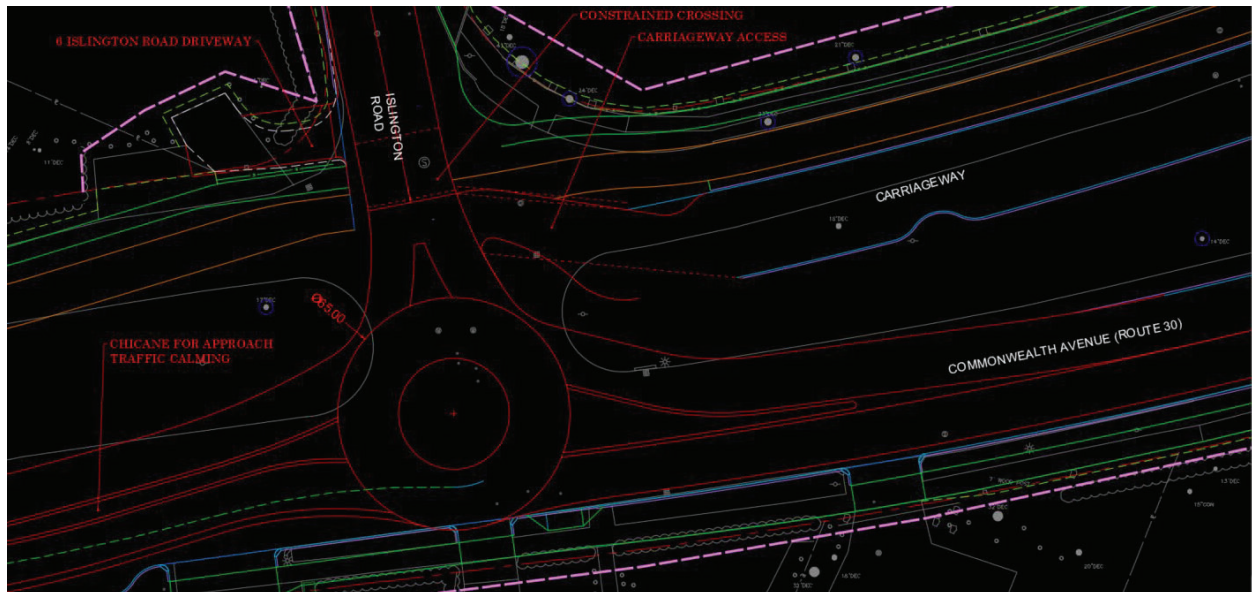
The required diameter circle for single lane roundabout would need to provide entrances for both the Carriageway and Islington Road into the roundabout near each other – a design which presents concerns related to the additional conflicts between cars exiting the Carriageway and entering and exiting Islington Road without proper space to negotiate with each other. A compact single lane roundabout was evaluated to reduce the circle size such that the Carriageway could still enter in at Islington Road rather than the roundabout circle, mitigating these conflicts.

To design and construct a roundabout at this location, some or all following impacts may occur:

- Loss of parking spaces on the Carriageway;
- Re-routing the Carriageway to either enter Commonwealth Avenue earlier to avoid the additional roundabout approach leg;
- Loss of green space in the medians; and
- Convert the separated bicycle and pedestrian facilities to a shared use path or relocate the driveway at 6 Islington Road to push the crossing at Islington Road up.



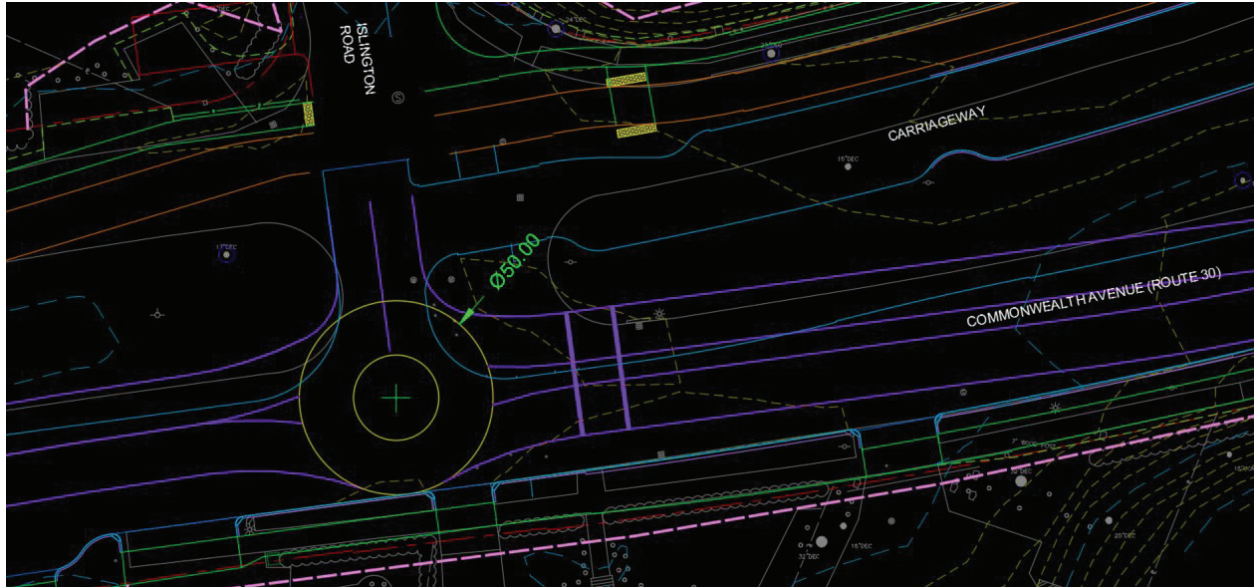
A basic sketch is included below to visually display a potential compact single-lane roundabout and how it would fit in this area. The draft roundabout linework is shown in red overlaid on to the current design. The sketch shows a 65-foot circle diameter, which is below the recommended minimum of 90-feet for a single lane roundabout based on the Federal and MassDOT Design Roundabout Guidance, but accommodates turns at this location for the 30-foot Single unit truck design vehicle, while incorporating a small raised center island. Approach roadways presented in this exercise are conceptual, since removing the conflicts with the Carriageway leg would require some of the impacts described above. This design can be evaluated further at the City's request.





