Somerset County Roadway Safety Study
Subregional Project

ROAD SAFETY AUDIT REPORT

MAIN STREET/FINDERNE AVENUE IN BRIDGEWATER TOWNSHIP

NJTPA

SOMERSET COUNTY

November 2021

Executive Summary

As part of the North Jersey Transportation Planning Authority (NJTPA)'s subregional studies grant program, Somerset County (the County) has conducted the Somerset County Roadway Corridor Safety Analysis study. The study will advance the County's efforts to address pedestrian, bicycle, and intersection safety. Five (5) County roadway corridors have been selected to go through a comprehensive safety analysis following the Federal Highway Administration's Road Safety Audit (RSA) process to identify vehicle, pedestrian, and bicyclist safety issues and to develop safety improvement recommendations. This RSA report has been prepared for the Main Street/Finderne Avenue corridor (Somerset County Route 533, CR 533), from 100' north of the South Avenue intersection at MP 29.60 to the Chimney Rock Road intersection at MP 30.60, in Bridgewater Township. According to the compiled crash data, 201 crashes occurred on the 1-mile segment analysis area during the 3-year vehicle and 5-year pedestrian crash analysis period.

The pre-audit meeting was held at 10:00 AM via video conferencing on Tuesday, April 6th, 2021, on the morning of the in-field review meeting to introduce the audit team, cover the activities to complete the RSA, define the RSA process, cover existing conditions data, present safety measures under consideration, summarize crash data collected for the corridor, and go over ground rules for conducting the in-field portion of the audit safely. The in-field component of the RSA was conducted at 2:00 PM on the same day as the pre-audit meeting. Participants were paired off with each other to walk halves of the corridor. Utilizing aerial mapping, prompt lists, photography, and video, participants recorded their observations of the corridor, as well as safety measures to address potential safety concerns. On the following day (Wednesday, April 7th, 2021), the RSA team reconvened via video conferencing to view photos gathered during the in-field audit to discuss each potential safety concern, elaborate on potential ideas to mitigate, cover questions on travel pertaining to the overall corridor, and summarize next steps for this study.

Discussions from the RSA process helped to form the basis of the Implementation Matrix in the **Identified Issues & Observations** section of this report, which serves as a record of items discussed during the post-audit meeting. Major findings (or recommendations) from these discussions included:

- Turning prohibitions on Finderne Avenue to address sight distance issues and cut-through traffic;
- Ideas (striping/signing/signalization) to facilitate ped/bike crossings at north/south of bridge location;
- Signal modifications at Main Street & Finderne Avenue to improve ped/bike/left turn safety;
- Cycling route connections/speed humps within the neighborhood SE of Main Street & Finderne Avenue;
- Diverter island at Main Street & Fulton Avenue to preclude left turn movements within queued area;
- New sidewalks on north side of Main Street to define pedestrian walking areas; and,
- LPIs/countdown signals at Main Street intersections with Ramsey/Pearl Streets and Chimney Rock Road.

A key recommendation from this RSA was to investigate the feasibility of a road diet on Main Street from Finderne Avenue to Chimney Rock Road, possibly extending eastward beyond the RSA study area. Redesigning Main Street to accommodate a road diet would result in significant safety and mobility improvements for those who use the corridor via active modes of travel. Since Main Street has an AADT of 21,000, thorough intersection-by-intersection capacity analysis, design, administrative approval, and public vetting is needed to ensure the efficacy and success of the road diet. Main Street has a cartway width of 46' to 48' and could potentially accommodate one 11' travel lane, 5' bike lane, and 2' buffer in each direction of travel with a center two-way left turn lane.

Please note that recommendations cited in the Implementation Matrix are to reflect feedback received during the RSA process and are meant to be a record of ideas discussed. As these recommendations are considered for advancement into either a Concept Development (CD) study, or incorporation into an overlapping County or municipal project, the recommendations herein should be thoroughly evaluated for feasibility and practicability and designed as appropriate by the roadway owner and/or a professional engineer for conformance to all applicable codes, standards, and best practices.

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I. Introduction

As part of the North Jersey Transportation Planning Authority (NJTPA)'s subregional studies grant program, Somerset County (the County) has conducted the Somerset County Roadway Corridor Safety Analysis study. The study will advance the County's efforts to address pedestrian/bicycle and intersection safety. Five (5) County roadway corridors have been selected to go through a comprehensive safety analysis following the Federal Highway Administration's Road Safety Audit (RSA) process to identify vehicle, pedestrian, and bicyclist safety issues and to develop safety improvement recommendations. One of the locations that have been selected is the Main Street/Finderne Avenue corridor (Somerset County Route 533, CR 533), from 100' north of the South Avenue intersection at MP 29.60 to the Chimney Rock Road intersection at MP 30.60, in Bridgewater Township.

The purpose of this RSA Report is to detail the site selection, road/multimodal inventory, land use investigation, crash data collection, crash analysis efforts, post/pre-audit meetings, and in-field RSA investigation conducted for the Main Street/Finderne Avenue corridor. Flowing from this RSA is a list of potential recommendations proposed to improve safety. These recommendations were based on the investigated crash data, as well as recommendations made during the in-field RSA and post-audit meeting. This introduction serves to provide background on selection of the investigated corridor and covers the logistics of the RSA process that was performed. This RSA report also seeks to provide sample figures of improvements and crash countermeasures that could be considered as the County, or municipality, seeks to move forward on its Concept Development (CD) and/or Local Safety Program grant (or other funding) application. Please note, in applying these ideas to the corridor, design of such improvements, conceptual or otherwise, is the responsibility of the designated jurisdiction as is standard RSA practice.

A. Site Selection

Selection of the Main Street/Finderne Avenue corridor was based on a rigorous process which started with a list of top crash segments for the County from NJTPA's Network Screening Lists (NSL)[1] and used supporting collision data, equity data, recommendations from prior studies, and public/stakeholder input to develop a shortlist of top crash segments. Segments with recently constructed safety improvements or locations undergoing study/design were identified through discussions with County Engineering and removed from this shortlist to target segments not currently being considered. The remaining locations were further prioritized and ranked with more recent crash severity and frequency data (old crash data from NSL superseded with more recent crash data from Safety Voyager), traffic volume data from NJTPA's regional travel demand model (NJRTM-E), and environmental justice data from NJTPA.

Input on these top crash locations was obtained through the Public Involvement Plan for this project, which included gathering information from the public via a virtual mapping tool and project email address and gathering information from a Technical Advisory Committee (TAC)[2] via an initial virtual meeting conducted in August 2020. Based upon public and stakeholder input, the following (5) segment locations (including the segment being studied in this report) were selected to be advanced for RSA review:

1. Finderne Avenue/Main Street (CR 533) in Bridgewater Township, MP 29.60-30.60
2. Franklin Boulevard (CR 617) in Franklin Township, MP 0.00-1.00
3. Somerset Street (CR 626) in Raritan Borough, MP 0.00-0.67
4. Greenbrook Road (CR 636) in North Plainfield Borough, MP 0.70-1.97
5. Main Street (CR 533) in Millstone Borough, MP 25.14-25.87

[1] https://www.njtpa.org/Projects-Programs/Local-Programs/Local-Safety-Rural-Roads/Local-Safety-Program/Network-Screening-Lists.aspx Top crash segment lists on this webpage are based upon a programmatic analysis of statewide locations utilizing 2014-2018 crash data.
[2] Stakeholders on the TAC include NJDOT, NJ TRANSIT, FHWA, RideWise, AARP, Vorhees Transportation Center, and various County advocates.

Main Street/Finderne Avenue was selected based on the relatively high crash frequency on this corridor and recommendations from previous studies. This corridor was identified within the *WalkBikeHike* (2019) and *Regional Center Pedestrian, Bicycle and Greenways Systems Connection Plan* (2009) studies as in need of improved facilities for pedestrian and cyclist connectivity, with bike lanes proposed on Main Street in both studies. **Table 1** shows the portions of the selected segment, or intersections, that qualified as one of the top 100 crash locations[1] in the County based on either overall crash data for the years of 2016 through 2018 or pedestrian/cyclist crash data for the years of 2014 through 2018 as listed on the NSLs.

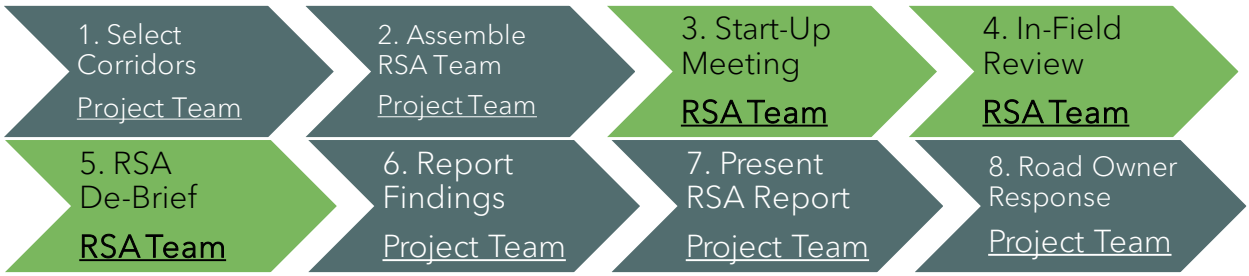
Table 1 – Main Street/Finderne Avenue NJTPA 2019 NSL Rankings for Somerset County

Corridor Segments Overall Crash Data	Corridor Segments Ped/Bike Crash Data	Intersection Locations Overall Crash Data	Intersection Locations Ped/Bike Crash Data
#4 MP 29.27-30.27	#18 MP 29.6-30.6	Main/Finderne (#1)	Main/Finderne (#11)
		Chimney Rock Road (#77)	Bridgewater Avenue (#72-tie)
			Fulton Avenue (#72-tie)

B. What is a Road Safety Audit (RSA)?

An RSA is a formal safety performance examination of an existing or future road or intersection by a multi-disciplinary audit team, including public works, law enforcement, emergency medical services, engineering, and planning. It qualitatively estimates and reports on existing and potential road safety issues and identifies opportunities for improvements in safety for all road users. RSAs can be used on any size project, from minor maintenance to mega-projects, and can be conducted on facilities with a history of crashes or during the design phase of a new roadway or planned upgrade. RSAs consider all road users, account for human factors and road user capabilities, are documented in a formal report, and require a formal response from the road owner. **Figure 1** shows the steps employed by the County to complete the RSA, as informed by the Federal Highway Administration's (FHWA's) RSA process. The steps that traditionally consist of an in-field review of conditions with an RSA team are highlighted in green in Figure 1.

Figure 1 – Eight-Step RSA Process as Adopted from FHWA RSA Process



The RSA program is conducted to identify potential countermeasures for roadway segments demonstrating a history of, or potential for, a high frequency of crashes or an identifiable pattern of crash types. Recommendations range from low-cost, quick-turnaround safety improvements to more complex strategies, which are all codified in this report within an Implementation Matrix, categorizing improvements by timeline, cost, and jurisdiction. Implementation of improvement strategies identified through this process may be eligible for Local Federal Aid Safety Funds. Because the RSA process is adaptable to local needs and conditions, recommendations can be implemented incrementally as time and resources permit. Please note that the RSA process does not include the design or thorough evaluation of improvements that are being considered, conceptual or otherwise. Following the eighth and final step of the RSA process, it will be incumbent for the designated jurisdiction to start to evaluate and design the potential improvements presented herein, as is standard RSA practice.

At the request of NJTPA, RSAs originally planned for Fall 2020 were postponed until Spring 2021, due to the COVID-19 pandemic. In addition to postponement, the County took additional steps to safely conduct this RSA. Both the start-up meeting and RSA de-brief (steps #3 and #5 shown in **Figure 1**), which are traditionally conducted in-person, were conducted virtually via video conferencing to reduce the exposure and potential risk of disease transmission. Furthermore, the essential step of in-field review was conducted in a socially distanced manner with participants paired off in groups spaced more than six feet apart from each other. All in-field RSA participants were masked for the entire duration of the field visit to further reduce the risk of disease transmission. Through this process, the post-audit "de-brief" meeting benefitted from being held virtually after the day on which the in-field review was conducted.

Some notable benefits produced by a virtual post-audit included:

- Additional time for participants to share photos, videos, and scans of their observations;
- Available screensharing for quick review and consensus of RSA observations;
- An involved discussion of the observations and recommendations was well established by the wide audience of stakeholders;
- Additional time for participants to process their observations and organize their thoughts for discussion.

II. Corridor Description & Analysis

A. Study Location

The study area consists of one mile of CR 533 (Main Street/Finderne Avenue) extending from 100' north of the South Avenue intersection at MP 29.60 to the Chimney Rock Road intersection at MP 30.60 (Figure 2). A straight-line diagram of the corridor is provided in **Appendix A**. The identified segment is in the Township of Bridgewater in the County of Somerset. The corridor includes varied land use types, including industrial/manufacturing, single-family detached residential, multi-family attached residential, and commercial neighborhood business. Industrial uses are located at both ends of the corridor with buildings used for storage, medical research and development, warehousing/distributing, and auto repair. The residential neighborhood southeast of the Main Street & Finderne Avenue intersection is comprised of multi-family and single-family housing, while other housing along the corridor is generally comprised of single-family. Land adjacent to the intersection of Main Street & Finderne Avenue intersection, and land on the north side of Main Street, is zoned as a neighborhood business, which includes strip malls, medical offices, and gas stations, but can also include single-family and multi-family buildings repurposed for commercial use. Institutional uses on the corridor include the Finderne Fire Department, which has signal pre-emption for fire calls, and the Somerset County Transportation Office, where the County's transit vehicles are parked and maintained.

Figure 2 – Study Area Location Map

Major vehicle and pedestrian trip generators on the study corridor include the Bridgewater Corporate Campus and the Somerset County Educational Services Commission on the southern end of the corridor, the retail center on the northeast quadrant of the Main Street & Finderne Avenue intersection, and the County Public Works Facility/ Transportation Office on the eastern end of the corridor.

B. Roadway and Intersection Characteristics

Main Street is classified by NJDOT (the New Jersey Department of Transportation) as an urban minor arterial and has a posted speed of 40 mph, which transitions to 45 mph beyond either end of the corridor. The corridor consists of two 11'-12' travel lanes (two in each direction) undivided. No parking or shoulders are provided on the corridor. There are three signalized and 13 unsignalized intersections along the corridor. The cartway for the corridor widens at the intersection of Main Street & Finderne Avenue to provide northbound and westbound left-turn bays.

C. *Existing Bicycle/Pedestrian Accommodations*

Sidewalks are provided on the south side of Main Street and the west side of Finderne Avenue and provide sidewalk connectivity from one end of the corridor to the other. Sidewalks are provided on both sides of the road between Second Street and Pearl Street. Worn paths have been noted to exist where gaps in the sidewalk are present on one side of the road. Sidewalks consist of concrete and bituminous asphalt paving. Curb cuts for commercial driveway locations, particularly those closer to the intersection of Main Street & Finderne Avenue are generally wide, which can increase pedestrian exposure and risk to vehicular crashes.

D. *Traffic Volumes*

According to traffic data available from NJDOT[3] count station #091816, Average Annual Daily Traffic (AADT) on Main Street is approximately 20,000 vehicles per day. Supporting count data from NJDOT is provided in **Appendix B**. NJTPA's NJRTM-E travel demand model provides an AADT estimate of 21,000 based upon 2020 pre-COVID-19 conditions.

