



# Twin Ports Interchange Reconstruction Project Monthly Public Update

November 25, 2019

# Today's Plan

- Project Team Introductions
- Background and status for those who are new to the project
  - Who is here for the first time today?
  - How did you hear about the meeting?
- Refresher on CMGC Contracting
- Project Update

# Twin Ports Interchange (TPI) 2020-2023

## Twin Ports Interchange Project Layout

**mi** DEPARTMENT OF  
TRANSPORTATION

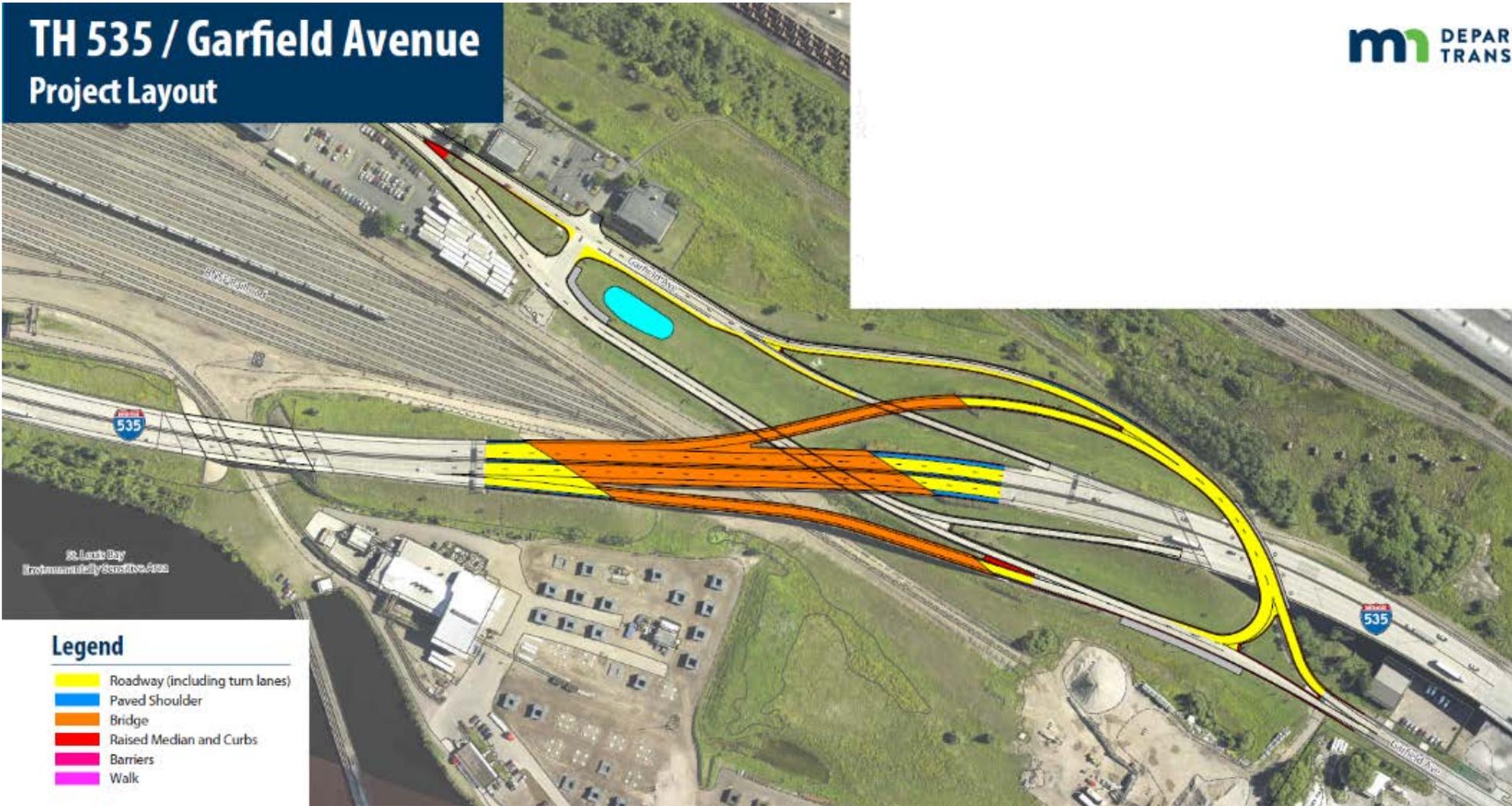


### Legend

- Yellow: Roadway (including turn lanes)
- Blue: Paved Shoulder
- Orange: Bridge
- Red: Raised Median and Curbs
- Pink: Barriers
- Magenta: Walk

