## PARGONG

## Route D Roadway Improvements

Missouri Department of Transportation
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MoDOT Job No. J6S3215
Parsons Project No. 649337
Parsons
530 Maryville Centre Drive, Suite 400


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To: Lisa Kuntz, MoDOT Project Manager<br>From: Travis Pfeiffer, PE Project Manager<br>Subject: Travis Pfeiffer, PE<br>District St. Louis - Design<br>Route D, St. Louis County Route D Roadway Improvements Job No. J6S3215 Conceptual Study Report

## PURPOSE OF STUDY

The purpose of this conceptual study is to develop conceptual plans for the construction of pavement, pedestrian and ADA improvements along MO Route D (Page Avenue) from I-170 to Ogden Avenue. The existing corridor consists of an older commercially established area with residential properties. Most of the existing sidewalks and curb ramps do not meet current ADA standards. A conceptual design has been established to improve the existing sidewalks to better provide ADA compliance throughout the project corridor.

## SUMMARY OF PROPOSED IMPROVEMENTS

The Parsons team has worked with MoDOT to develop a conceptual plan to bring the approximate 3.7 mile Route D (Page Avenue) corridor between I-170 and Ogden Avenue into compliance with current ADA standards. The project proposes replacing sidewalk, curb ramps, detection devices and, where needed, curb and gutter to provide for a fully compliant ADA pedestrian facility along the entire project corridor; as well as mill and overlay mainline with new pavement markings.

Below is a summary of information that was used for this conceptual design. This information includes conceptual cost estimates, existing facilities and proposed design criteria for the project.

## DESIGN TRAFFIC

ADT (Const.) $=$ 39,150 (2024)
ADT (Design) $=38,000$ (2018)

## CONCEPTUAL COST

Construction: \$13,099,816.00*

* Includes Sidewalk Alternates
(See Appendix A - Cost Estimate)
\% Trucks
= 5\%

Operational (Posted) Speed - 35 mph
Functional Classification - Principal Arterial (Major Route)

## EXISTING FACILITIES

- $2 \times 11^{\prime}-12^{\prime}$ through lanes in each direction throughout the project limits
- Right and left-turn lanes at intersections and two-way left turn lanes throughout project limits
- 8' - 10' shoulder in areas outside of intersections.
- Various curb and gutter types and other curbs throughout project limits.
- Concrete traffic islands at the intersections of Route D and Ferguson Avenue, Hanley Road, Midland Road, and North and South Road.
- Four Existing Bridges: three over railroad systems, and one over waterway.
- Concrete and asphalt shoulders present.
- Sidewalks throughout the project limits but not complete connectivity
- HMA pavement on concrete base
- Normal Access Control
- R/W width varies from $45^{\prime}$ to 150 ' (half width, from centerline), but is generally 50 ' in width.


## PROPOSED DESIGN CRITERIA - MATCH EXISTING

| FUNCTIONAL <br> CLASSIFICATION | DESIGN SPEED | NO. \& WIDTH OF <br> LANES | ROADBED WIDTH |  | RIGHT OF WAY |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  | Width | Control |  |
| Principal Arterial | $35-40 \mathrm{mph}$ | $4 \times 12^{\prime}$ <br> $\left(\mathrm{w} / 12^{\prime}\right.$ turn lanes $)$ | Varies | $60^{\prime}$ Varies | Normal |

## ACCIDENT AND SAFETY ENHANCEMENTS

The 3.62 mile study corridor of Route D (Page Avenue) through the projects limits covered by this Conceptual Study Report has been broken up into one total segment when analyzing the accident data. The accident data has been included in Appendix D. The provided crash data was divided into eastbound and westbound movements and combined to be analyzed into one crash rate calculation. However, the extremely low crashes for the westbound movement ( 9 crashes over a 5 year period) appears to determine an additional analysis may be required during final design.

The average crash rate per segment was calculated using guidance from the MoDOT Engineering Policy Guide - Section 128.5

- Crash Rate Calculation:

Route D: 214/HMVMT

## PROPOSED PAVEMENT DESIGN

## EXISTING PAVEMENT CONDITIONS

The existing Route D corridor is in fair-to-good condition and is need of some preventative pavement maintenance. The pavement was last rehabilitated in 2006; where it was coldmilled and overlaid with 1.75 " SP125MCLP. The existing typical section of the roadway has two 12 foot thru-lanes in each direction with a combination of open shoulders or other various roadside barriers, such as Type A or S barrier curbs, or Type A or B curb and gutter. Valley gutter is also present in portions of the corridor. Right and left-turn lanes are provided at intersections throughout the project limits, as warranted by traffic. Concrete median strips are utilized to divide the traffic and distinguish the turn lanes throughout the project limits. A two way left turn lane is provided throughout different areas of the project limits, as warranted by traffic. The existing pavement consists of concrete base with asphalt overlay pavement. Refer to Appendix D for existing pavement report.

## PROPOSED PAVEMENT TREATMENT

The proposed pavement treatment is a Mill and Overlay. The project has been estimated with a 4" Coldmill and replace with 3" SP125CLP w/ PG 70-22. The proposed limits of mill and overlay go from l-170 to Ogden Avenue with paving exceptions (at the bridges) excluded from the estimate. It is assumed that $1 \%$ of the Mill and Overlay area will require patching and full-depth pavement repair per MoDOT standards.

Additionally, there are areas of raised asphalt shoulders behind existing curb throughout the project limits. In many areas, these raised asphalt shoulders are being used as sidewalks in their existing condition. As part of this project, the majority of these raised shoulders are to be removed and replaced with proposed concrete sidewalks. Those existing shoulders which are not replaced with concrete sidewalk will be milled and overlayed with Bituminous Pavement Mixture PG64-22 (BP-1) with mainline roadway.

