TECHNICAL MEMORANDUM

DATE: **August 14, 2023**
TO: **Erin Stevens, Town of Concord**
FROM: **Julie Dombroski, Boston Region MPO**
Casey Cooper, Boston Region MPO
Rebecca Morgan, Boston Region MPO
RE: **Community Transportation Technical Assistance (CTTA) Program: Route 2 Crossings in Concord**

This memorandum details the results of a transportation study on crossings at two intersections along Route 2 in Concord. The study was conducted through the Community Transportation Technical Assistance (CTTA) Program, which provides technical analysis and support to municipal officials about local transportation issues. Staff members of the Boston Region Metropolitan Planning Organization (MPO) and the Metropolitan Area Planning Council (MAPC) administer this program.

The Town of Concord contacted the Central Transportation Planning Staff (CTPS), which is the staff to the MPO, regarding the safety of pedestrian crossings at two intersections on Route 2 (the Concord Turnpike). The Town requested that CTPS study the conditions at the intersection of Route 2 at Route 62 (Main Street) and the intersection of Route 2 at Old Road to Nine Acre Corner (ORNAC). The Town indicated that the current signal timing, specifically the pedestrian phase, needs to be reviewed. Figure 1 shows an overview of each intersection in the study area. This study identified short-term improvements for safer pedestrian and bicycle crossings and conditions at each intersection.

Both intersections were included in the study area of a previous CTPS study of Route 2 conducted as part of the 2013 Long-Range Transportation Plan (LRTP) Priority Corridors Program. Recommended treatments included signal retiming and coordination throughout the corridor. One proposed geometric change is pertinent to the present study: the addition of a second westbound left-turn lane on Route 2 at Route 62. A second left-turn lane was not implemented—the existing intersection only has one westbound left-turn lane on Route 2.

Civil Rights, nondiscrimination, and accessibility information is on the last page.



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FIGURE 1
Study Area Diagram
Route 2 at RT 62 and RT 2 at ORNAC

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1 EXISTING CONDITIONS

The study intersections are located in the Town of Concord, which is a member of the Minuteman Advisory Group on Interlocal Coordination (MAGIC) subregion in the Boston area. Concord is home to many historic sites, including Minuteman National Historical Park and Walden Pond. The population as of the 2020 Census was 18,491.

Route 2 is a principal arterial roadway that carries regional traffic between Greater Boston and north-central Massachusetts. Route 2 cuts through the town of Concord, effectively separating the northern and eastern sections of the town from the western and southern sections of the town. The section of Route 2 in the study area is a separated four-lane highway. The speed limit is 45 miles per hour, but it should be noted that stakeholders mention that vehicles are regularly travelling 10-15 miles per hour faster than the posted speed.

The junction of Route 2 and Route 62 is a signalized, skewed, four-leg intersection. Route 62 is an east-west roadway that connects West Concord village to the center of Concord. Much of the land use surrounding the area is for residential purposes, but there are some offices located southeast of the intersection.

The intersection of Route 2 and ORNAC is a signalized, four-leg intersection. ORNAC connects southwestern Concord to the town center. Most of the land use around the intersection is dedicated to medical and office uses. Emerson Hospital is a notable landmark located on the southern corner of the intersection.

These intersections are within the study area of an ongoing study by the Massachusetts Department of Transportation (MassDOT) and Vanasse Hangen Brustlin (VHB) of Route 2 between Fitchburg and Lincoln. The MassDOT study stretches between Oak Hill Road in Fitchburg and Bedford Road in Lincoln and is concerned with operations and safety within the corridor. At the time of the writing of this memorandum, the findings of the MassDOT study have not been made public. The study is slated to be published in late summer or early fall 2023. Efforts should be made between the Town of Concord and MassDOT to incorporate pedestrian and bicycle accommodations and upgrades at the intersection of Route 2 and Route 62 and the intersection of Route 2 and ORNAC in accordance with this memorandum and the to-be-published study.

1.1 Site Visit

Staff met with Erin Stevens, Senior Planner for the Town of Concord, on Tuesday, February 7, 2023. A walk-through of each intersection was conducted.

Staff took photographs and video of existing conditions at each intersection. Staff also discussed issues and concerns with Ms. Stevens.

1.1.1 Findings

Staff observed and noted existing conditions of the pedestrian facilities at each intersection, which are listed below:

Route 2 at ORNAC

- Crosswalk markings are faded on both crossings.
- The only streetlight present is at the southwest corner of the intersection.
- ADA-accessible push-buttons are not present on any poles.
- The pedestrian signal indicator at the southeast corner of the intersection is not in operation.
- The median on the Route 2 crossing is crumbling. (See Figure 2.)
- The curb ramps on the Route 2 crossing are partially deteriorated, and the detectable warning strip at the northeast corner of the intersection is not aligned with the crosswalk.
- Detectable warning strips on both curb ramps of the ORNAC crossing could be better aligned with the crosswalk.
- The curb ramp and detectable warning strip on ORNAC at the southwest corner of the intersection is deteriorated.
- The signal controller cabinet on the ORNAC crossing obstructs pedestrians from a northeast-bound driver’s view. (See Figure 3.)

Figure 2
Intersection of Route 2 and ORNAC:
Existing Condition of Median on Route 2



ORNAC = Old Road to Nine Acre Corner.
Source: Central Transportation Planning Staff.

Figure 3
Signal Controller Cabinet on ORNAC



ORNAC = Old Road to Nine Acre Corner.
Source: Central Transportation Planning Staff.

Route 2 at Route 62

- ADA-accessible push-buttons are present.
- The median is grade separated.
- An impact attenuator is attached to the concrete median barrier.
- No street lighting is present at the intersection. The closest streetlight is on Route 62 westbound about 450 feet before the intersection. (See Figure 4).
- There is no guardrail on the sidewalk at the northeast corner of the intersection. (See Figure 5.)

Figure 4
Streetlight on Route 62 Near Orchard Road



Source: Google Maps Streetview.

Figure 5
View of the Intersection of Routes 2 and 62 from the Northwest Corner



Note: There is no guardrail on the sidewalk at the northeast corner of the intersection. The sidewalk of note can be seen on the left side of the image, across the street.
Source: Central Transportation Planning Staff.

1.2 Safety Concerns

Due to the scope of the study, five-year crash data was not collected for this study. However, CTPS utilized the MassDOT IMPACT Crash Portal[1] to determine if there were any crashes involving vulnerable road users[2] at each intersection over the last five years (2018–22). One crash occurred within the five year period. On June 30, 2022, at 7:55 AM, a pedestrian crossing Route 2 was hit by a vehicle turning right onto Route 2 southbound from ORNAC.

Several safety-related issues were identified by CTPS, as well as stakeholders, including Town staff and Emerson staff. Notable issues identified by stakeholders included inadequate crossing times, right-turn-on-red conflicts, insufficient or nonexistent street lighting, and general feelings of unsafe conditions for people who walk or bike across these intersections.

2 ENGAGEMENT AND OUTREACH

In collaboration with the CTPS Communications and Engagement team, staff created a survey to gauge comfort and perceived safety of roadway users, specifically those who use the crossings, at each intersection. Questions regarding each crossing—two at the intersection of Route 2 and ORNAC and one at the intersection of Route 2 and Route 62—were posed to respondents, as well as questions specific to Emerson Hospital employees and patients regarding their transportation habits when visiting the hospital.

One of the final survey questions allowed for respondents to volunteer their name and email address to participate in additional feedback opportunities. On Friday, June 30, 2023, emails were sent out with a summary of proposed short-term interventions. Responses were requested by Wednesday, July 12. Copies of the responses can be found in Appendix B.

2.1 Notable Survey Results

A survey regarding perceived safety at each study intersection was conducted between May 4, 2023, and June 13, 2023. A total of 548 responses were recorded. Appendix A contains each question on the survey and the breakdown of responses to each of them. Notable survey questions and results are highlighted in the sections below.

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[1] https://apps.impact.dot.state.ma.us/cdp/home

[2] In Massachusetts, vulnerable road users include people walking and biking; roadside workers; people using mobility devices such as wheelchairs, motorized bicycles, scooters, skateboards, roller skates, and other micromobility devices; horse riders and horse-drawn carriages; and farm equipment. https://www.massbike.org/new-massachusetts-vulnerable-road-users-laws-webinar-recap-faq

2.1.1 Intersection of Route 2 and Route 62 (Main Street)

- A majority of respondents said they feel ”very unsafe” or “unsafe” while crossing Route 2.
- About 50 percent of respondents in this section of the survey said they do not get enough time to cross the roadway.
- Most people stated they would “definitely” or “probably” use this crossing more if it was safer.

2.1.2 Intersection of Route 2 and ORNAC

The following responses pertain to the crossing on Route 2:

- Almost a quarter of people using this crossing are going to Emerson Hospital.
- Most respondents feel “very unsafe” or “unsafe” using this crossing.
- Nearly half of respondents believe there is not enough time to cross Route 2.
- More than 70 percent of people who responded said they would “definitely” or “probably” use the crossing more frequently if it was safer.

The following responses pertain to the crossing on ORNAC:

- About 65 percent of respondents feel “very unsafe” or “unsafe” while using the ORNAC crossing.
- Just under half of the respondents feel there is not enough time to cross the road.
- A majority of people noted they would “definitely” or “probably” use this crossing more frequently if it was safer.

3 EXISTING CONDITIONS ANALYSIS

To examine the existing conditions, CTPS requested MassDOT’s assistance in collecting Automatic Traffic Recorder (ATR) counts on the approaching roadways and intersection turning movement counts (TMCs) for this study. The ATR counts were performed during the week of March 27–31, 2023. The TMCs were collected Thursday, March 30, 2023, and Saturday, April 8, 2023.

3.1 Daily Traffic Volumes

Based on the data, staff estimated the average weekday traffic volumes in roadway sections near the study intersections as follows:

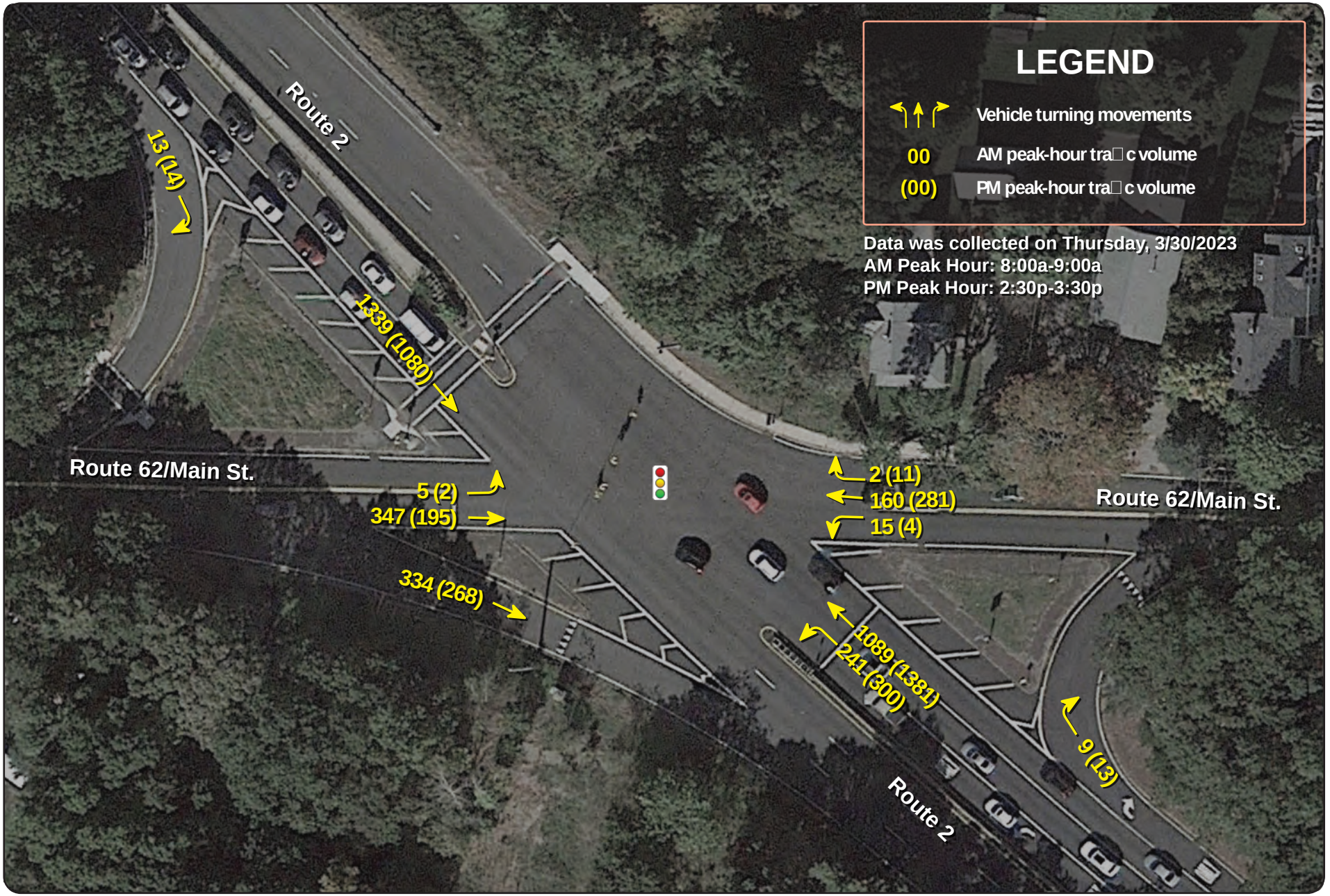
- Route 2 at Route 62
    - Route 62, west of Route 2—13,900 vehicles, with a split of 6,950 (50 percent) eastbound vehicles and 6,950 (50 percent) westbound vehicles

    - Route 62, east of Route 2—5,800 vehicles, with a split of 2,958 (51 percent) eastbound vehicles and 2,842 (49 percent) westbound vehicles
    - Route 2, north of Route 62—37,000 vehicles, with a split of 18,870 (51 percent) southeast-bound vehicles and 18,130 (49 percent) northwest-bound vehicles
    - Route 2, south of Route 62—43,200 vehicles, with a split of 22,032 (51 percent) southeast-bound vehicles and 21,168 (49 percent) northwest-bound vehicles
- Route 2 at ORNAC
    - ORNAC, west of Route 2—9,100 vehicles, with a split of 6,006 (66 percent) northeast-bound vehicles and 3,094 (34 percent) southwest-bound vehicles
    - ORNAC, east of Route 2—4,100 vehicles, with a split of 2,050 (50 percent) northeast-bound vehicles and 2,050 (50 percent) southwest bound vehicles
    - Route 2, south of ORNAC—42,300 vehicles, with a split of 21,573 (51 percent) southeast-bound vehicles and 20,727 (49 percent) northwest-bound vehicles
    - Route 2, north of ORNAC—43,200 vehicles, with a split of 22,032 (51 percent) southeast-bound vehicles and 21,168 (49 percent) northwest-bound vehicles

3.2 Turning Movement Counts

MassDOT collected turning movement counts at the study intersections on Thursday, March 30, 2023, during the morning peak period (6:00 AM–10:00 AM) and the evening peak period (2:00 PM–6:00 PM), and on Saturday, April 8, 2023, during the midday peak period (10:00 AM–2:00 PM). Pedestrian and bicycle counts were also collected during these periods.

Figures 6 and 7 summarize the 2023 AM and PM peak-hour traffic turning volumes, pedestrian, and bicycle counts by approach at the intersections.

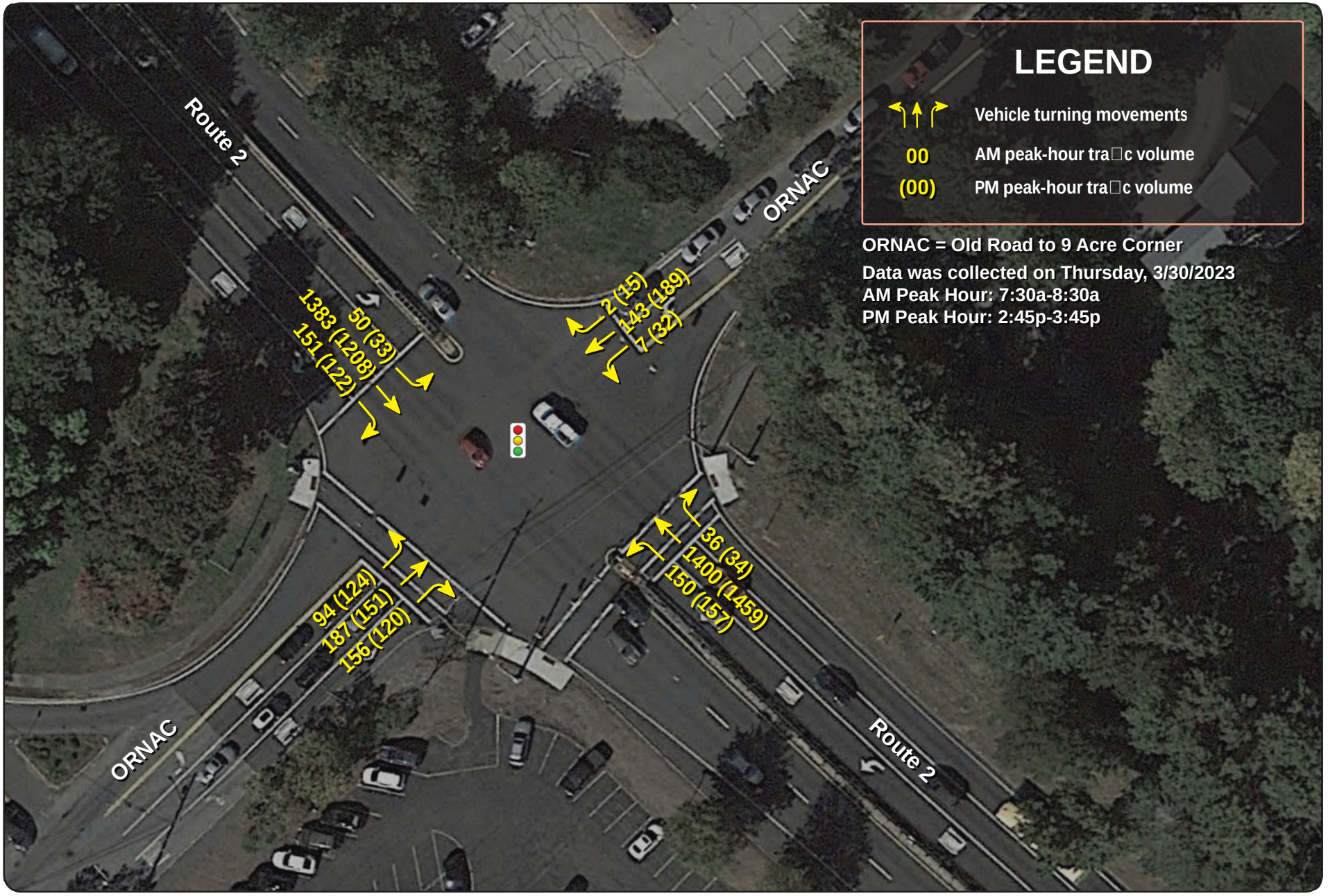


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FIGURE 6
Weekday Peak-Hour Turning Movement Counts
Route 2 at Route 62/Main Street in Concord

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FIGURE 7
Weekday Peak-Hour Turning Movement Counts
Route 2 at Old Road to Nine Acre Corner (ORNAC) in Concord

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3.3 Intersection Capacity Analysis

An intersection capacity analysis was performed for each of the study intersections to compare existing delay and level of service (LOS) to the same operational metrics with the proposed signal changes. The analysis was performed using the peak-hour turning movement counts.[3] Intersection capacity analyses for the intersection of Route 2 at Route 62 and Route 2 at ORNAC are displayed in Tables 1 and 2, respectively. Further contents of the analysis can be found in Appendix C.

