

**OREGON DEPARTMENT OF TRANSPORTATION**  
REGION 5 TECHNICAL CENTER  
Highway Engineering  
Office Phone: (541) 963-3177  
Fax Number: (541) 963-5307

DATE: May 1, 2017

TO: Sean Maloney  
Project Leader

FROM: Kelli N. Martin  
Roadway Designer  
Region 5 Tech. Center, La Grande

SUBJECT: CONCEPT PLANS ALTERNATIVE ANALYSIS NARRATIVE  
US395: Sidewalk Improvements (John Day)  
John Day Highway  
Key Number: 18918  
EA: PE002732-000

***Location and description:***

This project is located along US395, through the City of John Day, between 4<sup>th</sup> Avenue and Blue Gulch Road at Grant Union High School.

The primary purpose of this project is to provide connectivity in pedestrian and bicycle facilities between the end of the current system at 6<sup>th</sup> Avenue and Grant Union High School.

The following alternative analysis will discuss 3 options of accomplishing the project goal as well as the associated design elements; in particular a storm water drainage system.

***Option 1: Storm Drain System***

This option consists of traditional curb and gutter with sidewalk from 6<sup>th</sup> Avenue to Grant Union High School. In addition an underground storm water system will be installed and extend to 4<sup>th</sup> Avenue where it will outlet into a water treatment facility, with overflow protection, prior to being outlet into Canyon Creek.

The construction cost of this option is estimated at \$1,362,350.55.

***Sidewalks and ADA:***

A standard 6' Sidewalk has been designed.

Due to the installation of the storm drain system and associated inlets, the ADA ramps on all crossings between 4<sup>th</sup> Avenue and 6<sup>th</sup> Avenue need to be upgraded to full ADA compliance in this project.

Additional survey will be required at Grant Union High School prior to design of the end of sidewalk and an ADA compliant route through the parking lot at the school. Work potentially will consist of additional slope paving and grading.

Drainage:

Traditional curb and gutter will be installed between 6<sup>th</sup> Avenue and Grant Union High School.

12" storm sewer pipe will be installed between 4<sup>th</sup> Avenue and Grant Union High School, for the purpose of this analysis inlets were assumed to be positioned at the maximum inlet spacing of 300', and at the beginning and end of curb runs. Additional inlets and a larger trunk line may be needed once access locations have been finalized and a full hydraulic analysis for the storm water system has been completed.

The storm sewer system will require water treatment prior to discharge into Canyon Creek due primarily to the change in drainage conveyance from existing conditions. Potential issues surrounding the treatment system along 4<sup>th</sup> street include, but are not limited to: limited area available to adequately treat the water quality design volume; increase of point discharge due to 10-year design event; right of way concerns related to the future activities of adjacent land owners; and Oregon DEQ's classification of the subsurface infiltration and treatment facility potentially as an Underground Injection Control system (UIC).

Geotechnical:

No walls will be required with this option.

Surfacing:

A 2" grind and inlay will be completed in the bike lane, between the fog line and the gutter line, as well as through the city street connections.

This will alleviate any trench resurfacing joints and place asphalt joints in the optimal locations.

Additionally the bike lane/shoulder could benefit from minor grade adjustments throughout the length of the sidewalk installation.

Longitudinal Pavement Markings:

The fog line will be replaced with longitudinal paint.

Bike lane stencils will be installed per the ODOT Stripping Manual.

Permanent Signing:

A reasonable estimate has been utilized as a placeholder. Upon option selection, permanent signing design will be evaluated at Design Acceptance Plans.

Traffic Control/Staging:

The traffic control will be accomplished via standard drawings and a pedestrian routing plan.

The pedestrian routing plan will shift pedestrians to the East side of the highway, where they will be channelized with surface mounted tubular markers throughout the length of the construction zone, where they will be returned to West side of the highway.

The potential exists during project development to evaluate staged construction which would minimize detour length as well as allow for the opportunity to utilize reuse of devices, potentially lowering pedestrian traffic control costs.