All pavement design will be confirmed by MoDOT prior to final design.

## PROPOSED PEDESTRIAN DESIGN

Below is a summary of the existing and proposed improvements along Route D within the project limits from I-170 to Ogden Avenue. The following discussions detail the existing pedestrian accommodations and explain the proposed conceptual design improvements to provide for a fully ADA compliant corridor. See Appendix B for Proposed Conceptual Plans for Route D.

## I-170 TO WALTON ROAD (APPR0X. STA. 161+75 TO STA. 180+75)

## EXISTING CONDITIONS

The existing section of Route D between I-170 and Walton Avenue does not have any existing pedestrian facilities within these project limits but has a bus stop on each side of the roadway just east of I-170. There are existing pedestrian push buttons at the intersection of Route D and Waterworks Road but no sidewalk or curb ramps associated with the push buttons.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route D includes pavement rehabilitation only. Sandblasting Facility Road will also be milled and overlayed. There are no proposed ADA facilities or sidewalk improvements.

Most of the improvements remain within existing Right of Way. It appears that a portion of the existing roadway is outside existing Right of Way near I-170 along the southside of the road and one of the approaches has proposed work going outside the Right of Way. Since there are no proposed sidewalk facilities along this side, it may be recommended during final design to have a paving exception within these areas to avoid the acquiring Proposed Right of Way.

## WALTON ROAD TO CRYSTAL COURT (APPROX. STA. 180+75 TO STA. 192+70)

## EXISTING CONDITIONS

The existing section of Route D between Walton Road and Crystal Court does not have definitive existing sidewalks within these limits, but there are raised asphalt shoulders behind the curb being utilized as sidewalk. There are existing pedestrian push button facilities at the intersection of Route $D$ and Walton Road but no existing ADA sidewalks or curb ramps. There are two bus stops on the south side of Route D within these limits, one at approximately Sta. $181+45$ and the other at approximately Sta. 190+65.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route $D$ includes ADA improvements and pavement rehabilitation. The ADA improvements include proposed curb ramps at the intersections of Walton Road and Crystal Court. The existing pavement will be milled and overlayed.

New Type S Curb will be installed along eastbound Route D from Walton Road to approximately Sta. 188+00. At this point, the proposed curb ties into the existing curb. Existing curb will be used from here to the East. New concrete sidewalk will be
constructed behind the back of proposed/existing curb through these limits. New ADA compliant curb ramps will be provided per MoDOT standards. Proposed commercial approaches will be removed and replaced with ADA-compliant approaches when pedestrian facilities are adjacent to them.

The proposed improvements in this section remain within existing Right of Way.

## CRYSTAL COURT TO NORTH AND SOUTH BOULEVARD (APPROX. STA. 192+70 TO STA. 215+25)

## EXISTING CONDITIONS

The existing section of Route D between Crystal Court and North and South Boulevard does not have defined sidewalk throughout this segment on either side of the road. Adjacent to the eastbound roadway, behind existing curb, the existing raised asphalt/gravel shoulder varies in width and is being used as a sidewalk. Most of the westbound roadway is an open shoulder condition with a ditch, and no sidewalks are present. There are no existing curb ramps within this segment. There are several bus stops located within this segment, and they are located approximately at the following stations: Sta. 204+00 Lt., Sta. 206+40 Rt., 211+90 Lt. and Sta. 214+50 Rt.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route D includes ADA improvements and pavement rehabilitation. The existing pavement will be milled and overlayed. Existing curb will be used in place where present, otherwise new Type S Curb will constructed. New concrete sidewalk will be constructed along eastbound Route D from Carolyn Park Drive to Atherton Drive. New ADA compliant curb ramps will be provided per MoDOT standards at the intersections of Carolyn Park Drive, Gulf Drive, Ermes Drive, and Atherton Drive. Proposed commercial and residential approaches will be removed and replaced with ADA-compliant approaches when pedestrian facilities are adjacent to them. There is an existing signed crosswalk across Route D at approximately Sta. 204+10. New ADA compliant curb ramps will be provided per MoDOT standards to provide connectivity from the sidewalk adjacent to the eastbound travel lanes to the bus stop on the north side of Route D. A flashing safety beacon will be added to the midblock crosswalk between Gulf Drive and Ermes Drive.

Sidewalk is proposed along the westbound roadside for an Alternative A from Walton Road to midblock cross walk at Sta. 204+10.

Sidewalk is proposed along the westbound roadside for an Alternative B from Sta. 204+10 to North and South Boulevard.
The proposed improvements in this section remain within existing Right of Way.

## NORTH AND SOUTH BOULEVARD TO HARRISON AVENUE (APPROX. STA. 215+25 TO STA. 222+20)

## EXISTING CONDITIONS

The existing section of Route $D$ between Atherton Drive and Harrison Avenue Street does not have definitive existing pedestrian facilities adjacent to the eastbound lanes, although the existing raised asphalt shoulders are being used as sidewalks. There is some existing sidewalk adjacent to the westbound lanes within this segment The existing curb ramps within this segment, when present, do not meet current ADA design standards for grade and detectable warning devices (i.e. truncated domes at signalized intersections and public streets). Existing bus stops do not exist in this roadway segment.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route D includes ADA improvements and pavement rehabilitation. The ADA improvements include removal and replacement of sidewalk throughout the segment, removal and replacement of curb ramps and detectable warning devices. New ADA compliant curb ramps will be provided per MoDOT standards at all intersections within this segment. The existing pavement will be milled and overlayed. Where needed, new Type $S$ curb will
be constructed. New concrete sidewalk will be constructed behind the back of proposed/existing curb through these limits. Proposed commercial and residential approaches will be removed and replaced with ADA-compliant approaches when pedestrian facilities are adjacent to them. The existing pedestrian signals and push buttons at the intersection of Route $D$ and North and South Boulevard will be removed and replaced to meet MoDOT and ADA standards.