Table 1
Summary of Intersection Capacity Analysis
Route 2/Concord Turnpike at Route 62/Main Street
2023 AM and PM Peak-Hour Traffic Conditions

Analysis Period	AM	AM	PM	PM
Approach	LOS	Delay (seconds)	LOS	Delay (seconds)
Route 2 northbound	C	22.2	B	17.7
Route 2 southbound	D	35.7	D	37.5
Route 62 eastbound	D	47.3	C	27.8
Route 62 westbound	D	40.7	E	69.3
Intersection Average	C	33.1	C	29.4

Notes:
All movements share a single lane on all approaches.
AM Peak Hour = 8:00 AM–9:00 AM. PM Peak Hour = 2:30 PM–3:30 PM.
Delay = Average delay per vehicle (seconds).
LOS = Level of service.
Source: Central Transportation Planning Staff.

[3] Staff used Synchro Version 10.3, developed and distributed by Trafficware Ltd. It can perform capacity analysis and traffic simulation (when combined with SimTraffic) for an individual intersection or a series of intersections in a roadway network.

Table 2
Summary of Intersection Capacity Analysis
Route 2/Concord Turnpike at Old Road to Nine Acre Corner (ORNAC)
2023 AM and PM Peak-Hour Traffic Conditions

Analysis Period	AM	AM	PM	PM
Approach	LOS	Delay (seconds)	LOS	Delay (seconds)
Route 2 northbound	B	19.9	C	20.9
Route 2 southbound	B	10.2	C	21.5
ORNAC eastbound	D	48.8	D	50.3
ORNAC westbound	D	52.2	E	61.9
Intersection Average	C	20.5	C	27.0

Notes:
All movements share a single lane on all approaches.
AM Peak Hour = 7:30 AM–8:30 AM. PM Peak Hour = 2:45 PM–3:45 PM.
Delay = Average delay per vehicle (seconds).
LOS = Level of service.
Source: Central Transportation Planning Staff.

4 PROPOSED SOLUTIONS

Staff were tasked with proposing short-term interventions at each intersection to improve pedestrian safety. Solutions are proposed based on existing conditions analysis, survey feedback and comments, and input from stakeholders.[4]

4.1 Route 2 at Route 62

Interventions proposed at the intersection of Route 2 and Route 62 are listed below. Key elements of the short-term proposals can be found in Figure 10. The Synchro report of phase changes can be found in Appendix D.

- Extend the pedestrian phase by 3 seconds.
- Restripe crosswalks with zebra, continental, or ladder-style markings.[5]
- Create a curb bulb by repainting existing zebra-striped pavement with bright color(s) and installing flex posts to “shorten” crossing distance and aid in visibility. (See Figures 8 and 9.)
- Install a 6 foot bike lane on Main Street westbound approaching the intersection.[6]

[4] Relevant stakeholders include Town of Concord staff, MassDOT District 4 staff, Emerson Hospital staff, and members of the Concord Transportation Advisory Committee.
[5] See Manual of Uniform Traffic Control Devices (MUTCD) Section 3B.18 https://mutcd.fhwa.dot.gov/htm/2009/part3/part3b.htm#section3B18
[6] Six feet is considered a desirable bike lane width. https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/conventional-bike-lanes/

- Install a 4 foot bike lane on Main Street eastbound approaching the intersection.[7]
- Install signal heads with backplates and retroreflective borders.
- Install wayfinding signs along Main Street for pedestrians on the sidewalk headed towards West Concord or Concord Center

After review of the proposed interventions, Town of Concord Engineering department suggests bolstering the proposed painted pavement with temporary curbs. They also recommend that further work be done to improve the slip ramp crossing.

[7] Four feet is the minimum required bike lane width. https://safety.fhwa.dot.gov/PED_BIKE/univcourse/pdf/swless19.pdf

Figure 8
Existing Zebra-Striped Pavement on Route 2 Southbound

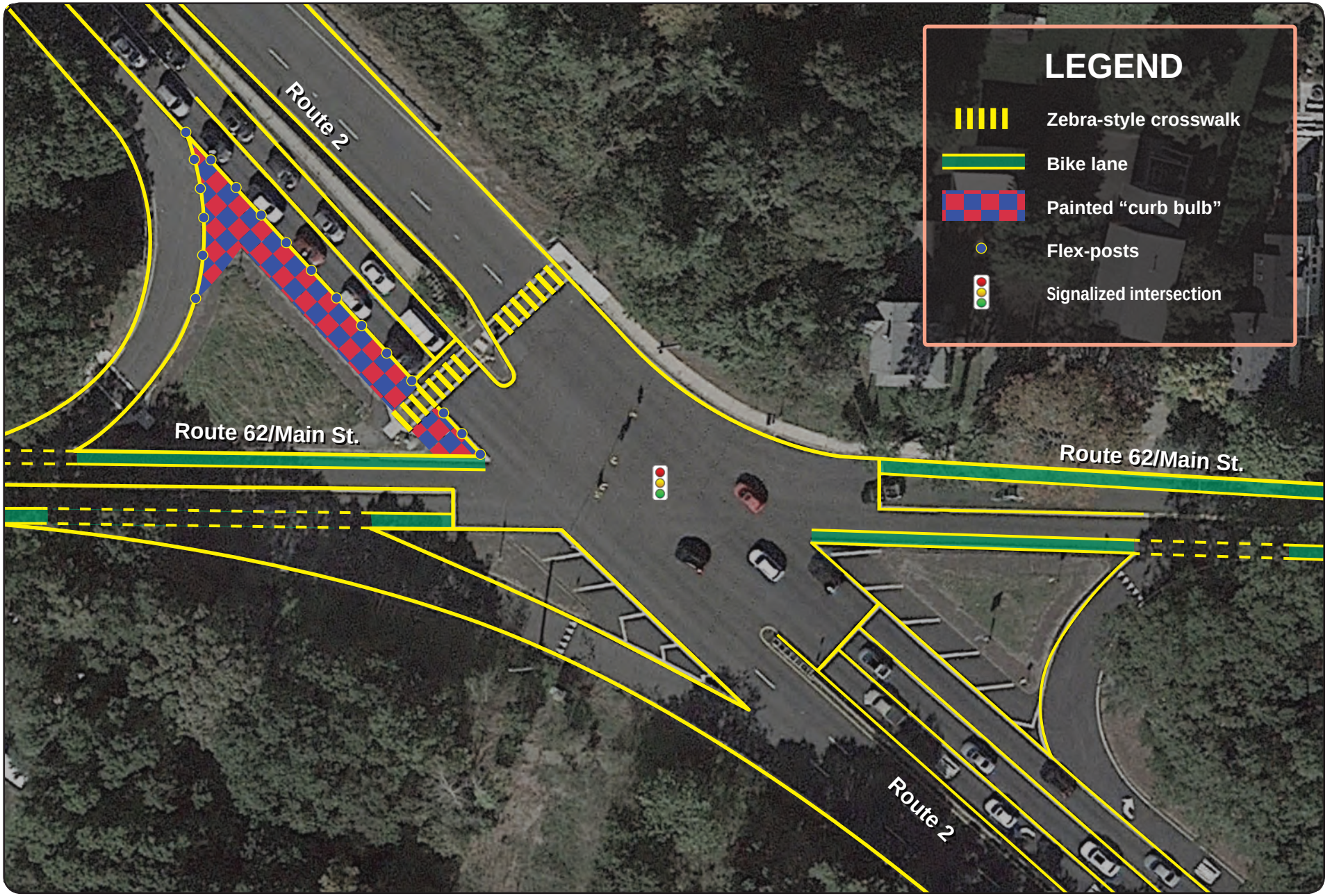


Source: Google Maps.

Figure 9
Example of a Curb Bulb in Seattle, Washington



https://streetsillustrated.seattle.gov/urban-design/adaptive-design/intersection-treatments/
Source: Photo from the City of Seattle Right-of-Way Improvements Manual, Chapter 5.1 Adaptive Design: Intersection Treatments. (2017).


LEGEND
Zebra-style crosswalk
Bike lane
Painted “curb bulb”
Flex-posts
Signalized intersection
Route 2
Route 62/Main St.
Route 62/Main St.
Route 2

4.2 Route 2 at Old Road to Nine Acre Corner (ORNAC)

Interventions proposed at the intersection of Route 2 and ORNAC are listed below. Key elements of the short-term proposals can be found in Figure 17. The Synchro report of phase changes can be found in Appendix D.

- Restrict right turns on red on the northbound and eastbound movements by installing signs (MUTCD R10-11) on respective approaches at the intersection. (See Figure 11.)
- Upgrade lighting at the intersection.
- Paint sharrow markings on ORNAC.[8]
- Install “Bicycle May Use Full Lane” (MUTCD R4-11) signs on ORNAC approaches. (See Figure 12.)
- Install signal heads with backplates and retroreflective borders.

The proposed treatments to the crossing at Route 2 are as follows:

- Extend the pedestrian phase by 5 seconds.
- Restripe the crosswalk with zebra, continental, or ladder-style markings.
- Repair crumbling pavement on the median.
- Utilize flex posts to distinguish the median from the roadway and aid in visibility.
- Add a “STOP for pedestrians” (MUTCD R1-5b) sign (see Figure 13) in addition to existing pedestrian crossing signs (see Figure 14).

The proposed treatments to the crossing at ORNAC are as follows:

- Extend the pedestrian phase by 4 seconds.
- Restripe the crosswalk with zebra, continental, or ladder-style markings.
- Remove the existing yield to pedestrian sign (see Figure 15) and replace it with a sign in the current MUTCD style (see Figure 13).
- Add a MUTCD W11-2 style sign in advance of the intersection. (See Figure 16.)

The Town Engineering Department commented that the median sign at the intersection is missing and that further work should be done to improve bicyclist safety at the intersection of ORNAC and Old Marlboro Road.

[8] It should be noted that sharrows are not considered adequate bicycle facilities, and are proposed here as a short-term fix, not a permanent solution to cyclist safety. https://nacto.org/publication/urban-bikeway-design-guide/bikeway-signing-marking/shared-lane-markings/

Figure 11
MUTCD Standard "No Turn on Red" Signs



Source: Manual on Uniform Traffic Control Devices.
https://mutcd.fhwa.dot.gov/htm/2003r1/part2/fig2b-19_longdesc.htm

Figure 12
MUTCD Standard "Bike May Use Full Lane" Sign



Source: Manual on Uniform Traffic Control Devices.
https://mutcd.fhwa.dot.gov/SHSe/shs_2004_2012_sup.pdf

Figure 13
MUTCD Standard "Stop Here for Pedestrians" Sign



Source: Manual on Uniform Traffic Control Devices.
https://mutcd.fhwa.dot.gov/htm/2009/part2/part2b.htm

Figure 14
Existing Pedestrian Crossing Sign on Route 2 Northbound



Source: Google Streetview.

Figure 15
Existing Pedestrian Crossing Sign on ORNAC Eastbound



ORNAC = Old Road to Nine Acre Corner.
Source: Google Streetview.

Figure 16
MUTCD Standard Pedestrian Warning Sign



Source: Manual on Uniform Traffic Control Devices.
https://mutcd.fhwa.dot.gov/htm/2009/part2/part2c.htm#section2C50



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FIGURE 17
An overview of short-term improvement alternatives at the intersection of RT 2 and ORNAC.

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5 RECOMMENDATIONS AND CONCLUSIONS

In this study, CTPS performed a series of safety and operations analyses, identified issues and concerns, and proposed short-term improvements for the intersections of Route 2 at Route 62 and Route 2 at ORNAC. The proposed short-term improvements would enhance safety and operations for the intersections under the existing conditions. We recommend that, in coordination with MassDOT District 4, the Town of Concord pursue implementing these proposed improvements soon.

Concord can seek funding for improvements from multiple sources, most notably MassDOT's Complete Streets Program and the Community Connections grant program offered by the Boston Region MPO (and administered by CTPS). A list of funding sources for community transportation projects complied by MassDOT can be found on the Mass.gov website: https://www.mass.gov/info-details/funding-for-community-transportation.

Additionally, CTPS recommends the Town and MassDOT work together to further study and implement some of the following long-term changes:

- Repair loop detectors so motorcycles and bicycles are detectable.
- Re-coordinate and optimize signal timing, including analysis of concurrent and exclusive pedestrian phases.
- Install bicycle lanes on both cross streets at each intersection.
- Upgrade pedestrian push-buttons at ORNAC intersection to ADA-accessible ones.
- Repair curb ramps at ORNAC intersection and realign detectable warning strips with crosswalks.
- Replace pedestrian signal indicator at the southeast corner of the intersection.

Staff also recommend that long-term interventions, mentioned above, be studied in accordance with the proposed interventions in the soon-to-be-completed VHB study.

Appendix A

Summary of Survey Results by Question and Answer			
Q/A	**Are you a Concord resident?**	**548**	**Total Responses**
	Yes	360	65.7%
	No	188	34.3%
Q/A	**What neighborhood/area of town do you live in?**	**359**	**Total Responses**
	West Concord (142)	142	39.6%
	Concord Greene (18)	18	5.0%
	Near the Depot (18)	18	5.0%
	Concord Center (17)	17	4.7%
	Concord (13)	13	3.6%
	ORNAC (7)	7	1.9%
	Near Willard School (7)	7	1.9%
	Elm Street (7)	7	1.9%
	Old Marlboro Road (6)	6	1.7%
	Thoreau Hills (5)	5	1.4%
	Sudbury Road (4)	4	1.1%
	Barrett's Mill Road (4)	4	1.1%
	Annursnac Hill (4)	4	1.1%
	Main Street (4)	4	1.1%
	Near Peabody Middle School (4)	4	1.1%
	Everett Street (4)	4	1.1%
	Downtown (4)	4	1.1%
	White Pond (4)	4	1.1%
	Emerson Hospital Area (4)	4	1.1%
	Conantum (3)	3	0.8%
	Elsinore Street (3)	3	0.8%
	South Meadow (3)	3	0.8%
	Riverdale Rd (2)	2	0.6%
	Stow Street (2)	2	0.6%
	East Quarter (2)	2	0.6%
	Highland Street (2)	2	0.6%
	Great Meadows (2)	2	0.6%
	Thoreau Street (2)	2	0.6%
	East Concord (2)	2	0.6%
	Near the High School (2)	2	0.6%
	Main Street - Concord Center (2)	2	0.6%
	Coolidge Rd (2)	2	0.6%
	Upland Rd (2)	2	0.6%
	Harrington Avenue (2)	2	0.6%
	Lexington Road (2)	2	0.6%
	Old North Bridge (2)	2	0.6%
	Strawberry Hill Road (2)	2	0.6%
	Macmillan Drive	1	0.3%
	Allen Farm	1	0.3%
	Near RT 2	1	0.3%
	Rideout	1	0.3%
	Peter Spring	1	0.3%
	Tarbell Spring	1	0.3%
	Near South Bridge	1	0.3%
	Near Middlesex HS	1	0.3%

	Park Lane	1	0.3%
	Near Orchard House	1	0.3%
	The Ridge	1	0.3%
	Milldam Square	1	0.3%
	Virginia Road	1	0.3%
	Baker Avenue	1	0.3%
	Fairhaven	1	0.3%
	Walden Woods	1	0.3%
	Mildred Circle	1	0.3%
	Bedford Street	1	0.3%
	Upper Lowell Road / Middlesex School	1	0.3%
	Hubbard Street	1	0.3%
	Ripley School Area	1	0.3%
	Monument Street	1	0.3%
	Lowell Road	1	0.3%
	Thoreau District	1	0.3%
	Whittemore Street	1	0.3%
	Southfield/Riverdale	1	0.3%
	Near the Rec Center	1	0.3%
	Walden Street	1	0.3%
	Near Verrill Farm	1	0.3%
	Keyes Road	1	0.3%
	Newbury Court	1	0.3%
	Old Bedford Road	1	0.3%
	Hill Street / Buckmaster Drive	1	0.3%
	Indian Pipe Lane	1	0.3%
	Nashawtuc Hill/Town Center	1	0.3%
	Ministerial Drive	1	0.3%
	Damon Street	1	0.3%
	Cambridge Turnpike	1	0.3%
	Alcott Elementary	1	0.3%
	Wright Farm	1	0.3%
	Meriam's Corner	1	0.3%
	Crescent Road	1	0.3%
	Musketaquid Road	1	0.3%
	Off Barretts Mill	1	0.3%
The following questions are about the crossing at RT 2 and RT 62			
Q/A	**How often do you use this crossing when walking, biking, or using a mobility device (such as a wheelchair)? Select the answer that best fits your experience.**	**425**	**Total Responses**
	Every day	3	0.7%
	Multiple times a week	42	9.9%
	Once a week	17	4.0%
	A few times a month	55	12.9%
	Once every few months	45	10.6%
	A few times a year	65	15.3%
	Never	198	46.6%
Q/A	**Where are you going when using this crossing? Select all that apply.**	**421**	**Total Responses**
	Job	26	6.2%

