Proposed Residential Development
Greenbrier Phase II

Seekonk,
Massachusetts

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EXECUTIVE SUMMARY

This transportation assessment has been prepared to evaluate potential traffic impacts associated with a proposed 240-unit residential development, Greenbrier Phase II (the "Project"), to be constructed adjacent to the existing Greenbrier Condominiums and Apartments Complex (Phase I), which is located on the east side of Fall River Avenue (Route 114A) in Seekonk, Massachusetts. Access to the Project site will be provided off Cole Street (approximately 345 feet east of the intersection of Route 114A and Cole Street) with no internal connection between the proposed residential development and the existing Greenbrier Complex that would result in access to Greenbrier Drive and Howland Street.

The scope for this transportation assessment was developed in consultation with the Town of Seekonk and the Town's Traffic Consultant, Vanasse & Associates, Inc., and it was performed in accordance with MassDOT's Transportation Impact Assessment (TIA) Guidelines. All traffic count data obtained for the purpose of this assessment were evaluated and adjusted, as required, to meet pre-COVID conditions.

Additionally, this assessment identifies and addresses the roadway improvements that were approved as part of the required mitigation under the Final Environmental Impact Report (FEIR) Certificate EEA #13450 for the existing Greenbrier Condominiums and Apartments Complex that have not been constructed to date.

However, it is the Proponent's intent to have these improvements designed, permitted, and constructed in accordance with MassDOT requirements and approvals prior to the completion and occupancy of the first building structure of the proposed Project. As such, these improvements are considered as "existing" under both the No-Build and Build Condition analyses for the purpose of this assessment.

The required mitigation under the certificate for the existing Greenbrier Phase I Complex included the following roadway improvements:

- Widening of the westerly side of Fall River Avenue to provide a three-lane cross-section in the vicinity of the existing Greenbrier Drive intersection (two lanes southbound and one lane northbound), and a four-lane cross-section in the vicinity of the Cole Street intersection, extending to the I-195 westbound ramp.
- Extension of the existing sidewalk at Perry Avenue, running southerly along Fall River Avenue to the intersection of Cole Street and Springhouse Trail.
- Design of a traffic signal system for the intersection of Fall River Avenue and Cole Street that will operate in coordination with the signals at the I-195 ramps and the Lowe's Access Road. Additionally, as part of the widening, the Proponent was to install all subsurface infrastructures necessary for the installation of the traffic signal system.
- The intersection of Cole Street and Fall River Avenue was to be monitored by the Proponent after reaching full occupancy, and the traffic signal was to be installed when it was determined to either meet the warrant for signalization or it becomes necessary for safe operations.

Although the Greenbrier Phase I project was completed a few years ago, full or near full occupancy was not achieved until recent years. In the interim, the Proponent acquired an additional 22-acre parcel that was formerly the site of the Showcase Cinema, with the intent of subdividing the property into two separate parcels. Parcel one will consist of approximately 7.8 acres and will include the existing Showcase building. The second parcel will consist of 14.2 acres and will be the site for the proposed Project. It is the Proponent's current plans to remodel the existing Showcase building for warehouse and medical office space, including associated parking, within the next couple of years. Given the time frame to complete these improvements, we considered this component as a separate project, and included this project under the "No-Build" condition analysis for the Greenbrier Phase II Project.

Since the original Greenbrier Condominiums and Apartments project reached near full occupancy in recent years, and since the Proponent was planning on constructing the proposed Project, our office conducted a preliminary traffic evaluation in October 2020 to determine if, (a) under current conditions, the intersection of Cole Street and Fall River Avenue met the warrant for signalization, and (b) determine if the proposed project should have full access to the existing Greenbrier Complex. Based on that preliminary assessment, it was determined that the proposed residential project should have no physical connection to Greenbrier Drive and Howland Street, and that the Cole Street and Fall River Avenue intersection currently met the warrant for signalization.

Findings and Recommendations

Following are key findings based on our assessment of the proposed Project:

- In a period of 4 years and 8 months, the segment of Fall River Avenue from the County Street intersection to the intersection of the I-195 EB Ramps experienced a total of 155 accidents. The intersection of Cole Street and Fall River Avenue experienced 23 accidents during this time frame with approximately 57 percent of the accidents classified as angle-type accidents. Additionally, the Crossroads Convenience Store, which is located near the Cole Street intersection, experienced 26 accidents during the same time frame, with two of the accidents involving pedestrians.
- Based on the latest Institute of Transportation Trip Generation Manual for this Land Use Code as well as data obtained at the existing Greenbrier Complex, the proposed residential development is estimated to generate approximately 1,306 vehicle trips on an average weekday, 61 vehicle trips during the weekday morning peak period, and 138 vehicle trips during the weekday evening peak period.
- The available sight distance at the proposed driveway will meet the minimum sight distance requirements for the posted speed of Cole Street and will provide a clear line of sight to the Cole Street and Fall River Avenue intersection and to the Springhouse Trail and Cole Street intersection.
- As long as the approved roadway improvements proposed under the mitigation for the FEIR Certificate are in place, the proposed Project will not have a significant impact on the operations along Fall River Avenue. Increase in delays and queues will be minimal between the No-Build and Build Conditions.

Based on our findings, it is our recommendation to implement minor additional improvements to facilitate safer operations within the study area. These recommendations include the following:

- Closure of the by-pass connection between Fall River Avenue and Cole Street, located between the Crossroads Convenience Store property and the Cole Street intersection.
- Minor geometric improvement to the Cole Street and Fall River Avenue intersection to provide a northbound channelized free-right-turn from Fall River Avenue.
- As part of the proposed development for the Showcase building site, the southernmost driveway along Fall River Avenue will be closed and a new driveway will be provided off the proposed Greenbrier Phase II access drive. This driveway will have a "no trucks" restriction.

GENERAL INFORMATION

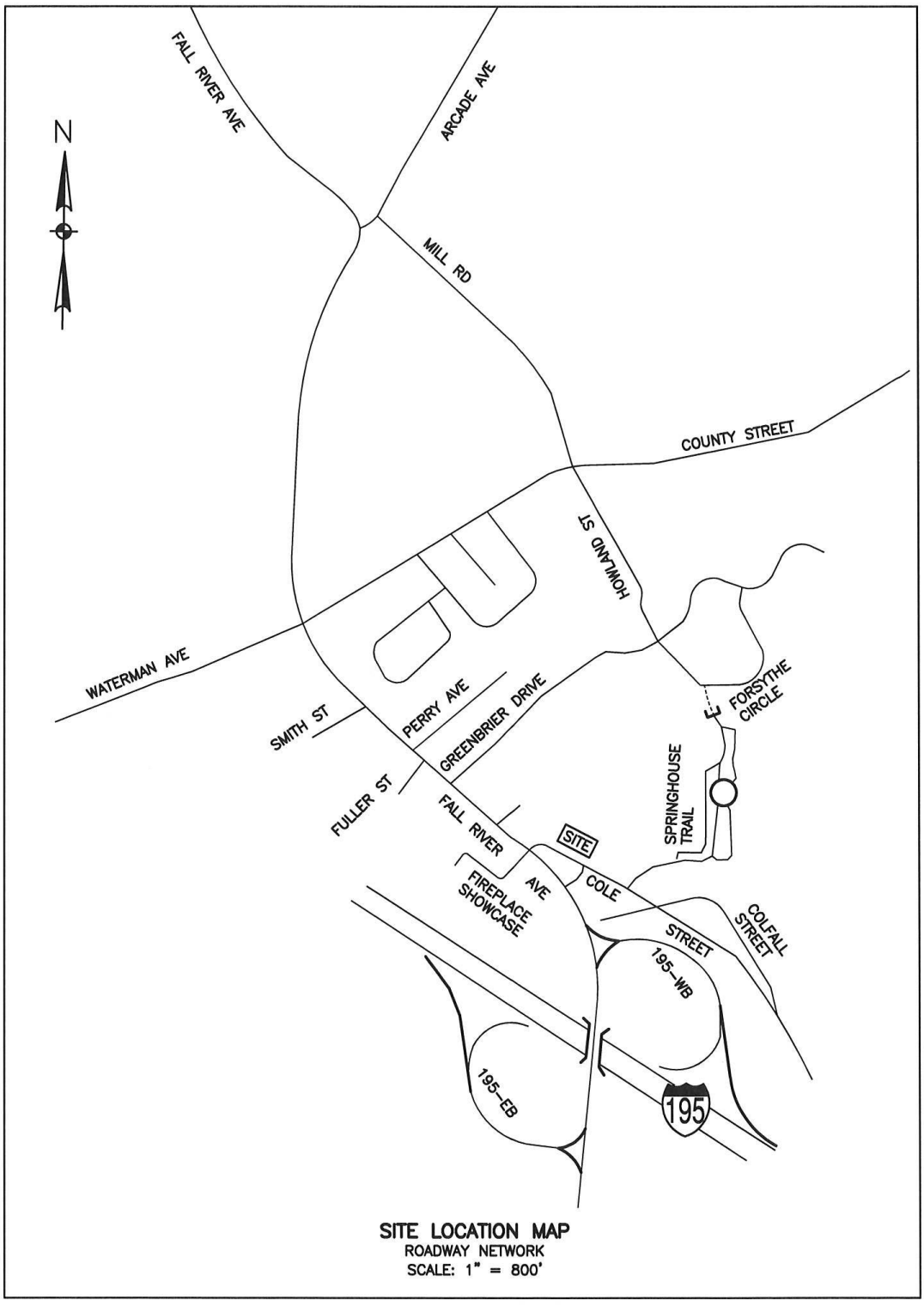
Project Description

In recent years, the Proponent acquired approximately twenty-two acres of land, formerly the Showcase Cinema property, located on the easterly side of Fall River Avenue (Route 114A), and adjacent to the existing Greenbrier Condominiums and Apartments Complex. The 22-acre parcel will be subdivided into two separate parcels. The existing Showcase building site will retain approximately 7.8 acres, and the remaining 14.2 acres will be utilized for the proposed 240-unit residential development project. Figure 1 shows the location of the Project site and surrounding roadway network system.

Access and egress from the proposed residential development will be provided via a new driveway located off Cole Street, approximately 345 feet east of the Route 114A and Cole Street intersection, and approximately 345 feet west of the Springhouse Trail and Cole Street intersection. Although the proposed Project will be located adjacent to the existing Greenbrier Phase I Complex, the site internal roadway system has been designed to provide no physical connection for general vehicular traffic between the proposed and existing developments that would result in access to Greenbrier Drive and Howland Street. However, emergency vehicles will have access through a gated emergency access road that will be locked at all times. Pedestrian access will be provided throughout the entire site and bicycle accommodations will be supplied at the community center.

Primary access and egress to the existing Showcase building site will be provided via the existing northernmost driveway located off Route 114A. A secondary new driveway will be constructed to intersect the proposed Project site access driveway one hundred feet north of Cole Street. This driveway will be signed to provide truck access restriction. Additionally, the existing southernmost driveway located off Route 114A will be closed to provide safer operations at the Cole Street intersection.