MINI-ROUNABOUT

A mini-roundabout is the only roundabout type that would fit within the Islington Road intersection without the significant impacts discussed above. A diameter of 50-feet is shown below, which is within the suggested range of this type of circular intersection (45 to 80 feet by Federal Highway Administration (FHWA), 45 to 90 feet MassDOT for a mini-roundabout with an SU-30 design vehicle). This sketch shows that this circle would allow for deflection along Commonwealth Avenue while allowing delivery trucks. The sketch below shows what this would look like:



The following recommended volume ranges and entering speeds have been outlined in FHWA and MassDOT guidance related to mini-roundabouts. The Build Condition data (future year 2030, Ash Street approach closed and Carriageway travel routed to Islington Road) is included in the table for comparison.

Table 4. Roundabout Volume Thresholds

Volume Thresholds	Recommended from FHWA Guidance	Recommended from MassDOT Guidance	Commonwealth Avenue at Islington Road
Volume of daily entering traffic	Range of 12,000 to 16,000 veh/day	Maximum of 15,000 veh/day	Approximately 21,450 veh/day

Congestion associated with a mini-roundabout may have network-wide impacts such as cut-through traffic on other routes that become more appropriate for through travel. Other guidance related to



the appropriateness of roundabouts includes other factors such as speeds and side street presence to determine if there will be negative safety impacts of a mini-roundabout when used in the wrong context. From the [FHWA Mini-Roundabouts Technical Report](#) p. 6:

Locations with light volumes of minor street traffic may not provide a suitable location for a mini-roundabout. Major street vehicles may become conditioned over time to ignore the intersection control due to a lack of minor street vehicles presence, which requires major street drivers to slow and proceed cautiously through the intersection. One rule of thumb used in the U.K. is to have at least 10 percent of the total intersection volume generated from the minor street [7]. Another measure used in the U.K. is that mini roundabouts should not be considered at intersections with volumes below 500 daily vehicles on the minor street [6].

Daily ATR traffic data was not collected at Islington Road so it cannot be stated with certainty whether Islington Road sees volumes below 500 vehicles per day. Peak hour volumes were extrapolated to daily volumes based on a 0.085 K Factor that result in a range of 447 to 812 daily vehicles along Islington Street (with the rerouted Carriageway volume).

Traffic volumes at Commonwealth Avenue and Islington Road in the Build Condition where vehicles from the Carriageway are included at the Islington Road approach were used to calculate the proportions of cross traffic to the roundabout:

Table 5. Roundabout Volume and Minor Street Comparison

Volume Criteria	a.m. Peak	p.m. Peak	Midday
Total entering the intersection (veh/hour)	1834	1695	1525
Volume entering from Islington Road (veh/hr)	69	38	36
% Minor Street	3.8%	2.2%	2.4%

The percentage of vehicles on the minor street ranges from 2.2% to 3.8% across all peak hours, well below the minimum 10% that is generally used in the U.K. for mini-roundabouts. In addition to the safety concerns, the FHWA Roundabout Informational Guide states: “The maximum throughput is achieved with an equal proportion of vehicles on the major and minor roads, and with low proportions of left turns.”

From NCHRP 672 p 3-25:



Because of their mountable nature, mini-roundabouts do not provide the same degree of visibility and channelization provided by larger roundabouts with raised islands. As a result, mini-roundabouts have some notable limitations in application: • Mini-roundabouts are recommended primarily for areas in which all approaching roadways have an 85th-percentile speed of less than 30 mph (50 km/h) or less. Although some traffic calming may result from their use (and they could be integrated into a broader system of traffic calming measures), the mini-roundabout should be limited to use in lower speed environments.

As discussed above, safety can be a concern for vehicles on the major route that may not expect to see the mini-roundabout due to the context of the roadway and may not be prepared to navigate a mini-roundabout due to expected traveling speeds. Although the proposed design will apply traffic calming measures along the corridor, the current 85 percentile speeds demonstrate that this application may not be appropriate at this location.

Roundabouts do not need to meet warrants to be justified; however, guidance suggests that a mini-roundabout is not an appropriate treatment at Commonwealth Avenue and Islington Road and may have operational and safety impacts that should be considered in balance with their benefits.

SOURCES:

- <https://www.mass.gov/doc/massdot-guidelines-for-the-planning-and-design-of-roundabouts/download>
- <https://www.fhwa.dot.gov/publications/research/safety/00067/00067.pdf>
- <https://nacto.org/docs/usdg/fhwa-mini-roundabouts-technical-report.pdf>
- <https://nacto.org/docs/usdg/nchrprpt672.pdf>

- 6) *Circulation on the Carriageway was flipped from Islington Road to Ash Street in 2009. Crash data should be studied before 2009.*

Reported crashes from 2004-2008 were queried from the MassDOT Impact Portal for the five-year period prior to the circulation change along the Carriageway. **Table 6** summarizes the reported crash data from that time period. The summary shows that two angled collisions were reported in 2005 which did not result in injury and one crash involving a vehicle on Commonwealth Avenue intending to turn left struck a cyclist which resulted in injury. In addition, seven rear-end collisions occurred (four of them occurring under wet, snow roadway conditions) with most of these vehicles slowing or stopped in traffic traveling east. The crash rate for Islington Street/Commonwealth Avenue for the crash data studied from 2004-2008 was 0.27 crashes per million entering vehicles (MEV). The District 6 average for unsignalized intersections is 0.52 crashes per MEV. The crash rate calculated from 2015-2019 was 0.17 crashes per MEV.