E. *Transit Service*

There are no transit services on this section of Main Street/Finderne Avenue. The NJ TRANSIT Bridgewater Train Station with Raritan Valley Line service is approximately one mile east of the study corridor. The County, however, operates several SCOOT bus lines on the corridor, which include (as of Winter 2020):

- SCOOT PEAK (Hillsborough to Bedminster) – Also known as Bus Routes 858, 859, and 860, these bus lines serve the same route, for the most part, traveling through Manville, Somerville, and Bridgewater. The bus stop at Main Street & Finderne Avenue is served during weekday AM and PM peak periods with varying headways of approximately one hour. These routes travel on Finderne Avenue south of the intersection and Main Street west of the intersection.
- CAT-1R (Branchburg to New Brunswick) – This bus line has listed stops in Branchburg (Raritan Valley Community College), Somerville, Bound Brook, South Bound Brook, Franklin, and New Brunswick. Buses also travel on Main Street through the study area with no listed stops; however, the bus schedule for this line says that route deviation is available. Weekday service is provided during AM, afternoon, and PM peak times with headways of one to two hours.
- R1 (Bound Brook to Somerville) – This bus line serves Bound Brook, Bridgewater, Hillsborough, Manville, and Somerville. The bus stop at Main Street & Finderne Avenue is served during late morning and afternoon periods with varying headways of approximately two hours. This route travels on Finderne Avenue south of the intersection and Main Street east of the intersection.
- R2 (Bound Brook to Somerville) – This bus line serves destinations similar to R1. The bus stop at Main Street & Finderne Avenue is served during the morning and early afternoon periods with varying headways of approximately one to two hours. This route travels on Finderne Avenue south of the intersection and Main Street east of the intersection.
- Inbound (far side) and outbound (near side) bus stops are signed on Main Street 200' east of Finderne Avenue, which are able to serve CAT-1R, R1, and R2 bus services. Since SCOOT PEAK turns west of the intersection, buses might be boarding and alighting at unsigned locations.

F. *Community Profile*

Population and income characteristics from the American Community Survey (ACS), an update to the 2010 Census performed by the U.S. Census Bureau, were used to identify Environmental Justice populations. The latest ACS for this study area is a five-year estimate from 2015 through 2019 for County Census Tract 510. A summary of the demographics is listed in

Table 2. Study area demographics show that there are fewer zero vehicle households and fewer people commuting to work via transit than the County average despite the available nearby transit options.

[3] AADT data obtained from https://www.njtms.org/map/.

Table 2 – Main Street/Finderne Avenue RSA Study Area Demographics

Characteristic		Census Tract Average	County Average
Below Poverty Level[4]		4.0%	5.1%
Race/ Ethnicity[5]	White	66.0%	66.3%
	Asian American	20.3%	17.7%
	Black or African American	5.6%	9.7%
	American Indian/Alaskan	0.0%	0.3%
	Other	8.1%	6.0%
	Hispanic/Latino (Ethnicity)	21.0%	14.7%
Limited English Proficiency (LEP)[6]		7.5%	4.4%
Use Public Transportation[7]		2.5%	5.3%
Zero Vehicle Households[7]		1.6%	2.1%

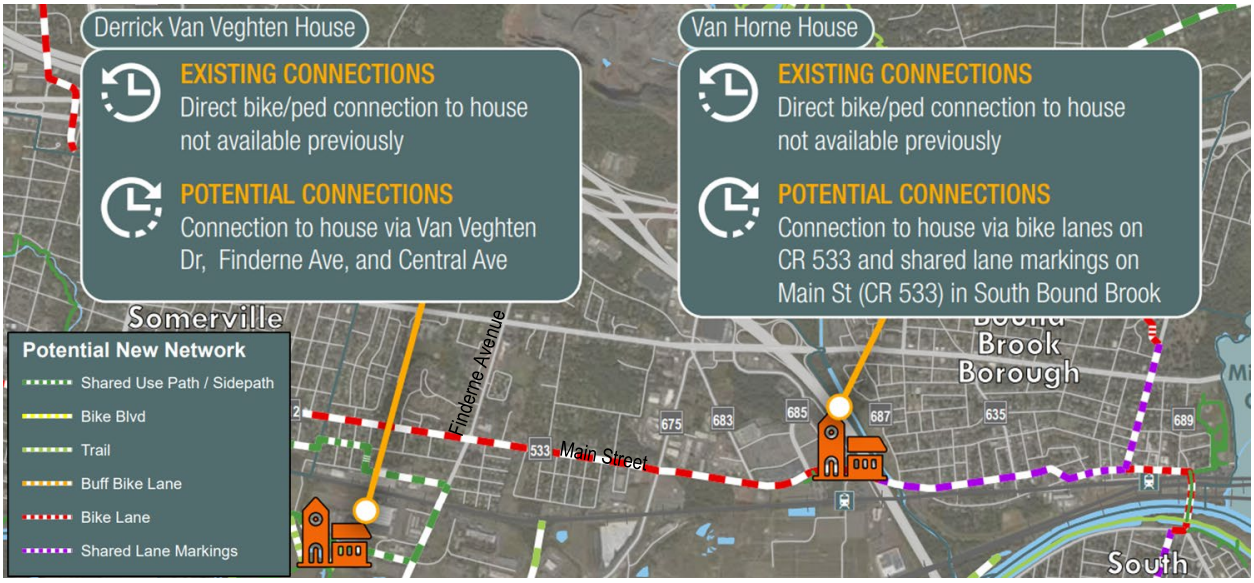
G. Redevelopment

This corridor was identified within the *WalkBikeHike* (2019) and *Regional Center Pedestrian, Bicycle and Greenways Systems Connection Plan* (2009) planning studies as in need of improved facilities for pedestrian and cyclist connectivity, with bike lanes proposed on Main Street in both studies. A shared-use sidewalk had also been proposed to run along Finderne Avenue in the *WalkBikeHike* study. In addition to improving access to nearby historical sites, as shown in **Figure 3**, these mobility improvements could spur local redevelopment and economic growth. Redevelopment applications on the study segment have mainly consisted of minor subdivisions, lot line adjustments, changes to uses, gas station upgrades, and changes to parking. The following significant applications are currently pending approval and/or construction according to data delivered by County Planning:

- *K9 Resorts Day Care & Luxury Hotel Bridgewater* – Currently under construction at 600 East Main Street just to the west of the Main Street & Finderne Avenue intersection is a one-story building that will be a daycare/hotel for pets.
- *7-11* – Multiple applications have been submitted to construct a 3,000 SF convenience store at both the southwest and northeast corners of the intersection of Main Street & Finderne Avenue.
- *Eden Wood Realty* – A formal site application has been submitted to redevelop the former Weyerhauser property located south of Main Street, located along Radel Avenue, as a 220-unit one- and two-bedroom non-age-restricted apartment complex with various amenities. Existing parking and paving would make way for a new building and a 464-space parking lot.

[4] 2019: ACS 5-Year Estimates Data Profiles, TableID S1701, "Poverty Status in the Last 12 Months"
[5] 2019: ACS 5-Year Estimates Data Profiles, TableID DP05, "ACS Demographic and Housing Estimates"
[6] 2019: ACS 5-Year Estimates Data Profiles, TableID S1602, "Limited English-Speaking Households"
[7] 2019: ACS 5-Year Estimates Data Profiles, TableID S0802, "Means of Transportation to Work by Selected Characteristics"

Figure 3 – Multimodal Recommendations from WalkBikeHike Study



H. Proposed Improvements from Previous Studies

Previously proposed transportation improvements on or near the Main Street/Finderne Avenue corridor include the following from the *WalkBikeHike* (2019) and *Regional Center Pedestrian, Bicycle and Greenways Systems Connection Plan* (2009) studies:

- Implement a road diet along Main Street to provide adequate shoulders/width for bike lanes;
- Complete sidewalk connectivity on Main Street corridor;
- Add new crosswalk striping and refresh existing crosswalk striping, where applicable;
- Standardize curb ramps to appropriate grades, widths, and tactile surface with truncated domes;
- Reconstruct railroad/highway grade crossing at Main Street & Chimney Rock Road intersection
- Decrease 40 mph speed limit; and,
- Construct shared-use sidewalk on Finderne Avenue from Central Avenue southward.

Pertinent excerpts from these studies, and associated improvements, are provided in **Appendix C**.

I. Public Meeting #1

On Thursday, November 12, 2020, the first public meeting for this project was held via Zoom conferencing to obtain feedback for the five locations selected for RSA review. Email blasts, advertisements, and social media notifications were provided in advance of the meeting. This meeting introduced the project team, who provided an overview of the study, stating the purpose and need. Statistics of crashes on County jurisdiction roadways were reviewed, showing a steady increase of crashes over the past ten years. The Consultant Team explained the RSA process and the technical analysis used in the development of the shortlist of corridors. Due to the pandemic, virtual, or socially distanced options for conducting the RSA process were discussed.

The Consultant Team then explained the study's Public Involvement Plan (PIP), an iterative process designed to collect feedback and input. The opportunities to collaborate on the PIP were virtual, including public meetings and comments received through the project website and project email. The Consultant Team then explained the process of selecting the five corridors. The selection process was based on County roadway screenings for top crash locations, and evaluation of equity data. Moreover, a virtual mapping tool was employed to gather Public/stakeholder input obtained from the initial virtual mapping outreach conducted in Fall 2020. The virtual mapping tool allowed users to pin comments on areas of concern on a virtual map.

As part of the PIP, the public meeting included an opportunity to hear from attendees on comments specific to each corridor selected for RSA review by splitting the overall meeting into breakout rooms. The group in the Main Street/Finderne Avenue breakout room discussed various concerns and suggestions regarding pedestrian and cyclist safety and connectivity. Comments received were as follows:

- Traffic volumes are very high, particularly truck traffic. There was a suggestion to limit truck travel.
- The pedestrian environment at the Main Street & Finderne Avenue intersection feels unsafe. Pedestrians do not have enough crossing time.
- Speeding, evasive maneuvers, and running through red lights are driving behaviors that have been observed on Main Street from Chimney Rock Road to Adamsville Road. Enforcement seems to be lacking at this location.
- The intersection of Ramsey Street & Main Street often has near misses for turning vehicles for residents turning out of the neighborhood to the south. A participant was in a crash at this location.
- There is not enough lighting to see pedestrians and cyclists. Cyclists tend to share the right lane with vehicles on the corridor.
- Turning on to Main Street from driveways and side streets is a common issue because there are not enough gaps in traffic to safely turn, particularly near shopping areas. The County Public Works Facility is another challenging location to turn out onto Main Street.
- Suggestion to explore connecting the County Public Works Facility to Polhemus Lane where there is signalized control.
- Ponding on the corridor has been observed during periods of heavy rain. Participants suggested that it would be worthwhile to explore green infrastructure to address ponding.
- The lack of street trees on Finderne Avenue was raised by community members.
- There is an expectation that the baseball stadium to the east of the study area will generate more traffic in the future. The stadium lights may also create visibility challenges for drivers.
- The corridor has a lot of driveway curb cuts to which participants requested better driveway and access management.
- The Bridgewater train station attracts significant commuter traffic, and people use surrounding streets (e.g., Pearl Street) as cut-throughs. Speeding is common on these streets. The neighborhood southeast of the intersection of Main Street & Finderne Avenue sees a particularly high amount of cut-through traffic despite signing that would discourage such activity.
- People often pass school buses and emergency vehicles, even when their lights are flashing.

J. Technical Advisory Committee Meeting #2

Following an August 2020 meeting with the TAC (Technical Advisory Committee) to select the five corridor locations for further review, the County held the second TAC meeting in February 2021. This meeting consisted of a 45-minute presentation followed by interactive breakout rooms with discussion centered around the corridors selected for further review. The presentation included the following topics: project background, summary of selected corridors, description of potential safety measures, and a discussion of demonstration projects.

A breakout room was dedicated solely to the discussion of potential safety measures to be implemented in response to potential issues on the Main Street/Finderne Avenue corridor in Bridgewater Township. Participants were asked to review the ten safety measures discussed during the presentation. They were then asked to rate the effectiveness and ease of implementation of each safety measure based on their own opinion/perspective. Participants were also asked to identify specific areas within each corridor that were areas of concern.

Table 3 contains a summary of those ratings and discussions for each safety measure, along with additional comments made toward each safety measure.

Table 3 – Perceived Effectiveness and Ease of Implementation for Various Safety Measures

Safety Measure	Effectiveness (1 = not effective; 10 = very effective)	Ease of Implementation (1 = easy; 10 = hard)
Lighting	10	8
Curb Extensions/Bus Bulbs	4	8
Daylighting[8] and Crosswalks	10	0
Walkways for Sidewalk Gaps	10	8
Dedicated Turn Lanes	8	8
Leading Pedestrian Intervals (LPI)	10	1
High Visibility Crosswalks	10	1
Turn Restrictions	8	5
Bike Lanes	8	2
Lane Width Reduction/Road Diet	10	2

Breakout Group Additional Comments:

- Lighting:
  - Crashes occurring at night; may be matters of spacing of lighting overhead.
  - Pedestrian scale lighting important, but also important near residential areas.
- Curb Extensions/ Bus Bulbs:
  - Curb extension and bus bulb design to be investigated at Finderne Avenue & Main Street intersection.
  - Existing curb radii at Finderne Avenue & Main Street should be enlarged to accommodate trucks.
- Daylighting and Crosswalks:
  - Crosswalks should be lit at all crossing locations, keep utilities in mind.
- Walkways for Sidewalk Gaps:
  - Access management for sidewalks is a top priority. One possibility could be potential easements that take away driveways and/or consolidate driveways.
  - There were maintenance concerns with regards to sidewalks.
- Dedicated Turn Lanes:
  - The Chimney Rock Road intersection has left turn conflict issues, substantiating a need for eastbound and westbound dedicated left turn lanes. There was no push back when considering center turn lanes as part of a road diet on Main Street. However, capacity reduction was a concern.
  - Could also consider a roundabout at Chimney Rock Road & Main Street, depending on available right-of-way.
- Leading Pedestrian Intervals (LPI):
  - LPIs at Finderne Avenue & Main Street intersection could reduce pedestrian crashes, should phasing permit implementation. There needs to be a public education component if LPIs are implemented.
- High Visibility Crosswalks:
  - There are no high visibility crosswalks; this is a good opportunity for placemaking.
  - Such crosswalks would be effective at Finderne Avenue & Main Street, especially for pedestrians.

[8] Daylighting is the act of restricting parked or standing vehicles through striping or curbing to improve sight distance at crosswalks or intersections.

- Bike Lanes:
  - If there is room on the road for bike lanes, participants would be supportive.
  - Biking and truck traffic between Bound Brook, Manville, and Somerville Boroughs is a concern.

- Lane Width Reduction/Road Diet:
  - Lane width reductions were suggested as a possible demonstration project. Participants agreed that lane width reductions are appropriate in this area to reduce speeds.
- Additional Comments:
  - Other safety improvements included backplates at signals to improve nighttime visibility.
  - The park on the northwest corner of Finderne Avenue & Main Street used for public art installations.

K. Technical Advisory Committee Meeting #3

Following the RSAs in Spring 2021 and authoring of the draft RSA reports and accompanying recommendations soon thereafter, the County held the third and final TAC meeting for the study in August 2021. The virtual meeting format consisted of a 45-minute presentation with interactive breakout rooms. The presentation included the following topics: project background, project status, identification of needs, and proposed safety measures by corridor.

