



PUBLIC WORKS DEPARTMENT

CITY HALL
10300 TORRE AVENUE • CUPERTINO, CA 95014-3255
TELEPHONE: (408) 777-3354 • FAX: (408) 777-3333
CUPERTINO.ORG

CITY COUNCIL STAFF REPORT

Meeting: January 15, 2019

Subject

Accept the City of Cupertino Storm Drain Master Plan dated September 2018

Recommended Action

Adopt Resolution No. 19-XXX accepting the City of Cupertino Storm Drain Master Plan dated September 2018

Background:

The purpose of the City-wide Storm Drainage Master Plan is to document the City's existing storm drainage system, identify drainage deficiencies, and prioritize system replacements and upgrades to correct the deficiencies. A storm drain deficiency has been defined as a pipe or system's inability to convey storm water runoff from a 10-year storm (a hypothetical storm of a rain intensity that occurs once every 10 years). Designing storm drain systems for 10-year storm conveyance is the current industry standard. Older standards, from the 1960's and 1970's, set pipe sizes for the conveyance of a 3-year storm. Portions of the City's existing storm drain system were constructed under the older standard, and these areas have resulted in some of the improvement projects listed in the updated Storm Drain Master Plan.

The City is approximately 11 square miles in area and has a total of nearly 90 linear miles of storm drain mains. Historically, there have been three pipe materials commonly used within the City: (1) Reinforced Concrete Pipe (RCP), (2) Corrugated Metal Pipe (CMP), and (3) Plastic Pipe. The overwhelming majority of the City's storm drain pipe consists of reinforced concrete pipe. Plastic pipe makes up a very small portion of the City's system, and typically has been used in areas where physical constraints require the use of a pipe size that is smaller than RCP will permit. Portions of the City have sections of corrugated metal pipe. These sections are typically short and usually convey storm water from a single drain inlet to a nearby creek or drainage channel.

Corrugated metal pipe has a relatively short life expectancy of 30 years, however much of the CMP remaining within the City is more than 55 years old. The City has systematically replaced these sections of CMP with RCP or plastic pipes as upgrades were needed or failures have occurred.

Reinforced concrete and plastic pipes are generally considered to have an expected life of 100 years. The majority of the City's storm system was constructed to meet the population increase that occurred between 1950 and 1970. Therefore, these pipes still have an expected remaining life of 35 to 55 years and immediate replacement is not warranted if they are still of adequate design capacity.

As part of the master plan process, the City's Public Works Department, in conjunction with the Geographical Information System (GIS) team, had a comprehensive survey performed of the City's storm drain system, which located most of the storm drain facilities and documented elevations and pipe alignments where possible. Where information was not located with the survey, additional field investigations and engineering judgement were used to fill in the data gaps. Additionally, the City had a Light Detection and Ranging (LIDAR) survey performed for the City's surface features. The information collected in these endeavors was used in the analysis performed by Schaaf & Wheeler Consulting Civil Engineers for the Storm Drain Master Plan, providing for a more precise storm drain master plan than was previously available to the City.

Recent improvements made to the City's storm drain system were based on information and recommendations from the 1993 Storm Drain Master Plan, observed field conditions and site specific hydraulic studies. These recent improvements were incorporated into the latest model and were analyzed with the 2018 Storm Drain Master Plan.

Completed storm drain related projects since the 1993 Storm Drain Master Plan include:

- N. Foothill Boulevard and Cupertino Road Storm Drain Improvements
- Regnart Road Slide and Storm Drain Repair
- Bubb, Elm and McClellan Road Storm Drain Improvement Project
- Monta Vista Storm Drain system
- Lindy Lane Storm Drain Improvements
- Gardena Drive/Stelling Avenue Valley Gutter Installation
- Calabazas Creek Outfall Repair
- San Fernando Avenue/McClellan Road Valley Gutter Installation
- Bollinger Road Culvert Repair
- Stevens Canyon Road Curb Inlet Installation
- East Estates Drive Outfall Repair
- Stevens Canyon Road Curb Inlet Installation
- Homestead Road (at De Anza Blvd) Storm Drain Construction
- Stevens Canyon Road Storm Drain and Retaining Walls Replacement

Other upgrades of major drainage systems have been constructed by private developers as a condition of development.

The Storm Drain Master Plan has identified upgrades to correct existing deficiencies within the storm drain system. The near-term projects include:

- Pumpkin Drive/Fiesta Lane Improvement Project
- Bubba Road Improvement Project
- Stevens Creek East Improvement Project
- McClellan Road Improvement Project
- Foothill South Improvement Project
- Foothill North Improvement Project
- Cali Avenue Improvement Project

Discussion:

The total cost to upgrade undersized pipe systems for high priority projects is estimated at approximately \$80M (at 2018 construction costs). It is not feasible to replace all the deficient lines or install additional lines in a timely manner. Therefore, a system of prioritization is recommended to gradually upgrade the drainage system.

High Priority Projects – Replacement of pipelines that are undersized for a 10-year storm event in locations where either existing flooding has occurred, or where existing topography hinders overland flow conveyance. These projects will help to reduce the potential for uncontrolled flow of runoff outside of the City right-of-way and/or to minimize pockets of standing water within the right of way due to insufficient capacity to convey the 10-year storm event. These projects improve conditions at locations with the deepest and longest-duration flooding situations.

13 high priority projects were identified and are aimed at reducing significant 10-year flooding throughout the City.

Total estimate cost of High Priority projects (at 2018 construction costs) is \$13M.

Moderate Priority Projects – These improvements are intended to contain most of the 10-year flooding within the street right-of-way. The duration and depth of flooding corrected by a moderate priority improvement is less than that of a high priority improvement.

27 moderate priority projects were identified that will reduce most flooding at the 10-year level of service. The City may need to progressively re-prioritize moderate priority projects based on funding, other utility improvements, land use changes, and condition assessments.

Total estimate cost of Moderate Priority projects (at 2018 construction costs) is \$26M.

Low Priority Projects – These improvements are aimed at containing the remaining 10-year flooding in the street right-of-way. The areas of flooding addressed by low priority projects are much smaller than those of moderate and high priority projects. Includes replacement of undersized pipelines where there is adequate flow capacity within the street surface area to convey the excess runoff, or correct nuisance ponding in the street.

81 low priority projects are recommended to alleviate minor 10-year flooding.

These projects are not likely to be constructed before the next storm drain master plan update.

Sustainability Impact

No sustainability impact with the acceptance of the Storm Drain Master Plan.

Fiscal Impact

There is no fiscal impact with the acceptance of the Storm Drain Master Plan. Recommended improvements that are prioritized in the Storm Drain Master Plan will require expenditures from the Storm Drain Improvement Fund, account number 210-99-071-900-905. Current storm drain property related fees are insufficient to fund infrastructure improvements.

Prepared by: Chad Mosley, Acting Assistant Director of Public Works/City Engineer

Reviewed by: Roger Lee, Acting Director of Public Works

Approved for Submission by: Timm Borden, Interim City Manager

Attachments:

A – Draft City of Cupertino Storm Drain Master Plan dated September 2018

B – Draft Resolution