

Date: February 11, 2019 BETA Job No.: 6415
To: Ms. Tracey Donnelly, AIA, RGB Architects
Cc: Mr. Nami Moghadam, Joe Casali Engineering, Inc.
From: Paul J. Bannon
Subject: Proposed Elementary School System Upgrades – Traffic Operations and Safety Analysis

1.0 INTRODUCTION

The following technical memorandum was prepared as part of the Rhode Island Department of Education's (RIDE) review of the Westerly School Department's proposal for elementary school building upgrades. It is our understanding that the Westerly School Department is in the process of redefining the elementary and middle school system grade levels as part of school infrastructure improvements at the three elementary schools in the community. The three schools include State Street Elementary, Dunn's Corners Elementary, and Springbrook Elementary. Figure 1 on the following page depicts the school locations within the town.

The current elementary school system includes three elementary schools that provide for five grade levels (Kindergarten through Grade 4) accommodating a total of approximately 945 students. The new proposal for the elementary school system includes construction of a new school building to accommodate an "Upper" elementary school level program serving grades 3 through 5 at the State Street location. The existing building at State Street will be razed and the site fully redeveloped to accommodate the new campus. Dunn's Corner Elementary and Springbrook Elementary will be upgraded with minor additions and improvements to accommodate four grade levels (Pre-Kindergarten through grade 2) which is a reduction of one grade level as Pre-K is added. The redistribution of grades will result in an increase in enrollment at the State Street School as all students at these grade levels in the community (similar to the Middle School), will come together at one location. The lower elementary school grades will be divided equally through redistricting at the two remaining schools where the enrollment will essentially stay at the current number of students.

The study included herein was completed as part of a transportation planning level analysis relating to the operations and safety of the town-wide upgrade of the elementary school system. A preliminary analysis was completed to define current and future traffic (vehicular, pedestrian) conditions along the servicing roadways to the three elementary school locations. The primary focus was on the State Street Elementary school location as it will be a full redesign of a school campus where current design principles and criteria for school campuses can be more easily implemented and integrated into the school building and site infrastructure. Also as part of the study, the site access and circulation at all three schools for buses, parent/guardian drop-off/pick-up, and staff/visitors have been evaluated to define potential issues and possible mitigation measures to insure safe and efficient access to and through the school properties.



The traffic engineering study completed for this project included the following:

- An inventory of the physical roadway characteristics of the servicing roadways to all three elementary schools including roadway alignment, pavement width, signing, traffic control, and pedestrian/bicycle access to determine the adequacy of the existing roadway geometric features in reference to access, safety, and operations.
- A review of the current site access and circulation for buses, parent/guardian drop-off/pick-up, and staff/visitors accommodations at all three elementary school locations.
- A traffic counting program to define existing traffic patterns and operating characteristics along the servicing roadways to the State Street school as part of design of future site access and circulation needs. The data collection included manual turning movement counts (TMC) at the State Street intersections with Hollis Street and Westminster Street.
- An analysis of accident records obtained from the Westerly Police Department to determine if there are any safety concerns relative frequency, severity or pattern of the crashes along the servicing roadways.
- Evaluation and analysis of the traffic safety and operational conditions for existing and future traffic conditions at the three schools.
- Development of recommendations for improvements where necessary to maintain and/or provide safe and efficient access and circulation for pedestrian and vehicular traffic at all three elementary school locations.

This study was prepared for submission to the Town of Westerly School Building Committee as part of the preliminary review process to address the Rhode Island Department of Education (RIDE) Stage II Guidelines for a Traffic Impact Plan, and was conducted in accordance with standards of the Traffic Engineering and Transportation Planning professions for preparation of such reports. The study summarizes and addresses each of the school locations individually including State Street, Dunn's Corners and Springbrook respectively as follows:

2.0 STATE STREET ELEMENTARY SCHOOL

Based upon information provided by RGB, and a review of the proposed site plan prepared by *Joe Casali Engineering*, it is our understanding that the school redevelopment project includes razing of the existing State Street Elementary School building to allow construction of a new "Upper" elementary school accommodating grades 3 through 5. Parking will be provided for a total of 170 vehicles in two parking lots; the primary parking lot (134 spaces) in front of the building and a secondary overflow parking lot (36 spaces) on the westerly side of the building adjacent to the Westerly Senior Center. Access and egress to the main parking lot will be provided from two driveways on State Street and a driveway on Westminster Street that

also provides access to the overflow parking lot. Parent/guardian drop-off/pick-up circulation will be internal through the main parking lot on State Street with a designated drop-off/pick-up area at the front main entry way to the building. In addition, bus drop-off/pick-up will be separate from parent and teacher/staff access and located on the easterly side of the building with access off of Hollis Street.

2.1 Project Area

State Street Elementary School is centrally located in the more densely populated area of the town. The school campus property is situated on the northerly side of State Street between Westminster Street and Hollis Street with the building fronting State Street. Land use in the immediate area can be defined as predominantly medium-density residential properties including single family homes. To the north are residential properties that are separated and buffered by a large wooded area on the subject lot, and to the immediate west is the *Westerly Senior Citizens Center*.

Granite Street/Franklin Street (Route 1) and Beach Street (Route 1A) will serve as the primary north/south access routes to the proposed State Street Upper Elementary School, with local residential streets including State Street, Westminster Street and Hollis Street providing immediate local access through the neighborhood.

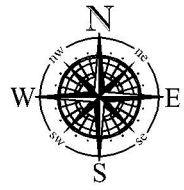
2.2 Existing Conditions

As noted previously, the State Street Elementary School, which fronts State Street to the south and Hollis Street to the east, serves grades Kindergarten through 4. The school is a one-story building with staff/visitor parking available on the easterly side of the property. Additional staff/visitor parking is available on-street along both sides of State Street along the school frontage; though it's not delineated. Access to the parking lot is provided at an entrance only driveway on State Street and an exit only driveway on Hollis Street. Bus drop-off/pick-up is provided at the front of the building through a bus loop. In addition, parents/guardians were observed to park along both sides of Hollis Street along the school property frontage during the student pick-up process. Figure 2a on the following page depicts the school access and circulation patterns observed through the data collection program.

2.2.1 ROADWAYS

State Street

State Street is classified as a local road extending from Beach Street (Route 1A) on the west to East Avenue on the east. The roadway can be described as a two-way street, servicing single-family residential homes, the State Street Elementary School, and the Westerly Senior Center, as described previously.



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Figure 2a - State Street Elementary School Existing Access and Circulation



State Street is approximately 36 feet wide from Route 1A easterly to Emerald Street where it narrows to approximately 30 feet. The centerline is delineated with a double yellow centerline for a segment of the roadway, where no shoulder markings or delineated parking lane is provided along its length. The adjacent photograph depicts State Street looking east with the school on the left. Concrete curbing and sidewalk is provided only on the northerly side of the roadway between Westminster Street and Emerald Street, which has been recently reconstructed including new curb ramps as can be seen in the photo. The pavement can be classified as being in fair to good condition east of Hollis Street and in fair condition west of Hollis Street including along the school frontage with visible crack sealing and patching.



School signing is limited along its length where the speed limit (25 mph) is posted only for the eastbound direction of State Street, and on-street parking is permitted except for parking sign restrictions in the vicinity of intersecting side streets. A "School Zone" is signed on the block between Westminster Street and Hollis Street, with a Speed Limit of 20 mph. The location and mounting of the school zones should be upgraded as to location and modernization to provide improved visibility and enforcement of the speed restriction and definition of the school zone. Sporadic lighting on utility poles is provided for nighttime illumination of the roadway.

Hollis Street

Hollis Street is a short local road extending from Fairview Avenue in the north to State Street. Hollis Street is a two-way roadway servicing single-family residential homes and the State Street Elementary School. A one-way driveway exit from the school parking lot is present to the rear of the school. The roadway is approximately 36 feet wide delineated with a double yellow centerline with no observed signed parking restrictions. The adjacent photograph depicts Hollis Street looking south with the school on the right.



There is no curbing or sidewalks on either side of the street, which is not common of the local residential streets in the immediate school area within the neighborhood. The pavement can be classified as being in good condition with no visible

pavement distress. The speed limit is posted at 20 mph with a supplemental *Slow Children School* sign in the vicinity of the school, though no "School Zone" designation is present. Lighting on utility poles is provided along the easterly side for night-time visibility of the roadway.

Westminster Street

Westminster Street is a local road extending from Cross Street to the north to Wells Street. Westminster Street is a two-way roadway servicing single-family residential homes and the *Westerly Senior Center*. In the project area, the roadway is approximately 32 feet wide with a faded double yellow centerline, no shoulder markings and no observed signed parking restrictions. The adjacent photograph depicts Westminster Street looking south with the *Westerly Senior Center* to the left.



Concrete curbing and sidewalk is provided on the easterly side of the road from Wells Street northerly to John Street and on the westerly side from John Street northerly to Cross Street. The pavement can be classified as being in good condition with no visible pavement distress. The speed limit is posted at 25 mph. Sporadic lighting on utility poles is provided along the westerly side for night-time visibility of the roadway.

2.2.2 INTERSECTIONS

State Street at Hollis Street

Hollis Street intersects State Street to form a 3-Way, "T"-type intersection with *Stop* control on the minor Hollis Street approach. All approaches to the intersection provide a single all-purpose lane. Concrete curbing and cement concrete sidewalks including curb ramps are provided on the northeast and northwest corner of the intersection.



Marked crosswalks are delineated across the Hollis Street southbound and State Street westbound approaches to the intersection; though, the widths of the marked crosswalks do not meet federal and ADA standards. The

marked crosswalks are faded, do not provide the minimum width, and are lacking school crossing signs. The photograph on the previous page depicts the typical characteristics of the intersection looking east along State Street with Hollis Street to the left.

State Street at Westminster Street

Westminster Street intersects State Street to form a four-way, unsignalized intersection with an all-way *Stop* condition. All approaches to the intersection provide a single all-purpose lane. The *Stop* signs at the intersection appear to be in good condition; however no *Stop Ahead* signs were observed on any of the approaches to the intersection, which is a major junction entering the high density school and senior center block where crosswalks are provided and pedestrian activity could be higher than other locations in the neighborhood.

