

## STAFF REPORT

**DATE:** October 27, 2020  
**TO:** City Council  
**FROM:** Robert A. Clarke, Director of PW – Engineering & Transportation  
Brian Abbanat, Senior Transportation Planner  
**SUBJECT:** Anderson Road – Chavez Elementary School Improvements Design Concept for SACOG Grant Application

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### **Recommendation**

Approve resolution supporting Concept 2 as the basic design concept framework for the subject project in preparation for a SACOG Regional Funding design and capital grant application due in mid-January.

### **Fiscal Impact**

The total project cost is estimated at approximately \$3.4 million for Concept 2. The required minimum local match contribution is 11.47%, or, approximately \$390,000, split proportionally between the City and the Davis Joint Unified School District (DJUSD), which is determined by assigning local match obligations to improvements located on each agency's respective property/right of way Attachment 2 confirms DJUSD's commitment to their local match requirement.

*Table 1: Fiscal Impact Summary*

| Concept  | Total Cost  | Grant Request Requirement | Local Match | Est. City Local Match | Est. DJUSD Local Match |
|--|-------------|---------------------------|-------------|-----------------------|------------------------|
| Concept 1 (pickup/drop-off remains on the street)  | \$1,509,675 | \$1,336,515               | \$173,160   | \$173,160             | \$0                    |
| Concept 2 (relocates pickup/drop-off on to current staff parking lot, constructs new parking in Redwood Park adjacent to Chavez ES south driveway) | \$3,416,595 | \$3,024,712               | \$391,883   | \$173,160             | \$218,724              |

### **City Council Goals**

This project supports the Council goal to Fund, Maintain, and Improve Infrastructure as well as Objective 2A to restripe safe routes to school (in this case, access to Chavez ES).

### **Background and Analysis**

The Anderson Road -Chavez Elementary School (ES) Improvements project is a street improvement project on Anderson Road between Villanova Drive and Amherst Drive. This project builds upon prior planning and outreach efforts, including the 2014 Walk Bike Audit Report and the 2018 planning & outreach process to establish a vision for improving the corridor between Covell Blvd and Russell Blvd.

The City and DJUSD are partnering on a SACOG Regional Funding grant application due in January for a project that would focus on safety and design improvements fronting Chavez Elementary school (approximately Amherst Drive to Villanova Dr). Regular coordination between City and DJUSD staff has occurred since February 2020 in preparation for this grant application. If the project is funded, the project will proceed to more formal engineering work in 2021, followed by construction no sooner than summer 2022.

*Anderson Road Conditions:*

Anderson Road plays a critical role in multi-modal transportation. Nearly 2,200 cyclists, 11,000 vehicles, and over 100 buses travel through the corridor on a typical weekday. Major destinations served by Anderson Road include the western portion of the main UC Davis campus, the newly built West Village, UC Davis Silo Transit Terminal, several central Davis residential neighborhoods, downtown, and access to Hwy 113. Thus, Anderson Road serves as a primary north-south arterial in Davis.

A particularly challenging segment is between Rutgers Drive and Amherst Drive where Chavez ES fronts onto Anderson Road on the west side. During morning and afternoon school bells, parents/caregivers who drop off or pick-up their children at school must do so at the curb on Anderson Road. The volume of different users, particularly at the morning peak, results in multiple crossing conflicts between people on bikes, school drop-off, buses and motor vehicles. These safety concerns have been well documented throughout the formal processes conducted to date. A summer 2020 community survey indicated that 2/3 of respondents believed improving safety on Anderson Road was either very or extremely important. More information about traffic conditions including historical documents, crash statistics, and traffic visual simulations on Anderson Road can be found at the below link:

<https://www.cityofdavis.org/city-hall/improvement-projects/anderson-road-improvements>

*Project Design Framework:*

Staff and consultants have developed design concepts representing a framework for improvements. Importantly, the design concepts must have enough detail for grant evaluators to assess the project's benefits while leaving enough flexibility for the City to make necessary changes during the formal design process. Adequate detail is also needed to estimate the total project costs so the grant can cover as much as possible and reduce local cost burden. As a result, staff presents two design concepts with a list of design features that form the project's framework for the grant application. Accompanying exhibits are for illustrative purposes and generally reflect the intended road configuration, geometry, and markings. However, specific details will be resolved during the final design process if the project is funded. Councilmembers should also note that if the project is funded for design and construction, the project will return to the community and relevant commissions at typical project design milestones.

Two design concepts were developed by the City's on-call transportation design concept, Fehr & Peers and were carried through the community input process. Concept 1 assumes the Chavez ES student pickup and drop-off remain on the street, whereas, Concept 2 assumes pickup and drop-off are relocated onto a redesigned school site frontage that is currently the Chavez ES staff

parking lot. Most other improvements within the project boundary are consistent between the two concepts. Fehr & Peers has authored a technical memo summarizing the project background, design concepts, and multi-modal traffic operations. The memo also includes direct links to the traffic visual simulations referenced above.

