

TECHNICAL MEMORANDUM

TO: Art Martineau, PE, Town Engineer
Town of Andover - Department of Public Works
5 Campanelli Drive
Andover, Massachusetts 01810
Attn: Officer Glen Ota

DATE: May 29, 2024

FROM: Samuel W. Gregorio, PE, PTOE, RSP₁, Project Manager
Rana Eslamifard, Transportation Engineer

PROJECT #: T1265.10

RE: Lincoln Street Corridor Safety Improvements - Andover, Massachusetts
One-Way Flow & Cut Through Assessment

INTRODUCTION

TEC, Inc. (TEC) has been retained by the Town of Andover (the "Town") to evaluate the proposed one-way flow condition along Lincoln Street in Andover, Massachusetts in conjunction with the Town's Complete Street Tier 3 Project along the same corridor. The Town recently submitted its Tier 2 Prioritization Plan as part of the Massachusetts Department of Transportation's (MassDOT) Complete Streets Funding Program which was approved by MassDOT on April 17, 2024. The Prioritization Plan highlighted the Lincoln Street Shared Use Path as its #1 ranked project, the same project the Town is seeking to submit for Tier 3 construction funding upon further discussions with the neighborhood and community. The project seeks to construct a shared use path along the easterly side of Lincoln Street between Lowell Street (Route 133) and Shawsheen Street which will close a network gap between the accommodations provided along each arterial corridor. To minimize the horizontal impact of the project with respect to right-of-way, the proposal would reallocate roadway width to the shared use path resulting in a narrower vehicular travel way which would be expected to only carry a single direction of travel.

Although the project is anticipated to provide increased pedestrian and bicycle access to Andover High School and the West Middle School, both located along Shawsheen Street just east of its intersection with the Lincoln Street terminus, a primary concern of the Lincoln Street neighborhood residents is the existing flow pattern and the need for reduction in cut-through traffic. This technical memorandum provides documentation as to the anticipated effect of converting Lincoln Street to one-way flow; including the effects to the neighboring neighborhood roadways: Cindy Lane, Marilyn Road, Arthur Road, Theodore Avenue, and Cyr Circle.

EXISTING CONDITIONS

Geometric Conditions

Lincoln Street is a 2,000-foot-long two-lane north-south local roadway under the jurisdiction of the Town of Andover. The roadway provides a direct connection between Lowell Street to the north and Shawsheen Street to the south. Lincoln Street provides a single travel lane in each direction with direction flow unmarked. A sidewalk is provided along the easterly edge of pavement

between Shawsheen Street and Marilyn Road with no formal bicycle accommodation provided. Signed turn restrictions are posted to restrict Lowell Street, both eastbound and westbound, turning traffic onto Lincoln Street between 7:30 am and 8:30 pm (Monday to Friday) coinciding with the Andover High School and West Middle School arrival times. A similar ‘No Left Turn’ restriction is posted along Marilyn Road at Lincoln Street for the same hours to deter cut-through traffic along the other neighborhood roadways.

Lincoln Street provides one of three access/egress points to a series of neighborhood roadway including: Cindy Lane, Marilyn Road, Arthur Road, and Theodore Avenue. Specifically, Marilyn Road intersects Lincoln Street approximately 570-feet south of Lowell Street and both Arthur Road and Theodore Avenue intersect Lowell Street approximately 700-feet and 950-feet east of Lincoln Street, respectively. If utilized as a cut-through, these neighborhood streets have no direct connection and travel within these neighborhood streets require two (2) or three (3) turning movements. Separately, Cyr Circle intersects with Lincoln Street approximately 650-feet north of Shawsheen Street; however, the local roadway has no outlet.

Existing Traffic Volumes

To establish existing traffic volume conditions along the Lincoln Street corridor, TEC commissioned Turning Movement Counts (TMCs) during a typical weekday on Tuesday, April 23, 2024 from 7:00 am to 7:00 pm at both the intersections of Lowell Street / Lincoln Street / Chandler Circle and Shawsheen Street / Lincoln Street. Area schools were in regular session during the time of traffic counts. A detailed summary of the TMC, partitioned into 15-minute intervals, is provided within Attachment A. A breakdown of the hourly Lincoln Street specific traffic volumes at each end of the corridor is provided in Table 1.

Table 1 – Summary of Lincoln Street Terminus Bidirectional Traffic Volumes by Hour

<u>Time Period</u>	<u>Lowell Street at Lincoln Street</u>			<u>Shawsheen Street at Lincoln Street</u>		
	<u>Lincoln NB</u>	<u>Lincoln SB</u>	<u>Total</u>	<u>Lincoln NB</u>	<u>Lincoln SB</u>	<u>Total</u>
7a-8a	19	10	29	17	13	30
8a-9p	26	13	39	19	32	51
9a-10a	21	12	33	22	16	38
10a-11a	17	12	29	17	18	35
11a-12p	20	15	35	16	17	33
12p-1p	26	13	39	32	22	54
1p-2p	17	23	40	18	23	41
2p-3p	36	32	68	37	34	71
3p-4p	76	30	106	71	36	107
4p-5p	37	30	67	48	38	86
5p-6p	48	32	80	56	45	101
6p-7p	37	20	57	39	34	73

The individual weekday morning peak hour for Lincoln Street traffic is from 8:00 am to 9:00 am, for both terminus intersections, during the weekday morning. The weekday afternoon peak hour is defined as 2:15 pm to 3:15 pm for Lincoln Street at its intersection with Shawsheen Street and from 2:30 pm to 3:30 pm at its intersection with Lowell Street; although the latter is only one (1) vehicle greater during that 60-min block as compared to having the same 2:15 pm - 3:15 pm block. Each time block generally coincides with the Andover High School / West Middle School bell schedule of 8:15 am start of classes and 2:51 pm / 2:50 pm end of classes.

Effectiveness of Lowell Street Turn Restrictions

The traffic volumes indicate that between 7:30 am and 8:30 am, only seven (7) vehicles turn onto Lincoln Street from Lowell Street during the hour-long time period of the posted turn restrictions. This equates to about one (1) vehicle every 8½ minutes. Nineteen (19) vehicles exit Lincoln Street onto Shawsheen in the same southbound direction which may indicate that some vehicles are left-turning left from Marilyn Road onto Lincoln Street, which itself has an internal neighborhood restriction; however, the number of rooftops within the neighborhood and along Lincoln Street suggests that many of these 'additional' vehicles could be neighborhood residents. Overall, the outlet volumes along Lincoln Street during the times of restrictions would suggest that there is minimal use of the other neighborhood roadways (Cindy Lane, Marilyn Road, Arthur Road, and Theodore Avenue) to bypass the turn restrictions.

Travel Time Measurements

TEC staff conducted various vehicular travel time runs via three (3) separate origin / destination routes during the peak morning hour (7:50 am to 8:50 am) on Wednesday, May 15, 2024 and during the peak afternoon hour (3:00 pm to 4:00 pm) to determine the travel time characteristics of the direction flow condition. Each route consisted of a minimum of three (3) separate directional runs over the course of the selected peak hour. The three (3) routes included:

- Lincoln Street to/from the West Parish Cemetery (WPC) Entrance along Lowell Street, west of Shawsheen Street.
- Lincoln Street to/from Stop & Shop (S&S) along North Main Street (Route 28)
- Lincoln Street to/from Shawsheen Square (North Main Street / Lowell Street / Haverhill Street intersection)

The three bidirectional routes were chosen to emphasize a key regional route choice, as well as a common origin/destination point. Lincoln Street to/from the WPC representing travel to/from Interstate 93, Lincoln Street to/from Stop & Shop representing travel to/from Route 28 and points generally south and east including Downtown Andover, and Lincoln Street to/from Shawsheen Square representing travel to/from Interstate 495. Each of the runs was completed for both directions of travel along Lincoln Street, including to/from the north along Lowell Street and to/from the south along Shawsheen Street. In addition, specific travel time runs were conducted bidirectionally between each terminus end of Lincoln Street via the intersection of Lowell Street / Shawsheen Street / Beacon Street / Reservation Road. This additional travel time run to/from each end of Lincoln accounts for a second possible route choice for each origin/destination. For instance, TEC accounted for the possibility that a neighborhood driver has two possible routes to get to their destination for each potential future one-way flow condition along Lincoln Street.