Concrete curbing and cement concrete sidewalks including curb ramps are provided only on the northeast and southeast corners of the intersection. Marked crosswalks are provided across all approaches to the intersection; though no curb ramps for accessibility are



available on the northwest and southwest corners. In addition, the marked crosswalks, similar to the other two study intersections, do not meet today's pedestrian safety and ADA standards. The marked crosswalks are also faded, do not provide the minimum width, and is lacking school crossing signs. The above photograph depicts the typical characteristics of the intersection looking west along State Street.

2.2.3 TRAFFIC OPERATIONS

Existing traffic flow characteristics for the servicing roadways were developed from a traffic counting program completed by BETA including Manual Turning Movement Counts (TMC) at key intersections in the study area to determine the traffic patterns relating to school arrival and dismissal periods. Manual turning movement counts were conducted at the State Street intersections with Hollis Street and with Westminster Street in January, 2019.

Based upon the school start time of 8:50 AM and the dismissal at 3:15 PM, peak period turning movement counts were collected during the weekday morning between 7:30 and 9:00 AM and during the afternoon period between 2:30 and 4:00 PM at the study intersections of State Street with Hollis Street and Westminster Street.

The turning movement count data found that State Street between Westminster Street and Hollis Street services a low volume of approximately 130 vehicles during the weekday morning peak hour between 8:00 AM and 9:00 AM and approximately 120 vehicles during the weekday afternoon peak hour between 2:30 PM and 3:30 PM. Complete count information can be found in the Attachments.

Our review of the arrival and dismissal periods at the school found that the drop-off and pick-up plan in place works efficiently with minimal congestion around the school and on school grounds. As noted, buses are separated from the parents and teacher parking areas. Parents park in the rear lot or on Hollis Street away from the front of the building and bus access to the school. The order of dismissal providing for parent pick-up first, followed by buses then walkers allows for an orderly flow of pedestrian and vehicular activity at this location.

2.3 Pedestrian and Bicycle Accessibility

Pedestrian accommodations along the school perimeter roadways and at intersections within the study area are as noted in the previous section as part of the Roadway and Intersections discussions. Sidewalks are provided on State Street for a short section only on the north side between Hollis Street and Westminster Street. Along the south side of State Street there is no existing sidewalk for the entire length of the corridor. There are no sidewalks along Hollis Street which abuts the school property for most of its length and operates as a parking area for parents during the afternoon dismissal period.

Sidewalk is provided along the easterly side of Westminster Street to the west of the school and along each of the north/south side streets, Champion Street and Emerald Street from Wells Street to State Street. In addition, most of the residential streets in the neighborhood surrounding the school provide sidewalks on either one side or both sides of the road providing some level of pedestrian connectivity within the immediate area.

Bicycle accommodation within the immediate neighborhood including along State Street, Hollis Street, and Westminster Street is provided by means of shared use of the travel lanes. No signing is provided for this shared condition which would alert motorists of potential higher bicycle activity in the area surrounding the school. As noted there are no delineated shoulders though the widths of the streets provide adequate room for markings.

2.4 Safety Analysis

To determine if there are any limiting factors affecting safety relating to access to the school property, the physical characteristics of the adjacent servicing roadways, and specifically at the site driveway locations were investigated. These limiting factors would potentially include horizontal or vertical alignment changes or roadside obstructions that limit sight distances for vehicles traveling along the road, or entering the road from a side street or driveway location. In this instance, the sight distance standard is necessary to permit

turning vehicles to safely enter and exit the site driveways and allow for safe pedestrian access to and from the school property.

The horizontal alignment of State Street in the immediate project area can be described as generally straight. The vertical alignment of State Street is generally level along the school frontage with a minor incline from west to east just east of Hollis Street. In addition, the vertical alignment is undulating with generally an upgrade from Beach Street to Westminster Street. The physical roadway features of State Street as described provide sight distances in excess of 300 feet to the east and west of both the proposed school driveways. These values are greater than the 115-foot minimum stopping sight distance required according to AASHTO design standards for the speed limit of 20 mph, and low travel speeds observed as a result of the school zone along this section of State Street.

The vertical and horizontal alignment of Hollis Street in the immediate project area can be described as generally level and straight. The physical roadway features of Hollis Street as described provide sight distance in excess of 500 feet to the north of the proposed bus right turn out only driveway. These values are greater than the 115-foot minimum stopping sight distance required according to AASHTO design standards for the speed limit of 20 mph, and low travel speeds observed on Hollis Street.

The vertical and horizontal alignment of Westminster Street in the immediate project area can be described as generally level and straight. The physical roadway features of Westminster Street as described provide sight distance in excess of 300 feet to the north and south of the proposed school driveway. These values are greater than the 155-foot minimum stopping sight distance required according to AASHTO design standards for the posted speed limit of 25 mph.

As a result of the preliminary evaluation of the existing roadway geometry and physical features, it does not appear that any significant physical roadway safety deficiencies exist within the defined study area, except for the previously mentioned pedestrian accessibility and signing concerns. It is recommended that the following base conditions be addressed:

- All marked school crossings along State Street should be restriped in compliance with both state and federal regulations including installation of appropriate school crossing signs.
- Curb ramps should be provided at all marked school crosswalks in accordance with Americans with Disabilities Act (ADA) regulations.
- School zone signing should be updated both along State Street and Hollis Street and installed along Westminster Street in compliance with both state and federal guidelines.

Also, as part of our analysis, accident data was obtained from the Westerly Police Department for the latest three-year period from January, 2016 to December, 2018 to determine if any location along State Street experienced a high frequency or pattern of accidents. Upon review of the data, it was determined that a total of six accidents (avg. 2 per year) were found to have taken place along State Street between Beach Street and East Avenue during the three-year period. Summarizing the data, Five (5) of the accidents occurred at an intersection with State Street with one injury reported and one (1) occurred at a mid-block

section along State Street with no reported injuries. The two intersection accident, with no injuries reported, were both angle collisions that occurred at the all-way *Stop* intersection of State Street with Westminster Street. Both angle accidents can be attributed to drivers not yielding to right-of-way. The other three intersection accidents, with one injury reported, were all rear-end collisions that occurred at the intersection of State Street with Beach Street. The rear-end collision can be attributed to distracted drivers. The single mid-block accident, with no injuries reported, occurred in front of the Westerly Senior Center where a vehicle turning into the parking lot was struck by a vehicle entering State Street from an on-street parking space. In addition, all accidents occurred on dry road surface conditions and the majority (5 accidents) occurred during daylight hours.

2.5 Future Conditions

As previously noted, the school upgrade project includes razing of the existing State Street Elementary School building to allow construction of a new “Upper” elementary school to accommodate grades 3 through 5. Parking for a total of approximately 170 vehicles will be provided in two on-site parking areas; the primary parking lot (134 spaces) in front of the school building and a secondary parking lot (36 spaces) on the west side of the school building adjacent to the Senior Center. A portion of the parking spaces will be designated for teacher/staff parking, approximately 76 spaces, which will be separate from the visitor and parent parking area. Access and egress to the primary parking lot will be provided from two new driveways on State Street and a secondary driveway on Westminster Street.

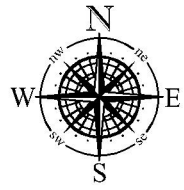
The bus drop-off/pick-up area will be separate from the parent and teacher lots and will be located on the easterly side of the building with an exclusive access off of Hollis Street. Several internal bus circulation options are being considered to reduce possible emissions exposure while weighing the loading and unloading safety of elementary aged children. Figures 2b and 2c on the following pages depict the proposed site access and circulation layout, provided by *Joe Casali Engineering*.

In an effort to develop the design for the access and circulation plan for the parent drop-off/pick-up area, the existing school arrival/dismissal operation for the 305 students was reviewed relative to the number of students taking the bus versus being driven by a parent, and a review of the parking and queuing during the arrival and dismissal periods. Based upon this analysis it was determined that approximately 65 to 75 percent of the students are bused resulting in approximately 50-60 parent trips to the school. These ratios were confirmed in discussions with school staff and field observations at the other two elementary schools.

The result of the study found that the number of students being dropped-off and picked-up by parents is approximately seventeen percent of the school enrollment at a given school. Translating this percentage to the new elementary school enrollment would result in an estimated 90 to 100 parent trips to the school. It is anticipated that the bus ridership may be greater at this location as the Upper Elementary School proposed is a town-wide school where all students in the community will be attending versus the current more local neighborhood school that draws from a much smaller area of the town.

To accommodate this increased demand at the new State Street School, the parent/guardian drop-off/pick-up circulation will be internal through the main parking lot with a designated drop-off/pick-up area at the main entrance in front of the building. This operation will be managed based upon actual vehicle demands where the parking lot layout and access design will allow for managed stacking within the lot and controlled access/egress on the driveways to facilitate circulation needs.