# I-535 / Garfield Avenue (2021-2022)

## TH 535 / Garfield Avenue Project Layout



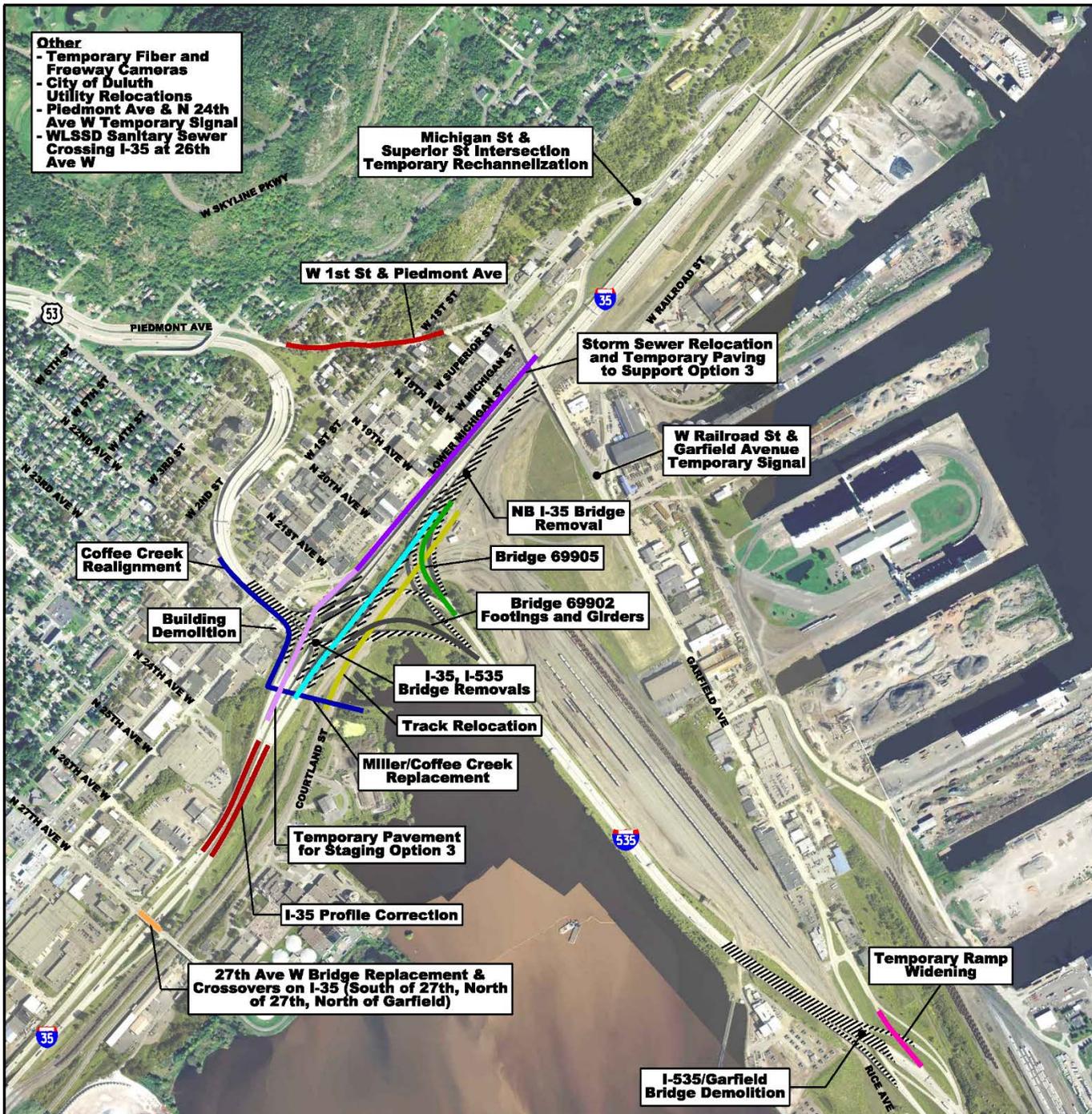
# Project Purpose/Goals

- **Enhance safety by eliminating blind merges and left exits**
  - Moving left exits to the right
  - Relocating merges
- **Replace aging infrastructure**
  - Reconstructing weight restricted and non-redundant bridges
  - Reduces maintenance and closures
  - Eliminates some bridge structure
- **Improve freight mobility**
  - Allow oversize/overweight freight on the Interstate
  - First and last mile to port!