	Hospital/medical office	34	8.1%
	Recreation	175	41.6%
	Shopping	87	20.7%
	Residence	58	13.8%
	Train station	20	4.8%
	Other (responses below)	21	5.0%
	Just crossing the street.		
	School		
	Running		
	Activities and Childcare with my son.		
	Restaurants		
	School		
	High School		
	Meetings, library		
	Church		
	Willard Elementary		
	Running		
	restaurant		
	Dentist		
	church		
	Going to Concord center on bike		
	cycling		
	Family visit (Bedford)		
Q/A	**How safe do you feel when crossing Route 2?**	**219**	**Total Responses**
	Very safe	2	0.9%
	Safe	21	9.6%
	Neutral	44	20.1%
	Unsafe	99	45.2%
	Very unsafe	53	24.2%
Q/A	**How would you rate the condition of sidewalks around the intersection of Route 2 at Route 62 (Main Street)?**	**211**	**Total Responses**
	Very good	0	0.0%
	Good	16	7.6%
	Average	90	42.7%
	Poor	74	35.1%
	Very poor	31	14.7%
Q/A	**How would you rate the condition of the marked crossing at Route 2?**	**214**	**Total Responses**
	Very good	1	0.5%
	Good	19	8.9%
	Average	84	39.3%
	Poor	84	39.3%
	Very poor	26	12.1%
Q/A	**Does the existing signal timing provide you a sufficient amount of time to safely cross the intersection?**	**216**	**Total Responses**
	Yes	71	32.9%
	No	103	47.7%
	I'm not sure	42	19.4%

Q/A	How would you rate the lighting conditions at the intersection of Route 2 at Route 62 (Main Street)?	211	Total Responses
	Very good	2	0.9%
	Good	21	10.0%
	Average	118	55.9%
	Poor	56	26.5%
	Very poor	14	6.6%

Q/A	Would you use this crossing more frequently if you felt safer using it?	216	Total Responses
	Definitely yes	97	44.9%
	Probably yes	57	26.4%
	Maybe	31	14.4%
	Probably not	30	13.9%
	Definitely not	1	0.5%

Q/A	Do you have additional comments about the intersection and crossing?	91	Total Responses
	The sidewalks in the area are a mess and need to be cleaned.		
	children often need to cross to get to and from school and activities - I see kids and teens running, on bikes etc - please keep our school age residents in mind when updating design		
	The angled nature of the intersection makes it more difficult for pedestrians and cyclists to be sure that approaching cars on Route 2 are slowing down to actually stop when they have a red light, particularly cars that come from the East. Some percentage of motorists run red lights, either intentionally or because they are distracted. The very high speeds of some of the vehicles on Route 2 makes this at-grade pedestrian crossing feel unsafe.		
	scary		
	Another one that I just try to avoid if I can. Same issues. East bound traffic comes racing down the hill. Wide intersection that people don't pay attention.		
	No sidewalk there or markings to cross		
	Yes, my special needs son crosses here several times a week and my heart is racing every time knowing how dangerous it can be to get across. No parent, or anybody, should have to be that frightened in their own community for the simple reason of trying to get around the town. It's a terrible shame and must be addressed.		
	This crossing is dangerous. Turning cars are dangerous to bikes and peds. The crossing for bikes on Rt 62 is dangerous, there is no button or camera to trip the light on the eastbound side of Rt 62 and on the westbound side, the button is inappropriately placed for bikes.		
	The light signal is poorly tuned to cyclists. The sensors do not work well and there is not enough time to cross the intersection (using the green light as a vehicle, not the walk signal).		
	It's just a long, super-sketchy intersection. It's like playing Frogger to get to the other side.		
	This is the only way non-driving teens and preteens can travel between west and central concord unless they take the commuter rail. A safe crossing is critical for the safety and health of our kids.		
	cars coming from all directions and I can't tell who has a red light, worried about cars turning		
	This crossing is the primary reason my children don't bike to school. We feel we are literally risking our lives by trying to cross here.		

The intersection is quite large and oddly shaped for good visibility and timing to see bikes. Cars turning left through the intersection are the ones i have to watch out for because of this. I usually use the crossing at ORNAC instead of this one because it feels marginally safer although further out of my way.
I'm mostly concerned about cars not being able to be see me while crossing
Safe Concord Middle School access by people living east of Rt 2 is next to impossible for students other than those very experienced biking in traffic. With BFRT bridge completed, it's ironically now easier for people in Acton to access our school than it is for our own residents.
Route 62 is dangerous for cyclists (road and intersection). I go out of my way to use the intersection at Emerson Hospital to avoid Rt 62 and this intersection.
Light is triggered by cars, but me on my bicycle does not trigger the light to change.
The pedestrian cross walk activation buttons need to be either be closer to rt 62 or there need to be a guardrail protecting the sidewalk from rt 2 traffic (west bound side)
I would use my bike instead of my car much more when going into concord center from my home in west concord if i felt safer using this crossing. I travel into concord center multiple times a week with my son for sports or other activities, and would travel by bike almost every time if it were safe. Unfortunately I feel i have to drive for these journeys as there is no good way onto the pedestrian crossing for bikes when traveling eastbound. I frequently see cars on route 2 jumping the light, and when no cars around the light will not change to green for a cyclist waiting on route 62, you have to press the pedestrian button. This makes is unsafe to use this junction when it isn't busy.
My wife needs to cross route 2 to access the medical buildings on the northern side and will not do so on foot because it is so dangerous. And because she cannot drive, this means she has to Uber for a half mile. The intersection on Rt 62 is extremely terrifying for pedestrians.
The condition of the roads on route 62 make cycling on that road very dangerous. There is much traffic and so many potholes that one is forced to cycle into the traffic to avoid the holes.
I need to walk, because my vision keeps me from being able to drive.
I don't use this intersection often. I might it it was markedly safer than the ORNAC crossing.
There's never a truly safe time to cross currently because cars are turning even during the "walk" cycle
I have usually crossed here while on my bike so the width and condition of the road is more important as a cyclist than the sidewalks. I would like better sidewalks and crossing for pedestrians also.
I would like for the street to be safe enough for my teenager to cross on her bike. But I'm afraid she will be stuck in the middle median or get hit by the left turning cars
The crossing does not feel super safe but is not the worst in town as there is a light/walk signal. Sometimes cars turn left onto Rte 2 which is terrible for traffic as there are not two lanes and makes pedestrians less safe; left turn from Main to Rte 2 should not be allowed from either direction.
I live in West Concord and frequently travel to Concord center for a number of reasons. This is a short trip that is too far to walk but would be ideal to make on a bicycle. During times of heavy traffic, bicycling would be both faster for me as an individual, and would also remove my car from the traffic jam approaching this light, making it faster for others to travel through this light as well. I strongly support making this junction more friendly for cyclists and pedestrians in the interest of reducing congestion and improving transit between Concord center and West Concord.
Needs to recognize bikes. Big issue with people running red lights at high speed. Possibly consider putting cameras to catch those that do

After crossing the road is very narrow and busy going in to west concord. In particular the stretch between Baker and where 62/comm ave split is very dangerous.
Add some infrastructure for bikes since a lot of people cross here. Maybe a marked area for bikes to queue at the red light or a short bike lane.
This intersection is even more dangerous during the winter months as no snow removal occurs
This is the primary route connecting West Concord to Concord Center. Sidewalks leading up to it start and stop, forcing pedestrians to cross 62. Visibility for both cars and pedestrians/cyclists is poor. This intersection is not safe, which is unfortunate because I would love for my kids to have the ability to safely bike to their friends' houses, shops, library, schools, etc.
Turning cars don't respect the crosswalk. When biking, the crosswalk heading towards west concord is far away from the intersection. There is no way to safely click the walk button going towards concord center when on a bike with no cars around the change the signal.
Cars turning left from Main Street onto Rt. 2 West cannot see pedestrians, especially young middle and elementary school bikers.
It would be more important to put a crosswalk across Rte 2 at Baker ave so people can come down Elm and get to the railroad easier.
Is there any way to connect a path to the side of the railroad tracks that already pass under art 2? We need a pedestrian bridge or tunnel there.
Usually do this on bike. Bike path would be awesome!
I avoid crossing here unless it is very early in the morning on a weekend.
If there were a pedestrian overpass at ORNAC, then many of us would opt to cross route 2 there (i.e. rather than at Main St.).
I've never had an issue with crossing rt 2. I wait for the light to turn in my favor and check both ways.
Vehicles run the Route 2 light all the time. I would not want to cross it as a pedestrian, and am very careful when crossing with a bike. It's a very unfriendly intersection, and I don't think most vehicles even recognize it as a pedestrian crossing since it's used so infrequently. It would be great if kids from W. Concord could bike to the HS but it feels too unsafe, especially early in the morning.
Again, the question above is moot because I am always either commuting by bike or foot and must cross safe or not. The main element that makes this crosswalk unsafe is that when pedestrians are able to cross (walking toward West Concord from Concord Center), vehicles turning right onto Rt. 2 (heading toward Acton) may also be in motion. I have had several cars screech to a halt while I am in the crosswalk because they are only looking left for traffic and not for pedestrians in the crosswalk that is located too far to the right to be visible (why they are doing this is a mystery because traffic is stopped on Rt. 2). The solution is obvious, traffic must be stopped when the crosswalk sign is illuminated.
On a bike this intersection feels absurdly unsafe when approaching. Traffic seems to treat the first few seconds of the red light as optional, so as a biker there is no choice but to come to a complete stop unless there is accompanying cars which have already come through the intersection and the route 2 traffic has already come to a full stop. Tight shoulders and the turning lane also add additional hazards which the short light cycle make harder to deal with. I generally avoid crossing route 2 on a bike at all as a result.
The slip ramps from Route 2 EB and WB to Route 62 should be eliminated. A holistic review should be included for both intersections.
ditto 2 previous
I ride my bike by day. I would never cross at night or with a child. There would not be enough time to cross using a chair, or by walking.

Car traffic flowing from 62 east onto 2 east has no reason to think of, watch for, stop or even pause for bikes trying to get to the intersection with Rte 2 safely. It is a long and risky interaction, bound to result in a bike-car accident sooner or later.
High speed traffic and crossing time is a problem.
There is no sense that cars are actually expecting any person to be crossing. They are speeding as fast as possible as if the whole section of route 2 is a giant speedbump. When I wait at the crosswalk there is no sense that I'm seen. It definitely feels like crossing a highway.
I mostly drive to avoid having to cross, Rt 2, including putting my bike on the car to transport it across the highway, which is nuts.
My son is in 1st grade at Willard, we would all love to bike to school together, but the crossing on Main St is not safe for him
In discussions with other Concord families, this dangerous crossing is a primary barrier preventing walking, jogging, biking, etc between west Concord and Concord center areas. It is especially bad with kids, the sidewalks are narrow and curb quality is poor, especially close to Rte 2. I would love to see an underground or raised walkway here!
crossing Rt 2 going to west concord on my bike, I am always concerned about cars coming behind me that would be turning onto Rt 2 westbound. and I also need to be mindful of cars coming at me, turning left. and then crossing Rt 2 going to Concord center, there is a curved exit ramp for cars exiting RT 2 that is really scary.
The crossing area is not well marked for pedestrians or to get driver's attention.
This crossing for cyclists, is very long. when riding with a group. the light on Rte 62 does not last long enough for an entire group (of 5 or more) to cross, and there is risk from cars turning off of Route 2 onto 62 during that time. It is generally unsafe unless there is very little traffic and riding alone or in a small group.
My children like to bike on the Bruce Freeman Rail Trail but we live on the other side of Rt-2. There is no safe way for children to bike from Concord Center to West Concord so my kids take the train one stop rather than risk any of the Rt-2 crossings. A biking route that connects the Bruce Freeman Rail Trail with the Reformatory Branch Trail is needed.
No.
People run red lights frequently.Signals fail frequently.
The amount of cars and heavy trucks going through red lights at this and the other crossing is absurd. State Police should be handing out tickets left and right. It is only a matter of time until people are killed either in their cars or on foot.
I feel very safe at this intersection and run over the crosswalk at all hours of the day.
Replace roads and pot holes. Add bike lane or marked space for bikers.
cars routinely run he red light
This intersection is the scariest I've seen for people trying to cross I crossed one time and the next day saw someone almost get hit there now I only do it when absolutely necessary it's very very very scary
Would love this to be safe for cyclists to cross. I do not feel safe cycling from West Concord into Concord Center with children (some in a bike trailer, some on their own bikes). So we never do it.
The significant issue that needs to be addressed is that a cyclist heading east cannot trigger a light cycle to cross. If there is no vehicle heading east to trigger the sensor, the programming skips. There is no button because the cross walk is on the opposite side. There should be a crossing button on the east bound side. This gap would have been known when the intersection was last redesigned.

I would like to access shopping and the Bruce Freeman Rail Trail in West Concord by biking from my home, but that requires traveling along Main Street (Route 62) westward from Thoreau Street. It's a busy stretch of road with fast traffic, minimal shoulders, and no bike lanes, but the most challenging aspect by far is the Route 2 crossing. In particular, the diagonal nature of the intersection makes the crossing longer than the actual width of Route 2 and increases the risk of being hit by cars turning onto Route 2 westbound (when biking toward West Concord) or eastbound (when biking back from West Concord).
There is not enough time to cross, either biking or walking on pedestrian crossong
I once almost a cyclist wearing black on a black bike with no headlight crossing route 2 at that intersection. Better lighting and marked crosswalks would have helped tremendously.
Multiple- a professional traffic engineer should spend some quality time watching and then redesigning several aspects of this crossing. Crossing towards Concord Center, the crosswalk is positioned West of Main Street so when people are in the crosswalk they cannot be easily seen by the traffic from Main Street turning West onto Rte 2. Pedestrians are in the crosswalk when the Main Street light turns green, this in danger from traffic turning. There are no modern flashing crosswalk posts and signage typically found at all pedestrian crossings at the Bruce Freeman Rail trail. There are No additional crosswalk signs which light up with the wording - Pedestrians In Crosswalk- as used in the town of Belmont. *Additional hazards included crossing when walking across Rte 2 from Concord Center towards West Concord. The push-button and supporting pole at the lined crosswalk is probably 30 feet away from Main Street on a long, gradual curve. There is No signage which restricts at right hand turn heading west from Main to Rte 2. There are No clear sight lines to see pedestrians in the crosswalk due to the curve. Thus, cars in a hurry to make a right turn-on-red create real hazardous conditions for pedestrians in the crosswalk. More flashing pedestrian in-crosswalk signage to warn drivers is needed.*
You need to copy the way Cambridge Turnpike in Concord by the Concord Museum has been designed and do that here on all rte 2 crossings too!! Put in cobble stones to narrow the road and slow cars. Make sure crosswalks run in both directions. Think of pedestrian and bike traffic and bike and pedestrian safety as important as cars traffic - visit Copenhagen to see how it's done !
I worry that a car on route 2 might go through the red light while I'm crossing.
As already commented - I will still use this crossing even if I feel unsafe because it connects me to where I need to go but would greay appreciate safer conditions.
Some concern about cars turning right on red from Main St
An option for a protected crossing without cars would be best solution here. It feels like I am gambling with my safety whenever I cross route 2. I only recently started crossing when I got an e-bike so that I could zoom across. One still has to time it well and pray that drivers are being attentive. I've been honked at while crossing eastward by a car that didn't see me when they tried to turn right into route 2 - I had lights and safety vest (following all the recommendations) and it wasn't dark. The unfortunate truth is that folks just don't look for bikes, walkers, wheelchair users, or anything that is not a car.
These crossings are very dangerous. It is what we have and make the best of it each day we use it. Every day I cross this highway I am aware I could die or be seriously hurt.