*Cost Estimates:*

Fehr & Peers has provided planning level cost estimates for both concepts presented here. Concepts 1 and 2 are identical between Villanova Drive and just north of Rutgers Dr. At Rutgers drive, the designs diverge, with Concept 1 considerably less expensive as improvements are limited to within the City right of way. In contrast, Concept 2 proposes substantial improvements on the Chavez ES site itself, raising the project cost. Below are summary costs for the two concepts:

**Concept 1: \$1.5 million**

**Concept 2: \$3.4 million (preferred alternative)**

The below table illustrates a more detailed breakdown of estimated costs for the two alternatives:

*Table 2: Project Cost Estimates*

| Concept   | Total Cost         | Grant Request      | Local Match Requirement (11.47%) | Est. City Local Match | Est. DJUSD Local Match |
|---|--------------------|--------------------|----------------------------------|-----------------------|------------------------|
| <b>Concept 1 (pickup/drop-off remains on the street)</b>  | <b>\$1,509,675</b> | <b>\$1,336,515</b> | <b>\$173,160</b>                 | <b>\$173,160</b>      | <b>\$0</b>             |
| <i>Design</i>   | \$335,625          | \$297,129          | \$38,496                         | \$38,496              | \$0                    |
| <i>Construction Award</i>   | \$868,797          | \$769,146          | \$99,651                         | \$99,651              | \$0                    |
| <i>Contingency</i>  | \$234,810          | \$207,877          | \$26,933                         | \$26,933              | \$0                    |
| <i>Construction Mgt./Ins</i>  | \$70,443           | \$62,363           | \$8,080                          | \$8,080               | \$0                    |
| <b>Concept 2 (relocates pickup/drop-off on to current staff parking lot, constructs new parking in Redwood Park adjacent to Chavez ES south driveway)</b> | <b>\$3,416,595</b> | <b>\$3,024,712</b> | <b>\$391,883</b>                 | <b>\$173,160</b>      | <b>\$218,724</b>       |
| <i>Design</i>   | \$612,345          | \$542,109          | \$70,236                         | \$38,496              | \$31,740               |
| <i>Construction Award</i>   | \$2,056,450        | \$1,820,575        | \$235,875                        | \$99,651              | \$136,224              |
| <i>Contingency</i>  | \$560,850          | \$496,521          | \$64,329                         | \$26,933              | \$37,397               |
| <i>Construction Mgt./Ins</i>  | \$186,950          | \$165,507          | \$21,443                         | \$8,080               | \$13,363               |

*Cost Implications:*

A considerable cost difference exists between Concept 1 and Concept 2, primarily explained by extending improvements onto the Chavez ES campus frontage as well as construction of replacement parking adjacent to the south driveway for that lost at the campus frontage. These costs have been confirmed as eligible grant-related expenses by relevant grant funding staff as they are required to address the safety issues present on Anderson Road.

From a local match perspective, Concept 1 requires the City to cover the full local match costs. In Concept 2, local match expenses are split proportionally between the City and DJUSD. As shown in Table 2, since the incremental cost of Concept 2 results from improvements on the

Chavez ES site, DJUSD would be responsible for the accompanying local match obligation. Thus, the City local match requirements should not change significantly.

Additionally, as noted, design details (e.g. landscaping, materials, etc.) will be developed in final design if funded. Consultants have taken a conservative approach to the cost estimates to hopefully accommodate revisions that may occur during the final design process.

### **Community Outreach and Commission Review**

Extensive community outreach has occurred over the years leading to the proposed design concepts, including:

- 2014 WBAR: 2 parent workshops
- 2018 Anderson Road Streetscape Planning & Outreach:
  - 12 stakeholder interviews
  - 3 community workshops (113 participants)
  - Review and feedback from the BTSSC on 3/8/18
- July-August 2020 Anderson Rd-Chavez ES Improvements Phase 1 Recorded Workshop and Survey
  - 58 survey responses
  - 67% stated improving Anderson Rd safety is very or extremely important
  - 52% stated design concepts are headed in the right direction
- September 16, 2020 Recreation and Park Commission supported 7-0-1 conversion of Redwood Park turf immediately adjacent to the Chavez ES south driveway to replace staff parking that would be lost under Concept 2:

*“We believe the initial proposal has relatively low impact on park space and we recommend that further designs include landscape improvements to mitigate against the loss of green space and include safety measures to protect pedestrians, cyclists, and others in the area.”*
- September 24, 2020 live webinar
  - 23 attendees
  - Comments included:
    - General support for Concept 2 over Concept 1
    - Suggestion to relocate lane merge to north of Radcliffe Dr
    - Traffic signal or stop sign at Radcliffe Dr
- October 8, 2020 the Bicycling, Transportation, and Street Safety Commission (BTSSC) discussed the item and provided feedback on the two design concepts. Discussion focused on some details that can be resolved during final design, if funded, and bigger picture issues of prioritizing parking and driving access over safety and City sustainability goals. The BTSSC supported Concept #2 via 7-0 vote:

*“BTSSC supports Concept #2 as the preferred concept for the purposes of the grant application.”*
- October 27, 2020 City Council

## **Conclusion**

Based on community outreach conducted, traffic analysis, DJUSD input, and Staff and consultant professional judgement, Staff recommends Concept 2 as the preferred alternative. Consultants, City Staff, and DJUSD Staff all support locating the Chavez ES student drop-off / pickup area off the street and onto the campus site due to significant safety benefits over Existing Conditions and Concept 1. Concept 1 was developed primarily as a backup to Concept 2 if for unforeseeable reasons the City's and DJUSD's interests and/or priorities diverge or as a potential alternative if the City is not awarded the full request amount. Regarding the latter, SACOG occasionally elects a project for funding, but at less than the applicant's full request amount. In this event, the City and DJUSD could proceed with Concept 2, funding the difference with local funds. Alternatively, the City and DJUSD could de-scope the project to Concept 1. While not ideal, a Concept 1 project will provide safety benefits that justify implementing the project. In either scenario, the City's local match obligation would remain similar.