# Project Status

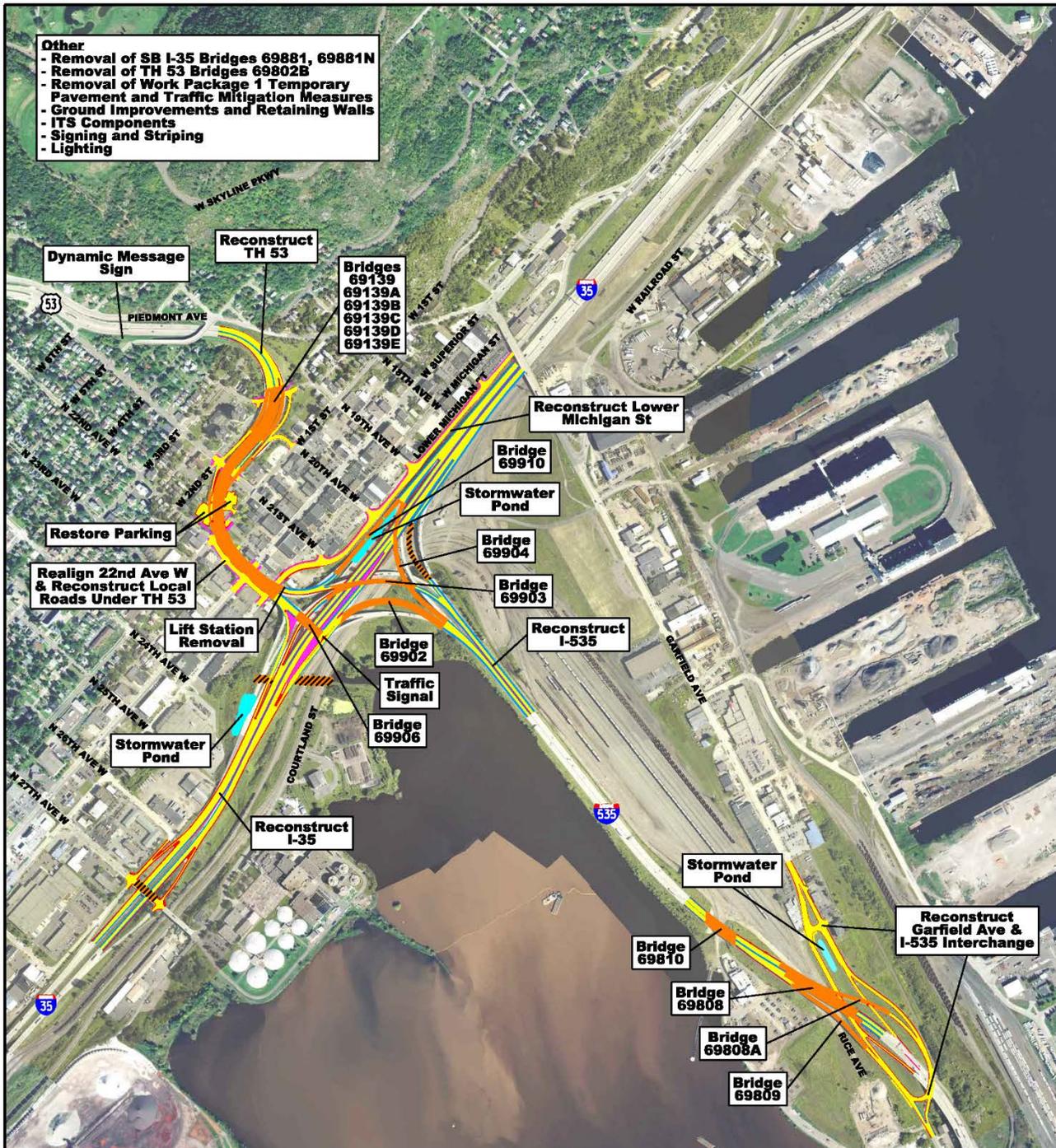
- Detailed engineering started in October 2018.
- Engineering design is 60+% complete.
- We are learning new things about the project everyday.
- Work was divided into two Work Packages for construction in 2020-2023.
- Project budget: \$343 million.
- Many unknowns in a large urban project.