	Lots of hazards at this crossing! Not enough time to cross if disabled, in a wheel chair. Right turn on red heading West from Main Street is a bad design because it does not take pedestrians in account. Car drivers cannot see pedestrians in the curve. No flashing pedestrians signage, not colored crosswalks markings, no bright, fluorescent signage (as typical in Cambridge crossings, Bruce Freeman Railtrail)
	when crossing from WC into concord, I wish there was a crosswalk request right at the light. As I recall, there isn't a request button there. many times, cyclist are reliant on cars to trigger the light because the request buttons aren't easily accessible
	This is the other walking route from West to Central Concord. A bit better than Emerson one, but a little unclear once you get to the median. Much less traffic turning right there though, so usually safe.
	I would probably bike to work every day with decent weather if I didn't have to cross route 2
	I walk or bike across the intersection now and then (more in good weather months, of course) and not at night (so I don't have an opinion about the lighting).
	Either provide left turn lanes or ban left turns
	Again, cars are so focused on getting through the intersection as quickly as possible they often don't even look for pedestrians.
	Extremely danger for bikers
	I'd love to ride my bicycle to Concord and the library. I am a sane, rational person. Trying to cross 2 either way feels dangerous and crazy.
	I am usually biking so I really do not know about the sidewalk conditions
	Is there an alternative solution to crossing Route 2 near Main St, eg rail-with-trail alongside MBTA tracks? Route 2 is a highway. Brighter paint or longer crossing signals aren't going to make people feel safer. Please zoom out and look for a creative solution for alternative transit connectivity. I know several kids who rode bikes every day to the middle school but do not ride to CCHS because of Route 2. Let's not tinker. Let's come up with a bigger solution.
	I rarely cross Rt. 2 on foot or on a bike because it is not safe. I would certainly cross on foot more often if it were safe - and there was no threat of cars on Rt 2 running that light. There is no room for bikes and cars to ride safetly together on Rt. 62 given how narrow it is and the many potholes lining the sides of the road - this also needs to be addressed.
	Cars should not be allowed to make a right on Red when the crosswalk light is on as cars will make the turn even if someone is on the crosswalk. The crosswalk should be boldly painted (maybe in yellow) indicating to drivers that there is in fact a crosswalk there! Signs alerting drivers to an upcoming crosswalk should be posted on both sides of route 2 alerting of what's ahead.
	The biggest problem is cars running the red light.
	The following questions are about the RT 2 crossing at the intersection of RT 2 and ORNAC

Q/A	**How often do you use this crossing when walking, biking, or using a mobility device (such as a wheelchair)? Select the answer that best fits your experience.**	**523**	**Total Responses**
	Every day	5	1.0%
	Multiple times a week	50	9.6%
	Once a week	31	5.9%
	A few times a month	84	16.1%
	Once every few months	70	13.4%
	A few times a year	98	18.7%
	Never	185	35.4%

Q/A	Where are you going when using this crossing? Select all that apply.	487	Total Responses
	Job	65	13.3%
	Hospital/medical office	118	24.2%
	Train station	13	2.7%
	Recreation	172	35.3%
	Shopping	47	9.7%
	Residence	52	10.7%
	Other	20	4.1%
	To my car from the hospital		
	Car		
	Emerson cafeteria		
	Just simply crossing the highway.		
	Concord middle school		
	Kids to CMS		
	Running		
	School		
	Town Hall		
	ON a bike ride		
	School		
	theater/town center		
	On a run		
	Biking to Concord center		
	shuttle lot		
	School		
	Traveling to Sudbury		

Q/A	How safe do you feel when crossing Route 2?	316	Total Responses
	Very safe	1	0.3%
	Safe	23	7.3%
	Neutral	72	22.8%
	Unsafe	130	41.1%
	Very unsafe	90	28.5%

Q/A	How would you rate the condition of sidewalks around the intersection of Route 2 at ORNAC?	297	Total Responses
	Very good	2	0.7%
	Good	33	11.1%
	Average	140	47.1%
	Poor	91	30.6%
	Very poor	31	10.4%

Q/A	How would you rate the condition of the marked crossing at Route 2?	308	Total Responses
	Very good	3	1.0%
	Good	32	10.4%
	Average	133	43.2%
	Poor	98	31.8%
	Very poor	42	13.6%

Q/A	Does the existing signal timing provide you a sufficient amount of time to safely cross the intersection?	311	Total Responses
	Yes	104	33.4%

	No	143	46.0%
	I'm not sure	64	20.6%
Q/A	**How would you rate the lighting conditions at the intersection of Route 2 and ORNAC?**	**302**	**Total Responses**
	Very good	4	1.3%
	Good	25	8.3%
	Average	184	60.9%
	Poor	68	22.5%
	Very poor	21	7.0%
Q/A	**Would you use this crossing more frequently if you felt safer using it?**	**311**	**Total Responses**
	Definitely yes	117	37.6%
	Probably yes	105	33.8%
	Maybe	58	18.6%
	Probably not	27	8.7%
	Definitely not	4	1.3%
Q/A	**Do you have additional comments about the intersection and crossing?**	**119**	**Total Responses**
	Cars are unaware of pedestrian cross singles making it difficult to cross with cross signals.		
	Multiple cars speeding through red light		
	I witnessed an employee get hit at this intersection many years ago, thats is all I need to know it should be safer		
	many road cyclists use this to cross route 2 - please keep this safety in mind for design updates		
	One of the crossing lights is out. I patiently wait for crossing signal but cars ignore it. Yesterday I had the crossing signal, not only did I almost get hit, but the person in the car gave me dirty looks and was screaming at me. She had no idea that I had the right of way.		
	In 1997 I had a car accident at that intersection. Both cars were totaled and all went to the ED		
	cars crossing route 2 get a green arrow the same time pedestrians get a walk signal, it is a nightmare!!!		
	I would propose a that a pedestrian sky bridge be put in that has access to the hospital for employees and patients. This would make it safer and also help with traffic flow		
	NEED A BRIDGE		
	Working in the John Cuming Building I see accidents with pedestrians & vehicles and many near misses. Pedestrians, bikers, families with strollers are taking a risk crossing as traffic goes through the red light so often and drivers are not careful getting on to Route 2 at the intersection.		
	I am always in a car so these questions do not apply		
	When the pedestrian light is on, all other lights should be red. Instead, the traffic parallel to the crosswalk have a green light at the same time as the pedestrian light is on so traffic that is turning puts pedestrians at risk, especially when the drivers are paying attention to their phones instead of the pedestrians. I have had many times when I started to cross when the pedestrian light was lit and almost got hit by a car making a turn (they also have a green light) because they were not paying attention. Feel like it is incredibly risky to cross at that intersection.		
	I try my best to avoid it. Too many accidents from people not paying attention. Lord help you if you get stuck in the middle. Cars blasting past you at 65 with not a lot of room.		
	an over route 2 walkway would be the best solution		

I used to park in the employee lot across the street. On a nice day it was faster to walk. However there were times when turning traffic disregarded pedestrian crossing. in particular cars turning right onto rt 2 from the hospital. This is where I myself was almost hit at least once. People turn right regardless of red or green light without yielding even a pedestrian is standing there.
Too many cars coming from different directions.
I only use the crosswalk if absolutely necessary.
It clearly is not and has never had any consideration for pedestrian safety during the planning process.
No push button for bikes heading south on ORNAC towards Emerson Hospital.
riding a bike with traffic actually it is right after the crossing toward the hospital where the greatest danger lives as the T intersection, cars turn without looking
Also,if the stop lights were larger maybe there would be less cars going through RED lights.
Cars are often in a hurry at these intersections, which make the crosswalks risky
Where the crosswalk is located is a pain for cyclists. We are supposed to stay on the road but the crosswalk signal button (if their is one) is closer to the barriers.
It's not so much the timing but other cars turning on red
A safer way is needed to get from Old Marlborough to Emerson side and then across Route 6.
cars are too fast and I don't trust that they will stop for the light
I go to lengths to avoid the crossing because of how unsafe it feels.
I generally bike through this intersection. I find the cars turning left across the intersection are the ones I have to watch out for the most, they are always impatient to turn. I have never walked across this intersection, but would guess the same problem exists and is worse for pedestrians.
traffic route 2 generally travels well over the speed limit which contributes to the safety concerns.
It seems you never get a green light as a bike on ORNAC unless a car is waiting at the stop line, which can make it hard to cross.
The intersection is not safe for cyclists
What does ORNAC stand for? Also, the car sensors do not work for motorcycles in all locations, particularly left turns off Rt 2
I need to walk across the intersection because my vision keeps me from driving.
As an experienced adult runner and cyclist, I feel fairly safe crossing here. However, I am extremely concerned about the safety of less experienced people and especially children- this is NOT a safe intersection for children.
Lots of red light violations
It's not safe to cross because there are cars turning even during the "walk" signal
The signs/signals are okay, but it is still nerve wracking to cross.
The biggest problem (for me) is when there are no cars with me on ornac to trigger the light. If the light does not change automatically then I need to press the crosswalk button, which puts me on the wrong side of the righ hand turn lane.
I have no problem crossing Rte. 2 on my bike.
the BIG need for me right now. There should be No Turn on Red for Rte 2 drivers and more minutes to cross.
it is VERY dangerous to cross here because of the right turn on. Drivers only look for cars and pedestrians and cyclist are invisible. Also in the winter time it is difficult to cross because the sidewalk is often very very poorly plowed.
Traffic lights need to respond to bikes. Could put red light cameras on the intersection to stop people running red lights at high speed.
should cross without having green light for cars turning onto Route 2; could be a raised crossing near the prison that connects to the Bruce Freeman Rail Trail

Pedestrians are so infrequent here that drivers don't look to see the white walking pedestrian symbol before yielding. the pedestrian crossing signal should be much more noticeable like the ones on the bike path crossing nearby.
For us residents who live in concord who wish to bike to west concord to pick up the new Bruce freeman trail, it's near impossible to allow our kids to cross route 2 on their bikes or walking in a safe manner. The ornac and 62 intersection of route 2 are very large to cross with traffic traveling at high speeds that need to stop for lights. The risk of a car running the lights is just too much of a risk to allow a truly safe crossing.
Needs no right on red sign from Route 2
It is even more dangerous in the winter months as no snow removal is done on these corners
Cars (especially those turning left from ORNAC do not respect the crosswalk. I've been nearly hit many times. And yelled at.
Very unsafe that cars can turn right onto 2 (with Emerson on the right) while pedestrians are crossing. It is difficult to see pedestrians while in the turn lane.
Need to be more safe, crossing from Old Marlboro to ORNAC
We need a bridge or a tunnel at that intersection.
I would love to bike to work from West Concord to Concord Center but I don't feel safe crossing Rt 2.
Pedestrian/cyclist/wheelchair overpass, please!
I bike across it infrequently. I don't have reason to walk across but it feels very unfriendly to pedestrians.
Since I cross every day, the above question is moot; I have to cross whether safe or not. The fact that all traffic is not required to be at a full stop when the crosswalk signal is on is the main reason this intersection is unsafe for pedestrians. I have been nearly hit at least a half-dozen times by cars that are turning right onto Rt. 2 from ORNAC/OMR because they are only looking left for oncoming traffic - definitely not on the alert for pedestrians. The intersection of ORNAC/OMR is ridiculous; backed up with dozens of cars at morning rush hour with those on OMR trying to turn left onto ORNAC to either cross Rt. 2 or enter it - doing the swivel-head trying to see cars flying by from all different directions. Those who desire traffic backups and auto/pedestrian accidents designed that intersection and Rt. 2 crossing perfectly. I'm on bicycle most of the time and feel I have to be on high-alert at those two intersections. For those on foot desiring to cross ORNAC (moving toward the hospital from OMR) and then Rt. 2 are doomed to wait and wait for the crosswalk signals. In fact, all push-button pedestrian crosswalks punish those who choose not to drive; wait, wait, wait. Please take a lesson from the Netherlands who give top priority crossing for those on foot.
Sky bride
a safer crossing is particularly desirable to access the Bruce Freeman Rail Trail, and Middle School, on bikes from town.
The main problem is from cars turning right not yielding. Also, one must hustle as a pedestrian to get across in time.
I never say this, but given how long it takes to feel like traffic has safely STOPPED esp. after dark/winter, the walk cycle needs to be longer! I can't believe I just typed that, I'm usually the person saying they're too long, but this one is different.
I cross on a bike during the day. I think this intersection would be dangerouson foot or in a chair at night.
High Speed traffic and quick crossing is a concern crossing
Precarious, especially with kids, standing next to a highway (with cars going 50-60mph at times) waiting for the walk signal.
This also needs to be made more safe for KIDS so they can bike between Concord Center and W Concord

I have only ever made this crossing by bike. When crossing Route 2 by bike, I ride on the road with traffic, never on the sidewalk/crosswalk.
The issue is when you are crossing, drivers still turn right on a red signal and it's at the same time the cross light is on so you could get hit by someone taking a right onto rt 2 from ORNAC. There should be a NO RIGHT ON RED SIGN and LOOK FOR CROSSERS bright signs or flashing signs.
The short light creates a competition between bicyclists and motorists trying to turn right. This is a uniquely dangerous situation.
east and west bound traffic running the lights is scary AF
One crossing issue is the need to avoid/accommodate autos making a right turn onto Route 2 while crossing as a pedestrian
It's the people coming down ORNAC and turning right onto route 2 who have no awareness of pedestrians.
you have to be aware and pay attention whenever you cross any intersection or road
The traffic light will not turn green when only bikes are on the Concord side of ORNAC waiting to cross in the street. They will only change if a car is present. This is a major issue for cyclists.
seldom a pedestrian here
Paint and lights will not make a pedestrian safe while crossing 5 lanes of a 60 MPH highway. A handicap accessible, elevated pedestrian crossing is needed to connect the only "Medical Professional" zoned parcels in Concord. A no delay, elevated pedestrian crossing would reduce parking needs of these buildings and encourage re-investment in these parcels as they could be used as a health care campus rather than satellite buildings divided by a highway.
Too many trucks in left lanes.
Light timing should allow for people who run yellow light to red.
Traffic on 2 is going at a high rate of speed, it's scary because not everyone is paying attention and is focused on getting through the intersection quickly- not paying attention to pedestrians.
The amount of cars and heavy trucks going through red lights at this and the other crossing is absurd. State Police should be handing out tickets left and right. It is only a matter of time until people are killed either in their cars or on foot.
The sidewalks and crosswalks in all of West Concord, especially on Main Street are in poor condition, especial for people in wheelchairs. They have to use the street in a lot of cases where drivers are already speeding and driving recklessly.
I do. I think that the best place to have a safe cross walk would be a walking bridge off Baker Ave. on Concord center side of route 2 towards Baker av on West concord side of route 2. There's no intersection there nowadays. It would be a very short walk from Elm Street to west concord center for all the neighborhoods around there
I run across it about once or twice a month. Always seems fine. The sidewalk on the North side is impossible for a tall person to walk down, however
Needs to be safer for pedestrians.
Pot holes and roads are in desperate need of repair/repaving
cars often speed through when the light is turning to or is red
I've seen too many accidents here and the drivers zip by and it's really scary to even consider walking here I do it only when I absolutely have to
the crossing signals are not sufficient for cars to be aware of pedestrians. It should be more pronounced that there is a pedestrian crossing. Drivers do not seem to expect pedestrians so they do not look for them and it puts pedestrians at risk, even if they have a walk signal.

The area feels super unsafe for pedestrians or bikers. I only cross when I have to and have seen multiple near hit episodes when people take a right turn from ORNAC onto R2 and are oblivious to the fact that pedestrians are crossing. Very scary.
A bike area/box ahead of stopped traffic would be very good
I believe this crossing is a risk and obstacle for Emerson employees that park on the opposite side of route 2.
These intersections are also used by bikers and runners. Getting them more pedestrian friendly will definitely a lot more people.
There is not enough time to cross, either on a nike or if walking bike on pedestrian crossing.
Could use more time crossing on bikes
I am a biker and don't use the sidewalk. It might be beneficial to have additional space as I have to get off my bike at time to walk my bike to the intersection
too many accidents there over the years
extremely dangerous....cars turn right from ORNAC to rte 2 while pedestrians have walk sign. Cars drive very fast and swerve around walkers, who have walk sign and are crossing in crosswalk
Deaths and serious injuries have occurred at the crossing. There are No safe, flashing, well designed crosswalk indicator lights on signs found at typical crossings such as the Bruce Freeman Rail Trail, . There is a Very Unsafe concrete curb in the middle of Rte 2 where pedestrians get stranded because the traffic from ORNAC to Rte 2 Does Not Stop.. There is a very unsafe light sequence whereby the ORNAC light allows Right Turn When there are pedestrians in the crosswalk. It's virtually Impossible to cross ORNAC from Emerson to Old Marlboro because there is no pedestrian warning signs, crosswalk indications alerting the high-speed exit from Rte 2 Eastbound to ORNAC.
It's poorly designed - dangerous for residents - doesn't meet the needs of people going to the hospital either - the crosswalk should be on both sides of the street - it's only on one side - there should be 2 crosswalks not just one - the parking lot is horribly designed - unsafe for anyone going to the hospital - the irony that this area is for healing is profound - the road is also not appropriately designed - it should have pavers embedded in the asphalt like on Cambridge turnpike to get cars to stay in their lanes -
The signal timing is particularly dangerous for cyclists when there is a trying to turn right. The green is so brief that it forces a competitive situation between the two.
I'm always worried about getting hit by cars turning right on red from ORNAC
I run across the intersection so timing is not that much of an issue but it does not feel safe. Many runners in Concord use this, including the HS cross country team.
It is dangerous and kids and adults need to use it to get to and from concord and west concord. Please improve it and add sidewalks. More bike paths as well!!
I saw a blind person w/ cane once attempting to cross and truly was concerned for that soul.
One will always feel a bit anxious crossing a highway, even if signage and light cycles are adjusted. It seems like a relatively in frequent need, and I wonder whether there are other problems that are more urgent.

	Very poor for pedestrian safety. Bad sight lines for pedestrians and cars. No Crosswalk warnings for traffic traveling East & West on Rte 2. No pedestrian sings for motorists which indicate pedestrians in the crosswalks. No signs which indicate where the pedestrian crosswalk is. No flashing lights indicating pedestrians are crossing. No different pavement markings at crosswalk. Paint has worn off of crossings. No Safe Space which protect pedestrians who are stuck in the curb between the East & West Lanes because the light was too short. Right turn on Red Eastbound does not have any devices which warn of pedestrians in the crosswalk. Pedestrians in crosswalk can be invisible to drivers heading East because of poor, short sight lines.
	Drivers are not careful when they are turning right.
	Pedestrian route going to Old Marlboro Rd is tricky.
	I hate using this crossing as it terrifies me!
	when the weather is nice I like to walk to the shuttle lot
	A pedestrian bridge at Ornac would be transformational!
	Would love to connect both concord center and west concord, as we are one town. Kids can play together, and access the bike trail from home without having to park. There is limited parking for the bike trail in Concord. Bike to school day could actually be possible for kids in our neighborhood if there was a safe way across RT. 2. Please make a fly over or a bike bridge for pedestrians and bikers.
	Nothing further to add
	There should also be a crosswalk from Old Marlboro Rd across ORNAC to the hospital for people who walk to the hospital that way.
	The cars are always in such a hurry, they overlook pedestrians all the time. You REALLY need to use caution.
	Cars crossing route 2 toward Emerson. This is driving. The light has no pause for oncoming cars, toward Emerson. Cars crossing toward Concord and turning left on Route 2 can so easily collide with the oncoming cars. It needs a left turn light going toward 62. It's get confusing to cross toward Concord and see where cars behind you are coming from. This all means I am crossing in the wrong place. I don't see how I am supposed to cross. Have you tried in all directions? I admit I have no idea how to balance pedestrians/cyclists versus heavy Route 2 traffic. Thank for surveying.
	traffic, especially semi drivers seem to consider Route 2 as a main highway without lights
	Make sure that the lights change when a biker is in the intersection waiting for the light
	Sometimes a bicycle alone isn't enough to "trigger" the light and we have to wait until a car comes along. My bike group frequently discusses whether we'd be "safer" using the pedestrian crossing light versus the green traffic light to cross
	Elevate the crossing
	Even if crossing with the signal permits, still have a nagging feeling that some Rt. 2 driver isn't going to stop and might sail into me.
	Crossing route 2 very intimidating must make sure cars driving 60 mph really stop also much watch cars running form ORNAC see you so that they don't run you over always worried about distracted drivers
The following questions are about the ORNAC crossing at the intersection of RT 2 and ORNAC.	

