



Memorandum

Date: September 16, 2020
To: Utilities Commission
Stan Gryczko, Public Works Utilities and Operations Director
From: Brian Mickelson, Assistant City Engineer
Adrienne Heinig, Management Analyst
Subject: Item 6D – Stormwater Capital Improvement Projects – Priority and Risk

Recommendation

Receive informational report.

Background

For the past few months, the Utilities Commission has been reviewing the financial plan for the Stormwater Utility, one of three cost of service studies that are currently underway. The City's stormwater rates have been in place since the mid-1990's, prior to the adoption of Proposition 218 in November of 1996, and the resulting changes to the rate implementation process associated with the proposition's approval. The current rate revenue does not fully cover the financial needs of the Stormwater program, as the system is aging, and needs upgrades and replacements to reflect the changing stormwater landscape of the City of Davis. It has been recommended that stormwater rates should be raised to capture current and planned future costs. To that end, staff have completed and presented a 30-year capital improvement project plan, although the majority of projects would be scheduled for completion within the first 10 years of the potential rate adoption. This project list, amounting to about \$34 Million dollars over 30 years, is one of the largest drivers of the necessary rate increase.

Project Prioritization

Through the evaluation of the financial plan of the Stormwater Utility, questions arose as to whether City staff could rank or prioritize the capital projects, to smooth out necessary rate adjustments or reduce those adjustments. Staff has consistently indicated that all of the capital projects included within the financial plan are necessary and high priority. The projects are based on recommendations from a study conducted in February 2015. This study was used to understand the anticipated timelines, cost and priority for each project.

Within the study, prioritization is focused as follows: *The most problematic and immediate issues should be addressed first. Problematic issues include an inadequately sized pump station, safety concerns for the City's Staff or the general public, or regular and significant staff maintenance efforts.*

The City has 9 pump stations, with three that need extensive work as described below, and the remaining 6 in good working order. While the stations not identified as the highest priority could benefit from some renovation, it would not be appropriate to focus limited resources on those projects at this time, and that work is included as maintenance and smaller-cost efforts budgeted over time (captured in the study as Annual Misc. Upgrades). All of the capital projects listed in the financial plan have either inadequate sizing, safety concerns, and/or significant staff maintenance effort needed, making them high priority projects.

Each of these projects, with immediate hazards and risks, along with longer-term hazards and risks, are included below:

Note: *While the full failure of the stations might be an unlikely occurrence, even with the age of the infrastructure, staff were asked to include information on all risks associated with the CIP projects. Each of these sections will include information on what would occur in a full failure scenario.*

Capital Improvement Projects Listing and Detail

Storm Drainage Station No. 6

Year Constructed: 1924

Pump Type: Electric

SDS (Storm Drainage Station) #6 is the City's oldest station, and is located at Richards Blvd. and Olive Drive. The station was developed just after the construction of the undercrossing. The station is well past its useful life, as typically the useful life of pump station equipment is around 20-30 years, with structures having a useful life of around 50 years. Although the station has been maintained well by stormwater staff, the station needs to be replaced to address a number of safety issues and capacity concerns.

Immediate Hazards/Risks:

- Accessing the station – access is a walkway which is only separated from close large traffic by a chain. The access itself is below accepted requirements for operations and maintenance needs.
- Hazardous materials – The discharge pipe is comprised of asbestos cement.

Long-term Risks

As the station is the oldest in the Stormwater Utility, the surrounding needs of the City have changed considerably since construction. The station does not have the capacity to address the volume of stormwater needed to prevent flooding in the Richards Blvd undercrossing.

Failure of the Station

Failure of the station would result in flooding of the Richards Boulevard tunnel and would cut off this route into and out of the City. This would be an immediate impact to safety, as there is no interconnect to alert staff to the flooding. If flooding occurs and is not reported, this leaves drivers in an unsafe condition, especially at night when the flooding is less visible. In addition, this eliminates this route if needed for an evacuation, reduces in the ability to get goods into and

out of the City, and effects operations on Interstate 80 as northbound traffic would not have access to central Davis from this interchange, shifting traffic to other interchanges.