# Work Package 1 Details



- Spring 2020 – Spring 2021
  - 27<sup>th</sup> Ave W. Bridge replacement
  - Lowering the profile (hump) of I35 for improved sight distance
  - Bridge removals/construction
  - Lower Michigan Street Storm Sewer relocation and bypass
  - W. 1<sup>st</sup> Street & Piedmont Ave
  - Temporary widening of Garfield Interchange off ramp
  - Garfield bridge removal

# Work Package 2 Details



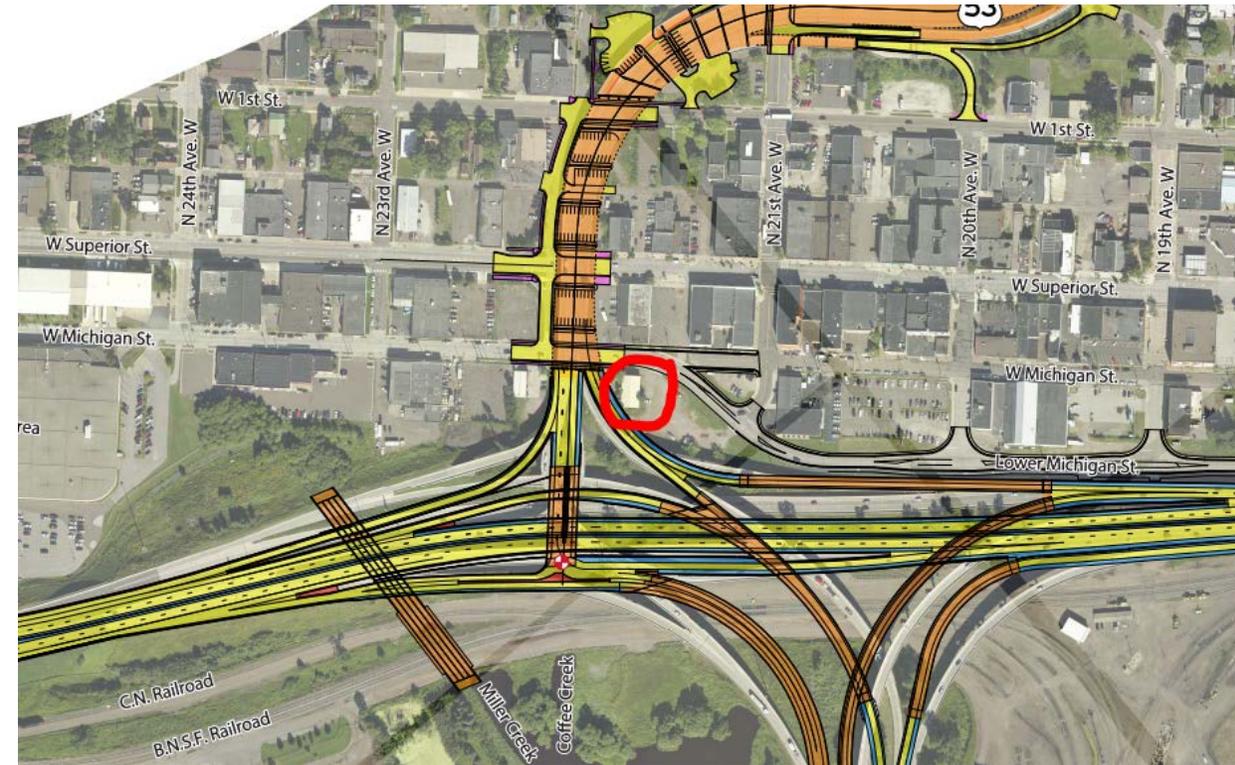
- Spring 2021 – Fall 2023
  - Majority of staged bridge removals and construction
  - Storm water pond construction
  - Ground improvements and retaining walls
  - Restore areas surrounding US53 bridges
  - Lighting and ITS Components