## **Attachments**

1. Resolution
2. Letter from DJUSD
3. Technical Memorandum
4. CIP Worksheet
5. Design Concepts: Plan View (link provided to due file size)  
[http://documents.cityofdavis.org/Media/Default/Documents/PDF/CityCouncil/Bicycling-Transportation-Street-Safety-Commission/General-Documents/2020/October 8/6A1-Anderson Rd-Chavez ES Improvements-ATT 1 \(Plan View\).pdf](http://documents.cityofdavis.org/Media/Default/Documents/PDF/CityCouncil/Bicycling-Transportation-Street-Safety-Commission/General-Documents/2020/October 8/6A1-Anderson Rd-Chavez ES Improvements-ATT 1 (Plan View).pdf)
6. Design Concepts: Renderings (link provided due to file size)  
[http://documents.cityofdavis.org/Media/Default/Documents/PDF/CityCouncil/Bicycling-Transportation-Street-Safety-Commission/General-Documents/2020/October 8/6A1-Anderson Rd-Chavez ES Improvements-ATT 1 \(renderings\).pdf](http://documents.cityofdavis.org/Media/Default/Documents/PDF/CityCouncil/Bicycling-Transportation-Street-Safety-Commission/General-Documents/2020/October 8/6A1-Anderson Rd-Chavez ES Improvements-ATT 1 (renderings).pdf)

**RESOLUTION NO. 20-XXX, SERIES 2020**

**RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DAVIS  
SUPPORTING CONCEPT 2 AS THE BASIC DESIGN FRAMEWORK FOR THE  
ANDERSON ROAD-CHAVEZ ELEMENTARY SCHOOL IMPROVEMENTS PROJECT  
FOR THE SACOG REGIONAL FUNDING PROGRAM GRANT APPLICATION**

WHEREAS, in 2014, the City of Davis completed the Walk Bike Audit Report, which included parent workshops and Safe Routes to School safety improvements recommendations at eleven (11) local elementary schools and three (3) junior high schools; and

WHEREAS, in 2015, the City of Davis applied to the Sacramento Area Council of Governments (SACOG) Community Design grant program to fund design improvements on Anderson Road to improve safety and comfort of all users; and

WHEREAS, the 2015 SACOG grant application was not selected for funding and, in response, the Davis City Council allocated \$90,000 in 2017 to conduct a planning and outreach process to establish a long-term vision for the Anderson Road corridor based on broader neighborhood and community outreach; and

WHEREAS, the Anderson Road planning & outreach process was completed in 2018; informed by twelve (12) stakeholder interviews and three (3) community workshops totaling 113 participants; and feedback from the Bicycling, Transportation, and Street Safety Commission; and

WHEREAS, in preparation for the 2020 SACOG Regional Funding cycle, staff collaborated with street design consultants Fehr & Peers; Dutch street design consultant, Bike Minded; grant application services consultant TJKM; and DJUSD staff over a nine (9) month period to develop design concepts; and

WHEREAS, this process included extensive community outreach to solicit input on the design concepts including a recorded workshop; community survey (58 participants); live workshop (23 participants); presentation to the Recreation and Park Commission; and presentation to the Bicycling, Transportation, and Street Safety Commission; and

WHEREAS, two design concepts were developed with Concept 2 relocating the student drop-off/pickup area from the street curb onto an improved Chavez ES site frontage in the existing staff parking lot; and

WHEREAS, the design concepts also include design improvements at Rutgers Drive and Villanova Drive intersections, and multi-modal improvements along Anderson Drive; and

WHEREAS the balance of staff, consultant, DJUSD, and community opinion support Concept 2 due to multi-modal traffic circulation and safety benefits over Concept 1 and Existing Conditions; and

WHEREAS the Recreation and Park Commission supported 7-0-1 converting a portion of Redwood Park turf to parking immediately adjacent to the south Chavez ES driveway; and

WHEREAS the Bicycling, Transportation, and Street Safety Commission supported 7-0 Concept 2 for the purposes of the grant application.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Davis does hereby support Concept 2 as the basic design framework for the Anderson Rd-Chavez ES Improvements project for the 2020 SACOG Regional Funding Program grant application.

PASSED AND ADOPTED by the City Council of the City of Davis on this 27th day of October, 2020 by the following vote:

AYES:

NOES:

ABSENT:

Gloria Partida  
Mayor

ATTEST:

Zoe S. Mirabile, CMC  
City Clerk

October 22, 2020

Mike Webb, City Manager  
City of Davis  
23 Russell Blvd  
Davis, CA 95616

Please accept this letter in full support of the Anderson Road Improvement Grant Application the City is preparing.

The Concept 2, if approved for grant funding, includes improvements on the César Chávez Elementary School Campus. Specifically, the improvements on the campus would include changes to the Rutgers/Anderson signaled intersection, a new vehicle access curb cut, and a re-alignment of the existing visitor and school staff parking lot.

The second concept also includes the construction of parking on the north frontage of Redwood Park. It is the District's understanding this new parking lot to be built on City park property would be for the exclusive use of DJUSD visitors and staff during school business hours. DJUSD support of Concept 2 is predicated on the provision of additional parking at Redwood Park as outlined by City staff.

The District understands there is a matching share requirement for the grant and the District is committed to providing a matching share amount of approximately \$220,000 which is based on the 11.47% local match requirement and the project cost estimate provided by City staff for improvements on the elementary school campus.

The District has been very pleased with the process used by the City to develop the grant proposal and we are very hopeful the grant will be approved so that much needed safety improvements can be made.

If I can be of further assistance, please do not hesitate to contact me.

Sincerely,



John A. Bowes, Ed.D.  
Superintendent





# Memorandum

Date: October 2, 2020  
To: Brian Abbanat, City of Davis  
From: Greg Behrens & Adrian Engel, Fehr & Peers  
Subject: **Anderson Road Improvements  
Phase 1 Cesar Chavez Elementary School Improvements  
Improvement Concepts & Multi-Modal Traffic Operations**

RS20-3900

This memorandum summarizes the improvement concepts and multi-modal traffic operations analysis prepared in support of the SACOG Regional Funding grant application for Cesar Chavez Elementary School (Chavez E.S.) improvements (Phase 1 of the Anderson Road Improvements). This memorandum contains the following sections:

- Project Background
- Improvement Concepts
- Multi-Modal Traffic Operations

Accompanying figures are presented at the end of this memorandum.