The peak morning hour travel time runs were completed between 7:50 am to 8:50 am to balance between the Lincoln Street traffic volume peak (8:00 am to 9:00 am) and the general roadway network peak (7:30 am to 8:30 am) while capturing the traffic to/from the school campus prior to the bell. This was to allow for a mix of travel time runs experiences. Similarly, the peak afternoon hour travel time runs were completed between 3:00 pm to 4:00 pm to balance between the Lincoln Street traffic volume peak (2:30 pm to 3:30 pm) and the general roadway network peak (3:00 pm to 4:00 pm) while capturing the traffic to/from the school campus following the bell. Each hour-long block does include the individual peak 15-min time period of Lincoln Street volume.

Reference Point

Each travel time run started and/or ended along Lincoln Street at its intersection with Marilyn Road to provide a consistent frame of reference. TEC notes that the staff driver knowingly violated the posted turn restrictions during the weekday morning along Lowell Street in order to access Lincoln Street and provide an accurate representation of travel time.

Summary of Travel Time Run Results

Table 2 presents a summary of the average travel time runs during the weekday morning peak hour of travel and Table 3 presents a summary of the average travel time runs during the weekday afternoon peak hour of travel. Travel time run data is provided in Attachment B.

Table 2 – Average Vehicular Travel Times for Weekday Morning (7:50 am to 8:50 am)

<u>Route Choice</u>	<u>Time</u>
Origin / Destination: West Parish Cemetery	
<u>Lincoln St [NB] to WPC via Lowell St</u>	= <u>2:22</u>
<u>Lincoln St [SB] to WPC via Shawsheen S to Lowell St</u>	= <u>2:55</u>
<u>WPC to Lincoln St [NB] via Lowell St to Shawsheen St</u>	= <u>3:38</u>
<u>WPC to Lincoln St [SB] via Lowell St</u>	= <u>2:13</u>
Origin / Destination: Stop & Shop	
<u>Lincoln St [NB] to S&S via Lowell St to RT 28</u>	= <u>3:38</u>
<u>Lincoln St [NB] to S&S via Lowell St to Shawsheen St to Stevens St to RT 28</u>	= <u>7:36</u>
<u>Lincoln St [SB] to S&S via Shawsheen St to Stevens St to RT 28</u>	= <u>4:14</u>
<u>Lincoln St [SB] to S&S via Shawsheen St to Lowell St to RT 28</u>	= <u>5:30</u>
<u>S&S to Lincoln St [NB] via RT 28 to Lowell St to Shawsheen St</u>	= <u>7:17</u>
<u>S&S to Lincoln St [NB] via RT 28 to Stevens St to Shawsheen St</u>	= <u>6:40</u>
<u>S&S to Lincoln St [SB] via RT 28 to Stevens St to Shawsheen St to Lowell St</u>	= <u>8:32</u>
<u>S&S to Lincoln St [SB] via RT 28 to Lowell St</u>	= <u>3:55</u>
Origin / Destination: Shawsheen Square	
<u>Lincoln St [NB] to Shawsheen Sq via Lowell St</u>	= <u>2:18</u>
<u>Lincoln St [NB] to Shawsheen Sq via Lowell St to Shawsheen St to Stevens St to RT 28</u>	= <u>9:16</u>
<u>Lincoln St [SB] to Shawsheen Sq via Shawsheen St to Lowell St</u>	= <u>4:10</u>
<u>Lincoln St [SB] to Shawsheen Sq via Shawsheen St to Stevens St to RT 28</u>	= <u>5:54</u>
<u>Shawsheen Sq to Lincoln St [NB] via RT 28 to Stevens St to Shawsheen St</u>	= <u>8:00</u>
<u>Shawsheen Sq to Lincoln St [NB] via Lowell St to Shawsheen St</u>	= <u>5:37</u>
<u>Shawsheen Sq to Lincoln St [SB] via RT 28 to Stevens St to Shawsheen St to Lowell St</u>	= <u>9:52</u>
<u>Shawsheen Sq to Lincoln St [SB] via Lowell St</u>	= <u>2:15</u>

Underline represents the shortest travel time for either northbound or southbound movements along Lincoln regardless of route choice.

The weekday morning travel time runs indicate the following key characteristics for travel to/from the Lincoln Street neighborhood:

- Travel from Lincoln Street to the WPC is approximately 33 seconds shorter on average in the morning via Lincoln Street northbound as opposed to Lincoln Street southbound. Travel from the WPC to Lincoln Street is approximately 1½ minutes

shorter on average in the morning via Lowell Street (entrance to Lincoln Street southbound condition).

- Travel from Lincoln Street to Stop & Shop is approximately 36 seconds shorter on average in the morning via Lincoln Street northbound via Lowell Street as opposed to Lincoln Street southbound via Shawsheen Street to Stevens Street. Travel from Stop & Shop to Lincoln Street is approximately 2¾ minutes shorter on average in the morning via Lowell Street (entrance to Lincoln Street southbound condition).
- Travel from Lincoln Street to Shawsheen Square is approximately 2 minutes shorter on average in the morning via Lincoln Street northbound via Lowell Street as opposed to Lincoln Street southbound via Shawsheen Street to Lowell Street. Travel from Shawsheen Square to Lincoln Street is approximately 3½ minutes shorter on average in the morning via Lowell Street (entrance to Lincoln Street southbound condition).

Overall, the weekday morning travel time data suggests the Lincoln Street southbound condition is favorable for all inbound travel where Lincoln Street is the destination. The data does suggest that the Lincoln Street northbound condition is favorable for all outbound travel where Lincoln Street is the origin; however, the difference in travel time is minimal for travel to the WPC and Stop & Shop.

Table 3 – Average Vehicular Travel Times for Weekday Afternoon (3:00 pm to 4:00 pm)

<u>Route Choice</u>	<u>Time</u>
Origin / Destination: West Parish Cemetery	
<u>Lincoln St [NB] to WPC via Lowell St</u>	= 3:19
<u>Lincoln St [SB] to WPC via Shawsheen S to Lowell St</u>	= 3:27
<u>WPC to Lincoln St [NB] via Lowell St to Shawsheen St</u>	= 3:10
<u>WPC to Lincoln St [SB] via Lowell St</u>	= 3:17
Origin / Destination: Stop & Shop	
<u>Lincoln St [NB] to S&S via Lowell St to RT 28</u>	= 6:40
<u>Lincoln St [NB] to S&S via Lowell St to Shawsheen St to Stevens St to RT 28</u>	= 7:40
<u>Lincoln St [SB] to S&S via Shawsheen St to Stevens St to RT 28</u>	= 4:52
<u>Lincoln St [SB] to S&S via Shawsheen St to Lowell St to RT 28</u>	= 9:27
<u>S&S to Lincoln St [NB] via RT 28 to Lowell St to Shawsheen St</u>	= 6:05
<u>S&S to Lincoln St [NB] via RT 28 to Stevens St to Shawsheen St</u>	= 4:12
<u>S&S to Lincoln St [SB] via RT 28 to Stevens St to Shawsheen St to Lowell St</u>	= 6:59
<u>S&S to Lincoln St [SB] via RT 28 to Lowell St</u>	= 3:17
Origin / Destination: Shawsheen Square	
<u>Lincoln St [NB] to Shawsheen Sq via Lowell St</u>	= 4:58
<u>Lincoln St [NB] to Shawsheen Sq via Lowell St to Shawsheen St to Stevens St to RT 28</u>	= 9:31
<u>Lincoln St [SB] to Shawsheen Sq via Shawsheen St to Lowell St</u>	= 7:45
<u>Lincoln St [SB] to Shawsheen Sq via Shawsheen St to Stevens St to RT 28</u>	= 6:43
<u>Shawsheen Sq to Lincoln St [NB] via RT 28 to Stevens St to Shawsheen St</u>	= 5:54
<u>Shawsheen Sq to Lincoln St [NB] via Lowell St to Shawsheen St</u>	= 5:13
<u>Shawsheen Sq to Lincoln St [SB] via RT 28 to Stevens St to Shawsheen St to Lowell St</u>	= 8:41
<u>Shawsheen Sq to Lincoln St [SB] via Lowell St</u>	= 2:25

Underline represents the shortest travel time for either northbound or southbound movements along Lincoln regardless of route choice.

The weekday afternoon travel time runs indicate the following key characteristics for travel to/from the Lincoln Street neighborhood:

- Travel from Lincoln Street to the WPC is approximately 8 seconds shorter on average in the afternoon via Lincoln Street northbound as opposed to Lincoln Street southbound. Travel from the WPC to Lincoln Street is approximately 7 seconds shorter on average in the afternoon via Shawsheen Street (entrance to Lincoln Street northbound condition).
- Travel from Lincoln Street to Stop & Shop is approximately 2 minutes shorter on average in the afternoon via Lincoln Street southbound via Shawsheen Street to Stevens Street as opposed to Lincoln Street northbound via Lowell Street. Travel from Stop & Shop to Lincoln Street is approximately 1 minute shorter on average in the afternoon via Lowell Street (entrance to Lincoln Street southbound condition).
- Travel from Lincoln Street to Shawsheen Square is approximately 2 minutes shorter on average in the afternoon via Lincoln Street northbound to Lowell Street as opposed to Lincoln Street southbound via Shawsheen Street to Stevens Street. Travel from Shawsheen Square to Lincoln Street is approximately 2 minutes shorter on average in the afternoon via Lowell Street (entrance to Lincoln Street southbound condition).