The crashes which would be considered correctable through a traffic signal would include angled and pedestrian/cyclist collisions. **Table 7** breaks down the crashes at the Islington Road to provide severity and type per crash.

Table 6. Study Area Crash Summary 2004-2008

Summary Criteria	Ash Street at Route 30	Islington Road at Route 30	Woodbine Street at Route 30
Year			
2004	0	0	0
2005	1	5	1
2006	1	1	2
2007	3	3	1
2008	1	2	1
Type			
Head On	0	0	0
Angle	1	2	2
Rear-End	5	7	0
Single Vehicle	0	1	2
Sideswipe	0	0	1
Involved Cyclist/Pedestrian	0	1	0
Severity			
Property Damage Only	6	8	3
Personal Injury	0	3	2
Fatality	0	0	0
Total	6	11	5



Table 7. Commonwealth Avenue/Islington Road Crash Data 2004-2008

Crash Date	Crash Severity	Manner of Collision
02/03/2005	Non-fatal injury	Rear-end
02/09/2005	Property damage only (none injured)	Angle
06/09/2005	Property damage only (none injured)	Angle
09/12/2005	Non-fatal injury	Involved Cyclist/Pedestrian
10/13/2005	Property damage only (none injured)	Single vehicle crash
11/21/2006	Property damage only (none injured)	Rear-end
02/03/2007	Property damage only (none injured)	Rear-end
03/03/2007	Not Reported	Rear-end
03/22/2007	Non-fatal injury	Rear-end
08/04/2008	Property damage only (none injured)	Rear-end
11/06/2008	Property damage only (none injured)	Rear-end

The information above is based on a query of the MassDOT portal and was not verified against actual police reports. Full query results are attached to this document.

JULIA MALAKIE

7) *Was any test done to simulate rotary instead of signal at Comm and Auburn, e.g. flashing yellow, to gauge effect on Islington Road wait times? Was it done at same time as flashing yellow at Ash? If not, can this be done?*

There are significant challenges with simulating the roundabout at Auburn Street that made it more challenging than at Ash Street, such as the safety of drivers departing Auburn Street in the existing configuration without a traffic signal. The intersection of Auburn Street does meet signal warrants and is located next to the interchange, so detouring traffic would likely have been needed. Given the 1,800-ft distance from that signal compared to the 500-ft distance to Ash Street, the simulation performed is considered sufficient to observe gaps at Islington Road. Although the signal at Auburn Street will be gone in the proposed condition, the interchange will still be signalized to provide gaps, and pedestrian-activated beacons will also stop traffic when a pedestrian or cyclist crosses Route 30 at the roundabout.



- 8) *4/6 presentation reported wait times to get out of Islington, with Ash signal on flashing yellow, as mean=21 sec, median = 11 sec. and maximum = 78 seconds. What was sample size, and does it include total wait times for cars that are not first in queue, or is it reflecting the time it takes once you're at Comm?*

There was one round of observations performed over two days with observations at the morning peak, midday peak, and afternoon peak. There were 33 data points, reflecting four (4) cars approaching every 15-minutes, which matches the trends shown from traffic data collected over a larger period of time. Full observation data is attached to this document and a summary of the mean/median/maximum wait times per each observation window over the two days is shown in **Table 8.**

Table 8. Observed Islington Road Delays

Median Wait Times	a.m. Peak (7:45-8:03 a.m.)	Midday (12:25-12:45 p.m.)	p.m. Peak (4:55-5:25 p.m.)	Average
Average Wait Time	25 sec	21 sec	20 sec	22 sec
Minimum Wait Time	1 sec	1 sec	1 sec	1 sec
Maximum Wait Time	78 sec	58 sec	67 sec	78 sec

Additionally, the project team and City staff performed left turns from 7:30am-8:15am on March 10, 2022. 11 turns were taken, with the average wait time experienced at 19 seconds.

- 9) *What were mean, median and max times to get out of Ash Street turning left, and turning right, with the Ash Street signal on flashing yellow (analogous to Q2 above)?*

We did not observe turning vehicles out of Ash Street since the request from the community was to address concerns regarding Islington Road left turns on Route 30. Observations at Ash Street were outside of the scope of what was requested by the City of Newton staff.

- 10) *In the 4/6 presentation, Islington Road Travel Time Comparison (1:42 in video), why is the preferred alternative (unsignalized left) travel time in PM rush hour less than under existing conditions?*

We have updated the traffic analysis to reflect the revised design at Islington Road which provides separate left and right-turn lanes from Islington Road onto Commonwelath Avenue and also included the additional trips proposed from the Ash Street theatre development project into the