Q/A	How often do you use this crossing when walking, biking, or using a mobility device (such as a wheelchair)? Select the answer that best fits your experience.	466	Total Responses
	Every day	2	0.4%
	Multiple times a week	29	6.2%
	Once a week	15	3.2%

	A few times a month	51	10.9%
	Once every few months	40	8.6%
	A few times a year	76	16.3%
	Never	253	54.3%
Q/A	**Where are you going when using this crossing? Select all that apply.**	**310**	**Total Responses**
	Job	22	7.1%
	Hospital/medical office	74	23.9%
	Recreation	122	39.4%
	Shopping	28	9.0%
	Residence	45	14.5%
	Train station	8	2.6%
	Other	11	3.5%
	Just crossing the street.		
	Concord middle school		
	Kids to CMS		
	Running		
	school		
	Theater/town center		
	Running		
	white house addiction group iop		
	Biking to Cincird Center and the library there		
	shuttle lot		
Q/A	**How safe do you feel when crossing ORNAC?**	**192**	**Total Responses**
	Very safe	2	1.0%
	Safe	17	8.9%
	Neutral	49	25.5%
	Unsafe	80	41.7%
	Very unsafe	44	22.9%
Q/A	**How would you rate the condition of sidewalks around the intersection of Route 2 at ORNAC?**	**187**	**Total Responses**
	Very good	2	1.1%
	Good	13	7.0%
	Average	95	50.8%
	Poor	55	29.4%
	Very poor	22	11.8%
Q/A	**How would you rate the condition of the marked crossing at ORNAC?**	**190**	**Total Responses**
	Very good	2	1.1%
	Good	11	5.8%
	Average	94	49.5%
	Poor	53	27.9%
	Very poor	30	15.8%
Q/A	**Does the existing signal timing provide you a sufficient amount of time to safely cross the intersection?**	**191**	**Total Responses**
	Yes	62	32.5%
	No	77	40.3%
	I'm not sure	52	27.2%

Q/A	How would you rate the lighting conditions at the intersection of Route 2 and ORNAC?	187	Total Responses
	Very good	1	0.5%
	Good	12	6.4%
	Average	108	57.8%
	Poor	47	25.1%
	Very poor	19	10.2%

Q/A	Would you use this crossing more frequently if you felt safer using it?	192	Total Responses
	Definitely yes	69	35.9%
	Probably yes	59	30.7%
	Maybe	35	18.2%
	Probably not	25	13.0%
	Definitely not	4	2.1%

Q/A	Do you have additional comments about the intersection and crossing?	67	Total Responses
	There have been numerous accidents and fatalities at this intersection over many years.		
	Too much going on at the intersection to feel safe. Not sure if drivers will obey the laws.		
	Traffic is horrendous here people have been hit or killed while trying to get across when walking. Even when trying to get on Rte. 2 from ORNAC is not a fun task		
	I feel a little safer with this one but there are different factors involved. People turning Right on to ORNAC do not pay attention. People turning left from Rt 2 are always in a hurry to beat the light. I usually try to avoid and cross closer to the hospital and walk in the grass or the shoulder.		
	Simply put, it's even worse than crossing route 2, if that's possible.		
	This crossing is dangerous.		
	right hand turns off of route 2 come on fast		
	Again, drivers are often complacent and in a hurry. I have been nearly hit several times from people turning right from ornac onto rt 2, because pedestrians are just not frequent enough there.		
	Signals for pedestrians crossing ORNAC and Route 2 should be synchronized.		
	I usually jaywalk where ORNAC meets OMR, as it is easier to cross there.		
	Drivers have zero expectation of seeing pedestrians or bicyclists here, and they drive accordingly.		
	It's known to be bike and pedestrian unsafe		
	There needs to be a dedicated bike lane for crossing rt 2 when on a bike. The left turn signals need to be triggered when on a motorcycle		
	I primarily use this intersection for cycling and I've seen in the past that if a car doesn't come, the light will not change to green when heading southbound on ORNAC at this intersection. It will go red for route 2 and then green for the north traffic on ORNAC, but never change for the southbound side. This was a while ago and may have been fixed.		
	I need to walk across because my vision keeps me from being able to drive.		
	I don't even use this crosswalk because it is awkwardly placed. Coming from Old Marlboro on a bicycle, I generally cross ORNAC at that junction- which is a tricky junction for everyone- motorists, cyclists, etc. I don't know what the best redesign should be, but this whole area is tricky.		
	Lots of red light violations		
	I answered "Never" to crossing Rt2, because it's deadly. If there were a safe way to cross ORNAC, on the "Main Street" side of Rt2, then I might cross there. If there were a safe way to cross Rt 2 on the West side of that intersection, then I would definitely cross there, almost daily.		

I am THRILLED that you are looking into this. I am a new apt owner at Newbury Court and I have always taken long walks daily wherever I live. My children are quite concerned about my crossing ORNAC. A No Turn on Red at the Route 2 corner is a small change that could help, but what we really need is either an overpass or a crossing with a light farther from Route 2, near the country club. And a sidewalk on that side.
right turn on red makes this crossing unsafe.
Put stop line farther back
no comments
Needs lines to mark cross walk and a no right on red sign coming from highway. Very worried about my elderly parents crossing here coming from Newbury Court and crossing to walk to West Concord. Drivers whip through the crosswalk on the way to the hospital and need cautioning measures. At a bare minimum there need to be crosswalk lines. A stop for pedestrians signs in the middle of the crosswalk would be good too.
This crossing is probably not used very often. Pedestrians are typically coming from Old Marlborough and cross at the intersection of Old Marlborough and ORNAC, especially if they're going to Emerson.
Cars turning onto ORNAC from Rte 2 do not respect the crosswalk.
Make crossing btw Old Marlborough and ornac safer
We need a bridge or a tunnel there.
It is hazardous crossing here because of the cars.
A button to push that would set off flashing lights to stop automobile traffic and allow pedestrians to cross - akin to the one at Bruce Freeman Rail Trail on Old Marlboro Road - would be helpful.
Please see my written comments for crossing Rt. 2; I have commented there on this crossing as well. But I will say again, the main reason this crosswalk is dangerous is because of the "right on red" option for auto drivers. This should not be allowed - all traffic should be stopped when the pedestrian crosswalk is illuminated. In the winter, the corners of this crosswalk are completely plowed under with giant snowbanks from the plows clearing Rt. 2 and ORNAC. When using this crosswalk in the winter, I often have to climb over these enormous banks just to get to the "beg button" in order to then wait a long time and cross Rt. 2. I am 63 years old and still able to do this physically; that won't be the case much longer. Again, those who choose to commute on foot are punished with terribly long waits and now almost unscalable snow mountains. Here is an obvious situation where vehicles are prioritized and those who choose to transport themselves differently must suffer. I often just skip the "beg button" and make the dash across ORNAC without the crosswalk signal because I have already waited a long time to cross Rt. 2. Let's face it, at this intersection cars will never NOT be prioritized, thus it will remain a dangerous crossing area because too many drivers prioritize moving their vehicle over safety. They do not and will not pay attention to any "safety" measures in the form of signage or painted lines.
cars on Route 2 traveling east have a free right turn which makes this crossing very dangerous.
ditto previous
High speed traffic and quick crossing time is a problem.
I don't use it but my kids would on their bikes if the route 2 crossing were safer
The short light creates a competition between motorists trying go turn right, and bicyclists. This is a uniquely dangerous situation.
I know of one pedestrian death there 2005 +/-
Not sure cars making the right turn off 2 have enough visibility for the speed they go.
I, personally, would like to see a longer light at this intersection.
occasional pedestrian

This crossing should be part of an elevated pedestrian crossing that is U shaped connecting all four corners of the intersection to separate high speed vehicles from pedestrians for a safer and more efficient intersection. This will encourage investment in the surrounding parcels.
I usually take the shuttle because I have been told people run the red light often. I would walk more often if I felt safe
I think it would be helpful to have alternate routes displayed at thick traffic times.
This is a dangerous intersection- my daughter's car was hit there by a truck driving through on a red light . There needs to be more signage and clarity that is is a crossing, there are no sidewalks on ORNAC either.
People turning right onto ORNAC heading south on 2 often don't look before turning. They don't have a clear view of people in the crosswalk. May benefit from no turn on red.
I simply run across most of the time. Any side street off route 2 is prove to be sketch. But I am always running so it works.
Pot holes and road are in desperate need of repair and repaving
No
There is no enough time to cross, either on a nike or using pedestrian walkway.
More time to cross and I am always on a bike.
Town's most dangerous crossing with bad sight lines, no advanced warning lights for Rte 2 traffic entering ORNAC to Emerson, no speed reduction on Rte 2 to ORNAC
There should be two crosswalks on both directions - not one !!! There should be pavers or cobblestones in the asphalt at intersection w route 2 to keep cars in lane and slow them down; the crossing lights are poorly designed and old; it's not clear how long you'll have to wait for cars to stop; I would recommend going to Amsterdam or Copenhagen and see how they handle hospital intersections and copy that
Regarding the questions about would I use a crossing more frequently if the safety were improved - I use these crossings to get me to where I'm going regardless of their safety but would GREATLY appreciate feeling safer as a cyclist. So please don't misconstrue answers about "would I use it more"
I worry about getting hit by cars turning right on red off Rte 2 and ORNAC. Rather than use the crosswalk, I cross further down towards the hospital. There should be a crosswalk near Old Marlboro Rd, where I live.
Again, I will run here. It is the main way I get to the newly built rail trail that I would love to use more but I often feel stuck running on the other side of Rte 2.
I would like my kids to be able to ride their bikes to west concord and the only sidewalk option requires this crossing. It is too dangerous!
No right on red from art 2Clearly and BOLD white linesBetter lighting
I"m 75 years old and (weather permitting) I use a bicycle.
When crossing this intersection, I look both ways on both roads and pay serious attention. I hate having to cross Rt. 2 as it is so dangerous.. A walking bridge would be fantastic, tho I am sure it is way out of budget.
An Impossible Place to cross! Traffic from Rte 2 East to ORNAC cannot see pedestrians plus their exit speed is very fast. Total lack of visual warnings for drivers - no flashing signs, no specific arrows which point to the crosswalk, no visible contrasting crosswalk colors, no poles and pedestrians controls<
The Rte. 62/Rte. 2 intersection is not well designed if you're on foot or traveling by bicycle. Especially of concern are cars that need to take a left onto Rte 2. headed westbound from Rte 62. While cars are are fighting to make the turn, oncoming pedestrians (headed towards West Concord) are at risk.

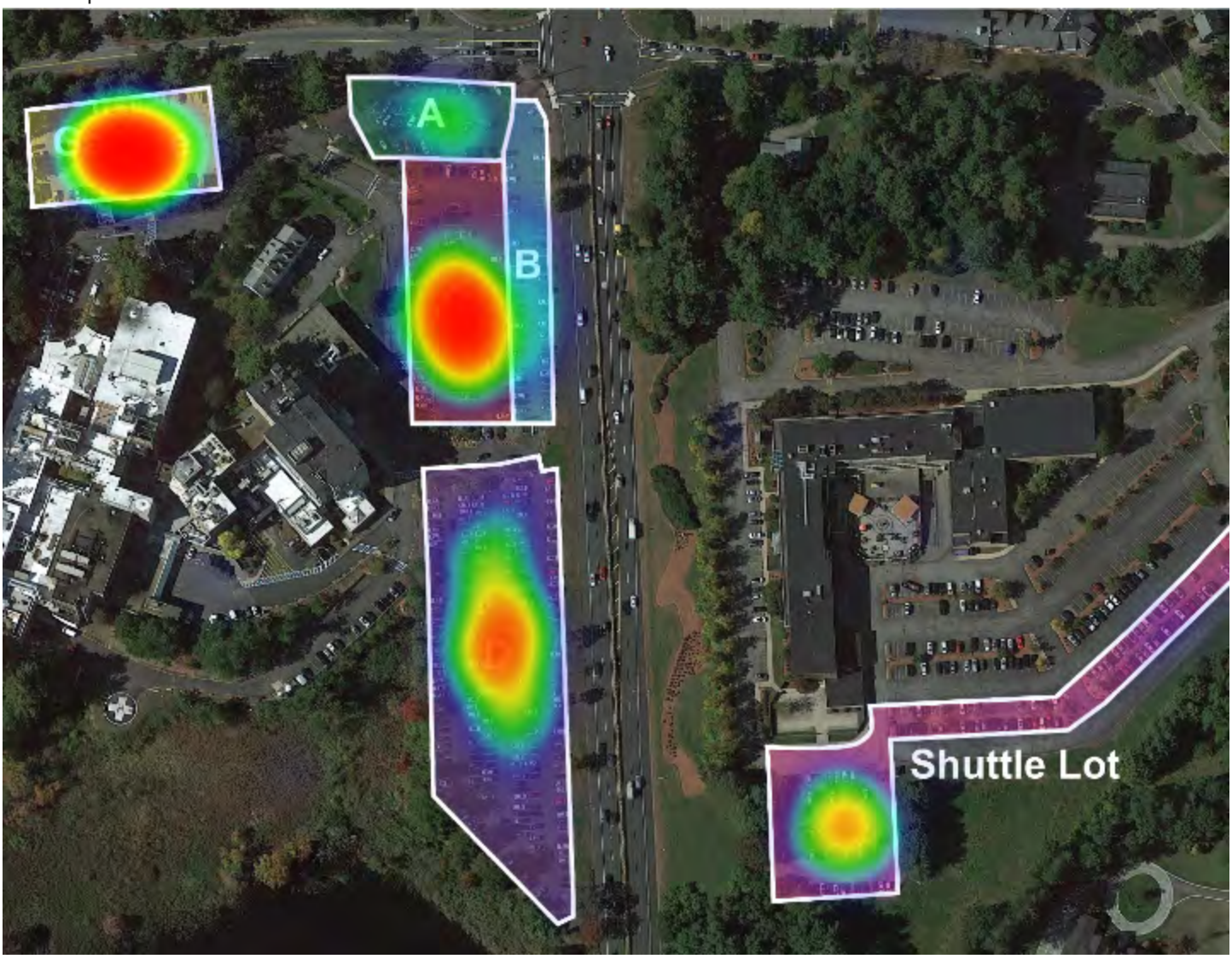
I walk from Concord Center into West Concord weekly in the summer. This is one of two ways to do that and this crossing is the trickiest. Traffic coming off rt 2 doesn't expect pedestrians and there isn't much of a sidewalk there, or from Old Marlboro to Emerson.
I like to walk to the shuttle lot in nice weather
When crossing towards Emerson, cars can turn from Route 2 onto Ornac without seeing the pedestrian.
As I have already written drivers of semis seem to think that being Route 2 it is a through way and they don't expect to have to stop at traffic lights.
I generally drive and only walk if I am prohibited from driving by medical orders.
Even with the signal permission, am unsure whether some absent-minded Rt. 2 driver will miss the stop light and sail into me.
When the walk sign is on cars also have the turn signal coming off of ORNAC often not expecting pedestrians or just distracted more than once I have neatly been hit by a turning car.

The following questions are about Emerson Hospital			
Q/A	**Do you visit Emerson Hospital in Concord or their nearby associated offices?**	**359**	**Total Responses**
	Yes	288	80.2%
	No	71	19.8%
Q/A	**Are you an Emerson Hospital employee or patient?**	**446**	**Total Responses**
	Employee	109	24.4%
	Patient	251	56.3%
	Both	48	10.8%
	Other	38	8.5%
	parking lot D		
	D		
	Shuttle lot		
	Visitor		
	Visiting patients there		
	Parent of Patient		
	sometimes patient		
	former employee		
	no		
	I walk from my house		
	D		
	No		
Q/A	**Do you take the shuttle from the employee parking lots across Route 2 to the hospital?**	**191**	**Total Responses**
	Yes	76	39.8%
	No	109	57.1%
	Not aware of shuttle	6	3.1%
	The only responses to this question were from Emerson employees		

The following question asks employees and patients where they park when they arrive at the hospital. Responses were collected via a heat map.

Q38 - Where do you park when visiting Emerson Hospital? Select all that apply. In this image, the main hospital building is on the left.