Most of the improvements remain within existing Right of Way. Proposed ADA improvements on the southeast corner of Route D and North and South Boulevard will require proposed Right of Way to construct.

## HARRISON AVENUE TO NORTH OF DUSKY DRIVE (APPROX. STA. 222+20 TO STA. 243+50)

## EXISTING CONDITIONS


#### Abstract

The existing section of Route D between Harrison Avenue to Midland Boulevard has existing raised asphalt shoulders on both sides of Route D that are being used as sidewalks, and existing curb ramps do not meet current ADA design standards for grade and detectable warning devices (i.e. truncated domes at signalized intersections and public streets). From Midland Boulevard to the eastern limits of this segment there is existing sidewalk on both sides of Route $D$, but none of the existing curb ramps meet current ADA design standards for grade and detectable warning devices (i.e. truncated domes at signalized intersections and public streets). Concrete median strips are utilized to divide the traffic and distinguish the turn lanes at the intersections of Midland Boulevard and North Hanley Road. There are four bus stops located within this segment. They are located at approximately Sta. 223+00 Rt., Sta. 233+00 Rt., Sta. 240+25 Lt. and Sta. 244+70 Rt.


## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route $D$ includes ADA improvements and pavement rehabilitation. The ADA improvements include removal and replacement of sidewalk throughout the corridor, removal and replacement of curb ramps and detectable warning devices. New ADA compliant curb ramps will be provided per MoDOT standard at all intersections within this corridor (Lamb Avenue, Midland Boulevard, North Hanley Road, Racine Drive, and Dusky Drive). The existing pavement will be milled and overlayed. Along the both sides of Route D from Harrison Avenue to Midland Avenue, the existing curb will be used in place with the exception of new Type S Curb to be constructed as needed. New concrete sidewalk will be constructed behind the back of proposed/existing curb through short segments within these limits. Route D from Midland Boulevard to Dusky Drive proposed isolate segments of curb and gutter and new sidewalk. Between the entire segment of Harrison Ave. to Dusky Dr., proposed commercial and residential approaches will be removed and replaced with ADA-compliant approaches when pedestrian facilities are adjacent to them. The existing pedestrian signals and push buttons at the intersection of Route D with Midland Boulevard and North Hanley Road will be removed and replaced to meet MoDOT and ADA standards. There is an existing signed crosswalk across Route D at approximately Sta. 244+00. New ADA compliant curb ramps will be provided per MoDOT standards to provide connectivity from the sidewalk adjacent to the westbound travel lanes to the bus stop on the south side of Route D. A flashing safety beacon will be added to the midblock crosswalk along the east side of Ducky Drive.

Most of the improvements remain within existing Right of Way. Proposed ADA improvements on the southeast corner of Route D and N. Hanley Road and southeast corner of Route D and Midland Boulevard will require proposed Right of Way to construct. Small, isolated sections of temporary Right of Way may be required for apron construction along the eastbound roadway between Midland Boulevard and N. Hanley Road. Although, these aprons may be able to be reduced during final design if the tie in grades are able to be met within the existing Right of Way.

## NORTH OF DUSKY DRIVE TO PENNSYLVANIA AVENUE (APPROX. STA. 243+50 to STA. 283+90)

## EXISTING CONDITIONS

The existing section of Route $D$ between Dusky Drive and Partridge Avenue contains existing concrete pavement and bridge barrier from approximately Sta. $247+40$ to Sta. 250+00. There are 5' concrete sidewalks along both sides of Route D along
the bridge. Along the eastbound lanes of Route D, the newly reconstructed eastbound concrete sidewalk (5' wide) continues off the bridge and through the limits of this segment, most of the existing curb ramps along this stretch meet current ADA design standards for grade and detectable warning devices. A majority of the westbound direction, within these limits, does not have existing sidewalk. There are existing raised asphalt shoulders along the westbound movements, that are being use as sidewalk and none of the existing curb ramps are ADA compliant. There are four bus stops located within this corridor. They are located at approximately Sta. 251+80 Rt./Lt., Sta. 272+27 Rt, and Sta. 279+80 Rt.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route $D$ includes pavement rehabilitation and some ADA improvements. Most of the existing sidewalk and existing curb ramps along the eastbound lanes of Route D meet the current ADA design standards for grade and detectable warning devices and will not need to be reconstructed. Those that don't meet all the standards will be replaced with new curb ramps, that will be ADA compliant and some need alignment work to promote a safer crossing. New sidewalk will need to be constructed along the westbound direction. The westbound direction will need all new curb ramps that adhere to current standards. Proposed commercial and residential approaches will be removed and replaced with ADA-compliant approaches when pedestrian facilities are adjacent to them. There will be no proposed pedestrian facility work along the eastbound lanes of Route $D$, as there are no existing issues with connectivity that need resolved. The westbound lanes are being proposed for new sidewalk and ADA facilities through the entire segment. At the intersection of Route D and SR-180 the curb ramps on the north side of Route D will be replaced with ADA compliant curb ramps. This signalized intersection will also get updated with pedestrian push buttons at all 4 corners and new traffic signal equipment. The existing pavement will be milled and overlayed.

The proposed improvements in this section remain within existing Right of Way.

