

Engaging Stakeholders to
Identify Sustainable
Solutions for Flooding in
Newport's Prescott Hall
Neighborhood
NYWEA-NEWEA Joint Spring
Technical Conference and
Exhibition

June 9, 2023

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Jacobs

Challenging today.
Reinventing tomorrow.



Agenda

- Project Objective
- Prescott Hall Study Area
- Stakeholder Engagement
- Hydraulic Model
- Alternatives Evaluation
- Results and Flood Control Benefits
- Next Steps

Project Objective

- **Problem:** Historic drainage and flooding issues in the Prescott Hall neighborhood during high intensity rainfall events and extreme high tides
- **Objective:** Identify sources of flooding, evaluate mitigation alternatives, develop recommendations including cost estimates
- **Outcome:** Short-term and long-term control recommendations to reduce the magnitude and frequency of flooding



Project Approach

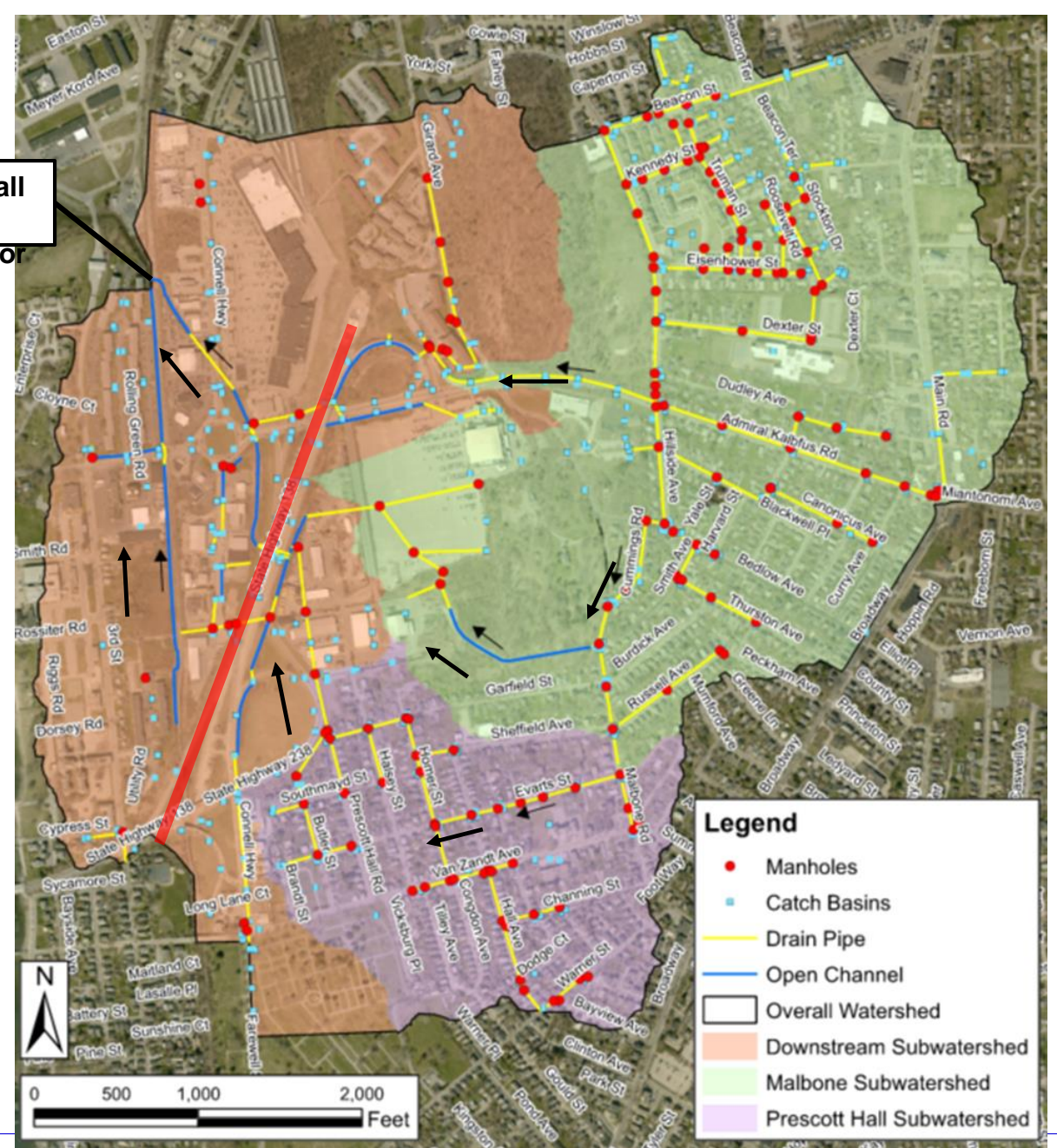
- Data collection and review to develop understanding of the contributing factors to flooding
- 2D hydraulic modeling of study area
- Developed potential mitigation alternatives
 - Short-term (1-3 years)
 - Long-term (3+ years)
 - Cost estimates
 - Implementation schedule
- Stakeholder coordination throughout
 - Public Involvement Program
 - 3 public workshops
 - 2 public surveys
 - RIDOT Coordination
 - 3 coordination meetings