Overall, the weekday afternoon travel time data suggests the Lincoln Street southbound condition is favorable for all inbound travel where Lincoln Street is the destination except for from the west (WPC) where the difference in travel time is less than 10 seconds. The data does suggest that the Lincoln Street northbound condition is favorable for outbound travel to Shawsheen Square but favorable to the southbound condition to Stop & Shop where the travel to the WPC is again negligible.

DISCUSSION

As part of the flow evaluation, TEC assessed the traffic impact under three (3) specific categories, including effect on the connecting neighborhood roadways, effect on school related cut-through traffic, and effect on resident travel times. Each category is summarized separately below:

Effect on Connecting Neighborhood Roadways

It is anticipated that there would be minimal impact on the connecting neighborhood roadways of Cindy Lane, Marilyn Road, Arthur Road, and Theodore Avenue following implementation of a one-way flow condition along Lincoln Street, regardless of directional flow. Note that any one-way flow condition along Lincoln Street would require the removal of the posted restrictions from Lowell Street between 7:30 am and 8:30 am.

- Under Lincoln Street northbound flow condition where the northbound traffic volume is generally consistent with the existing northbound volume, vehicles would generally utilize the neighborhood in the same manner as today. The Lincoln Street northbound movement at Lowell Street currently operates at an acceptable LOS C which renders the use of roadways such as Marilyn Road to Cindy Lane/Arthur Road or Theodore Avenue ineffective. This is unlikely to change at all if the future

flow condition is one-way northbound. There would be no anticipated growth in southerly direction traffic through the neighborhood as these vehicles would be forced to turn back to Lowell Street once intersecting Lincoln Street.

- Under Lincoln Street southbound flow condition where the southbound traffic volumes are slightly increased with the removal of turn restrictions, it is expected that the use of the connecting neighborhood roadway would be limited. Vehicles traveling from Lowell Street to the west would be able to access Lincoln Street prior to Arthur Road and/or Theodore Avenue leaving any increase in volume to be from Lowell Street to the east. With the posted turn restrictions removed from Lincoln Street, the likelihood of cut-through via Arthur Road and/or Theodore Avenue is minimal as the left-turn delay for any street is likely to be similar with the overall travel time being roughly the same. Any minor increase in cut-through could be somewhat mitigated with the similar posted left-turn restriction along Marilyn Road at Lincoln Street with generally the same effectiveness as the existing condition.
- Cyr Circle has no separate outlet other than its current intersection with Lincoln Street with traffic signage provided at the intersection to relay the flow condition. Although some cut-through attempted traffic volume may travel along Cyr Circle, this level of traffic is minimal, if not negligible. A potential flow condition of one-way along Lincoln Street, regardless of direction, is anticipated to have minimal impact on all traffic patterns on this short roadway. For those drivers who are unfamiliar with the neighborhood, a Lincoln Street southbound flow condition would generally limit most of the minimal vehicles attempting, incorrectly, to use Cyr Circle based on the visible geometry of the roadway turning north, east of the intersection. This gives the appearance that Cyr Circle will not intersect Shawsheen Street.

Effect on School Related Cut-Through Traffic

The Lincoln Street southbound traffic volumes are generally consistent throughout the day ranging from thirteen (13) vehicles between 7:00 am and 8:00 am to forty-five (45) vehicles between 5:00 pm to 6:00 pm at the intersection with Shawsheen Street. The Lincoln Street northbound traffic volumes account for more variability throughout the day ranging from seventeen (17) vehicles between 7:00 am and 8:00 am to 71 vehicles between 3:00 pm and 4:00 pm. The variability is not only notable as it relates to school arrival and dismissal time periods, but in other hours after school dismissal. This same variability is not observed in the southbound direction in the morning hours which would typically be seen as the inverse condition. This may suggest that regardless of school related traffic, the northbound condition provides a more desirable traffic route for non-residents as opposed to the southbound condition. This can somewhat be explained by the geometrics of Lincoln Street and its place in the overall roadway network:

- Lincoln Street northbound is beneficial as a cut-through as a driver can avoid the side-street condition of the traffic signal (less overall green time) located at the intersection of Lowell Street / Shawsheen Street / Beacon Street / Reservation Road if travelling to/from the west. This condition does somewhat exist for Lincoln Street southbound; however, a driver would have passed through the signal and most likely would still be sitting in a queue and a stop-sign approaching the schools at some point whether on Shawsheen Street or on Lincoln Street.

- Lincoln Street northbound provides a low volume 'quick way out' once a driver leaves the main school driveway almost directly opposite Lincoln Street along Shawsheen Street. Similarly, Lincoln Street southbound driver is most likely sitting in a queue and a stop-sign regardless of which roadway they are taking to the school.

Overall, a one-way flow condition along Lincoln Street is expected to reduce the number of vehicles along the roadway regardless of one-way flow direction. Where there may be an expectation of some redistribution to Lincoln Street once the one-way flow is in place, the removal of all traffic volumes from the opposing direction will decrease the traffic.

Effect on Resident Travel Times

The travel time runs depict of faster origin to destination routes under both the Lincoln Street northbound and southbound condition. Overall, the travel time runs indicate that Lincoln Street northbound travel is more beneficial during the weekday morning; however, multiple of these favorable runs are less than a 1-minute difference. This would suggest that there is no substantial effect on the neighborhood residents in contrast to the removal or lessening of other neighborhood concerns such as cut-through traffic. During the weekday afternoon, the Lincoln Street southbound condition generally provides the more beneficial condition with the exception to travel to Shawsheen Square (2-minute addition) and to/from WPC of which the latter for both inbound and outbound is less than 10 seconds of travel time difference.

There would be an expectation of additional travel time for neighborhood residents for some particular routes whether a Lincoln Street northbound or southbound one-way flow condition. It does appear that the Lincoln Street southbound condition provides the most overall beneficial travel time potential, or in most cases is generally negligible as compared to a faster Lincoln Street northbound condition.

RECOMMENDATION

TEC recommends a **Lincoln Street southbound one-way flow condition** to be incorporated into the Complete Streets project as a) there is not expected to be any substantial change in traffic along the connecting neighborhood streets (Cindy Lane, Marilyn Road, Arthur Road, and Theodore Avenue), b) the more applicable desire for non-resident Lincoln Street use appears to be northbound regardless of the existing posted restriction, and c) the general benefit, in most conditions, of resident travel time in the Lincoln Street southbound direction. It can be expected that the overall Lincoln Street southbound traffic volumes would be retained as part of this condition in which the northbound traffic volumes are removed. In addition, TEC would expect that the traffic volumes between 7:30 am and 8:30 am along Lincoln Street will slightly increase with the removal of the posted turn restriction; however, this slight increase should be limited to only this hour.

Attachment A

Turning Movement Counts (TMCs)

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lowell St/SR 133 & Chandler Cir/Lincoln St
 City: Andover
 Control: 1-Way Stop(WB)

Project ID: 24-430035-001
 Date: 4/23/2024

Data - Total

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
AM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
7:00 AM	1	42	2	0	5	79	1	0	1	2	3	0	0	0	2	1	0	0	139		
7:15 AM	0	56	0	0	2	97	0	0	1	1	2	0	3	0	2	0	0	164			
7:30 AM	5	56	0	0	0	152	0	0	1	1	8	0	2	0	1	0	0	226			
7:45 AM	1	60	1	0	0	161	1	0	2	0	19	0	3	2	3	0	0	253			
8:00 AM	3	85	3	0	1	170	0	0	4	0	7	0	4	4	5	0	0	286			
8:15 AM	1	68	0	0	0	169	1	0	2	1	5	0	1	1	4	0	0	253			
8:30 AM	1	82	1	0	2	135	2	0	0	2	2	0	0	0	3	0	0	230			
8:45 AM	5	90	3	0	3	138	2	0	2	3	2	0	2	0	2	0	0	252			
9:00 AM	1	63	1	0	2	98	2	0	1	2	1	0	1	2	2	0	0	176			
9:15 AM	3	40	1	0	1	85	0	0	1	1	5	0	0	1	3	0	0	141			
9:30 AM	0	56	1	0	2	65	1	0	2	0	1	0	0	0	5	0	0	133			
9:45 AM	0	48	1	0	3	57	2	0	0	1	6	0	1	0	6	0	0	125			
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL				
APPROACH %'s :	2.69%	95.52%	1.79%	0.00%	1.46%	97.71%	0.83%	0.00%	18.48%	15.22%	66.30%	0.00%	25.76%	15.15%	57.58%	1.52%	2378				
PEAK HR :	07:45 AM - 08:45 AM																TOTAL				
PEAK HR VOL :	6	295	5	0	3	635	4	0	8	3	33	0	8	7	15	0	1022				
PEAK HR FACTOR :	0.500	0.868	0.417	0.000	0.375	0.934	0.500	0.000	0.500	0.375	0.434	0.000	0.500	0.438	0.750	0.000	0.893				
	0.841				0.939				0.524				0.577								