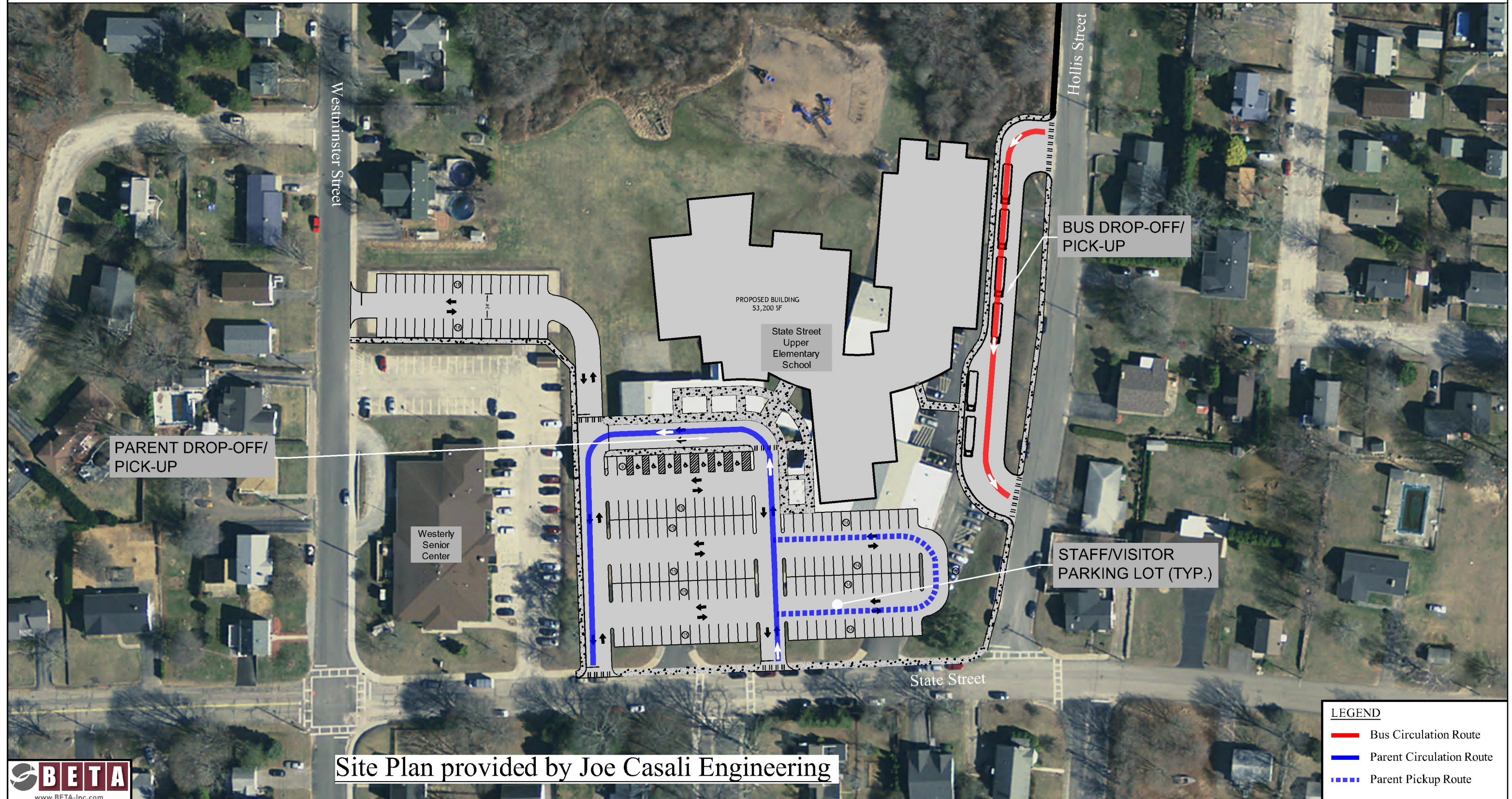
Based upon the low volume serviced along State Street, Hollis Street, and Westminster Street and the site access and circulation proposed, there should be no discernable impacts to the good traffic operations presently experienced along the servicing roadways in the immediate project area.

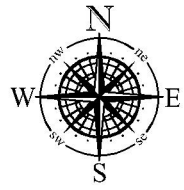


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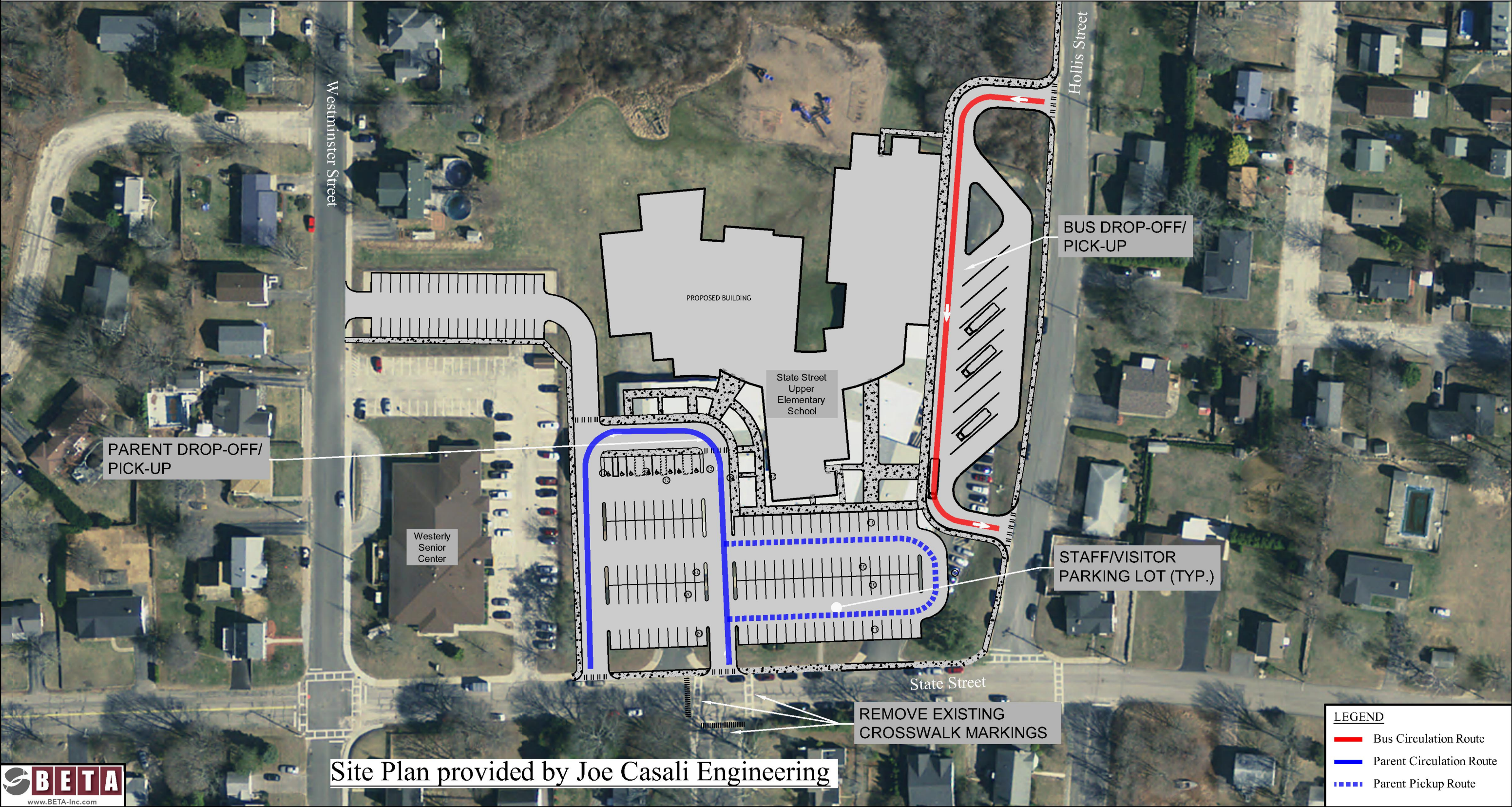
Figure 2b - State Street Elementary School Proposed Access and Circulation - Alternative 1





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Figure 2c - State Street Elementary School Proposed Access and Circulation - Alternative 2



3.0 DUNN'S CORNERS ELEMENTARY SCHOOL

Dunn's Corners Elementary School currently serves grades Kindergarten through 4. As part of the town's plan of redefining the elementary and middle school grade levels, Dunn's Corners Elementary School will be reduced by a grade level and serve Pre-Kindergarten through grade 2. The enrollment is expected to be similar to current levels as students in grades 3 and 4 will transfer to the new State Street Upper Elementary school, while only adding Pre-Kindergarten. Also, redistricting will accommodate approximately half the students from grades K-2 from the State Street Elementary school to reach current school enrollment levels. The school building is proposed to include minor upgrades to its facilities to accommodate the redistribution of students. As part of the school review and upgrade, the school department has requested that Plateau Road servicing Dunn's Corners Elementary School be closed as a public street and defined as a school access road as part of the school property.

3.1 Project Area

Dunn's Corners Elementary School serves the southeastern section of the community. The school is situated within a residential neighborhood on the southerly side of Plateau Road between Urso Drive to the west and Stuart Street to the east. The neighborhood is accessed from Post Road (Route 1) to the north and Shore Road (Route 1A) via a network of local residential streets to the south of the school.

Land use in the immediate area can be defined as medium-density residential properties within the neighborhood. Along Route 1, the properties consists of a mixture of residential properties and small to large scale commercial buildings and shopping centers containing restaurants, pharmacies, professional offices, and banks. In addition, the Westerly Middle School is located west of the Dunn's Corners Elementary on Sandy Hill Road, off of Route 1. Post Road (Route 1) serves as the primary access route to the school, with local residential streets including Plateau Road providing immediate local access through the neighborhood.

3.2 Existing Conditions

The Dunn' Corners Elementary School currently serves five elementary school grades with a total of approximately 325 students. The school is situated on the southerly side of Plateau Road which services only the school and operates as essentially a school access road. The building is a one-story structure with parking provided along the frontage of the building and along Plateau Road in defined areas of perpendicular parking. Parallel parking was also observed along the road due to the inadequate number of designated parking spaces in front of the school building for teachers and staff.

Bus drop-off/pick-up is provided on the westerly side of the school building through a small bus loop. Buses were observed to enter the school property from the west through Urso Drive and exited either east through Stuart Street or west back through Urso Drive. The parent/guardian drop-off/pick-up is provided directly in the front of the building where a majority of the parents/guardians were observed entering from the west through Urso Drive, similar to the buses, and then proceeded along the southerly side of Plateau

Road to queue up in a designated stacking lane in front of the building, then exiting east through Stuart Street. These conditions are presented in Figure 3 on the following page.

3.2.1 ROADWAYS

Plateau Road

Plateau Road is classified as a local road running generally east/west approximately 1,400 between Urso Drive and Stuart Street. The road also includes a short north/south cul-de-sac servicing sixteen (16) homes. It is important to note that based on the Westerly GIS map, Plateau Road just east of the cul-de-sac to Stuart Street is part of the school property. Plateau Road including the cul-de-sac can be described as an undelineated, two-way road servicing single-family residential homes and the Dunn's Corners Elementary School. Plateau Road including the cul-de-sac is approximately 36 feet where it narrows to approximately 28 feet along the school property. The adjacent photograph depicts Plateau Road looking east with the school on the right and available school parking on the left.

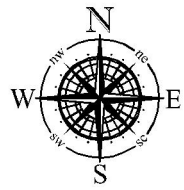


There is no curbing or sidewalk provided along the roadway, which is typical of the adjacent residential neighborhood. The only sidewalk provided is a short, 75-foot long sidewalk in front of the school building. The pavement can be classified as being in good condition along the residential frontage and in fair condition along the school frontage with visible patching and alligator cracking. There was no observed posted speed limit along Plateau Road and was assumed at 25 mph due to the residential nature of the area. In addition, school zone signing is limited and is only provided on the eastbound approach to Dunn's Corners Elementary School. Lighting on utility poles is only provided at intersecting streets.