Elizabeth Brook Watershed

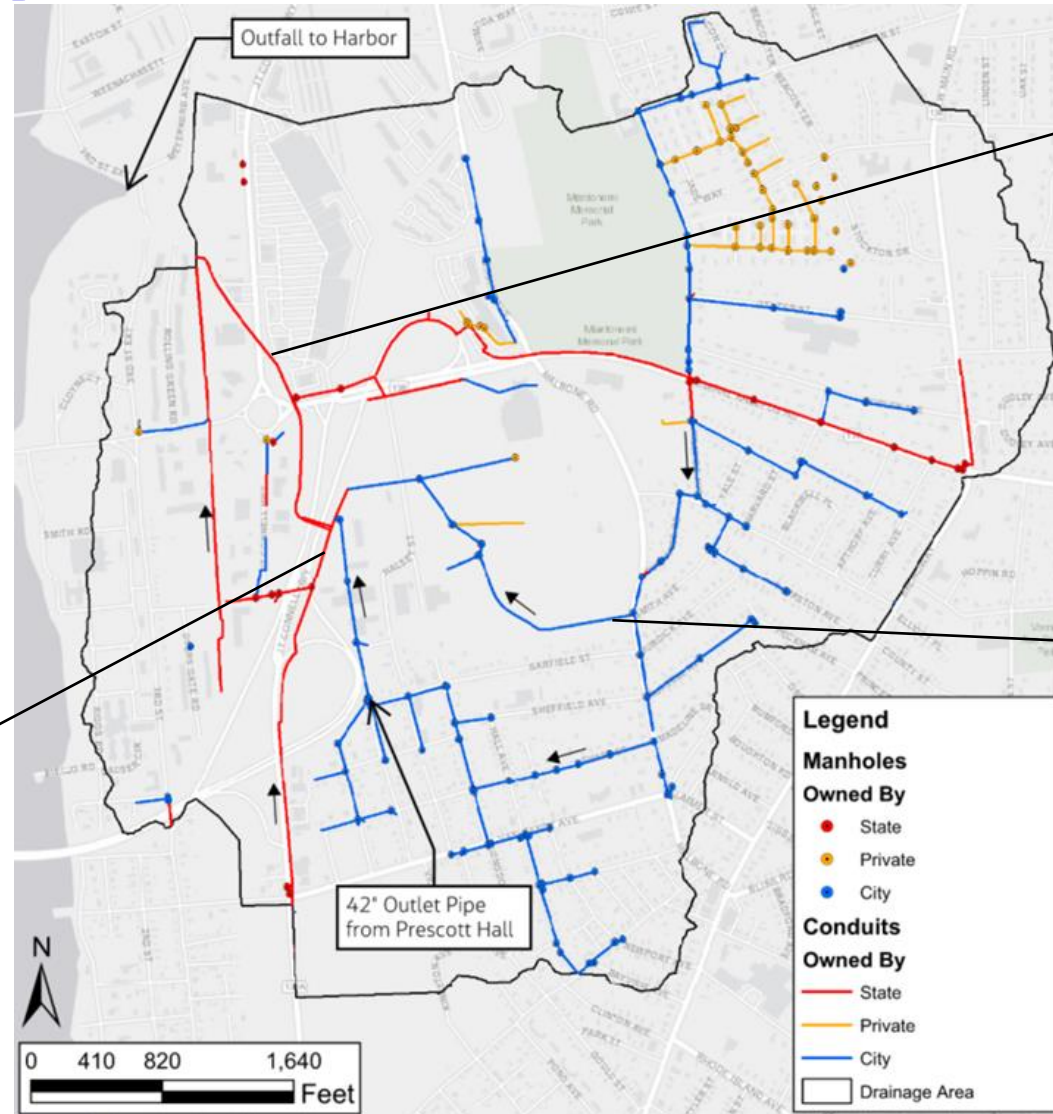
- Watershed characteristics
 - 586 acres
 - 50% impervious cover
 - 6% average slope
 - Max elevation: 157.8 ft
 - Min elevation: 0.8 ft
 - Shallow groundwater
 - Lies within FEMA 100-yr and 500-yr flood zones

Outfall to Harbor



Existing Drainage Infrastructure

- Mix of ownership between City, State & Private
- City storm drain outlets to RIDOT drainage channels and culverts
- Outfalls to harbor; no tide gate



Past Flooding Events

- September 13, 2022
 - 1.36 inches rain in 20 minutes

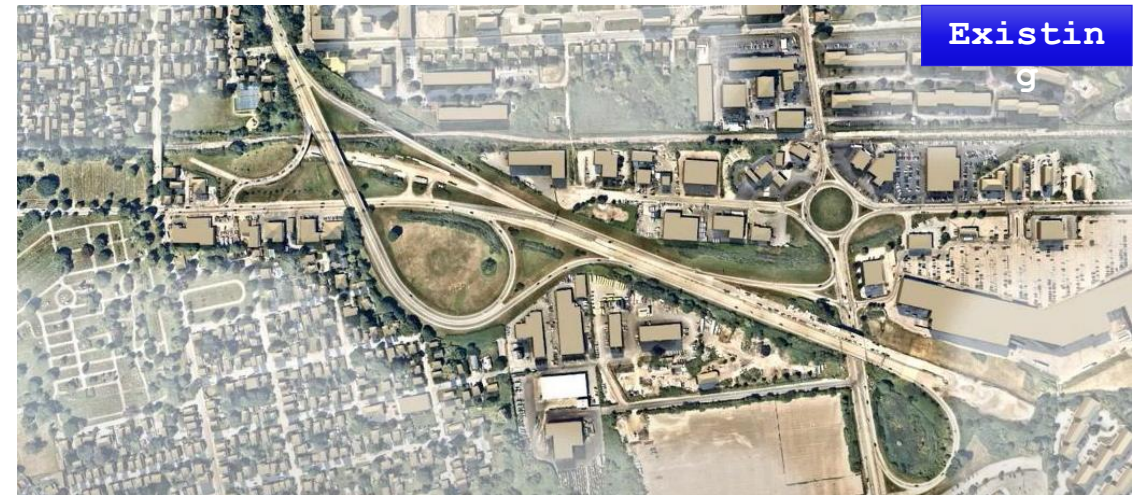


- July 14, 2020
 - 1.53 inches rain in 40 minutes



RIDOT Pell Bridge Improvement Project

- Construction began in Summer 2021 and is ongoing
- Includes improvements that will impact critical components of the drainage system downstream of Prescott Hall
 - Relocating existing ramp further east, extending along Halsey St to Admiral Kalbfus Rd
 - New ramp sits at higher elevation than existing highway
 - Cleaning of existing drainage channels and culverts



