SHIELDS STREET AND ELIZABETH STREET UNDERPASS
PROGRAM PLAN

COLORADO STATE UNIVERSITY
FORT COLLINS, COLORADO

July 11, 2016

Summary of Information:

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<th>Name of Project:</th>
<th>Shields St and Elizabeth St Underpass Program Plan</th>
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<tr>
<td>Applicant:</td>
<td>Colorado State University, Facilities Management Department</td>
</tr>
<tr>
<td>Contacts:</td>
<td>Shelly Carroll, Fred Haberecht</td>
</tr>
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<tr>
<td>Rev. Date</td>
<td>A 7/11/2016</td>
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## APPENDICES

APPENDIX A – Conceptual Design

APPENDIX B – Underpass Vicinity Map

APPENDIX C – Project Budget
1.0 EXECUTIVE SUMMARY

This document provides planning information for a proposed pedestrian and bicycle underpass at Shields Street and Elizabeth Street as well as required on-grade crossing improvements. Shields Street is a major arterial running along the west edge of CSU’s main campus. In recent years a large amount of student housing has been built west of Shields Street and the volume of bicycles and pedestrians crossing Shields St. from the west has increased. CSU and the City of Fort Collins evaluated intersections along Shields Street and determined that the highest volume of bicycle and pedestrians occurs at Elizabeth St. Evaluation of options determined that a grade separated crossing would provide the highest level of pedestrian and bicycle safety, and that this intersection was the most appropriate location for the underpass. The overall schedule to complete project is 12 months. The estimated cost of the project is $9.4-$10.8M, to be funded from University resources.

The proposed project is envisioned as an opportunity to create unified connection between Campus West and Main campus. The proposed project will require extensive design and construction coordination with the City of Fort Collins and neighboring stakeholders. Design will incorporate regulatory standards for development of City roadways, intersections, utility relocations, and work in ROW areas owned and operated by the City of Fort Collins. Design efforts will also consider those privately owned properties adjacent to the project extents to unify their needs for continued operational success with this proposed new development to the site. This will include neighborhood outreach for commentary during design and prior to construction as well as on-going communications throughout the construction duration. The project will necessitate the relocation of University and/or City utility infrastructure, requiring easements between the entities. In addition the project will required grant of public right-of-way to allow for City ownership and operation of the improvements.
2.0 JUSTIFICATION
Shields Street is a major arterial running along the west edge of CSU’s main campus. In recent years a large amount of student housing has been built west of campus and the volume of bicycles and pedestrians crossing at Shields Street has increased. CSU and the City of Fort Collins have evaluated the intersection and have found that a grade separated crossing provides the highest level of pedestrian and bicycle safety.

3.0 PROJECT DESCRIPTION
The underpass is planned as a 14’ wide by 9’ high tunnel that will cross Shields Street south of W. Elizabeth Street and will require one set of stairs on each side. The existing drive entrance to the Campus West Shops will need to be relocated and some parking will be lost on both sides to allow for ADA accessible approaches.

4.0 BENEFITS
The benefits of this project include:
- Provide a safe bicycle and pedestrian crossing at Shields and Elizabeth Streets
- Provide better connectivity between Main and West campuses

5.0 FACILITIES NEEDS

5.1 Conceptual Plan
A conceptual plan is included in Appendix A. The bridging documents for the Design Build procurement have been developed.
5.2 Existing Site Analysis

Site constraints are significant. A feasibility study was commissioned in Feb. 2016 to evaluate the constraints and determine if an underpass at this location was possible. Results of the study are as follows:

Storm Sewer Infrastructure
The existing storm sewer system located in the vicinity of the project covers an unusually large area and manages runoff in a somewhat piecemeal fashion. Storm pipes from all directions feed into 2 separate manholes located at the southeast corner of the intersection. Each manhole collects and conveys runoff to separate discharge points. The northern manhole collects and conveys runoff from the City streets and directs it southeast via a 34” storm drain across the CSU intramural fields to another manhole located north of South Drive. The southern manhole collects and conveys runoff southeast and then east along the north side of the practice fields via 6” storm line. Due to the depth and location of the system it was determined that it will need to be relocated, which is feasible using conventional construction practices.