The meeting was then divided into five breakout rooms, one for each of the selected corridors. Each breakout room discussed a specific set of recommendations pertaining to that corridor. Participants were asked to provide their general reactions to the proposed recommendations and whether they would accomplish the goals of the study. Potential barriers or other ways to accomplish study goals were also discussed. The topic of discussion for the breakout room specific to the Bridgewater Township RSA was the road diet proposed for the Main Street corridor, between Finderne Avenue and Chimney Rock Road. Provided below is participant feedback received on this specific proposed safety measure:

- The County would need to consider improving capacity on parallel routes (such as Route 28) before reducing the capacity of Main Street with a road diet.
- There are fewer pedestrians on the Main Street corridor itself, but the road diet may encourage additional traffic. Significant bike activity has been observed along the corridor, but most commonly near Harry Ally Park.
- Fast moving traffic is common on Main Street, which can make turning in and out of various businesses and cross streets difficult. Left turns leave drivers feel particularly exposed, which may be helped with the addition of a two-way left-turn lane.
- A benefit of the road diet is that drivers would be crossing fewer lanes to take turns out of the cross streets. Main Street west of Finderne Avenue has less volume, so there would be even more of a potential for a road diet. Main Street east of Finderne Avenue needs further study.
- Signage and green paint were recommended by a participant for proposed bike infrastructure to align with NACTO recommendations. The participant also requested if bike lanes could be made wider to accommodate buffers. It should be noted that existing bike lanes striped by the County do not include green paint.

Additional comments were received during the breakout room (not pertaining to the road diet):

- The most notable crash cluster for the study area involves vehicles turning left on Finderne Avenue northbound on toward Somerville. The safety recommendation is to provide protected left-turn phasing through signal redesign. The project team needs to confirm that this works.
- It was requested that crossing times at the Main Street & Finderne Avenue intersection should be extended for pedestrians. New pedestrian signal heads and ADA curb ramps at this intersection

(and along the corridor) would further improve pedestrian safety. A full reconstruction of the intersection may be required.
- There is overgrowth on the bridge heading to Manville.

L. Public Meeting #2

On Wednesday, September 29, 2021, from 7:00 PM to 9:00 PM, Somerset County held the second and final public meeting for the study. The virtual meeting format consisted of a 45-minute presentation touching on the following topics: project background, project status, identification of needs, and proposed safety measures by corridor.

The meeting was then divided into seven breakout rooms, one for each of the selected corridors, one for county-wide general transportation comments and suggestions, and one for Spanish speakers. Much like at the third TAC meeting, participants were asked to provide their general reactions to the proposed road diet recommendations and whether they would accomplish the goals of the study. Potential barriers or other ways to accomplish study goals were also discussed. Provided below is participant feedback received on this specific proposed safety measure:

- Additional development of this concept is needed to show how the road diet would tie into existing intersections (such as Manville Boulevard), as well as turning lanes at signals.
- While the road diet proposed is a dramatic change, addition/widening of sidewalks along Main Street are welcome changes.
- There is a concern of traffic volumes being constrained with the reduction of travel lanes.
- Road diet could be extended east of Chimney Rock Road.
- Vehicle speeding was a concern on this portion of Main Street, which the road diet could address.
- Existing Main Street intersections are not safe for pedestrian crossings, which could be improved with a road diet.

Additional comments were received during the breakout room (not pertaining to the road diet):

- Speed bumps proposed for side streets are welcome to slow traffic speeds.
- Main Street tractor trailer truck limitations should be implemented.
- Trucks should be restricted to local deliveries. There is a large amount of truck traffic in the area.
- Amazon delivery trucks cause congestion when they park in the middle of the road for a drop off instead of pulling into driveways.
- The Ramsey Street traffic signal at the Finderne Fire Station should be on side street recall to act as a traffic calming measure.
- There is a concern of e-bike speeds and safety on roadways with conflicting vehicles and pedestrians.
- The northwest corner of Main Street & Finderne Avenue and the southwest corner of Main Street & Chimney Rock Road (County-owned properties) can be viewed as landscaping opportunities, rather than the existing river stone or chain link fence that is in place.

III. Crash Findings

The analysis used to support the RSA process incorporated a data-driven effort to utilize reportable crash information resulting in any combination of fatality, injury, or property damage. The datasets used for this analysis are sourced from local law enforcement responses to reported vehicular crashes. These on-scene responses subsequently translate to official law enforcement generated reports. Concurrently, the individual reports are aggregated to render serviceable crash information. To be entirely inclusive in obtaining complete crash information, the data was accumulated using three (3) distinct resources: NJDOT's Safety Voyager[9], New Jersey Division of Highway Traffic Safety (NJDHTS) Numetrics[10], and the NJDOT raw crash tables[11]. The three sources were compared against each of the other obtained sources to allow for duplicate records to be discarded and all distinct records to be included with the goal of producing a complete and comprehensive representation of the crashes within the extent of the corridor.

The datasets were obtained for a three-year analysis period from the beginning of January 2016 through the end of December 2018 for vehicle-vehicle crash incidents and from the beginning of January 2014 through the end of December 2018 for vehicle-pedestrian/cyclist crash incidents. According to the compiled crash data, 201 crashes occurred on the 1-mile segment analysis area during the analysis period. The following evaluation breaks down crash attributes as a percentage of the total crashes to achieve a stronger understanding of the localized trends compared to County roadway systems crash performance. Furthermore, all crashes along this segment were mapped onto collision diagrams, which can be found in **Appendix D**, providing a quick spatial overview of crash clustering patterns.

In reviewing the crash data, the following crash clusters and prevailing safety issues were noted:

- Two fatal fixed object collisions have occurred on this corridor, which may suggest unsafe speeds
- At the Central Avenue intersection
    - Multiple right-angle collisions, mostly resulting in injury
    - Opposite direction sideswipe crashes on the EB approach perhaps due to lack of striping
- At the Bridgewater Avenue/Second Street intersection
    - Multiple right-angle collisions, mostly resulting in injury
    - Cyclist collisions, indicating difficulty for non-motorized modes in crossing Finderne Avenue
- At the Main Street & Finderne Avenue intersection
    - Numerous left-turn collisions between NB left-turn and SB through traffic, the vast majority are injury
    - Left-turn crashes on other approaches to intersection perhaps due to permissive lefts
    - Five crashes between NB and SB traffic and crossing pedestrians and cyclists
    - Clustering of rear end crashes on NB, SB, and WB approaches to intersection
- At the Fulton Avenue/Shopping Center driveway intersection
    - Multiple left-turn and right-angle collisions suggesting short gaps being taken by drivers
    - Crashes involving non-motorized modes (pedestrian/cyclist) showing crossings at this location
- Lack of turning bays at Ramsey Street/Pearl Street resulting in rear end/left-turn collisions
- At the Chimney Rock Road intersection
    - Numerous collisions between EB left-turn and WB through vehicles
    - EB and WB rear end collisions between through/left-turn traffic due to lack of turn bays

[9] https://www.njvoyager.org/App/
[10] https://www.numetric.com/
[11] https://www.state.nj.us/transportation/refdata/accident/rawdata01-current.shtm

A. Temporal Trends

Sorting the crashes by month reveals that the study segment experienced the highest crashes in October, 11.0%. During the five (5) months of February, March, August, September, and October, the corridor experienced higher crash frequencies than the County-wide average. Notably, February experienced more frequent crashes than the County-wide average (7.0% vs. 9.5%), as shown in yellow in **Figure 4**.

Figure 5 highlights the crash percent distributions by day of the week. Results indicate statistical significance on Fridays compared to the County-wide averages, 23.0% vs. 15.8%, as shown in yellow in **Figure 5**. However, no recurring events or incidents were noted during the study timeframe. The period between 1:00 PM and 7:00 PM reveals higher crash frequencies than the County-wide average, as shown in **Figure 6.** More specifically, the 2:00 PM hour has crash frequencies higher than the County-wide average, 9.5% local distribution versus a 6.4% County-wide distribution, as shown in yellow in **Figure 6**. The highest frequency of crashes occurred during the 05:00 PM hour, 11.0%, shown in yellow in **Figure 6**.

Figure 4 – Vehicular Crashes, Percent Distribution by Month

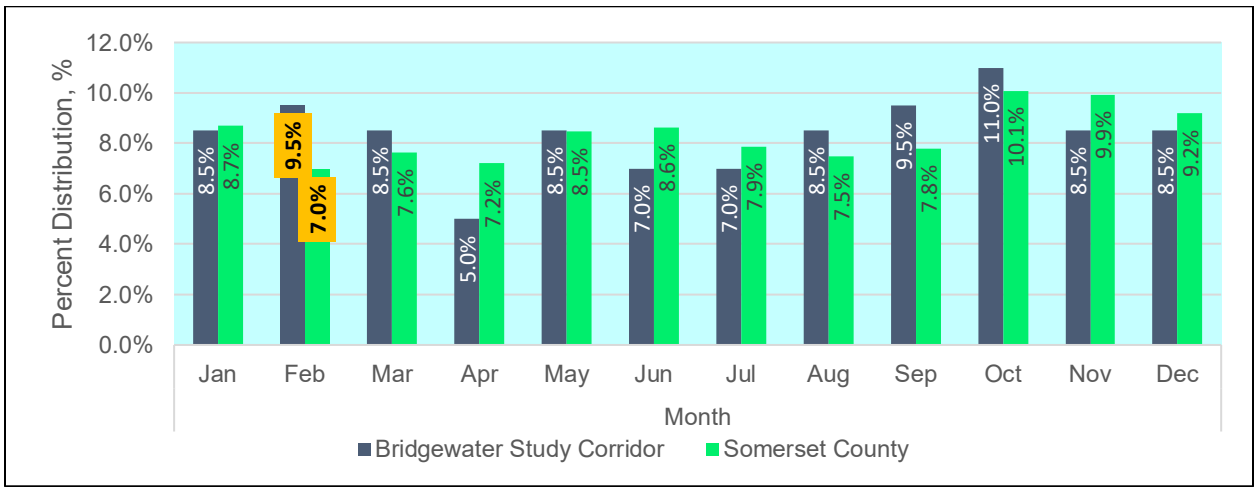


Figure 5 – Vehicular Crashes, Percent Distribution by Day

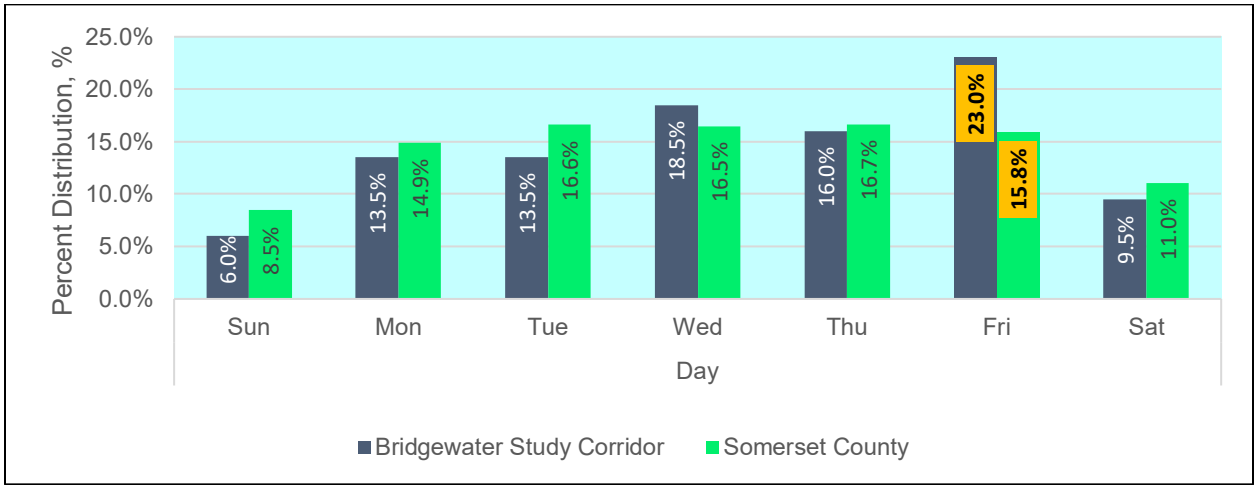
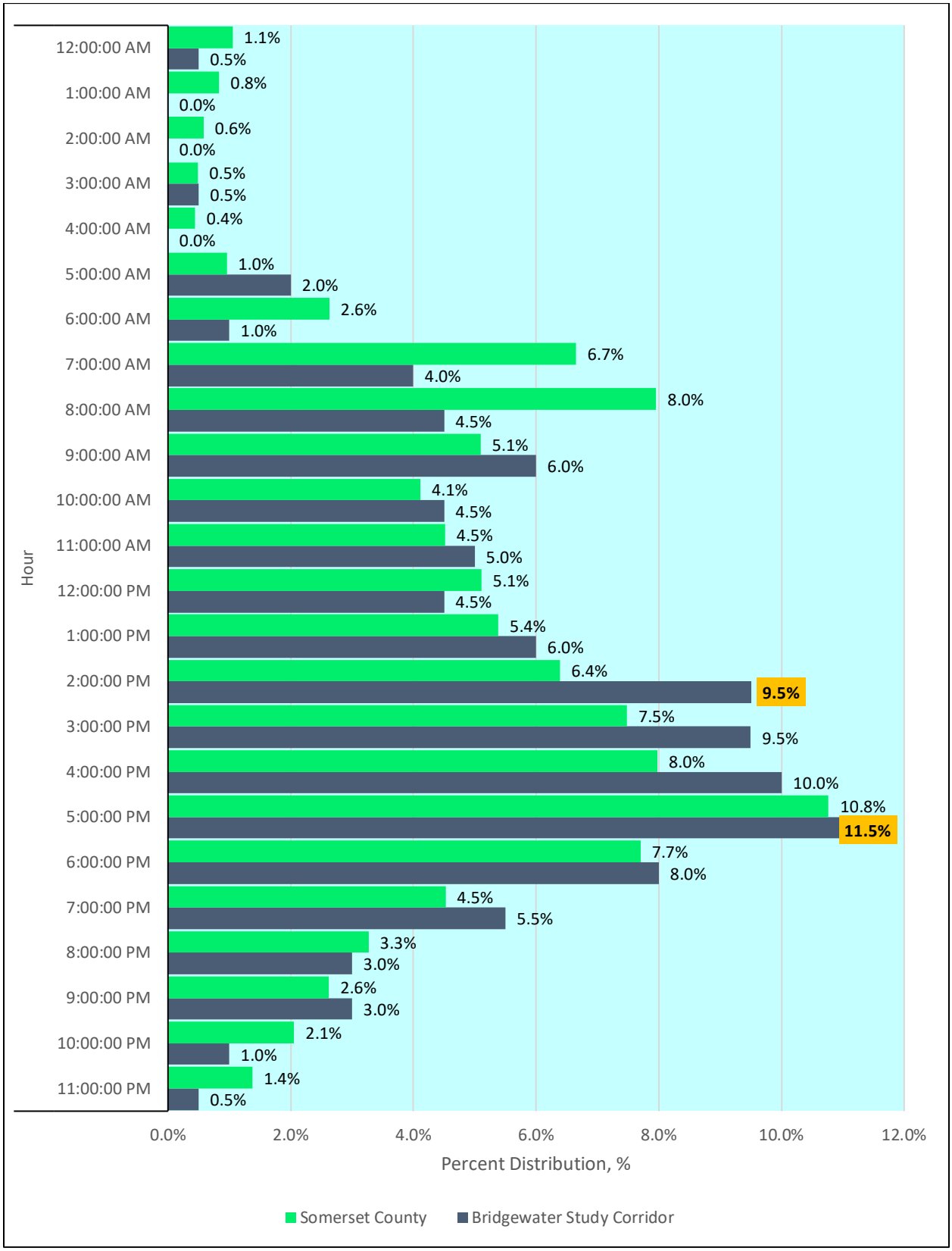


Figure 6 – Vehicular Crashes, Percent Distribution by Hour



B. Collision Types

Sixty-three rear end and 37 left-turn crashes make up approximately half of the crash distribution on the study segment, which are common types of crashes on roadways with two lanes in each direction without turning bays for left-turn movements. When compared to County-wide averages, left-turn, sideswipe, cyclist, and pedestrian collisions were found to be overrepresented, with left-turn crashes almost three times more frequent (18.5% vs. 6.5%, as shown in yellow in **Figure 7**). The frequency of cyclist and pedestrian crashes is approximately three and two times, respectively, the average share seen on the County roadway system. A breakdown of crash frequency by type is provided in **Table** 4.