# November Tree Clearing - COMPLETE

- In progress  
project  
2020
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- 1  
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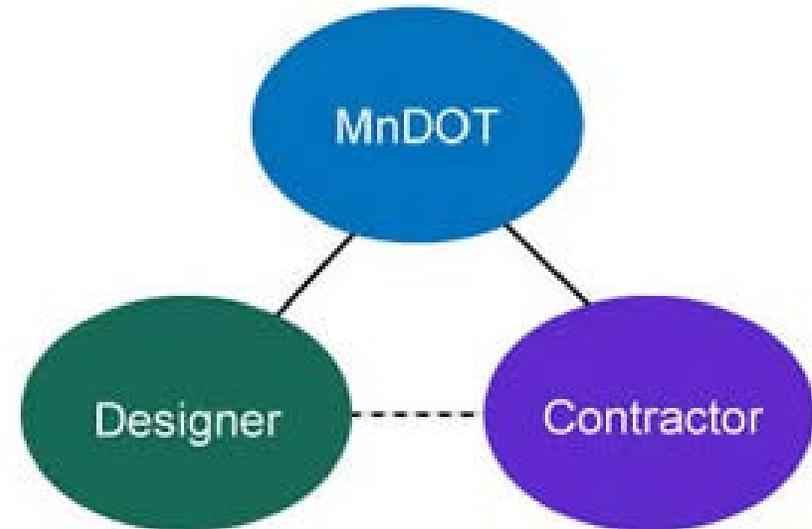
# Building Removal Update



# Contracting Methods & Collaboration

- Design-Bid-Build (Traditional Low Bid)
  - No up front collaboration
- Design-Build
  - Collaboration between contractor and designer
- **CMGC (Construction Manager General Contractor)**
  - **Collaboration between owner, contractor and designer BEFORE CONSTRUCTION**
  - **Contractor: Ames/Kraemer Joint Venture**

CM/GC Contracting Relationship



# TPI CMGC Project Team Members

- Part of the Project Team
  - Owner: MnDOT
  - Designers: Many!
  - Contractor (Ames – Kraemer Joint Venture)
- Key individuals are co-located at 1220 Railroad Street

- Co-location



# CMGC Benefits at TPI

- Implemented test programs to learn more so scope and cost can be refined:
  - Test wells – determine flows and chemical composition
  - Test pile foundations – install test bridge supports to verify and optimize design
  - Test ground improvement section – verify performance, measure displacement and settlement
  - Dewater, clean and inspect large storm sewer – large culvert under BNSF; turned out that the pipe is in good condition and no work is needed.
  - Temporary engineering – designing temporary works needed to build the work – shoring, sheeting necessary to protect public and railroad traffic during construction. Also working on bridge demolition engineering

# CMGC Benefits at TPI



# CMGC Benefits at TPI

- Team approach to carrying traffic resulted in the use of Michigan Street to carry I-35 southbound traffic. This allowed winter work and reduced the project length by about a year.
- Wall taskforce eliminated some walls and refined others.
- Worked through leaving some structures in the ground when possible to minimize the amount of contaminated soil and water to be handled.
- Also worked on raising structures foundations when possible to minimize handling contaminated soils and water.
- Found most efficient and cost effective method to construct a wall and bridge abutment over an abandoned City of Duluth sewer lift station.
- Difficult issues are hit head-on every day by the TPI team.

# Where are we today?

- Design is advancing, field testing has been done.
- Construction engineering with Contractor has been advanced.
- We know **A LOT** more today and are learning more every day.
- Costs have risen and total cost appears to be more than \$100 million above estimate.
  - Current estimated total project cost: \$443
- **As design progresses, the cost will continue to change. The values above are snapshot in time.**

# How are project budgets determined?

- For most projects, projects are defined, scope and estimated years in advance
- Early estimates for budget are typically based on unit costs for major project components (pavement, bridges, culverts, etc) with a contingency added to account for unknowns
- They also include estimates for engineering, land acquisition, etc.
- This works fairly well for most projects
- TPI and other major projects are very difficult to estimate early for budget purposes because of complexity
- They are so complicated, they need engineering to inform budget
- It is a “Catch 22”.