Storm Drainage Station No. 5 (El Macero Drainage Station)

Year Constructed: 1966

Pump Type: Electric

This station drains South Davis, Willowbank, El Macero, a large portion of unincorporated area comprised of agricultural lands and extends into Solano County. This station protects structures, Interstate 80 and adjacent properties from property and crop damage.

Immediate Hazards/Risks:

- Flooding - During larger storms, the station floods. This can be evidenced by a steel plate which was welded into the doorway which stands approximately 2 and a half feet tall in order to keep flood water from entering the door and flooding the station. If water enters the station, the control equipment will short out and cause the station to fail. During these times of water inundation, the only way staff can access the pump station is to wear waders and wade out to it. This presents a number of hazards to staff attempting to access the station, detailed below.
 - Shock hazard – The steel plate protecting the station can present a shock hazard for staff in flooding events.
 - Hazards to staff – Include drowning risks, as well as back or other injuries.
- Risk to equipment - the pumps themselves are at risk of being flooded causing them to short out and fail. Vegetation growth can cause issues by blocking the pumps, preventing staff from accessing them.
- Aging Equipment - station has seen wear and its components are wearing out.
- Frequent power outages occur, necessitating more maintenance work by staff, and requiring access during periods when the conditions may not be safe.

Long-term Risks

The station needs to be raised in order to proactively prevent the flooding events, and remove safety hazards for staff. In addition, the station location and service area (largely impacted by surrounding agricultural properties) necessitate a close review of the placement of the station, as well as protection for the station against material more likely to occur in a non-urban setting, such as ongoing sediment runoff requiring frequent cleanouts.

Failure of the Station

Failure of the station would result in significant flood damage to adjacent crops, structures and if flooding continued long enough, it could reach Interstate 80, causing safety and operational issues. In addition as failure of this station would flood the station, this would result in the large cost of loss of the mechanical, electrical and computer equipment in the station.

Storm Drainage Station No. 3 (H Street Pump Station)

Year Constructed: 1948

Pump Type: Diesel

This station is the largest of the City’s pump stations, and is centrally located in town. With the changes around the station since the initial installation, including the construction of the Covell overpass, and the buildout of the Cannery development, the station is at risk for structural damage in a seismic event, and inadequately sized to meet the required capacity.

Immediate Hazards/Risks:

- Capacity - this station is responsible for draining a large area from approximately State Route 113 to Pole Line and from just north of Covell to Russell Boulevard, there is a large potential for flooding with only one station conveying all the stormwater. At times in the past, during larger storms, flooding has occurred on several streets including H Street, 14th Street, and L flooding has occurred on several streets including H Street, 14th Street, and L Street, as well as other areas. This flooding has been several feet deep and has inundated cars and yards.
- Aging Equipment - The overall pump station is aging. This includes control panels, pumps and overall structure. This is the City’s second-oldest station, and is well past the 30 to 50-year operational period for equipment and station infrastructure.
- Difficult to backup - As this station runs diesel powered pumps, they do not lend themselves to backup power like electricity powered pumps. This leaves the largest station without backup power.
- Structural concerns - The structure is also built under the fill of Covell Boulevard which covers the majority of the north side of the structure. Seismic standards have changed over time and the facility should be evaluated based upon current seismic structural standards.
- Air quality concerns - The Yolo-Solano Air Quality district has been emphasizing that the City should convert the diesel-powered pumps to electric for some time.

Long-term Risks

Flooding already occurs with this station, as detailed above. Small equipment failures in the station could greatly increase the flooding that is already occurring.

Failure of the Station

Failure of this station would result in significant and widespread flooding within the area from State Route 113 to Pole Line and from just north of Covell to Russell Boulevard. This would present many safety issues for residents and would also result in extensive property damage. It would also compromise the transportation system making it difficult or impossible for emergency response and other users to traverse the system in a central portion of town.

Covell Channel Widening

Year Constructed: 1966

The Covell Channel, along the edge of Covell Blvd. in West Davis has been overflowing into City streets more and more frequently in recent years, and in some cases shut down the roadway to traffic. Planned improvements include the installation of box culverts across the west and north sides of Covell and Lake intersection, and widening and realigning the channel from Lake to Riesling. This will increase the capacity of the channel, move it farther from the edge of roadway, and align it with the improved section of channel in front of the hospital.