The existing Showcase building will be remodeled to provide warehouse and medical office space and the site parking lot layout reconfigured to provide the required number of parking spaces for the new building uses. It is anticipated that the work on the Showcase parcel will be completed approximately five years before the proposed Project is completed.


N
FALL RIVER AVE
ARCADE AVE
MILL RD
COUNTY STREET
HOWLAND ST
WATERMAN AVE
SMITH ST
PERRY AVE
GREENBRIER DRIVE
FORSYTHE CIRCLE
SPRINGHOUSE TRAIL
FULLER ST
FALL RIVER AVE
SITE
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195-EB
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SITE LOCATION MAP
ROADWAY NETWORK
SCALE: 1" = 800'

FIGURE 1

Study Approach

The scope for this assessment was developed in consultation with the Town of Seekonk and the Town's Traffic Consultant, Vanasse & Associates, Inc. (VAi). Additionally, the study was conducted in accordance with the MassDOT's Transportation Impact Assessment (TIA) Guidelines.

In October 2020, prior to the preparation of this assessment, our office obtained automatic traffic counts at four separate locations, three on Route 114A and one on County Street, east of the Howland Street intersection. In addition, we obtained turning movement counts at the three existing access driveways for the Greenbrier Condominiums and Apartments Complex and at the intersection of Cole Street and Route 114A. The data obtained from these counts provided us with the necessary information to determine if the proposed Project's internal site layout should provide a connection for general vehicular traffic to the existing Greenbrier residential development and to determine if the intersection of Cole Street and Route 114A met the warrant for signalization (a requirement under the Final Environmental Impact Report (FEIR) Certificate EEA #13450 for the existing Greenbrier Condominiums and Apartments Complex).

The data obtained for the preliminary evaluation was utilized in conjunction with new data obtained in late August 2021 for this transportation impact assessment. Our approach in the development of this assessment included the following major tasks:

Task 1 - Conducted field reviews, evaluated existing conditions including roadway geometry, pedestrian and bicycle facilities, availability of public transit, and evaluated approximately five years of crash data along the segment of Route 114A between the intersection of County Street and the I-195 EB Ramp. We obtained supplemental automatic counts (ATRs) and turning movement counts (TMCs) at most of the previously counted locations and obtained new counts at three additional intersections. We evaluated the 2021 and 2020 traffic data and made the necessary adjustments to meet pre-COVID conditions and conducted operational analyses of project area intersections under existing conditions.

Task 2 - Obtained and analyzed proposed site traffic projections, determined site traffic distribution and assignment, obtained background traffic growth rate for the area, and projected the data for a period of seven years, as per TIA Guidelines. The future no-build and build conditions were evaluated and analyzed with the assumption that all required improvements under the mitigation for the original Greenbrier development project were in place and as such, considered existing for the purpose of this assessment.

Task 3 - We summarized our findings and made additional recommendations that provide improved traffic operations and safety conditions in the vicinity of the Project area.

EXISTING CONDITIONS AND ANALYSES

Study Area

The study area for this project was developed in consultation with the Town of Seekonk and the Town's Traffic Consultant, Vanasse & Associates, Inc., for assessment of potential traffic effects with respect to the proposed residential development. The study area extends the length of Route 114A from the intersection of County Street south to its intersection with the I-195 EB Ramp. The study also includes a segment of County Street from the intersection of Route 114A to just east of the Howland Street intersection as well as a segment of Cole Street extending from the intersection of Route 114A to the intersection of Springhouse Trail.

Following is a list of the signalized and unsignalized intersections that were evaluated within the Project study corridor for potential effects.

Signalized Intersections

- Route 114A and County Street
- Route 114A and I-195 WB Ramps
- Route 114A and I-195 EB Ramps

Unsignalized Intersections

- County Street and Howland Street/Mill Road
- Route 114A and Greenbrier Drive
- Route 114A and Cole Street*
- Cole Street and Springhouse Trail

*This intersection was evaluated as a signalized intersection under the No-Build and Build conditions.

Roadways and Intersections

Route 114A is a state roadway, classified as an Urban Minor Arterial. Within the Project area, Route 114A runs in a north-south direction and is posted for 30 mph. Within the study area, Route 114A is a two-lane roadway varying in width from 42 to 45 feet. The roadway in this area is striped to provide two 12-foot travel lanes and two 9- to 11-foot shoulders. South of the I-195 westbound ramps, the typical section of Route 114A widens to provide four 11-foot travel lanes and two 4-foot shoulders. The four-lane section continues south to the intersection of Route 6. Land use along Route 114A is primarily commercial. Sidewalks are present on the east side of Route 114A from Mill Road to Perry Avenue, and from the Clarion Inn to Route 6. On the west side of Route 114A, sidewalks are present from Burrs Pond to Fuller Street and from just south of the I-195 EB Off-Ramp to Route 6. On-street parking is prohibited along the Route 114A corridor.

I-195 is a major divided limited access highway system, providing access to cities located east and west of the Project and to other major highways. It provides access to I-95 to the west and to I-495 and Route 24 to the east. Both I-195 eastbound and westbound ramps are signalized at their junction with Route 114A. Ramp signals are three-phase, fully actuated systems, with no pedestrian actuation provided. Both ramp signals

are coordinated via spectrum radio with the traffic signal system at the intersection of the Lowe's access roadway. Crosswalks are not present at either ramp intersection.

County Street is under town jurisdiction and is classified as an Urban Collector. County Street runs in an east-west direction from its intersection with Warren Avenue and Waterman Avenue in East Providence, RI, to the Rehoboth Town line. County Street is a two-lane roadway, approximately 30 feet in width. In the vicinity of Howland Street, the posted speed limit is 30 mph. On-street parking is prohibited along most of the corridor. Land use is primarily residential, although commercial development is present near the Route 114A intersection and the Olney Street intersection.

The signalized intersection of County Street and Route 114A is currently under construction and is undergoing signal and geometric improvements. These improvements include provisions for exclusive left-turn lanes at three of the approaches to the intersection, new sidewalks, a new fully actuated signal system with protected left-turn phase for the eastbound and northbound approaches, and an exclusive pedestrian phase. These enhancements will improve operations at the intersection during off-peak periods. However, during peak periods, the intersection will continue to experience operational issues related to high traffic volumes and limited capacity.

Cole Street is a local, two-lane road, approximately 30 feet wide and under town jurisdiction. Cole Street runs in a southeasterly-northwesterly direction with a posted speed limit of 30 mph. Cole Street intersects with Route 114A at an acute angle, approximately 650 feet north of the I-195 westbound ramp. The intersection is unsignalized and operates under stop-sign control.

Traffic Volumes

As mentioned in a previous section of this report, a data collection program was conducted in October 2020 and a new data collection program was conducted in August 2021 to establish baseline traffic conditions in the Project study area. Both programs included automatic 48-hour counts, turning movement counts, speed and classification data.

48-Hour Automatic Traffic Counts (ATRs) were obtained at the following locations:

October 2020

- Route 114A between Clarke Street and Arcade Avenue
- Route 114A between County Street and Perry Avenue
- Route 114A between I-195 Ramps
- County Street east of Howland Street

August 2021

- Route 114A between County Street and Perry Avenue
- Route 114A between I-195 Ramps

Turning Movement Counts (TMCs) were obtained at the following intersections:

October 2020

- Route 114A and Greenbrier Drive (6:30 am to 6:30 pm)
- Route 114A and Cole Street (6:30 am to 6:30 pm)
- Cole Street and Springhouse Trail (7:00 to 11:00 am and 2:00 to 6:00 pm)
- County Street and Howland Street/Mill Road (7:00 to 11:00 am and 2:00 to 6:00 pm)

August 2021

- Route 114A and County Street (7:00 to 11:00 am and 2:30 to 6:30 pm)
- Route 114A and Greenbrier Drive (7:00 to 11:00 am and 2:30 to 6:30 pm)
- Route 114A and Cole Street (6:30 am to 6:30 pm)
- Route 114A and I-195 WB Ramp (7:00 to 11:00 am and 2:30 to 6:30 pm)
- Route 114A and I-195 EB Ramp (7:00 to 11:00 am and 2:30 to 6:30 pm)
- Cole Street and Springhouse Trail (7:00 to 11:00 am and 2:30 to 6:30 pm)

Manual turning movement counts were obtained during the weekday morning and evening peak periods, except for the Greenbrier Drive intersection, which was counted for a 12-hr period in 2020, and the Cole Street intersection, which was counted for a 12-hour period under both programs.

Based on analysis of manual count data, weekday morning and evening peaks occur anywhere between 7:15 and 8:00 AM, and 4:15 and 5:45 PM, respectively. Since individual intersection peak hours fluctuate within the above time periods, actual peak hour volumes were used in the baseline condition analysis for the Route 114A corridor.

The evaluation of the automatic count data showed that traffic volumes along the Route 114A corridor increased by approximately 17% between October 2020 and August 2021. However, based on historic data obtained from the MassDOT Transportation Data Management System, traffic volumes decreased between 2019 and 2020 by approximately 20% in the study area. As such, we adjusted the August 2021 data by an additional 5% so that the baseline data for this assessment could be representative of conditions found during pre-COVID times.

Automatic count data were not adjusted with seasonal factors since this information is not currently available for counts obtained in 2020 or 2021, due to the COVID pandemic impact on traffic related data. We calculated an Average Daily Traffic (ADT) for each location counted as well as the directional distribution of traffic. This information is presented in Figure 2.

Since the 2021 count data was acquired in late August during schools' summer break, the Town had some concerns that the counts may not represent conditions when schools are in session. As such, supplemental counts were obtained at the Howland Street/Mill Road and County Street intersection on September 29, 2021, from 2:00 to 3:00 pm and at the intersection of Springhouse Trail and Cole Street from 7:30 to 8:30 am, also on September 29, 2021, and again on October 6, 2021. The results of the supplemental counts showed an increase in traffic of 20% during the morning hour counts. The difference between the

supplemental afternoon count and the August count was minimal. Based on the new data, we adjusted the morning peak hour base volumes for all project intersections by an additional 15% for a total increase of 20%.

Peak hour volumes for the 2021 adjusted weekday peaks are presented in Figures 3 and 4 for the study intersections. Turning movement and automatic count sheets obtained during both count programs, as well as adjusted intersection morning and evening peak hour summaries are provided in Appendix A.

Pedestrian and Bicycle Facilities

Pedestrians and bicycles were counted at all study intersections as part of the turning movement counts conducted during both count programs. Pedestrian volumes ranged from one pedestrian crossing at the Greenbrier Drive intersection to 18 crossings at the County Street and Route 114A intersection. Table 1 below provides a breakdown of the number of pedestrian crossings and observed bicycles within the study corridor. Data pertaining to pedestrian and bicycle are also included in the count sheets provided in Appendix A.