603 Responses



Q/A	Do you have additional comments about the intersections and crossings near Emerson Hospital?	146	Total Responses
	The crossings and intersections are very dangerous and not properly identified, marked, or protected.		
	People running the red light.		
	I don't use the crosswalks because I don't feel safe to.		
	An overpass would be nice		
	none		
	It would be helpful to have a crosswalk from Baker Ave. Extension to the Paparazzi area across Elm Street.		
	I would never attempt to cross!!		
	Very concerning intersection/crossing as drivers try to "make the green light" and speeds are high in the area.		
	The crossing is not bad. However, the lights need to have more of a delay due to people running yellow lights.		
	I would not cross at any of these intersections as the are unsafe even with the crossing button. Too many distracted drivers causing accidents or near misses,a walking bridge is needed for those that have to park across from the hospital.		
	Never use them because they appear too unsafe.		
	I don't feel safe driving across rt. 2, too many running the red light		
	It's challenging to make a left hand turn to go Rt 2 West.		
	I do not feel safe crossing route 2		
	Crossing from the hospital to get to the Old Marlborough sidewalk is cumbersome (since it feels "out of the way" to have to go up along route 2), causing many to jaywalk, which poses a safety issue - this crossing area should also be assessed.		
	do not feel safe crossing rt 2		
	traffic turning east on to RTE 2 hardly ever yields / clears the cross walk before turning		
	I cross Rte 2 to come to the hospital and each day cars are driving through red lights. close to collision many times		
	Something has to be done for safety.		
	When turning left from the hospital onto rte 2, there is always a delay from the other cares crossing over the intersection...there needs to be a delay in the lights coming from the Care One Concord side....we always get stuck and miss the green light when turnong left onto rte 2 from the hospital.		
	Allowing more time for pedestrians to see that cars have stopped before crossing is important.		
	I never cross because it is far too dangerous. I have heard of enough incidents with crossing to never try it myself.		
	It's awful		
	No		
	Build a pedestrian sky bridge along route two		
	crosswalks OVER route 2 will help. As a driver I know the 62 intersection is not particularly safe.		
	I witnessed a nurse being struck by a car while trying to cross Rte 2 to get to Emerson Hospital. She lives with a severe head injury. I will never again try to walk across Rte 2. It is not safe for anyone who is not in a car. A pedestrian bridge would make sense as a way to improve safety for pedestrians.		

I never use these intersections to cross because they seem very unsafe.
Neither of those crossings are safe for humans. They are also difficult for cars.
I grew up in Concord...It is scary enough driving on or crossing Rte 2....Cars travel in excess of 60+ MPH as they approach the intersections....As a long time employee a few people have been hit trying to walk across Rte 2.....
The scope of the study is too narrow, fails to address already identified hazards that may be addressed at low cost (e.g. pavement markings on Rt 62) and does not address the issue of school children crossing town to get to Middle and High School campuses. Missed opportunities abound.
Route 2 is a major thoroughfare and should be treated as one. It should not exist as the STRODE that is currently in use. It can be a street or it can be a road but we should not tolerate it being both.
The traffic light at Rte2/ORNAC, coming from Concord Center, has wait times up to 7 min to turn green. Specifically, does not sense small cars or regular motorcycles. This forces some to cross Rte 2 on a red light. This is dangerous, especially coming in for emergency calls at night. This has been a problem for years. Please fix this. Thank you.
I NEVER cross Rt. 2 as a pedestrian because I am too afraid to!!! I have witnessed significant vehicle crashes at these intersections because of how dangerous they are. I won't cross as a pedestrian in their current configuration.
I have seen many people walking or biking almost be hit and 1 minor accident, one severe accident.
I used to ride the Emerson Shuttle and needed to walk across from the shuttle lot a couple of times. I had a vehicle taking a right turn on red almost run into me, despite having the crosswalk signal that I was free to cross. It is a dangerous intersection in my opinion.
When I have to walk from the west concord train station to Emerson for work the side walk stops short and there is no cross walk marking to cross over to Emerson Hospital. It is a very busy spot and you have to walk on the dirt path briefly and run across the road quickly!.. Please address this area.
Route 2 should be raised and not have crossings for side streets
It seems there is never a time when it's safe to cross. There is always a car turning somewhere, and drivers are not watching for pedestrians .
I do not use these intersections because they are not safe. If they were made safer I would use them frequently.
ORNAC, in general, needs a sidewalk. It would greatly benefit Emerson, the retirement community, and children getting to Willard through the path to Willard on Nut Meadow. (Williams needs a sidewalk as well!)
yes, the light at Rt 2/Ornac is too close to the intersection with OMR and the Emerson entrance. Traffic gets stacked up/confused, people don't signal especially before turning onto OMR.

	On days when I'm really determined to not die on Route 2 and I have enough time, I'll try crossing at Baker Ave instead. The lights there don't register when a bicyclist is waiting at the light, so if I'm there alone I have to wait until a car shows up to trigger the change of lights. Sometimes it can take a long time, particularly if it's outside of rush hour. But bicyclists are people too, and we also need to get places and cross the road! Thank you for designing with us in mind.
	No
	Please consider some form of separated crossing infrastructure for non-vehicular transportation on Route 62. Perhaps rail-with-trail along the MBTA route from the West Concord station to Concord Station? As it is, no West Concord kids can bike to the high school safely.
	No
	Walking across Route 2 is very, very dangerous. I need to walk because my vision keeps me from being able to drive.
	I'm thrilled that these intersections are getting studied. However, what I'd really like to see is a coherent plan to enable safe biking and pedestrian connectivity from the Bruce Freeman Rail Trail to Concord Center. A key component is a safe crossing of Route 2, but there are other issues. E.g. the stretch on Old Marlboro from the BFRT to Emerson is pretty narrow and twisty and not great for cyclists (sidewalks are OK for pedestrians, though they are narrow in spots and probably not great for people in wheelchairs); similar comments for Rt 62 from the BFRT to Concord Center (sidewalk access is marginally OK; cycling infrastructure less so).
	My family (West Concord) crosses here to visit grandparents in Concord, usually pushing a stroller. It is always feels a little bit unnatural/risky and wish it was a more pedestrian-welcoming intersection.
	I am pro-human powered transportation because it is better for the environment and quality of life
	I would love to be able to walk, run, or bike to the other side of route 2 but I doubt I ever will with the existing configurations of these intersections.
	The red-light running is insane. Between 3 and 6pm, every single cycle, someone runs it. I mean this literally. This contributes to gridlock. And if you think that's bad, take a look at the Baker Ave intersection. It is the place where the most reckless drivers run reds to get across, cause gridlock, nearly hitting other cars, and literally driving the wrong way on Elm St, to make up a minute.
	I support pedestrian and cyclist improvements for these intersections, even if such improvements lengthen the time it takes for me to travel by car through these junctions. The safe and efficient travel of pedestrians, cyclists, and other non-motorized forms of transit should be prioritized over car travel.
	Elderly people and hospital staff need to use these at all hours, and they are simply unsafe.
	Both intersections could use improvements
	I never cross because I am nervous about biking with my family... But would love for it to be safer so we could access the Bruce Freeman Rail Trail
	Thank you for working on this, I hope changes are implemented soon.

	Improvements, such as those made near 126 would help. The crossing is highly dangerous for children in particular.
	Would love to see a safer crossing from Baker Ave across Rt 2.
	No
	I would like to cross, but there is no curb cut across rt. 2 at ornac
	I would walk or ride my bike there more often if it felt safe for pedestrians. It is car friendly but not pedestrian friendly.
	No
	62 on the east side of Route 2 needs to be addressed as well. Having made it across the intersection it's still a bit uncomfortable biking along the section of 62 between Route 2 and the center of town. Road conditions and shoulder are in terrible shape, and the intersection of Dee Road and 62 is fraught.
	I believe I covered all of my concerns, with the exception of mentioning that there is no bike lane at this - or any - intersection. This is simply irresponsible this day and age. Lastly, and I don't mean any disrespect here... this survey feels as if it were designed by someone who does not frequent crosswalks on foot or bike. What was meant by "lighting"? The lights to illuminate the area at night or the actual traffic lights. Illuminating lights are average when they should be the ideal at these intersections, and the traffic lighting in correspondence with the crosswalks is downright dangerous. The single line response sections of this survey make proofreading one's comments absolutely maddening. Sorry if there are typos.
	The north side of the crosswalk at Rt. 2 and ORNAC is way too dark at night. I do not think there is a street light there.
	I don't cross these intersections in any way but by car because they are too dangerous!
	They are terrifying... I worry about walkers, bikers, etc. and so glad I only approach by car. Very very dangerous intersections. People from out of town have no idea how dangerous it is for being crossing except by car.
	I would never walk across these intersections. They seem far too dangerous for pedestrians.
	please make them as safe as you can
	they could be safer; people crossing need more visibility; cars turning sometimes don't see them right away
	it should be grade separated for safer cycling and walking access to Emerson, BFRT and the Middle School
	Yes! I walk many, many places in Concord, but would never walk there. It is completely walker unfriendly. Crossing Route 2 to get to West Concord, which I would love to do, is just not going to happen as currently configured. Thanks for your interest.
	Don't let my kids bike across rt. 2 because it's too dangerous. Too many people going South on rt. 2 run the light. Dangerous for drivers too coming from ORNAC across rt. 2 onto 62 (I come off Old Marlboro onto ORNAC several times a week)
	Additional background information should be collected. Very high bicycle utilization in this corridor. A grade separated crossing should be considered.
	too short, dark. BUT DON'T BLIND CARS WITH LED'S, THAT MAKES IT WORSE!!!
	I would strongly discourage someone from crossing Rite 2 on foot, if asked.

	I do not cross the road on foot because I don't think it's safe. An overpass would probably be the only thing that would make it feel safe enough to cross rte 2
	I would never cross Rt. 2 on foot or let my children do so for any reason. I could walk to Emerson from my house, but I get in the car because I don't want to be hit by one.
	Since I live very close to Emerson and ORNAC, I do know the traffic and lights there.
	On a road bike, I can cross these safely. But it's still an unpleasant experience. I hope that aesthetics can be improved as safety is enhanced.
	I would never consider crossing at these on foot or bike. Much too dangerous!
	I don't use the crossings because I don't feel the crossings are safe for pedestrians. I always take the shuttle across the street
	Crossing Rt 2 anywhere in town is scary to do. I have crossed at 2 other locations and I always feel vulnerable.
	I don't use these because they're so unsafe
	i have been riding my bike to work, crossing RT 2 on Rt 62 for 15 years or more. it is a tricky intersection
	I have not found a bicycle rack at Emerson. I lock my bike to a NO PARKING sign.
	Too dangerous to cross Rt 2.
	I think it's important to know WHY folks may NOT cross route 2 and what changes may encourage them to do and so and they'd feel much safer.
	There's no way I would cross there unless in a vehicle - too unsafe. It needs a safer means and not just a protected stop hoping Rte 2 traffic will always obey the red lights
	I have always thought this to be more dangerous for pedestrians than the Rt2/Main St intersection..more options for turning by vehicles. And perhaps tired, distracted drivers. The result of both is more danger for pedestrians, bicyclists, etc.
	I don't cross because it's too dangerous.
	I don't cross on foot or by bike because it seems too dangerous!
	Signs acknowledging cyclist needs and tuning the lights to change for cyclists and not just cars would be a big improvement, as would making adequate light cycle times to allow cyclists sufficient time to cross the intersection. I have also seen numerous near car/pedestrian collisions when pedestrians try to cross Route 2, as cars are not alerted to the pedestrians and assume they can go when the cross traffic is clear.
	Crossing at ORNAC in a vehicle is also dangerous with persons taking a left onto R2W. The lighting allowing a left should be updated.
	No
	no
	Not a critical issue
	Please consider building a U shaped elevated pedestrian crossing connecting all four corners of the Emerson Hospital intersection to spur future development of a medical campus and establishing a protected biking route that connects the Bruce Freeman Rail Trail with the Reformatory Branch Trail. Thank you

iT MAKES ME NERVOUS THAT SO MANY THINGS COULD HAPPEN AT THAT INTERSECTION. TURNING OUT OF WEST CONCORD OR CROSSING 4 LANES.
What about a footbridge or a tunnel?
I have never used the crossing as I am too afraid to do so. I try to go very early to any appointments in the Emerson Complex so as to get a parking place on the side that I have my appointment. If possible I schedule on *Sunday as there is much parking available then. Regarding parking, I have arranged for rides so as to avoid crossing Rt 2 as a pedestrian. The way the traffic travels on route 2 it would make sense to have a bridge for pedestrians, bicycles, mobility devices with access for strollers and mobility challenged people*
It would be very dangerous to pass route 2 maybe they could do a bridge system
If the crossings were made better or safer O would use these more regularly since I live on the W Concord side and would like to be able to get to main Concord easily on foot or bike. At present it seems a little unsafe.
There is real danger from cars & trucks running red lights. This is a constant occurrence largely ignored by the police
Crosswalks, sidewalks and basic walkability is very poorly maintained by the town.
They could be safer, for sure. I don't bike, but my children do. They wouldn't bike on ORNAC, though. But it's always important to put the pedestrian or biker first, because they are more vulnerable and at risk than drivers.
A walking bridge would be ideal.
Way more safety needs to be in place
I often walk from my house in West Concord to Emerson Hospital. There should be a better pedestrian way to get from OMR across ORNAC than walking all the way to the Rte 2 crosswalk. Almost everyone I've seen walk from OMR to the hospital cuts across OMR before the end; walks in the road or in the dirt for a short distance; then crosses ORNAC where there is no sidewalk, but is good visibility to see oncoming traffic. There should be a better system of crosswalks at the end of OMR.
They need to be improved if we want pedestrians/bicyclists to use them. As they are, I feel unsafe crossing them and particularly unsafe letting my children cross them.
Scary intersection for pedestrians and bikers. That's why I don't use it. I do cross route 2 on foot at Sudbury rd fairly often, which was not included in this study. That could be made safer by having all traffic lights turn red when someone hits the walk button
I'm not your target audience. I live in a route 2 adjacent neighborhood with no crosswalks for bikes or pedestrians. We have no safe access, without going miles out of our way, to West Concord, its rail station and bike path despite living very close to them. This situation should also be factored into your plan.
I ise these intersections on weekend mornings, esp. Sunday.
I do not use rat 62 intersection - I deliberately go to ORNAC when on my bike
extremely dangerous for patients and employees of Hospital, Newbury Court, General Public
cars aren't expecting pedestrians and are focused on the route 2 light.

I checked the "never" box because that is the case now, due to a frightening event in the past. I've been a volunteer and an employee at Emerson, and when my mother was living in the nursing home across route 2, I used to walk across from the hospital to spend a few minutes with her. One day I had pressed the cross button, but when I started out, a woman swung from ORNAC into the east-bound lane of route 2, thinking, I guess, that she was merely making a right turn on red. I leaped back, but she came within inches on hitting me. She looked as horrified as I felt. Something is needed to signal to drivers that a right turn is not allowed just then.
No visual indication for drivers regarding pedestrians crossing. No Safe protection for pedestrians stuck on the tiny space between the high-speed traffic because the drivers did not let them cross to get to Emerson. It is a deadly intersection in need of major redesign.
They are extremely dangerous and hurt the town, the hospital, its staff and patients!! Humans evolved to walk - the way we design our streets must acknowledge that!
I would be afraid to walk this at night because it's so dark.
It's dangerous to cross rt 2 and so far I have not had to do so. But my former trash collector was killed crossing st 2 so I am concerned
So greatly appreciate you doing this research and planning!!
It is so dangerous to cross these intersections not in a car - even dangerous in a car. Also, with the motel converted to a homeless shelter, I am quite concerned that we will have more people trying to cross by foot, as West Concord is the closest train and/or resources for these people.
too dangerous like taking your life into your own hands
As I said, please add a crosswalk from the hospital side of ORNAC to Old Marlboro. Many hospital employees cross for daily walk down Old Marlboro
I think that these could definitely be made safer and am glad they are surveying this.
We need a protected crossing for walkers, parents with strollers, wheelchair users, and bikers.
Speed on Rte 2 is very high as drivers try to make ORNAC AND MAIN Street green lights. Past deaths and injuries at ORNAC are very tragic.
Do not use them because it's unsafe to do so.
Kids on bikes! There is no good way for anyone to ride a bike from West to Central Concord. Given all the issues with parking and the environment, we should have a way for students to ride to school. This is only going to get more important as eBikes are adopted.
I consider these crossings too dangerous to use except in case of absolute necessity.
Could some of the volume be diverted from that intersection by having direct access to Rt. 2 Eastbound from the Emerson parking lots?
Why does this survey keep jumping back to ORNAC from the route 62 intersection? I think the 62 intersection is more important
I occasionally walk or jog along Old Marlborough Road and turn right onto ORNAC. That can be tricky, with traffic coming from several directions. Not sure what could be done to improve that situation.
Place. Place a crosswalk directly from Old Marlboro Rd across ORNAC rather than the crossing along Rt.2

I am most concerned about the safety of walkers and bikers because there is no special crossing light for walkers. Cars on both sides are very close to bikers so I try to keep as far from them as possible
An overpass at Emerson would be awesome. Main Street could use more signage, lighting, markings to make it clearer to vehicles that it isn't just an intersection but a pedestrian crossing. Attention grabbing painted lanes and lighting would help like is often used on rail trail crossings.
As it is now, wouldn't consider crossing Rt 2. No enforcement of people running red lights. It's even dangerous in a car!
A tough one: is pedestrian use at either of these intersections reasonable? Possible? I know people are crazy and will not cooperate. Please look at solutions -- a bridge? -- that prohibit pedestrians crossing on the ground at either intersection. Thank you for trying here.
no; thanks for doing this survey, though
I avoid the intersection because there is no over pass. The intersection is too dangerous for me. I have mobility issues.
I almost always drive, and some of my doctors are now located on Baker Ave Ext.
not enough time to cross and drivers seem eager to get going which is scary for one wants to cross
No pedestrian crossing at Rt. 2 feels safe; this is not a regular route for me/my family, however.
The intersection of Route 2 and Baker Ave Extension needs a pedestrian crosswalk and sidewalks on Baker Ave extension to allow safe crossing

Appendix B

On Friday, June 30, 2023, the following email was sent to 73 respondents to the survey. These survey takers offered their names and email addresses at the end of the survey to be contacted for more information on proposed interventions. Those who were inclined to respond, were asked to do so by Wednesday, July 12, 2023. Fifteen (15) responses were received via email between June 30 and July 12, 2023. Below are the responses, organized by date and time they were received by MPO staff. Personal information is omitted, except for the names of respondents.

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

Julie Dombroski <jdombroski@ctps.org> Fri, Jun 30, 2023 at 9:20 AM

[redacted]

Good morning,

Thank you for participating in the recent survey of the crossings at the intersections of Route 2 at Route 62/Main Street and Route 2 at Old Road to Nine Acre Corner (ORNAC) in Concord. We're reaching out today to gather additional thoughts on each crossing.

The Boston Region Metropolitan Planning Organization (MPO) is conducting a study examining possible **short-term** interventions to improve pedestrian and cyclist safety at each intersection. Below are proposed interventions at each intersection. Feel free to provide comments and feedback on these interventions or additional safety concerns or ideas in a response to this message. Responses will be accepted until Wednesday, July 12.