ROW:

This Right of Way estimate is assuming 9 minimum land acquisitions and 4 larger land acquisitions. Areas for permanent slope, drainage, and temporary work easements are estimated. Improvements and personal property relocations within these acquisition areas have been estimated based on historic experience. The Miscellaneous and Legal & Contingency categories are very nominal based on prior experience in the City of John Day. It is assumed that appraisal reports can be based on previous research conducted in the prior project. This estimate is without benefit of a Right of Way Layout or an OPAL, Official Project Access List.

Concept estimate, for 13 files, with 20% contingency: \$99,390.

Utilities:

The City of John Day has prior rights for their facilities throughout the project section. City facilities, potable water & sewer, will therefore be

reimbursable and the City would have the option to do the work themselves or have it added to the contract. All other utilities are considered to be non-reimbursable since they occupy public right of way.

This option has identified the need for potable water line relocation (estimated at 25% of the total length, mostly occurring between 4<sup>th</sup> street and 6<sup>th</sup> street), service line reconnections, valve replacements, hydrant replacements, service connections, water meter replacements, adjustments of manholes, and moving the pressure reducing station within the project limits.

Further investigation into the facilities and verification of their location depths will need to be conducted prior to Design Acceptance Plans.

### ***Option 2: Roadside Swale***

This option consists of a roadside swale coupled with offset at grade sidewalk between 6<sup>th</sup> Avenue and Grant Union High School.

The construction cost of this option is estimated at \$1,003,288.13.

#### *Sidewalks and ADA:*

The design includes a standard 6' at grade sidewalk.

Due to the installation of sidewalk, the ADA ramps on all crossings between 6<sup>th</sup> Avenue and Grant Union High School need to be upgraded to full ADA compliance in this project.

Additional survey will be required at Grant Union High School prior to design of the end of sidewalk and an ADA compliant route through the parking lot at the school. Work potentially will consist of additional slope paving and grading.

#### *Drainage:*

The drainage from the roadway will be accommodated in a 10' wide roadside swale.

The swale will contain a small 6" perforated drain pipe under a 10" layer of river rock mulch. This pipe will be able to carry the water quantity that is in excess of the infiltration rate over the area of the swale during the design storm event. This pipe is designed to outlet a small quantity of stormwater into 2-3 drainage easements along the length of the swale and finally into

a swale that will be installed down 6<sup>th</sup> Avenue within ODOT Right of Way. This swale will be designed to accommodate and infiltrate the remainder of the water volume associated with the design event.

The design is dependent on several assumptions including infiltration rate, which will need to be verified via soil testing should this alternative move forward. Detached sidewalks are considered to be non-pollutant generating areas, therefore water quality treatment is not likely to be required. Verification with the water quality/resources unit in Salem will be necessary should this option be pursued. Should quality of the water need to be accounted for, a media filter can be designed along the bottom of the swale. Finally, it was assumed the swale would provide consistency in conveyance with existing conditions, thereby further avoiding a trigger for water quality treatment and quantity discharge control. In order to maintain this assumption several locations for the outlet of overflow will need to be identified.

Geotechnical:

No walls will be required with this option.

Surfacing:

A 2" grind and inlay will be completed in the bike lane, between the fog line and the gutter line, as well as through the city street connections.

The bike lane/shoulder could benefit from minor grade adjustments throughout the length of the sidewalk installation. Additionally the installation of curb at the ADA ramp locations will require some removal and replacement of the existing asphalt.

Longitudinal Pavement Markings:

The fog line will be replaced with longitudinal paint.

Bike lane stencils will be installed per the ODOT Stripping Manual.

Permanent Signing:

A reasonable estimate has been utilized as a placeholder. Upon option selection, permanent signing design will be evaluated at Design Acceptance Plans.

Traffic Control/Staging:

The traffic control will be accomplished via standard drawings and a pedestrian routing plan.

The pedestrian routing plan will shift pedestrians to the East side of the highway, where they will be channelized with surface mounted tubular markers throughout the length of the construction zone, where they will be returned to West side of the highway.

The potential exists during project development to evaluate staged construction which would minimize detour length as well as allow for the opportunity to utilize reuse of devices, potentially lowering pedestrian traffic control costs.