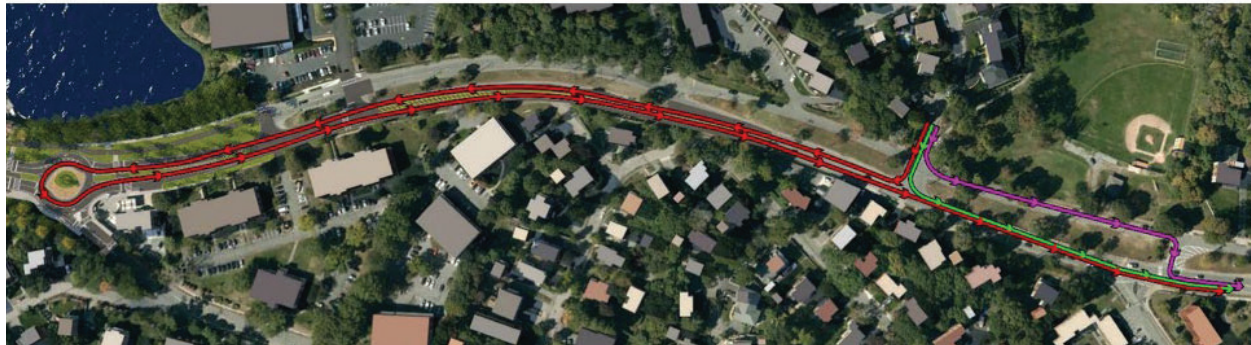


future alternatives analysis. Using this revised analysis, the even travel time is shown to have a slightly longer time under the preferred alternative which is in line with expectations (see **Table 9**).

Table 9. Travel Time Comparison

Route to go from Islington Road to Commonwealth Avenue EB	a.m. Travel Time (min)	p.m. Travel Time (min)
Existing Conditions (signal)	0.8	1.0
Preferred Alternative (unsignalized)	2.7	1.2
Alternative Option – Auburn Street Roundabout	2.2	1.8

Route to go from Islington Road to Comm Ave EB	AM Travel Time (min)	PM Travel Time (min)
Existing Conditions (Signal) 	0.8	1.0
Preferred Alternative (Unsignalized Left) 	2.7	1.2
Alternate Option (Auburn Street Roundabout) 	2.2	1.8



11) *Does the light impact Comm Ave traffic in a negative way?*

Yes, when the signal is actuated by a vehicle on the Carriageway or Ash Street approach, it stops the heavier flow of traffic traveling on Commonwealth Avenue. The delay and queuing of vehicles along Commonwealth Avenue at Ash Street improves with the removal of the signal.

12) *See if Ash Street should be two-way?*

City of Newton Planning and Department of Public Works (DPW) have stated that bringing Ash Street back to two-way is not an option being explored under this project.



13) *Look into development at Playhouse and if we have that included that into our growth.*

A background growth of 0.5% per year for 10 years was applied to existing traffic data to reflect the Build Condition of 2030. HSH also reviewed the traffic impact study for the playhouse and projections add four (4) left-turning vehicles in the a.m. peak hour, five (5) in the p.m. peak hour, and 15 during the Saturday midday peak hour turning left from Ash Street onto Route 30. These left turning vehicles have been included within the traffic analysis.

MARC LAREDO

14) *What would prevent us from pursuing your recommended alternative (which does offer many benefits) but installing (at city expense) a traffic light at Islington Road after the work is done?*

When work is performed using state and federal funds, the City enters a contract with MassDOT that includes a moratorium where work cannot be performed within the project limits and a Traffic Control Agreement (TCA) that exists in perpetuity. This prevents the City from installing a traffic signal, even with City funds without an approved TCA modification from MassDOT. The City asked MassDOT to clarify if the moratorium or TCA would be lifted if significant safety issues after the project is constructed made a signal warranted. The following responses was received:

After construction of the project, the Town must be in compliance with the Traffic Control Agreement between the Town and MassDOT. TCAs are in perpetuity, and do not expire. At any time a municipality may request a modification to the TCA. It is up to MassDOT to review and either approve or deny. In the case of a signal meeting warrants at a future time, that would certainly be something that could be brought to MassDOT's attention.

Traffic analysis shows that it is unlikely that a MUTCD Warrant would be met based on the warrants that exist related to vehicular volumes (Warrants 1 thru 3). This section of the MUTCD can be found here: <https://mutcd.fhwa.dot.gov/htm/2009/part4/part4c.htm>

Section 4C.08 Warrant 7, Crash Experience, of the 2009 MUTCD, describes when a traffic control signal is appropriate based on the severity and frequency of crashes, as discussed below:

Standard:

The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and



- B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and*
- C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.*

The 2009 MUTCD tables referenced in the criterion C can be found in Appendix X. To summarize the MUTCD excerpt provided, Warrant 7 requires meeting three conditions to be satisfied; a) safety enhancements installed at the intersection with the goal of reduced the crash frequency have not met their intended goal; b) the intersection has experienced five or more crashes, within a 12-month period, of the type that can be corrected with a signal (like angle crashes); and c) vehicular volumes on the major street and the higher-volume minor approach, or pedestrian volumes at the intersection meet or exceed the thresholds shown in the tables referenced above.

From the pre-2009 crash data summarized in Question #6, 2005 was the year where the crashes would have come closest to meeting Warrant 7. Within this 12-month period, there was one cyclist crash and two angled crashes, totaling to three crashes of the type that could be corrected by a signal under Condition B. Only the cyclist collision resulted in injury and the angled crashes were coded as no injury, so this would be four crashes short of Warrant 7 in the new MUTCD.

It should be noted that there is a new (11th) edition of the MUTCD to be published some time before May 2023, which proposes to revise the language of criterion B and provide sub criteria that focus on the type of crash – angle or pedestrian, amount of crashes within a one-year or three-year period, and severity of crash – property damage only or fatal-and-injury crashes, which have to exceed certain thresholds shown in new tables added to Warrant 7. The new language for criterion B can be found in Appendix Y, which is a released copy of the proposed changes to the MUTCD (FHWA-2020-0038_attachment_1, pg. 419). These changes to criterion B clarify what is required to meet it and help meet Warrant 7.