NS/EW Streets:	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0					
NOON	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
10:00 AM	0	63	3	0	2	68	0	0	0	0	6	0	0	0	2	0	0	144			
10:15 AM	1	40	1	0	2	74	0	0	1	2	2	0	1	2	4	0	0	128			
10:30 AM	4	69	0	0	2	64	0	0	0	1	4	0	2	0	2	0	0	148			
10:45 AM	0	53	0	0	2	55	2	0	1	1	1	0	0	1	3	0	0	119			
11:00 AM	1	46	3	0	3	62	1	0	2	1	1	0	1	2	3	0	0	126			
11:15 AM	0	55	1	0	3	66	1	0	0	1	1	0	2	1	4	0	0	135			
11:30 AM	2	64	1	0	2	63	1	0	1	0	3	0	1	0	4	0	0	142			
11:45 AM	4	68	0	0	2	70	1	0	1	0	2	0	0	0	2	0	0	150			
12:00 PM	0	52	1	0	2	69	1	0	0	0	2	0	1	0	7	0	0	135			
12:15 PM	2	75	1	0	3	64	3	0	1	1	4	0	0	1	4	0	0	159			
12:30 PM	2	50	1	0	2	73	0	0	0	2	4	0	2	0	5	0	0	141			
12:45 PM	2	57	0	0	3	58	3	0	3	3	4	0	0	4	2	0	0	139			
1:00 PM	1	51	2	0	6	60	2	0	1	0	6	0	2	1	1	0	0	133			
1:15 PM	2	47	0	0	3	70	1	0	2	1	3	0	1	1	4	0	0	135			
1:30 PM	0	56	1	1	4	64	2	0	0	0	0	0	2	0	2	0	0	132			
1:45 PM	1	61	2	0	5	50	0	0	2	0	3	0	0	0	3	0	0	127			
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL				
APPROACH %'s :	2.32%	95.78%	1.80%	0.11%	4.20%	94.15%	1.65%	0.00%	20.83%	15.28%	63.89%	0.00%	18.75%	16.25%	65.00%	0.00%	2193				
PEAK HR :	11:30 AM - 12:30 PM																TOTAL				
PEAK HR VOL :	8	259	3	0	9	266	6	0	3	1	11	0	2	1	17	0	586				
PEAK HR FACTOR :	0.500	0.863	0.750	0.000	0.750	0.950	0.500	0.000	0.750	0.250	0.688	0.000	0.500	0.250	0.607	0.000	0.921				
	0.865				0.962				0.625				0.625								

NS/EW Streets:	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0					
PM	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
2:00 PM	5	52	2	0	4	87	2	0	0	5	1	0	1	1	4	0	0	164			
2:15 PM	1	61	1	0	6	88	1	0	0	1	2	0	4	0	6	0	0	171			
2:30 PM	1	83	0	1	9	75	0	0	2	2	3	0	2	3	9	0	0	190			
2:45 PM	1	73	5	0	5	79	2	0	1	3	0	0	1	1	4	0	0	175			
3:00 PM	5	61	1	0	4	98	0	0	4	3	3	0	18	10	22	0	0	229			
3:15 PM	0	81	2	0	4	69	1	0	0	1	3	0	2	4	6	0	0	173			
3:30 PM	2	105	1	0	6	93	2	0	1	0	1	0	3	3	5	0	0	222			
3:45 PM	6	65	1	0	11	81	0	0	1	2	4	0	0	1	2	0	0	174			
4:00 PM	6	66	3	0	3	96	2	0	2	2	0	0	0	2	5	0	0	187			
4:15 PM	1	64	3	0	8	87	0	0	1	4	2	0	1	3	5	0	0	179			
4:30 PM	1	89	2	0	2	76	1	0	0	3	0	0	1	0	10	0	0	185			
4:45 PM	4	82	1	0	8	104	1	0	1	0	4	0	3	0	7	0	0	215			
5:00 PM	2	75	2	0	7	93	1	0	0	3	2	0	3	2	4	0	0	194			
5:15 PM	2	65	1	0	5	106	0	0	2	2	1	0	4	4	3	0	0	195			
5:30 PM	1	87	3	0	5	100	6	0	1	3	0	0	1	6	4	0	0	217			
5:45 PM	2	73	1	0	8	77	1	0	1	2	3	0	7	3	7	0	0	185			
6:00 PM	4	66	2	0	5	116	1	0	0	2	0	0	4	3	1	0	0	204			
6:15 PM	2	67	1	0	1	96	2	0	1	5	2	0	4	5	4	0	0	190			
6:30 PM	3	60	3	0	3	80	1	0	0	1	5	0	0	3	8	0	0	167			
6:45 PM	4	54	1	0	4	76	0	0	0	3	3	0	1	3	1	0	0	150			
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL				
APPROACH %'s :	3.49%	94.08%	2.37%	0.07%	5.66%	93.09%	1.26%	0.00%	17.31%	45.19%	37.50%	0.00%	25.64%	24.36%	50.00%	0.00%	3766				
PEAK HR :	04:45 PM - 05:45 PM																TOTAL				
PEAK HR VOL :	9	309	7	0	25	403	8	0	4	8	7	0	11	12	18	0	821				
PEAK HR FACTOR :	0.563	0.888	0.583	0.000	0.781	0.950	0.333	0.000	0.500	0.667	0.438	0.000	0.688	0.500	0.643	0.000	0.946				
	0.893				0.965				0.950				0.932								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lowell St/SR 133 & Chandler Cir/Lincoln St
 City: Andover
 Control: 1-Way Stop(WB)

Project ID: 24-430035-001
 Date: 4/23/2024

Data - Cars

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
AM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
7:00 AM	0	38	2	0	5	77	1	0	1	2	3	0	0	0	2	0	0	0	0	131	
7:15 AM	0	51	0	0	2	95	0	0	1	1	2	0	3	0	2	0	0	0	0	157	
7:30 AM	4	52	0	0	0	148	0	0	1	1	7	0	2	0	1	0	0	0	0	216	
7:45 AM	1	59	1	0	0	153	1	0	2	0	19	0	3	2	3	0	0	0	0	244	
8:00 AM	3	81	3	0	1	160	0	0	4	0	6	0	4	3	5	0	0	0	0	270	
8:15 AM	0	63	0	0	0	166	1	0	2	1	5	0	1	1	4	0	0	0	0	244	
8:30 AM	1	79	1	0	1	130	2	0	0	2	2	0	0	0	3	0	0	0	0	221	
8:45 AM	5	86	3	0	3	133	2	0	2	3	2	0	2	0	2	0	0	0	0	243	
9:00 AM	1	61	1	0	1	95	2	0	1	2	1	0	1	2	2	0	0	0	0	170	
9:15 AM	2	40	1	0	1	80	0	0	1	1	5	0	0	1	3	0	0	0	0	135	
9:30 AM	0	51	1	0	2	61	1	0	2	0	1	0	0	0	5	0	0	0	0	124	
9:45 AM	0	42	1	0	3	55	2	0	0	1	6	0	1	0	6	0	0	0	0	117	
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					TOTAL
APPROACH %'s :	2.32%	95.78%	1.91%	0.00%	1.37%	97.76%	0.87%	0.00%	18.89%	15.56%	65.56%	0.00%	26.56%	14.06%	59.38%	0.00%					
PEAK HR :	07:45 AM - 08:45 AM																TOTAL				
PEAK HR VOL :	5	282	5	0	2	609	4	0	8	3	32	0	8	6	15	0					979
PEAK HR FACTOR :	0.417	0.870	0.417	0.000	0.500	0.917	0.500	0.000	0.500	0.375	0.421	0.000	0.500	0.500	0.750	0.000					0.906
	0.839				0.921				0.512				0.604								