3.2.2 TRAFFIC OPERATIONS

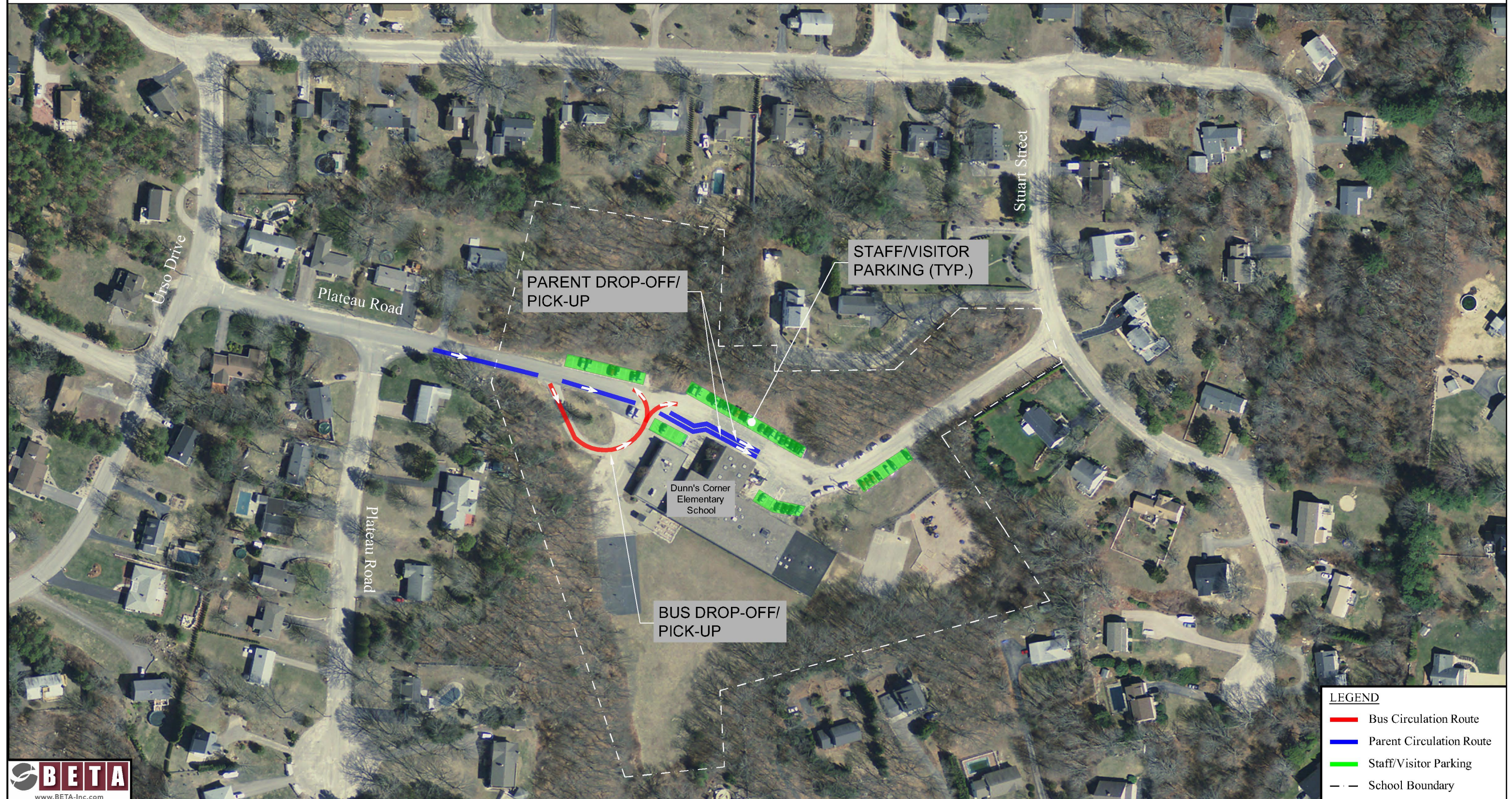
Existing traffic flow characteristics for the servicing roadways were developed from field observations of the arrival and dismissal periods around the school start time of 8:50 AM and the dismissal at 3:15 PM. Our review of the arrival and dismissal periods at the school found that the drop-off and pick-up plan in place works efficiently with minor congestion on school grounds due to parents not following dismissal protocols.

Based upon the location of the school it is not possible to separate bus and vehicle access to the school grounds. The school bus area is designated on the westerly side of the building and once buses enter the school property, they can access the bus loop which is managed by school staff to restrict blocking the bus



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Figure 3a - Dunn's Corner Elementary School Existing Access and Circulation



loop access/egress. Nine buses service this school and arrive at different times around the arrival and dismissal periods in a staggered manner. The parents are required to drop-off and pick-up students along the front or easterly side of the building separate from the bused students. During the busiest period for an elementary school which is typically the afternoon pick-up hour where stacking is required, a pick-up plan is in place for parents to follow. Parents are required to enter from Urso Drive and stack in a double lane designated along the front of the school building as seen in the adjacent photograph. Those parents parked in the queuing lane must remain in the vehicle. A school staff member identifies the parents in order of stacking and then brings the children out in small groups to the vehicles in the front of the queue in a defined loading area. Parents wishing to enter the building to pick-up their child must park in available spaces (which are limited). A number of parents were observed entering from the east from Stuart Street and parking along the roadside. These vehicles were counter to the planned flow and caused unnecessary delays to the process by interfering with exiting vehicles travelling through the school property from west to east per the school pick-up plan. The buses arrive randomly and are loaded separately upon arrival by staff escorting the groups from the building to the bus loop.



3.3 Pedestrian and Bicycle Accessibility

As previously mentioned, there are no sidewalks provided on Plateau Road including along the adjacent neighborhood streets, typical of residential roads within the neighborhood, forcing parents and students to walk in the street while accessing and travelling through the school property. The nearest sidewalk available is on Route 1, which is provided on both sides of the corridor. Bicycle accommodation within the immediate neighborhood including on Plateau Road is provided by means of shared use of the residential streets. Based upon conversations with the school staff, there are no walkers at this location currently which is consistent with past experience over the years at the school.

3.4 Safety Analysis

To determine if there are any limiting factors affecting safety relating to access to and through the existing school, the physical characteristics of the local servicing roadways in the project area, and specifically at the site driveway locations were investigated. These limiting factors would potentially include horizontal or vertical alignment changes or roadside obstructions that limit sight distances for vehicles traveling along the

road, or entering the road from a side street or driveway location. In this instance, the sight distance standard is necessary to permit vehicles to safely enter and exit the school property.

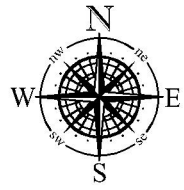
The horizontal and vertical alignment of Plateau Road can be described as generally straight with a decline from both intersecting side streets to the front of the building which is at a low point. The physical roadway features of Plateau Road as described provide no conditions limiting sight distances along its length, and in excess of 300 feet to the north and south of the Urso Drive and Sacco Drive intersections. These values are greater than the 155-foot minimum stopping sight distance required according to AASHTO design standards for the speed limit of 25 mph, and low observed travel speeds experienced on Plateau Road. As a result of the preliminary evaluation of the existing roadway geometry and physical features, it does not appear that any significant physical roadway safety deficiencies exist within the defined study area except for the previously mentioned pedestrian accessibility and signing concerns.

3.5 Future Conditions

The upgrade to the Dunn's Corners Elementary School will include small additions to the building on the westerly and southerly side of the building totaling approximately 4,000 square feet of area. Also, as noted, changes to this school operation will include relocation of Grades 3 and 4 to the new upper Elementary School on State Street and adding a Pre-Kindergarten. The elimination of the third elementary school, and redistribution of students in the community will result in a level student population at the Dunn's Corner Elementary School.

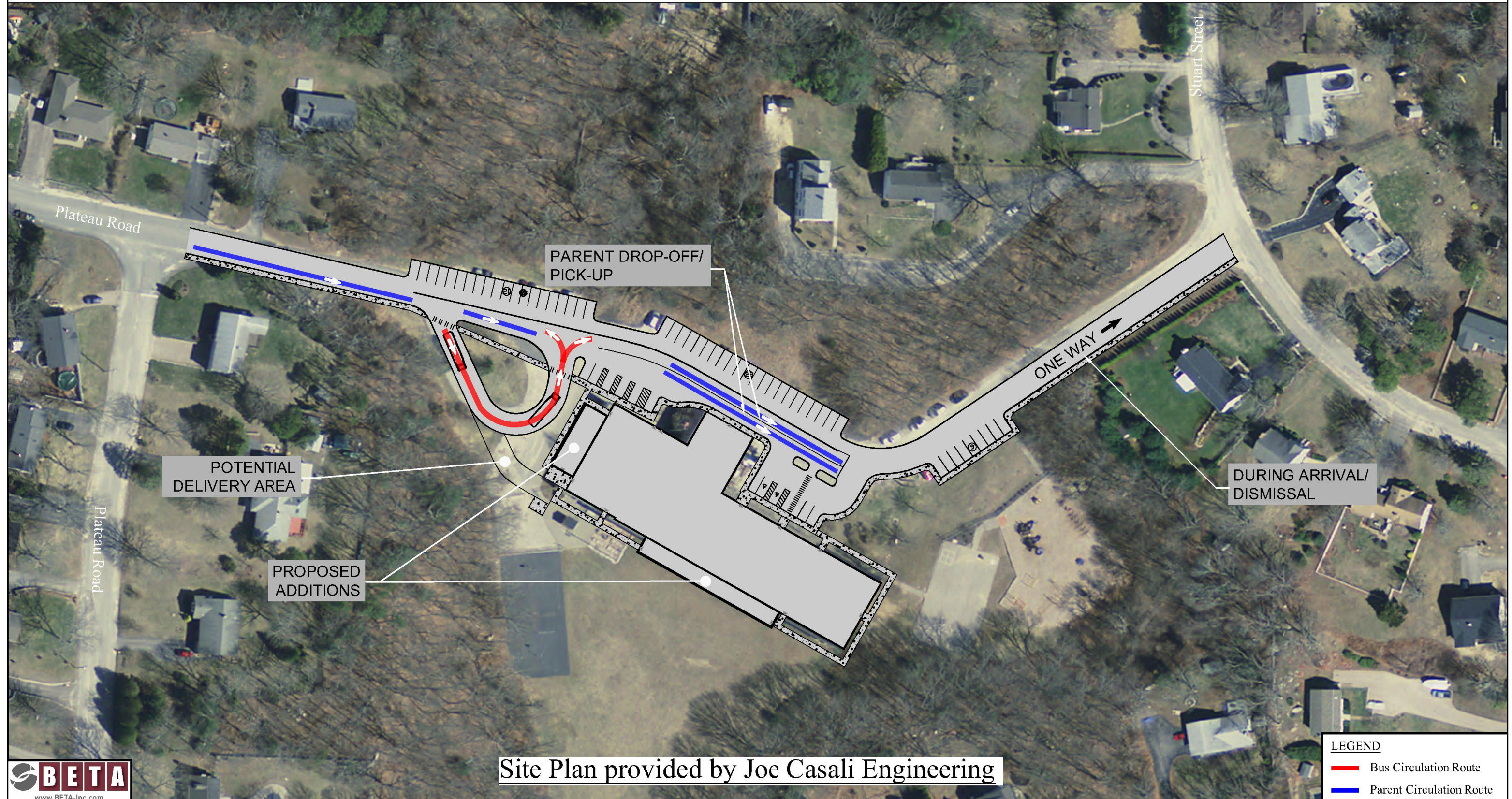
In order to address these changes within the structure of the existing school building renovations and campus property, several improvements to enhance pedestrian, bicycle and vehicular traffic should be implemented to supplement the drop-off and pick-up operation that presently is in place and functions efficiently. Figure 3b depicts the future recommended conditions at the school which includes the following;