ROW:

This Right of Way estimate is assuming 1 minimum land acquisition and 11 larger land acquisitions. Areas for permanent slope, drainage, and temporary work easements are estimated. Improvements and personal property relocations within these acquisition areas have been estimated based on historic experience. The Miscellaneous and Legal & Contingency categories are very nominal based on prior experience in the City of John Day. It is assumed that appraisal reports can be based on previous research conducted in the prior project. This estimate is without benefit of a Right of Way Layout or an OPAL, Official Project Access List.

Concept estimate, for 12 files, with 20% contingency: \$116,130.

Utilities:

The City of John Day has prior rights throughout the project section. City utilities, potable water & sewer, will therefore be reimbursable. All other utilities will be non-reimbursable.

This option has identified the need for potable water line relocation (estimated as the total length between 6<sup>th</sup> street and Grant Union High School), service line reconnections, valve replacements, hydrant replacements, service connections, water meter replacements, adjustments of manholes, and moving the pressure reducing station within the project limits.

Further investigation into the facilities and verification of their location depths will need to be conducted prior to Design Acceptance Plans. Should sufficient cover for frost be available based on the potable water line depths, the relocation of the existing water lines may not be necessary due to swale construction.

### ***Option 3: Curb and Gutter Swale***

This option consists of a curb and gutter and drainage swale coupled with an offset sidewalk between 6<sup>th</sup> Avenue and Grant Union High School.

Three retaining walls will be required due to the grade difference at the back of walk. Pedestrian handrails will be installed on each of the 3 walls.

The construction cost of this option is estimated at \$1,337,829.60.

#### *Sidewalks and ADA:*

The design includes a standard 6' offset sidewalk.

Due to the installation of sidewalk, the ADA ramps on all crossings between 6<sup>th</sup> Avenue and Grant Union High School need to be upgraded to full ADA compliance in this project.

Additional survey will be required at Grant Union High School prior to design of the end of sidewalk and an ADA compliant route through the parking lot at the school. Work potentially will consist of additional slope paving and grading.

#### *Drainage:*

The drainage from the roadway will be accommodated in a 13.5' wide swale between the back of curb and the sidewalk. Curb cuts will be utilized to convey water from the gutter line into the swale.

The swale will contain a small 6" perforated drain pipe under a 10" layer of river rock mulch. This pipe will be able to carry the water quantity that is in excess of the infiltration rate over the area of the swale during the design storm event. This pipe is designed to outlet a small quantity of stormwater into 2-3 drainage easements along the length of the swale and finally into a swale that will be installed down 6<sup>th</sup> Avenue within ODOT Right of Way. This swale will be designed to accommodate and infiltrate the remainder of the water volume associated with the design event.

The design is dependent on several assumptions including infiltration rate, which will need to be verified via soil testing should this alternative move forward. Detached sidewalks are considered to be non-pollutant generating areas; therefore water quality treatment is not likely to be required. Verification with the water quality/resources unit in Salem will be necessary should this option be pursued. Should quality of the water need

to be accounted for, a media filter can be designed along the bottom of the swale. Finally, it was assumed the swale would provide consistency in conveyance with existing conditions, thereby further avoiding a trigger for water quality treatment and quantity discharge control. In order to maintain this assumption several locations for the outlet of overflow will need to be identified.

#### Geotechnical:

Three walls will be required due to the grade difference at the back of walk. A geotechnical engineer will need to further evaluate the wall design. For the purposes of this analysis, the walls were assumed to be ridged gravity retaining walls.

Two of the three walls will be constructed at the back of walk within close proximity to the buildings. These walls will present like downtown areas where the sidewalk is constructed abutted to the buildings themselves. Additional area will be given where available.

The third wall will be constructed at the residence prior to the High School. The grade difference at the back of walk would require slope construction further into the lawn of the residence; therefore a wall was chosen to minimize impacts to the property.

#### Surfacing:

A 2" grind and inlay will be completed in the bike lane, between the fog line and the gutter line, as well as through the city street connections.