# PENNSYLVANIA AVENUE TO KINGSLAND AVENUE (APPROX. STA. 283+90/99+40 (STATION EQUATION PRESENT) TO STA. 126+65) 

## EXISTING CONDITIONS

The existing section of Route D between Pennsylvania Avenue and Kingsland contains existing conditions along the westbound lanes that include a raised asphalt shoulder behind the curb, with a 5 ' concrete sidewalk at the back of the asphalt shoulder. Most of the existing curb ramps, when present along this stretch of sidewalk do not meet current ADA design standards for grade and detectable warning devices. Along the eastbound lanes from Pennsylvania Avenue to Sta. $118+30 \mathrm{Rt}$. there is newly constructed 5' concrete sidewalk with updated curb ramps that meet current ADA design standards for grade and detectable warning devices. From Sta. 118+30 Rt. to Kingsland Avenue there is a raised asphalt shoulder behind the curb, with a 5' concrete sidewalk at the back of the asphalt shoulder. This portion of the sidewalk is uneven and broken in several places. There are four bus stops located within this corridor. They are located at approximately Sta. 103+50 Lt., Sta. 103+90 Rt., Sta. 112+10 Rt, Sta. 116+90 Lt.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route $D$ includes ADA improvements and pavement rehabilitation. The ADA improvements include removal and replacement of sidewalk, curb ramps and detectable warning devices throughout the segment.. New ADA compliant curb ramps will be provided per MoDOT standard at all intersections within this segment that don't have existing ADA compliant curb ramps (Milford Avenue, Colby Avenue, Leroy Avenue, Belrue Avenue, Woodruff Avenue, and Kingsland Avenue). Proposed commercial and residential approaches will be removed and replaced with ADA-compliant approaches when pedestrian facilities are adjacent to them. The existing pavement will be milled and overlayed. The raised asphalt shoulders behind the curb will be milled and overlayed as well. The intersection of Route $D$ and Ferguson Avenue will be equipped with new traffic and pedestrian signal equipment.

Most of the improvements remain within existing Right of Way. Proposed ADA improvements on the northeast corner of Route D and Pennsylvania Avenue go outside the existing Right of Way. Proposed Right of Way will be necessary to construct the new curb ramp and to provide ample room for signal equipment.

## KINGSLAND AVENUE TO OGDEN AVENUE (APPROX. STA. 126+65 TO STA. 156+00)

## EXISTING CONDITIONS

The existing section of Route D between Kingsland Avenue and Ogden Avenue is equipped with raised shoulder on both sides of Route D, which currently acts as a sidewalk for pedestrians. Along the westbound direction, there is an existing 5' wide concrete sidewalk through the following limits: Sta. $132+60$ to Sta. $140+25$, and Sta. $153+60$ to Ogden Avenue. There is no sidewalk along the westbound lanes over the bridge from Sta. 140+25 to Sta. 153+60. Along the eastbound lanes an existing 5' wide concrete sidewalk begins at Sutter Avenue and continues across the bridge behind concrete barrier to Ogden Avenue. The 5' wide concrete sidewalk transitions to $4 \frac{1}{2}$ ' wide on the bridge. The existing curb ramps within this segment, when present, do not meet current ADA design standards for grade and detectable warning devices There are two bus stops located within this segment. They are located at approximately Sta. 130+15 Lt. and Sta. 131+46 Rt. The existing asphalt pavement needs rehabilitation.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

The proposed conceptual design for this section of Route D includes ADA improvements and pavement rehabilitation. The ADA improvements include removal and replacement of sidewalk throughout the segment, removal and replacement of curb ramps and detectable warning devices. New sidewalks will need to be constructed along both sides of the roadway from Kingsland Avenue and Gregan Place and continue along the eastbound direction to Sutter Avenue. It is recommended to leave the existing Route D bridge over the railroad as existing and direct pedestrian traffic to the sidewalk along the eastbound side of the roadway; opposed to widening the existing bridge to accommodate pedestrians along the westbound side. New ADA compliant curb ramps will be provided per MoDOT standard at all intersections within this segment that don't have existing ADA compliant curb ramps (Kingsland Avenue, Gruner Place, Gregan Place, and Sutter Avenue). Proposed commercial and residential approaches will be removed and replaced with ADA-compliant approaches when pedestrian facilities are adjacent to them. At the intersection of Route D and Sutter Avenue pedestrian push buttons will be added to facilitate pedestrian movements across Route D and Sutter Avenue. The curb ramps and pedestrian push buttons at the intersection of Route D and Ogden Avenue will be completely reconstructed to comply with current ADA standards. The existing pavement will be milled and overlayed. The raised asphalt shoulders behind the curb will be milled and overlayed as well.

Most of the improvements remain within existing Right of Way. Proposed ADA improvements on the southeast corner of Route D and Sutter Avenue will require proposed Right of Way to construct. A small sections of temporary Right of Way may be required for apron construction along the westbound roadway just west of the intersection with Route D and Sutter Avenue. Right of Way will be required on the eastbound side of the approach with Route $D$ and Odgen Road. It appears a majority of the approach is outside of existing Right of Way. The sidewalk on the southeast corner also appears to be outside of existing Right of Way. Proposed Right of Way will be required for the curb ramp construction and to tie back into existing sidewalk. The northeast corner will require sidewalk to connect the existing sections. The signal equipement will need to be relocated outside of the curb ramp path to construct. These two element will nee proposed Right of Way to complete.

OGDEN AVENUE TO N. SKINKER PARKWAY (APPROX. STA. 156+00 TO STA. 173+00)

## EXISTING CONDITIONS

The section of Route D roadway between Ogden Avenue and N. Skinker Parkway was recently repaved, most likely during the summer season of 2018. Existing sidewalks are limited on both sides of the roadway, and does not have full connectivity on either side within this section. Existing curb ramps do not meet current ADA standards.

