50% PROGRESS REPORT

BRT Bus Station Location and Traffic Flow Enhancement Study
Project ID: CEEn-2016CPST-009

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Introduction

The vision of this project is to provide appropriate bus rapid transit (BRT) station locations on 900 North in Provo, Utah that will improve transit access at Brigham Young University (BYU), meet the needs of BYU, and follow the consistency of the rest of the BRT system. AECOM is helping UTA, in conjunction with other organizations such as UDOT and the Cities of Orem and Provo, design a BRT system that will provide improved public transportation between Orem and Provo. There will be several stations created along the route. The goal of this capstone project is to design the station on 900 North between 700 and 900 East in Provo, UT and improve traffic flow through this area.

The size of the BRT stations are 12 feet wide by 60 feet long with a 13-inch platform height. This is only the size of the platform, and additional space must be provided on the roadway along the station for the BRT buses to drive up to. The project must meet the Americans with Disabilities Act (ADA) requirements for all sidewalks and accesses to the stations. There should be minimum impacts to BYU parking and utilities in the area. No impacts are allowed to the Stonebridge Apartment property located at 758 East and 900 North.

Schedule Review

The project team is currently on track with the planned schedule. During the most recent meeting with the sponsor, the team presented the design chosen from the original options. The sponsor was able to

give feedback and gave the team additional details regarding the size of the platforms. The next task is to make some slight changes according to the sponsor's feedback. After the changes are made, the team will begin to prepare the final presentation and deliverables for the sponsor.

Literature Review

In order to create an appropriate roadway geometry at the Campus Drive / 700 East, the turning radii of bus vehicles was researched. The American Association of State Highway and Transportation Officials (AASHTO) gives turning radii information in A Policy on Geometric Design of Highways and Streets. The following information was considered in the design:

- The Minimum Design Turning Radius for the Articulated Bus found in Table 2-2b is 39.4 feet and 41.6 feet for the City Transit Bus.
- The Minimum Inside Radius for the Articulated Bus and the City Transit Bus are 21.3 feet and 24.5 feet, respectively.
- Because the City Transit Bus has an overall larger turning radius, those distances will govern our design.

BRT Station Design Scope Review

The project team spoke with the sponsor and a BYU representative to review the project scope and understand the needs of each involved party. The following is a summary of those considerations needed for this project:

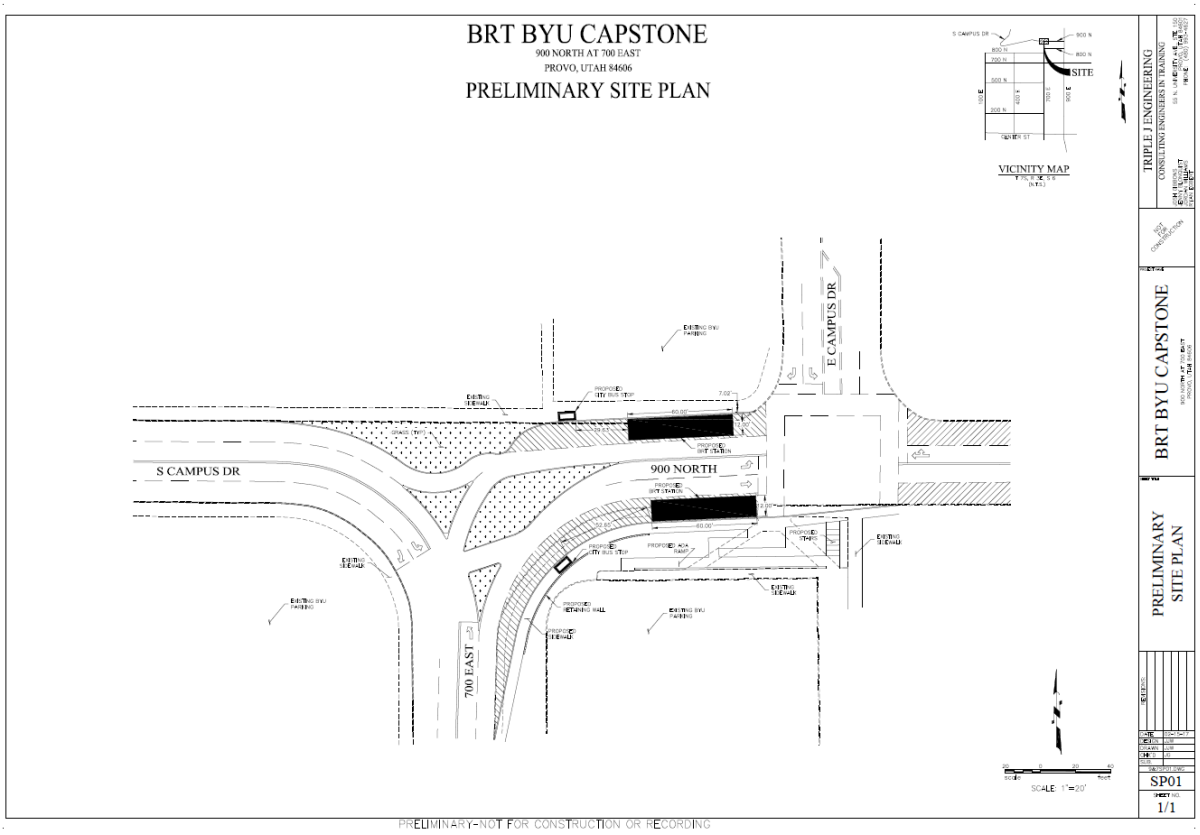
- BYU does not want to learn parking as a result of this project, especially at the parking facilities along 900 North between Campus Drive and 900 East. If needed, parking area can be taken from the parking lots northwest and south west of the Campus Drive / 900 East signalized intersection.
- BYU would like to have the BRT stations close to campus to allow easy access to students using the BRT system.