Prescott Hall
Neighborhood

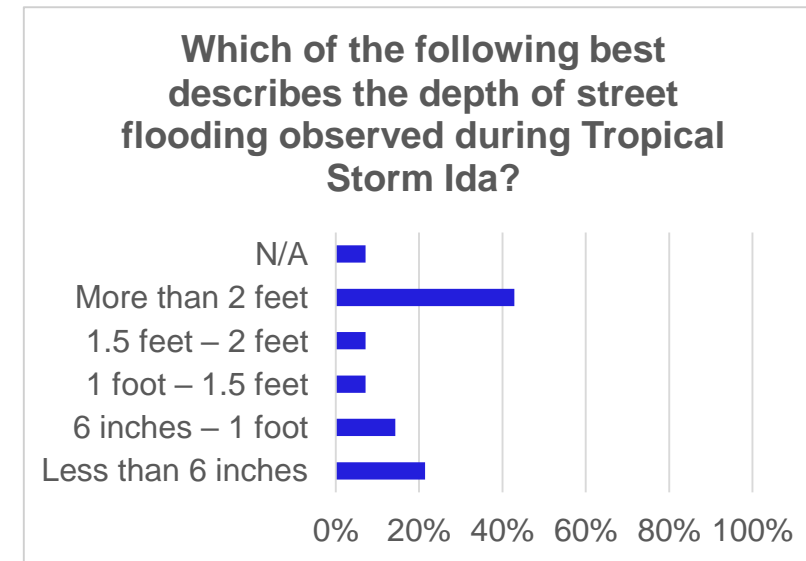
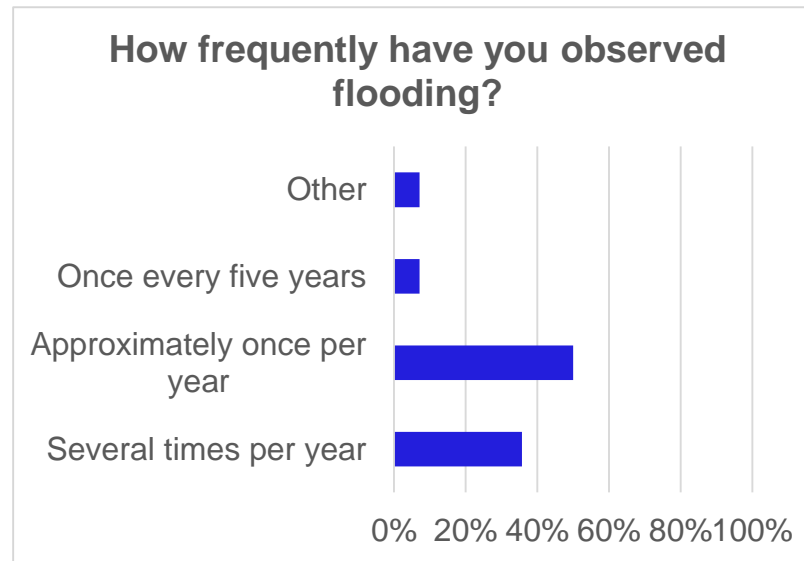
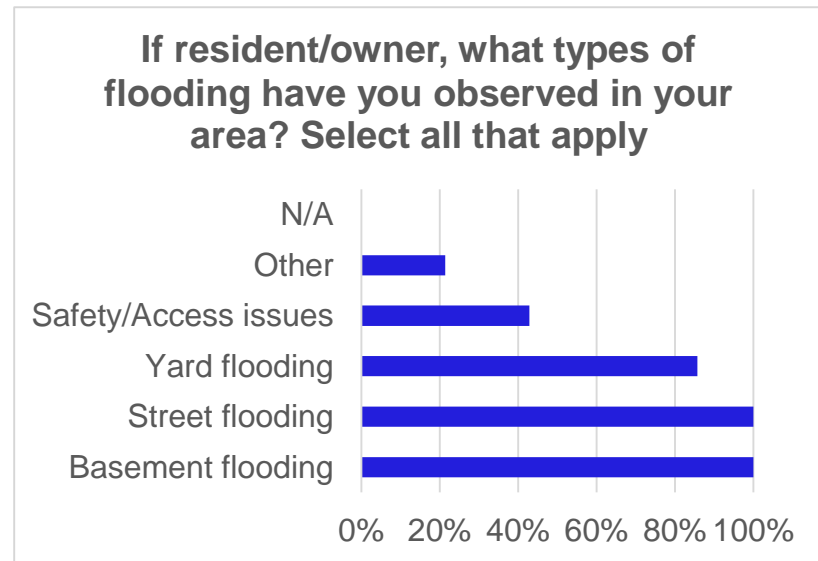
<https://www.dot.ri.gov/projects/pellbridgeramps/>

Public Involvement Program

- 3 Public Workshops
 - **Workshop 1, May 2022:** Presented drainage study scope, causes of historic flooding events, and collection of input on neighborhood priorities for system improvements
 - **Workshop 2, June 2022:** Presented hydraulic model development, potential mitigation measures, and identified list of alternatives evaluation criteria
 - **Workshop 3, September 2022:** Presented 'best fit' mitigation measures, flood control benefits, implementation plan and costs
- 2 Public Surveys
 - **Survey 1:** Collected information on stakeholders completing the survey, historic flooding conditions (frequency, duration, and depth of flooding), requested photos/videos documenting past flooding events
 - **Survey 2:** Collected stakeholders' weightings for alternatives evaluation criteria