## PROPOSED IMPROVEMENTS AND RIGHT OF WAY IMPACTS

Due to the resurfacing of this roadway section, it is recommended to end the project limits at the Ogden Avenue intersection. If upgrades to exist sidewalk and curb ramps are desired for this section, further discussion will be required.

## OTHER DESIGN CONSIDERATIONS

## EXISTING STRUCTURES

## BRIDGE A3885

This structure is a single-cell arched culvert over the St. Louis Belt and Terminal Railroad. It has a barrel length of approximately 210 ' with a 31'-6" horizontal clearance. The structure is located under a vertical curve in the roadway and has approximately 2.5 feet of fill over it. Since construction in 1983, the structure itself has not had any repairs but there have been several work orders completed to the roadway and approach over it. It was last inspected on September 11, 2018 and Parsons Engineers visited the site with MoDOT St. Louis District Bridge Engineer, Joseph Molinaro, on November 7. Parsons noted that the walls and roof of the structure were in generally good condition with some efflorescence at the joints in the roof. The inspection report states that the approach pavement has settled and displaced. At the site, Parsons noted that the pavement over the structure had several large cracks indicating some settlement has occurred around the structure. Parsons also noted that the barriers were slightly out of alignment.

It has been recommended to remove the existing pavement and fill over the structure including the approaches for a distance of $225-\mathrm{ft}$. A waterproofing membrane will be placed over the structure to prevent further leaching of water through the roof. A granular fill will be backfilled over the structure with new pavement and approaches. This roadway is in an urban area has an average daily traffic total over 17,500 vehicles. With an expected 6 -mile detour, work will be completed with staged construction.

## BRIDGE A5328

The structure near Sutter Avenue was built in 1997 and it spans MetroLink tracks at the West end and Engleholm Creek at the East end. This six-span, 481-ft long by 75 -ft wide structure is comprised of precast, prestressed l-girders supported by cap and 4 -column piers over individual spread footings. The structure was last inspected on September 11, 2018 and was generally rated in good condition. On November 7, Parsons Engineers visited the site with MoDOT St. Louis District Bridge Engineer, Joseph Molinaro. Parsons noted that brush and trees were growing under the structure and adjacent to the MSE walls at the abutments. The approach slabs appeared to have settled with severe cracking at each abutment. The barrier on southwest corner of the bridge at the MSE wall was out of alignment and damaged. Under the structure, it was observed that approximately half of the columns were spalling at the interface with the ground. Several MSE wall panels have minor spalls and/or broken.

It has been recommended to remove the overgrowth at the walls and under the bridge. The existing approach slabs at both ends will be removed and replaced. This will correct the joint at the bridge and any settlement issues. The barrier at the southwest corner will be repaired. The columns showing spalling will all be repaired along with the MSE wall panels. An epoxy polymer concrete overlay will be placed to protect the deck from deterioration and to extend service life. This roadway is in an urban area and has an average daily traffic total over 13,400 vehicles. With an expected 17 -mile detour, work will be completed with staged construction.

BRIDGE A7109
This structure is a 3-span bridge over a railroad spur near I-170 at the Concrete Sandblasting Plant. It was built in 2006 with a length of $126-\mathrm{ft}$ and a width of 76 -feet. It is comprised of precast, prestressed deck beams supported on cap and 5 -column piers on spread footings. The structure was last inspected on September 11, 2018 and was generally rated in good condition. The inspection report noted some minor repairs with the most recent being the approach joints sealed with a hot pour mix at the time of inspection. On November 7, Parsons Engineers visited the site with MoDOT St. Louis District Bridge Engineer, Joseph Molinaro. Parsons observed the structure had some leaching between deck beams but no other issues requiring repair.

It has been recommended to place an epoxy polymer concrete overlay on the deck to protect the deck and beams from deterioration and to extend service life. This roadway is in an urban area and has an average daily traffic total of nearly 20,000 vehicles. With the high volume of traffic and the proximity to l-170, work is expected to be completed with staged construction.

## BRIDGE B0388

This structure is a short, single-span bridge over a branch to the River des Peres near Pennsylvania Avenue. The original structure went thru a major rehabilitation in 2012 as part of the Safe and Sound Project with the entire superstructure replaced along with partial substructure. The 28 -foot long by 92 -foot wide bridge is comprised of low-profile deck beams. The structure was last inspected on September 11, 2018 and was generally rated in satisfactory condition. The inspection report noted some long cracks allowing superstructure joint leakage with some efflorescence observed on the bottom of the deck beams. On November 7, Parsons Engineers visited the site with MoDOT St. Louis District Bridge Engineer, Joseph Molinaro. Parsons was not able to inspect under the bridge but did observe the minor deck cracking.

It has been recommended to place an epoxy polymer concrete overlay on the deck to protect the deck and beams from deterioration and to extend service life. This roadway is in an urban area near a signalized intersection. It has an average daily traffic total of nearly 18,000 vehicles. With the high volume of traffic, proximity to the intersection, and a proposed detour of 16 miles, work is expected to be completed with staged construction.

## METRO BUS STOPS

There are multiple existing bus stops along Route $D$ through the limits of this project. Most do not have direct connections with pedestrian facilities, and connecting these bus stops with ADA compliant facilities was a goal of this project.

Future coordination with representatives from Metro in St. Louis and the Project Team will be required during future phases of the project.

## DRAINAGE IMPROVEMENTS

The majority of this project replaces raised asphalt shoulder with proposed concrete sidewalk adjacent to existing curb. As such, existing drainage patterns were not modified, and existing sewers, swales, and crossings were used in-place. This project does impact a number of existing inlets and manholes. It is assumed that most will be adjusted to new ADA compliant elevations and slopes, while some will require reconstruction. These quantities have been included in the project cost estimate.