Figure 7 – Vehicular Crashes, Percent Distribution by Crash Type

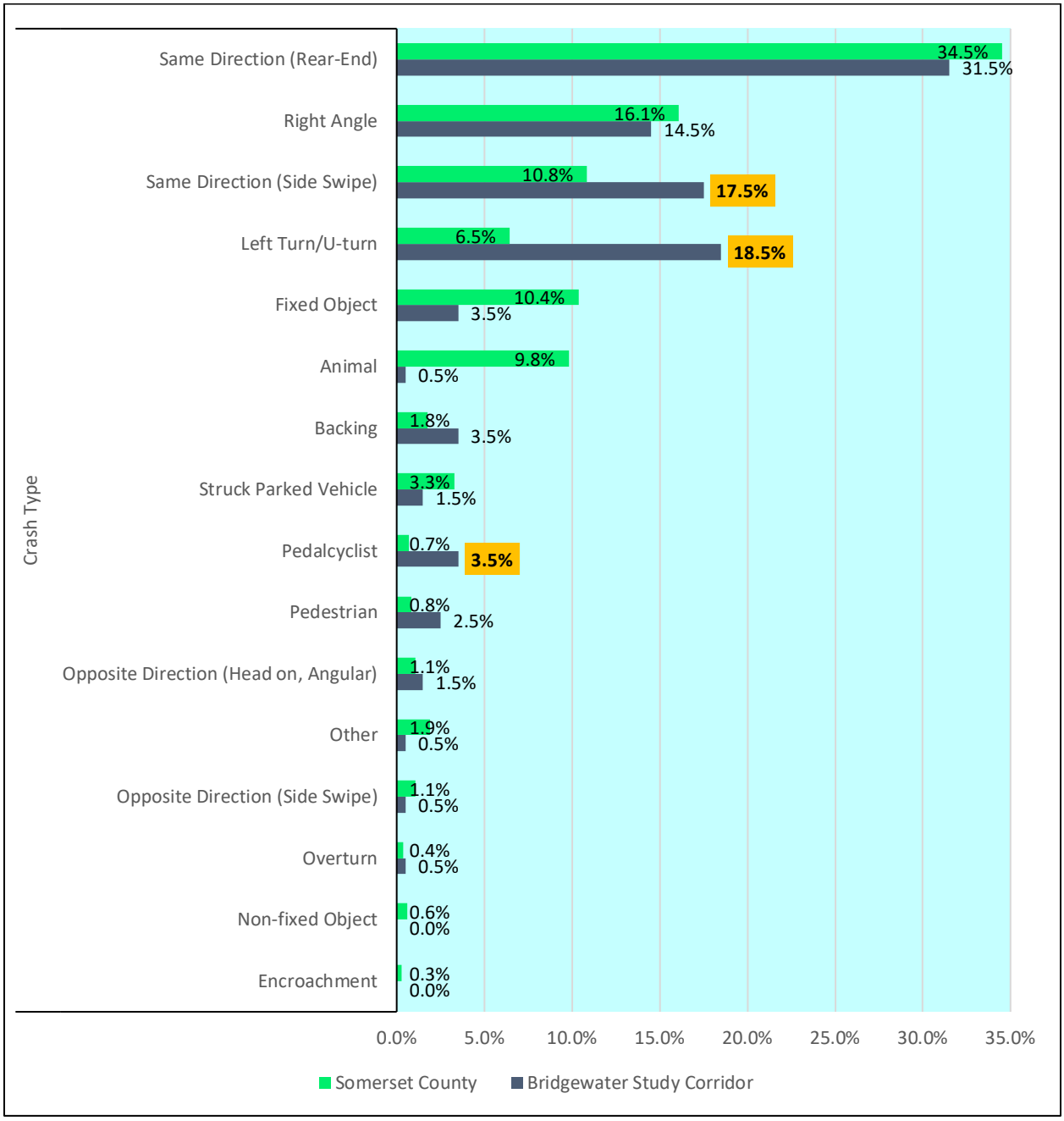


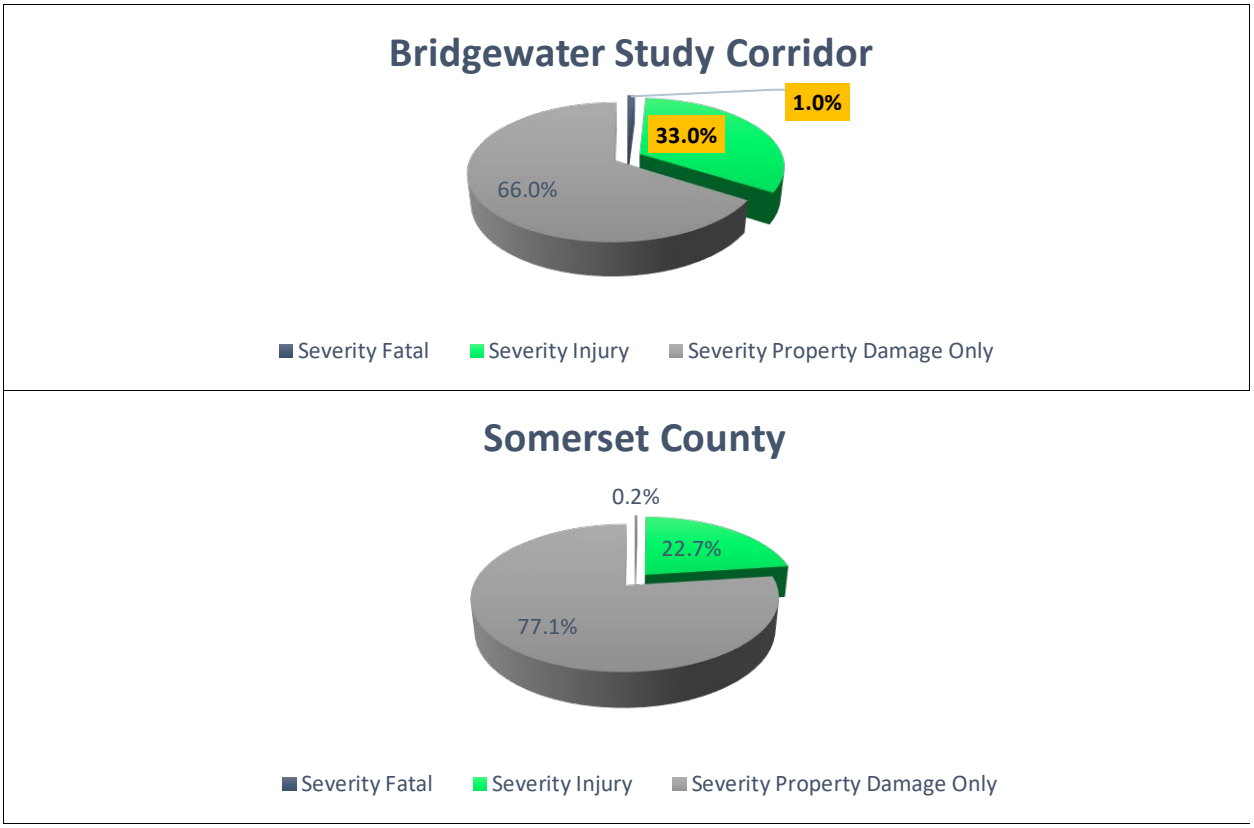
Table 4 – Vehicular Crashes by Type

Crash Type	Total
Animal	1
Backing	7
Fixed Object	7
Left Turn/U-turn	37
Opposite Direction (Head on, Angular)	3
Opposite Direction (Side Swipe)	1
Other	1
Overturn	1
Pedalcyclist	7
Pedestrian	5
Right Angle	30
Same Direction (Rear-End)	63
Same Direction (Side Swipe)	35
Struck Parked Vehicle	3
Total	201

C. *Crash Severity*

The study segment revealed noticeable injury and fatal crash severity trends greater than County-wide averages, which may be evidence of speeding on the corridor. Data shows an increase in crashes resulting in injury when compared to the County, 33.0% versus 22.7%. Crashes that involved fatalities were approximately five times as prevalent on the study segment than at the County level, occurring 1.0% of the time analyzed compared to the 0.2% County-wide average for fatality severities (highlighted in yellow in **Figure 8**).

Figure 8 – Vehicular Crashes, Percent Distribution by Severity



D. Roadway Surface & Light Condition

Most crashes occurred during dry driving conditions (14.5%), and the percentage of wet conditions was lower than the County wide average (16.1%) (highlighted in yellow in **Figure 9**).

Figure 9 – Vehicular Crashes, Percent Distribution by Surface Condition

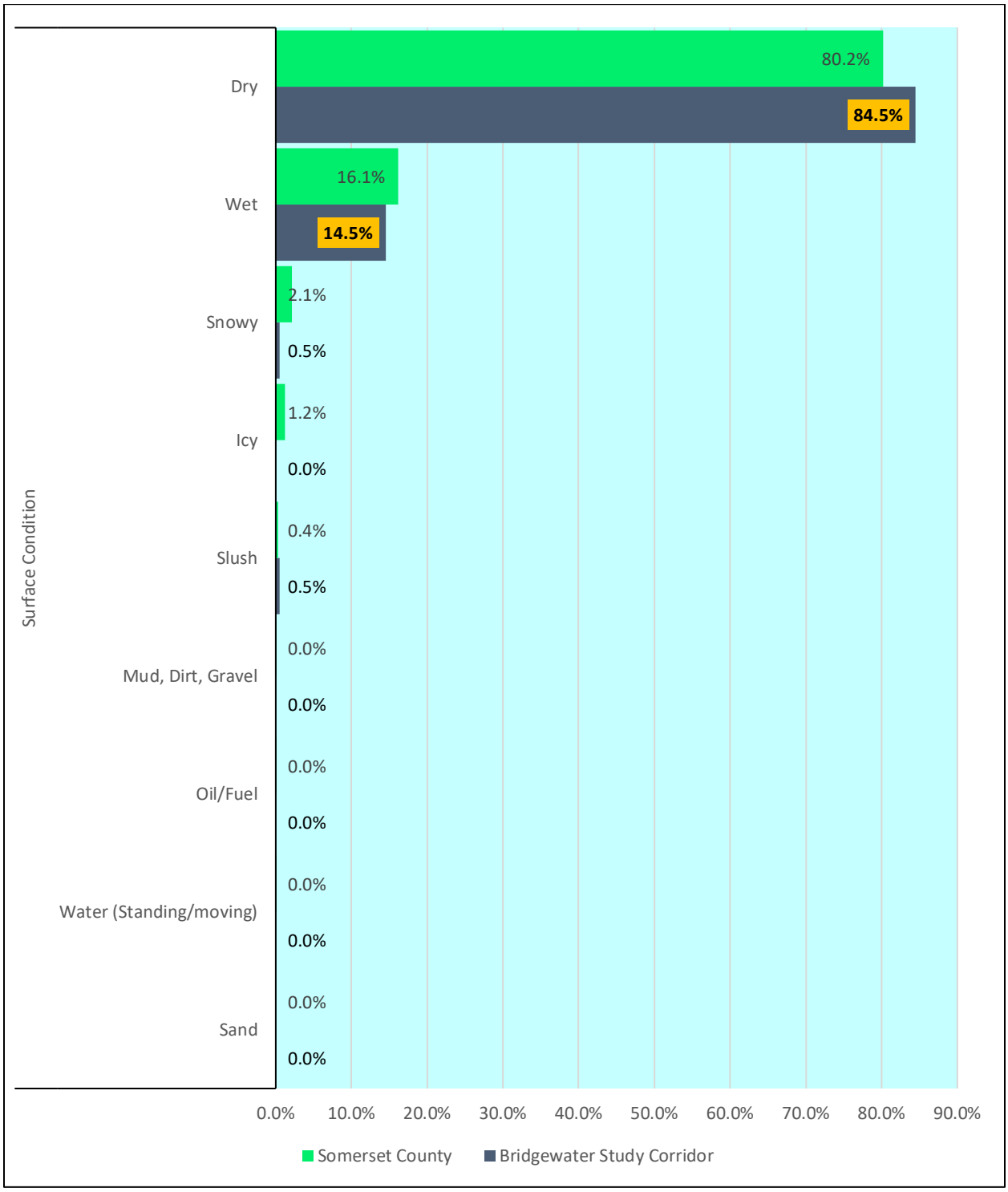
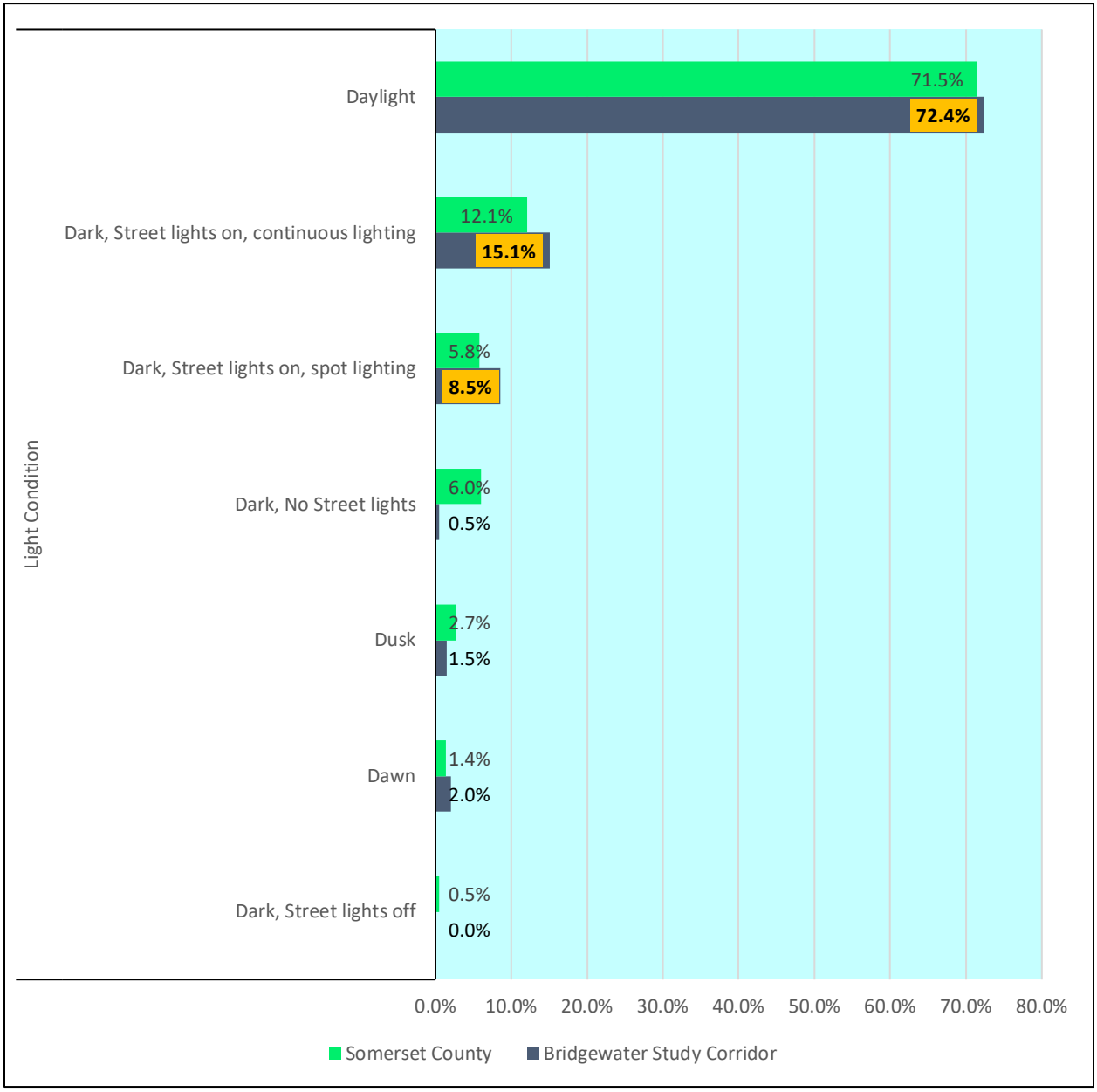


