

The Miriam Hospital

As mentioned previously in the report, Miriam Hospital provides 144 spaces of visitor parking in the two lots along Summit Avenue between Fifth Street and Seventh Street. Task 2 of the Scope of Services requested modeling the potential traffic impact on local streets of a proposal to relocate the two visitor lots on Summit Avenue to the existing employee lot on Seventh Street. A portion of the available 327 spaces currently identified as employee parking would therefore be made available for visitors and patients. The existing visitor lots would then potentially become an open space buffer to the neighborhood. BETA investigated how moving the parking areas would affect traffic circulation and operations on the local streets. Coordination with the affected property owners was not completed as part of this task.

In order to complete this task, BETA conducted a traffic analysis of the surrounding roadways and parking lots. A review of the vehicle counts obtained for the roadways in close proximity to the hospital and associated parking lots indicated that the peak hour of traffic occurred between 2 and 4pm. This would coincide with the afternoon shift change of the hospital. Manual turning movement counts were then completed at four intersections through which vehicles would travel to obtain access to these lots; namely, the intersections of Fifth Street and Highland Avenue, Fifth Street and Summit Avenue, Seventh Street and Summit Avenue, and Seventh Street and Highland Avenue. In addition to counting the turning movements at the intersections surrounding the hospital, BETA observed the vehicle access and egress of the two visitor lots on Summit Avenue, and the employee lot on Seventh Street to obtain origin and destination information during this period.

The key to any traffic analysis is the evaluation of the peak hour operations. Therefore, a capacity analysis was performed for the peak hour, which represents the highest one-hour volume period of traffic serviced on the roadways surrounding the hospital. Likewise, the most accurate means of evaluating traffic impacts is the measurement of intersection/roadway capacities to define changes from existing to future conditions. Intersection capacity is measured through utilization of the methodology presented in the 2000 Highway Capacity Manual. The results of this technique are expressed in terms of Level of Service (LOS). Level of Service is a qualitative measure of traffic flow efficiency based on anticipated vehicle delays. For example, LOS “A” represents the best conditions with little or no delay, while LOS “F” indicates that the roadway or intersection is at full capacity, potentially resulting in extensive vehicle delays. The table below defines the thresholds of the various levels of service:

<i>Level of Service</i>	<i>Signalized Delay Per Vehicle (sec)</i>	<i>Unsignalized Delay Per Vehicle (sec.)</i>
<i>A</i>	<i><10</i>	<i><10</i>
<i>B</i>	<i>>10 and <20</i>	<i>>10 and <15</i>
<i>C</i>	<i>>20 and <35</i>	<i>>15 and <25</i>
<i>D</i>	<i>>35 and < 55</i>	<i>>25 and <35</i>
<i>E</i>	<i>>55 and <80</i>	<i>>35 and <50</i>
<i>F</i>	<i>>80</i>	<i>>50</i>

Based on the data obtained, it was determined that due to the low volume of traffic serviced, all four intersections currently operate at a Level of Service “A”, indicating little or no delay is experienced on the roadways and, at the intersections in the immediate vicinity of the hospital.

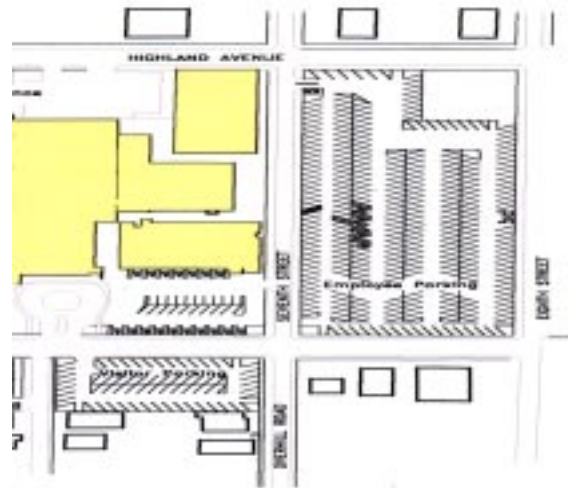


Figure 44 -Miriam Hospital and associated parking lots

The suggested future condition identified in the scope of services would relocate the visitor parking to a portion of the employee lot. A potential redesign to accommodate a dual purpose lot is discussed in the next section. In order to complete our analysis, several assumptions have been made in the analysis of the future travel patterns, and are detailed below:

- In order to estimate future traffic conditions around Miriam Hospital as proposed by the SNA, BETA developed several options for a combined employee/visitor parking lot on Seventh Street. These designs are discussed in detail in the next section. The designs were developed to minimize loss of parking spaces in the existing employee lot while allowing for a mixed use that requires separation. This conceptual exercise resulted in a loss of a total of five spaces in the lot, reducing the number from 327 to 322.
- Under existing conditions, 51 vehicles were observed entering the employee lot during the peak hour, and 48 exited during the same time. The proposed reconfiguration of the parking lot to accommodate visitor parking would reduce the available employee spaces from 327 spaces to 145 spaces, or a reduction of approximately 45%. Therefore, it is assumed that the number of employees entering and exiting the lot during the peak hour would be reduced by 45%, leaving 23 entering and 22 exiting.
- Similarly, 45 cars were observed entering the two lots on Summit Avenue during the same peak hour, while 39 vehicles exited. The proposed layout of the new visitor parking at the Seventh Street lot would provide 176 spaces, increasing the available visitor parking by approximately 20%. Therefore, it is assumed the number of visitors/patients entering the visitor portion of the Seventh Street lot will be increased by 20%, (relocated on-street parking) resulting in 54 trips entering and 47 trips exiting during the peak hour.

- It is assumed that visitors currently entering and exiting the hospital area from Summit Avenue and the Hope Street area would continue to do so under future conditions. Additional signing would be added to the Fifth Street and Summit Avenue intersection to direct the cars to the proposed visitor parking area.
- Those vehicles currently traveling to the hospital from North Main Street would follow the same route to the new lot as they do today, however, signs at the corner of Fifth Street and Highland Avenue would direct visitors to the Seventh Street lot via Highland Avenue.
- The analysis was also completed transferring those vehicles currently heading east on Fifth Street from North Main Street to Seventh Street, with similar results as described above.
- The proposed configuration of the visitor parking would displace 150 employee spaces. It is assumed that there is sufficient occupancy at the satellite lot on North Main Street to accommodate those displaced employees, based on our field review of available parking spaces in the lots.
- Based on observations made by BETA, the Miriam Hospital currently operates shuttle buses to transport their employees to and from the satellite lots at Third Street (referred to as the Arena parking lot) and on North Main Street located behind the former Sears building. It is estimated that additional shuttle runs would be required during the peak hours to transport the employees displaced by relocated visitor parking.

It is estimated that an additional 5 shuttle bus runs (assuming 50% bus occupancy) would be required to transport the displaced employees during the peak hour. This is not based upon displaced spaces but employee trips during the peak hour as counted. The assumed route would be from North Main Street to Tenth Street, then turning right onto Highland Avenue, and left onto Seventh Street to access the front of the hospital on Summit Avenue. These trips were added to into the intersection volumes along with the redistributed traffic in order to calculate future capacity conditions.

The capacity analysis was run using HCS 2000 software to determine the level of delay at each of the intersections. Displacing the 177 employee vehicles, and re-routing the visitor vehicles to the Seventh Street lot would not result in any discernable reduction in the level of service, or delay to the local streets and intersections surrounding the hospital. The complete analysis is included in the Appendix.

The intersection delays remained practically unchanged from existing to future conditions as described. The changes in delay were all less than one second per vehicle either greater or less, depending on the intersection. This change would not be noticeable by the driver or person observing intersection operations. Due to the low hourly volumes traveling through these intersections, vehicles approaching the stop-controlled intersections typically are able to proceed through an intersection immediately after stopping for a stop sign.