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
NOON	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
10:00 AM	0	60	3	0	2	65	0	0	0	0	4	0	0	0	2	0	0	0	0	136	
10:15 AM	1	40	1	0	2	70	0	0	1	0	2	0	1	2	4	0	0	0	0	124	
10:30 AM	4	67	0	0	2	62	0	0	0	1	4	0	2	0	2	0	0	0	0	144	
10:45 AM	0	51	0	0	2	53	2	0	1	1	1	0	0	1	3	0	0	0	0	115	
11:00 AM	1	41	3	0	3	55	1	0	2	1	1	0	1	2	3	0	0	0	0	114	
11:15 AM	0	50	1	0	3	64	1	0	0	1	1	0	2	1	4	0	0	0	0	128	
11:30 AM	2	62	1	0	2	60	1	0	1	0	3	0	1	0	4	0	0	0	0	137	
11:45 AM	3	64	0	0	2	69	1	0	1	0	1	0	0	0	2	0	0	0	0	143	
12:00 PM	0	51	0	0	2	67	1	0	0	0	2	0	1	0	6	0	0	0	0	130	
12:15 PM	2	73	1	0	3	61	3	0	1	1	4	0	0	1	4	0	0	0	0	154	
12:30 PM	0	49	1	0	2	72	0	0	0	2	4	0	2	0	5	0	0	0	0	137	
12:45 PM	2	55	0	0	3	57	3	0	3	3	4	0	0	2	2	0	0	0	0	134	
1:00 PM	1	50	2	0	6	52	2	0	1	0	3	0	2	1	1	0	0	0	0	121	
1:15 PM	2	46	0	0	3	69	1	0	1	1	3	0	1	1	4	0	0	0	0	132	
1:30 PM	0	53	1	1	4	63	2	0	0	0	0	0	2	0	2	0	0	0	0	128	
1:45 PM	0	58	2	0	5	49	0	0	2	0	3	0	0	0	3	0	0	0	0	122	
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					TOTAL
APPROACH %'s :	1.99%	96.13%	1.77%	0.11%	4.37%	93.92%	1.71%	0.00%	21.54%	16.92%	61.54%	0.00%	19.48%	14.29%	66.23%	0.00%					
PEAK HR :	11:30 AM - 12:30 PM																TOTAL				
PEAK HR VOL :	7	250	2	0	9	257	6	0	3	1	10	0	2	1	16	0					564
PEAK HR FACTOR :	0.583	0.856	0.500	0.000	0.750	0.931	0.500	0.000	0.750	0.250	0.625	0.000	0.500	0.250	0.667	0.000					0.916
	0.852				0.944				0.583				0.679								

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
PM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
2:00 PM	5	50	2	0	3	85	2	0	0	3	0	0	1	1	2	0	0	0	0	154	
2:15 PM	1	59	1	0	5	84	1	0	0	1	2	0	3	0	5	0	0	0	0	162	
2:30 PM	1	82	0	1	7	75	0	0	2	2	3	0	2	3	9	0	0	0	0	187	
2:45 PM	1	71	5	0	5	77	2	0	1	3	0	0	1	1	4	0	0	0	0	171	
3:00 PM	5	61	1	0	4	93	0	0	4	3	3	0	18	10	21	0	0	0	0	223	
3:15 PM	0	79	2	0	4	66	1	0	0	1	3	0	2	4	6	0	0	0	0	168	
3:30 PM	1	104	1	0	6	90	2	0	1	0	1	0	3	3	5	0	0	0	0	217	
3:45 PM	5	64	1	0	10	78	0	0	1	2	3	0	0	1	2	0	0	0	0	167	
4:00 PM	5	66	3	0	3	95	2	0	2	2	0	0	0	2	5	0	0	0	0	185	
4:15 PM	1	63	3	0	8	85	0	0	1	4	2	0	1	3	5	0	0	0	0	176	
4:30 PM	1	89	2	0	2	76	1	0	0	3	0	0	1	0	10	0	0	0	0	185	
4:45 PM	4	81	1	0	8	102	1	0	1	0	4	0	3	0	7	0	0	0	0	212	
5:00 PM	2	74	2	0	7	91	1	0	0	3	2	0	3	2	4	0	0	0	0	191	
5:15 PM	2	64	1	0	5	105	0	0	2	2	1	0	4	4	3	0	0	0	0	193	
5:30 PM	1	87	3	0	5	98	6	0	1	3	0	0	1	6	4	0	0	0	0	215	
5:45 PM	2	72	1	0	8	76	1	0	1	2	3	0	7	3	7	0	0	0	0	183	
6:00 PM	4	66	2	0	5	115	1	0	0	2	0	0	4	3	1	0	0	0	0	203	
6:15 PM	2	67	1	0	1	96	2	0	1	5	1	0	4	4	4	0	0	0	0	188	
6:30 PM	3	60	3	0	3	80	1	0	0	1	4	0	0	3	8	0	0	0	0	166	
6:45 PM	4	54	1	0	4	76	0	0	0	3	2	0	1	3	1	0	0	0	0	149	
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					TOTAL
APPROACH %'s :	3.33%	94.20%	2.40%	0.07%	5.51%	93.21%	1.28%	0.00%	18.56%	46.39%	35.05%	0.00%	25.88%	24.56%	49.56%	0.00%					
PEAK HR :	04:45 PM - 05:45 PM																TOTAL				
PEAK HR VOL :	9	306	7	0	25	396	8	0	4	8	7	0	11	12	18	0					811
PEAK HR FACTOR :	0.563	0.879	0.583	0.000	0.781	0.943	0.333	0.000	0.500	0.667	0.438	0.000	0.688	0.500	0.643	0.000					0.943
	0.885				0.966				0.950				0.932								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lowell St/SR 133 & Chandler Cir/Lincoln St
 City: Andover
 Control: 1-Way Stop(WB)

Project ID: 24-430035-001
 Date: 4/23/2024

Data - HT

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
AM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
7:00 AM	1	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
7:15 AM	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
7:30 AM	1	4	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	10	
7:45 AM	0	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
8:00 AM	0	4	0	0	0	10	0	0	0	0	0	1	0	0	0	0	1	0	0	16	
8:15 AM	1	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
8:30 AM	0	3	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
8:45 AM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
9:00 AM	0	2	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
9:15 AM	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
9:30 AM	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
9:45 AM	0	6	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL				
APPROACH %'s :	8.51%	91.49%	0.00%	0.00%	3.64%	96.36%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	50.00%	0.00%	50.00%	106				
PEAK HR :	07:45 AM - 08:45 AM																TOTAL				
PEAK HR VOL :	1	13	0	0	1	26	0	0	0	0	1	0	0	1	0	0	43				
PEAK HR FACTOR :	0.250	0.650	0.000	0.000	0.250	0.650	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.672				

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
NOON	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	TOTAL				
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
10:00 AM	0	3	0	0	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	8	
10:15 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
10:30 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
10:45 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
11:00 AM	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	12	
11:15 AM	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
11:30 AM	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
11:45 AM	1	4	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	7	
12:00 PM	0	1	1	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	5	
12:15 PM	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
12:30 PM	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
12:45 PM	0	2	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	5	
1:00 PM	0	1	0	0	0	8	0	0	0	0	0	3	0	0	0	0	0	0	0	12	
1:15 PM	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3	
1:30 PM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
1:45 PM	1	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL				
APPROACH %'s :	9.52%	88.10%	2.38%	0.00%	0.00%	100.00%	0.00%	0.00%	14.29%	0.00%	85.71%	0.00%	0.00%	66.67%	33.33%	0.00%	94				
PEAK HR :	11:30 AM - 12:30 PM																TOTAL				
PEAK HR VOL :	1	9	1	0	0	9	0	0	0	0	1	0	0	0	1	0	22				
PEAK HR FACTOR :	0.250	0.563	0.250	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.786				

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
PM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	TOTAL				
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
2:00 PM	0	2	0	0	1	2	0	0	0	2	1	0	0	0	2	0	0	0	0	10	
2:15 PM	0	2	0	0	1	4	0	0	0	0	0	0	1	0	1	0	0	0	0	9	
2:30 PM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
2:45 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
3:00 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	1	0	0	0	0	6	
3:15 PM	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
3:30 PM	1	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
3:45 PM	1	1	0	0	1	3	0	0	0	0	0	1	0	0	0	0	0	0	0	7	
4:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:15 PM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
5:00 PM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
5:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
5:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
5:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
6:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2	
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL				
APPROACH %'s :	15.79%	84.21%	0.00%	0.00%	12.82%	87.18%	0.00%	0.00%	0.00%	28.57%	71.43%	0.00%	16.67%	16.67%	66.67%	0.00%	71				
PEAK HR :	04:45 PM - 05:45 PM																TOTAL				
PEAK HR VOL :	0	3	0	0	0	7	0	0	0	0	0	0	0	0	0	0	10				
PEAK HR FACTOR :	0.000	0.750	0.000	0.000	0.000	0.875	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.833				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lowell St/SR 133 & Chandler Cir/Lincoln St
 City: Andover
 Control: 1-Way Stop(WB)