Public Survey 1 Results

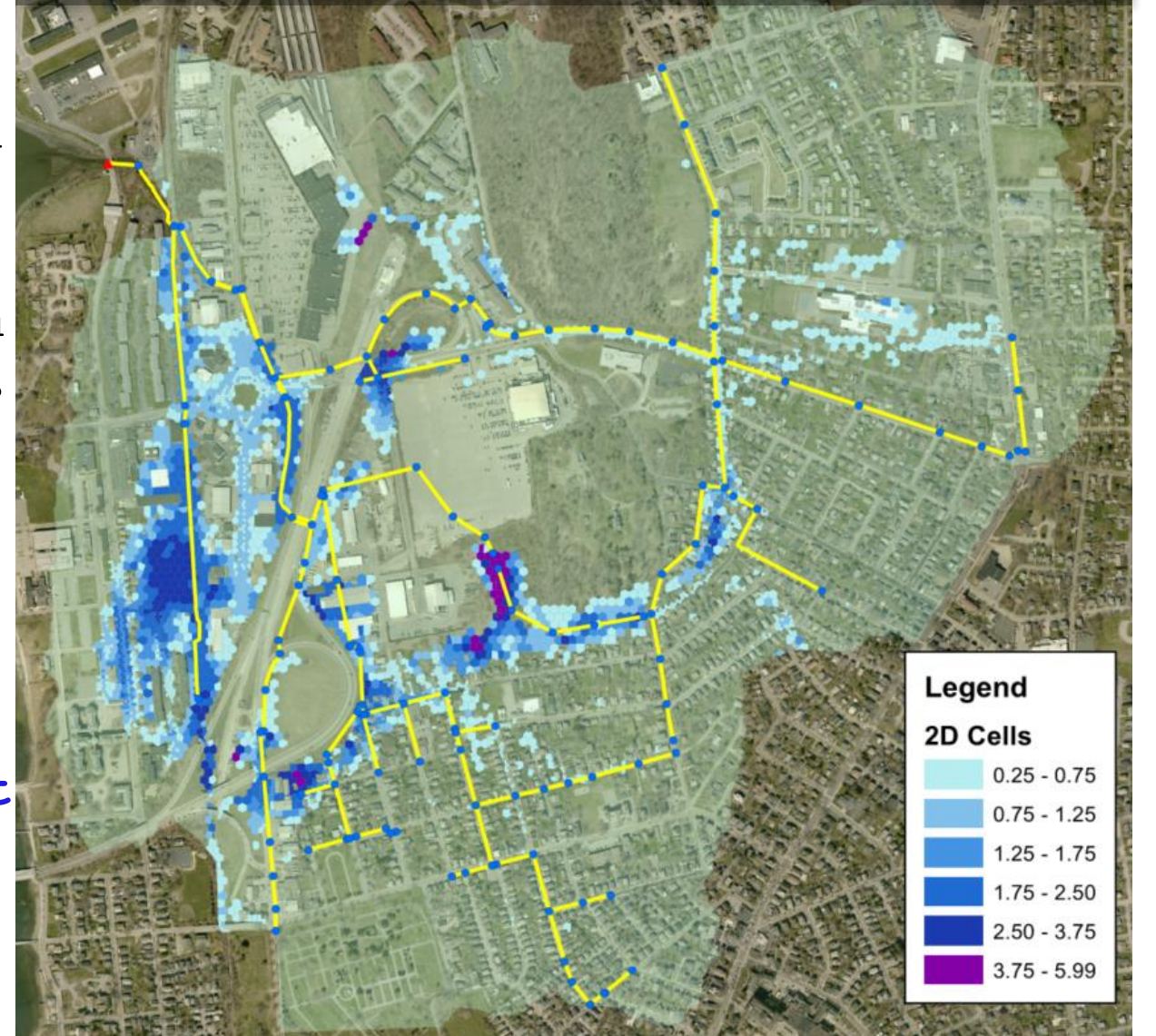
- Total responses: 14
- Included 9 questions focused on past flood observations
- All respondents were a resident/property owner
- Received photos/videos of past flooding events from 12 residents



Existing Conditions Model

- The *Existing Conditions* model characterizes existing surface runoff and flooding based on existing storm drain infrastructure and flow paths
- Model Results for 10-yr, 24-hr design storm
 - Prescott Hall Flood Volume: **3.92 MG**
 - Depth of Flooding at Prescott Hall Rd & Garfield St: **2.95 ft**

Existing Conditions Results - 10-yr, 24-hr Design Storm



Model Validation – Tropical Storm

9/2/21 6.34 inches rain in 24 hours

- Stakeholder photos were used to validate the existing conditions model for several past storm events

- Goal of the validation process is to verify the accuracy of the model



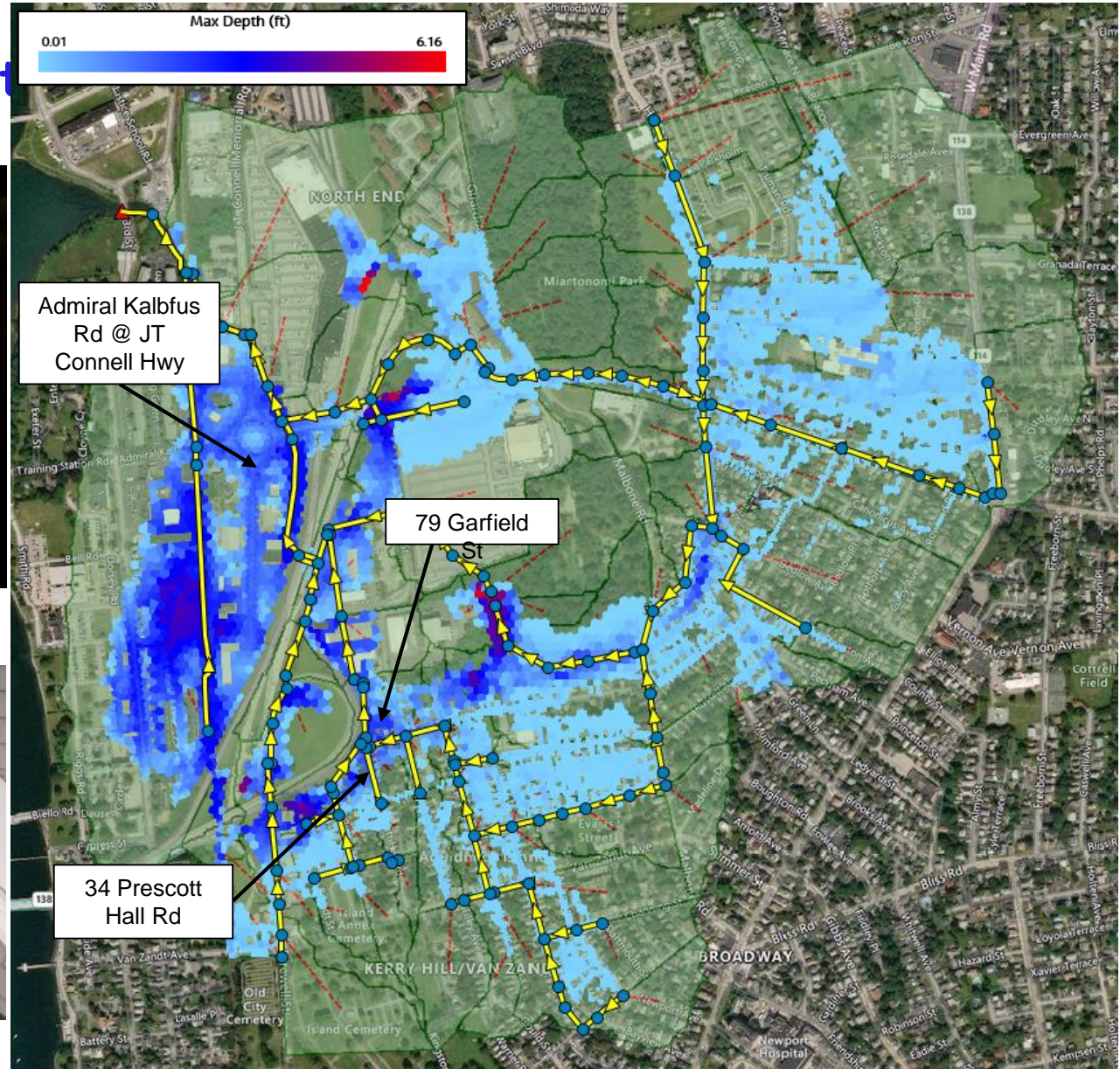
Admiral Kalbfus Rd @ JT Connell Hwy, South
Model Depth: 1.46 – 1.92 ft