Using the 2005 crash data, the pre-2009 crash data would have three applicable crashes and be one crash short of meeting the table requirements for a three-leg intersection in the MUTCD Amendments.

15) *I also am concerned that the traffic warrants don't take into account the difficulty (and danger) of cars having to make a left onto Commonwealth Avenue when there is a steady stream of ongoing traffic in both directions (a fact that is not taken into account in your traffic analysis).*

The state law requires engineers follow the traffic signal warrants outlined in the MUTCD when reconstructing or installing a traffic signal. The current MUTCD Traffic Warrant analysis considers typical weekday hourly traffic volumes on the side streets and major streets, major street speeds, and number of travel lanes per approach when determining if a signal is warranted or needed. The warrants could most closely deal with the topics of concern mentioned about are Warrant 1, Condition B, and Warrant 7.

Warrant 1, Condition B, is intended for application at locations where on an average day the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. This warrant does not consider gaps in traffic and therefore is not dependent on how traffic is controlled adjacent to the intersection.

Warrant 7 is a crash experience warrant which is intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. This warrant is discussed in the answer to the previous question.

JOHN OLIVER

16) *Request to know more about what Islington at Comm will look like (left and right turn lanes) – projected backups, etc.*

Given the low volume of vehicles exiting Islington Road even with the increased demand from closing the Ash Street approach, the initial concept design included a one-lane approach. Providing a right turn and left turn lane has been evaluated and incorporated into the preferred alternative in response to concerns about queues building as drivers wait for gaps.

It should be noted that there is a safety tradeoff in that vehicles waiting to take a right turn may block the visibility of vehicles waiting to take a left turn, which could make the delay greater for left-turning vehicles and increase the chance of a crash for that movement. For a summary of the Islington Road queues and delay, please see the response and table under Question #4.



SUSAN ALBRIGHT

17) *Concerns about only showing 3 parking spaces for the dog park and request to increase to 5.*

As part of the next step in the design process, HSH plans to perform a parking study related to concerns voiced by the vet hospital that parking along Woodbine is insufficient for their business and the Norumbega Park trails. The possibility of bringing more on-street parking to mitigate the vet hospital parking demand and meet the demand of a potential dog park will be evaluated at 75% design. The three spots can likely be increased to five spots.



Appendix

- Islington Road Full Observation Data
- Pre-2009 Crash Data Query Results

Newton Carriageway Transportation Improvements
 MassDOT Project Number: 610674

Islington Left Turns - Raw Data

Delay (s)	Video ID	Video Length	Date	Obs Time Frame
10	728	15:21	22-Mar	7:45-8:00
45	728	15:21	22-Mar	7:45-8:00
13	729	2:50	22-Mar	8:00-8:03
23	729	2:50	22-Mar	8:00-8:03
1	729	2:50	22-Mar	8:00-8:03
78	729	2:50	22-Mar	8:00-8:03
6	733	17:57	23-Mar	7:45-8:02
51	733	17:57	23-Mar	7:45-8:02
8	733	17:57	23-Mar	7:45-8:02
19	733	17:57	23-Mar	7:45-8:02
1	731	17:40	22-Mar	12:28-12:45
40	731	17:40	22-Mar	12:28-12:45
58	731	17:40	22-Mar	12:28-12:45
41	731	17:40	22-Mar	12:28-12:45
2	734	20:31	23-Mar	12:25-12:45
1	734	20:31	23-Mar	12:25-12:45
5	734	20:31	23-Mar	12:25-12:45
3	734	20:31	23-Mar	12:25-12:45
6	734	20:31	23-Mar	12:25-12:45
51	734	20:31	23-Mar	12:25-12:45
20	258		22-Mar	4:59-5:25
67	946		22-Mar	4:59-5:25
9	381		22-Mar	4:59-5:25
11	320		22-Mar	4:59-5:25
6	688		22-Mar	4:59-5:25
1	104		22-Mar	4:59-5:25
26	534		23-Mar	4:55-5:20
31	170		23-Mar	4:55-5:20
6	184		23-Mar	4:55-5:20
11	184		23-Mar	4:55-5:20
5	737		23-Mar	4:55-5:20
47	514		23-Mar	4:55-5:20
25	937		23-Mar	4:55-5:20

NOTES:

Video ending in 421, car waited about 58 seconds to turn left and ended up turning right (3/23 evening observation)

Newton Carriageway Transportation Improvements
MassDOT Project Number: 610674

Islington Left Turns performed by Project Team - Raw Data

Delay (s)	Obs Time Frame
3	8-8:15am
3	8-8:15am
26	8-8:15am
5	8-8:15am
45	8-8:15am
65	8-8:15am
9	8-8:15am
3	8-8:15am
37	7:30am-7:45am
7	7:30am-7:45am
11	7:30am-7:45am