# What are some of the Cost Drivers?

- Michigan Street utilities
- Traffic Staging: The use of Michigan Street
- Coffee Creek culvert replacement
- Miller Creek culvert replacement
- Contaminated soil and water
- Foundations/Ground Improvements
- Limited area to work, store materials, etc.
- Railroad Work

# Lower Michigan Street Utilities

- A large storm sewer needs to be relocated away from future wall and bridge footings
- A large gas line is in the same proximity and also needs to move
- City of Duluth is moving the gas line now
- Sanitary sewer lift station must also be relocated
- Lower Michigan will require substantial excavation for these moves, and temporary pavement will be placed to carry traffic during construction
- All of these items were informed by advanced design and add cost

# Lower Michigan Street Utilities



# Traffic Staging: The use of Michigan Street

- Lower Michigan will be used to carry southbound I-35 for a period of time
- This will allow year round work and save about a year of construction
- At the end of the project, Michigan Street will need to be reconstructed to account for the utility moves and any damage from freeway traffic and construction equipment



# Coffee Creek Culvert Replacement

- The existing culvert is from 1891 and needs to be moved out from under the highway 53 bridges and under 22<sup>nd</sup> Avenue West so the new TH 53 bridge can be constructed
- There are a lot of City and private utilities that need to be relocated and reconstructed to avoid interference
- Advanced design finds issues and solutions, in this case, requiring significant utility work