Table 1

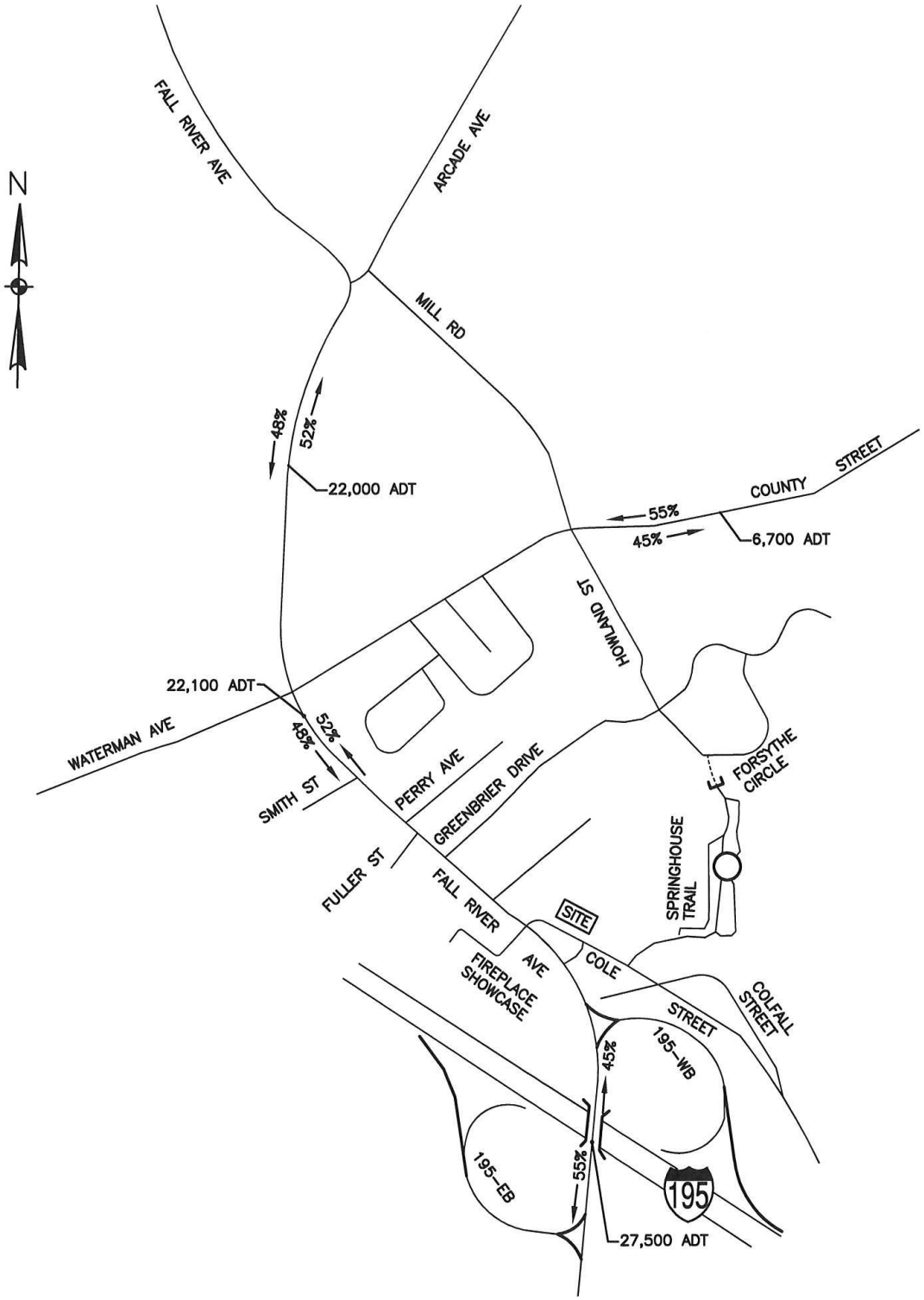
SUMMARY OF PEDESTRIAN AND BICYCLE ACTIVITIES

INTERSECTION	*PEDESTRIAN CROSSINGS*		*BICYCLES*	
	2020	**2021**	**2020**	**2021**
Route 114A & Greenbrier Drive	6	1	1	2
Route 114A & Cole Street	2	2	4	2
Route 114A & County Street	-	18	-	5
Route 114A & I-195 WB Ramps	-	0	-	2
Route 114A & I-195 EB Ramps	-	2	-	0
County Street & Howland Street	9	-	5	-
Cole Street & Springhouse Trail	11	4	5	1

Public Transportation

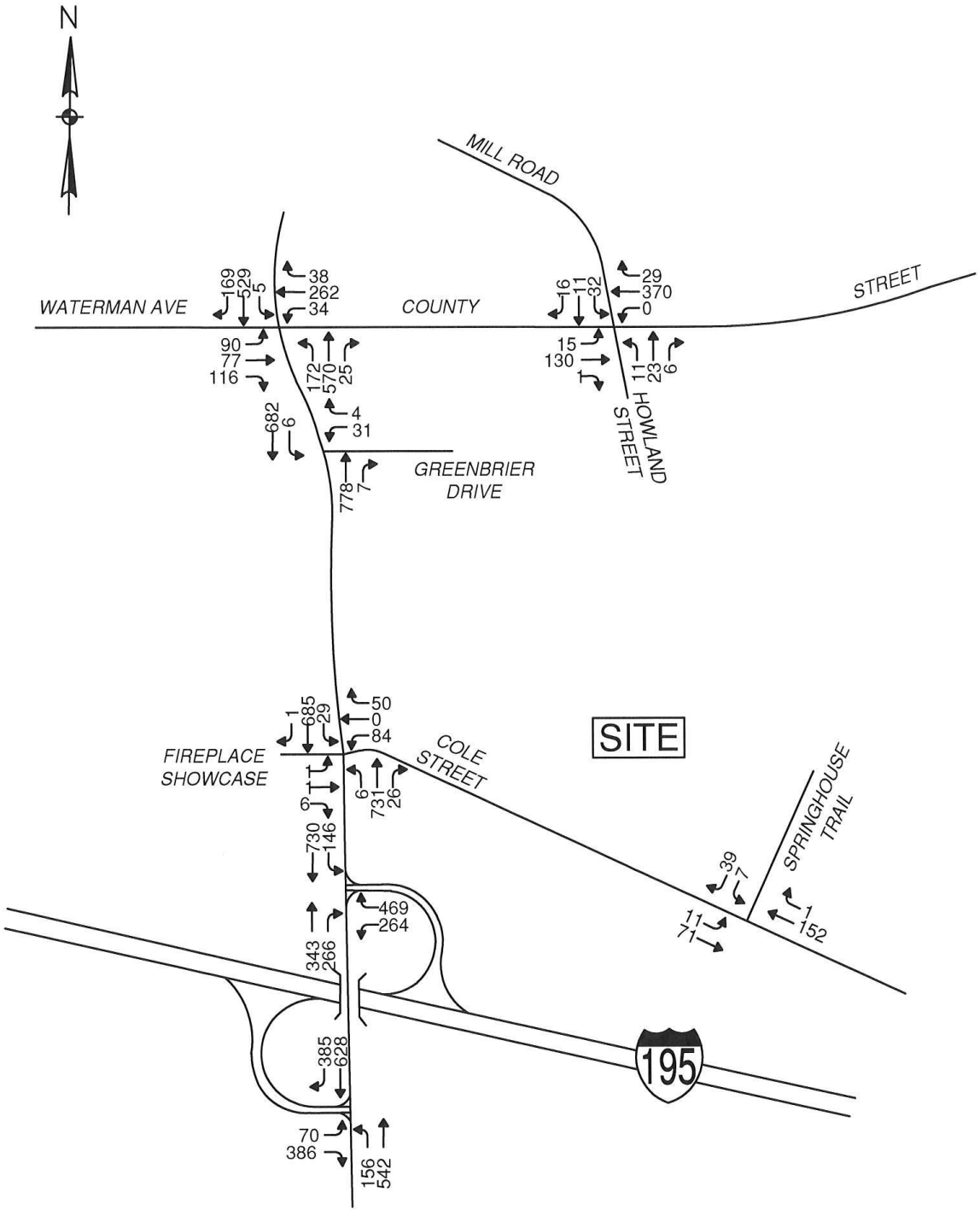
Public transportation is not readily available near the proposed site. The nearest bus route is Bus Route 16 (Seekonk-Attleboro), operated by the Greater Attleboro Taunton Regional Transit Authority (GATRA). The nearest stop on Bus Route 16 is in northern Seekonk at Central Avenue, approximately 7 miles from the Project site.

Access to the Massachusetts Bay Transportation Authority (MBTA) Commuter Rail (Providence/Stoughton line) is available from downtown Providence, South Attleboro Station (currently closed), and Attleboro Station. The closest commuter rail station is Providence, approximately 6 miles west of the Project site. South Attleboro Station is approximately 7 miles to the north, and Attleboro Station is approximately 12 miles to the northeast.