Crash Date	Crash Severity	Crash Time	Crash Year	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	First Harmful Event	Light Conditions	Manner of Collision	Non-Motorist Action (All)	Non-Motorist Location (All)	Non-Motorist Type (All)	Road Surface Condition	Roadway Junction Type	Total Fatalities	Total Non-Fatal Injuries	Traffic Control Device Type	Trafficway Description
02/09/2005	Property damage only (none injured)	4:25 PM	2005	No injury	1	D1: (No improper driving) / D2: (Failed to yield right of 2 way),(Made an improper turn)	Collision with motor vehicle in traffic	Daylight	Angle				Dry	Not at junction	0	0	No controls	Two-way, not divided
02/03/2005	Non-fatal injury	9:00 AM	2005	Incapacitating	2	D1: (No improper driving) / D2: (Inattention)	Collision with motor vehicle in traffic	Daylight	Rear-end				Wet	T-intersection	0	1	No controls	Two-way, not divided
06/09/2005	Property damage only (none injured)	9:37 AM	2005	No injury	2	D1: (Unknown) / D2: (Unknown)	Collision with motor vehicle in traffic	Daylight	Angle				Dry	T-intersection	0	0	No controls	Two-way, not divided
09/12/2005	Non-fatal injury	6:13 PM	2005	Non-fatal injury - Non-incapacitating	1	D1: (No improper driving)	Collision with motor vehicle in traffic	Daylight	Involved Cyclist/Pedestrian	P2: Walking, running or cycling	P2: In roadway	P2: Cyclist	Dry	Driveway	0	1	No controls	Two-way, not divided
10/13/2005	Property damage only (none injured)	11:30 PM	2005	No injury	1	D1: (Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc),(Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc)	Collision with ditch	Dark - lighted roadway	Single vehicle crash				Not reported	T-intersection	0	0	No controls	Two-way, not divided
05/21/2005	Not Reported	3:23 PM	2005	Not reported	2		Not reported	Daylight	Rear-end				Wet	Not at junction	0	0	Traffic control signal	Not reported
07/16/2005	Non-fatal injury	4:00 AM	2005	Non-fatal injury - Non-incapacitating	1	D1: (Followed too closely),(Inattention) / D2: (No improper driving),(No improper driving)	Collision with motor vehicle in traffic	Dark - lighted roadway	Single vehicle crash				Dry	Y-intersection	0	1	School zone signs	Two-way, not divided
03/22/2006	Property damage only (none injured)	8:29 AM	2006	No injury	2	D1: (Made an improper turn) / D2: (Unknown)	Collision with motor vehicle in traffic	Daylight	Rear-end				Dry	T-intersection	0	0	Traffic control signal	Two-way, divided, unprotected median
02/07/2006	Non-fatal injury	3:35 PM	2006	Possible	2	D1: (Made an improper turn) / D2: (Unknown)	Collision with motor vehicle in traffic	Daylight	Angle				Dry	Five-point or more	0	2	Stop signs	Two-way, divided, unprotected median
02/14/2006	Property damage only (none injured)	6:20 AM	2006	No injury	2		Not reported	Dark - lighted roadway	Rear-end				Dry	Not at junction	0	0	Traffic control signal	Two-way, not divided
11/24/2006	Unknown	12:43 AM	2006	Not Applicable	1	D1: (No improper driving)	Collision with other light pole or other post/support	Dark - lighted roadway	Single vehicle crash				Wet	Not at junction	0	0	No controls	Two-way, divided, unprotected median
11/21/2006	Property damage only (none injured)	11:36 PM	2006	No injury	1	D1: (Fatigued/asleep)	Collision with utility pole	Dark - lighted roadway	Single vehicle crash				Dry	Not at junction	0	0	No controls	Two-way, divided, unprotected median
11/21/2006	Property damage only (none injured)	4:23 PM	2006	No injury	2	D1: (No improper driving) / D2: (Unknown)	Collision with motor vehicle in traffic	Dusk	Rear-end				Dry	T-intersection	0	0	No controls	Two-way, not divided
11/25/2006	Property damage only (none injured)	8:36 PM	2006	No injury	2	D1: (No improper driving) / D2: (Wrong side or wrong way)	Collision with motor vehicle in traffic	Dark - lighted roadway	Sideswipe, opposite direction				Dry	Not at junction	0	0	Warning signs	Two-way, not divided
01/03/2007	Property damage only (none injured)	8:15 AM	2007	No injury	3	D1: (No improper driving) / D2: (No improper driving) / D3: (No improper driving)	Collision with motor vehicle in traffic	Daylight	Rear-end				Dry	T-intersection	0	0	Traffic control signal	Two-way, not divided
03/13/2007	Not Reported	10:00 AM	2007	Not reported	2	D1: (No improper driving)	Collision with parked motor vehicle	Daylight	Angle				Dry	Not at junction	0	0	No controls	One-way, not divided
03/22/2007	Non-fatal injury	5:12 PM	2007	Non-fatal injury - Non-incapacitating	2	D1: (No improper driving) / D2: (Other improper action)	Collision with motor vehicle in traffic	Daylight	Rear-end				Wet	Not at junction	0	1	No controls	Two-way, not divided
04/22/2007	Property damage only (none injured)	4:05 AM	2007	No injury	1	D1: (Other improper action)	Collision with utility pole	Dark - lighted roadway	Single vehicle crash				Dry	T-intersection	0	0	No controls	Two-way, divided, unprotected median
05/08/2007	Property damage only (none injured)	9:11 AM	2007	No injury	2	D1: (No improper driving) / D2: (Inattention)	Collision with motor vehicle in traffic	Daylight	Rear-end				Dry	Not at junction	0	0	No controls	Two-way, divided, unprotected median
02/03/2007	Property damage only (none injured)	11:00 AM	2007	No injury	2		Not reported	Daylight	Rear-end				Snow	Not reported	0	0	No controls	Not reported
03/03/2007	Not Reported	2:00 AM	2007	Not reported	2		Not reported	Daylight	Rear-end				Dry	T-intersection	0	0	Traffic control signal	Two-way, divided, unprotected median
04/07/2008	Property damage only (none injured)	8:30 PM	2008	No injury	2	D1: (No improper driving)	Collision with motor vehicle in traffic	Dark - lighted roadway	Sideswipe, same direction				Dry	Not at junction	0	0	No controls	Two-way, divided, positive median barrier
02/20/2008	Property damage only (none injured)	1:35 AM	2008	No injury	2	D1: (No improper driving)	Collision with motor vehicle in traffic	Dark - lighted roadway	Angle				Ice	T-intersection	0	0	No controls	Two-way, not divided
05/03/2008	Non-fatal injury	1:57 AM	2008	Possible	1	D1: (Driving too fast for conditions),(Failure to keep in proper lane or running off road)	Collision with tree	Dark - lighted roadway	Single vehicle crash				Wet	Not at junction	0	1	No controls	Two-way, not divided
08/04/2008	Property damage only (none injured)	6:09 PM	2008	No injury	2	D1: (No improper driving) / D2: (Followed too closely)	Collision with motor vehicle in traffic	Daylight	Rear-end				Dry	T-intersection	0	0	No controls	Two-way, not divided
10/21/2008	Property damage only (none injured)	6:14 PM	2008	No injury	2	D1: (No improper driving) / D2: (Followed too closely)	Collision with motor vehicle in traffic	Dark - lighted roadway	Rear-end				Dry	T-intersection	0	0	Traffic control signal	Two-way, not divided
11/06/2008	Property damage only (none injured)	4:44 PM	2008	No injury	2	D1: (No improper driving) / D2: (Unknown)	Collision with motor vehicle in traffic	Dark - lighted roadway	Rear-end				Wet	T-intersection	0	0	No controls	Two-way, divided, unprotected median