- A continuous sidewalk should be installed along Plateau Road within the school campus property and striped crosswalks be installed where appropriate in compliance with both state and federal regulations including providing appropriate school crossing signs.
- Curb ramps be provided at all marked school crosswalks in accordance with Americans with Disabilities Act (ADA) regulations.
- School zone and speed limit signing be installed at the entrances to Plateau Road within the school campus.
- Provide appropriate identification and/or directional signing at the school entrance locations off of both Urso Drive and Sacco Drive to identify Plateau Road as a school driveway and not a through residential street. One-way west to east (Urso Drive to Sacco Drive) circulation should be enforced through signage during the arrival and dismissal periods.
- Install pavement markings and signage to better delineate the pick-up and drop-off zone at the front of the school.



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Figure 3b - Dunn's Corner Elementary School Proposed Access and Circulation



4.0 SPRINGBROOK ELEMENTARY SCHOOL

Springbrook Elementary School currently serves Kindergarten through grade 4. As part of the town's plan of redefining the elementary and middle school grade levels, Springbrook Elementary School will be reduced by a grade level and serve Pre-Kindergarten through grade 2. The enrollment is expected to be similar to current levels as students in grades 3 and 4 will transfer to the new State Street Upper Elementary school, while only adding Pre-Kindergarten. Also, redistricting will accommodate approximately half the students from grades K-2 from the State Street Elementary school to reach current school enrollment levels. The school is proposed to include minor internal upgrades to its facilities to accommodate the redistribution of students.

4.1 Project Area

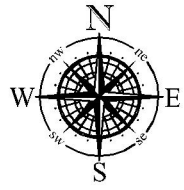
Springbrook Elementary School is located in the northwest section of the town. The school is situated on the southerly side of Springbrook Road between White Rock Road to the west and Boombidge Road to the east. Access to the school is provided primarily through the main driveway intersection with Springbrook Road, and a secondary access to the local neighborhood at a cul-de-sac on Spencer Drive.

Land use in the immediate area can be defined as pre-dominantly residential in nature. Further west along Springbrook Road and White Rock Road, the properties consists of a mixture of residential and industrial lots including a quarry, *Westerly Packing Company*, *Main Precision Manufacturing Inc.*, and *Griswold Textile*. In addition, Pawcatuck River and the Rhode Island/Connecticut state line are located just to the west of Springbrook Elementary School. Further south is the Westerly downtown area, which is approximately 1.5 miles south of the school.

4.2 Existing Conditions

The Springbrook Elementary School currently serving five grade levels has an enrollment of approximately 320 students. The building is a one-story structure surrounded by multiple parking areas on both the northerly (front) and easterly sides of the building and open space and wooded areas to the south. Teachers and staff occupy most of the available parking spaces delineated on the property, leaving few for parents and visitors. Access and egress to the school is provided from a main driveway on Springbrook Road and a gated, secondary access off of Spencer Drive at its cul-de-sac terminus.

Bus drop-off/pick-up is provided on the northerly side of the school building through a small bus loop. Buses were observed to only enter and exit the school property from the north via Springbrook Road. No buses utilize the back or secondary driveway on Spencer Drive. The parent/guardian drop-off/pick-up is designated directly in the front of the building for drop-off and on the southeasterly side of the building during the dismissal period. These conditions are presented in Figure 4a on the following page.



Westerly Elementary Schools WESTERLY, RHODE ISLAND

Figure 4a - Springbrook Elementary School Existing Access and Circulation



4.2.1 ROADWAYS

Springbrook Road

Springbrook Road is classified as a local collector road linking to higher order roadways for regional access in this area of the community. The road runs generally east/west between White Rock Road and Boombridge Road to the east. Springbrook Road can be described as a two-way, two lane roadway delineated by a double yellow centerline servicing single-family residential homes and the Springbrook Elementary School. The roadway is rural in nature unlike the other two school locations which are serviced by neighborhood residential streets, and is approximately 24 feet along its length. The adjacent photograph depicts Springbrook Road looking east with the school on the right and the car pulling out of the school driveway.



There is no curbing or sidewalk provided along the roadway. The pavement can be classified as being in good condition. The roadway is posted at 25 mph beyond the immediate school property frontage but includes a School Zone identified with signing and a 20 mph posted speed limit immediately in advance of the school driveway. The signing is limited and inconsistent with current design criteria for placement, mounting and materials. A dynamic speed sign is located to the immediate west of the school for eastbound traffic on Springbrook Road to alert motorist of their actual speed in advance of the school driveway. This installation lends to the observation that vehicle speeds along Springbrook Road are greater than desired in the immediate area of the school campus which is not readily visible while traveling along the road.

4.2.2 TRAFFIC OPERATIONS

Existing traffic flow characteristics for the servicing roadways were developed from field observations of the arrival and dismissal periods around the school start time of 8:50 AM and the dismissal at 3:15 PM. Our review of the arrival and dismissal periods at the school found that the drop-off and pick-up plan in place works relatively efficiently with minor congestion on school grounds due to the lack of available parking. Teachers and staff occupy most of the delineated parking spaces available at the school.

Based upon the location of the school and the limited campus area, it is not possible to separate bus and vehicle access to the school. The school bus area is designated on the northerly side (front entrance) of the building and once buses enter the school property, they can access the bus loop which is managed by school staff. The front bus loop is signed as a restricted area for the arrival and dismissal periods, though through discussions with staff, parents are allowed to access the bus loop to drop their child off in the morning when

buses are not present. This is common as buses arrive randomly and there are only seven buses that service this school. During the dismissal period parents are allowed to travel through this bus area prior to buses arriving at 3:15 PM. If a parent arrives after a bus, they must either park in front of the building or access the school property via Spencer Drive in the rear of the building.

In order to expedite the dismissal period, at this school students are classified as either being transported by bus or parent, or are defined as walkers. This identification aids in the dismissal process that occurs in three phases including release of walkers, parent pick-up then bus transport. Parents start arriving at the school around 2:45 and proceed to the easterly side or rear of the building. Parents stack and park on the access road adjacent to the building and sidewalk to wait for the end of the school day. At this school, unlike Dunn's Corners Elementary, parents must exit their vehicle and line up at the rear door of the building.

At dismissal around 3:15 PM a school staff member releases the walkers who exit the school to the rear to Spencer Drive via the existing sidewalk. After these children leave school grounds a staff member then identifies parents in the waiting line at the door and brings their child to the exit, where the child is then escorted by the parent to the parked car. All parents exit the site to the rear through Spencer Drive. The buses are then loaded at the front of the building and exit via the bus loop to Springbrook Road. The operations of the arrival and dismissal period appear to be adequate and managed, though there is an undesirable mixing of parents and buses during these periods. The limited available parking spaces on the site reduce available options to separate these site users to provide a more desirable site circulation pattern.

4.3 Pedestrian and Bicycle Accessibility

As previously mentioned, there are no sidewalks available on Springbrook Road or along the adjacent neighborhood streets, which is typical of the residential roads in this area. A short section of sidewalk is provided on the school property from the front of the building along the driveway to the rear of the property and ending at the cul-de-sac on Spencer Drive.

Bicycle accommodations within the immediate neighborhood including Springbrook Road is provided by means of shared use of the travel lanes which is not signed or striped accordingly to alert motorist of a possible increase in bicycle activity around the school property.

4.4 Safety Analysis

To determine if there are any limiting factors affecting safety relating to access to and through the existing school, the physical characteristics of the local servicing roadways in the project area, and specifically at the site driveway locations were investigated. These limiting factors would potentially include horizontal or vertical alignment changes or roadside obstructions that limit sight distances for vehicles traveling along the road, or entering the road from a side street or driveway location. In this instance, the sight distance standard is necessary to permit turning vehicles to safely enter and exit the site driveways.

The vertical and horizontal alignment of Springbrook Road in the immediate project area can be described as generally level and straight along the frontage of the school property. These physical roadway features of Springbrook Road as described provide sight distances in excess of 500 feet to the east and west of the existing school driveway. These values are greater than the 155-foot minimum stopping sight distance required according to AASHTO design standards for the posted speed limit of 25 mph and the School Zone speed limit of 20 mph.

As a result of the preliminary evaluation of the existing roadway geometry and physical features, it does not appear that any significant physical roadway safety deficiencies exist within the defined study area, except for the previously mentioned pedestrian accessibility and signing concerns.

4.5 Future Conditions

The upgrade to the Springbrook Elementary School will be limited to minor internal work to accommodate the change of grades. As noted, changes to this school operation will include relocation of Grades 3 and 4 to the new upper Elementary School on State Street and adding a Pre-Kindergarten. The elimination of the third elementary school, and redistribution of students in the community will result in a level student population at the Springbrook Elementary School.