79 Garfield St.
Model Depth: 1.74 – 2.38 ft



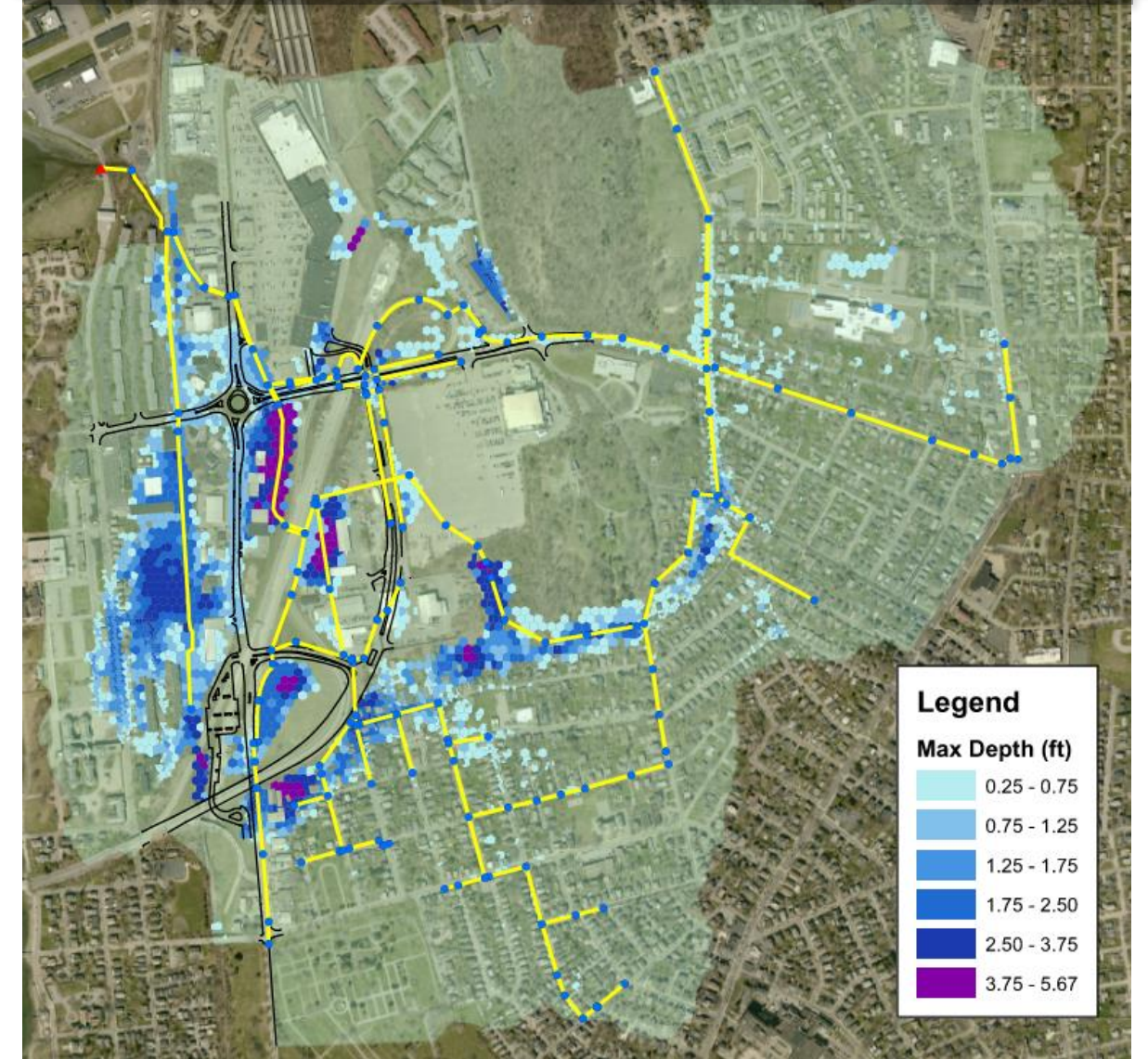
34 Prescott Hall Rd.
Model Depth: 1.5 – 2.37 ft