Crash Date	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Emergency Use (All Vehicles)	Vehicle Towed From Scene (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	County Name	Location	Geocoding Method	Hit and Run	Locality	Most Harmful Event (All Vehicles)	Speed Limit
02/09/2005	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Light truck/van, mini-van, pickup, sport utility)	V1:(No) / V2:(No)	V1:(Yes, vehicle or trailer disabled) / V2:(Yes, vehicle or trailer disabled)	V1: E / V2: W	Clear	MIDDLESEX	Roadway	At Address	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	30
02/03/2005	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Light truck/van, mini-van, pickup, sport utility)	V1:(No) / V2:(No)	V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: E / V2: E	Cloudy/Other	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	3
06/09/2005	V1: Turning left / V2: Travelling straight ahead	V1:(Light truck/van, mini-van, pickup, sport utility)		V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: N / V2: E	Clear/Clear	MIDDLESEX	Unknown	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	30
09/12/2005	V1: Turning left	V1:(Light truck/van, mini-van, pickup, sport utility)		V1:(No)	V1: E	Clear/Clear	MIDDLESEX	Roadside	At Address	No hit and run		V1:(Collision with cyclist (bicycle, tricycle, unicycle, pedal car))	35
10/13/2005	V1: Travelling straight ahead	V1:(Passenger car)		V1:(Yes, vehicle or trailer disabled)	V1: E	Rain/Rain	MIDDLESEX	Roadside	At Intersection	No hit and run		V1:(Collision with curb)	30
05/21/2005	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)		V1:(No) / V2:(No)	V1: W / V2: W	Rain	MIDDLESEX	Not reported	At Intersection	No hit and run			
07/16/2005	V1: Travelling straight ahead	V1:(Passenger car)		V1:(No)	V1: E	Fog, smog, smoke	MIDDLESEX	Not reported	Off Intersection	No hit and run			
03/22/2006	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Light truck/van, mini-van, pickup, sport utility)		V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: E / V2: E	Clear	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	35
02/07/2006	V1: Turning right / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)		V1:(Yes, vehicle or trailer disabled) / V2:(Yes, vehicle or trailer disabled)	V1: W / V2: W	Clear	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Overtake/rollover)	35
03/14/2006	V1: Slowing or stopped in traffic / V2: Unknown	V1:(Passenger car) / V2:(Passenger car)		V1:(No) / V2:(No)	V1: S / V2: E	Clear	MIDDLESEX	Not reported	At Address	No hit and run			
11/24/2006	V1: Travelling straight ahead	V1:(Passenger car)		V1:(No)	V1: E	Rain	MIDDLESEX	Roadway	At Address	No hit and run		V1:(Collision with light pole or other post/support)	35
11/21/2006	V1: Travelling straight ahead	V1:(Passenger car)	V1:(No)	V1:(Yes, vehicle or trailer disabled)	V1: E	Clear	MIDDLESEX	Median	At Address	No hit and run		V1:(Collision with utility pole)	30
11/21/2006	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Light truck/van, mini-van, pickup, sport utility) / V2:(Passenger car)		V1:(No) / V2:(No)	V1: N / V2: Not Reported	Clear	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	30
11/25/2006	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Light truck/van, mini-van, pickup, sport utility) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: E / V2: W	Clear	MIDDLESEX	Roadway	At Address	Yes, hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	35
01/03/2007	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1:(No) / V3:(No)	V1:(No) / V2:(No) / V3:(Yes, vehicle or trailer disabled)	V1: W / V2: W / V3: Not Reported	Clear	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic)	30
03/13/2007	V1: Parked / V2: Not reported	V1:(Passenger car)		V1:(No)	V1: E	Clear/Clear	MIDDLESEX	Roadway	Off Intersection	Yes, hit and run		V1:(Collision with motor vehicle in traffic)	25
03/22/2007	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V2:(No)	V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: E / V2: E	Clear	MIDDLESEX	Roadway	At Address	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	35
04/22/2007	V1: Travelling straight ahead	V1:(Light truck/van, mini-van, pickup, sport utility)	V1:(No)	V1:(Yes, vehicle or trailer disabled)	V1: W	Clear	MIDDLESEX	Outside roadway	At Intersection	No hit and run		V1:(Collision with utility pole)	30
05/08/2007	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(No)	V1: S / V2: S	Clear	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	
02/03/2007	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V2:(Passenger car)		V1:(No) / V2:(No)	V1: S / V2: E	Cloudy	MIDDLESEX	Not reported	At Intersection	No hit and run			
03/03/2007	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Light truck/van, mini-van, pickup, sport utility)		V1:(No) / V2:(No)	V1: E / V2: E	Clear	MIDDLESEX	Not reported	At Intersection	No hit and run			
04/07/2008	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(No)	V1: E / V2: Not Reported	Clear/Clear	MIDDLESEX	Roadway	At Address	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	35
02/20/2008	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(Yes, vehicle or trailer disabled) / V2:(Yes, vehicle or trailer disabled)	V1: E / V2: W	Clear	MIDDLESEX	Roadway	Operator Designated	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	
05/03/2008	V1: Travelling straight ahead	V1:(Passenger car)	V1:(No)	V1:(Yes, vehicle or trailer disabled)	V1: E	Rain	MIDDLESEX	Roadside	Operator Designated	No hit and run		V1:(Collision with tree)	30
08/04/2008	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: E / V2: E	Cloudy	MIDDLESEX	Roadway	Off Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	30
10/21/2008	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck/van, mini-van, pickup, sport utility) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: W / V2: W	Cloudy	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	30
11/06/2008	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: E / V2: E	Rain/Rain	MIDDLESEX	Roadway	At Intersection	No hit and run		V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	25