Figure 10 – Vehicular Crashes, Percent Distribution by Light Condition



Approximately 72.4% of crashes on the study segment occurred during daylight conditions. This is slightly higher than the County-wide average of 71.5%. Crashes occurring during Dark, Street lights on, spot lighting, and Dark, Street lights on, continuous lighting are noticeably higher than the County average due to the developed nature of the study area. (Highlighted in yellow in **Figure** 10)

E. Location

A histogram of crash history, grouped in 0.02-mile segments, is provided in **Figure 11** and indicated that the signalized intersection of Main Street (CR 533/612) & Finderne Avenue (CR 533/633) experiences the highest occurrence of crashes on study segment corridor as shown highlighted in yellow in **Figure 11.** This intersection is also ranked as having the highest crash frequency and severity in the County on NJTPA's intersection NSL for Somerset County. The crashes at this location account for 36.5% of all study area crashes. Other crash hotspots include intersections with Chimney Rock Road (17 crashes), Fulton Street (12 crashes),

and Second Street (11 crashes), highlighted in yellow in **Figure 11.** A three-dimensional representation of this crash histogram for the 2016 through 2020 timeframe, imposed onto a map of the study area, is shown on **Figure 12.**

Figure 11 – Vehicular Crash Totals by Milepost

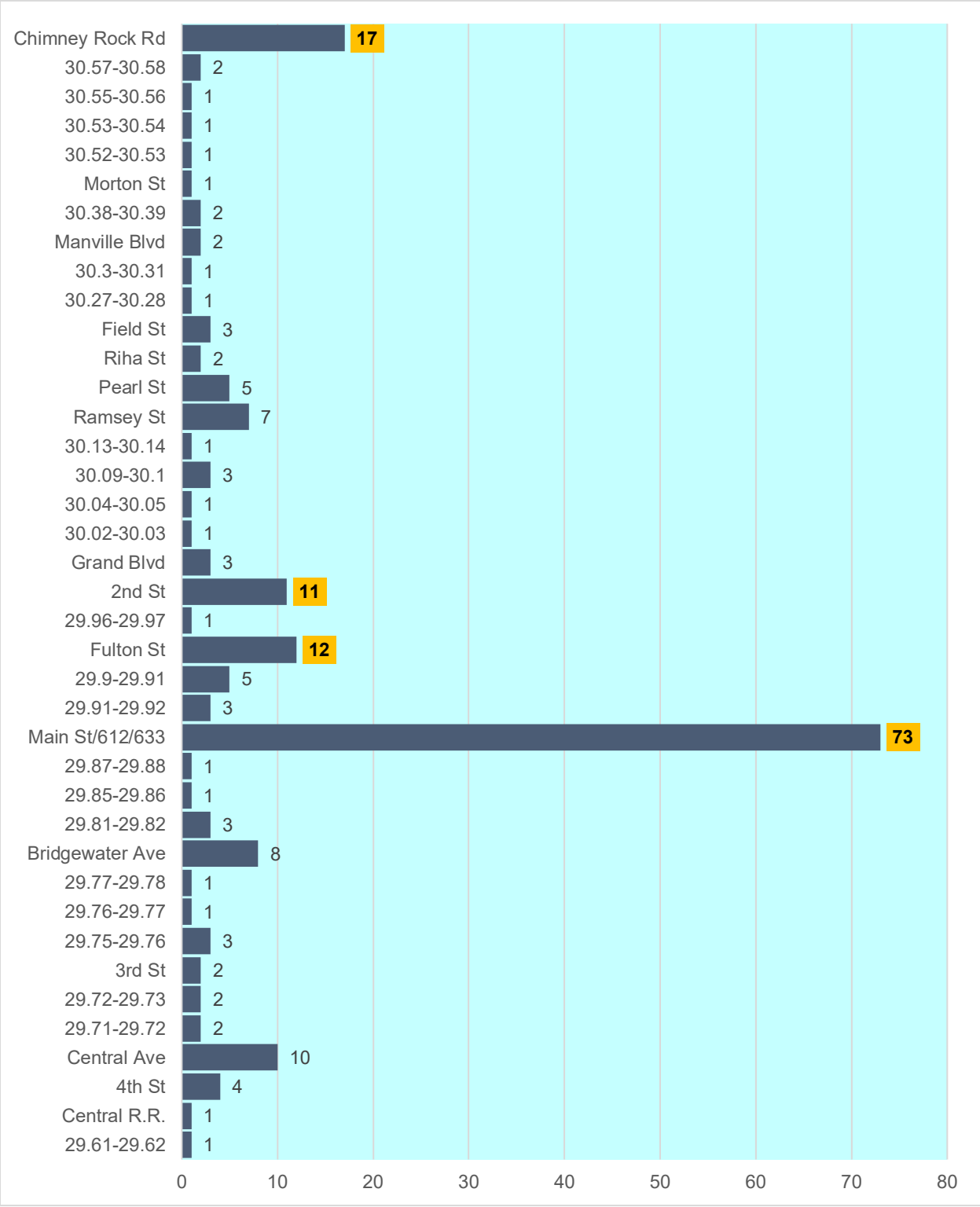


Figure 12 – Visual Estimation of 5-Year (2016 - 2020) Crash History Obtained from Safety Voyager [12]

F. Age of Those Involved

Person(s) involved data was also accessible from the NJDOT crash tables. Using this data for more investigation into age involved, a normal distribution table was developed in Figure 13 . Amongst the 201 crashes reported, the average person(s) involved age was determined to be approximately 42 years old. Approximately 68% of person(s) involved were between the ages of 23 and 61 years old.

[12] Five-year crash totals shown on histogram from Safety Voyager may vary from crash report data obtained from municipality's police department and do not include crashes recorded as occurring on side street approaches, which are included in the record of analyzed collected crash data.

Figure 13 – Histogram of Age(s) Involved

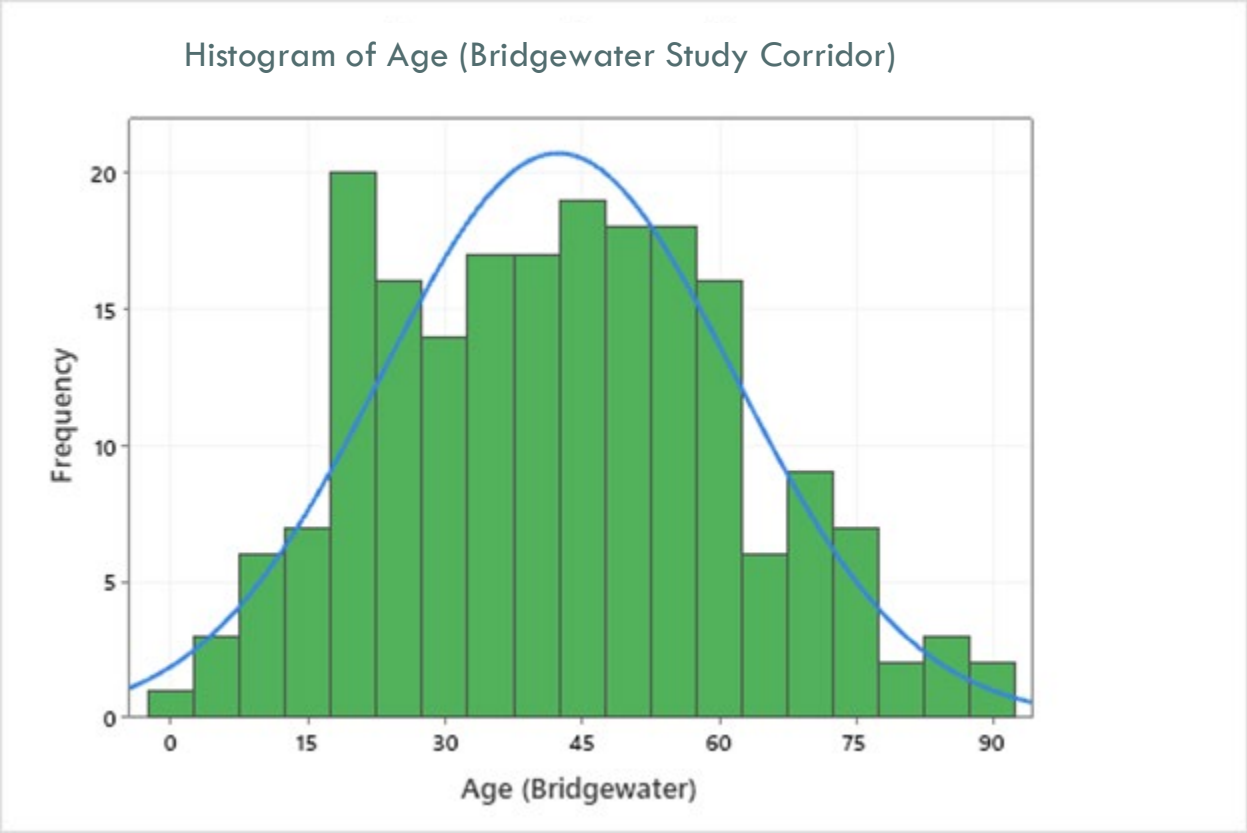


Table 5 lists the percent distribution of the age(s) of those involved in vehicular crashes, grouped by ten years of age. Data from the table indicates that crashes with drivers between the ages of 46 and 85 years old occur with a higher frequency on the study corridor than the County average for the same age groups. Ages 46-55 account for the highest frequency of those involved at 19.0%, marginally higher than the County average of 16.7%.

Table 5 – Age(s) Involved, percent distribution

Age Involved	Bridgewater Township Study Corridor	Somerset County
Under 16	6.0%	7.9%
16-25	16.5%	23.1%
26-35	17.5%	16.9%
36-45	15.5%	15.8%
46-55	19.0%	16.7%
56-65	12.5%	11.3%
66-75	8.5%	5.1%
76-85	3.0%	2.5%
86-95	1.5%	0.7%
96-105	0.0%	0.0%
106-116	0.0%	0.0%

IV. RSA Logistics

All data previously discussed in this report was used to inform the RSA conducted on this corridor. All participants involved in this RSA, whether in attendance during the pre-audit meeting, in-field review, and/or post-audit meeting, are listed in **Appendix E**. The pre-audit meeting was held at 10:00 AM via video conferencing on Tuesday, April 6th, 2021, on the morning of the in-field review meeting to introduce the audit team, cover the activities to complete the RSA, define the RSA process, cover existing conditions data, present safety measures under consideration, summarize crash data collected for the corridor, and go over ground rules for conducting the in-field portion of the audit safely. The PowerPoint used to facilitate this discussion is provided in **Appendix F**.

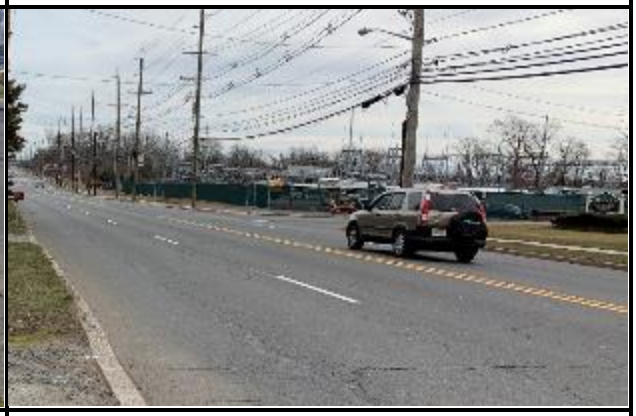
The in-field component of the RSA was conducted at 2:00 PM on the same day as the pre-audit meeting. The audit team met in a social-distanced manner, while masked, in the parking lot of the Finderne Fire Station for a flipbook RSA orientation presentation to reiterate the ground rules of the audit. Upon conclusion of the orientation, participants were paired off with each other to walk halves of the corridor, seeking to pair each Somerset County Roadway Safety Study project team member (whether with the County or Consultant team) with each of the stakeholders. Utilizing aerial mapping, prompt lists, photography, and video, participants recorded their observations of the corridor, as well as potential safety measures to address potential safety concerns. After walking the corridor, the RSA team met back in the parking lot to share overall thoughts on the corridor and fill out a survey on corridor identity, crossings, pedestrian-vehicle interactions, sidewalk and roadway conditions, and streetscape amenities, the answers of which were compiled and are averaged in **Appendix G**. Based on survey results, the corridor had the following perceived concerns:

- Lack of personal safety;
- Missing pedestrian signals;
- Faded or missing crosswalks;
- Missing curb ramps;
- Overall pedestrian-vehicle interactions, particularly due to vehicle speed and noise level;
- Cycling on the sidewalk;
- Narrow or non-existent buffer areas between sidewalks and travel lanes;
- Sidewalk nearing end of service life;
- Lack of benches, places to rest, trash cans, etc.
- Lack of lighting for pedestrians; and,
- Lack of street trees and landscaping.

On the following day (Wednesday, April 7th, 2021), the RSA team reconvened via video conferencing to view photos gathered during the in-field audit, some of which are presented in the following section, to discuss each observation, elaborate on potential ideas to mitigate, cover questions on travel pertaining to the overall corridor, and summarize next steps for this study. This discussion helped to form the basis of the Implementation Matrix in the **Identified Issues & Observations** section of this report. The PowerPoint used to facilitate this discussion is provided in **Appendix H**.

V. Identified Issues & Observations

This section depicts a sampling of overall issues identified during the RSA. Please refer to the Implementation Matrix in the following section of the report for a comprehensive list of identified corridor issues.