In order to address these changes within the structure of the existing school building renovations and campus property, several improvements to enhance pedestrian, bicycle and vehicular traffic in the area should be implemented to supplement the drop-off and pick-up operation that presently is in place and functions in a satisfactory manner. Minor signing and striping enhancements can be implemented in the immediate term, but long-term improvements to allow separation of site users could be considered for long term improvements for the site. Figure 4b depicts the future recommended conditions at the school which includes the following;

- Construction of a separate parking lot for teachers and staff which would allow the definition of three distinct areas for each of the users; parents, teachers and buses.
- A continuous sidewalk should be installed through the site by extending the existing sidewalk in front of the school to Springbrook Road.
- Curb ramps on the property should be upgrade for compliance with Americans with Disabilities Act (ADA) regulations.
- School zone and speed limit signing should be updated and installed at proper locations along Springbrook Road in advance of the school driveway.
- A second swing gate should be installed on the easterly side of the building adjacent to the playground area to allow a cordoned off area for safe crossing and a hard surface play area during recess. This area is presently delineated with traffic cones when students are playing on the paved surface.

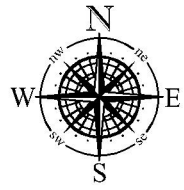
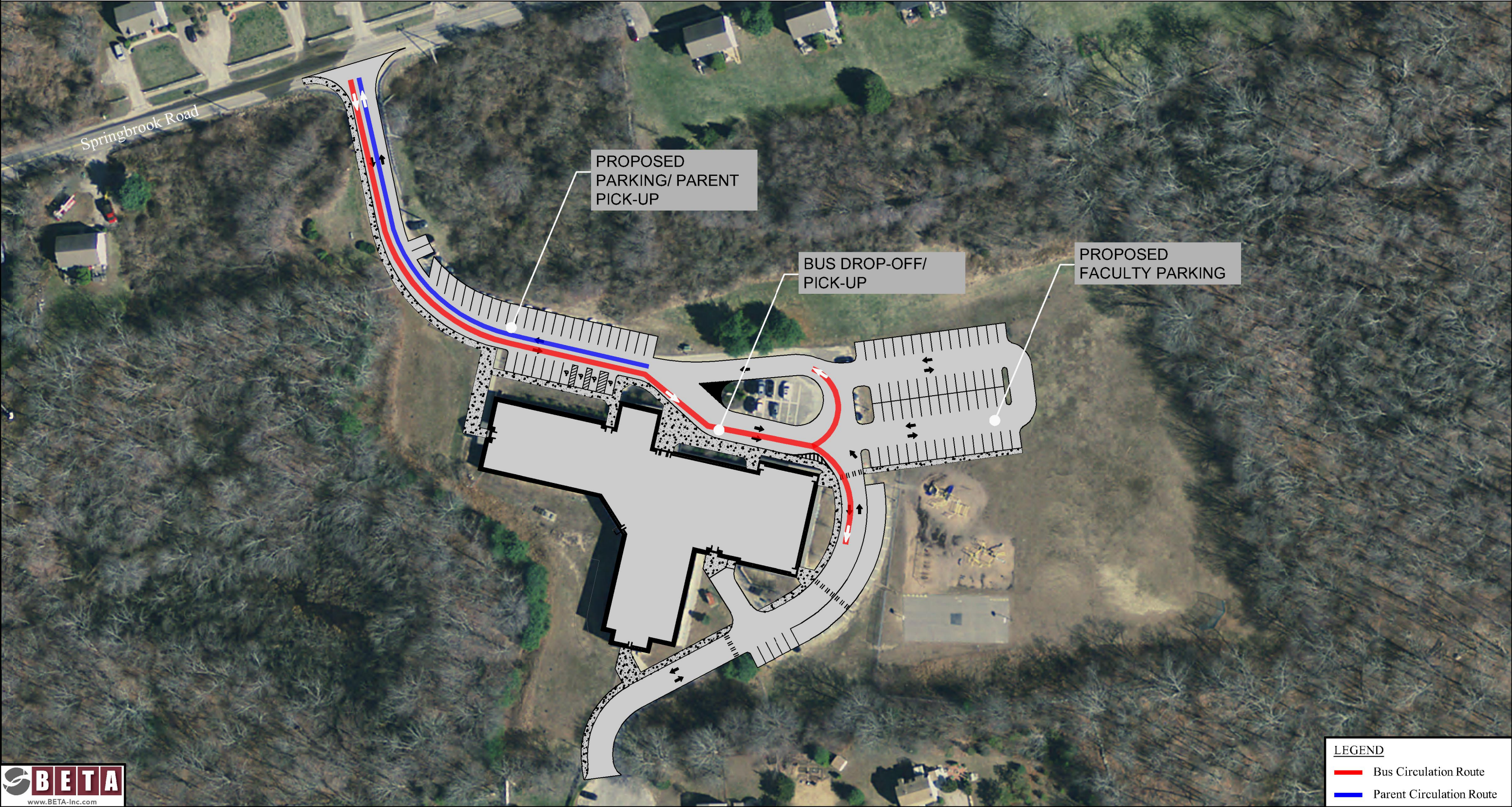


Figure 4b - Springbrook Elementary School Proposed Access and Circulation



ATTACHMENTS

- A. Existing Traffic Data
- B. Typical Traffic Controls for School Areas

ATTACHMENT A – Existing Traffic Data

Manual Turning Movement Count

State Street at Hollis Street

State Street at Westminster Street

A

Manual Turning Movement Count

State Street at Hollis Street

State Street at Westminster Street

State Street at Hollis Street



6 Blackstone Valley Place
Lincoln, RI 02865

Project: Westerly Elementary Schools
Town/City: Westerly, RI
Int.: State St. at Hollis St.
Weather: Sunny/30s

File Name : Hollis at State
Site Code : 00641502
Start Date : 1/29/2019
Page No : 1

Groups Printed- Vehicles

Start Time	Hollis Street Southbound					State Street Westbound					Northbound					State Street Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:30 AM	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	11
07:45 AM	1	0	4	0	5	0	10	0	0	10	0	0	0	0	0	0	2	0	0	2	17
Total	1	0	5	0	6	0	14	0	0	14	0	0	0	0	0	0	8	0	0	8	28
08:00 AM	4	0	6	0	10	0	12	1	0	13	0	0	0	0	0	0	4	0	0	4	27
08:15 AM	10	0	9	1	20	0	16	2	0	18	0	0	0	0	0	1	4	0	0	5	43
08:30 AM	13	0	22	0	35	0	17	5	0	22	0	0	0	0	0	3	7	0	0	10	67
08:45 AM	4	0	3	0	7	0	8	1	0	9	0	0	0	0	0	2	6	0	0	8	24
Total	31	0	40	1	72	0	53	9	0	62	0	0	0	0	0	6	21	0	0	27	161
*** BREAK ***																					
02:30 PM	0	0	4	0	4	0	6	0	1	7	0	0	0	0	0	2	8	0	0	10	21
02:45 PM	1	0	8	0	9	0	7	5	0	12	0	0	0	0	0	1	8	0	0	9	30
Total	1	0	12	0	13	0	13	5	1	19	0	0	0	0	0	3	16	0	0	19	51
03:00 PM	4	0	7	3	14	0	3	5	0	8	0	0	0	0	0	4	5	0	4	13	35
03:15 PM	25	0	16	10	51	0	10	3	0	13	0	0	0	0	0	9	15	0	0	24	88
03:30 PM	5	0	1	0	6	0	2	2	0	4	0	0	0	0	0	0	9	0	0	9	19
03:45 PM	1	0	2	0	3	0	0	2	0	2	0	0	0	0	0	1	5	0	0	6	11
Total	35	0	26	13	74	0	15	12	0	27	0	0	0	0	0	14	34	0	4	52	153
Grand Total	68	0	83	14	165	0	95	26	1	122	0	0	0	0	0	23	79	0	4	106	393
Apprch %	41.2	0	50.3	8.5		0	77.9	21.3	0.8		0	0	0	0		21.7	74.5	0	3.8		
Total %	17.3	0	21.1	3.6	42	0	24.2	6.6	0.3	31	0	0	0	0	0	5.9	20.1	0	1	27	

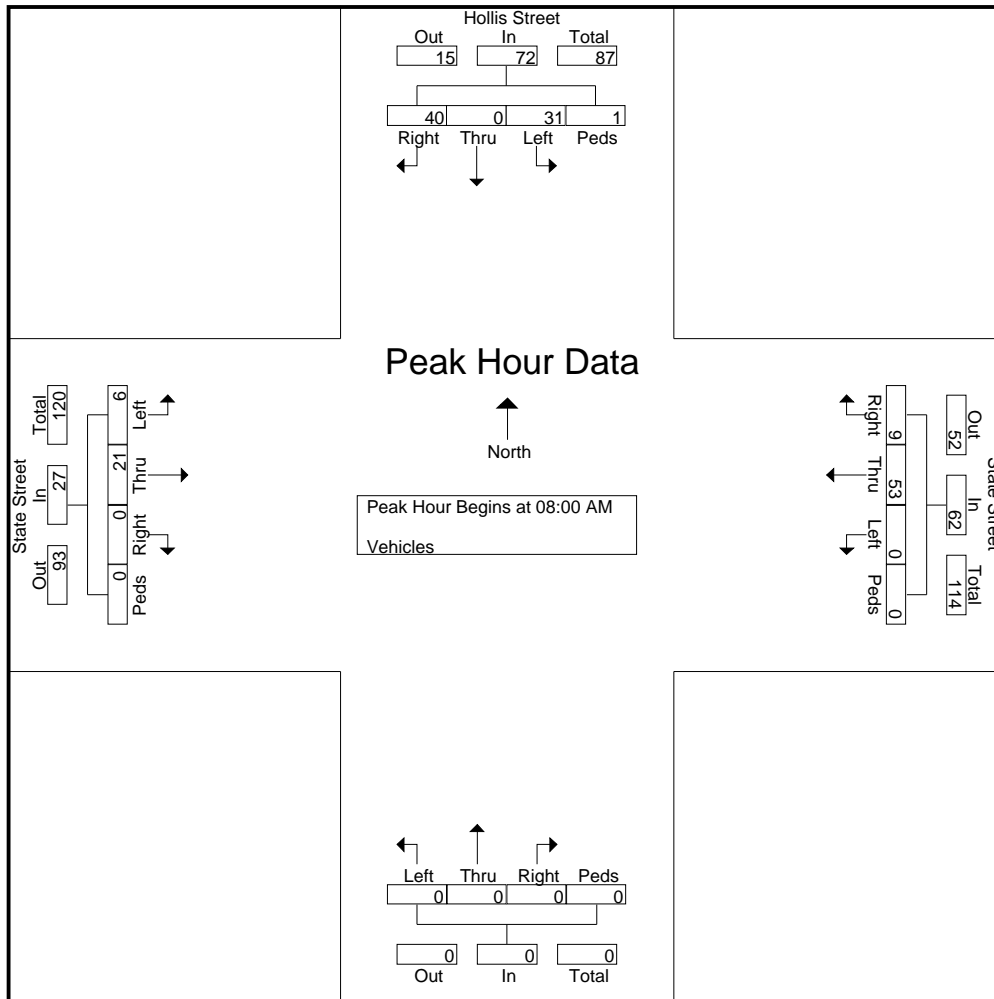


6 Blackstone Valley Place
Lincoln, RI 02865

Project: Westerly Elementary Schools
Town/City: Westerly, RI
Int.: State St. at Hollis St.
Weather: Sunny/30s