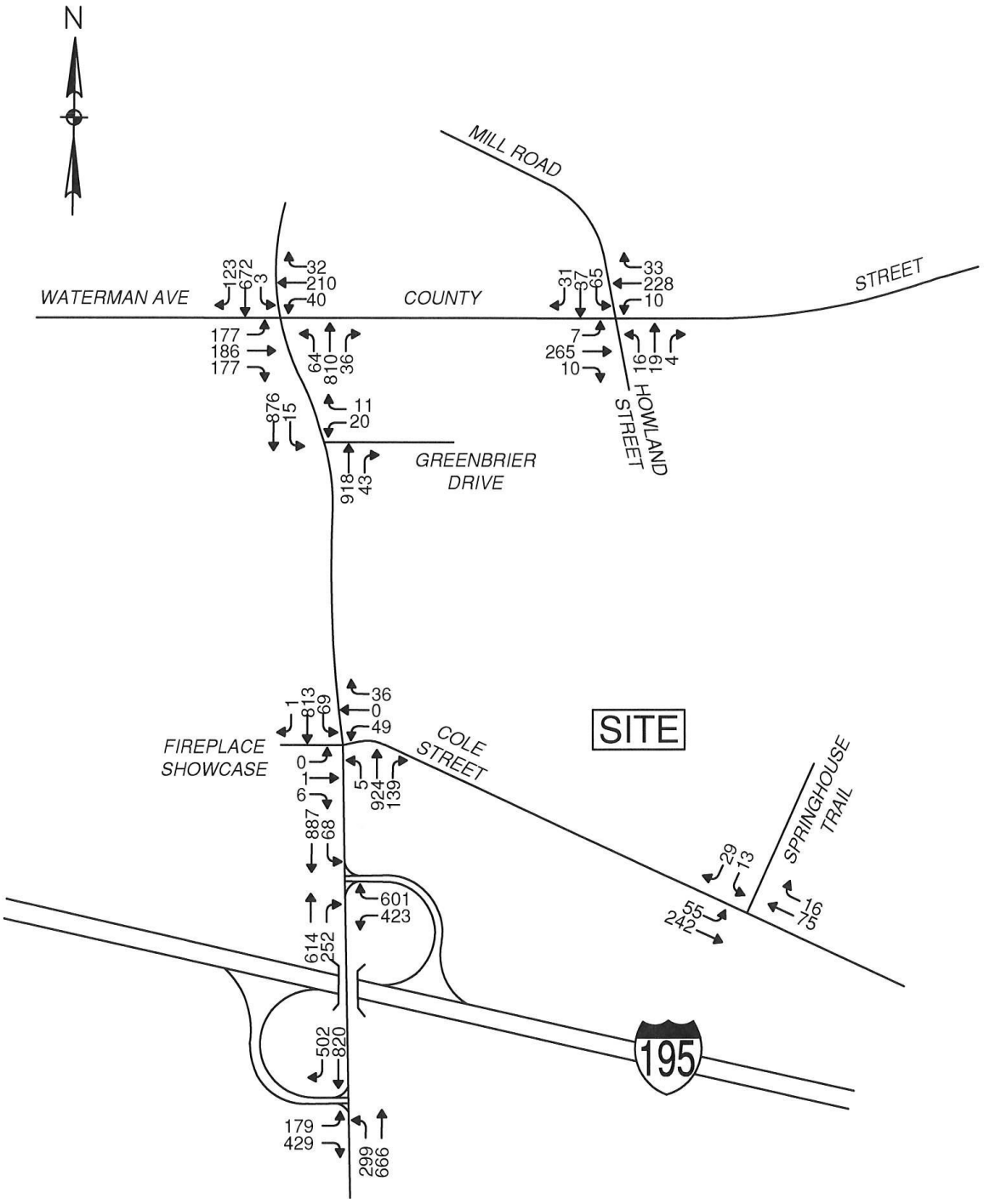
ADJUSTED 2021 ADT AND ROADWAY DIRECTIONAL DISTRIBUTION

FIGURE 2



2021 ADJUSTED EXISTING WEEKDAY AM PEAK VOLUMES

FIGURE 3



2021 ADJUSTED EXISTING WEEKDAY PM PEAK VOLUMES

FIGURE 4

Speed Data

Speed data were collected along Route 114A as part of the 48-hour automatic counts conducted for the Project. Speed data sheets are included with the ATRs count sheets in Appendix A. Table 2 below provides a summary of the vehicle travel speed along Route 114A and County Street. Analysis of speed data indicate that the 50th Percentile travel speeds along Route 114A range between 30 and 35 mph in the northbound direction and between 30 and 37 mph in the southbound direction. The 85th percentile speed range between 36 and 41 mph in the northbound direction and between 34 and 44 mph in the southbound direction.

Table 2

VEHICLE TRAVEL SPEED SUMMARIES (MPH)

	Fall River Avenue (Route 114 A)	
	Northbound	Southbound
Between County Street and Perry Avenue		
50th Percentile Speed	30 - 32	30 - 33
85th Percentile Speed	36 - 37	34 - 38
Posted Speed Limit	30	30
Between I-195 Ramps		
50th Percentile Speed	33 - 35	35 - 37
85th Percentile Speed	40 – 41	40 - 44
Posted Speed Limit	35	35
Between County Street and Clarke Street		
50th Percentile Speed	33 - 34	35
85th Percentile Speed	37	38 - 39
Posted Speed Limit	30	30
	County Street	
	Eastbound	Westbound
East of Mill Road		
50th Percentile Speed	38 – 39	36
85th Percentile Speed	43	40
Posted Speed Limit	30	30

Crash Data Evaluation

Motor vehicle crash reports were obtained from the Town of Seekonk and supplemented with data obtained from the MassDOT Highway Division for the intersections of Route 114A at County Street, Greenbrier Drive, Showcase Property Driveways, Cole Street, Crossroads Convenience Store Driveway, I-195 WB and EB Ramps and the Dublin Rose Sports Pub/Clarion Inn Driveway. We also obtained crash data for the Springhouse Trail and Cole Street intersection. The accident data covered a 4.7-year period from January 1, 2017, through August 15, 2021. During this period, 23 accidents were reported at the Cole Street intersection, 26 accidents at the Crossroads Convenience Store, 22 accidents at the I-195 WB Ramp, 19

accidents at the I-195 EB Ramp, and 46 accidents at the County Street intersection. All other locations experienced less than 9 accidents during the 4.7-year period. Over 50% of the accidents that occurred in the vicinity of the Cole Street and the Crossroads Convenience driveway intersections were angle-type accidents. Additionally, two of the accidents that occurred in this area involved pedestrians. Most of the accidents at the I-195 Ramps (over 80%) were rear-end type accidents. At the County Street and Route 114A intersection, the majority of accidents were rear-end type (41%) and angle-type accidents (30%).

The segment of Route 114A from the County Street intersection south to the intersection of the I-195 EB Ramp experienced a total of 155 accidents during the 4.7-year period. Table 3 provides a summary of the crash data for this segment of Route 114A. The summary table and a segment crash rate worksheet has been included in Appendix B as well as intersection crash rate worksheets for key intersections along Route 114A within the study area. Crash rate calculations indicate that some of the intersections within the study area exceed the MassDOT District 5 latest available average rates for signalized and unsignalized intersections.

Operational Analyses - Existing Conditions

Operational analyses for unsignalized intersections were conducted using the latest version of the HCS software, which uses the methods set forth in the 2016 Highway Capacity Manual for Two-Way Stop-Control published by the Transportation Research Board. Operational analyses for signalized intersections were conducted using SYNCHRO 10 software. Level of Service (LOS) is the term typically used in describing the operating condition of a road or intersection. LOS at signalized intersections is measured in terms of total control delay experienced by stopped vehicles at an intersection. Intersection LOS is intended to describe the level of driver discomfort, fuel consumption, and lost travel time experienced at an individual intersection approach, lane group, or at the intersection as a whole. LOS varies from A to F; with LOS A indicating delays less than ten seconds per vehicle and LOS F indicating delays in excess of 80 seconds per vehicle.

At an unsignalized intersection, LOS is measured in terms of average control delay, and it is used to provide a description of the delay and operational characteristics of the movements from a stop-sign controlled approach and those of left-turn movements from an uncontrolled approach. Through and right-turn movements on uncontrolled approaches generally do not experience delay. Tables 4 and 5 below identifies the level of service conditions for signalized and unsignalized intersections.

Capacity analyses for weekday peak periods were conducted for existing conditions. Capacity analyses were conducted for all study intersections listed under the “Study Area” Section of this report, and summary results are presented in Table 6 (unsignalized intersections) and Table 7 (signalized intersections). The summaries include LOS, delay, and volume-to-capacity for each movement and overall intersection conditions. As part of the operational analyses, the 50th and 95th percentile queue lengths were calculated for each signalized intersection during both peak periods as well as the 95th percentile queue length for minor street approaches at unsignalized intersections. This information is also presented in the above tables. The tables and the analysis result report for each intersection are provided in Appendix C.

Table 4

SIGNALIZED INTERSECTIONS
LEVEL OF SERVICE CONDITIONS

Level of Service	Average Control Delay (Seconds/Vehicle)
A	≤ 10.0
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 – 50
F*	> 50.0

*If the v/c ratio exceeds 1.0 (> 1), LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Table 5

UNSIGNALIZED INTERSECTIONS
LEVEL OF SERVICE CONDITIONS

v/c ≤ 1.0	Average Control Delay (Seconds Per Vehicle)
A	≤ 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F*	> 50.0

*If the v/c ratio exceeds 1.0 (> 1), LOS F is assigned to the individual lane group or the minor street approach at TWSC intersections. Overall intersection LOS is determined solely by control delay.

The two signalized I-195 Ramp intersections currently operate at acceptable LOS during the morning and evening peak periods. The County Street intersection will operate at acceptable LOS during off-peak periods when the current construction is completed; however, during the morning peak, it will operate at LOS E and LOS F during the evening peak. The unsignalized intersection of Route 114A with Cole Street also operates at LOS F during both peak periods. Additionally, the intersections of County Street with Howland Street/Mill Road, Cole Street with Springhouse Trail and Route 114A with Greenbrier Drive (morning peak only) operate at acceptable LOS during both peak periods.

Delay studies were conducted at the Greenbrier Drive and at the Cole Street intersections with Route 114A during the morning and evening peak periods. Delay data show maximum queue lengths of 3 and 5 vehicles

at the Greenbrier driveway and the Cole Street approaches, respectively. Intersection delay data sheets are provided in Appendix C.

A warrant analysis was conducted to determine if a signal system is warranted at the Cole Street intersection under current conditions. Traffic volumes obtained at the intersection were reviewed against the minimum thresholds set forth in the latest revisions of the Manual on Uniform Traffic Control Devices (MUTCD) for applicable warrants. Based on our evaluation, the intersection met the conditions under Warrants 1 "Eight-Hour Vehicular Volume" and Warrant 2: "Four-Hour Vehicular Volume." Warrant analysis worksheets are included in Appendix C.

Other Planned Development Projects

The Town of Seekonk Planning Department was contacted to determine if any major development or roadway improvement projects are planned in the vicinity of the proposed project that could potentially impact traffic volumes within the study area. The Town identified two future developments to have the potential to impact the study area. The two developments include a proposed 85-room hotel to be constructed adjacent to the Fireplace Showcase property and the development of the remaining Showcase property.

Traffic volumes that could potentially be generated by the hotel and the remodeling of the existing Showcase building to provide warehouse and medical office space were estimated using trip generation factors published in the 10th Edition of the Trip Generation Manual by the Institute of Transportation Engineers (ITE), a national professional organization for traffic and transportation engineers. The data provided by ITE are based upon traffic studies of similar land uses and are the accepted industry standard. Table 8 provides a summary of the anticipated vehicle trips that can potentially be generated by these sites. Calculations of site traffic for these land uses, and applicable ITE Land Use Code sheets are included in Appendix D.

PROPOSED SITE TRAFFIC

Site Trip Generation

Traffic volumes that could be generated by the proposed Project were also based on trip generation factors published in the 10th Edition of the Trip Generation Manual by the Institute of Transportation Engineers (ITE). Additionally, data obtained at the existing Greenbrier Complex provided us with a basis for comparison between the projected estimates and actual field data.

Daily traffic volumes are expected to increase as a result of the proposed development. It is estimated that the proposed Project will generate approximately 1,306 vehicle trips during an average weekday. During the peak periods of Route 114A, the proposed development is projected to generate approximately 81 vehicle trips during the morning peak and 138 vehicle trips during the evening peak. A site trip generation summary for the proposed Project is presented in Table 9. Calculations of site traffic for the expanded Project and supplemental material are included in Appendix D.