- Intersection of Route 2 and Route 62/Main Street
  - Extend the pedestrian phase (give people more time to cross the street)
  - Restripe crosswalks with zebra, continental, or ladder-style markings
  - 6' bike lane on RT 62/Main Street westbound
  - 4' bike lane on RT 62/Main Street eastbound
- Intersection of Route 2 and Old Road to Nine Acre Corner (ORNAC)
  - Extend the pedestrian phase on each crossing (give people more time to cross the street)
  - Restrict right turns on red on the northbound and eastbound directions
  - Paint sharrow markings on ORNAC
  - Install 'Bicycle May Use Full Lane' signs on ORNAC approaching the intersection
  - Restripe crosswalks with zebra, continental, or ladder-style markings
  - Repair crumbling pavement on median on RT 2 and utilize flex posts to distinguish median from roadway and aid in visibility

Thank you for taking the time to review these questions. If you have additional questions or would like to discuss this study or the survey further, please reach out to Julie Dombroski (jdombroski@ctps.org).

Best,

Julie Dombroski | she, her, hers
Transportation Planner
Central Transportation Planning Staff
Boston Region Metropolitan Planning Organization
857.702.3684 | jdombroski@ctps.org | www.bostonmpo.org

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Fri, Jun 30, 2023 at 9:34 AM
To: Julie Dombroski <jdombroski@ctps.org>

These are excellent improvements for adults/cyclists. Are they enough to let my kid cross over Route 2 to get to the Middle School on her bike. Not sure. Need bike lane to get to a safe area on Old Marlboro.

[redacted]

[Quoted text hidden]

Please be advised that the Massachusetts Secretary of State considers e-mail to be a public record, and therefore subject to the Massachusetts Public Records Law, M.G.L. c. 66 § 10.

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Fri, Jun 30, 2023 at 9:35 AM
To: Julie Dombroski <jdombroski@ctps.org>

These ideas might help....But until the MA State Troopers decide to crack down on drivers routinely running red lights, these measure are not enough to convince me to cross on foot. What about:
1.camera to catch offenders and issue hefty fines?
2.rumble strips or something to slow traffic at intersections? Drivers speed up at yellow lights? Isn't speed limit on rte 2 supposed to be 45mph?

[Quoted text hidden]
> [Quoted text hidden]
> [Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Fri, Jun 30, 2023 at 9:53 AM
To: Julie Dombroski <jdombroski@ctps.org>

This is great. Thank you for listening with such care and for responding so quickly.

On Fri, Jun 30, 2023 at 9:20 AM Julie Dombroski <jdombroski@ctps.org> wrote:

> [Quoted text hidden]
> [Quoted text hidden]

--

[redacted]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Fri, Jun 30, 2023 at 11:37 AM
To: Julie Dombroski <jdombroski@ctps.org>

Hi Julie,

Those interventions seem good to me.

Thank you.

[redacted]

From: Julie Dombroski <jdombroski@ctps.org>
Sent: Friday, June 30, 2023 9:20 AM
Subject: RT 2 Concord Crossings Survey Follow-Up

Good morning,
[Quoted text hidden]

[Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Fri, Jun 30, 2023 at 12:20 PM
To: Julie Dombroski <jdombroski@ctps.org>

Looks like some of your improvement suggestions might work. Lowering the speed limit and enforcing it should be part of the plan. The speed of vehicles is incredibly excessive for the Concord area of Rt 2 with all of the cross streets businesses and driveways.
Please try to address speed reduction on the parts of Rt2 with cross traffic.

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> [Quoted text hidden]
> [Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Fri, Jun 30, 2023 at 1:14 PM
To: Julie Dombroski <jdombroski@ctps.org>

Hi Julie,

Thanks for sharing this. I applaud the proposed changes in both intersections, but I feel that you aren't going far enough on the Intersection of Route 2 and Old Road to Nine Acre Corner (ORNAC) in one area:

Currently, the light won't trip for bicycles wanting to cross Route 2 on ORNAC. If the intent is for bikes to be pedestrians and cross by pressing the button to request a walk light, that isn't apparent or sensible. Every cyclist I know crosses by going into the middle lane (going from Emerson Hospital side) which is the vehicles going straight lane (this should be marked to share with bikes). You need to replace the sensors with ones that will recognize bikes, so that cyclists can get across when there are no cars around.

I want to share a recent experience on that very intersection. I turned left off Old Marlborough onto ORNAC and headed to the middle lane. The only car around was one behind me doing the same turn off Old Marlborough. As I proceeded to the stop line to wait for the Route 2 light to change, this driver came up on my left side, in the left turn lane, and as I was reaching the stop line, turned right across my front and into the right turn lane and then onto Route 2. Incredibly dangerous for me, probably an illegal right turn. I think it could have been helped with some signs about bikes using the middle lane, as well as road markings.

Thanks,

[redacted]

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> [Quoted text hidden]
> [Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Fri, Jun 30, 2023 at 7:17 PM
To: Julie Dombroski <jdombroski@ctps.org>

Thank you!

For the 62 crossing:
- extend the pedestrian phase
- 6' and 4' bike lanes
- could you also include a similar bike detector that was installed at the 126 crossing a few years back? I was the person who petitioned for that.

For ORNAC
- please restrict right turns on RED, especially southbound traffic. They never see people in the crosswalk!!
- bikes may use full lane
- extend pedestrian phase

Sent from my iPhone

> On Jun 30, 2023, at 6:20 AM, Julie Dombroski <jdombroski@ctps.org> wrote:
>
> [Quoted text hidden]
> [Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Sat, Jul 1, 2023 at 4:45 AM
To: Julie Dombroski <jdombroski@ctps.org>

Hello Julie,

Thank you for providing this list of possible actions. Based on my experience of crossing Route 2 at both intersections, I have highlighted in yellow the actions that I believe will have the greatest benefit for those crossing Route 2 - please see below.

Best wishes,

[redacted]

[Quoted text hidden]
[Quoted text hidden]
[Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Sat, Jul 1, 2023 at 3:40 PM
To: Julie Dombroski <jdombroski@ctps.org>

Thank you for these improvements. [redacted]

On Friday, June 30, 2023 at 09:20:23 AM EDT, Julie Dombroski <jdombroski@ctps.org> wrote:

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Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Mon, Jul 3, 2023 at 10:53 AM
To: Julie Dombroski <jdombroski@ctps.org>

Thank you for the follow up.

I think these are all good suggestions, with the exception of the sharrows. (https://www.peopleforbikes.org/news/we-were-wrong-about-sharrows)

I would stress the need to improve the median at the ORNAC/Rt 2 intersection. If a pedestrian stops halfway (which often happens because the light is short) it is a very scary place to wait.

Another helpful idea, although perhaps too ambitious, would be to slide the intersection of Old Marlboro and ORNAC slightly southward and align the exit from Emerson with OMR. Currently, cars are coming from every direction, often with no time to properly signal their intentions. Aligning the intersection and increasing the distance between Rt2 and OMR would provide some benefit.

Pedestrian improvements are also needed at ORNAC/OMR. A pedestrian coming from the West Concord train station to Emerson Hospital down OMR is currently forced to turn left on ORNAC, and cross ORNAC at the RT 2 intersection crosswalk, before doubling back to enter Emerson. In reality, folks jaywalk through the ORNAC/OMR intersection dodging traffic. There are actually a lot of people commuting to Emerson via the train and we should be making the walking route to Emerson as friendly as possible to encourage more folks to do this.

--
[redacted]

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[Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Thu, Jul 6, 2023 at 11:37 AM
To: Julie Dombroski <jdombroski@ctps.org>

Ms Dombroski,

Restricting right turns on red for cars at ORNAC completely misses the point If the aim is enhance bicycle safety at that intersection. The bicycle is always going to be to the right of the car If the car can't turn right when there is a safe opportunity, then when the very short light turns green, the bicycle, on the right, and the car trying to turn right are immediately put into competition, with mere seconds to decide the outcome. The button for the pedestrian crossing is on the sidewalk, yards away from where the bicyclist is in the road, where they should be, for pedesrian safety.

Extending the green to cross for both cars and pedestrians, and allowing cars to turn right on red would go farther to increase safety for bicycles.

[redacted]

> On Jun 30, 2023, at 9:20 AM, Julie Dombroski <jdombroski@ctps.org> wrote:
>
> [Quoted text hidden]
> [Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Sat, Jul 8, 2023 at 4:47 PM
To: Julie Dombroski <jdombroski@ctps.org>

Hi Julie –

Thank you for this information.

Though I would, of course, be happy if the safety measures listed below would be implemented at both intersections, I am still concerned that these interventions would still fall short in slowing down drivers on Route 2 and, unfortunately, I cannot think of anything short of a bike/pedestrian bridge spanning the highway that would make any difference. Though increasing biking and pedestrian crossing safety is of the utmost importance, the real problem are the drivers who aren't going to adhere to any measures taken to slow them down and/or make them stop when the lights are red. Those are the people that are the most dangerous.

Having said that, however, I still fully support ALL of the interventions listed below, not just "some" of them but ALL of them, at both intersections and look forward to taking advantage of these, and any other possible safety measures, as soon as they can be implemented.

Best,

[redacted]

From: Julie Dombroski <jdombroski@ctps.org>
Date: Friday, June 30, 2023 at 9:20 AM
Subject: RT 2 Concord Crossings Survey Follow-Up

WARNING: Harvard cannot validate this message was sent from an authorized system. Please be careful when opening attachments, clicking links, or following instructions. For more information, visit the HUIT IT Portal and search for SPF.

Good morning,

Thank you for participating in the recent survey of the crossings at the intersections of Route 2 at Route 62/Main Street and Route 2 at Old Road to Nine Acre Corner (ORNAC) in Concord. We're reaching out today to gather additional thoughts on each crossing.

The Boston Region Metropolitan Planning Organization (MPO) is conducting a study examining possible **short-term** interventions to improve pedestrian and cyclist safety at each intersection. Below are proposed interventions at each intersection. Feel free to provide comments and feedback on these interventions or additional safety concerns or ideas in a response to this message. Responses will be accepted until Wednesday, July 12.

- Intersection of Route 2 and Route 62/Main Street
  - Extend the pedestrian phase (give people more time to cross the street)
  - Restripe crosswalks with zebra, continental, or ladder-style markings
  - 6' bike lane on RT 62/Main Street westbound
  - 4' bike lane on RT 62/Main Street eastbound
- Intersection of Route 2 and Old Road to Nine Acre Corner (ORNAC)
  - Extend the pedestrian phase on each crossing (give people more time to cross the street)
  - Restrict right turns on red on the northbound and eastbound directions
  - Paint sharrow markings on ORNAC

- Install ‘Bicycle May Use Full Lane’ signs on ORNAC approaching the intersection
- Restripe crosswalks with zebra, continental, or ladder-style markings
- Repair crumbling pavement on median on RT 2 and utilize flex posts to distinguish median from roadway and aid in visibility

Thank you for taking the time to review these questions. If you have additional questions or would like to discuss this study or the survey further, please reach out to Julie Dombroski (jdombroski@ctps.org).

Best,

Julie Dombroski | she, her, hers
Transportation Planner
Central Transportation Planning Staff
Boston Region Metropolitan Planning Organization
857.702.3684 | jdombroski@ctps.org | www.bostonmpo.org

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Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Mon, Jul 10, 2023 at 4:41 PM
To: Julie Dombroski <jdombroski@ctps.org>

Hi Julie,
I ride in a [redacted] bike group from Maynard and we cross Rt 2 by Emerson quite a bit to get into Concord center and the surrounding area. If there are no cars waiting in either direction we have watched the light not turn green until cars show up. The other week is was a good solid 4 or 5 minutes. Is there anyway around this?

That's my only comment.

Thanks,
[redacted]

[Quoted text hidden]
[Quoted text hidden]

Julie Dombroski <jdombroski@ctps.org>

RT 2 Concord Crossings Survey Follow-Up

[redacted] Mon, Jul 10, 2023 at 11:59 PM
To: Julie Dombroski <jdombroski@ctps.org>

Hello Julie,

Thank you for your work here- these intersections need improvement!

I am more familiar with the crossing near Emerson Hospital. I approach this intersection frequently as a driver, runner, and cyclist, and occasionally as a pedestrian.

The suggestions listed below are helpful to be sure, but don't really address what I perceive to be the most dangerous part of this intersection, which is that the crosswalk at the mouth of ORNAC is too close to Route 2, and isn't really helpful for pedestrians coming from Old Marlboro (or cyclists that want to act like pedestrians for the sake of a safe crossing)- it's tucked out of the way and it's scary to use because you are adjacent to potentially fast-moving traffic, which may or may not turn onto ORNAC (particularly cars driving east on Route 2).

Here's my proposal: I would love to see a crosswalk across Old Marlboro, a short sidewalk section, and then a crosswalk across ORNAC that is farther from Route 2 (see red lines in image below).

I realize that (a) I am not an expert in this area, and (b) my proposal has 2 road crossings rather than 1! However, I think the advantages are:
- Less worry about cars taking right turns (or left turns) off Rt surprising you- there's more distance between the crosswalks and fast-moving traffic
- The crosswalk across ORNAC would be available to cyclists coming up Old Marlboro

I realize that my idea isn't perfect, but I hope it stimulates some better ones- I really do think that the crosswalk across ORNAC is scarier than the one across Route 2 (though I'd love to see that one improved as well). Of course, what I'd really LOVE is a pedestrian bridge (I use the ones over Storrow Drive in Boston frequently), but I suppose that's too much to ask for, or at least doesn't qualify as a short-term fix?

Cheers,

[redacted]



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Julie Dombroski <jdombroski@ctps.org>

ORNAC

Julie Dombroski <jdombroski@ctps.org> Wed, Jul 12, 2023 at 10:48 AM
To: [redacted]

[redacted]

When I was in the field, I also noticed issues with the pedestrian signals. Since you mention this is a recent issue, I will notify the Town and MassDOT about it.

The purpose of this study is to allow to Town, along with MassDOT, to pursue short-term improvements at each intersection. It is the hope that some of these short-term interventions can be implemented while a longer-term solution to pedestrian and cyclist safety is studied.

I hope this answers your question, please let me know if you have any additional questions.

Best,
Julie

On Wed, Jul 12, 2023 at 10:38 AM [redacted] wrote:

> Do you know when the work will be done? One of the walk signs has gone on the blink. It shows the white walk figure but nothing in red: no countdown and no stop hand.
>
> [redacted]
>
> On Fri, Jun 30, 2023 at 9:55 AM Julie Dombroski <jdombroski@ctps.org> wrote:
> [redacted]
>
> Yes, the proposed improvements 'Intersection of Route 2 and ORNAC' blank address the crossing on RT 2 and the crossing on ORNAC, with the exception of the proposal for the median on RT 2.
>
> Best,
> Julie
>
> On Fri, Jun 30, 2023 at 9:44 AM [redacted] wrote:
> Before I weigh in, I want to be clear what is meant by crossings at "intersection of route 2 and ORNAC." You are talking about people crossing route 2 AND crossing ORNAC, both? [redacted] person [redacted] who takes walks on Old Marlboro Rd, my main worry is crossing ORNAC so close to route 2 speeders.
>
> [redacted]
>
> On Fri, Jun 30, 2023 at 9:20 AM Julie Dombroski <jdombroski@ctps.org> wrote:
> Good morning,
>
> Thank you for participating in the recent survey of the crossings at the intersections of Route 2 at Route 62/Main Street and Route 2 at Old Road to Nine Acre Corner (ORNAC) in Concord. We're reaching out today to gather additional thoughts on each crossing.
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> - Intersection of Route 2 and Route 62/Main Street
> - Extend the pedestrian phase (give people more time to cross the street)
> - Restripe crosswalks with zebra, continental, or ladder-style markings
> - 6' bike lane on RT 62/Main Street westbound
> - 4' bike lane on RT 62/Main Street eastbound
> - Intersection of Route 2 and Old Road to Nine Acre Corner (ORNAC)
> - Extend the pedestrian phase on each crossing (give people more time to cross the street)
> - Restrict right turns on red on the northbound and eastbound directions
> - Paint sharrow markings on ORNAC
> - Install 'Bicycle May Use Full Lane' signs on ORNAC approaching the intersection
> - Restripe crosswalks with zebra, continental, or ladder-style markings
> - Repair crumbling pavement on median on RT 2 and utilize flex posts to distinguish median from roadway and aid in visibility
>
> Thank you for taking the time to review these questions. If you have additional questions or would like to discuss this study or the survey further, please reach out to Julie Dombroski (jdombroski@ctps.org).
>
> Best,
>
> **Julie Dombroski** | she, her, hers
> **Transportation Planner**
> Central Transportation Planning Staff

Boston Region Metropolitan Planning Organization
857.702.3684 | jdombroski@ctps.org | www.bostonmpo.org

Please be advised that the Massachusetts Secretary of State considers e-mail to be a public record, and therefore subject to the Massachusetts Public Records Law, M.G.L. c. 66 § 10.