Pedestrian & Cyclist	Pedestrian & Cyclist
	
Sidewalk on north side of Main Street often interrupted by wide asphalt curb cuts and parked/standing vehicles	Cycling on Finderne Avenue restricted to narrow multiuse path over bridge with minimal delineation from travel lanes
	
Sidewalks along Main Street lacking maintenance and are discontinuous	Vehicular-centric corridor could benefit from road diet, dedicating cyclist space while slowing vehicles
	
History of pedestrian crashes at Finderne Avenue & Main Street involving vehicles making permissive turns	Heavily-used cycling route lacking updated wayfinding to connect local communities

Operations & Visibility	Maintenance
	
Close calls between NB permissive left and SB through at Finderne Avenue & Main Street intersection	Ponding at side street crossings compromises pedestrian crossing areas, location also lacks curb ramps
	
Older signals at Chimney Rock Road and Ramsey Street lacking countdown pedestrian heads and proper clearance times	Transit stops on Main Street lack amenities, dedicated pull off areas, and updated bus route information
	
Right turn channelized operations at Finderne Avenue & Main Street are signalized, but conflicting crosswalks lack pedestrian heads	Non-compliant curb ramps filled with debris, crosswalk is missing, sight lines hard to establish due to bridge crest

VI. Findings & Recommendations

This section summarizes the site-specific and corridor-wide safety issues, potential strategies, and recommendations to improve safety. An Implementation Matrix is provided that summarizes the recommendations and provides qualitative information on time frame, cost, and responsible jurisdiction. Please note that recommendations cited in the Implementation Matrix are to reflect feedback received during the RSA process and are meant to be a record of ideas discussed. Symbols used in the Implementation Matrix are defined in **Table 6** as follows:

Table 6 – Legend of Symbols in Implementation Matrix

Symbol	Meaning	Definition
$	Low cost	Could be accomplished through maintenance
$$	Medium cost	May require some engineering or design and funding may be readily available
$$$	High cost	Longer term; may require full engineering, ROW acquisition, and new funding
🕐	Short term	Could be accomplished within 1 year
🕐🕐	Medium term	Could be accomplished in 1 to 3 years; may require some engineering
🕐🕐🕐	Long term	Could be accomplished in 3 years or more; may require full engineering

A. Implementation Matrix

The following represents the specific findings and recommendations made by the interdisciplinary RSA team, which were subsequently evaluated via discussions with County Engineering on Wednesday, June 2nd, 2021, and Thursday, June 3rd, 2021. As these recommendations are considered for advancement into either a CD study, or incorporation into an overlapping County or municipal project, the recommendations herein should be thoroughly evaluated for feasibility and practicability and designed as appropriate by the roadway owner and/or a professional engineer for conformance to all applicable codes, standards, and best practices. Corridor-wide recommendations, requiring a review of all important applicable infrastructure along the corridor pertinent to these specific topics, are provided in **Table 7**. Further defined recommendations at specific intersection or mid-block locations are provided in **Table 8**. **Recommendations bolded within the Implementation Matrix below feature one of the twenty Proven Safety Countermeasures from the FHWA[13], which means that the recommendation is shown to have a significant safety benefit as proven by substantial traffic safety research.** These recommendations are tied to Crash Modification Factors (CMFs) showing a substantial reduction in crashes, as well as research documented on the Crash Modification Factor Clearinghouse website that has a high-quality ranking. This high ranking indicates the quality of study design, sample size, statistical methodology, statistical significance, etc. for the research backing each CMF. Mapping of proposed location-specific recommendations is provided in **Appendix I**.

Table 7 – Corridor-Wide Recommendations

No.	Recommendation	Cost	Time Frame	Jurisdiction
Bicycle				
1	Evaluate and replace existing drainage grates with bicycle-safe drainage grates.	$	🕐🕐	County
Education				
2	Consider sidewalk, crosswalk, multimodal education campaign and code enforcement	$	🕐🕐	Municipality

[13] https://safety.fhwa.dot.gov/provencountermeasures/

No.	Recommendation	Cost	Time Frame	Jurisdiction
Maintenance				
3	**Restripe faded crosswalks**	$	🕐	Municipality/ County
4	Perform maintenance to clear overgrowth and debris on sidewalks and curb ramps.	$	🕐	Municipality
Operations				
5	**Perform a speed study along the corridor to determine the specific segments experiencing excessive speeds to recommend targeted traffic calming strategies.**	$$	🕐🕐	County
6	Evaluate intersection sight distances at unsignalized intersections with minor side streets.	$$	🕐	County
Pedestrian				
7	**Conduct a sidewalk assessment to determine the extent of sidewalk that needs to be replaced, repaired, and constructed.**	$$	🕐🕐	Municipality
8	Perform curb ramp assessment to determine the number of curb ramps that need to be replaced, repaired, and constructed.	$$	🕐🕐	Municipality/ County
Transit				
9	Coordinate with Somerset Transportation Office to provide amenities and information at existing bus stops. Improvements should consider any applicable triggers that could warrant construction of accessible walking routes to existing bus stops.	$	🕐	Municipality/ County
10	Consider branding of bus stop signing of existing bus stop locations with SCOOT, CAT, or RideWise logos to help improve the visibility and usability of transit options. Improvements should consider any applicable triggers that could warrant construction of accessible walking routes to existing bus stops.	$	🕐	County

Table 8 – Location-Specific Recommendations

No.	Recommendation	Cost	Time Frame	Jurisdiction
KEY STUDY RECOMMENDATION – Main Street from Fulton Avenue to Chimney Rock Road				
11	Evaluate the feasibility of a road diet, and construct if feasible. The road diet could include left turn refuges, bike lanes, pullout areas for transit stops, and/or curb extensions with striped parking in between.	$$	🕐🕐🕐	County
Finderne Avenue from Bridgewater Avenue to South Avenue				
12	Evaluate intersection sight distance at side streets and explore ways to mitigate issues.	$$	🕐🕐	Municipality/ County
13	Explore ways to reduce cut-through traffic on side streets, including dead ends and speed tables; perform an origin-destination study; consistently apply NB right turn restrictions at side streets.	$$	🕐🕐	Municipal
South Avenue				
14	**Investigate feasibility of prohibiting EB left turns to mitigate intersection sight distance issue.**	$$	🕐🕐	Municipality/ County
15	Consider constructing overhead flashing "RED SIGNAL AHEAD" sign for NB direction to reduce vehicles speeds over the bridge and reduce rear end crashes that occur on other side of bridge.	$$	🕐🕐	County

No.	Recommendation	Cost	Time Frame	Jurisdiction
16	Consider widening striped asphalt paving to the extent possible for opposing cyclist traffic with appropriate striping and signing at intersection.	$$	🕐🕐	Municipality
Finderne Avenue Bridge over New Jersey Transit Raritan Valley Line				
17	Improve bicycle wayfinding in vicinity of bridge.	$	🕐	County
18	Clear dirt and overgrowth on sidewalk over the bridge.	$	🕐	County
19	Improve delineation of multi-use path over bridge.	$	🕐	County
20	Once the bridge has reached the end of its serviceable life, the concept development study completed for the bridge replacement project should determine the scope of services and bridge width needed to accommodate a full-width multi-use path for comfort of pedestrian and cyclist travel.	$$$	🕐🕐🕐	County/ Railroad
21	Consider upgrading guiderail on bridge.	$$	🕐🕐🕐	County/ Railroad
4th Street				
22	Consider constructing cul-de-sac or restrict turning movements due to sight distance issues due to bridge.	$$	🕐🕐	Municipality
23	**Consider installing temporary traffic diverters to modify access to 4th Street**	$	🕐	Municipality/ County
Central Avenue				
24	Install stop sign and stop bar.	$	🕐	Private
25	Conduct a driveway intersection safety improvement study to determine if Central Avenue (private driveway) cartway or pavement width can be reduced (or multiuse path crossing distance can be reduced via striping and curb extensions) to improve safety for crossing pedestrians and cyclists. Coordination with property owner is needed, especially upon redevelopment.	$$	🕐🕐	County/ Property Owner / Municipality
26	**Investigate feasibility of constructing offset signalized intersection with 4th Street to mitigate sight distance issues and improve pedestrian connectivity.**	$$$	🕐🕐🕐	County/ Municipality
27	**Explore adding curb extensions at corners to decrease vehicle/pedestrian conflict area.**	$	🕐🕐	County
28	Consider widening striped asphalt paving to the extent possible for opposing cyclist traffic with appropriate striping and signing at intersection.	$$$	🕐🕐🕐	Municipality
3rd Street				
29	**Install sidewalk on east side of road with a crosswalk and curb ramps across 3rd Street to provide a pedestrian connection.**	$$	🕐🕐	County/ Municipality
2nd Street				
30	Install timed right turn restriction signage.	$	🕐	Municipality
31	Improve ponding issue along crossing path along crosswalk on east side of Finderne Avenue.	$$	🕐🕐	County
32	Consider utilizing sharrows to connect bicycle route with the existing Township bicycle route west of Finderne Avenue on Bridgewater Avenue.	$	🕐	Municipality

No.	Recommendation	Cost	Time Frame	Jurisdiction
2nd Street/Bridgewater Avenue				
33	Consider exploring crossing options to better connect neighborhoods and bike route on both sides of Finderne Avenue, including hardscaped median refuge area, pedestrian-scale lighting, and RRFB.	$$$	🕐🕐🕐	County/ Municipality
Bridgewater Avenue				
34	Install more wayfinding for bicycle route.	$	🕐	Municipality
35	Consider adding truck restrictions.	$	🕐	Municipality
36	**Consider installing midblock crossings with refuge islands**	$$	🕐🕐	Municipality
Main Street/Finderne Avenue				
37	**Perform an intersection improvement study that looks at volumes, geometry, lane configuration, signal improvements, drainage, roadway improvements, and striping layout.**	$$	🕐🕐	County
38	Consider adjusting signal timing for NB protected left turns to reduce through/left vehicle conflicts, depending on capacity, and longer FDW times.	$	🕐🕐	County
39	Analyze the possibility of NO TURN ON RED signage for all approaches. No Turn on Red (NTOR) restrictions can be enacted at this intersection to mitigate the occurrence of right-hook pedestrian collisions.	$	🕐	County
40	**Investigate feasibility of constructing additional pedestrian signal heads and push buttons for crossing right turn slip ramps.**	$$	🕐🕐	County
41	Consider constructing overhead signals for right turn slip ramps.	$$	🕐🕐	County
42	Consider removing channelized right turns in favor of reducing vehicular-pedestrian conflicts.	$$$	🕐🕐🕐	County
43	Consider reducing striped radii on SE corner while providing truck apron.	$	🕐	County
44	**Upgrade signal heads from 8" to 12" and add backplates.**	$	🕐🕐	County
45	Redevelop County-owned land / electronic message sign on NW corner as a pocket park with mini recreation activities, shaded seating areas, and a focal point for congregating, such as a fountain or flagpole.	$$	🕐🕐	County
46	Perform study to look at the realignment of Finderne Avenue NB at this intersection to connect traffic more directly to the opposite leg.	$$$	🕐🕐🕐	County
47	**Consider implementing LPIs to help pedestrians establish their presence before conflicting vehicles have the right-of-way.**	$	🕐	County
48	**Consider changing left turn signal phasing from protective/permissive (eastbound, northbound, and southbound approaches) to protected-only (westbound approach) to provide further clearance and protection for pedestrians from left-hook collisions.**	$	🕐	County
49	Consider narrowing the channelized right-turn island, vehicular turning radii become less sweeping, right turning movements are slowed, and drivers turning right are forced to stop or yield to	$$$	🕐🕐🕐	County

No.	Recommendation	Cost	Time Frame	Jurisdiction
	approaching traffic while being provided with a better sight line to vehicles to the left.			
50	Consider installing a biofilter for Green Stormwater Infrastructure (GSI) on Northwest Corner of Finderne Avenue & Main Street. Municipality would be responsible for maintenance.	$$$	🕐🕐🕐	Municipality
Fulton Avenue				
51	**Investigate feasibility of installing crosswalk traversing Main Street with RRFB and pedestrian refuge island. Refuge island also acts as diverter island to change Fulton Avenue and shopping center access to RIRO.**	$$	🕐🕐	County/ Municipality
52	**Consider restricting left turns exiting Fulton Avenue**	$	🕐	Municipality
53	**Consider making driveway to shopping center right-in, right-out.**	$$	🕐🕐	County/ Property Owner
54	**Explore ways to reduce cut-through traffic, possibly with a speed table.**	**$**	🕐🕐	Municipality
55	Consider utilizing sharrows to connect bicycle route with the existing Township bicycle route west of Finderne Avenue on Bridgewater Avenue.	**$**	🕐🕐	Municipality
56	**Consider placing a diverter island in the cross-hatched median of Main Street to preclude at-risk turning movements at this intersection.**	$$	🕐🕐	County
57	Consider installing either paved or raised speed humps on Fulton Avenue between Main Street and 2nd Street	$$	🕐	Municipality
Grand Boulevard				
58	Install wayfinding for neighborhood park and add concrete sidewalk space.	$	🕐	Municipality
59	Resurface SB approach to eliminate ponding and erosion.	$	🕐	Municipality
Grand Boulevard to Ramsey Street				
60	**Reconstruct (or construct) sidewalks through driveway aprons to comply with ADA guidelines.**	$$	🕐🕐	Municipality/ Property Owner
Ramsey Street (Driveway)				
61	**Construct concrete sidewalk across driveway apron.**	$	🕐	Municipality/ Property Owner
Ramsey Street/Pearl Street				
62	**Install pedestrian countdown heads on signal.**	$	🕐	County
63	**Improve ponding issue along crosswalk traversing Pearl Street.**	$	🕐🕐	County
64	Consider coordinating with NJ TRANSIT to provide amenities and information at bus stops.	$	🕐	Municipality/ County
65	**Consider implementing LPIs to help pedestrians establish their presence before conflicting vehicles have the right-of-way**	$	🕐	County

No.	Recommendation	Cost	Time Frame	Jurisdiction
Riha Street				
66	Correct drainage issue on north side of Main Street.	$$	🕐🕐	County
67	**Repair pavement and stripe crosswalk across NB approach.**	$	🕐	Municipality/ County
Field Street to Chimney Rock Road/Polhemus Lane				
68	**Evaluate feasibility of installing sidewalk on north side of Main Street.**	$$	🕐🕐	Municipality
Field Street				
69	**Investigate feasibility of installing crosswalk for shopping center if sidewalks are provided on both sides of the roadway**	$$	🕐	County
Driveway between Newberry Street and Chimney Rock Road				
70	**Explore possibility of striping curb extensions to reduce length of vehicle/pedestrian conflict space.**	$	🕐	County
Chimney Rock Road/Polhemus Lane				
71	**Install pedestrian countdown heads on signal.**	$	🕐	County
72	**Construct new curb ramps where missing.**	$$	🕐🕐	County
73	**Consider implementing Lead Pedestrian Intervals (LPIs) to help pedestrians establish their presence before conflicting vehicles have the right-of-way**	$	🕐	County

B. Road Owner Response

An essential final step of the RSA process (see **Figure 1**) is a response from the roadway owner, which provides accountability between the funding body and the participating jurisdiction who acknowledges the findings within the RSA and their planned steps to address concerns. In responding to the RSA's findings, the road owner, in this case the County, must weigh the safety benefits posed by the recommendations within this report against the available resources to implement such improvements to make an informed decision. Because the audit process generated a long and wide-ranging list of improvements, the road owner is expected to implement these recommended improvements as time and funds allow in coordination with other projects and priorities.

Somerset County delivered their response following the finalization of the findings and recommendations table (see **Appendix J**). While the County has overseen this RSA process, by no means should this report be considered as a commitment to address some or all concerns and implement some or all improvements listed within this report. All potential recommendations must be fully studied. It is acknowledged that some recommendations may not be feasible.