## PROPOSED TRAFFIC SIGNAL DESIGN

There are nine (9) existing signalized intersection within the project limits. Of these, all but one (Waterworks Road) will be upgraded to conform to ADA standards and requirements. The Waterworks Road / Route D intersection doesn't have any existing pedestrian facilities in the vicinity and there aren't any existing bust stops to provide connectivity to, thus no work is being done to upgrade this intersection.

1. North and South Boulevard - Rebuild the pedestrian signal heads and push buttons on the north side of Route $D$ as these push buttons do not meet the location requirements set by the ADA standards.
2. Midland Boulevard - Rebuild the pedestrian signal head and push buttons in the northeast and southwest quadrants of the intersections. The push buttons do not meet the location requirements set by the ADA standards.
3. North Hanley Road - Correct the pedestrian push button location in the northeast quadrant of the intersection.
4. Pennsylvania Avenue - Replacement of all signal equipment with upgrades to accommodate ADA signal requirements.
5. Ferguson Avenue - Replacement of all signal equipment with upgrades to accommodate ADA signal requirements.
6. Sutter Avenue - Add a new pedestrian signal head at the southwest quadrant of the intersection.
7. Ogden Avenue - Rebuild the pedestrian signal heads and push buttons in the southeast, northeast and northwest quadrants of the intersection. These push buttons do not meet the ADA location requirements.

Midblock crosswalk signals or flashers can be discussed for roadway segments between the signalized intersections. The additional signals or flashers would most likely be desired near facilities with a large pedestrian movement and where long distances to existing signals exist. A few locations where this occurs are along Route $D$ near the side streets of:

- W. Of Ermes Drive
- Kingsland Avenue

All traffic signals shall be retrofitted with uninterruptable power supplies and new power services.

## UTILITIES

The project limits occur in a mix of residential and commercial areas. As such, it is anticipated that there will be minor utility conflicts during the construction of this project. This work includes:

1. Power - The conceptual design shows a sidewalk design which avoids conflicts with overhead utility poles. However, there are several conflicts with utility pole guy wires which will need to be addressed during the next phase of this project.
2. Water - There will be minor water valve adjustments required as part of this project.
3. Gas - There will be minor gas valve adjustments required as part of this project.
4. Sewer - It is anticipated that some existing sewer manholes will need to be adjusted as part of this project.
5. Signals / Fiber Optic - The conceptual design was laid out to avoid conflicts with signal or fiber optic cabinets. However, it is anticipated that handholes will need to be adjusted or reconstructed as part of this project.

## RIGHT OF WAY

Right of way was evaluated at a very high level using GIS information of existing right of way. Estimated impacts include:
Harrison to Midland (North Side)
$570^{\prime} \times 10^{\prime}$
Midland to Hanley (South Side)
$280^{\prime} \times 10^{\prime}$
Pennsylvania to Colby Avenue (North Side)
$700^{\prime} \times 10^{\prime}$
Woodruff to Kingsland (North Side)
490'x10'

The net is 20,400 SF of R/W or Easement. Using $\$ 20 /$ sf; would result in $\$ 408,000$ in R/W for the corridor.