Sanitary Sewer Infrastructure
There is an existing 12” sanitary sewer main which runs north to south down the west half of Shields St. There is an 8” line located in the middle of Elizabeth St. which run west to east and connects into the manhole located at the middle of the intersection. This manhole is located just north of the proposed underpass location. Due to the shallow depth of the sanitary sewer line it was determined the underpass could cross underneath the system and that rerouting isn’t technically feasible or necessary. This constraint was used to set the initial depth of the underpass box.

Dry Utilities and Waterline
Numerous dry utilities and waterlines are located within the project vicinity. These utilities will require relocation both horizontally and vertically. Utilities within the assumed area of construction have been potholed to determine both size and depth. Because pressurized and dry utilities are much more easily relocated, a technical analysis for rerouting these lines wasn’t required.

Campus West Shops and West Elizabeth Street
There are currently two drive lanes of varying widths (three at the intersection), a 5 foot wide bike lane, and a 9 foot wide attached sidewalk with tree grates located along the south half of Elizabeth Street. The existing Elizabeth Street R.O.W. is offset about 2.5 feet north from back of walk. There is an existing sidewalk and utility easement the follows the back of walk. Directly south of the sidewalk is the Campus West Shops parking lot which has 17 feet deep, head-in parking, with wheel stop blocks, followed by a 24-foot wide drive isle, back to back 45-degree parking stalls, a 16-foot wide drive isle, and 7-foot wide sidewalk along the existing building. A large island with an ATM building is located at the NE portion of the site.

Modifications to the Campus West Shops parking lot and Elizabeth Street are anticipated as part of this project and will be required to meet the minimum design criteria evaluated in this study. In order to provide the length of approach necessary to meet required grades, the existing drive entrance on the north side of the lot will need to be shifted west. This shift will result in some conflicting turning
movements related to the opposing entrance on the north side of Elizabeth. Consideration of channelization or other traffic calming measures should be considered at final design. The northerly Campus West parking spaces will also have to be reconfigured, including the elimination of some spaces to make room for the approach ramps and retaining walls and the ATM building will have to be removed to make room for relocated drive aisles.

5.3 Floodplain Analysis
The project lies within the City floodway/floodplain and will therefore be required to meet current City criteria regarding developments in these critical zones. In addition, special consideration has been taken into the preliminary design of the underpass so that floodwaters will not inundate the underpass in a 100-yr design storm event. To achieve this end all entry points and exterior walls will need to be designed above the 100-yr BFE during final design. The conceptual design and modeling presented in this study assumes these elevations were set at least 6” above the 100-yr water surface elevation (WSEL). This model was used by Ayers Associates to complete a preliminary floodway analysis to determine if the improvements affect flood water levels. Under existing rules established by the City and FEMA, any improvements within the flood plain must demonstrate negligible rise in expected flood elevations. This concept is generally referred to as a No-Rise Certification. Based on preliminary calculations, it appears that a No-Rise result is feasible, but will vary depending on final design and layout.

5.4 LEED Goal/Sustainability

Not applicable.

5.5 Acquisition of Real Estate

No Land acquisition is required, however the project will necessitate the relocation of University and/or City utility infrastructure, requiring easements between the entities. In addition the project will required grant of public right-of-way to allow for City ownership and operation of the improvements.

6.0 PROJECT COST

The estimated cost of the project is $9.4M-$10.8M, to be funded from University resources. The project budget is included in Appendix C.

7.0 PROJECT SCHEDULE

The overall schedule is estimated at 12 months.

8.0 RELATION TO MASTER PLAN AND OTHER PROJECTS

Grade separated crossings are identified as desired Bicycle and Pedestrian Improvements in the CSU Master Plan approved April 2015.
Appendix A

Conceptual Design
Appendix B

Site Map
Figure 1.1 - Vicinity Map
Appendix C

Budget
# Project Title: Shields and Elizabeth Underpass

**Budget** 14-Jul-16

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<th>Project Contingency 10% for Renovation</th>
<th>Total Contingency</th>
<th>Subtotal Budget: FY 2016-2017</th>
<th>Total Project Cost / sqft</th>
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<td>$900,357</td>
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## Professional Services

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## Subtotal Budget: FY 2016-2017

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**COLORADO STATE UNIVERSITY**

Facilities Planning Design and Construction