C. Potential External Funding Sources

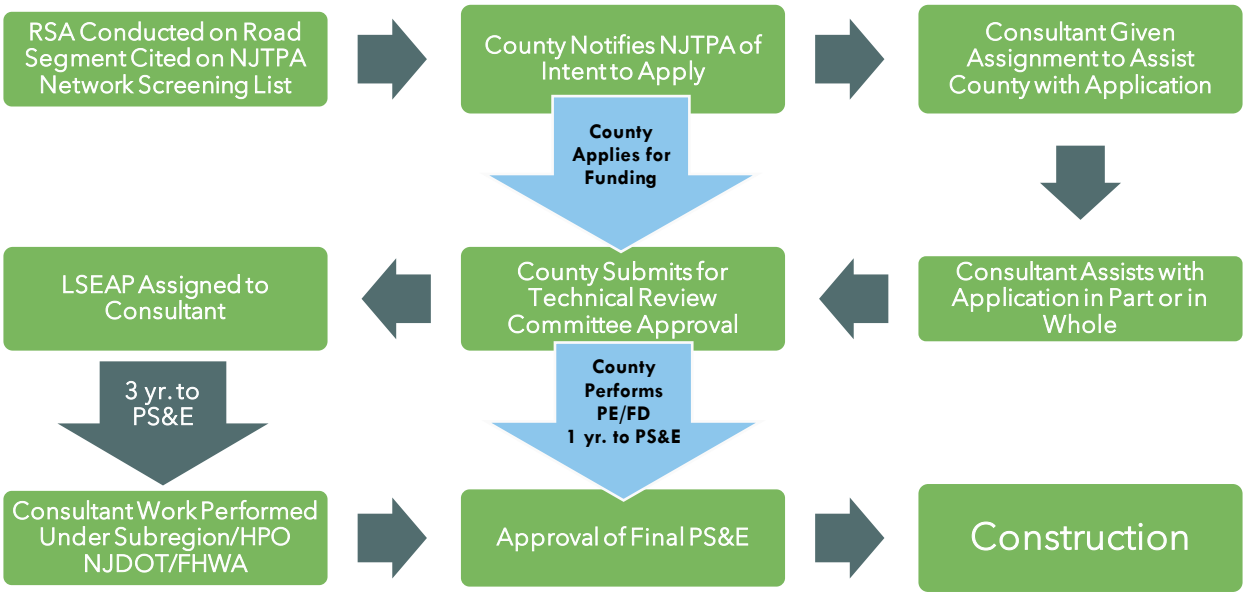
Local Safety Program

The County has previously used RSAs as a "launching pad" for pursuing funding for corridor safety improvement projects, such as Main Street in Manville and Hamilton Street in Franklin, via the Local Safety Program (LSP) offered through NJTPA. Should the County desire to pursue funding of safety improvements on this corridor, the RSA can help to scope the specific safety improvements to be conceptualized and designed for eventual funding and construction. The RSA can also be appended to Section 4 of the funding application[14] submitted to NJTPA as a further substantiation and documentation of the understanding of the existing safety issues and proposed safety measures. This application, which also requests information on scope, location ranking, HSM analyses, estimated costs, and environmental impacts, may be filled out by the

[14] Application for FY 2020 provided here: https://www.njtpa.org/NJTPA/media/Documents/Projects-Programs/Local-Programs/Local-Safety-Rural-Roads/FY-2020-LSHRRRP-Application-Rev_191003.doc?ext=.doc

County itself or with assistance from a consultant designated by NJTPA. Pending determination of eligibility by NJTPA's Technical Review Committee, the County can choose to either perform the Preliminary Engineering and Final Design work in-house or obtain assistance for such work through NJTPA's Local Safety Engineering Assistance Program. It should be noted that implementation of improvements through the LSP often takes around five to six years from corridor selection to construction. A simplified flowchart of this process from RSA to construction is shown in **Figure 14**. If faster implementation is desired, County and municipal operating and capital budgets could be relied upon if internal funding is available.

Figure 14 – Project Development Process for Local Safety Program after RSA Completion



Transportation Alternatives Program

The purpose of the Transportation Alternatives Set-Aside Program (TA Set-Aside) federal grant initiative is to support the construction of "non-traditional" surface transportation projects, which typically involves the designing of infrastructure for active modes such as pedestrians, cyclists, and other non-motorized forms of travel. Supported projects can also have elements that bolster the recreational, historic, cultural, or environmental assets of the project area. Grant funding for a given project can range from $150,000 to $1,000,000. The amount of funding is determined on a project-by-project basis with award of prior grant money, and successful execution of prior funded projects, playing a factor. The County would not be prohibited from applying for both Safe Routes to School and TA Set-Aside funding at the same time.

TA Set-Aside lists the following activities that are eligible for funding under its "Pedestrian/Bicycle Facilities" and "Community Improvement" categories:

- New/reconstructed sidewalks/curb ramps;
- Bike lane striping;
- Wide paved shoulders;
- Bike parking and bus racks;
- New or reconstructed off-road trails;
- Bike/pedestrian bridges and underpasses;
- Lighting;
- Historic sidewalk paving;
- Benches;
- Planting containers;
- Decorative walls; and,
- Walkways.

The recommendations within the Implementation Matrix touch on many of the prior elements listed. To best position itself to attain approval for funding, the applying jurisdiction, whether County or municipal, should pass a resolution of support showing the commitment of maintenance of the proposed complete streets elements. Furthermore, the applicant should have data supporting that the implementation of similar

improvements elsewhere within its jurisdiction has resulted in the increase of non-motorized transportation, the stimulus of economic activity, and the improvement in quality of life. A handbook summarizing the process of applying for these funds can be found at NJDOT's Local Aid website[15].

D. Demonstration Project

Demonstration projects are where an example improvement is completed for a selected corridor with foresight to prepare for larger rollouts. The improvement(s) should highlight the concept and illustrate the benefits of RSAs and how RSAs may improve the overall level of safety for the road users. The selected demonstration projects should be of strategic importance, and which is representative of the general safety theme suggested for the selected corridor.

Some of the greatest challenges along Main Street and Finderne Avenue are how drivers use local cross streets to perform cut-through traffic maneuvers, especially in the Finderne Avenue neighborhood southeast of the intersection of Finderne Avenue & Main Street. There are several signed turn restrictions during peak periods, including one at the intersection of Finderne Avenue & 4th Street. Temporary traffic diverters (**Figure 15**) could be installed to modify access to 4th Street. By only allowing right turns from 4th Street to Finderne Avenue, the temporary diverters would prevent drivers from using the 4th Street as a cut-through to bypass congestion experienced at Finderne Avenue & Main Street, whether turning right from Finderne Avenue northbound onto 4th Street or making the left turn from 4th Street to Finderne Avenue southbound, which has substandard sightlines due to the crest of the overpass. The vertical delineators pictured would preserve temporary first responder access, while still accommodating movements that would not adversely affect traffic flow in the neighborhood.

Should the temporary access modification prove to be successful, the Township/County could consider full street closure, with 4th Street becoming a dead end, using hard curbing and trees to screen the street, while preserving pedestrian access. Shown in

Figure 16 is a similar improvement implemented by Mercer County. This could be considered as an alternate option to the recommendation within the Implementation Matrix to install an offset signal at Finderne Avenue & Central Avenue/4th Street. With the closure of 4th Street, capacity analysis software should be used to determine if sufficient capacity exists on alternate routes (3rd Street and 2nd Street) to handle the additional demand.

Figure 15 – Temporary Traffic Diverter Allowing Right Turns onto Main Road[16]

[15] https://njdotlocalaidrc.com/perch/resources/Uploads/2020-ta-set-aside-handbook-8-12-20.pdf
[16] From SFMTA implementation (San Francisco, CA)

Figure 16 – Street Closure near Similar Vertical Crest in Hamilton Township (Google Streetview)

E. Visualization of Potential Safety Measures

Provided in this section of the report are visualizations of some of the larger reaching proposed safety measures on the corridor in the Implementation Matrix (**Table 7** and **Table 8**). Visualizations of these safety measures, along with accompanying descriptions on how these ideas seek to improve safety for vehicular, pedestrian, and cyclist travel, are adapted from the following state and national videos and publications:

- *New Jersey Pedestrian and Bicycle Resource Center* video library, 2021[17]
- *Cross County Connection TMA* video library, 2021[18]
- *NJDOT Technology Transfer* video library, 2021[19]
- *NJDOT Safe Routes to School* video library, 2021[20]
- *2017 State of New Jersey Complete Streets Design Guide*, NJDOT, 2017
- *Proven Safety Countermeasures*, FHWA, 2017
- *Small Town and Rural Multimodal Networks*, FHWA, 2016
- *Separated Bike Lane Planning and Design Guide*, FHWA, 2015
- *New Jersey School Zone Design Guide*, NJDOT, 2014
- *Urban Bikeway Design Guide 2nd Edition*, National Association of City Transportation Officials, 2014
- *Urban Street Design Guide*, National Association of City Transportation Officials, 2012

Key Study Recommendation – Road Diet on Main Street

While this roadway corridor has a vehicle-centric design with two lanes of travel allocated for each direction, both Main Street and Finderne Avenue act as a conduit of intercity pedestrian and cyclist travel between the downtown areas of Somerville, Bound Brook, and Manville, which are comprised of census tracts citing zero-vehicle households of up to 11%. While pedestrian connectivity throughout the corridor is needed, especially the completion of sidewalk on the northern side of the Main Street corridor, redesigning Main Street to accommodate a road diet would have significant safety and mobility improvements for those who use the corridor, via active modes of travel.

Since Main Street has an Average Annual Daily Traffic (AADT) of 21,000, thorough intersection-by-intersection capacity analysis, design, administrative approval, and public vetting is needed to ensure the efficacy and success of the road diet. A four-lane to three-lane road diet, where properly implemented, could result in a 19-47%[21] reduction in total crashes. Standard types of crashes on a four-lane section of roadway such as Main Street include "ghosting" right angle crashes (where left turn vehicles cannot see an approaching vehicle in the right lane due to a stopped opposing left turn vehicle) and "lane shopping" crashes where vehicles jump from left lane to right lane and back to aggressively pass slower vehicles. An example view of a road diet is shown in **Figure 17**.

[17] https://www.youtube.com/channel/UCMsSU487ZPfaOAjcC7K8_SQ
[18] https://www.youtube.com/channel/UC5C0fODzuDqT9ycKMYv0C3Q
[19] https://www.youtube.com/channel/UC-L3YfqzFHcuDw6aI7wDrJQ
[20] https://www.youtube.com/channel/UCjlvrPjwNZ97MkX5IRol4ow
[21] FHWA. (2017). Proven Safety Countermeasures. https://safety.fhwa.dot.gov/provencountermeasures/.

Figure 17 – Road Diet Enacted in Pompton Lakes Borough on Former Four-Lane Section[22]

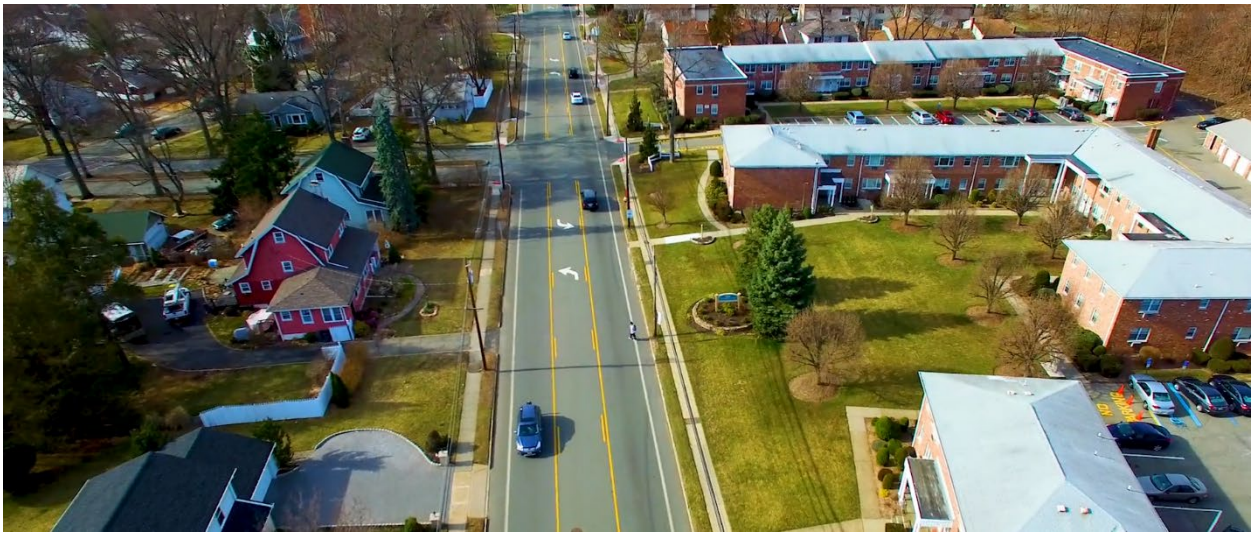
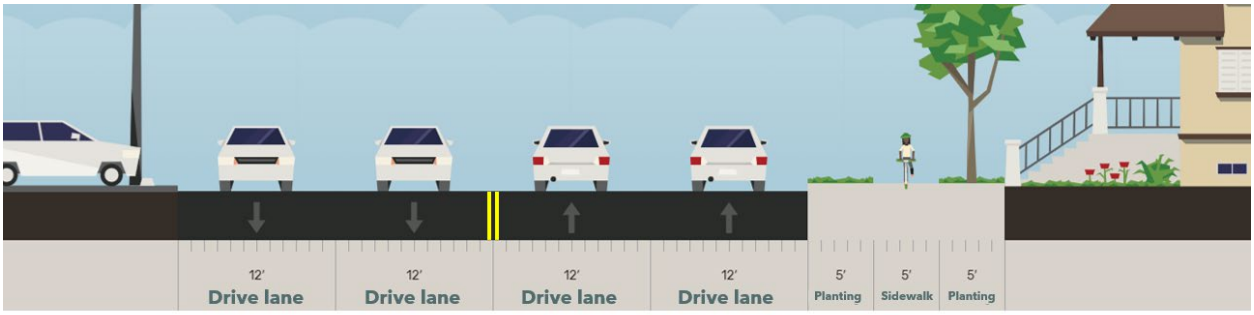
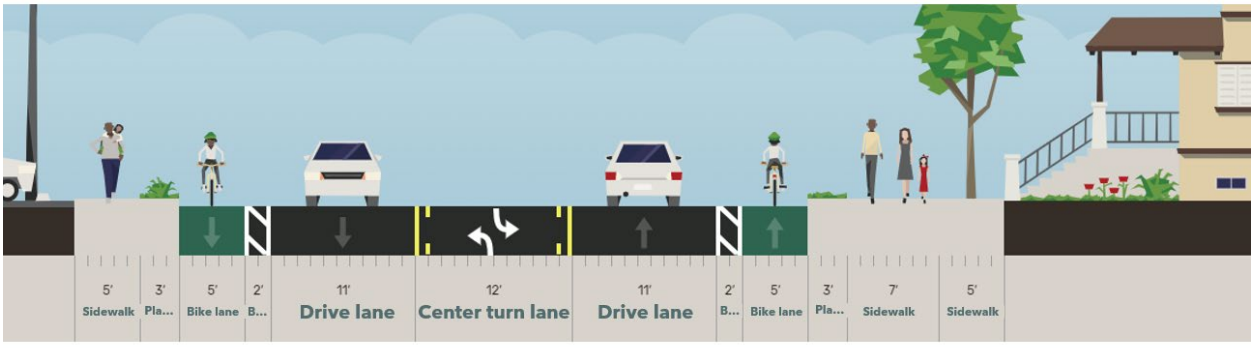


Figure 18 – Road Diet on Main Street Facing East, West of Ramsey Street, Before and After[23]



Existing Cross-Section of Main Street, West of Ramsey Street



Cross-Section of Main Street After Road Diet, West of Ramsey Street

Main Street is of a similar cartway width (46' to 48') as this example and could potentially accommodate one 11' travel lane, 5' bike lane, and 2' buffer in each direction of travel with a center two-way left turn lane. With a 71-foot ROW, there is an opportunity to enhance sidewalks including installing a sidewalk on the north side of Main Street and widening the existing sidewalk on the south side of Main Street (**Figure 18**). Both sidewalks could be increased to a minimum 6' feet in width and should be separated from the

[22] NJDOT / FHWA. (2015). 2015 CS Winner: Passaic County. YouTube. Civic Eye Collaborative. https://www.youtube.com/watch?v=_BAqvIRwjfM.
[23] Streetmix utilized for cross-section visualization: https://streetmix.net/-/505994.

street with a small buffer area. In addition, bus pull-offs could be provided by transitioning the bike lane and buffer area to sharrows at bus stops (**Figure 19**). Ideally, the road diet would be carried to the east towards Bound Brook to connect with more densely populated areas. While the intersection of Finderne Avenue & Main Street may not be able to accommodate cartway width for a bike lane, sharrows on Fulton Avenue and 2nd Street could be utilized by the Township to connect this bicycle route with the existing Township bicycle route west of Finderne Avenue on Bridgewater Avenue. Multiuse crossings with refuge islands at the intersections of Finderne Avenue & Bridgewater Avenue and Main Street & Fulton Avenue, if feasible, would help to further facilitate these connections.