## Project Background

This section provides a summary of Fehr & Peers' understanding of the project background.

### Location

The Phase 1 improvements would be located on Anderson Road in Central Davis. Anderson Road is a major north-south arterial, connecting Central Davis with North Davis to the north and the UC Davis campus to the south (where it transitions to La Rue Road). Anderson Road additionally provides connections with major east-west arterials including Russell Boulevard, Covell Boulevard, and Eighth Street, as well as local shopping centers including University Mall and Anderson Plaza.

Figure 1 shows the extents of the Phase 1 improvements. Phase 1 improvements would be concentrated on Anderson Road between Radcliffe Drive and Amherst Drive. This segment of Anderson Road includes the Chavez E.S. school



frontage as well as two signalized intersections at Rutgers Drive and Villanova Drive. Note that improvements to Anderson Road north and south of this segment would not be included as part of Phase 1.

## Purpose and Need

The purpose of the Phase 1 improvements is to enhance safety on Anderson Road within the vicinity of Chavez E.S. by reducing potential conflicts between transit, bicyclists, pedestrians, and vehicles. Additionally, Phase 1 seeks to improve the safety, organization, and operations associated with the Chavez E.S. loading zone.

The City has determined that the Phase 1 improvements are needed for the following reasons:

- Anderson Boulevard is an **important multi-modal corridor**, serving over 10,900 vehicles, 2,100 bicyclists, and 100 bus trips per day. Anderson Road has not received major transportation infrastructure investments in recent decades, and thus requires improvement in order to best serve the varied needs of its current users.
- Anderson Road serves as the **primary access point for Chavez E.S.**, providing access for students who walk, bike, or are driven to and from school. The Rutgers Drive intersection serves high volumes of students and parents during school pick-up and drop-off times. Moreover, the existing on-street school loading zone on the school's Anderson Road frontage is very well utilized during school pick-up and drop-off times. The existing off-street parking lot accessed via Anderson Road provides parking supply for Chavez E.S. staff (currently, school loading activity is prohibited in this parking lot). The City and the Davis Joint Unified School District (DJUSD) share a joint interest in improving multi-modal access and circulation conditions along the school's Anderson Road frontage.
- The existing configuration of Anderson Road poses **numerous multi-modal conflicts**. Conflicts between bicyclists and vehicles occur along the lengthy on-street school loading zone as vehicles weave through the existing bike lane to pull to and from the curb. This is particularly prevalent during the morning drop-off period when high demand for the loading zone overlap with high volumes of southbound bicyclists. Conflicts between bicyclists and buses occur at bus stops near Villanova Drive and Amherst Drive as buses weave through the existing bike lane to pull to and from the curb. Finally, conflicts between bicyclists, pedestrians, and vehicles occur at the Anderson Road/Rutgers Drive intersection as high volumes of bicyclists and pedestrians mix in the marked crosswalks and conflict with turning vehicles. The Phase 1 improvements are needed to reduce the quantity and severity of these conflicts.
- Anderson Road has a **demonstrated collision history**. Between 2009 and 2019, 106 total collisions occurred on Anderson Road between Russell Boulevard and Covell Boulevard, including several within the Phase 1 segment. Of these collisions, 53 percent involved bicyclists. The Phase 1 improvements are needed to help reduce the number and rate of these collisions.

## Planning History

Efforts to identify and implement safety improvements within the vicinity of Chavez E.S. date back to the 2014 City of Davis Walk and Bike Audit Report, which identified the need for improvements on Anderson Road and adjoining roadways in order to enhance bicycle and pedestrian access for Chaves E.S. students. In 2017, the City of Davis initiated the Anderson Road Streetscape Improvement Project, which established a long-term street design vision based on an extensive community engagement process. This project examined improvements to Anderson Road



along the 1-mile segment between Russell Boulevard and Covell Boulevard. Although vetted with the community, the Anderson Road Streetscape Improvement Project was never finalized and adopted by the City Council.

This current effort seeks to implement the first phase of improvements identified in part by the Anderson Road Streetscape Improvement Project, with a focus on the Chavez E.S. frontage. The City is pursuing funding for Phase 1 through the SACOG Regional Funding competitive grant program.

## Improvement Concepts

This section describes the two improvement concepts currently under consideration for the Phase 1 improvements. Preliminary improvement concepts were prepared during Summer 2020 and refined based on community feedback received from an online survey and two virtual workshops held during Summer and Fall 2020. The improvement concepts were developed specifically to address the Phase 1 project purpose and needs described previously.

### Concept 1

Figure 2 illustrates Concept 1, which would include the following features:

1. Install a separated bikeway on southbound Anderson Road from just north of Villanova Drive to just north of Amherst Drive.
2. Maintain a bike lane on northbound Anderson Road, but widen the bike lane to meet current City standards, including a painted buffer, high visibility conflict zone markings, and new signing and striping.
3. Relocate the southbound Anderson Road two-to-one lane merge from south of Villanova Drive to just south of Radcliffe Drive.
4. Install low impact corner treatments at the Anderson Road/Villanova Drive intersection.
5. Install transit boarding islands on southbound Anderson Road immediately south of Villanova Drive and on northbound Anderson Road in front of the United Methodist Church.
6. Maintain on-street loading zone operations on Anderson Road in front of Chavez E.S.
7. Install a pedestrian refuge and bulbouts at the Anderson Road/Rutgers Drive intersection.