- The private property southeast of the Campus Drive / 900 East signalized intersection cannot be altered, and no right-of-way area can be taken from it.
- The BRT stations need to be placed on the outside of the roadway, as opposed to the center. The BRT will have exclusive lanes east of the Campus Drive / 900 East intersection.

BRT Station and Roadway Geometry Design

Based on the given needs and considerations, the project team decided to design the BRT stations west of the Campus Drive / 900 East intersection. By doing this, minimal impacts would be made to the BYU parking and the stations would be very close to campus. With the current preliminary design, westbound BRT buses will immediately enter into the BRT station area after passing through the Campus Drive / 900 North signalized intersection. The platform for this station cuts into the existing parking area slightly, but impacts are minimal. Northbound BRT buses will have an exclusive lane added immediately north of the J-Dawgs property. The buses can pull into this lane to travel around the curve. The station rests immediately before the Campus Drive / 900 North intersection. Bus stations have been designed to be close to the BRT stations.

Based on traffic volume data, it was also determined that the main movement at the Campus Drive / 700 East intersection would be from the south to east leg. This was included in the design, with the eastbound Campus Drive leg of the intersection teeing into the major movement. The eastbound movement is stop-controlled at the intersection. Consideration was taken so that the buses can pull out safely going west, then south without interfering with vehicles trying to turn right to go west. An image of the preliminary design is shown in the figure below.



Traffic Analysis

Traffic volume data for the study area was provided by the sponsor so that the project team could complete a traffic analysis of the project. The analysis is currently in progress. An initial analysis of the evening peak hour traffic volumes at the Campus Drive / 700 East intersection show that the heaviest movements are the northbound right and southbound left movements. These volumes indicate a need to make the main movement at the intersection from the south leg to the east leg, and vice versa. It is anticipated that by doing so, the level of service will improve at the study intersections.

The project team is using Synchro 9 software to model the study intersections in existing conditions. They Synchro model will be used to determine existing level of service conditions. A second Synchro model will be created with the proposed roadway geometry of the BRT station design. The existing

traffic volumes will be used in the proposed model and level of service conditions will be determined for this second model. The level of service will be compared between the existing conditions and the proposed conditions. Due to limitations in Synchro software, the actual BRT buses will not be modeled. However, the traffic analysis will be done to see how the change in roadway geometry changes the level of service conditions of the common vehicles traveling through the corridor.

Conclusion

In conclusion, the project team has come up with a satisfactory conclusion to meet all the requirements and the resulting time spent will be used to further improve the quality of the solution and incorporate more details into the design and information to be presented at the conclusion of this project.