The bike lane/shoulder could benefit from minor grade adjustments throughout the length of the sidewalk installation. Additionally the installation of curb at the ADA ramp locations will require some removal and replacement of the existing asphalt.

#### Longitudinal Pavement Markings:

The fog line will be replaced with longitudinal paint.

Bike lane stencils will be installed per the ODOT Stripping Manual.

#### Permanent Signing:

A reasonable estimate has been utilized as a placeholder. Upon option selection, permanent signing design will be evaluated at Design Acceptance Plans.



Traffic Control/Staging:

The traffic control will be accomplished via standard drawings and a pedestrian routing plan.

The pedestrian routing plan will shift pedestrians to the East side of the highway, where they will be channelized with surface mounted tubular markers throughout the length of the construction zone, where they will be returned to West side of the highway.

The potential exists during project development to evaluate staged construction which would minimize detour length as well as allow for the opportunity to utilize reuse of devices, potentially lowering pedestrian traffic control costs.

ROW:

This Right of Way estimate is assuming 1 minimum land acquisition and 11 larger land acquisitions. Areas for permanent right of way purposes, slope, drainage, and temporary work easements are estimated. Improvements and personal property relocations within these acquisition areas have been estimated based on historic experience. The Miscellaneous and Legal & Contingency categories are very nominal based on prior experience in the City of John Day. It is assumed that appraisal reports can be based on previous research conducted in the prior project. This estimate is without benefit of a Right of Way Layout or an OPAL, Official Project Access List.

Concept estimate, for 12 files, with 20% contingency: \$142,244.

Utilities:

The City of John Day has prior rights throughout the project section. City utilities, potable water & sewer, will therefore be reimbursable. All other utilities will be non-reimbursable.

This option has identified the need for potable water line relocation (estimated as the total length between 6<sup>th</sup> street and Grant Union High School), service line reconnections, valve replacements, hydrant replacements, service connections, water meter replacements, adjustments of manholes, and moving the pressure reducing station within the project limits.

Further investigation into the facilities and verification of their location depths will need to be conducted prior to Design Acceptance Plans.

Should sufficient cover for frost be available based on the potable water line depths, the relocation of the existing water lines may not be necessary due to swale construction.

#### ***Option 4: At Grade Sidewalk***

This option consists of an offset 6' sidewalk and buffer strip between 6<sup>th</sup> Avenue and Grant Union High School.

The construction cost of this option is estimated at \$658,808.36.

#### ***Sidewalks and ADA:***

The design includes a standard 6' sidewalk; offset 10' from edge of pavement. The buffer strip will contain 2' of aggregate shoulder and 8' of buffer strip material. This option proposes sod lawn, as is consistent with other sections of buffer strip located within the City. Other alternatives are available, such a river rock, at the City's discretion. The buffer strip will act as a visual and physical deterrent to drivers accustomed to open frontage conditions. Driveways will be located and installed in accordance with the recommendations from Access Management.

Due to the installation of sidewalk, the ADA ramps on all crossings between 6<sup>th</sup> Avenue and Grant Union High School need to be upgraded to full ADA compliance in this project.

Additional survey will be required at Grant Union High School prior to design of the end of sidewalk and an ADA compliant route through the parking lot at the school. Work potentially will consist of additional slope paving and grading.

#### ***Drainage:***

Maintaining the cross slope of the road between edge of pavement and the sidewalk coupled with draining the sidewalk away from the roadway, will maintain the natural drainage of the site. Therefore, the site will classify as having no-effect on the existing drainage.

No drainage features will be required of this design.

#### ***Geotechnical:***

No walls will be required with this option.

#### ***Surfacing:***

A 2" grind and inlay will be completed in the bike lane, between the fog line and the gutter line, as well as through the city street connections.

The bike lane/shoulder could benefit from minor grade adjustments throughout the length of the sidewalk installation. Additionally the installation of curb at the ADA ramp locations will require some removal and replacement of the existing asphalt.

Longitudinal Pavement Markings:

The fog line will be replaced with longitudinal paint.

Bike lane stencils will be installed per the ODOT Stripping Manual.