### Concept 2

Figure 3 illustrates Concept 2, which would include the following features:

1. Items 1 through 5 listed as components of Concept 1.
2. Relocate the school loading zone into the existing off-street school parking lot. Construct a new west leg of the Anderson Road/Rutgers Drive intersection to serve as the inbound driveway for the new off-street loading zone. Vehicles would circulate one-way counterclockwise through the loading zone, exiting the site at the existing driveway immediately north of the Redwood Park tennis courts.
3. Construct a new northbound left-turn lane and southbound right-turn lane at the Anderson Road/Rutgers Drive intersection to accommodate inbound vehicle trips to the new off-street loading zone.
4. Construct a new crossing on the south leg of the Anderson Road/Rutgers Drive intersection to increase crossing opportunities for bicyclists and pedestrians traveling to and from the school.



5. Install a bike signal and scramble phase at the Anderson Road/Rutgers Drive intersection.
6. Convert existing on-street loading zone to Chavez E.S. staff parking (to replace lost parking that would occur due to the new off-street loading zone) and manage this parking through the City's permit parking program. If additional parking supply is needed for Chavez E.S. staff, explore the conversion of the existing turf west of the Redwood Park tennis courts into additional staff parking spaces.

## Concept Visualizations

Figures 3 and 4 provide additional visualizations of the two improvement concepts. Figure 3 shows the concepts from a bird's eye view, while Figure 4 shows the improvement concepts from the perspective of a southbound motorist approaching the school frontage.

## Cost Estimates

Figures 5 and 6 provide total cost estimates for Concepts 1 and 2, respectively. Concept 1 would cost an estimated \$1.5 million and Concept 2 would cost an estimated \$3.4 million. The cost difference can largely be attributed to the Concept 2 costs associated with signal modifications at the Anderson Road/Rutgers Drive intersection and the reconfiguration of the existing off-street parking lot into a loading zone.

## Multi-Modal Traffic Operations

This section describes the expected changes to multi-modal traffic operations associated with Concepts 1 and 2.

## Multi-Modal Conflicts

Concepts 1 and 2 would address multi-modal conflicts in a similar manner, except for a few notable differences:

- Concepts 1 and 2
  - **Separated bikeway** – Both concepts would construct a new separated bikeway on southbound Anderson Road. The separated bikeway would allow southbound bicyclists to travel adjacent to the curb, substantially reducing conflicts between bicyclists and weaving vehicles and buses utilizing the curb in the existing condition.
  - **Southbound lane merge** – Both concepts would shift the location of the southbound Anderson Road two-to-one lane merge from south of Villanova Drive to just south of Radcliffe Drive. This modification would shift the southbound lane merge further north from the school zone (from 200 feet to over 800 feet north of the existing on-street loading zone), allowing for merge maneuvers to be completed well in advance of the school zone. This would help to reduce the speed of southbound traffic entering the school vicinity, particularly by addressing the behavior currently exhibited by some motorists who accelerate into the school zone in an attempt to merge in front of vehicles in the adjacent travel lane at the last possible moment.
  - **Anderson Road/Villanova Drive** – Both concepts would install low impact corner treatments at the Anderson Road/Villanova Drive intersection, which would reduce the corner turning radius (and



- corresponding vehicle turning speeds), provide greater refuge for bicyclists and pedestrians, and reduce the crossing distance for bicyclists and pedestrians.
- **Transit boarding islands** – Both concepts would install transit boarding islands on southbound Anderson Road immediately south of Villanova Drive and on northbound Anderson Road in front of the United Methodist Church. The boarding islands would allow buses to serve passengers without the need to weave across bicyclists (i.e., bicyclists would travel between the boarding islands and the curb).
  - Concept 1
    - **School loading zone** – Concept 1 would maintain on-street loading for Chavez E.S., but relocate the on-street loading zone in between the travel lane and the separated bikeway (i.e., switching the placement of the loading zone and the bikeway). Relative to existing loading zone operations, this would reduce conflicts between southbound bicyclists and weaving vehicles pulling to and from the curb, but increase conflicts between southbound bicyclists and people getting in and out of vehicles utilizing the on-street loading zone. Note that the proposed buffer area between the loading zone and the separated bikeway is intended to reduce this conflict potential by providing space for people exiting vehicles to wait for a gap in southbound bicycle traffic before crossing the bikeway to the adjacent sidewalk. A buffer area would also be provided on the driver's side of the vehicle to create space between the loading zone and the travel lane for passengers to get in and out of vehicles.
    - **Anderson Road/Rutgers Drive** – Concept 1 would install a pedestrian refuge and bulbouts at the Anderson Road/Rutgers Drive intersection, which would increase visibility of bicyclists and pedestrians and reduce the crossing distance for bicyclists and pedestrians.
  - Concept 2
    - **School loading zone** – Concept 2 would relocate school loading activity to the existing off-street parking lot. This modification would shift all loading activity onto the Chavez E.S. campus, and thus substantially reduce related conflicts on the street. In contrast to Concept 1, this would substantially reduce the potential for conflicts between bicyclists and pedestrians in the southbound separated bikeway, as students and parents would no longer be required to cross the separated bikeway to travel between the campus and the loading zone. This modification would increase vehicle turning activity into the new inbound driveway at the west leg of the Anderson Road/Rutgers Drive intersection, however, the provision of a bike signal for southbound bicyclists would substantially reduce potential conflicts between southbound bicyclists and turning vehicles.
    - **Anderson Road/Rutgers Drive** – Concept 2 would install a bike signal and scramble phase at the Anderson Road/Rutgers Drive intersection. These signal modifications would allow the intersection to operate with exclusive bicycle and pedestrian crossing phases, substantially reducing potential conflicts between bicyclists, pedestrians, and turning vehicles.