In addition to defining the capacity impacts on the surrounding roadway system resulting from the parking relocation scenario, the SNA requested BETA to estimate the potential daily traffic volume redistribution on these roads. For this task it was assumed that all traffic accessing the Miriam Hospital parking lots from the Hope Street area would continue to use their present routes through the neighborhood, due to the short relocation distance of the proposed visitor lots. Traffic entering from North Main Street could be signed at either North Main Street or at Highland Avenue to the proposed Seventh Street visitors lot. If signed at North Main Street, a large percentage of the visitors to the hospital could be re-distributed to Seventh Street. Similarly, if visitor parking is signed at Highland Avenue, the Fifth Street and Seventh Street blocks west of Highland Avenue would continue to experience present traffic volumes while Highland between Fifth and Seventh Streets would service the re-distributed volume.

In order to complete this task, BETA utilized the turning movement data obtained in the origin/destination study in combination with the 24-hour automatic recorder data obtained on Fifth Street and Seventh Street west of Highland Avenue. The average turning percentage of traffic from Fifth Street eastbound into the visitor's lot was used to estimate the percentage of Fifth Street hourly volume which may be re-distributed due to the relocation of the visitor's lots to Seventh Street.

Based on these calculations, it is estimated that approximately 630 visitor-parking related vehicles per day on Fifth Street could be affected by the relocation of the visitor's lot to Seventh Street. If the visitor's lot was signed on North Main Street at Seventh Street the daily volumes on Fifth Street would potentially be reduced by approximately 20 percent (2,970 vpd to 2,340 vpd), while Seventh Street traffic would potentially increase by approximately 40 percent (1625 vpd to 2255 vpd). This 40 percent increase directly resulting from the 630 vpd (visitors) relocated to Seventh Street, would be offset, or slightly less due to the relocation of those employees which used this route and were moved to the North Main Street lot. This employee redistribution was not factored into the daily redistribution due to the numerous routes presently used by the 144 displaced employee spaces. The effect of this daily traffic volume re-distribution was analyzed for the peak hour conditions as noted previously and would not result in adverse impacts at the intersections surrounding the hospital.

Proposed Parking Scenarios

BETA Group, Inc. has developed several parking scenarios that illustrate the configuration of a potential mixed employee/visitor lot on Seventh Street. The intent of the redesigned lot was to minimize the loss of spaces currently available in the lot while providing two separate and distinct parking areas. Based upon the existing maximized configuration it was found that a chain link fence or similar barrier would minimize parking loss while providing separation and control.

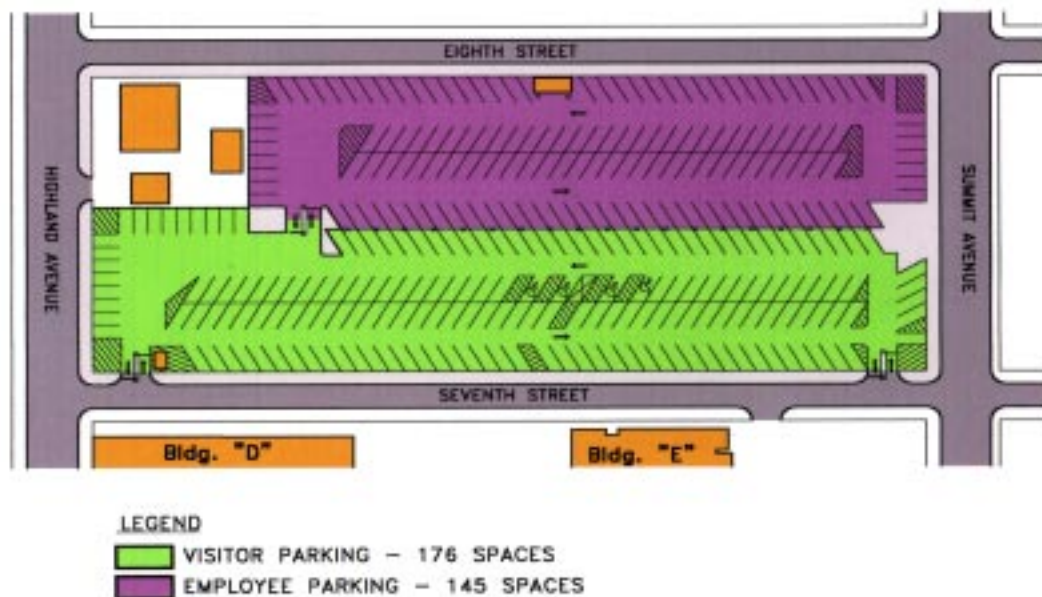


Fig. 45

Figure 45 illustrates the configuration with 145 spaces reserved for employees. They would enter the lot at the two existing entrances on Seventh Street, and access the employee lot via a gate behind the visitor section. This option allows for 176 visitor spaces which is greater than the 144 presently available in the Summit Avenue lots. These additional spaces could potentially reduce visitor parking infiltration into the neighborhood.