Project ID: 24-430035-001
 Date: 4/23/2024

Data - Bikes

NS/EW Streets:	Lowell St/SR 133				Lowell St/SR 133				Chandler Cir/Lincoln St				Chandler Cir/Lincoln St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0	0	0	0	4
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.500

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	3
PEAK HR :	11:30 AM - 12:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	0	0	0	0	3	0	0	0	1	0	0	0	1	0	0	5
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.250

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lowell St/SR 133 & Chandler Cir/Lincoln St
City: Andover

Project ID: 24-430035-001
Date: 4/23/2024

Data - Pedestrians (Crosswalks)

NS/EW Streets:	Lowell St/SR 133		Lowell St/SR 133		Chandler Cir/Lincoln St		Chandler Cir/Lincoln St				
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SCRAMBLE (NE/SW)		TOTAL
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	
7:00 AM	0	0	0	0	0	0	1	0	0	0	1
7:15 AM	0	0	0	0	0	0	1	2	0	0	3
7:30 AM	0	0	0	0	0	0	1	0	6	0	7
7:45 AM	0	0	0	0	0	0	1	0	5	0	6
8:00 AM	0	0	0	0	0	0	2	3	3	2	10
8:15 AM	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	1	0	0	0	0	0	1	1	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	1	0	0	1
9:15 AM	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	1	1	0	2	4
TOTAL VOLUMES :	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	TOTAL
APPROACH %'s :	1	0	0	0	0	0	8	8	14	4	35
	100.00%	0.00%					50.00%	50.00%	77.78%	22.22%	
PEAK HR :	07:45 AM - 08:45 AM										TOTAL
PEAK HR VOL :	1	0	0	0	0	0	4	4	8	2	19
PEAK HR FACTOR :	0.250	0					0.500	0.333	0.400	0.250	0.475
		0.250						0.400		0.500	

NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SCRAMBLE (NE/SW)		TOTAL
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	
10:00 AM	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	1	0	1
11:00 AM	0	0	0	0	0	0	1	2	1	1	5
11:15 AM	0	0	0	0	0	0	2	3	0	0	5
11:30 AM	0	0	0	0	0	0	1	0	0	0	1
11:45 AM	0	0	0	0	0	0	1	0	0	0	1
12:00 PM	0	0	0	0	0	0	1	0	1	0	2
12:15 PM	0	0	0	0	0	0	0	1	0	0	1
12:30 PM	0	0	0	0	0	0	4	0	1	0	5
12:45 PM	0	0	0	0	0	0	0	1	0	1	2
1:00 PM	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	1	0	0	0	1
1:45 PM	0	0	0	0	0	0	2	0	0	0	2
TOTAL VOLUMES :	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	TOTAL
APPROACH %'s :	0	0	0	0	0	0	13	7	4	2	26
							65.00%	35.00%	66.67%	33.33%	
PEAK HR :	11:30 AM - 12:30 PM										TOTAL
PEAK HR VOL :	0	0	0	0	0	0	3	1	1	0	5
PEAK HR FACTOR :							0.750	0.250	0.250	0	0.625
								1.000		0.250	

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SCRAMBLE (NE/SW)		TOTAL
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	1	0	1	1	3
3:00 PM	0	0	0	0	0	0	1	2	0	15	18
3:15 PM	0	0	0	0	0	0	0	0	1	0	1
3:30 PM	0	0	0	0	0	0	2	0	2	0	4
3:45 PM	0	0	0	0	0	0	0	1	0	6	7
4:00 PM	0	1	0	0	0	0	0	1	0	1	3
4:15 PM	0	0	0	0	0	0	1	1	0	1	3
4:30 PM	0	0	0	0	0	0	2	1	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	1	0	1	2
5:15 PM	0	0	0	0	0	0	1	1	0	1	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	1	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	2	3	2	3	10
6:30 PM	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES :	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	TOTAL
APPROACH %'s :	0	1	0	0	0	0	11	11	6	29	58
	0.00%	100.00%					50.00%	50.00%	17.14%	82.86%	
PEAK HR :	04:45 PM - 05:45 PM										TOTAL
PEAK HR VOL :	0	0	0	0	0	0	1	2	0	2	5
PEAK HR FACTOR :							0.250	0.500		0.500	0.417
								0.375		0.500	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lincoln St & Shawsheen Rd
City: Andover
Control: 1-Way Stop(SB)

Project ID: 24-430035-002
Date: 4/23/2024

Data - HT

NS/EW Streets:	Lincoln St				Lincoln St				Shawsheen Rd				Shawsheen Rd				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
AM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
7:00 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	3	1	0	0	0	8		
7:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	4		
7:30 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	2	0	0	0	0	10		
7:45 AM	0	0	0	0	0	0	0	0	0	10	0	0	0	8	0	0	0	0	18		
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1		
8:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	4		
8:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	0	0	0	7		
8:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	0	0	0	9		
9:00 AM	0	0	0	0	1	0	0	0	0	1	0	0	0	5	0	0	0	0	7		
9:15 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	5		
9:30 AM	0	0	0	0	1	0	0	0	0	1	0	0	0	4	0	0	0	0	6		
9:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	1	0	0	0	5		
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					TOTAL
APPROACH %'s :	0	0	0	0	3	0	0	0	0	42	0	0	0	37	2	0					84
					100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	94.87%	5.13%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL				
PEAK HR VOL :	0	0	0	0	1	0	0	0	0	19	0	0	0	13	0	0					33
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.475	0.000	0.000	0.000	0.406	0.000	0.000					0.458

NS/EW Streets:	Lincoln St				Lincoln St				Shawsheen Rd				Shawsheen Rd				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
NOON	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	3	2	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
10:00 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	6		
10:15 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	8		
10:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	3		
10:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	0	5		
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
11:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3		
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
11:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	0	5		
12:00 PM	0	0	0	0	1	0	0	0	0	4	0	0	0	0	1	0	0	0	6		
12:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2		
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	7	0	0	0	0	8		
12:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	0	6		
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
1:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	4		
1:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	3	1	0	0	0	6		
1:45 PM	0	0	0	0	1	0	0	0	0	3	0	0	0	3	0	0	0	0	7		
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					TOTAL
APPROACH %'s :	0	0	0	0	2	0	0	0	0	31	0	0	0	35	4	0					72
					100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	89.74%	10.26%	0.00%					
PEAK HR :	12:15 PM - 01:15 PM																TOTAL				
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	5	0	0	0	10	2	0					17
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.357	0.250	0.000					0.531

NS/EW Streets:	Lincoln St				Lincoln St				Shawsheen Rd				Shawsheen Rd				TOTAL				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND								
PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	8	2	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					
2:00 PM	0	0	0	0	2	0	0	0	0	3	0	0	0	8	2	0	0	0	15		
2:15 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	4	0	0	0	0	12		
2:30 PM	0	0	0	0	3	0	0	0	0	9	0	0	0	1	0	0	0	0	13		
2:45 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	0	10		
3:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	8	1	0	0	0	10		
3:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	4		
3:30 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	5		
3:45 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	4	0	0	0	0	7		
4:00 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	4	0	0	0	0	9		
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4		
4:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	1	0	0	0	4		
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	0	5		
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1		
5:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4		
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
6:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	2		
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
6:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1		
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU					TOTAL
APPROACH %'s :	0	0	0	0	5	0	0	0	1	49	0	0	0	49	4	0					108
					100.00%	0.00%	0.00%	0.00%	2.00%	98.00%	0.00%	0.00%	0.00%	92.45%	7.55%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL				
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0					5
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.313	0.000	0.000	0.000	0.000	0.000	0.000					0.313

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lincoln St & Shawsheen Rd
 City: Andover
 Control: 1-Way Stop(SB)

Project ID: 24-430035-002
 Date: 4/23/2024

Data - Bikes

NS/EW Streets:	Lincoln St				Lincoln St				Shawsheen Rd				Shawsheen Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.500