## Vehicle Delay and Level of Service

This study analyzes traffic conditions at the Anderson Road intersections with Rutgers Drive and Villanova Drive using Level of Service (LOS) as a measure of operational performance for motorists. LOS is a qualitative measure of traffic flow from the perspective of motorists and is an indication of the comfort associated with driving. Typical factors that affect LOS include speed, travel time, and traffic interruptions. Empirical LOS criteria and methods of calculation have been documented in the *Highway Capacity Manual, 6<sup>th</sup> Edition* (Transportation Research Board, 2016). LOS is a letter



classification system, from A (representing free-flow traffic conditions) to F (oversaturated conditions where traffic demand exceeds capacity, resulting in long queues and delays).

Traffic operations at the Anderson Road/Rutgers Drive and Anderson Road/Villanova Drive intersections were analyzed using Vissim traffic simulation software, which accounts for interactions between intersections, queue spillback, vehicle platooning, etc. Importantly, Vissim also accounts for vehicle, bus, bicycle, and pedestrian activity. Traffic operations were analyzed during the weekday AM peak hour. This hour was selected for analysis because the effects of the improvement concepts would be most prevalent during the AM peak arrival, when high levels of multi-modal travel activity occur along the school frontage due to the combination of school drop-offs and heavy volumes of southbound bicyclists and buses traveling southbound on Anderson Road towards the UC Davis campus.

Table 1 displays the existing peak hour delay and level of service at the two study intersections. Both intersections currently operate at LOS B during the AM peak hour, with traffic generally progressing smoothly and most motorists experiencing little delay as they progress through the signalized intersections.

As shown in Table 1, the implementation of Concept 1 would cause minor changes to AM peak hour delay and overall intersection LOS would remain at LOS B. The implementation of Concept 2 would increase delay at both study intersections. The Anderson Road/Villanova Drive intersection would remain at LOS B, while the Anderson Road/Rutgers Drive intersection would degrade to LOS D. This is primarily due to the introduction of two new signal phases (the northbound left-turn phase and the scramble phase) at the Rutgers Drive intersection, which would increase the total cycle length and overall intersection delay relative to existing conditions.

Note that these results represent the AM peak hour only, when school loading activity is at its greatest and background traffic is at elevated levels. Vehicle delay during off-peak hours would be lower than the results presented in Table 1, particularly for Concept 2. Much of the AM peak hour delay for Concept 2 is due to calls for bicycle/pedestrian crossings and for the northbound left-turn signal phase into the off-street loading zone, which would both be greatly reduced during off-peak time periods.

**Table 1: AM Peak Hour Intersection Operations**

| Intersection                  | Traffic Control | Existing           |                  | Concept 1          |                  | Concept 2          |                  |
|-------------------------------|-----------------|--------------------|------------------|--------------------|------------------|--------------------|------------------|
|                               |                 | Delay <sup>1</sup> | LOS <sup>2</sup> | Delay <sup>1</sup> | LOS <sup>2</sup> | Delay <sup>1</sup> | LOS <sup>2</sup> |
| Anderson Road/Rutgers Drive   | Signal          | 18                 | B                | 17                 | B                | 37                 | D                |
| Anderson Road/Villanova Drive | Signal          | 11                 | B                | 18                 | B                | 20                 | B                |

Notes:

1. Delay is reported as seconds per vehicle. Values are rounded to the nearest whole number so the same delay may represent two different LOS conditions if the delay is within 0.5 seconds of the LOS threshold. Average control delay for signalized intersections is the weighted average for all movements.
2. "LOS" represents level of service, calculated based on methodologies contained in the *Highway Capacity Manual, 6<sup>th</sup> Edition* (Transportation Research Board, 2016).

Source: Fehr & Peers, 2020.



Videos of the simulations prepared for the traffic operations analysis can be viewed at the links below:

- Chavez E.S. frontage
  - [Existing conditions](#)
  - [Concept 1](#)
  - [Concept 2](#)
- [Concept 2 – Anderson Road/Rutgers Drive intersection](#)
- [Concepts 1 and 2 – Anderson Road/Villanova Drive intersection](#)

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## Appendix A. Figures

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## City of Davis Capital Improvement Project Planning Sheet 20/21

|                            |   |  |                                   |
|----------------------------|---|--|-----------------------------------|
| <b>Project Name:</b>       | Anderson Road - Chavez ES Improvements: Phase 1 (Concept 1) |  |                                   |
| <b>Requested By:</b>       |   | <b>Dept/Div</b>                        | <b>PW E&amp;T/ Transportation</b> |
| <b>CIP Project Number:</b> | 8298  | <b>Transportation Project Manager:</b> | Brian Abbanat                     |
| <b>Last Revision Date:</b> | 5/22/2020   | <b>Engineering Project Manager</b>     | Brian Abbanat                     |

|                          |            |  |                |     |            |  |
|--------------------------|------------|--|----------------|-----|------------|--|
| <b>Project Category:</b> | CIP Admin. |  | Transportation | XXX | Stormwater |  |
|                          | Facilities |  | Fleet/Equip    |     | Wastewater |  |
|                          | Parks/OS   |  | I/S            |     | Water      |  |

**Concept 1: Description**

Complete Streets improvement project on Anderson Road between Amherst Drive and Villanova Drive. Consists of:

1. Restriping/reconfiguration of Anderson Road
2. Intersection and signalization improvements at Villanova Drive and Rutgers Drive
3. Chavez ES parking lot reconfiguration & site improvements
4. Transit stop improvements

Funding comes from SACOG Regional Funding Program.

Location: Between Amherst Drive and north of Villanova Drive.