Figures 46 and 47 also show potential layouts for the shared parking lot between Seventh and Eighth Streets. These options allow for different combinations of employee/visitor spaces and result in a greater loss of spaces.

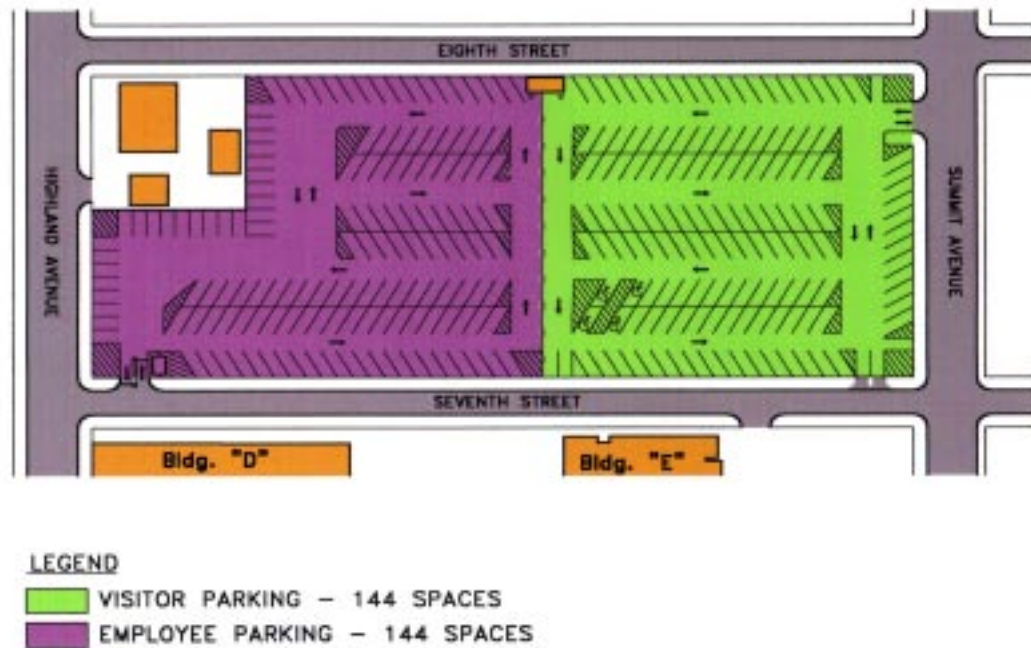


Figure 46

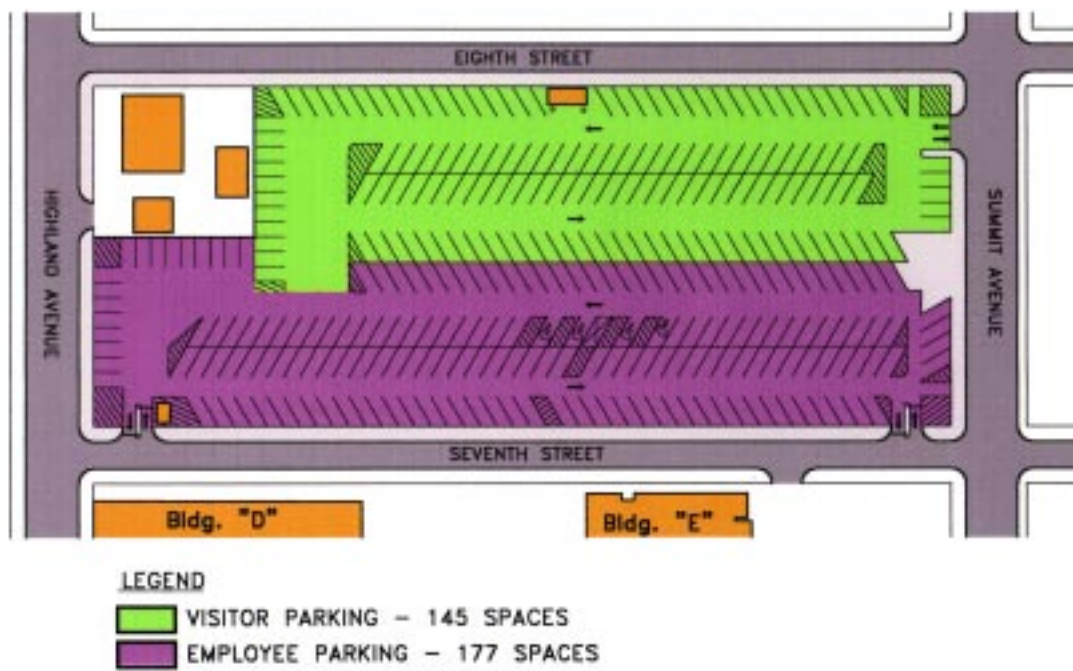


Figure 47

Relocation of the visitor parking to Seventh Street would allow the existing visitor lots along Summit Avenue to be converted to open space, providing a buffer between the hospital and its associated traffic and the residential neighborhood. Sixth Street could be terminated to allow a connection between the two areas, and a cul-de-sac constructed providing access to the open space for residents. The cul-de-sac would also allow a means for emergency vehicles to turn around. A potential layout of the open space has been prepared by Gates, Leighton & Associates, Inc., and is illustrated in Figure 48 .



Fig. 48 - Potential layout of greenspace, as illustrated by Gates, Leighton & Associates, Inc.

In summary of Task 2, BETA found that the servicing roadways and intersections would not be adversely impacted by the SNA proposal. Also, satellite parking appears to be sufficient to accommodate the relocation of 175 employees from the Seventh Street lot.

As part of this study, BETA did not investigate the feasibility and cost associated with obtaining the private property necessary to implement the SNA proposal. Additionally, the impact on the property owners affected by the parking relocation was not assessed. If the SNA determines that this option to create a buffer zone along Summit Street is a viable and important element in the overall neighborhood plan, further investigations must be completed to address these issues. Coordination with the City and property owners is necessary to further this option.

Project Implementation

The recommendations presented in this report represent a long-term vision for the Summit neighborhood. There are several issues which must be addressed that may influence the phasing of some or all of the proposed improvements. They include the following:

- Available financing
- Distribution of financing across political boundaries or wards within the city.
- Having a logical sequence of change
- Balancing the measures on all streets within the neighborhood.
- Monitoring the effects, which may change priorities.

Preliminary cost estimates have been prepared to identify the costs of various improvements. The larger the project, (i.e. incorporating many improvements over the entire neighborhood vs. smaller, more numerous projects), the lower the overall costs generally tend to be. Ideally, improvements should be made to an entire street in one project, although it may become necessary to implement only key features on one street, and key features on another street to balance the change across the neighborhood.

It is suggested that the improvements to Hope Street be completed as a separate, complete project. This is to reduce the anticipated construction-related delays to motorists, which in turn will limit the through movement of vehicles on parallel streets avoiding the construction zone.

As previously mentioned in the report, the section of Hope Street between Doyle Avenue and Braman Street is south of the project limits. However, traffic calming measures proposed for Hope Street north of Fifth Street are applicable to this section as well, and will tend to balance the roadway from Doyle Avenue to the Pawtucket City line.

Interim measures may be effective in achieving the overall goal of the project. For instance, striping may be placed at locations where center median islands or curb extensions are proposed. The high visibility crosswalks can be striped at applicable locations, and new trees can be planted in the existing strip between the current sidewalks and the curbing. The locations of the striping should be accurate and reflect the proposed curblines to simulate the final version of the measure sufficiently. It is also important not to let the temporary measures become permanent.