Table 8

TRIP GENERATION SUMMARY
(Hotel & Showcase Sites)

HOTEL SITE	
	Vehicle Trips
Weekday Morning Peak Hour	
Entering	22
Exiting	16
Total	**38**
Weekday Evening Peak Hour	
Entering	19
Exiting	19
Total	**38**
SHOWCASE SITE	
	Vehicle Trips
Weekday Morning Peak Hour:	
Entering	39
Exiting	11
Total	**50**
Weekday Evening Peak Hour:	
Entering	16
Exiting	41
Total	**57**

Table 9

TRIP GENERATION SUMMARY

RESIDENTIAL DEVELOPMENT SITE	
	Vehicle Trips
Weekday Morning Peak Hour:	
Entering	21
Exiting	60
Total	**81**
Weekday Evening Peak Hour:	
Entering	84
Exiting	54
Total	**138**

Site Trip Distribution and Assignment

Distribution and assignment of site-generated trips were based on existing traffic volumes, current travel patterns, access to major routes, locations of complementary land uses, and access to major employment areas. Similar methodology was applied to the two other planned development projects for the purpose of this assessment.

Figure 5 and 6 illustrates the distribution of site-generated traffic during the weekday morning and evening peak periods (respectively) for the hotel and the re-development of the Showcase property. Figure 7 illustrates the assigned percentages of the proposed Project site trips distributed along the Project roadways, and Figures 8 illustrates the anticipated Project site generated trips and their distribution through the study area roadway network for both analysis peak periods.

Site Access Circulation

Access and egress to the proposed Project site will be provided via a new full access driveway located off Cole Street, approximately 345 feet east of the Route 114A and Cole Street intersection, and 345 feet west of the Springhouse Trail and Cole Street intersection. The driveway is approximately 400 feet long and 24 feet wide. The driveway will operate under stop conditions at the intersection.

The site internal roadway system has been designed to prohibit general vehicular access between the existing Greenbrier Complex (Greenbrier Drive and Howland Street) and the proposed development. However, emergency vehicles will be permitted access via a single-lane road that will extend from the proposed development parking area to Forsythe Circle, a loop road associated with the existing Greenbrier Complex.

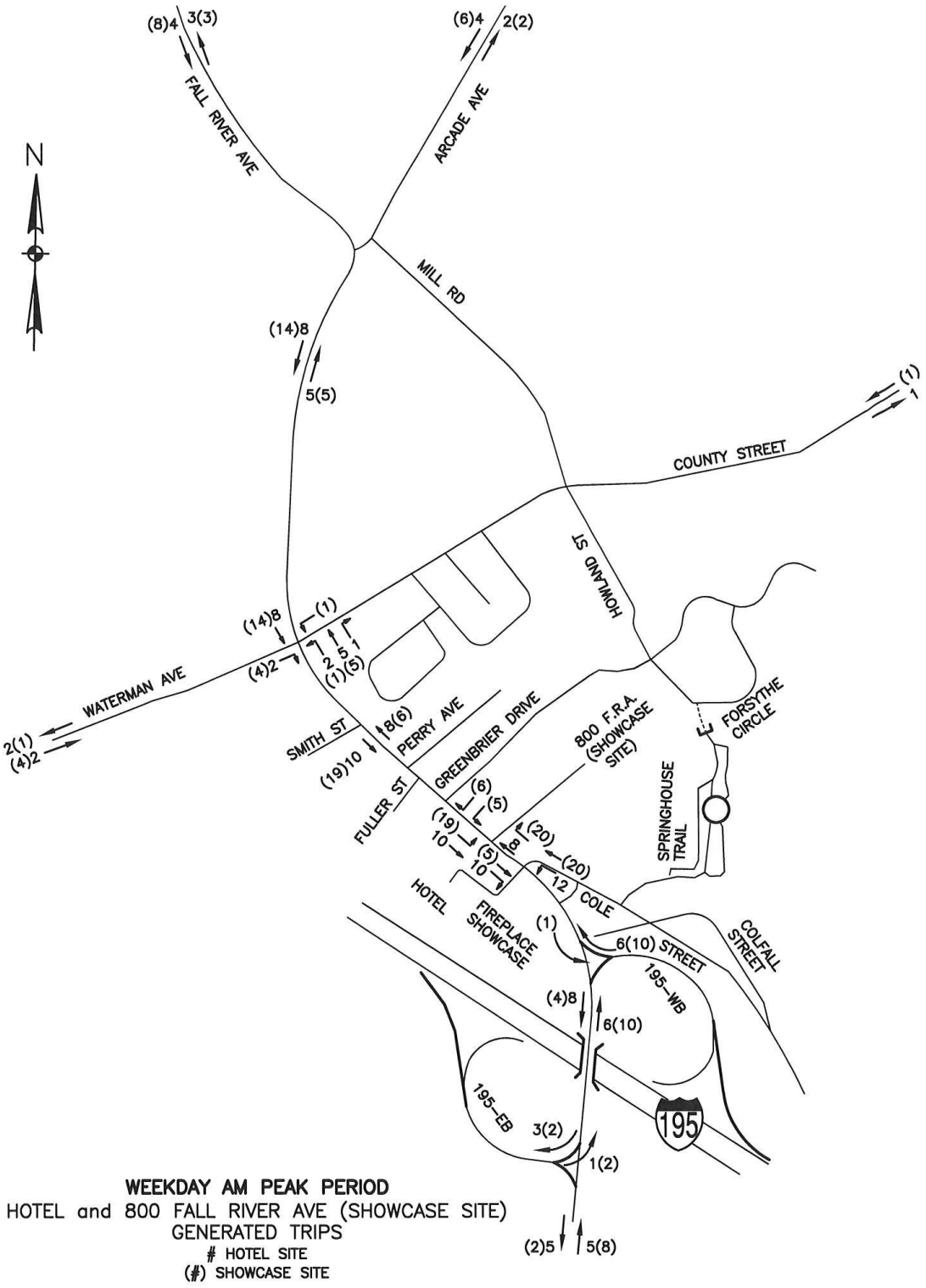
An internal system of sidewalks will be provided within the Project site. The sidewalk system will extend to the Cole Street intersection and will continue westerly to the intersection of Route 114A and easterly to the intersection of Springhouse Trail. The sidewalk will also extend along Route 114A from the Cole Street intersection, northerly to Perry Avenue as part of the improvements included in the mitigation for the existing Greenbrier Complex. A Site Circulation Plan and a Truck Sweep Path Plan are included in Appendix E.

Sight Distance – Proposed Driveway

The operational speed of Cole Street was determined to range between 25 and 30 mph at the proposed Project driveway. The required Stopping Sight Distance (SSD) for 25 mph is 155 feet, and the required SSD for 30 mph is 200 feet. The proposed driveway has SSD in excess of 200 feet. The required Intersection Sight Distance (ISD) for 25 mph for right turning vehicles is 240 feet, and 290 feet at 30 mph. The ISD requirement for left turning vehicles is 280 feet at 25 mph, and 335 feet at 30 mph. The available ISD is 350 feet for right turning vehicles and approximately 310 feet for left turning vehicles. A Sight Distance Plan illustrating the available ISD at the proposed driveway is included in Appendix E of this report.

Proposed On-Site Parking

On-site parking needs were assessed for the proposed Project. Under current zoning regulations, the Town of Seekonk requires 2.0 parking spaces per residential unit, such that a total of 480 off-street parking spaces will be required for the Project. However, we are proposing a total of 516 parking spaces including 15 handicap spaces which is equivalent to 2.15 parking spaces per residential unit.



