Schumacher Drainage and Roadway Improvements
Profile Adjustment
Challenges with Offsite Sheet flow
March 10, 2022

Agenda
• Background: Schumacher Area
• Regional Study
• Local Project Impact Analysis
• Analysis Challenges
• Design Solutions
• Questions

Background:
Schumacher Project Area
Background:
Schumacher Project Area

- Major Flooding Events:
  - Unnamed Event 2012
  - Memorial Day 2015
  - Tax Day 2016
  - Harvey 2017

- Larchmont Area Improvements 2016

- Regional Drainage Study 2018

Background:
Schumacher Area Flooding History

Background:
Schumacher Flooding
**Background:**

Schumacher Flooding

**Project Goals:**

- Full Roadway Reconstruction
- Conversion from roadside ditch to curb and gutter
- Pedestrian Friendly
- Accommodate Parking Needs

**Drainage Challenge**

2018 LiDAR Topography
**Schumacher Drainage Challenge**

**Project Goals**

- Full Roadway Reconstruction
- Conversion from Roadside Ditch to Curb and Gutter
- Pedestrian Friendly
- Accommodate Parking Needs

**Impact Analysis**

Truncated Model
Impact Evaluation

- **Method 1**: Proposed GeoPAK Roadway Surface Merged with 3D Mesh Surface
  - Labor and time intensive but very accurate

- **Method 2**: Approximation with Model Surface Adjustment
  - Significantly faster but not as accurate

- **Approach**: Combination of Method 1 and Method 2.
  - Utilized model surface adjustments (Method 2) to identify viable design alternatives.
  - Finalized evaluation with detailed surface adjustments from CAD - Method 1.

Schumacher Impact Assessment

Schumacher Existing Ponding

Schumacher Drainage Challenge

2018 Project Area LiDAR Topography
Schumacher
Proposed Ponding

- Lack of Adequate Outfall Capacity
- Offsite Contributing Flow
- Lack of Adequate Relief for Overland Sheet Flow Path Leaving the Project Limits
- Providing an Interim Design to Accommodate the Future Regional Project Improvements

Schumacher
Primary Design Challenges

- Full Roadway Reconstruction
  - Conversion from Roadside Ditch to Curb and Gutter
  - Pedestrian Friendly
  - Accommodate Parking Needs

Schumacher
Design Phase
Schumacher
Existing Conditions

- Roadway Higher than ROW

- Parking in ROW
First iteration:
- Input proposed storm sewers under existing LiDAR
- Imported proposed terrain
- Ran the analysis
- Identify areas that have flow leaving ROW

Subsequent iterations:
- Where flow leaves ROW, raise road using walls and rerun

Final solution kept road elevated as in existing conditions
Drainage Design Challenges
- Limited ROW (60 ft)
- Parking within ROW
- Densely Spaced Driveways
- Two Sanitary Sewers on Certain Streets
- Numerous Sanitary Service Leads
- 24-inch Waterline Along Bering
- Shallow Outfall Elevations

Design Constraints
- Maximize parallel parking
- Roadway must stay at or near existing elevations
- Swales behind the sidewalk
- Slotted curbs
- 8-ft sidewalks
- 3% roadway cross slopes
- 1% sidewalk cross slopes

Unique Roadway Design
- Large storm boxes
- 4.6 acre-feet of detention
- 2-foot-tall boxes over 24" water line
- Arch pipes (18"x28.5")
- Modified inlets
- Grate Inlet within curb

**SLOTTED CURB AT INLET**

- 4.6 acre-feet of detention
- Proposed roadway at existing elevations ensured no adverse impact to overland sheet flow patterns