## City of Davis Capital Improvement Project Planning Sheet 20/21

|                            |   |  |                                   |
|----------------------------|---|--|-----------------------------------|
| <b>Project Name:</b>       | Anderson Road - Chavez ES Improvements: Phase 1 (Concept 1) |  |                                   |
| <b>Requested By:</b>       |   | <b>Dept/Div</b>                                      | <b>PW E&amp;T/ Transportation</b> |
| <b>CIP Project Number:</b> | 8298  | <b>Transportation Project Manager:</b> Brian Abbanat |                                   |
| <b>Last Revision Date:</b> | 5/22/2020   | <b>Engineering Project Manager</b> Brian Abbanat     |                                   |

**Cost Estimate:**

| Item               | Description                                     | Units | Quantity | Unit Price | Total  |
|--------------------|---|-------|----------|------------|--|
| 1                  | Construction                                    | LS    | 1        | \$782,700  | \$782,700                                      |
| Subtotal           |   |       |          |            | \$782,700                                      |
| <b>Other Costs</b> |   |       |          |            |  |
|                    | Initiation                                      |       |          |            | N/A  |
|                    | Options Analysis                                |       |          |            | \$49,950 F&P Task Order #4                     |
|                    | Planning/Study                                  |       |          |            | \$90,000 2018 Alta Planning & Outreach Process |
|                    | Engineering & Design                            |       | 20%      | \$156,540  | Staff Estimate                                 |
|                    | Staff Time to support Planning and Design       |       | 3%       | \$23,481   | Default % from 8250                            |
|                    | Third Party Utility Coordination (PG&E etc.)    |       | 1%       | \$7,827    | Default % from 8250                            |
|                    | Pre-Construction Pot-Holing and Permitting      |       | 1%       | \$7,827    | Default % from 8250                            |
|                    | Mobilization                                    |       | 10%      | \$78,270   |  |
|                    | Materials Testing                               |       | 3%       | \$23,481   | Default % from 8250                            |
|                    | Construction Contingency                        |       | 30%      | \$234,810  | Default % from 8250                            |
|                    | Municipal Arts Fund*                            |       | 1%       | \$7,827    | Default % from 8250                            |
|                    | Constuction Administration and Inspection       |       | 5%       | \$39,135   | Default % from 8250                            |
|                    | Staff Construction Support and Project Closeout |       | 1%       | \$7,827    | Default % from 8250                            |
| Subtotal Other     |   |       |          |            | \$726,975                                      |
| <b>Grand Total</b> |   |       |          |            | <b>\$1,509,675</b>                             |

| <b>Financing Sources:</b>      | Total Amount       | Prior yrs. Actual | FY 20/21         | FY 21/22           | FY 22/23   | FY 23/24   | FY 24/25   |
|--------------------------------|--------------------|-------------------|------------------|--------------------|------------|------------|------------|
| General Fund (012):            | \$297,057          | \$139,950         | \$17,955         | \$139,152          |            |            |            |
| Construction Tax (200):        | \$0                |                   |                  |                    |            |            |            |
| Federal/State Hwy (210):       | \$1,212,618        |                   | \$138,585        | \$1,074,033        |            |            |            |
| Devel Impact Fees (Parks-483): | \$0                |                   |                  |                    |            |            |            |
| Devel Impact Fees (Roads-485): | \$0                |                   |                  |                    |            |            |            |
| Downtown Revitalization (476): | \$0                |                   |                  |                    |            |            |            |
| Solid Waste (520):             | \$0                |                   |                  |                    |            |            |            |
| Sewer Cap Replace(532):        | \$0                |                   |                  |                    |            |            |            |
| Storm Drain O&M (541):         | \$0                |                   |                  |                    |            |            |            |
| Storm Dr Cap Expans(543):      | \$0                |                   |                  |                    |            |            |            |
| <b>Total Project Cost:</b>     | <b>\$1,509,675</b> | <b>\$139,950</b>  | <b>\$156,540</b> | <b>\$1,213,185</b> | <b>\$0</b> | <b>\$0</b> | <b>\$0</b> |

| <b>Project/Funding Schedule:</b> | Total Amount       | Prior Years      | FY 20/21         | FY 21/22           | FY 22/23   | FY 23/24   | FY 24/25   |
|----------------------------------|--------------------|------------------|------------------|--------------------|------------|------------|------------|
| Planning:                        | \$139,950          | \$139,950        |                  |                    |            |            |            |
| Design:                          | \$156,540          | \$0              | \$156,540        |                    |            |            |            |
| Construction:                    | \$1,213,185        | \$0              |                  | \$1,213,185        |            |            |            |
| <b>Total Project Cost:</b>       | <b>\$1,509,675</b> | <b>\$139,950</b> | <b>\$156,540</b> | <b>\$1,213,185</b> | <b>\$0</b> | <b>\$0</b> | <b>\$0</b> |



## City of Davis Capital Improvement Project Planning Sheet 20/21

|                            |   |  |                                   |
|----------------------------|---|--|-----------------------------------|
| <b>Project Name:</b>       | Anderson Road - Chavez ES Improvements: Phase 1 (Concept 2) |  |                                   |
| <b>Requested By:</b>       | <u>Transportation</u>                                       | <b>Dept/Div</b>                        | <u>PW E&amp;T/ Transportation</u> |
| <b>CIP Project Number:</b> | <u>8298</u>   | <b>Transportation Project Manager:</b> | <u>Brian Abbanat</u>              |
| <b>Last Revision Date:</b> | <u>9/29/2020</u>  | <b>Engineering Project Manager</b>     | <u>Brian Abbanat</u>              |