NS/EW Streets:	Lincoln St				Lincoln St				Shawsheen Rd				Shawsheen Rd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
10:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
PEAK HR :	12:15 PM - 01:15 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NS/EW Streets:	Lincoln St				Lincoln St				Shawsheen Rd				Shawsheen Rd				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
6:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	0	0	0	1	0	0	0	0	3	0	0	0	2	2	0	8
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.500

National Data & Surveying Services

Intersection Turning Movement Count

Location: Lincoln St & Shawsheen Rd
City: Andover

Project ID: 24-430035-002
Date: 4/23/2024

Data - Pedestrians (Crosswalks)

NS/EW Streets:	Lincoln St		Lincoln St		Shawsheen Rd		Shawsheen Rd		TOTAL
	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
AM	EB	WB	EB	WB	NB	SB	NB	SB	
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	3	0	0	0	0	0	0	0	3
8:00 AM	3	0	0	0	0	0	0	0	3
8:15 AM	0	1	0	0	0	0	0	0	1
8:30 AM	1	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0
9:30 AM	0	1	0	0	0	0	0	0	1
9:45 AM	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES :	EB 7	WB 2	EB 0	WB 0	NB 0	SB 0	NB 0	SB 0	TOTAL 9
APPROACH %'s :	77.78% 22.22%								
PEAK HR :	07:30 AM - 08:30 AM								TOTAL 7
PEAK HR VOL :	6	1	0	0	0	0	0	0	7
PEAK HR FACTOR :	0.500	0.250							0.583

NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		TOTAL
	EB	WB	EB	WB	NB	SB	NB	SB	
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	1	1	0	0	0	0	0	0	2
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	1	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	1	0	0	0	0	0	0	0	1
1:00 PM	0	0	0	0	0	0	0	0	0
1:15 PM	1	0	0	0	0	0	0	0	1
1:30 PM	1	3	0	0	0	0	0	0	4
1:45 PM	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES :	EB 4	WB 5	EB 0	WB 0	NB 0	SB 0	NB 0	SB 0	TOTAL 9
APPROACH %'s :	44.44% 55.56%								
PEAK HR :	12:15 PM - 01:15 PM								TOTAL 1
PEAK HR VOL :	1	0	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.250	0							0.250

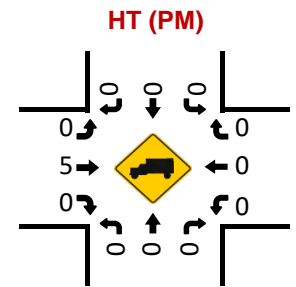
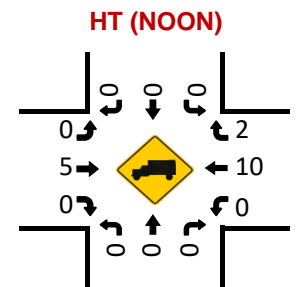
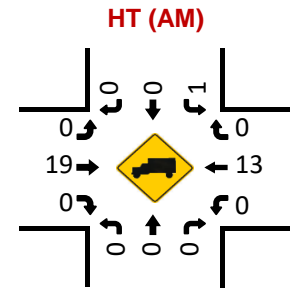
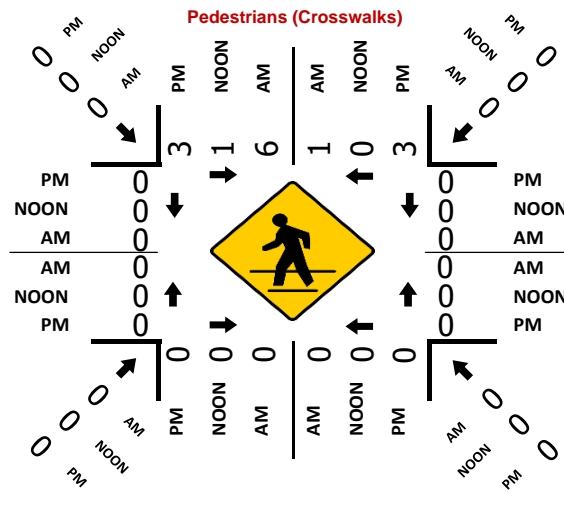
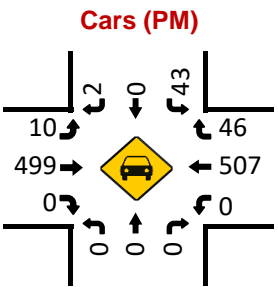
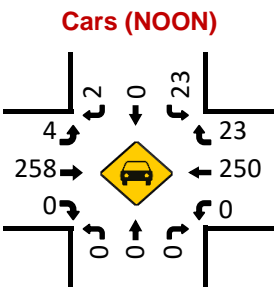
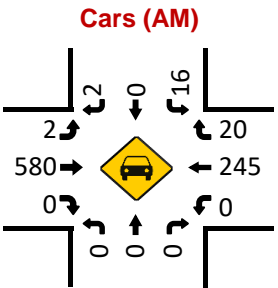
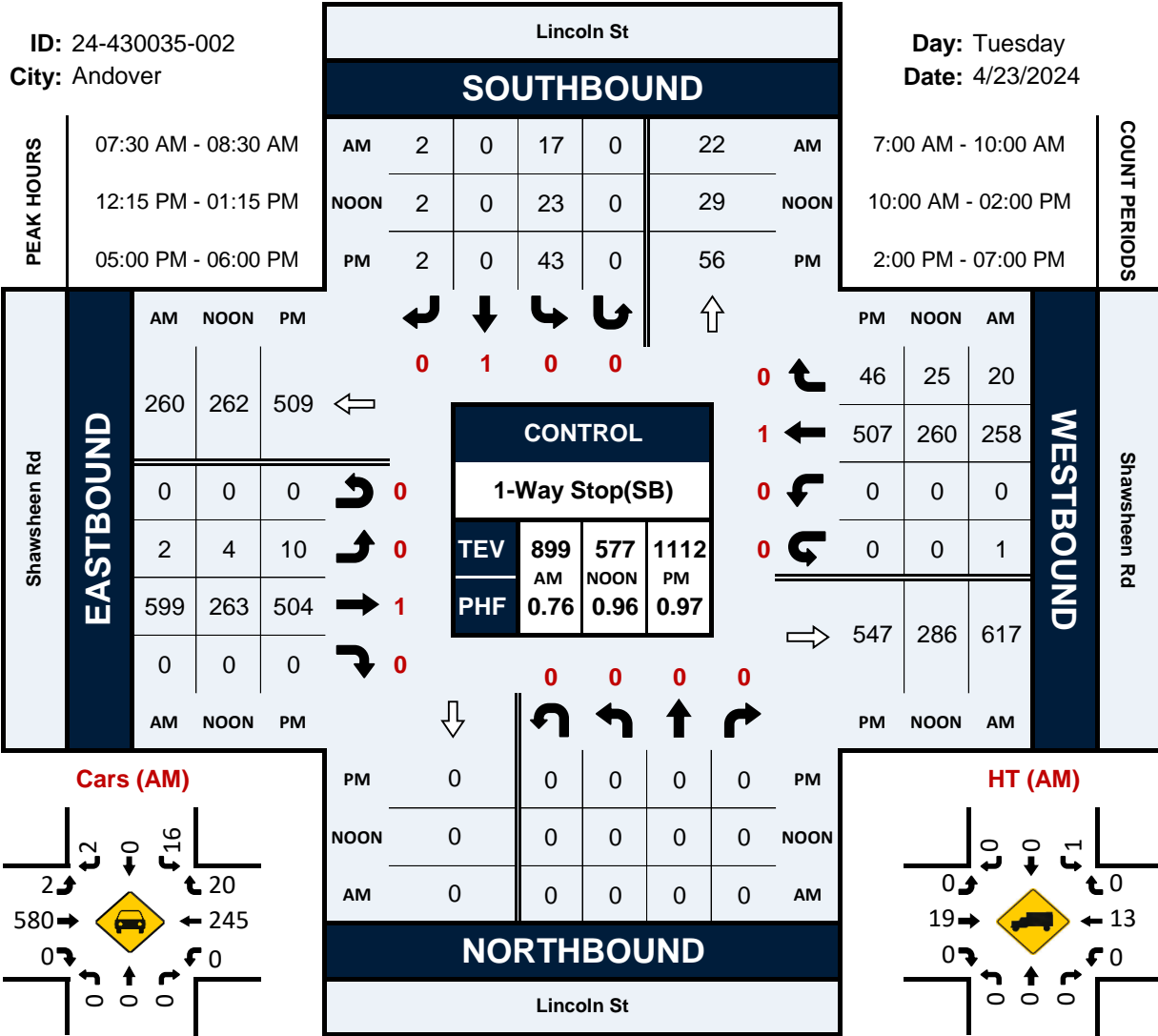
PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		TOTAL
	EB	WB	EB	WB	NB	SB	NB	SB	
2:00 PM	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0
2:45 PM	1	14	0	0	0	0	0	0	15
3:00 PM	0	4	0	0	0	0	0	0	4
3:15 PM	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0
3:45 PM	0	31	0	0	0	0	0	0	31
4:00 PM	8	1	0	0	0	0	0	0	9
4:15 PM	14	0	0	0	0	0	0	0	14
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	1	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	1	1	0	0	0	0	0	0	2
5:45 PM	2	2	0	0	0	0	0	0	4
6:00 PM	0	1	0	0	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	0	0
6:30 PM	0	3	0	0	0	0	0	0	3
6:45 PM	1	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	EB 28	WB 57	EB 0	WB 0	NB 0	SB 0	NB 0	SB 0	TOTAL 85
APPROACH %'s :	32.94% 67.06%								
PEAK HR :	05:00 PM - 06:00 PM								TOTAL 6
PEAK HR VOL :	3	3	0	0	0	0	0	0	6
PEAK HR FACTOR :	0.375	0.375							0.375