Baseline Conditions Model

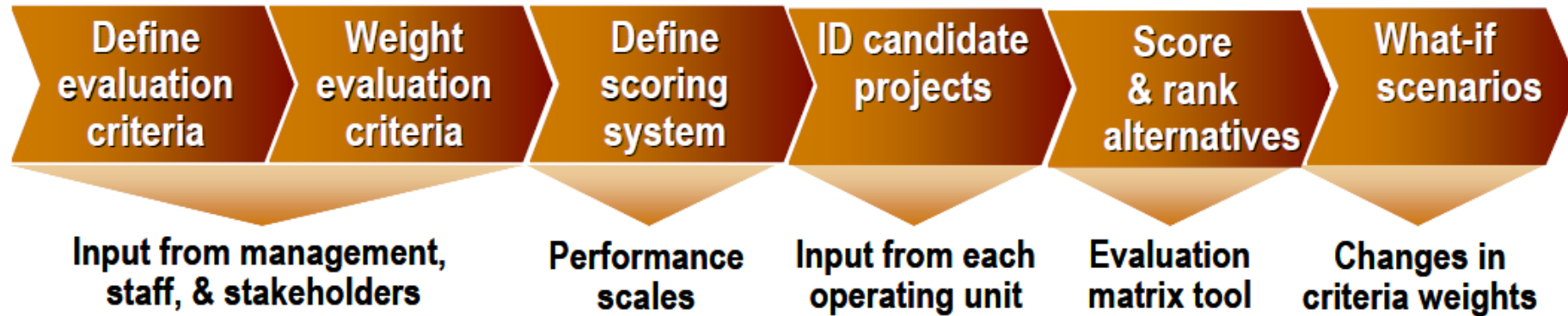
- The **Baseline Conditions** model reflects existing conditions, with the implementation of the RIDOT Pell Bridge Project
- Developed based on data provided by RIDOT, including proposed drainage improvements and topography changes
- Model Results for 10-yr, 24-hr design storm
 - Prescott Hall Flood Volume: **4.67 MG**
 - **19.1%** increase from Existing
 - Depth of Flooding at Prescott Hall Rd & Garfield St: **3.72 ft**

Baseline Conditions Results - 10-yr, 24-hr Design Storm



Alternatives Evaluation Process

Approach to identify solutions that address a broad range of constraints and community issues.



- Utilizing multi-objective decision analysis (MODA) allows for evaluation of all factors