WEEKDAY AM PEAK PERIOD
HOTEL and 800 FALL RIVER AVE (SHOWCASE SITE)
GENERATED TRIPS
HOTEL SITE
(#) SHOWCASE SITE

FIGURE 5

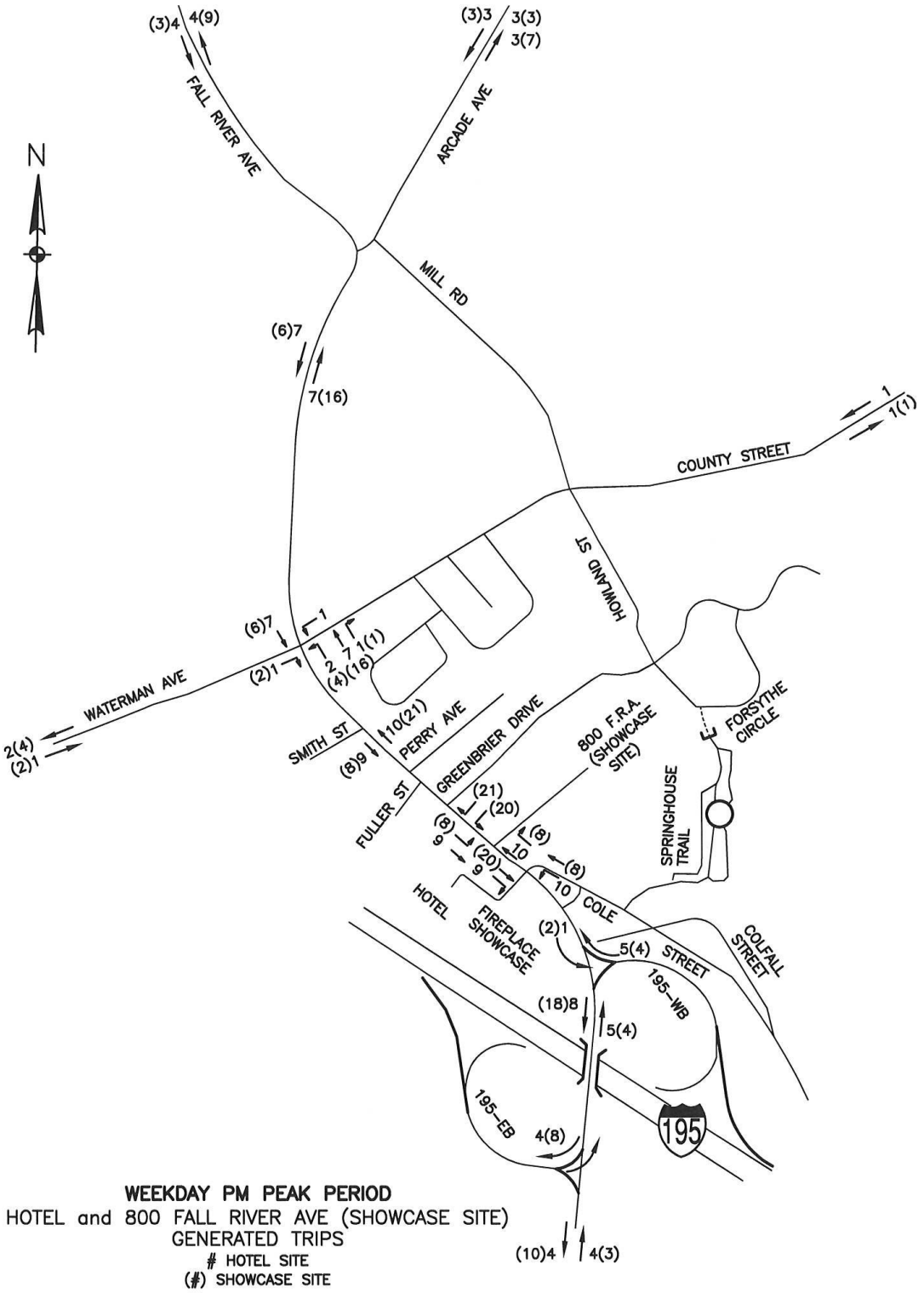
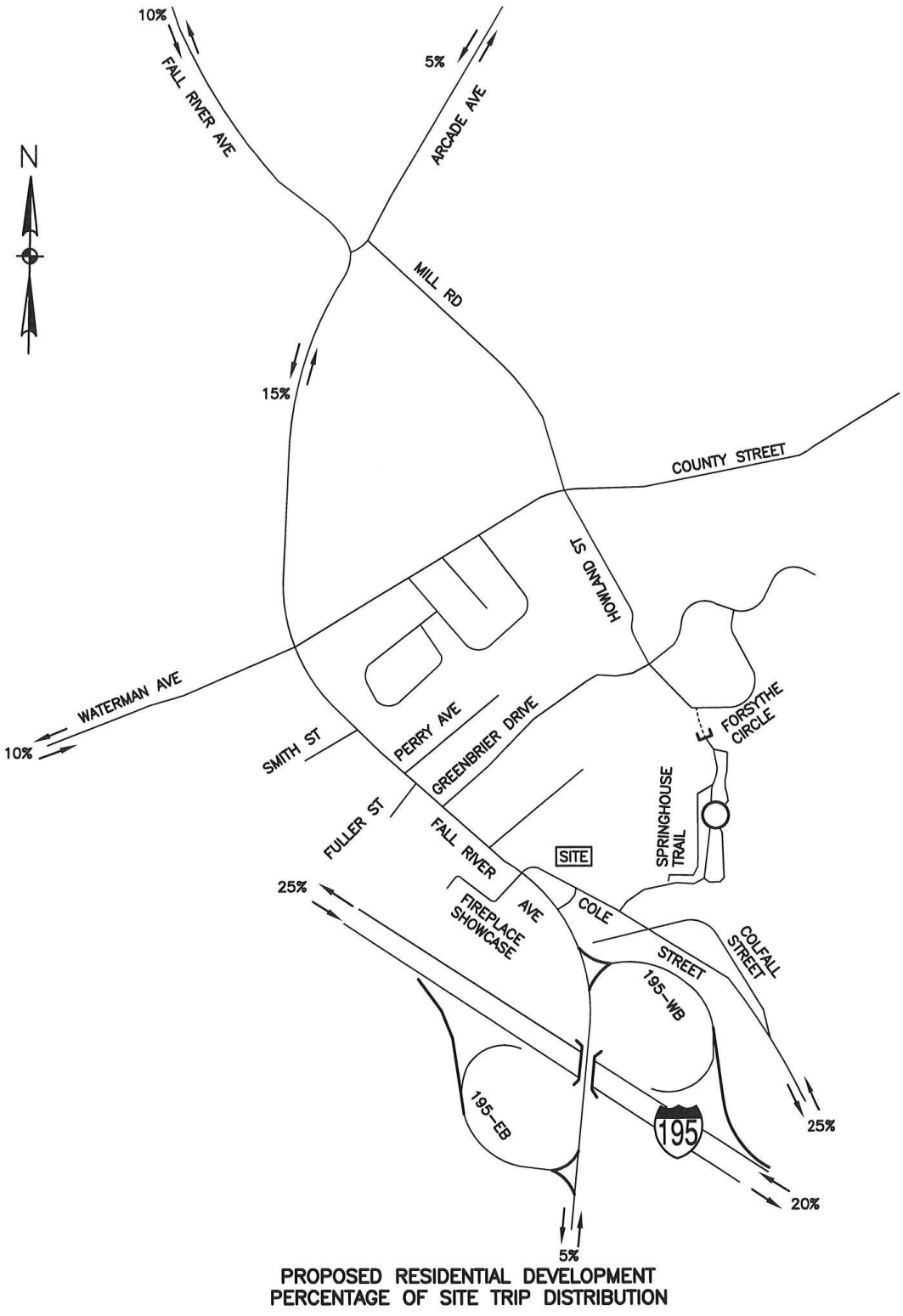

N
FALL RIVER AVE
ARCADE AVE
MILL RD
COUNTY STREET
HOWLAND ST
WATERMAN AVE
SMITH ST
PERRY AVE
GREENBRIER DRIVE
FULLER ST
800 F.R.A. (SHOWCASE SITE)
FORSYTHE CIRCLE
SPRINGHOUSE TRAIL
COLE
HOTEL FIREPLACE SHOWCASE
COLFALL STREET
195-WB
195-EB
195
(3)4 4(9)
(3)3 3(3) 3(7)
(6)7 7(16)
1 1(1)
(6)7 (2)1
2 7 1(1) (4)(16)
2(4) (2)1
10(21) (8)9
(21) (20)
(8) 9 (20) 9
(8) 10 (8) 10
(2)1 5(4)
(18)8 5(4)
4(8)
(10)4 4(3)
WEEKDAY PM PEAK PERIOD
HOTEL and 800 FALL RIVER AVE (SHOWCASE SITE)
GENERATED TRIPS
HOTEL SITE
(#) SHOWCASE SITE

FIGURE 6


10%
FALL RIVER AVE
5%
ARCADE AVE
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MILL RD
15%
COUNTY STREET
HOWLAND ST
WATERMAN AVE
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PERRY AVE
GREENBRIER DRIVE
FORSYTHE CIRCLE
SPRINGHOUSE TRAIL
FULLER ST
FALL RIVER
SITE
25%
FIREPLACE SHOWCASE
AVE
COLE
COLFALL STREET
STREET
195-WB
195-EB
195
25%
20%
5%
PROPOSED RESIDENTIAL DEVELOPMENT
PERCENTAGE OF SITE TRIP DISTRIBUTION

FIGURE 7

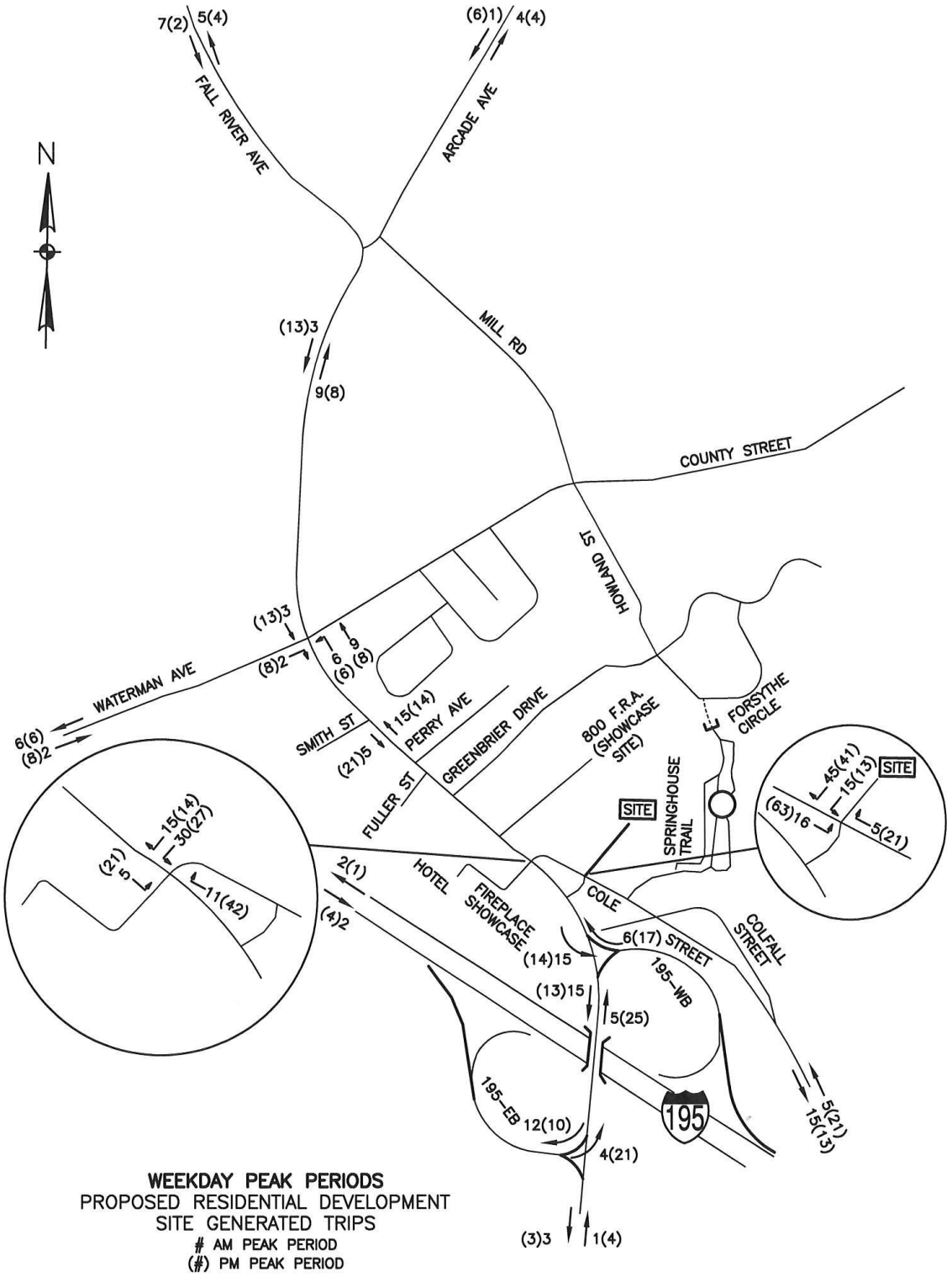

N
7(2)
5(4)
FALL RIVER AVE
(6)1)
4(4)
ARCADE AVE
(13)3
9(8)
MILL RD
COUNTY STREET
HOWLAND ST
(13)3
(8)2
6
9
(6)(8)
WATERMAN AVE
6(6)
(8)2
SMITH ST
(21)5
15(14)
PERRY AVE
GREENBRIER DRIVE
800 F.R.A. (SHOWCASE SITE)
FORSYTHE CIRCLE
FULLER ST
SITE
SPRINGHOUSE TRAIL
45(41)
15(13)
SITE
(63)16
5(21)
15(14)
30(27)
(21)
5
11(42)
2(1)
(4)2
HOTEL
FIREPLACE SHOWCASE
COLE
6(17) STREET
COLFALL STREET
(14)15
(13)15
5(25)
195-WB
195-EB 12(10)
195
5(21)
15(13)
4(21)
(3)3
1(4)
WEEKDAY PEAK PERIODS
PROPOSED RESIDENTIAL DEVELOPMENT
SITE GENERATED TRIPS
AM PEAK PERIOD
(#) PM PEAK PERIOD

FIGURE 8

FUTURE CONDITIONS AND ANALYSES

Background Traffic Growth

In addition to the two planned developments discussed previously, we contacted the Southeastern Regional Planning & Economic Development District (SRPEDD) office to obtain available data on background growth factors anticipated for the Town of Seekonk and the region based on overall population and employment trends. SRPEDD indicated that a growth rate of 1.0 percent per year was appropriate for this area.