## Appendix A - Cost Estimate


PRICING REPORT

| PRICING REPORT |  |  |  |  |  |  |  |  |  |  |  | $\begin{gathered} \text { Date: 02/01/2019 } \\ \text { Time: } 11: 51: 13 \\ \hline \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Project: ROUTE D IMPROVEMENTS <br> Location: ST. LOUIS COUNTY <br> County: ST. LOUS <br> District: St. Louis |  |  |  | $\begin{aligned} & \text { Project ID: J6S3215 } \\ & \text { Bid Date: } \quad / 1 \\ & \text { Route: } \quad D \end{aligned}$ |  | State: MO |  |  |  |  |  |  |
|  | Payltem | Description | Quantity Unit | Bid Price | Extension | district: st. <br> . | Extension | state averages | Extension | state averages | Extension_Alt |  |
|  | 2013000 | clearing and grubbing | 1.000 acre (1.0) | 5,000.00 | 5,000.00 | 5,836.86 | 5,836.86 | 4,799.91 | 4,799.91 | 4,418.48 | 4,418.48 |  |
|  | 2022010 | removal of improvements | 1.000 I.s. (1.0) | 500,000.00 | 500,000.00 | 96,276.44 | 96,276.44 | 47,114.05 | 47,114.05 | 49,351.90 | 49,351.90 |  |
|  | 2072000 | linear grading class 2 | 196.000 sta. (0.1) | 1,000.00 | 196,000.00 | 1,367.13 | 267,957.48 | 336.67 | 65,987.32 | 494.33 | 96,888.68 |  |
|  | 4011209 | "bituminous pavement mixure pg64-22, (bp-1)" | 176.000 ton (0.1) | 55.00 | 9,680.00 | 56.05 | 9,864.80 | 52.55 | 9,248.80 | 54.82 | 9,648.32 |  |
|  | 4030101 | asphaltic concrete mixture pg 64-22 (sp125c mix) | 18,759.000 ton (0.1) | 75.00 | 1,406,925.00 | 0.00 | 0.00 | 56.07 | 1,051,817.13 | 73.29 | 1,374,847.11 |  |
|  | 4071005 | tack coat | 5,886.000 gal (1.0) | 2.50 | 14,715.00 | 2.21 | 13,008.06 | 2.16 | 12,713.76 | 2.19 | 12,890.34 |  |
|  | 4081010 | prime-liquid asphalt re 70 or mc 30 | $74,160.000 \mathrm{gal}(10.0)$ | 10.00 | 741,600.00 | 10.44 | 774,230.40 | 10.00 | 741,600.00 | 10.00 | 741,600.00 |  |
|  | 5021110 | concrete pavement (10 in. non-reinf) | 2,050.000 s.y. (0.1) | 95.00 | 194,750.00 | 0.00 | 0.00 | 75.28 | 154,324.00 | 92.52 | 189,666.00 |  |
|  | 6042010 | adjusting manhole | 50.000 each (1.0) | 1,000.00 | 50,000.00 | 1,066.73 | 53,336.50 | 693.88 | 34,694.00 | 652.13 | 32,606.50 |  |
|  | 6042020 | adjusting basin or inlet | 50.000 each (1.0) | 1,300.00 | 65,000.00 | 1,181.34 | 59,067.00 | 1,856.41 | 92,820.50 | 1,258.80 | 62,940.00 |  |
|  | 6091010 | concrete curb (6 in. height and under) type s | $6,006.000$ If. (1.0) | 31.00 | 186,186.00 | 29.76 | 178,738.56 | 31.22 | 187,507.32 | 34.53 | 207,387.18 |  |
|  | 6131010 | furnishing and placing concrete material for full depth pavement repair | 136.000 s.y. (0.1) | 260.00 | 35,360.00 | 251.59 | 34,216.24 | 186.51 | 25,365.36 | 184.53 | 25,096.08 |  |
|  | 6131012 | subgrade compaction ( 6 in . depth) (pavement repair) | 136.000 s.y. (1.0) | 7.00 | 952.00 | 6.65 | 904.40 | 4.32 | 587.52 | 3.59 | 488.24 |  |
|  | 6131013 | type 1 or 5 aggregate for base ( 4 in. thick) (pavement repair) | 136.000 s.y. (1.0) | 7.75 | 1,054.00 | 8.06 | 1,096.16 | 5.32 | 723.52 | 5.18 | 704.48 |  |
|  | 6131014 | full depth pavement repair saw cut (for perimeter and internal saw cuts) | 391.000 If. (1.0) | 7.00 | 2,737.00 | 5.05 | 1,974.55 | 4.40 | 1,720.40 | 4.10 | 1,603.10 |  |
|  | 6131015 | "dowel bar (drilling, furnishing and installation) for full depth pavement repair" | 196.000 each (1.0) | 8.00 | 1,568.00 | 6.35 | 1,244.60 | 4.69 | 919.24 | 4.94 | 968.24 |  |
|  | 6131017 | dowel bar (furnishing and installation with baskets) for full depth pavement repair | 196.000 each (1.0) | 10.00 | 1,960.00 | 8.75 | 1,715.00 | 7.86 | 1,540.56 | 7.65 | 1,499.40 |  |
|  | 6131018 | "tie bar (drilling, furnishing and installation) for full depth pavement repair (type I joints)" | 196.000 each (1.0) | 8.50 | 1,666.00 | 9.24 | 1,811.04 | 7.97 | 1,562.12 | 8.05 | 1,577.80 |  |
|  | 6133018 | furnishing and placing bituminous material for class b partial depth pavement repair | 188.000 ton (0.1) | 120.00 | 22,560.00 | 103.88 | 19,529.44 | 108.93 | 20,478.84 | 110.47 | 20,768.36 |  |
|  | 6133019 | removal for class b partial depth pavement repair | 121.000 s.y. (0.1) | 60.00 | 7,260.00 | 14.53 | 1,758.13 | 30.68 | 3,712.28 | 20.27 | 2,452.67 |  |
|  | 6181000 | mobilization | 1.000 I.s. (1.0) | 540,281.32 | 540,281.32 | 279,478.43 | 279,478.43 | 119,865.04 | 119,865.04 | 127,847.64 | 127,847.64 |  |
|  | 6189901 | temporary traffic control (is) | 1.000 I.s. (1.0) | 250,000.00 | 250,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |  |
|  | 6200013 | "cold applied tape pavement marking, 24 in. white" | 1,053.000 If. (1.0) | 27.00 | 28,431.00 | 20.00 | 21,060.00 | 25.13 | 26,461.89 | 24.41 | 25,703.73 |  |
|  | 6200019 | "cold applied tape pavement marking, left/right arrow" | 80.000 each (1.0) | 320.00 | 25,600.00 | 300.00 | 24,000.00 | 323.99 | 25,919.20 | 322.65 | 25,812.00 |  |
|  | 6205901A | "4 in. yellow high build waterborne pavement marking paint, type I beads" | 30,622.000 If. (1.0) | 0.20 | 6,124.40 | 0.19 | 5,818.18 | 0.18 | 5,511.96 | 0.18 | 5,511.96 |  |

PRICING REPORT

PRICING REPORT


Appendix B - Conceptual Plans














Appendix C - SET Estimates
PRELIMINARY COST ESTIMATE

PRELIMINARY COST ESTIMATE

PRELIMINARY COST ESTIMATE

PRELIMINARY COST ESTIMATE


## Appendix D - Existing Pavement Report

St. Louis District Gregory J. Horn, District Engineer

Missouri Department of Transportation
1590 Woodlake Drive

TO: Lee Hilner -desl Rick Schneider -mtsl<br>Jason Blomberg -cm<br>Lisa Kuntz -aesl

FROM: Phil Ruffus
Senior Pavement Specialist
DATE: October 28, 2016

SUBJECT: Condition Survey
Job No.: Scoping Only
Route: D, St. Charles County

In response to a request made on August 25, 2016 we have conducted an investigation to determine the condition and depth of the asphalt pavement on 3.8 miles of Route D from I-170 to Kienlen Avenue in St. Louis County.

Eight cores were cut at random locations along the job. Drilling entailed coring the asphalt to the underlying concrete. The logs of the pavement types encountered are included along with photos and a map showing the approximate location of the cores.