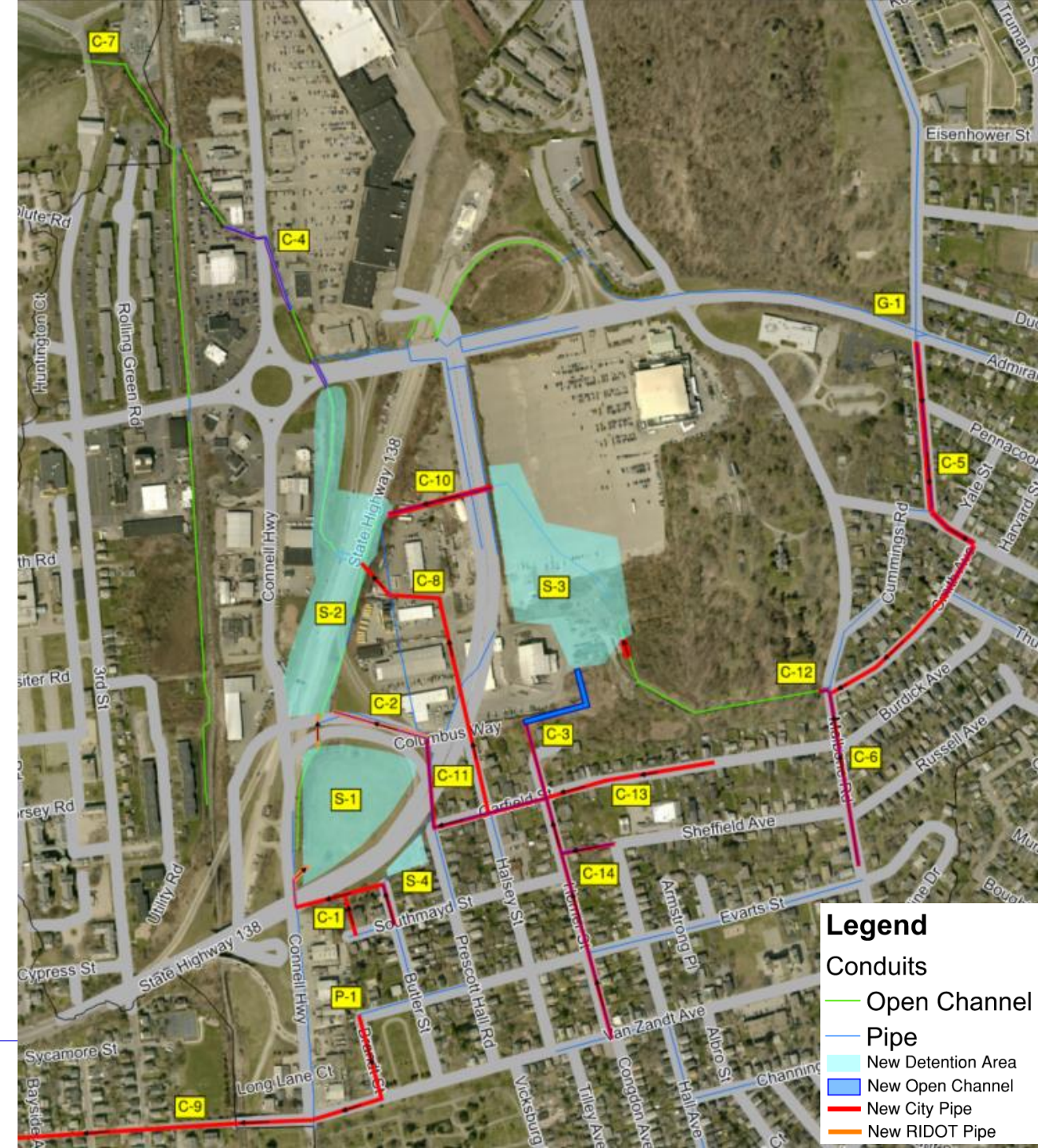
Public Survey 2 Results

- Total responses: 15
- All respondents were residents and/or property owners

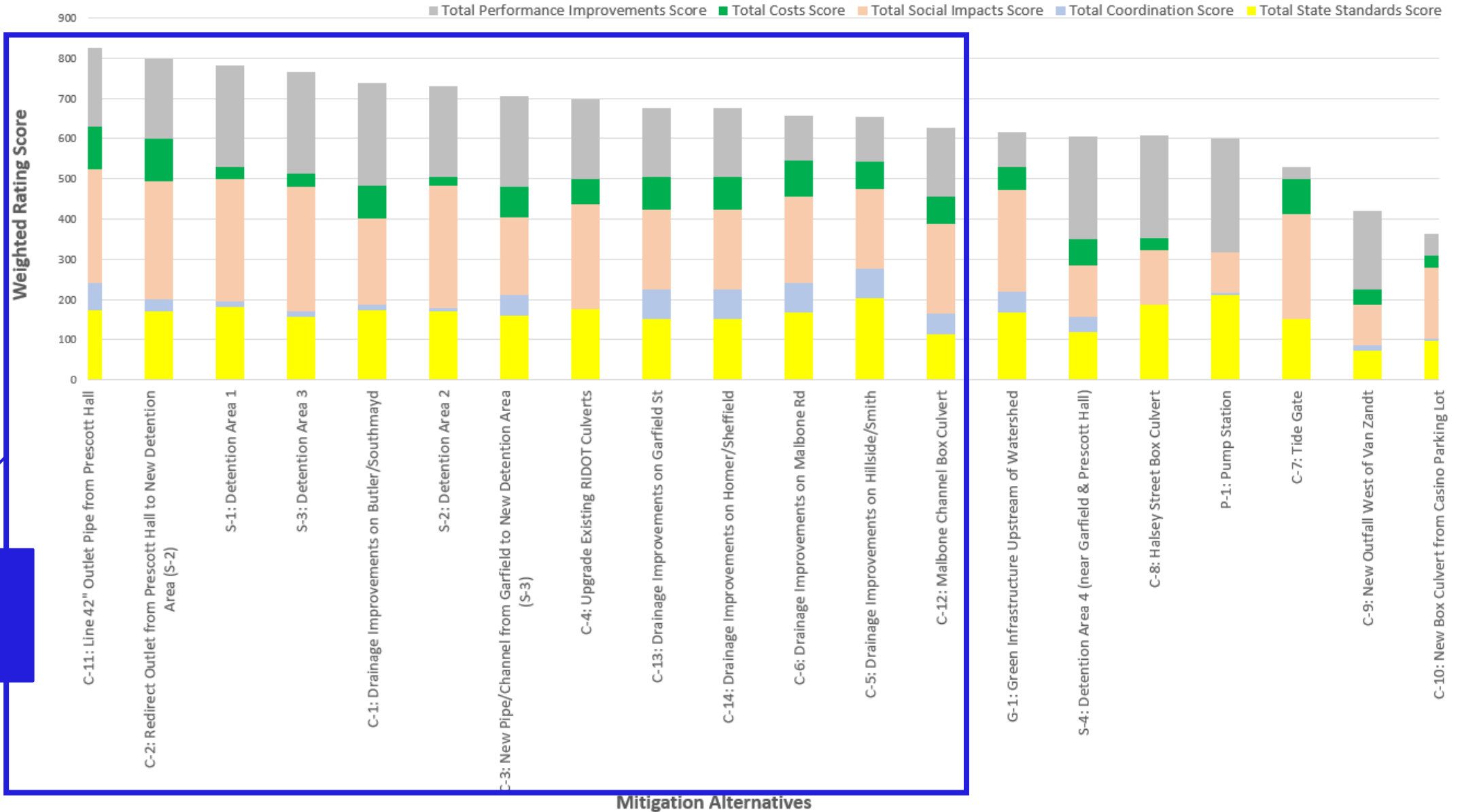


Summary of Alternatives Considered

- 20 total improvement projects considered:
 - 14 conveyance "C" alternatives
 - 4 storage "S" alternatives
 - 1 green infrastructure "G" alternative
 - 1 pump station "P" alternative