Lincoln St & Shawsheen Rd

Peak Hour Turning Movement Count

ID: 24-430035-002
City: Andover

Day: Tuesday
Date: 4/23/2024



Attachment B

Travel Time Runs

Route: Lincoln Street to/from West Parish Cemetery Driveway
 Driver: Rana Eslamifard (TEC)
 Date: May 15, 2024
 Period: Weekday Morning

Routes		Start Time	Travel Time	Finish Time
1A	Lincoln St @ Marilyn Rd	7:50	02:07	7:52
1B	WPC Parking	7:53	02:28	7:55
2A	Lincoln St @ Marilyn Rd	7:56	03:16	7:59
2B	WPC Parking	8:01	05:36	8:06
1A	Lincoln St @ Marilyn Rd	8:08	02:52	8:10
1B	WPC Parking	8:12	02:10	8:14
2A	Lincoln St @ Marilyn Rd	8:15	02:33	8:17
2B	WPC Parking	8:18	02:27	8:20
1A	Lincoln St @ Marilyn Rd	8:22	02:17	8:24
1B	WPC Parking	8:25	02:01	8:27
2A	Lincoln St @ Marilyn Rd	8:28	02:24	8:30
2B	WPC Parking	8:31	02:38	8:33
1A	Lincoln St @ Marilyn Rd	8:36	02:13	8:38
1B	WPC Parking	8:39	02:11	8:41
2A	Lincoln St @ Marilyn Rd	8:43	03:25	8:46
2B	WPC Parking	8:46	03:52	8:49

Start point: Lincoln Street @ Marilyn Road

Average Travel Time	1A	02:22
	1B	02:13
	2A	02:55
	2B	03:38

Route: Lincoln Street to/from West Parish Cemetery Driveway
 Driver: Rana Eslamifard (TEC)
 Date: May 13, 2024
 Period: Weekday Afternoon

Routes		Start Time	Travel Time	Finish Time
1	Lincoln St @ Marilyn Rd	2:58	03:40	3:01
1	WPC Parking	3:02	05:01	3:07
2	Lincoln St @ Marilyn Rd	3:10	04:20	3:14
2	WPC Parking	3:15	03:46	3:18
1	Lincoln St @ Marilyn Rd	3:18	04:25	3:22
1	WPC Parking	3:22	02:59	3:24
2	Lincoln St @ Marilyn Rd	3:24	02:44	3:26
2	WPC Parking	3:28	03:05	3:31
1	Lincoln St @ Marilyn Rd	3:32	02:57	3:34
1	WPC Parking	3:36	02:51	3:38
2	Lincoln St @ Marilyn Rd	3:40	03:52	3:43
2	WPC Parking	3:45	02:57	3:47
1	Lincoln St @ Marilyn Rd	3:49	02:15	3:51
1	WPC Parking	3:52	02:15	3:54
2	Lincoln St @ Marilyn Rd	3:56	02:52	3:58
2	WPC Parking	3:59	02:51	4:01

Start point: Lincoln Street @ Marilyn Road

1A 03:19
 1B 03:17
 2A 03:27
 2B 03:10

Route: Lincoln Street to/from Stop & Shop via Shawsheen Square
 Driver: Samuel Gregorio (TEC)
 Date: May 15, 2024
 Period: Weekday Morning

Trial # / Start point		Start Time	Travel Time @ Shawsheen Sq	Total Travel Time
1A	Lincoln St @ Marilyn Rd	7:59 AM	2:01	3:18
1B	Stop & Shop	7:49 AM	2:36	4:15
2A	Lincoln St @ Marilyn Rd	8:19 AM	2:15	3:50
2B	Stop & Shop	8:09 AM	2:27	4:10
3A	Lincoln St @ Marilyn Rd	8:39 AM	2:39	3:47
3B	Stop & Shop	8:29 AM	1:43	3:21

Start point: (A) Lincoln Street @ Marilyn Road; or (B) Stop & Shop Curb Cut

Average Travel Times	Direction A	1:23	2:11
	Direction B	1:21	2:21

Route: Lincoln Street to/from Stop & Shop via Shawsheen Square
 Driver: Kevin Dandrade (TEC)
 Date: May 13, 2024
 Period: Weekday Afternoon

Trial # / Start point		Start Time	Travel Time @ Shawsheen Sq	Total Travel Time
1A	Lincoln St @ Marilyn Rd	2:55 PM	4:15	5:55
1B	Stop & Shop	3:03 PM	3:38	5:28
2A	Lincoln St @ Marilyn Rd	3:09 PM	3:38	5:21
2B	Stop & Shop	3:17 PM	2:42	4:55
3A	Lincoln St @ Marilyn Rd	3:23 PM	6:05	7:25
3B	Stop & Shop	3:32 PM	1:57	3:39
4A	Lincoln St @ Marilyn Rd	3:36 PM	6:36	9:04
4B	Stop & Shop	3:45 PM	2:34	4:20
5A	Lincoln St @ Marilyn Rd	3:50 PM	4:16	5:39
5B	Stop & Shop	3:57 PM	1:16	3:03

Start point: (A) Lincoln Street @ Marilyn Road; or (B) Stop & Shop Curb Cut

Average Travel Times	Direction A	4:58	6:40
	Direction B	2:25	4:17

Route: Lincoln Street to/from Stop & Shop via School Street
 Driver: Rebecca Dean (TEC)
 Date: May 15, 2024
 Period: Weekday Morning

Trial # / Start point		Start Time	Total Travel Time
1A	Stop & Shop	7:50 AM	7:38
1B	Lincoln St @ Marilyn Rd	8:00 AM	4:41
2A	Stop & Shop	8:09 AM	9:13
2B	Lincoln St @ Marilyn Rd	8:21 AM	4:26
3A	Stop & Shop	8:30 AM	3:10
3B	Lincoln St @ Marilyn Rd	8:40 AM	3:36

Start point: (A) Stop & Shop Curb Cut; or (B) Lincoln Street @ Marilyn Road

Average Travel Times	Direction A	6:40
	Direction B	4:14

Route: Lincoln Street to/from Stop & Shop via School Street
 Driver: Rebecca Dean (TEC)
 Date: May 13, 2024
 Period: Weekday Afternoon

Trial # / Start point		Start Time	Total Travel Time
1A	Stop & Shop	3:00 PM	8:06
1B	Lincoln St @ Marilyn Rd	3:11 PM	4:51
2A	Stop & Shop	3:18 PM	3:00
2B	Lincoln St @ Marilyn Rd	3:23 PM	4:27
3A	Stop & Shop	3:31 PM	2:46
3B	Lincoln St @ Marilyn Rd	3:35 PM	4:15
4A	Stop & Shop	3:42 PM	2:58
4B	Lincoln St @ Marilyn Rd	3:49 PM	5:58

Start point: (A) Stop & Shop Curb Cut; or (B) Lincoln Street @ Marilyn Road

Average Travel Times	Direction A	4:12
	Direction B	4:52

Route: Lincoln Terminus
Driver: Samuel Gregorio (TEC)
Date: May 29, 2024
Period: Weekday Morning

Trial # / Start point		Total Travel Time
4a	Shawsheen to Lowell	1:52
4b	Lowell to Shawsheen	3:22

Route: Lincoln Terminus
Driver: Rebecca Dean (TEC)
Date: May 28, 2024
Period: Weekday Afternoon

Trial # / Start point		Total Travel Time
4a	Shawsheen to Lowell	2:47
4b	Lowell to Shawsheen	2:48