Existing conditions along this section of roadway exhibit two different asphalt types over concrete.

Block cracking is the predominate distress present throughout the route. There are additional areas experiencing potholing confined mostly to the longitudinal construction joints.

Based on the state of the extracted cores, and supported by field observations, the following can be stated:

1. The existing asphalt surface is over ten years old, and it is showing its age. There is appreciable rutting present in certain areas but not confined to the intersections.
2. There are a myriad of different drainage features throughout the route. In the sections with a u-gutter (buried at times), the asphalt exhibits more distress that is directly related to these structures. Also, water was observed collecting on the shoulders after rain events.
3. A majority of the asphalt lifts in the extracted cores are in fair condition and do not reflect the distressed roadway.

Our mission is to provide a world-class transportation experience that delights our customers and promotes a prosperous Missouri.

This route needs significant effort to bring it back into long time service. However, the current fiscal environment precludes rehabilitation as a choice. Unfortunately, there is also no "one size fits all" treatment. Therefore, the following options should be considered.
a. A CLC (contract level course) treatment would offer a significant design life as the current underlying roadbed is stable. However, an additional overlay would further exacerbate the existing drainage problems and is expensive.
b. A better solution would be to mill and fill a 24 " wide strip along the failing longitudinal joints. This repair option has been performed by the JOC on the section of Route D immediately to the west of this project. Immediately afterwards another project placed a UBAWS over the entire roadway. However, this stretch of Route D has significantly lower AADT and a microsurfacing would be a more cost effective treatment versus a UBAWS. The microsurfacing would also improve the rutted areas.

Historical records indicate the last project on this section of Route D was in 2005 during the Smooth Roads Initiative. Previous asphalt lifts were placed in 1987 and 1985.

Please call if you have any questions.

## MISSOURI DEPARTMENT OF TRANSPORTATION SYSTEM MANAGEMENT: ST. LOUIS METRO DISTRICT

$\qquad$
County: St. Louis

Logged by: Ruffus/Smith
$\square$
Route D
Job No.: Scoping only
Date Work Performed: September 6, 2016

| LOCATION | LOG OF MATERIALS | CLASSIFIED BY |  |
| :--- | :--- | :--- | :---: |
| Core 1 | $0.00-0.13^{\prime}$ | Asphalt, surface mix, fair condition. (LP) | B-31 Mobile Drill |
| 0.5 miles e/o | $0.13-0.33^{\prime}$ | Asphalt, subsurface mix, fair condition, debonded. | with 3" core bit |

I-170, Right
Lane, EB
Route D

Core 2
1.2 miles e/o

I-170, Right
Lane, EB
Route D

Core 3
2.2 miles e/o

I-170, Right
Lane, EB
Route D

Core 4
3.8 miles e/o

I-170, Right
Lane, EB
Route D

Core 5
3.1 miles e/o

I-170, Left
Lane, WB
Route D

Core 6
2.1 miles e/o

I-170, Left
Lane, WB
Route D
0.00-0.11' Asphalt, surface mix, fair/poor condition, slight stripping. (LP)
0.11-0.33' Asphalt, subsurface mix, fair condition, debonded. 0.33- Concrete.
0.00-0.12' Asphalt, surface mix, fair/poor condition, slight stripping. (LP)
0.12-0.24' Asphalt, subsurface mix, fair condition, debonded.
0.24- Concrete.
0.00-0.17' Asphalt, surface mix, fair condition. (LP)
0.17- Concrete. (gravel)
0.00-0.15' Asphalt, surface mix, fair condition. (LP)
0.15-0.42' Asphalt, subsurface mix, fair condition.
0.42- Concrete. (gravel)
0.00-0.15' Asphalt, surface mix, poor condition, moderate stripping, debonded. (LP)
0.15-0.42' Asphalt, subsurface mix, fair condition.
0.42- Concrete.

# MISSOURI DEPARTMENT OF TRANSPORTATION SYSTEM MANAGEMENT: ST. LOUIS METRO DISTRICT 

Sheet $\quad 2$ of $\quad 2$
$\qquad$
Logged by: Ruffus/Smith
Route D
Job No.: Scoping only
Date Work Performed: September 6, 2016

| LOCATION |  | LOG OF MATERIALS | CLASSIFIED BY |
| :---: | :---: | :---: | :---: |
| Core 7 | 0.00-0.15' | Asphalt, surface mix, fair condition. (LP) | B-31 Mobile Drill with 3" core bit |
| 1.1 miles e/o | 0.15-0.37' | Asphalt, subsurface mix, fair condition. |  |
| I-170, Left | 0.37- | Concrete. |  |
| Lane, WB |  |  |  |
| Route D |  |  |  |
| Core 8 <br> 0.6 miles e/o | 0.00-0.15' | Asphalt, surface mix, poor condition, moderate stripping. (LP) | " |
| I-170, Left | 0.15-0.35' | Asphalt, subsurface mix, poor condition, moderate |  |
| Lane, WB |  | stripping. |  |
| Route D | 0.35- | Concrete. |  |






Appendix E-Accident Data


5 Year Statewide Rate

\section*{| TYPE | 2013 | 2014 | 2015 | 2016 | 2017 | Ratc Levcl |
| :--- | ---: | ---: | ---: | ---: | ---: | :---: |
| CRASH RATE | 233.8 | 315.46 | 513.45 | 494.63 | 508.08 |  |
| STATE RATE-RT | 22.1 | 2169.9 | 214 | 214 | ROUTE DESG |  |
| MORE THAN I ROADWAY TYPE | 0 | 0 | 0 | 0 | 0 | ROADWAY TYPE |}




[^0]


[^0]:    1 Year Statewide Rate
    