File Name : Hollis at State
Site Code : 00641502
Start Date : 1/29/2019
Page No : 3

	Hollis Street Southbound					State Street Westbound					Northbound					State Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	4	0	6	0	10	0	12	1	0	13	0	0	0	0	0	0	4	0	0	4	27
08:15 AM	10	0	9	1	20	0	16	2	0	18	0	0	0	0	0	1	4	0	0	5	43
08:30 AM	13	0	22	0	35	0	17	5	0	22	0	0	0	0	0	3	7	0	0	10	67
08:45 AM	4	0	3	0	7	0	8	1	0	9	0	0	0	0	0	2	6	0	0	8	24
Total Volume	31	0	40	1	72	0	53	9	0	62	0	0	0	0	0	6	21	0	0	27	161
% App. Total	43.1	0	55.6	1.4		0	85.5	14.5	0		0	0	0	0		22.2	77.8	0	0		
PHF	.596	.000	.455	.250	.514	.000	.779	.450	.000	.705	.000	.000	.000	.000	.000	.500	.750	.000	.000	.675	.601



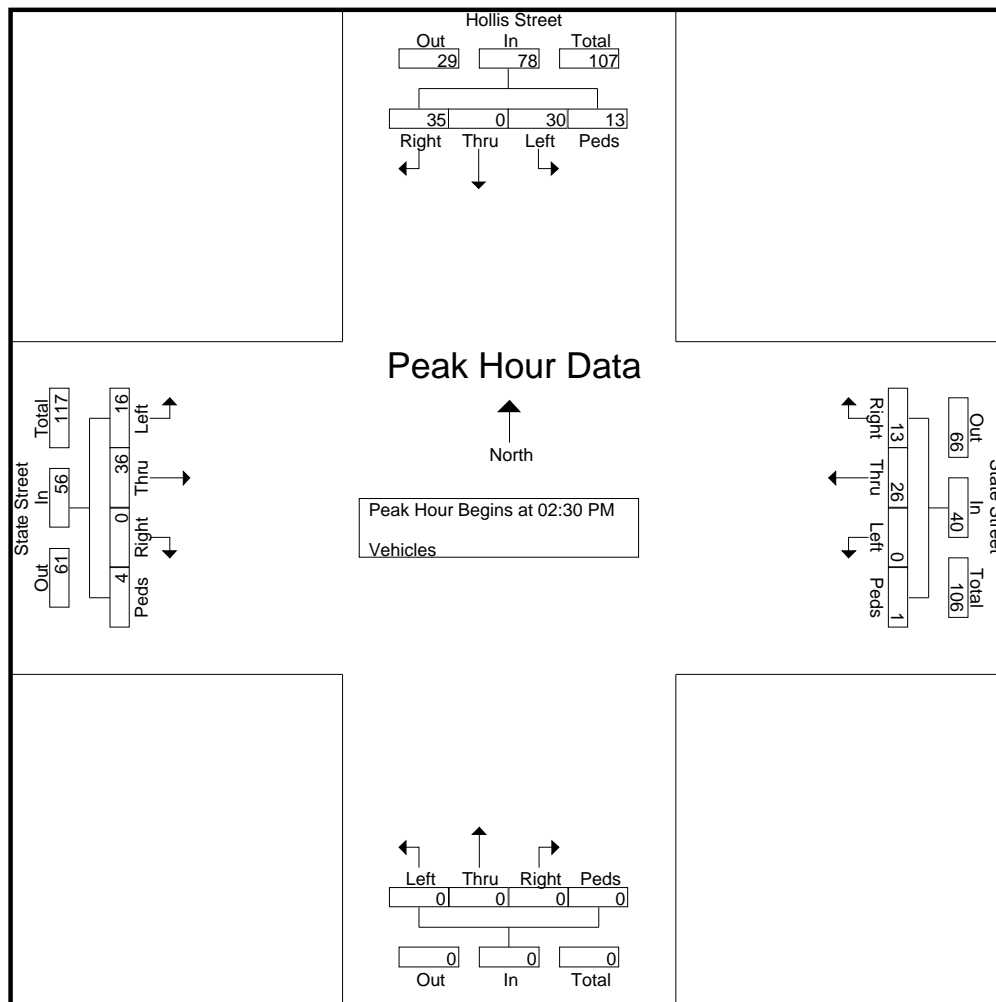


6 Blackstone Valley Place
Lincoln, RI 02865

Project: Westerly Elementary Schools
Town/City: Westerly, RI
Int.: State St. at Hollis St.
Weather: Sunny/30s

File Name : Hollis at State
Site Code : 00641502
Start Date : 1/29/2019
Page No : 4

	Hollis Street Southbound					State Street Westbound					Northbound					State Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:30 PM																					
02:30 PM	0	0	4	0	4	0	6	0	1	7	0	0	0	0	0	2	8	0	0	10	21
02:45 PM	1	0	8	0	9	0	7	5	0	12	0	0	0	0	0	1	8	0	0	9	30
03:00 PM	4	0	7	3	14	0	3	5	0	8	0	0	0	0	0	4	5	0	4	13	35
03:15 PM	25	0	16	10	51	0	10	3	0	13	0	0	0	0	0	9	15	0	0	24	88
Total Volume	30	0	35	13	78	0	26	13	1	40	0	0	0	0	0	16	36	0	4	56	174
% App. Total	38.5	0	44.9	16.7		0	65	32.5	2.5		0	0	0	0		28.6	64.3	0	7.1		
PHF	.300	.000	.547	.325	.382	.000	.650	.650	.250	.769	.000	.000	.000	.000	.000	.444	.600	.000	.250	.583	.494



State Street at Westminster Street



6 Blackstone Valley Place
Lincoln, RI 02865

Project: Westerly Elementary Schools
Town/City: Westerly, RI
Int.: State St. at Westminster St.
Weather: Sunny/30s

File Name : Westminster at State
Site Code : 00641501
Start Date : 1/29/2019
Page No : 1

Groups Printed- Vehicles - Bank 1

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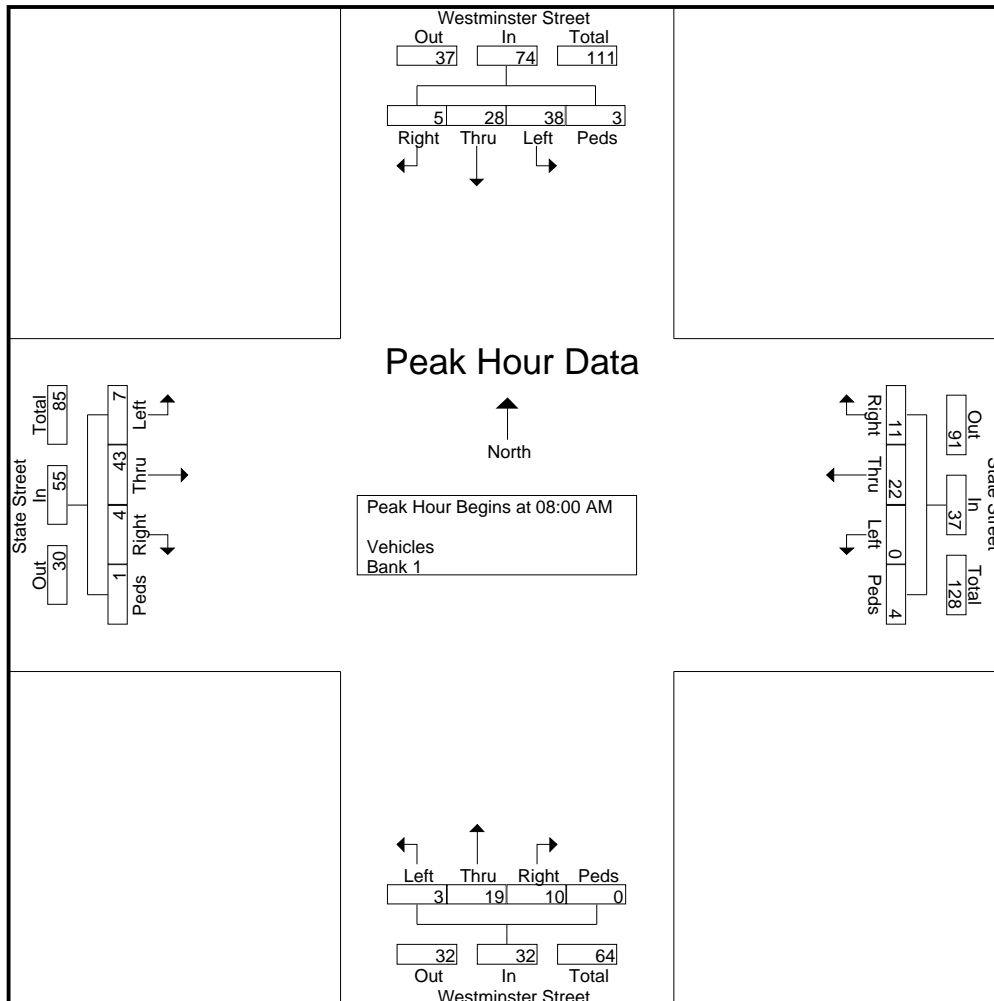


6 Blackstone Valley Place
Lincoln, RI 02865

Project: Westerly Elementary Schools
Town/City: Westerly, RI
Int.: State St. at Westminster St.
Weather: Sunny/30s

File Name : Westminster at State
Site Code : 00641501
Start Date : 1/29/2019
Page No : 3