Evaluation of potential traffic effects to the adjacent roadways and nearby intersections as a result of projected traffic volume increases was performed for a period of seven years to 2028, when the Project is expected to be fully developed. A seven-year timeline is also the recommended period for this type of project, as per the TIA Guidelines. The evaluation comprised of a comparative analysis of the future "No-Build" and future "Build" conditions. To evaluate the future "No-Build" conditions, the adjusted traffic count data obtained during the 2021 count program were increased using the 1.0 percent per year growth rate, resulting in 2028 base traffic conditions for both the future "No-Build" and future "Build" analyses.

No-Build Conditions

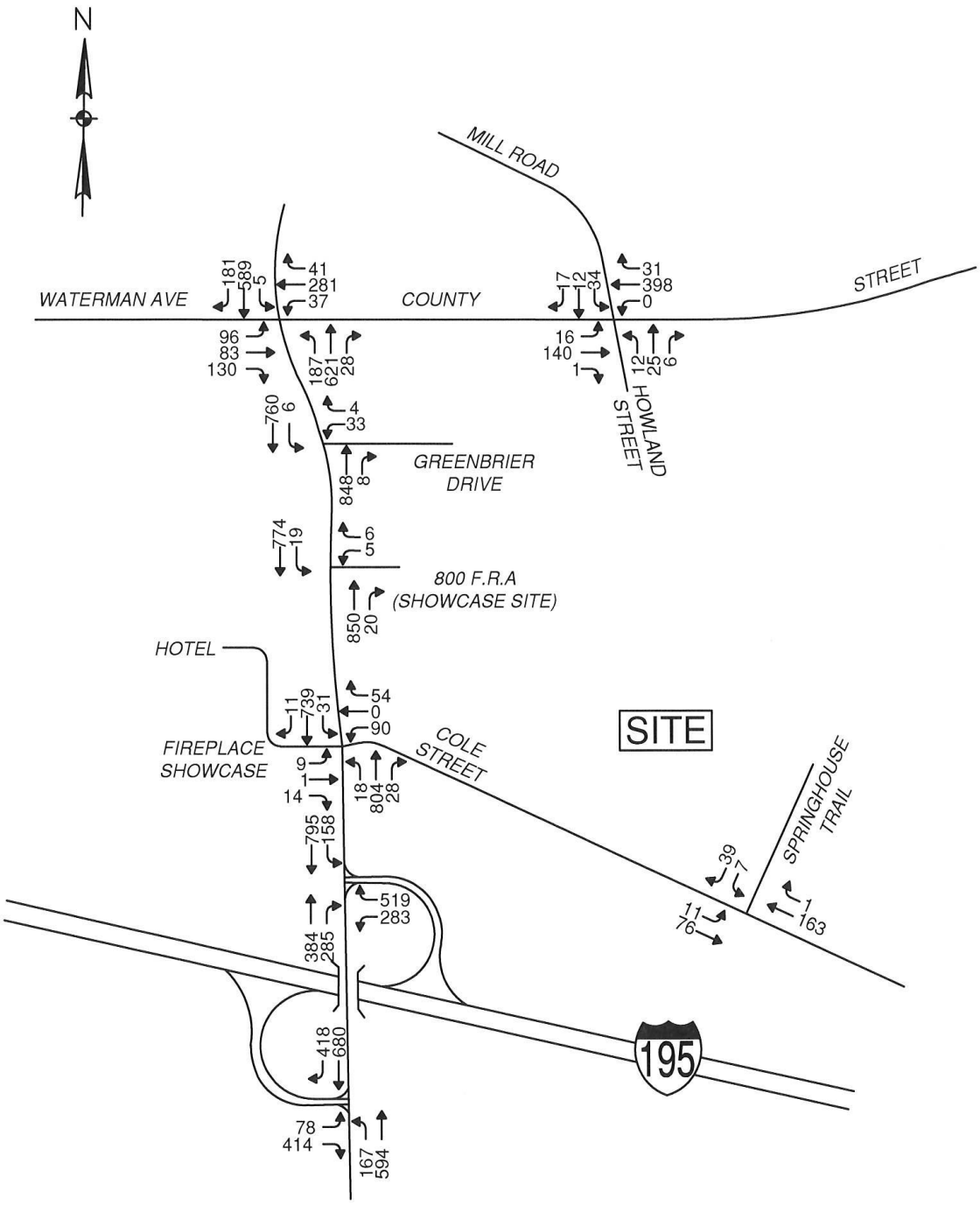
For the "No-Build" conditions, traffic increases within the Project area would be associated primarily with background traffic growth and traffic potentially generated by the other two planned developments proposed near the Project site. The 2028 "No-Build" alternative assumes that the development will not be built and that the Project site will continue to remain vacant. The projected 2028 "No-Build" traffic volumes for the weekday morning and evening peak periods are shown in Figures 9 and 10, respectively.

Build Conditions

The analysis of future "Build" traffic conditions is based on traffic volumes after the Project is in full operation. The future "Build" traffic volumes were calculated by summing the future "No-Build" traffic volumes described in the above section and the expected site generated traffic described previously under "Site Trip Generation." Additional traffic volumes from the proposed Project were assigned to the roadway network, as described in the section titled "Site Trip Distribution and Assignment." The projected 2028 "Build" traffic volumes for both weekday peak periods are depicted in Figures 11 and 12, respectively.

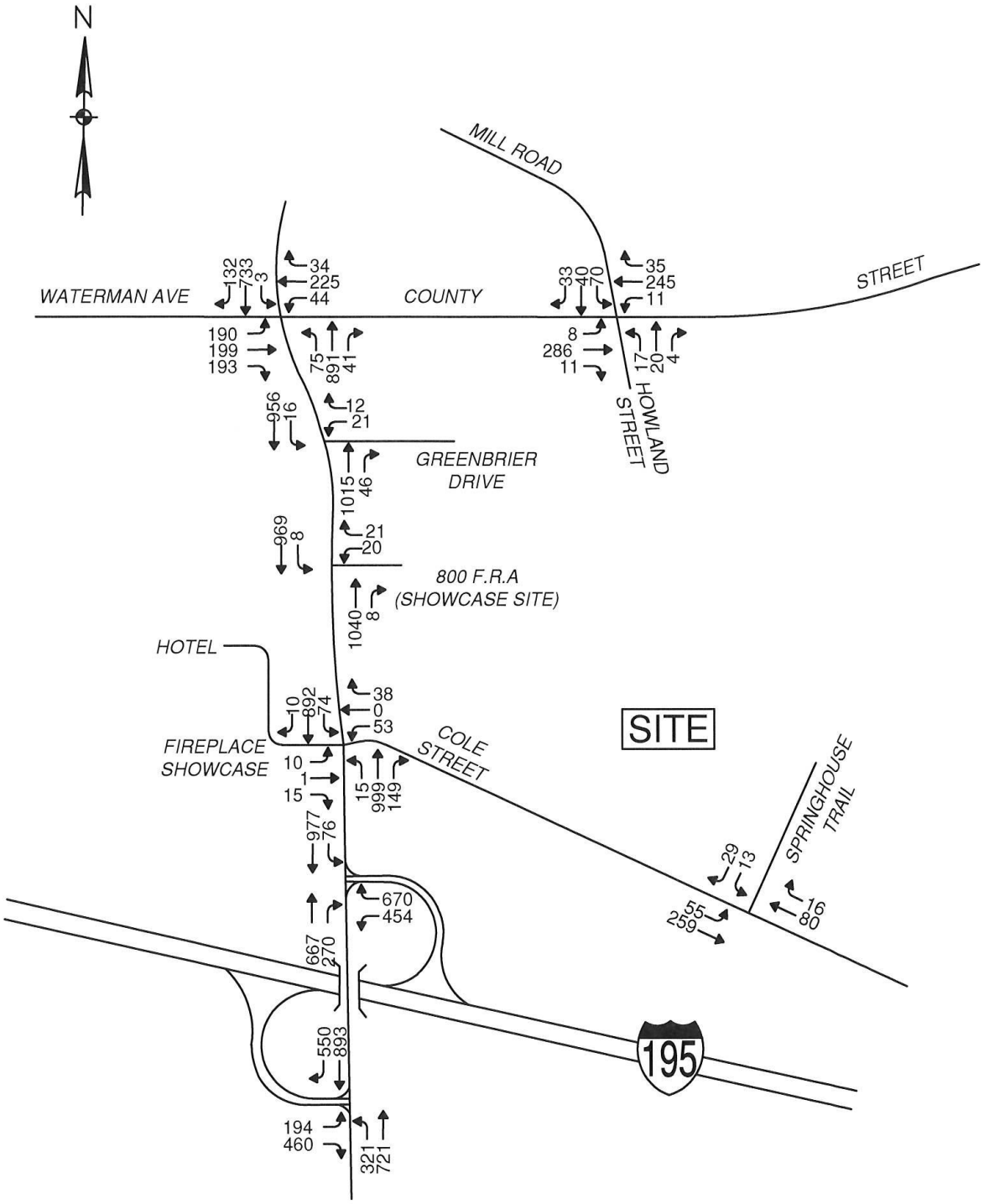
Operational Analyses – Future No-Build and Build Conditions

In determining traffic effects associated with the Project, a comparison of the future "No-Build" and future "Build" conditions analyses were necessary to determine if the proposed Project will affect operations of existing roadways and intersections within the study area. Results of operational analyses for both future No-Build and Build conditions are summarized in Table 10 and 12 for unsignalized intersections and Table 11 and 13 for signalized intersections, including the proposed new site access driveway. The summaries include LOS, delay, and volume-to-capacity ratios for each movement and overall intersection conditions. As well as the 50th and 95th percentile queue lengths calculated for each signalized intersection for both peak