Traffic Control Device						
Crash Date	Function	Vehicle Sequence of Events (All Vehicles)	Street Number	Roadway	Near Intersection Roadway	Street Name-linked RD
02/09/2005	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	2240	COMMONWEALTH AVENUE Rte 30 E		COMMONWEALTH AVENUE
02/03/2005	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE Rte 30 E / ISLINGTON ROAD		COMMONWEALTH AVENUE
06/09/2005	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE / ISLINGTON ROAD		COMMONWEALTH AVENUE
09/12/2005	Not reported	V1:(Collision with cyclist)	2236	COMMONWEALTH AVENUE		COMMONWEALTH AVENUE
10/13/2005	Not reported	V1:(Collision with curb),(Collision with tree)		COMMONWEALTH AVENUE / ISLINGTON ROAD		COMMONWEALTH AVENUE
05/21/2005	Yes, device functioning			COMMONWEALTH AVENUE Rte 30 / ASH STREET		COMMONWEALTH AVENUE
07/16/2005	Not reported	V1:(Collision with motor vehicle in traffic),(Collision with curb),(Collision with tree)		COMMONWEALTH AVENUE Rte 30	WOODBINE STREET	COMMONWEALTH AVENUE
03/22/2006	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE Rte 30 E / ASH STREET		COMMONWEALTH AVENUE
02/07/2006	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic),(Overturn/rollover),(Collision with curb)		COMMONWEALTH AVENUE Rte 30 / WOODBINE STREET		COMMONWEALTH AVENUE
02/14/2006	Yes, device functioning			COMMONWEALTH AVENUE Rte 30		COMMONWEALTH AVENUE
02/14/2006	No, device not functioning	V1:(Collision with motor vehicle in traffic)	2221	COMMONWEALTH AVENUE Rte 30		COMMONWEALTH AVENUE SERVICE ROAD
11/24/2006	Functioning	V1:(Collision with motor vehicle in traffic)	2250	COMMONWEALTH AVENUE		COMMONWEALTH AVENUE
11/21/2006	Not reported	V1:(Collision with utility pole)	2292	COMMONWEALTH AVENUE Rte 30 E		COMMONWEALTH AVENUE
11/21/2006	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE Rte 30 E / ISLINGTON ROAD		COMMONWEALTH AVENUE
11/25/2006	No, device not functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic),(Collision with highway traffic sign post)	2280	COMMONWEALTH AVENUE Rte 30 E		COMMONWEALTH AVENUE
01/03/2007	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE Rte 30 W / ASH STREET		COMMONWEALTH AVENUE
03/13/2007	Not reported	V1:(Collision with motor vehicle in traffic)		ASH STREET	COMMONWEALTH AVENUE	ASH STREET
03/22/2007	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	2240	COMMONWEALTH AVENUE		COMMONWEALTH AVENUE
04/22/2007	Yes, device functioning	V1:(Collision with utility pole)		COMMONWEALTH AVENUE Rte 30 W / WOODBINE STREET		COMMONWEALTH AVENUE
05/08/2007	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE / ASH STREET		COMMONWEALTH AVENUE
02/03/2007	Not reported	V1:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE / ISLINGTON ROAD		COMMONWEALTH AVENUE
03/01/2007	Yes, device functioning	V1:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE / ISLINGTON ROAD		COMMONWEALTH AVENUE
04/07/2008	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	2240	COMMONWEALTH AVENUE		COMMONWEALTH AVENUE
02/20/2008	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE		COMMONWEALTH AVENUE
05/03/2008	Not reported	V1:(Collision with curb),(Collision with tree)		COMMONWEALTH AVENUE / COMMONWEALTH AVENUE	WOODBINE STREET	COMMONWEALTH AVENUE
08/04/2008	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE	ISLINGTON ROAD	COMMONWEALTH AVENUE
10/21/2008	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		COMMONWEALTH AVENUE / ASH STREET		COMMONWEALTH AVENUE
11/06/2008	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		ISLINGTON ROAD / COMMONWEALTH AVENUE		COMMONWEALTH AVENUE



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