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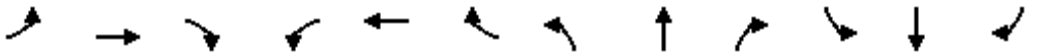
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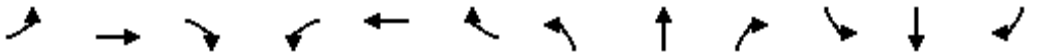
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Appendix C



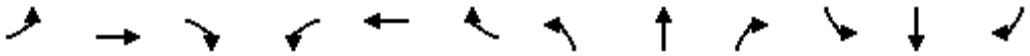
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	187	156	7	143	2	150	1400	36	50	1383	151
Future Volume (vph)	94	187	156	7	143	2	150	1400	36	50	1383	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	7.0		5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1563	1767	1859		1770	3524		1770	3539	1583
Flt Permitted	0.60	1.00	1.00	0.35	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1118	1863	1563	651	1859		1770	3524		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	203	170	8	155	2	163	1522	39	54	1503	164
RTOR Reduction (vph)	0	0	27	0	1	0	0	1	0	0	0	68
Lane Group Flow (vph)	102	203	143	8	156	0	163	1560	0	54	1503	96
Confl. Peds. (#/hr)			1	1					1			
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		8			4		1	6		5	2	2
Permitted Phases	8		1 8	4								
Actuated Green, G (s)	15.7	15.7	34.5	15.7	15.7		13.8	70.9		6.4	63.5	63.5
Effective Green, g (s)	15.7	15.7	34.5	15.7	15.7		13.8	70.9		6.4	63.5	63.5
Actuated g/C Ratio	0.14	0.14	0.31	0.14	0.14		0.13	0.64		0.06	0.58	0.58
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	2.0	2.0
Lane Grp Cap (vph)	159	265	490	92	265		222	2271		102	2042	913
v/s Ratio Prot		c0.11			0.08		c0.09	0.44		0.03	c0.42	0.06
v/s Ratio Perm	0.09		0.09	0.01								
v/c Ratio	0.64	0.77	0.29	0.09	0.59		0.73	0.69		0.53	0.74	0.11
Uniform Delay, d1	44.5	45.4	28.5	40.9	44.1		46.3	12.5		50.3	17.1	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.95	0.45	0.50
Incremental Delay, d2	6.5	11.3	0.3	0.1	2.2		11.9	1.7		2.6	1.3	0.1
Delay (s)	51.0	56.6	28.8	41.1	46.3		58.2	14.2		50.2	9.0	5.4
Level of Service	D	E	C	D	D		E	B		D	A	A
Approach Delay (s)		45.5			46.0			18.3			10.0	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	151	120	32	189	15	157	1459	34	33	1208	122
Future Volume (vph)	124	151	120	32	189	15	157	1459	34	33	1208	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	7.0		5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1563	1767	1843		1770	3525		1770	3539	1583
Flt Permitted	0.60	1.00	1.00	0.47	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1118	1863	1563	880	1843		1770	3525		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	164	130	35	205	16	171	1586	37	36	1313	133
RTOR Reduction (vph)	0	0	24	0	3	0	0	1	0	0	0	53
Lane Group Flow (vph)	135	164	106	35	218	0	171	1622	0	36	1313	80
Confl. Peds. (#/hr)			1	1					1			
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		8			4		1	6		5	2	2
Permitted Phases	8		1 8	4								
Actuated Green, G (s)	18.7	18.7	39.9	18.7	18.7		16.2	78.8		5.5	68.1	68.1
Effective Green, g (s)	18.7	18.7	39.9	18.7	18.7		16.2	78.8		5.5	68.1	68.1
Actuated g/C Ratio	0.16	0.16	0.33	0.16	0.16		0.13	0.66		0.05	0.57	0.57
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	2.0	2.0
Lane Grp Cap (vph)	174	290	519	137	287		238	2314		81	2008	898
v/s Ratio Prot		0.09			0.12		c0.10	c0.46		0.02	0.37	0.05
v/s Ratio Perm	c0.12		0.07	0.04								
v/c Ratio	0.78	0.57	0.20	0.26	0.76		0.72	0.70		0.44	0.65	0.09
Uniform Delay, d1	48.6	46.9	28.7	44.5	48.5		49.7	13.1		55.8	17.8	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.32	1.04	1.35
Incremental Delay, d2	17.7	1.5	0.2	0.4	10.2		9.9	1.8		2.8	1.2	0.1
Delay (s)	66.3	48.4	28.9	44.9	58.7		59.6	14.9		76.2	19.8	16.1
Level of Service	E	D	C	D	E		E	B		E	B	B
Approach Delay (s)		48.1			56.8			19.2			20.8	
Approach LOS		D			E			B			C	

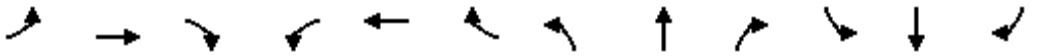
Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	347	334	2	160	15	241	1089	9	0	1339	13
Future Volume (vph)	5	347	334	2	160	15	241	1089	9	0	1339	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0		5.0	6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	1.00
Frt		1.00	0.85		0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)		1862	1583		1841		1770	3539	1583		3539	1583
Flt Permitted		1.00	1.00		0.93		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)		1856	1583		1720		1770	3539	1583		3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	377	363	2	174	16	262	1184	10	0	1455	14
RTOR Reduction (vph)	0	0	158	0	3	0	0	0	3	0	0	8
Lane Group Flow (vph)	0	382	205	0	189	0	262	1184	7	0	1455	6
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Prot		NA	Prot
Protected Phases		4			8		1	6	6		2	2
Permitted Phases	4		4	8								
Actuated Green, G (s)		24.8	24.8		24.8		18.8	74.2	74.2		50.4	50.4
Effective Green, g (s)		24.8	24.8		24.8		18.8	74.2	74.2		50.4	50.4
Actuated g/C Ratio		0.23	0.23		0.23		0.17	0.67	0.67		0.46	0.46
Clearance Time (s)		5.0	5.0		5.0		5.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0		3.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		418	356		387		302	2387	1067		1621	725
v/s Ratio Prot							c0.15	0.33	0.00		c0.41	0.00
v/s Ratio Perm		c0.21	0.13		0.11							
v/c Ratio		0.91	0.58		0.49		0.87	0.50	0.01		0.90	0.01
Uniform Delay, d1		41.6	37.9		37.1		44.4	8.8	5.9		27.4	16.2
Progression Factor		1.00	1.00		1.00		0.95	1.33	3.71		1.00	1.00
Incremental Delay, d2		23.7	1.4		0.4		21.2	0.5	0.0		8.3	0.0
Delay (s)		65.3	39.3		37.4		63.6	12.2	21.7		35.7	16.2
Level of Service		E	D		D		E	B	C		D	B
Approach Delay (s)		52.6			37.4			21.5			35.5	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

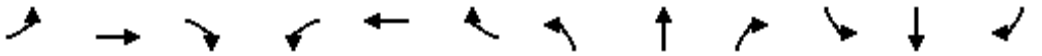


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	195	268	4	281	11	300	1381	13	0	1080	14
Future Volume (vph)	2	195	268	4	281	11	300	1381	13	0	1080	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0		5.0	6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	1.00
Frt		1.00	0.85		0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)		1862	1583		1852		1770	3539	1583		3539	1583
Flt Permitted		1.00	1.00		1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)		1859	1583		1848		1770	3539	1583		3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	212	291	4	305	12	326	1501	14	0	1174	15
RTOR Reduction (vph)	0	0	206	0	1	0	0	0	4	0	0	9
Lane Group Flow (vph)	0	214	85	0	320	0	326	1501	10	0	1174	6
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Prot		NA	Prot
Protected Phases		4			8		1	6	6		2	2
Permitted Phases	4		4	8								
Actuated Green, G (s)		24.0	24.0		24.0		34.2	87.0	87.0		47.8	47.8
Effective Green, g (s)		24.0	24.0		24.0		34.2	87.0	87.0		47.8	47.8
Actuated g/C Ratio		0.20	0.20		0.20		0.29	0.72	0.72		0.40	0.40
Clearance Time (s)		3.0	3.0		3.0		5.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0		3.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		371	316		369		504	2565	1147		1409	630
v/s Ratio Prot							c0.18	0.42	0.01		c0.33	0.00
v/s Ratio Perm		0.12	0.05		c0.17							
v/c Ratio		0.58	0.27		0.87		0.65	0.59	0.01		0.83	0.01
Uniform Delay, d1		43.4	40.6		46.5		37.6	7.9	4.6		32.5	21.8
Progression Factor		1.00	1.00		1.00		0.79	1.52	0.88		1.00	1.00
Incremental Delay, d2		1.4	0.2		18.3		4.9	0.8	0.0		5.9	0.0
Delay (s)		44.8	40.7		64.8		34.6	12.7	4.0		38.4	21.8
Level of Service		D	D		E		C	B	A		D	C
Approach Delay (s)		42.4			64.8			16.6			38.2	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

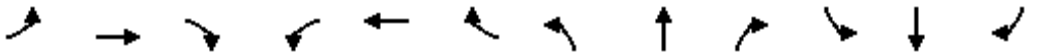
c Critical Lane Group

Appendix D



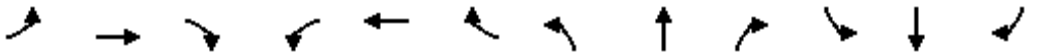
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	187	156	7	143	2	150	1400	36	50	1383	151
Future Volume (vph)	94	187	156	7	143	2	150	1400	36	50	1383	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	7.0		5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1563	1767	1859		1770	3524		1770	3539	1583
Flt Permitted	0.60	1.00	1.00	0.35	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1118	1863	1563	653	1859		1770	3524		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	203	170	8	155	2	163	1522	39	54	1503	164
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	102	203	170	8	156	0	163	1560	0	54	1503	164
Confl. Peds. (#/hr)			1	1					1			
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		1 8	4								2
Actuated Green, G (s)	17.3	17.3	37.7	17.3	17.3		15.4	75.3		7.4	67.3	67.3
Effective Green, g (s)	17.3	17.3	37.7	17.3	17.3		15.4	75.3		7.4	67.3	67.3
Actuated g/C Ratio	0.15	0.15	0.32	0.15	0.15		0.13	0.64		0.06	0.58	0.58
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	2.0	2.0
Lane Grp Cap (vph)	165	275	503	96	274		232	2268		111	2035	910
v/s Ratio Prot		c0.11			0.08		c0.09	0.44		0.03	c0.42	
v/s Ratio Perm	0.09		0.11	0.01								0.10
v/c Ratio	0.62	0.74	0.34	0.08	0.57		0.70	0.69		0.49	0.74	0.18
Uniform Delay, d1	46.8	47.7	30.2	43.0	46.4		48.6	13.3		53.0	18.4	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.8	8.6	0.4	0.1	1.6		9.3	1.7		3.3	2.4	0.4
Delay (s)	51.5	56.3	30.6	43.1	48.0		57.9	15.1		56.3	20.8	12.2
Level of Service	D	E	C	D	D		E	B		E	C	B
Approach Delay (s)		46.1			47.8			19.1			21.1	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	117.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	151	120	32	189	15	157	1459	34	33	1208	122
Future Volume (vph)	124	151	120	32	189	15	157	1459	34	33	1208	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	7.0		5.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1563	1768	1843		1770	3525		1770	3539	1583
Flt Permitted	0.60	1.00	1.00	0.47	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1118	1863	1563	884	1843		1770	3525		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	164	130	35	205	16	171	1586	37	36	1313	133
RTOR Reduction (vph)	0	0	0	0	3	0	0	1	0	0	0	0
Lane Group Flow (vph)	135	164	130	35	218	0	171	1622	0	36	1313	133
Confl. Peds. (#/hr)			1	1					1			
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		8			4		1	6		5	2	2
Permitted Phases	8		1 8	4								
Actuated Green, G (s)	19.1	19.1	40.4	19.1	19.1		16.3	79.4		5.5	68.6	68.6
Effective Green, g (s)	19.1	19.1	40.4	19.1	19.1		16.3	79.4		5.5	68.6	68.6
Actuated g/C Ratio	0.16	0.16	0.33	0.16	0.16		0.13	0.66		0.05	0.57	0.57
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	2.0	2.0
Lane Grp Cap (vph)	176	294	521	139	290		238	2313		80	2006	897
v/s Ratio Prot		0.09			0.12		c0.10	c0.46		0.02	0.37	0.08
v/s Ratio Perm	c0.12		0.08	0.04								
v/c Ratio	0.77	0.56	0.25	0.25	0.75		0.72	0.70		0.45	0.65	0.15
Uniform Delay, d1	48.8	47.1	29.3	44.7	48.7		50.2	13.2		56.3	18.0	12.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.3	1.3	0.3	0.3	9.4		9.9	1.8		4.0	1.7	0.3
Delay (s)	65.1	48.4	29.5	45.0	58.1		60.1	15.0		60.3	19.7	12.7
Level of Service	E	D	C	D	E		E	B		E	B	B
Approach Delay (s)		47.9			56.3			19.3			20.1	
Approach LOS		D			E			B			C	

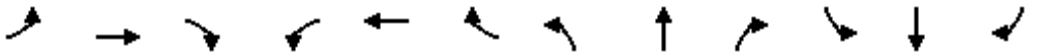
Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	347	334	2	160	15	241	1089	9	0	1339	13
Future Volume (vph)	5	347	334	2	160	15	241	1089	9	0	1339	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0		5.0	6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	1.00
Frt		1.00	0.85		0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)		1862	1583		1841		1770	3539	1583		3539	1583
Flt Permitted		1.00	1.00		0.95		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)		1856	1583		1742		1770	3539	1583		3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	377	363	2	174	16	262	1184	10	0	1455	14
RTOR Reduction (vph)	0	0	158	0	0	0	0	0	3	0	0	0
Lane Group Flow (vph)	0	382	205	0	192	0	262	1184	7	0	1455	14
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Prot		NA	Prot
Protected Phases		4			8		1	6	6		2	2
Permitted Phases	4		4	8								
Actuated Green, G (s)		25.3	25.3		25.3		19.2	74.7	74.7		50.5	50.5
Effective Green, g (s)		25.3	25.3		25.3		19.2	74.7	74.7		50.5	50.5
Actuated g/C Ratio		0.23	0.23		0.23		0.17	0.67	0.67		0.45	0.45
Clearance Time (s)		5.0	5.0		5.0		5.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0		3.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		423	360		397		306	2381	1065		1610	720
v/s Ratio Prot							c0.15	0.33	0.00		c0.41	0.01
v/s Ratio Perm		c0.21	0.13		0.11							
v/c Ratio		0.90	0.57		0.48		0.86	0.50	0.01		0.90	0.02
Uniform Delay, d1		41.7	38.0		37.2		44.6	8.9	6.0		28.0	16.6
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		21.7	1.4		0.3		25.2	0.7	0.0		8.7	0.0
Delay (s)		63.4	39.4		37.5		69.8	9.7	6.0		36.7	16.7
Level of Service		E	D		D		E	A	A		D	B
Approach Delay (s)		51.7			37.5			20.5			36.5	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	195	268	4	281	11	300	1381	13	0	1080	14
Future Volume (vph)	2	195	268	4	281	11	300	1381	13	0	1080	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0		5.0	6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	1.00
Frt		1.00	0.85		0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)		1862	1583		1852		1770	3539	1583		3539	1583
Flt Permitted		1.00	1.00		1.00		0.95	1.00	1.00		1.00	1.00
Satd. Flow (perm)		1859	1583		1848		1770	3539	1583		3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	212	291	4	305	12	326	1501	14	0	1174	15
RTOR Reduction (vph)	0	0	206	0	0	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	214	85	0	321	0	326	1501	10	0	1174	15
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA	Prot		NA	Prot
Protected Phases		4			8		1	6	6		2	2
Permitted Phases	4		4	8								
Actuated Green, G (s)		24.5	24.5		24.5		35.2	88.5	88.5		48.3	48.3
Effective Green, g (s)		24.5	24.5		24.5		35.2	88.5	88.5		48.3	48.3
Actuated g/C Ratio		0.20	0.20		0.20		0.29	0.73	0.73		0.40	0.40
Clearance Time (s)		3.0	3.0		3.0		5.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0		3.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		373	317		371		510	2567	1148		1401	626
v/s Ratio Prot							c0.18	0.42	0.01		c0.33	0.01
v/s Ratio Perm		0.12	0.05		c0.17							
v/c Ratio		0.57	0.27		0.87		0.64	0.58	0.01		0.84	0.02
Uniform Delay, d1		44.0	41.2		47.2		37.9	8.0	4.6		33.3	22.5
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		1.3	0.2		18.0		6.0	1.0	0.0		6.1	0.1
Delay (s)		45.4	41.3		65.1		43.9	9.0	4.6		39.4	22.5
Level of Service		D	D		E		D	A	A		D	C
Approach Delay (s)		43.0			65.1			15.1			39.2	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	122.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix E

Julie Dombroski <jdombroski@ctps.org>

CTPS Concord RT 2 Crossings Study Feedback

Timoner, Sara (DOT) <Sara.Timoner@dot.state.ma.us> Tue, Aug 15, 2023 at 11:34 AM
To: Julie Dombroski <jdombroski@ctps.org>
Cc: "Gregg, John E. (DOT)" <John.Gregg@dot.state.ma.us>

Hi Julie,

Here are the comments on the study:

Page 4

Page	Location	Comment
4/26	2 at ORNAC	Please re-check field conditions at intersection. All pedestrian buttons at this location are currently ADA accessible. The pedestrian crossing phasing at this intersection was recently updated and a pre-empt was installed which prioritizes pedestrian calls across Route 2.
10	2 at 62	Provide observed speeds on Route 62 and ORNAC in existing conditions narrative.
12/13	All	As the purpose of this effort was to document pedestrian safety, pedestrian counts should be provided in the report. Show pedestrian counts on Figures 6 and 7.
12/13	All	Weekday evening peak hours generally occur between 4-6pm, however the study is showing the evening peak hour starting at 2:30/2:45pm. Why is the evening peak hour so early? Please provide raw traffic counts in the appendix and double check peak hour of roadway.
14	All	Show V/C ratio in capacity analysis summary table.
15	2 at 62	Provide pedestrian clearance calculations to support recommended pedestrian time extension.
15	2 at 62	Flex posts are not recommended on high speed roads such as Route 2 due to maintenance concerns.
15	2 at 62	All proposed mitigation shall be MUTCD compliant. (Figures 8/9)
16	Figure 8	Relabel “Zebra striped’ pavement is to ‘hatched gore’.
16	All	Buffers should be considered for all bike lanes proposed on high speed/high volume roadways to provide safe passage for bicycles.
19	2 at ORNAC	Backplates with retroreflective boarders exist at this signal and can be seen in the photo on page 6 of this report.
19	2 at ORNAC	Provide pedestrian clearance calculations to support recommended pedestrian time extension.
26		Include the name of the intersection which need pedestrian signal indicators replaced in last bullet.

Let me know if you have any questions.

Thank you,

[Quoted text hidden]