Alternatives Scoring Matrix Results



Selected Implementation Plan

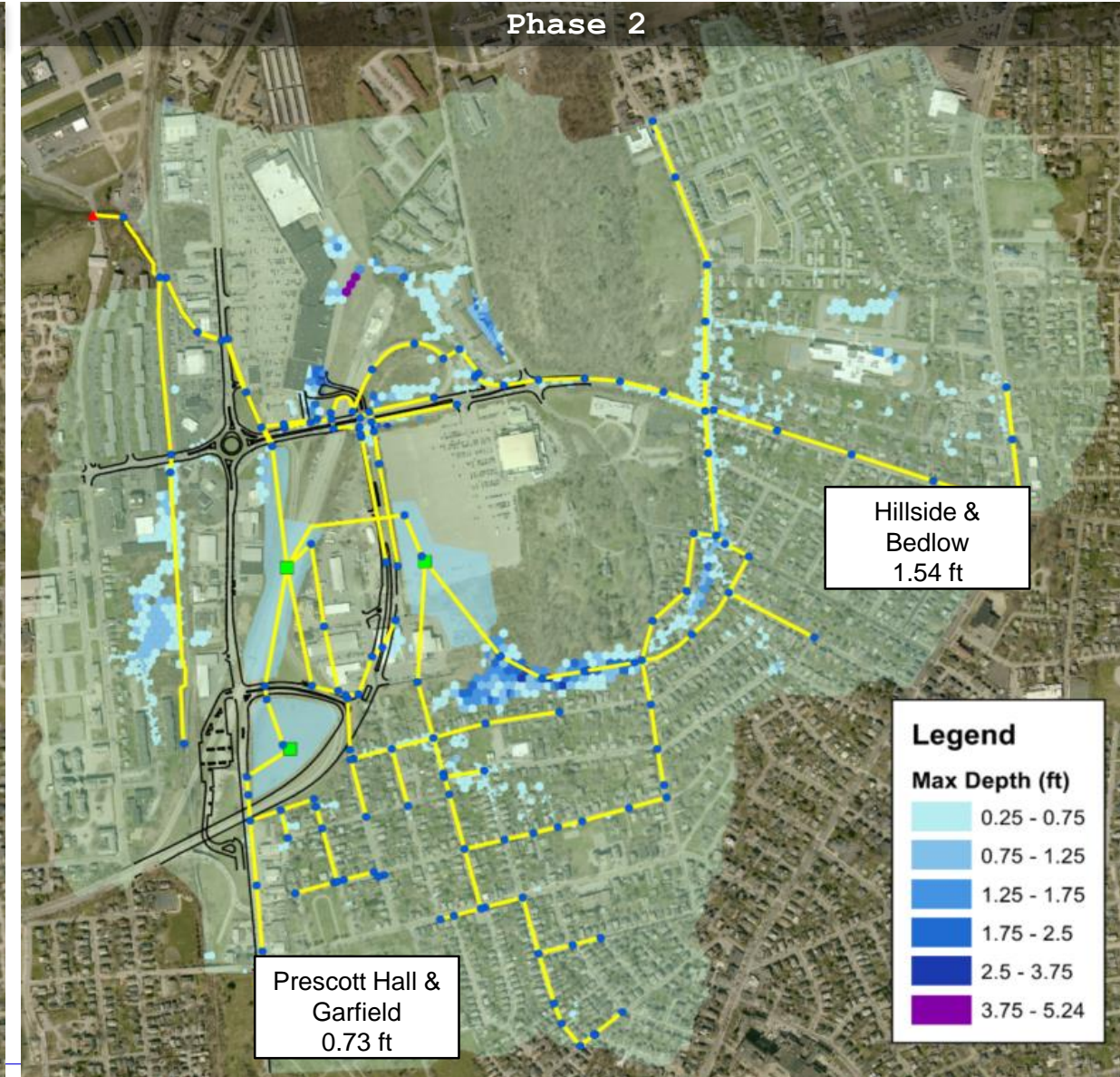
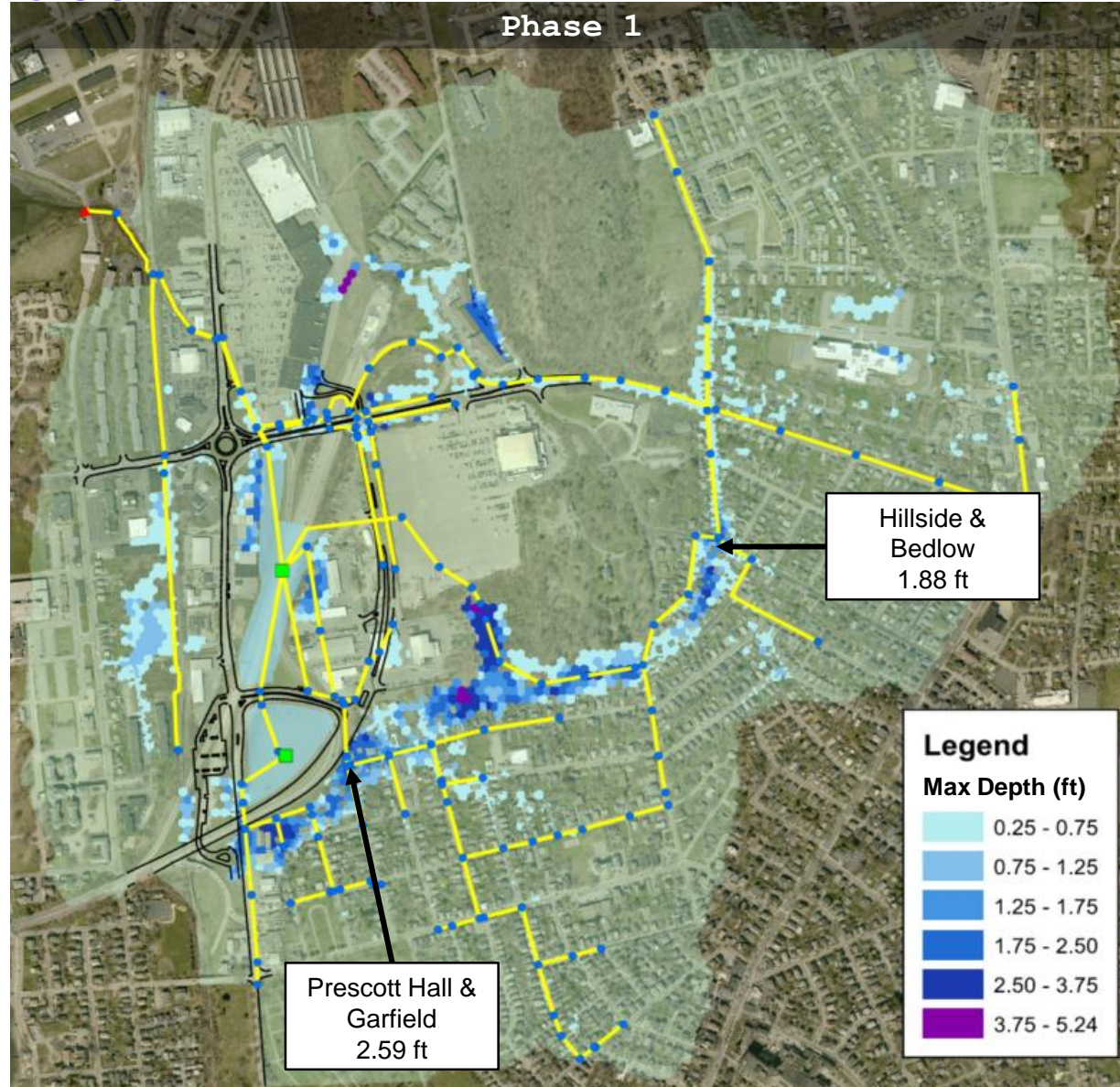


Phase 1 (Short-Term)



Phase 2 (Long-Term Controls)

Phase 1 and 2 Modeling Results - 10-yr, 24-hr Design Storm



Modeling Results and Flood Control Benefits – Summary

10-year, 24-hour Design Storm

Parameter	Existing	Baseline	Phase 1	Phase 2
Total Flood Volume in Prescott Hall (MG)	3.92	4.67	3.65	0.87
Flood Volume Change from Existing (%)	–	+19.1%	–6.89%	–77.8%
Max Flood Depth at Prescott Hall Rd & Garfield St	2.95 ft	3.72 ft	2.59 ft	0.73 ft

Next Steps

- Continue coordinating with DOT to maximize what can be included in Pell Bridge project
- Continue preliminary design for Phase 1
 - Optimize alternatives
 - Address constructability
 - Evaluate permit requirements
 - Evaluate financing options and rate impacts

Questions?

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