Immediate Hazards/Risks

- Capacity – This channel can no longer handle the flow of stormwater from the unincorporated areas west of the city limits. The original design was to divert stormwater from the west of Davis around developed areas to prevent flooding. With the changes to land use west of town, this amount of water entering this channel has increased significantly over the past 2 decades.
- Flooding – During larger storms the channel overflows and floods onto Covell Blvd. posing a significant hazard to vehicles traveling on Covell. This is most significant at the intersection of Lake and Covell and in front of Sutter Hospital. With the water covering the street, there is no indication of where the street is and the deep stormwater channel next to the street. This flooding is hazardous to drivers traversing next to this deep channel.

Long-term Risks

The largest long-term risk associated with the delay of this CIP project would be the recurrence and magnitude of flooding in the area, which is adjacent to residential areas and the City's only hospital with emergency services (flooding also occurred in the hospital parking lot in recent years, which was not directly related to the Covell Channel issues).

Necessary Assessments & Studies

The age of the infrastructure and equipment associated with the stormwater utility is a challenge, and highlights the need for the City to conduct studies to determine the most efficient and effective updates and upgrades to the system to best reflect the current and future needs of the City. In addition to the equipment and facilities already discussed, more than half of the City's drainage piping is over 40 years old, and 18 percent is over 60 years old. While there have been no piping failures, the continued assessment of the pipeline conditions is critical to planning out replacements and repairs moving forward. Without proper planning, failures within the stormwater system are more likely to occur, and can cause damage via flooding, as well as incur emergency repair costs.

In addition to infrastructure aging, there have been significant changes in hydrologic conditions in Davis, particularly in the West of Davis, which have in turn increased stormwater runoff and introduced unpredictable flow of stormwater. Studies need to be conducted to determine both the capacity of the City's system within each area of town, and what replacements or upgrades are necessary to meet the current and future demand. Also, the region's changing weather patterns will likely have a significant effect on runoff and will need to be evaluated.

Once the utility is able to conduct the necessary studies to determine the baseline needs for the infrastructure and capacity, the City can best prioritize and plan the projects and look for additional funding sources (grants, loans) as needed.

Funding Challenges

One of the most significant challenges associated with grant awards for stormwater has been the availability of implementation grants, and the lack of availability of planning grants. As discussed, stormwater staff need to conduct studies to determine the capacity and needs of each station, rather than replace the station in-kind, which requires planning activity. Without a “shovel ready” project, the City has been unable to apply for recent stormwater grants from the State. In recent years, the City has applied for planning grants now available through the Federal Management Agency (FEMA) Flood Mitigation Assistance program, however these applications have to date been unsuccessful. A planning grant was awarded to the City to look at meeting regulatory requirements for stormwater drainage in the downtown area at the Core Area Pond instead of individual developments. The City continues to apply for planning grants when opportunities arise.

Agencies with limited funding for stormwater infrastructure may look to other enterprise funds or general fund sources to offset expenditures. While one-time loans from other enterprise funds is possible, it is poor practice to rely on loans from other funds for standard operations and maintenance needs, and not a sustainable funding source. General fund dollars are subject to a different set of priorities – as the funds are not focused on a single utility (as with enterprise funds) and are more likely to retract with economic impacts to the region, such as recent recessions and the stay-at-home orders associated with the COVID-19 pandemic.

Future Costs/Challenges

Due to the fact that so much of the needs of the Stormwater utility are unknown, it is likely that there will be additional costs identified and additional projects necessary to bring the system into full and efficient functioning. As discussed in the details of the financial plan, should the rate adjustments be approved, the City would create a reserve for the Stormwater Fund, so funding associated with most of these projects (smaller operations and maintenance activities) would be taken from fund balance, and would not directly impact ratepayers. Larger projects identified would necessitate additional discussions around how the projects should be funded, likely during annual fund updates with the Commission and City Council.