The roundabout proposed at the intersection of Eighth Street and Lorimer Avenue should be considered a separate project, to be implemented if funding is available. While it is expected that these improvements will benefit the entire area surrounding this intersection, the costs associated with these improvements are relatively high when compared with the improvements proposed elsewhere.

The locations identified in this report represent the streets identified by the local residents at two public meetings held over the study phase. There were several comments received, both verbally and on the comment forms provided which have not been addressed herein, either because the traffic data obtained did not substantiate the complaint, or because it is believed the measures proposed in close proximity would alleviate the problem. It will be up to the local residents and city agencies to monitor the effects of the improvements once implemented to evaluate if the complaints need to be re-visited, or if additional measures are warranted.

This plan has attempted to give the neighborhood a direction and argument to carry it forward in the future years. Its intention is to achieve a calming of the traffic through the neighborhood; enhancing the quality of the environment for everyone, including those who are driving through; and giving residents and visitors greater opportunity and delight in using the public streets and spaces on Hope Street and throughout the Summit neighborhood of Providence.

Preliminary Cost Estimates

Hope Street (Braman Street to Fifth Street)

Remove and Replace deteriorated Concrete Sidewalks	\$50,000
Wheelchair Ramps	\$10,000
Curb Extensions/Neck-downs	\$115,000
Landscaping/Trees	\$20,000
Streetscape Amenities	\$25,000
Ornamental Lighting (85 lights @ \$4,800 each)	\$400,000
Brick Banding	<u>\$60,000</u>
Subtotal	\$680,000
25% Engineering and Contingencies	\$170,000

Total – Hope Street – Braman Street to Fifth Street **\$850,000**

Hope Street (Fifth Street to Hillside Avenue)

Median Islands	\$150,000
Blackstone Boulevard Curb	\$20,000
Striping and Signing	\$10,000
Brick Banding	<u>\$20,000</u>
Subtotal	\$200,000
25% Engineering and Contingencies	\$50,000

Total – Hope Street (Fifth Street to Hillside Street) **\$250,000**

Hillside Avenue

Neckdowns (3 locations)	\$60,000
Signing and Striping	\$3,000
Subtotal	\$63,000
25% engineering and Contingencies	\$17,000

Total – Hillside Avenue **\$80,000**

Lorimer Avenue

Traffic Circles	\$50,000
Curb Extensions/Neck-downs	\$50,000
Landscaping	<u>\$8,000</u>
Subtotal	\$108,000
25% Engineering and Contingencies	\$27,000

Total – Lorimer Avenue **\$135,000**

Rochambeau Avenue at Camp Street

Curbing	\$15,000
Sidewalks	\$10,000
R&D Items	\$5,000
Landscaping	<u>\$8,000</u>
Subtotal	\$40,000
25% Engineering and Contingencies	\$10,000

Total – Rochambeau and Camp **\$50,000**

Summit Avenue (including Ivy Street)

Curb Extensions	\$330,000
Signing and Striping	\$5,000
Landscaping	<u>\$25,000</u>
Subtotal	<u>\$360,000</u>
25% Engineering and Contingencies	\$90,000

Total - Summit Avenue **\$450,000**

Tenth Street at Highland Avenue

Curb Extensions	\$40,000
Signing and Striping	\$1,000
Landscaping	<u>\$3,000</u>
Subtotal	<u>\$44,000</u>
25% Engineering and Contingencies	\$11,000

Total – Tenth Street at Highland Avenue **\$55,000**

Eighth Street at Lorimer Avenue (Roundabout)

Curbing	\$30,000
Pavement/Driveways	\$20,000
Landscaping	<u>\$15,000</u>
Subtotal	<u>\$65,000</u>
25% Engineering and Contingencies	\$15,000

Total – Eighth Street at Lorimer Avenue **\$80,000**

Project Total \$1,950,000

Acknowledgements

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City of Providence

The Honorable Vincent A. Cianci Jr., *Mayor*
John Palmeri, *Director of Planning*
Samuel Shamoon, *Associate Director of Planning*
Robert Azar, *Project Coordinator*

Kevin Jackson, *Councilman Ward 3*

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