	Westminster Street Southbound					State Street Westbound					Westminster Street Northbound					State Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	6	5	1	0	12	0	2	3	0	5	1	4	1	0	6	2	9	2	0	13	36
08:15 AM	8	5	1	2	16	0	6	1	1	8	0	6	2	0	8	2	14	0	0	16	48
08:30 AM	20	11	3	1	35	0	11	5	1	17	1	2	5	0	8	1	17	1	1	20	80
08:45 AM	4	7	0	0	11	0	3	2	2	7	1	7	2	0	10	2	3	1	0	6	34
Total Volume	38	28	5	3	74	0	22	11	4	37	3	19	10	0	32	7	43	4	1	55	198
% App. Total	51.4	37.8	6.8	4.1		0	59.5	29.7	10.8		9.4	59.4	31.2	0		12.7	78.2	7.3	1.8		
PHF	.475	.636	.417	.375	.529	.000	.500	.550	.500	.544	.750	.679	.500	.000	.800	.875	.632	.500	.250	.688	.619



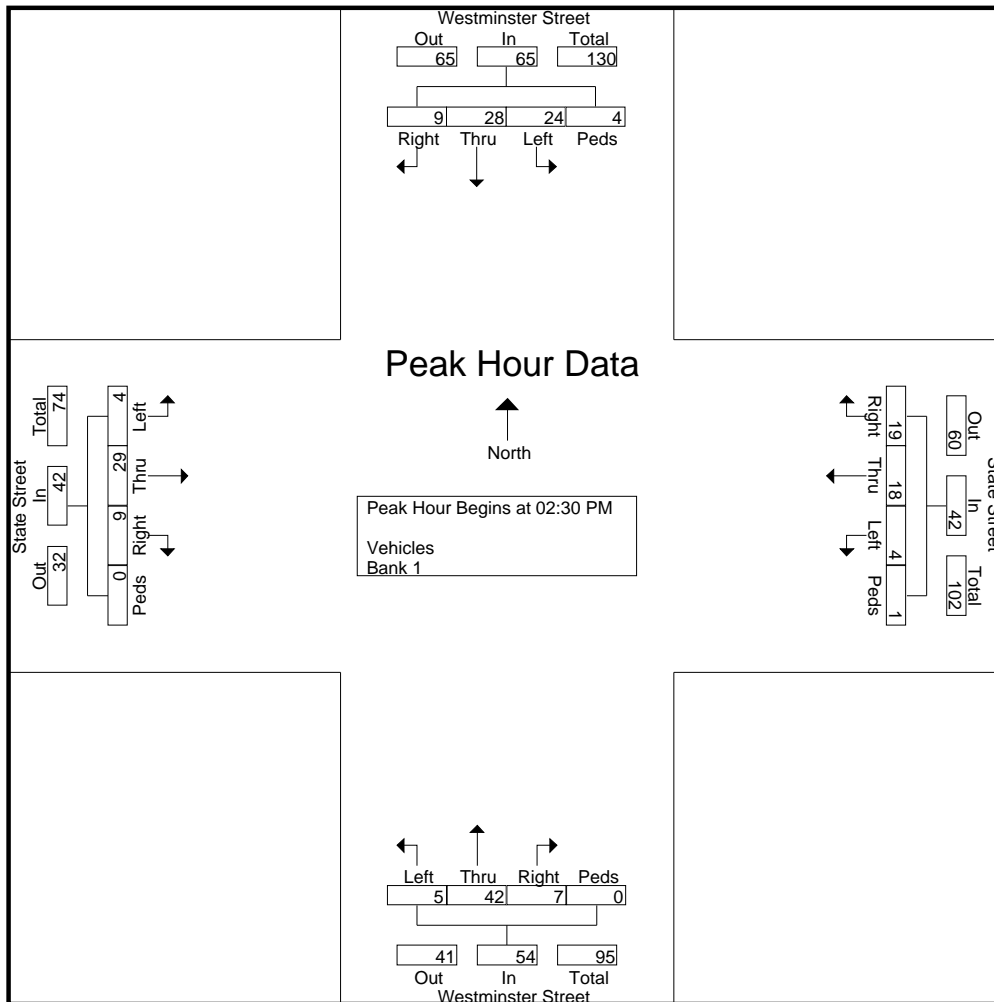


6 Blackstone Valley Place
Lincoln, RI 02865

Project: Westerly Elementary Schools
Town/City: Westerly, RI
Int.: State St. at Westminster St.
Weather: Sunny/30s

File Name : Westminster at State
Site Code : 00641501
Start Date : 1/29/2019
Page No : 4

	Westminster Street Southbound					State Street Westbound					Westminster Street Northbound					State Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:30 PM																					
02:30 PM	2	9	1	0	12	1	3	0	1	5	1	8	4	0	13	0	8	3	0	11	41
02:45 PM	5	7	2	0	14	2	2	1	0	5	1	12	0	0	13	2	8	1	0	11	43
03:00 PM	12	7	0	2	21	0	0	4	0	4	1	8	2	0	11	2	9	2	0	13	49
03:15 PM	5	5	6	2	18	1	13	14	0	28	2	14	1	0	17	0	4	3	0	7	70
Total Volume	24	28	9	4	65	4	18	19	1	42	5	42	7	0	54	4	29	9	0	42	203
% App. Total	36.9	43.1	13.8	6.2		9.5	42.9	45.2	2.4		9.3	77.8	13	0		9.5	69	21.4	0		
PHF	.500	.778	.375	.500	.774	.500	.346	.339	.250	.375	.625	.750	.438	.000	.794	.500	.806	.750	.000	.808	.725



ATTACHMENT B – Typical Traffic Control for School Areas

Typical Traffic Control for School Areas

School Advance
Crossing Assembly



AHEAD

OR

200 FT

OR

200
FEET

OR



OR



School Crossing
Assembly



School Zone Sign



ALL YEAR

SCHOOL

OR



OR



School Speed
Limit Assembly

SCHOOL

SPEED
LIMIT
20

7:30-8:30 AM
2:30-3:30 PM

OR

WHEN
CHILDREN
ARE PRESENT

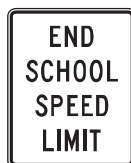
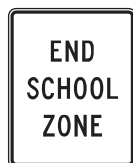
OR

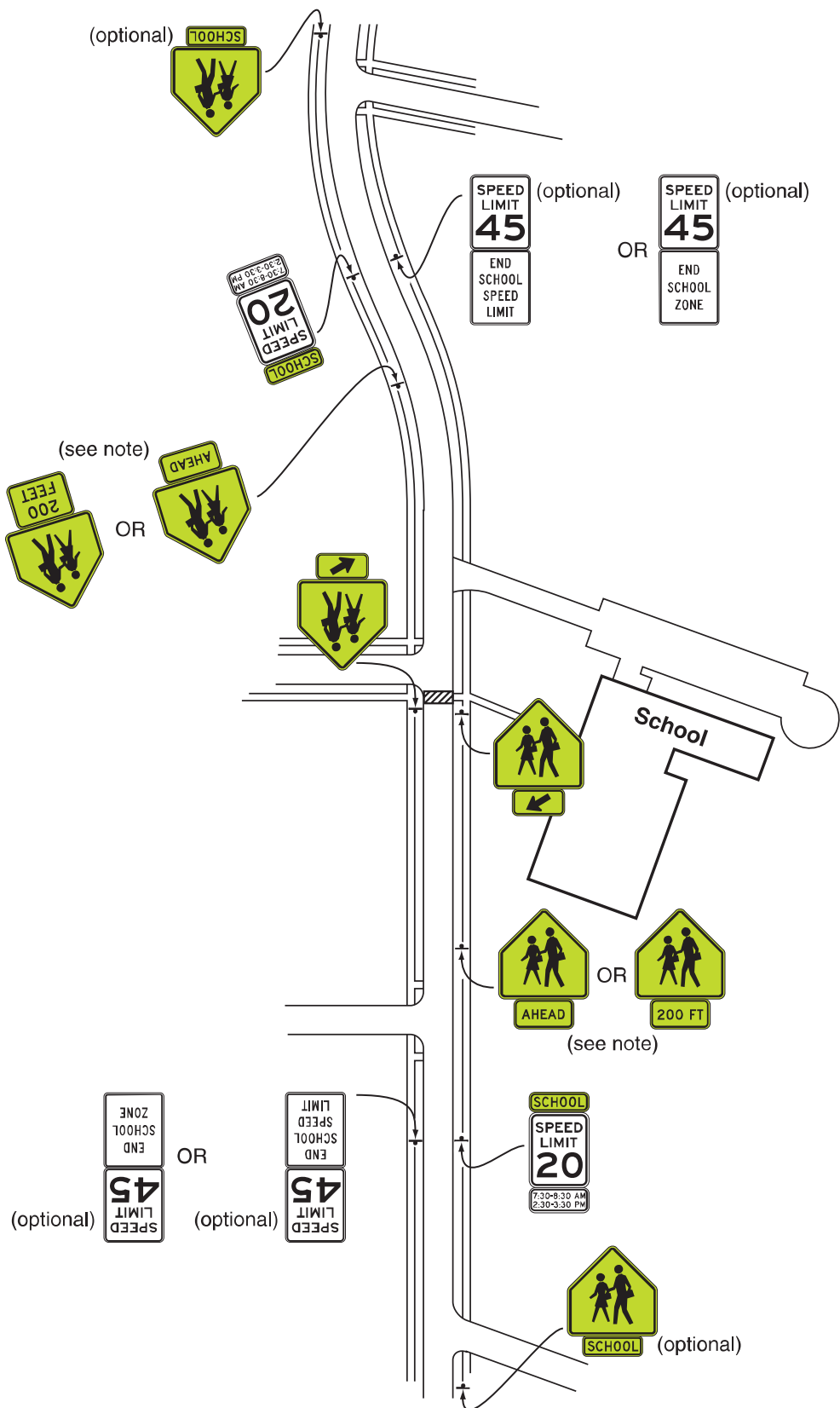
WHEN
FLASHING

OR

7:30-8:30 AM
2:30-3:30 PM

MON-FRI

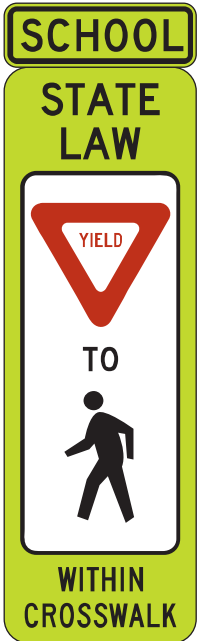




A - In advance of the school crossing



B - At the school crossing



OR



OR



OR



OR