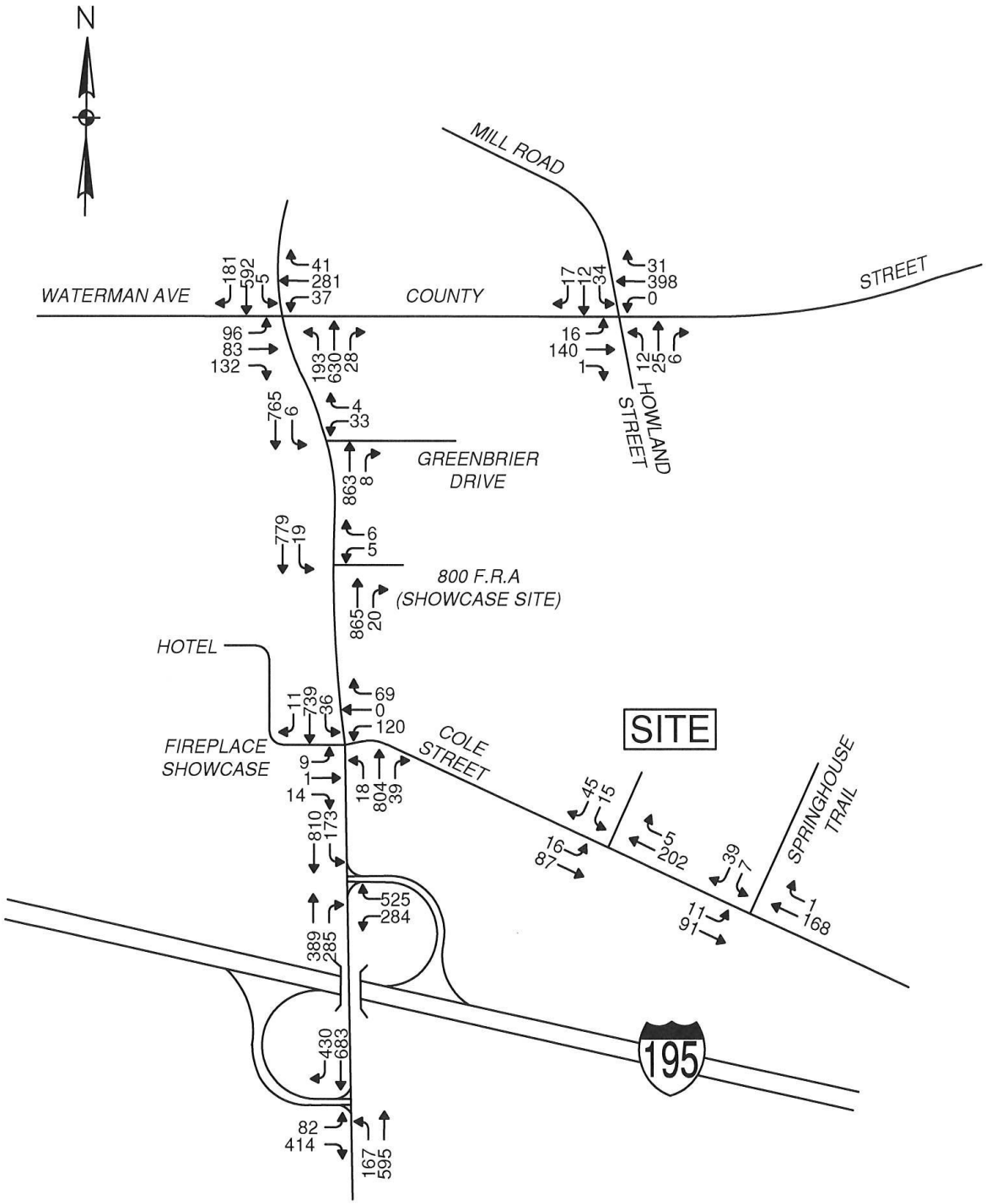
2028 FUTURE NO–BUILD TRAFFIC VOLUMES – WEEKDAY AM PEAK PERIOD

FIGURE 9



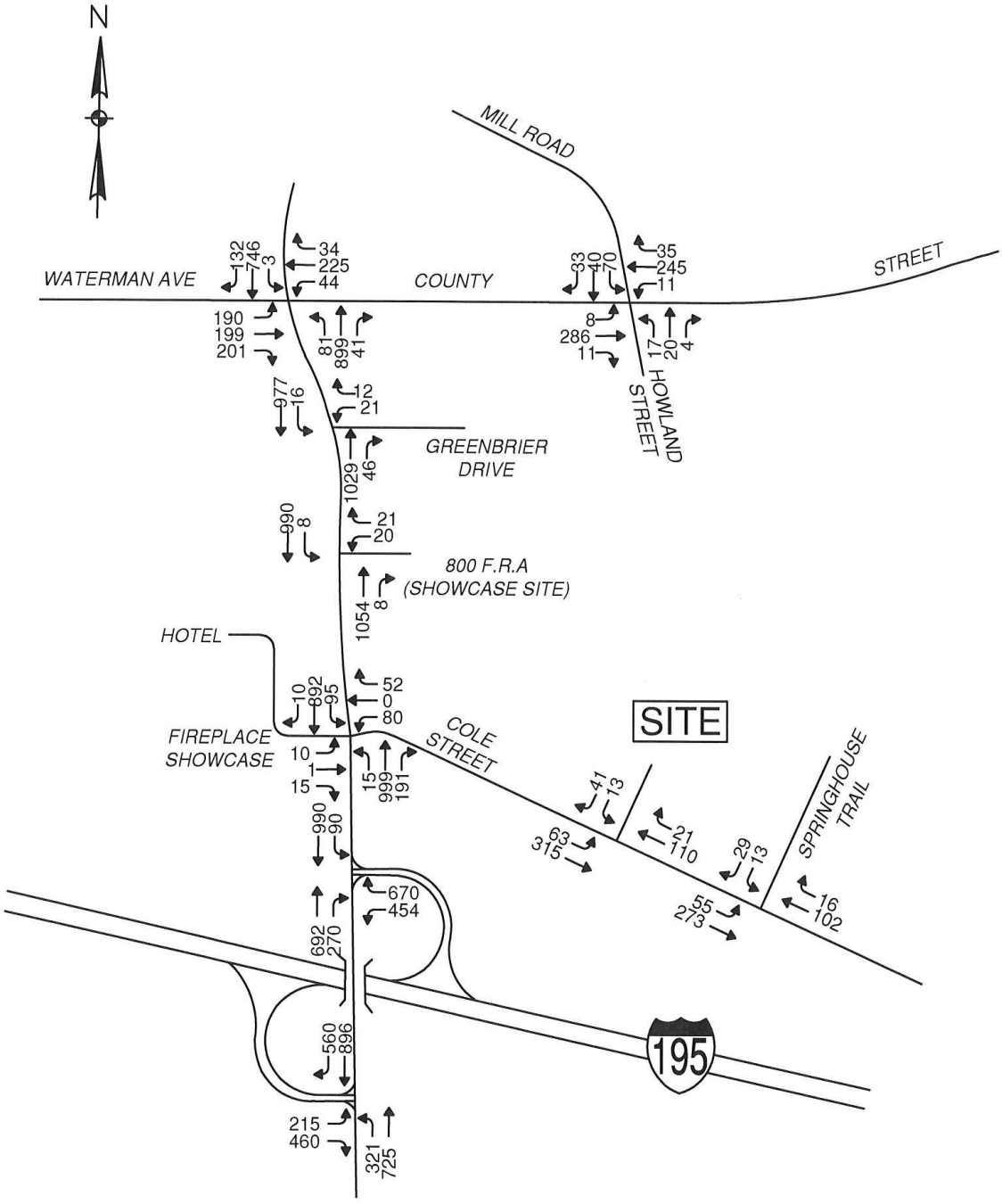
2028 FUTURE NO–BUILD TRAFFIC VOLUMES – WEEKDAY PM PEAK PERIOD

FIGURE 10



2028 FUTURE BUILD TRAFFIC VOLUMES – WEEKDAY AM PEAK PERIOD

FIGURE 11



2028 FUTURE BUILD TRAFFIC VOLUMES – WEEKDAY PM PEAK PERIOD

FIGURE 12

periods, and the 95th percentile queue length for minor street approaches at unsignalized intersections. The tables and the analysis result report for each intersection are provided in Appendix F.

As reflected in the above tables, nearly all of the signalized intersections within the Project study area are anticipated to continue operating at the same overall LOS under both future conditions, with some minor increases in overall delays. This includes the signalized Cole Street intersection, which will operate in coordination with the I-195 Ramps at overall level of service A/B during peak periods. The County Street intersection will require timing adjustments under both conditions to manage anticipated delays during peak periods. Unsignalized intersections are also anticipated to continue to operate at comparable LOS, with only slight increases in delays on their minor approaches. Additionally, the proposed new driveway located on Cole Street is anticipated to operate at LOS B during both peak periods.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Summary of Findings

Traffic projections indicate that approximately 1,306 new vehicle trips will be generated during an average weekday by the proposed Project. During the peak periods, the Project site is anticipated to generate approximately 80 to 140 vehicle trips.

The existing Greenbrier Complex was estimated to generate approximately 2,500 vehicle trips during an average weekday and 200 to 230 vehicle trips during peak periods. The existing complex currently generates approximately 160 vehicle trips during the morning peak and approximately 300 vehicle trips during the evening peak. Improvements required under the Final EIR Certificate EEA #13450 for the existing Greenbrier Condominiums and Apartment Complex have not been constructed to date. These improvements are necessary to alleviate transportation related impacts associated with the full build-out of the existing Greenbrier Complex. It is the intent of the Proponent to have these improvements designed, permitted, and constructed prior to the completion and occupancy of the first building structure of the proposed Project.

It is anticipated that the County Street intersection will operate at LOS E/F during peak periods, even after the current construction of the new improvements are completed. Operations at this intersection are anticipated to continue to deteriorate in the future in the absence of major geometric improvements under any scenario.

Operations along the Route 114A corridor between Arcade Avenue and Cole Street are greatly affected by the operations of the County Street intersection, the existing roadway capacity, and the numerous commercial and residential driveways located along this segment of roadway. It is anticipated that once the improvements under the transportation mitigation for the existing Greenbrier Complex are completed, including the full installation of the traffic signal at the Cole Street intersection, the segment of Route 114A south of County Street will experience substantial improvements. The segment of Route 114A between County Street and Arcade Avenue will continue to have operational issues, especially during peak periods due to limited roadway capacity.

The proposed Project will have minimal impacts on the operations of County Street (east of the Route 114A intersection) and Cole Street (east of Colfall Street), during the morning and evening peak periods.

Based on concerns from the Town and review of accident data obtained for the segment of Route 114A between County Street and the I-195 Ramps, it appears that the area just south of the Showcase driveway (closest to Cole Street) and the Crossroads Convenience Store and Gas Station experience a significant number of accidents. Based on field observations, it seems that many vehicles cut through the Convenience store parking lot and the access road between Cole Street and the store parking lot to access Cole Street during periods of congestion along Route 114A.

Recommendations

Based on analyses results and field observations, some additional improvements are recommended in conjunction with the improvements proposed in the FEIR Certificate to improve safety operations in the vicinity of the Project area. Following is an outline of proposed additional improvements.

- Closure of the old Showcase property southernmost driveway, located off Route 114A approximately 100 feet north of the Cole Street intersection, and provide a secondary access drive to the property off the proposed Project access driveway. Restrict access at the secondary driveway to prohibit trucks from entering and exiting at this location.
- Closure of the access road between the Cole Street intersection and the Crossroads Convenience Store. Remove pavement and loam and seed area.
- Provisions for a channelized island to provide a free right-turn at the Route 114A northbound approach to the Cole Street intersection.

A plan showing both the necessary improvements under the FEIR Certificate as well as the supplemental improvements proposed for this Project is included in Appendix G of this report.