  

|                          |            |                          |                |                                      |            |                          |
|--------------------------|------------|--------------------------|----------------|--------------------------------------|------------|--------------------------|
| <b>Project Category:</b> | CIP Admin. | <input type="checkbox"/> | Transportation | <input type="checkbox" value="XXX"/> | Stormwater | <input type="checkbox"/> |
|                          | Facilities | <input type="checkbox"/> | Fleet/Equip    | <input type="checkbox"/>             | Wastewater | <input type="checkbox"/> |
|                          | Parks/OS   | <input type="checkbox"/> | I/S            | <input type="checkbox"/>             | Water      | <input type="checkbox"/> |

**Concept 2: Description**  
 Complete Streets improvement project on Anderson Road between Amherst Drive and Villanova Drive. Consists of:

1. Restriping/reconfiguration of Anderson Road
2. Intersection and signalization improvements at Villanova Drive and Rutgers Drive
3. Relocating student drop-off/pickup from on-street onto the Chavez ES site frontage (i.e. current staff parking lot)
4. Chavez ES parking lot reconfiguration & site improvements
5. Construction of parking and landscaping at Redwood Park immediately adjacent to Chavez ES south driveway.
6. Transit stop improvements

Funding comes from SACOG Regional Funding Program.

Location: Between Amherst Drive and north of Villanova Drive.



## City of Davis Capital Improvement Project Planning Sheet 20/21

|                            |   |  |                        |
|----------------------------|---|--|------------------------|
| <b>Project Name:</b>       | Anderson Road - Chavez ES Improvements: Phase 1 (Concept 2) |  |                        |
| <b>Requested By:</b>       | Transportation  | <b>Dept/Div</b>                        | PW E&T/ Transportation |
| <b>CIP Project Number:</b> | 8298  | <b>Transportation Project Manager:</b> | Brian Abbanat          |
| <b>Last Revision Date:</b> | 9/29/2020   | <b>Engineering Project Manager</b>     | Brian Abbanat          |

**Cost Estimate:**

| Item               | Description                                     | Units | Quantity | Unit Price  | Total               |
|--------------------|---|-------|----------|-------------|---------------------|
| 1                  | Construction                                    | LS    | 1        | \$1,869,500 | \$1,869,500         |
| Subtotal           |   |       |          |             | \$1,869,500         |
| <b>Other Costs</b> |   |       |          |             |                     |
|                    | Initiation                                      |       |          |             | N/A                 |
|                    | Planning/Study                                  |       |          |             | \$90,000            |
|                    | Options Analysis                                |       |          |             | \$54,970            |
|                    | Engineering & Design                            |       | 20%      | \$373,900   | Staff Estimate      |
|                    | Staff Time to support Planning and Design       |       | 3%       | \$56,085    | Default % from 8250 |
|                    | Third Party Utility Coordination (PG&E etc.)    |       | 1%       | \$18,695    | Default % from 8250 |
|                    | Pre-Construction Pot-Holing and Permitting      |       | 1%       | \$18,695    | Default % from 8250 |
|                    | Mobilization                                    |       | 10%      | \$186,950   |                     |
|                    | Materials Testing                               |       | 3%       | \$56,085    | Default % from 8250 |
|                    | Construction Contingency                        |       | 30%      | \$560,850   | Default % from 8250 |
|                    | Municipal Arts Fund*                            |       | 1%       | \$18,695    | Default % from 8250 |
|                    | Constuction Adminstration and Inspection        |       | 5%       | \$93,475    | Default % from 8250 |
|                    | Staff Construction Support and Project Closeout |       | 1%       | \$18,695    | Default % from 8250 |
| Subtotal Other     |   |       |          |             | \$1,547,095         |
| <b>Grand Total</b> |   |       |          |             | <b>\$3,416,595</b>  |

| Financing Sources:             | Total Amount       | Prior yrs.<br>Actual | FY 20/21         | FY 21/22           | FY 22/23   | FY 23/24   | FY 24/25   |
|--------------------------------|--------------------|----------------------|------------------|--------------------|------------|------------|------------|
| General Fund (012):            | \$520,205          | \$144,970            | \$42,866         | \$332,369          |            |            |            |
| Construction Tax (200):        | \$0                |                      |                  |                    |            |            |            |
| Federal/State Hwy (210):       | \$2,896,390        |                      | \$331,034        | \$2,565,356        |            |            |            |
| Devel Impact Fees (Parks-483): | \$0                |                      |                  |                    |            |            |            |
| Devel Impact Fees (Roads-485): | \$0                |                      |                  |                    |            |            |            |
| Downtown Revitalization (476): | \$0                |                      |                  |                    |            |            |            |
| Solid Waste (520):             | \$0                |                      |                  |                    |            |            |            |
| Sewer Cap Replace(532):        | \$0                |                      |                  |                    |            |            |            |
| Storm Drain O&M (541):         | \$0                |                      |                  |                    |            |            |            |
| Storm Dr Cap Expans(543):      | \$0                |                      |                  |                    |            |            |            |
| <b>Total Project Cost:</b>     | <b>\$3,416,595</b> | <b>\$144,970</b>     | <b>\$373,900</b> | <b>\$2,897,725</b> | <b>\$0</b> | <b>\$0</b> | <b>\$0</b> |

| Project/Funding Schedule:  | Total Amount       | Prior Years      | FY 20/21         | FY 21/22           | FY 22/23   | FY 23/24   | FY 24/25   |
|----------------------------|--------------------|------------------|------------------|--------------------|------------|------------|------------|
| Planning:                  | \$144,970          | \$144,970        |                  |                    |            |            |            |
| Design:                    | \$373,900          | \$0              | \$373,900        |                    |            |            |            |
| Construction:              | \$2,897,725        | \$0              |                  | \$2,897,725        |            |            |            |
| <b>Total Project Cost:</b> | <b>\$3,416,595</b> | <b>\$144,970</b> | <b>\$373,900</b> | <b>\$2,897,725</b> | <b>\$0</b> | <b>\$0</b> | <b>\$0</b> |