Figure 19 – Transition from Bike Lane to Shared Bus Stop Area in Boston, Massachusetts[24]

Bus Stop Branding

For the six SCOOT bus routes utilizing Main Street, RSA participants observed the lack of amenities for transit service with no bus shelters, sitting areas, etc. Furthermore, as shown in the **Identified Issues & Observations** section of this report, these stops are incorrectly signed as having NJ TRANSIT service. While the installation of amenities, such as bus shelters, on the inbound (eastbound) side of Main Street would certainly help improve the visibility and useability of transit options in the Finderne neighborhood, a low-cost improvement that could be implemented within the corridor is the branding of bus stop signing with SCOOT, CAT, or RideWise TMA (Transportation Management Authority) logos. An example of bus stop branding for the Cross County Connection TMA's bus service in southern New Jersey is shown in **Figure 20**.

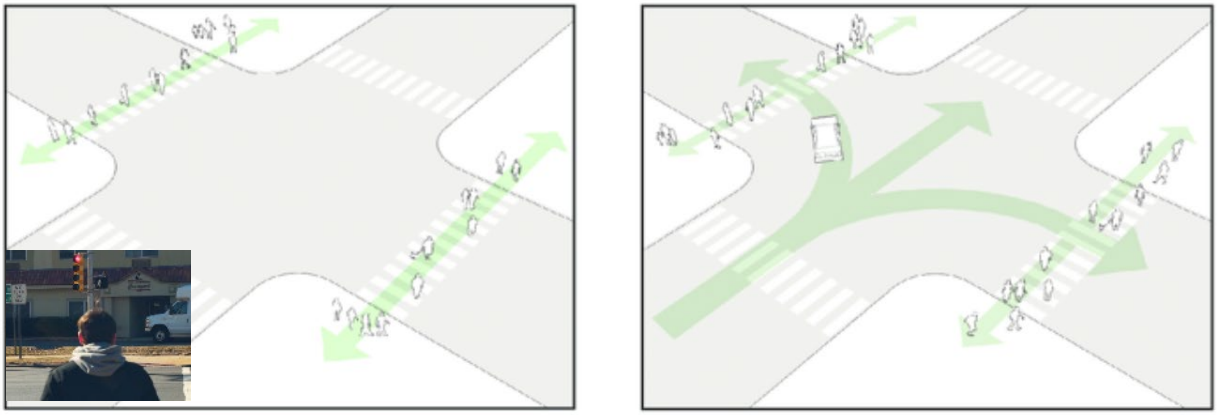
[24] USDOT / FHWA. (2015). *Separated Bike Lane Planning and Design Guide.*

Figure 20 – Sample of Bus Stop Branding[25]

Leading Pedestrian Intervals (LPIs) & Signal Phasing

LPIs are a low-cost, effective way to help pedestrians establish their presence at signalized crossing locations before conflicting vehicles have the right-of-way (**Figure 21**). This is one of FHWA's Proven Safety Countermeasures, boasting an approximate reduction of 13%[26] of pedestrian-vehicle crashes with proper implementation. Signal phasing and vehicular capacity are noted to be barriers to implementation, especially at signalized locations with lead left turn phasing, such as Main Street & Finderne Avenue. The County could take the approach to implement LPIs at every intersection where capacity and phasing allows, which could potentially make Main Street intersections with Ramsey Street/Pearl Street and Chimney Rock Road/Polhemus Lane candidates for implementation.

Figure 21 – Leading Pedestrian Interval (from NACTO and Lakewood Township)[27]



PHASE 1

Pedestrians are given a minimum head start of 3–7 seconds when entering the intersection.

PHASE 2

Through and turning traffic are given the green light. Turning traffic yields to pedestrians already in the crosswalk.

[25] CCC TMA. (2019). The Route 54-40 Community Shuttle Story. YouTube. Civic Eye Collaborative. https://www.youtube.com/watch?v=goRZBrrc8Tw.
[26] FHWA. (2017). Proven Safety Countermeasures. https://safety.fhwa.dot.gov/provencountermeasures/.
[27] Figure from National Association of City Transportation Officials. (2012). *Urban Street Design Guide*. Photo from NJDOT Technology Transfer. (2019). *What is an LPI?* YouTube. Civic Eye Collaborative. https://www.youtube.com/watch?v=xk8hn7rdHds.

At Main Street & Finderne Avenue, this improvement would be a way to target the pedestrian crash issues seen at this location (averaging one pedestrian crash per year). However, since all approaches have lead left turns, phasing at the intersection would have to drastically change to properly allocate LPIs on all crossings via lag left phasing, which could itself result in driver confusion and additional congestion. Left turn signal phasing itself can also be changed from protective/permissive (eastbound, northbound, and southbound approaches) similar to the protected-only (westbound approach) to provide further clearance and protection for pedestrians from left-hook collisions. In addition to LPIs and left turn signal phasing, No Turn on Red (NTOR) restrictions can be enacted at this intersection to mitigate the occurrence of right-hook pedestrian collisions.

All such signal phasing changes at Main Street & Finderne Avenue would result in the reduction of vehicular capacity at an already congested intersection. Initial investigation of the aforementioned signal phasing safety improvements discussed above within Synchro (with current signal timings and 2017 volumes delivered by the County) indicates the potential for queue spillback and failing conditions. The County should use caution and conduct a more detailed capacity analysis to determine if additional delay and queuing is outweighed by the potential safety benefit of the LPI. Costs calculated from HSM analyses and benefits calculated from the NJDOT *Road User Cost Manual* could be compared with each other for a B/C ratio.

Refuge Island/Diverter at Fulton Avenue Intersection

Through various outreach efforts (Public Meeting and TAC Meetings), both public and stakeholder participants have indicated occurrence of both cut-through and aggressive driving movements at the Main Street intersection with Fulton Avenue/Shopping Center Driveway. Drivers either drive straight across Main Street, turn left onto Main Street westbound, or turn left onto Main Street eastbound, which results in close calls and collisions at this four-leg unsignalized intersection location. A diverter island could be placed in the cross-hatched median of Main Street to preclude these at-risk turning movements at this intersection such as the crossing of three to four travel lanes, potential conflicting queues, and a wide median.

Figure 22 – Diverter Island for Consideration at Fulton Avenue[28]

[28] Figure from National Association of City Transportation Officials. (2014). Urban Bikeway Design Guide.

Figure 23 – RRFB Installation in Metuchen Borough by Middlesex County[29]

Furthermore, with the presence of multi-family housing to the south of the intersection and retail and recreational uses to the north of the intersection, such a diverter island (constructed in line with the current cross-hatched median on the westbound Main Street approach to Finderne Avenue) could also accommodate a 20' refuge area width for pedestrians to cross Main Street in two stages (**Figure 22**). It is recommended that pedestrian-actuated Rectangular Rapid Flashing Beacons (RRFBs, **Figure 23**Error! Reference source not found.) be implemented in conjunction with the diverter island to improve pedestrian visibility and improve the rate at which vehicles would stop for pedestrians.

Speed Humps on Fulton Avenue

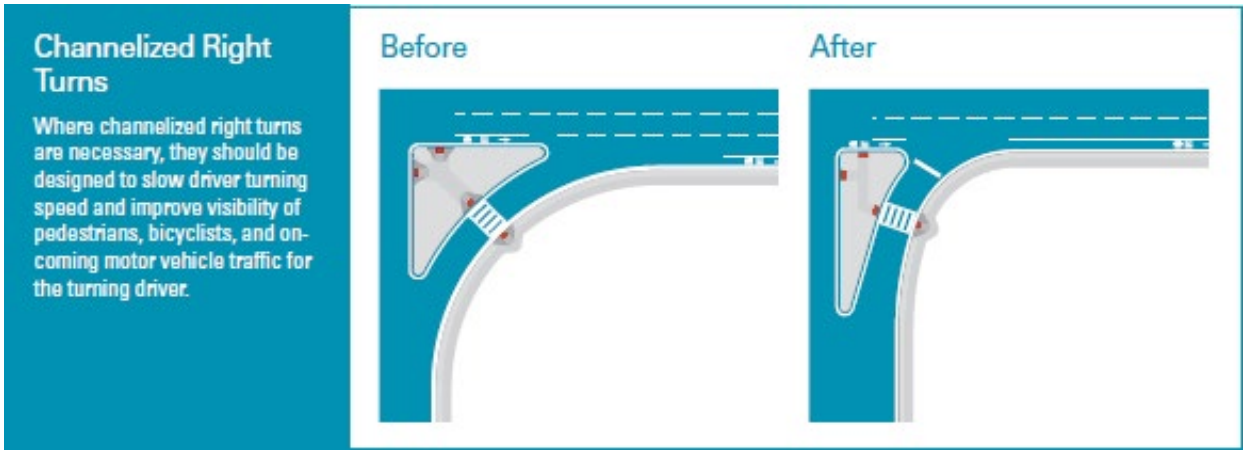
At the Township's discretion, either paved or raised speed humps could be installed on Fulton Avenue between Main Street and 2nd Street (and other locations throughout the neighborhood) to further discourage cut-through traffic. Speed humps can be designed to slow an average passenger car vehicle with a standard wheelbase width yet can also allow for bicyclists and larger emergency vehicles, such as firetrucks, to move along the street unimpeded (**Figure 24**).

Figure 24 – Sample Speed Humps from NACTO[30]

[29] NJDOT / FWHA. (2012). The Complete Streets Movement. YouTube. Civic Eye Collaborative. https://www.youtube.com/watch?v=IKAKxQvpeHk.
[30] Figure from National Association of City Transportation Officials. (2012). *Urban Street Design Guide*.

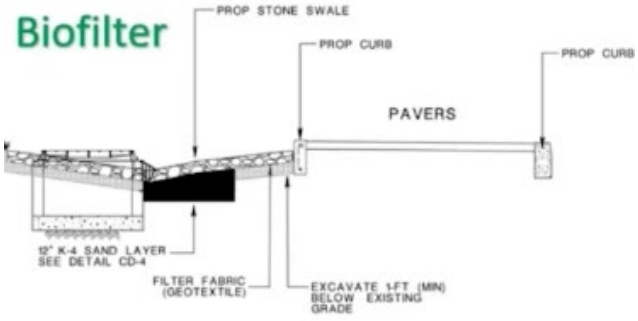
Channelized Right Turns at Finderne Avenue & Main Street
Channelized right turns introduce additional conflict points for a pedestrian crossing at an intersection. While these channelized right turn islands cannot be eliminated due to needed capacity at Finderne Avenue & Main Street, the design of these islands could be re-worked alongside ADA improvements for the non-compliant curb ramps at this intersection. By narrowing the channelized right-turn island, vehicular turning radii become less sweeping, right turning movements are slowed, and drivers turning right are forced to stop or yield to approaching traffic while being provided with a better sight line to vehicles to the left, as shown in **Figure 25**.

Figure 25 – Redesign of Channelized Right Turns[31]



Green Stormwater Infrastructure (GSI) – Biofilter on Northwest Corner of Finderne Avenue & Main Street
Currently, a small park exists in the northwest corner of the Finderne Avenue & Main Street intersection, which is owned and maintained by the County. Behind this small park exists a roughly 80' by 100' empty gravel lot owned by the County (according to Township tax maps), which could be redeveloped to incorporate a GSI feature, such as a bioswale or biofilter that would have plantings and mulch to slow infiltration and filter impurities (**Figure 26**). Such a feature would need to be maintained by the Township if the County is to consider implementation. A stormwater analysis should be performed to determine if an effective amount of runoff would be treated by this feature.

Figure 26 – Biofilter from Main Street Safety Improvements Project in Manville



[31] NJDOT. (2017). *2017 State of New Jersey Complete Streets Design Guide.*

Multi-use Path on West Side of Finderne Avenue

During the RSA, bike traffic was observed using the Finderne Avenue corridor for movements to and from the south (Manville). Although a bike route was signed over the railroad overpass and up to Bridgewater Avenue, little infrastructure and delineation was provided to bicycle traffic. Issues noted, like 4'-sidewalks with vegetative overgrowth, asphalt sidewalk areas without striping for active modes, and large curb cuts and unstriped driveway/street crossings (Central Avenue & Finderne Avenue), do not inform drivers of this important intercity travel route for pedestrians and cyclists. Although right-of-way is limited, this route should consist of striped asphalt paving, be widened to the extent possible for opposing cyclist traffic and should have appropriate striping and signing at intersections (Central Avenue, South Avenue, etc.; see **Figure 27**) to raise driver awareness of cyclists and pedestrians crossing driveways and intersections on the west side of Finderne Avenue.

Figure 27 – Multi-use Path Crossing Striping/Signing in Middle Township[32]

[32] NJDOT / FHWA. (2017). Cape May County: 2017 CS. YouTube. Civic Eye Collaborative. https://www.youtube.com/watch?v=Ecg2vAe_2K0.

VII. Conclusion

This RSA Report seeks to describe the process undertaken by the County to investigate potential traffic safety issues along the Main Street/Finderne Avenue corridor, from 100' north of the South Avenue intersection at MP 29.60 to the Chimney Rock Road intersection at MP 30.60, located in Bridgewater Township. From survey of prior County, municipal, or regional studies to public and stakeholder outreach conducted as part of this study to the crash data that was reviewed report-by-report to the observations made during in-field audits, potential concerns were observed and recorded, not only for corridor-wide issues, but for location-specific issues.

In order to address these potential concerns, discussions were held with the RSA team and County Engineering to develop a list of tasks to improve traffic safety on the corridor, which are codified in the Implementation Matrix (Chapter VI, Subsection A) in this report. To assist the responsible jurisdictions (whether municipal, County, or separate agency) to schedule and prioritize these improvements, such were classified by anticipated timeline and cost magnitude. The County should share the recommendations with all responsible jurisdictions to provide multiple potential avenues for implementation.

While the recommendations in the Implementation Matrix are centered around the engineering (and associated maintenance) of roadway features, changes to hard infrastructure alone will fall shy of the benefit that would be seen by implementing the 5E's of highway safety[33]:

- Engineering: highway design, traffic, maintenance, operations, and planning professionals;
- Enforcement: State and local law enforcement agencies;
- Education: communication professionals, educators, and citizen advocacy groups;
- Emergency response: first responders, paramedics, fire, and rescue; and,
- Equity: prioritizing the safety of vulnerable roadway users.

This approach recognizes a shared responsibility across numerous professions to see improved benefits in corridor crash performance, beyond the anticipated reduction in crashes with the implementation of proven crash countermeasures. RideWise, law enforcement, and EMS are encouraged to continue their efforts in educating the local driving population, holding driving behaviors accountable to Title 39, improving the response times to severe crash incidents, and reaching underserved communities with these safety strategies.

[33] Adapted from FHWA, https://safety.fhwa.dot.gov/hsip/resources/fhwasa1102/flyr3_in.cfm