CITY COUNCIL WORKSHOP
CITY OF FAIR OAKS RANCH, TEXAS

AGENDA TOPIC: Vestal Park Culvert Design Options

DATE: July 3, 2025

DEPARTMENT: Public Works and Engineering Services

PRESENTED BY: Lee Muñiz, P.E., CFM, Manager of Engineering Services

INTRODUCTION/BACKGROUND:

The Vestal Park Culvert project is located west of the intersection of Rocking Horse Lane and Pimlico Lane. The project involves the replacement of an aging 48-inch corrugated metal pipe (CMP) that has deteriorated over time. While the exact construction date of the culvert is unknown, records indicate it dates back as far as 1995, making it at least 30 years old.

In late 2019, improvements were made to the downstream section of the culvert within the boundaries of Vestal Park. These improvements included the installation of a concrete headwall and wingwalls, dissipation blocks, and decorative rock.

As part of a broader evaluation of drainage infrastructure, staff determined that the invert of the culvert is significantly degraded and in need of repair. The original cost estimate was based on a direct replacement of the existing CMP; however, further analysis revealed that the culvert is undersized for current stormwater capacity requirements. For local residential streets, the Unified Development Code specifies that bridges, culverts and other street crossings are to be designed to convey the 10-year storm under the street.

To address this, staff utilized the General Engineering Consultant (GEC) contract to develop a preliminary project design and updated cost estimate for a capacity-based upgrade. The GEC completed the design and provided a preliminary construction estimate, which exceeds the budgeted amount of $113,844. Based on this submittal, staff identified three potential project options:

- Option 1: Construct two 6 ft. wide by 4 ft. high concrete box culverts. This option offers the most benefit, including increased stormwater flow capacity and the use of concrete, which resists long-term degradation. The primary drawback is the higher cost compared to the original budget.

  Estimated Construction Cost: $548,000

- Option 2: Replace the existing corrugated metal pipe (CMP) with a 48-inch concrete pipe. This option is more affordable than Option 1 and still provides a material upgrade from CMP to concrete. However, it does not increase the culvert's capacity, meaning stormwater may still overtop the road during rain events.

  Estimated Construction Cost: $371,000

- Option 3: Perform in-house patching of the degraded CMP using concrete to fill voids. This is the least expensive and fastest option, as it would be completed by the City maintenance staff using internal resources. However, it is a temporary fix that would require future maintenance and does not improve the culvert's capacity.

  Estimated Construction Cost: Minimal (in-house labor and materials)

Staff recommends Option 3. It provides the most cost-effective solution to the present erosion issue and can be implemented quickly. It should be noted that future upgrades may be necessary, and motorists may need to detour around the affected area in the event the road is closed due to overtopping. As a point of reference, the estimated capacity of the existing culvert is the 2-year storm event; however, overtopping of the road has not occurred in over 20 years.

Staff seeks direction from City Council regarding the preferred project option. This guidance will enable staff to move forward with the design and construction phases of the selected solution.

POLICY ANALYSIS/BENEFIT(S) TO CITIZENS:

- The project aligns with Pillar 3 subsection 3.3 *Enhance and Ensure Continuity of Reliable Drainage Improvement Initiative* of the City's Strategic Action Plan.
- The construction of this project will address critical repairs to a deteriorating culvert crossing, helping to prevent a potential pipe collapse that could pose a significant risk to public safety.

LONGTERM FINANCIAL & BUDGETARY IMPACT:

The current project budget is $113,844. Budgetary impacts depend on the direction received during the workshop.