Permanent Signing:

A reasonable estimate has been utilized as a placeholder. Upon option selection, permanent signing design will be evaluated at Design Acceptance Plans.

Traffic Control/Staging:

The traffic control will be accomplished via standard drawings and a pedestrian routing plan.

The pedestrian routing plan will shift pedestrians to the East side of the highway, where they will be channelized with surface mounted tubular markers throughout the length of the construction zone, where they will be returned to West side of the highway.

The potential exists during project development to evaluate staged construction which would minimize detour length as well as allow for the opportunity to utilize reuse of devices, potentially lowering pedestrian traffic control costs.

ROW:

This Right of Way estimate is assuming 1 minimum land acquisition and 11 larger land acquisitions. Areas for permanent slope, and temporary work easements are estimated. Improvements and personal property relocations within these acquisition areas have been estimated based on historic experience. The Miscellaneous and Legal & Contingency categories are very nominal based on prior experience in the City of John Day. It is assumed that appraisal reports can be based on previous

research conducted in the prior project. This estimate is without benefit of a Right of Way Layout or an OPAL, Official Project Access List.

Concept estimate, for 12 files, with 20% contingency: \$99,540.

Utilities:

The City of John Day has prior rights throughout the project section. City utilities, potable water & sewer, will therefore be reimbursable. All other utilities will be non-reimbursable.

This option has identified the need for hydrant replacements, service connections, water meter replacements, adjustments of manholes, and moving the pressure reducing station within the project limits.

***Alternative Analysis***

Option 1 provides the traditional urban development feel and look. This option is as the City and ODOT scoped this project initially. The sidewalk abuts the roadway reducing shy distance and safety for pedestrians. This option provides for the least right of way impacts; it does impact more properties (13) due to the additional length of the construction. This option also includes a full storm sewer system requiring water treatment prior to discharge into Canyon Creek.

Option 2 provides for the intent of the project, sidewalk with a method for handling storm water, without as significant of a cost. In addition it offsets the sidewalk creating a safer pedestrian travel way. At low speeds curb provides a barrier to the traveling public; however at higher speeds such as those on this section of roadway, the curb provides little benefit and is outweighed by an offset sidewalk which provides a buffer between traffic and pedestrians. At grade sidewalk also reduced the construction of embankment and impacts to private property. Twelve properties are impacted with slightly larger takes and slope easements required. Additional, yet minimal, concerns with the swale surround the use of sanding rock and plowing of snow in the winter months. Deposition of sanding rock into the swale should be minimized if at all possible. Drainage curb could be installed with curb cuts to alleviate this concern should the team determine this to be the best course of action and the additional protection of the drainage curb deemed necessary.

Option 3 provides for a combination of the first two options, installing traditional curb and gutter in conjunction with the swale as a replacement to the storm water system. Again, the curb and gutter provide little benefit at expected speeds, the safety benefit comes more from the offset of the sidewalk. The swale increases in size, due to the additional width required to maintain the full design section below the gutter grade and install curb and sidewalk at grade with said curb.

Drainage curb could be installed with curb cuts to alleviate this concern should the team determine this to be the best course of action and the additional protection of the drainage curb deemed necessary. Right of way again impacts 12 properties will significantly larger takes as well as the close proximity of sidewalk to buildings within the project limits.

Option 4 provides for standard sidewalk and bike lanes to be provided with minimal project cost and impacts. The offset of the sidewalk will increase the safety of the pedestrians by providing a buffer from the traveling public. The buffer strip can be designed to the City's preferences while providing a visual and physical deterrent from the current open frontage conditions between driveways and property accesses as determined by Access Management. The majority of the sidewalk will remain on existing ODOT Right of Way with permanent easements needed for slopes, affecting an estimated 12 properties.

Minor thoughts:

River rock mulch in drainage swale areas was selected primarily due to minimal maintenance requirements; grass and landscape trees/shrubs (or native plantings) could be incorporated, or used entirely as aesthetic choice and cost options dictate. The design slope of the swale is 1:3, generally considered by ODOT as too steep to mow. Adjustments in the swale slope would increase the width of the swale. ODOT landscaper architects could assist with appropriate low maintenance alternatives.