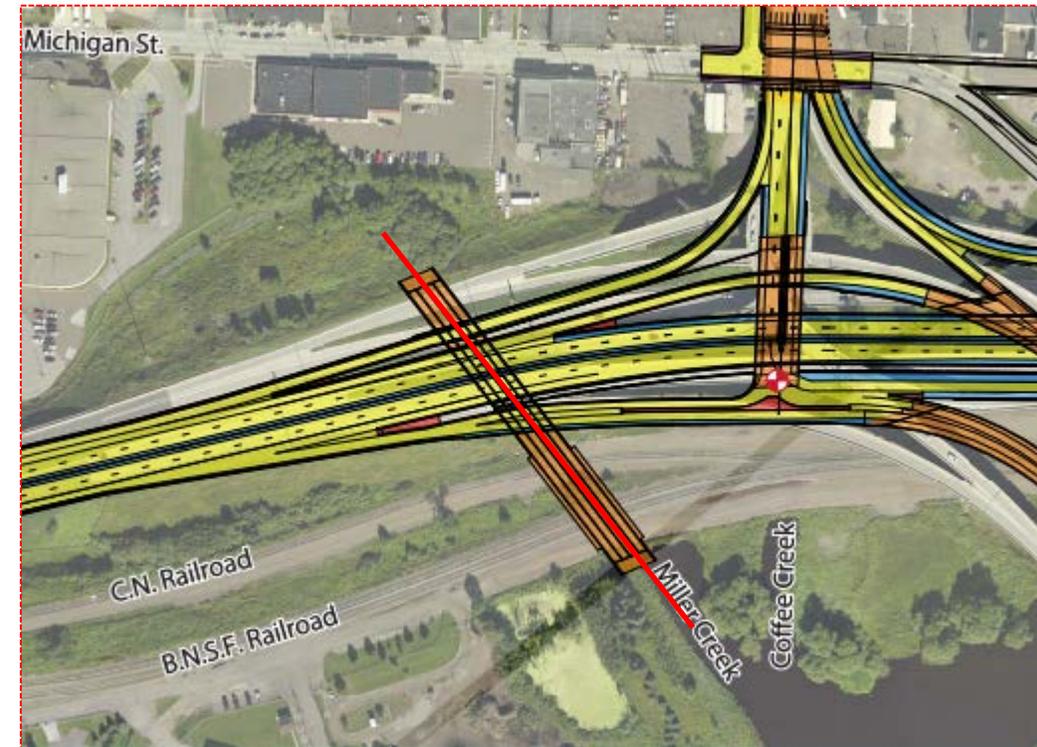
# Coffee Creek Culvert Replacement



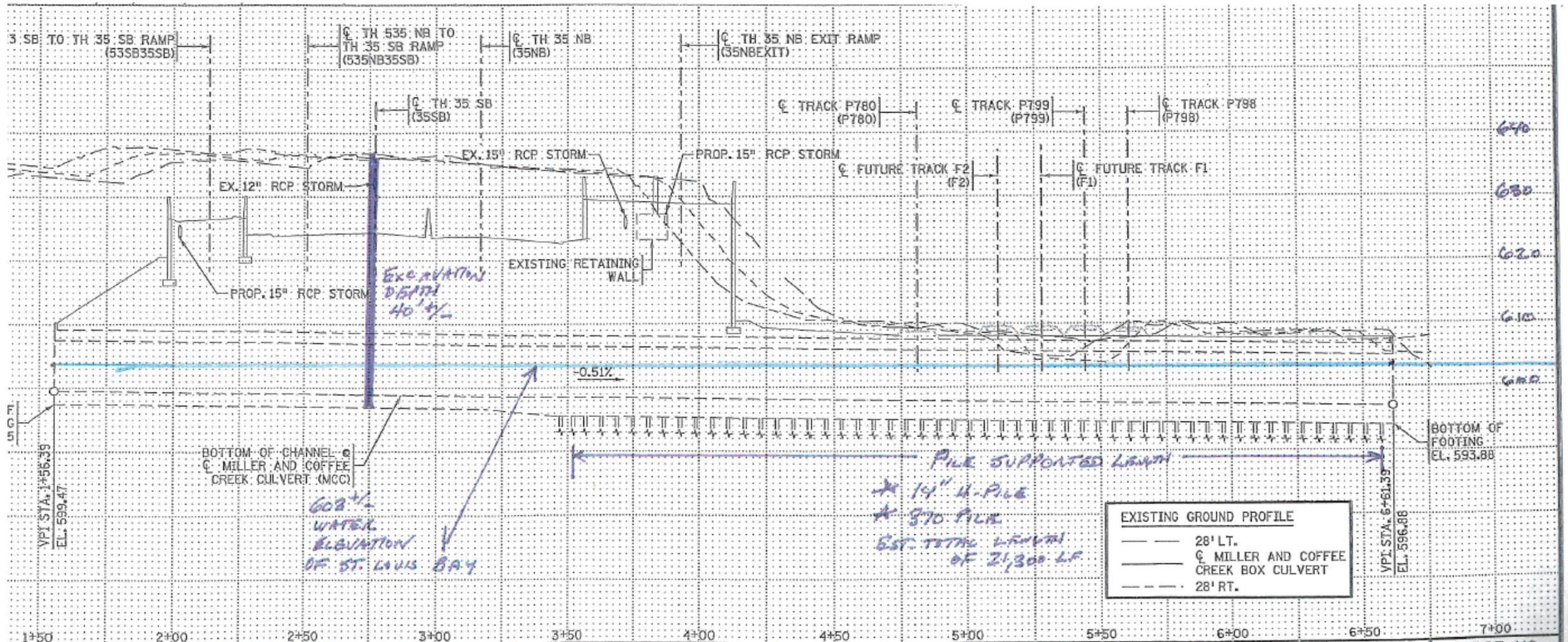


# Combined Miller and Coffee Creek Culvert

- Miller Creek Culvert Replacement
  - Deep placement
  - 10 stages of construction
  - Supporting the roadway during construction
  - Staging across the railroad
  - Poor soils
  - Require deep foundations
  - Under bay water level



# Combined Miller and Coffee Creek Culvert



WAS PREPARED BY ME OR UNDER  
I AM A DULY LICENSED  
LAWS OF THE STATE OF MINNESOTA



444 Cedar Street, Suite 1600  
Saint Paul, MN 55101  
651.292.4400  
tkda.com

**TWIN PORTS INTERCHANGE**  
**DULUTH, MINNESOTA**  
S.P. NO. 6982-69X19

TITLE: **BRIDGE SURVEY**  
**PLAN AND PROFILE**

|                           |          |          |
|---------------------------|----------|----------|
| DES: MAV                  | DR: HAP  | APPROVED |
| CHK: ADL                  | CHK: JRM |          |
| SHEET NO. 95 OF 98 SHEETS |          |          |

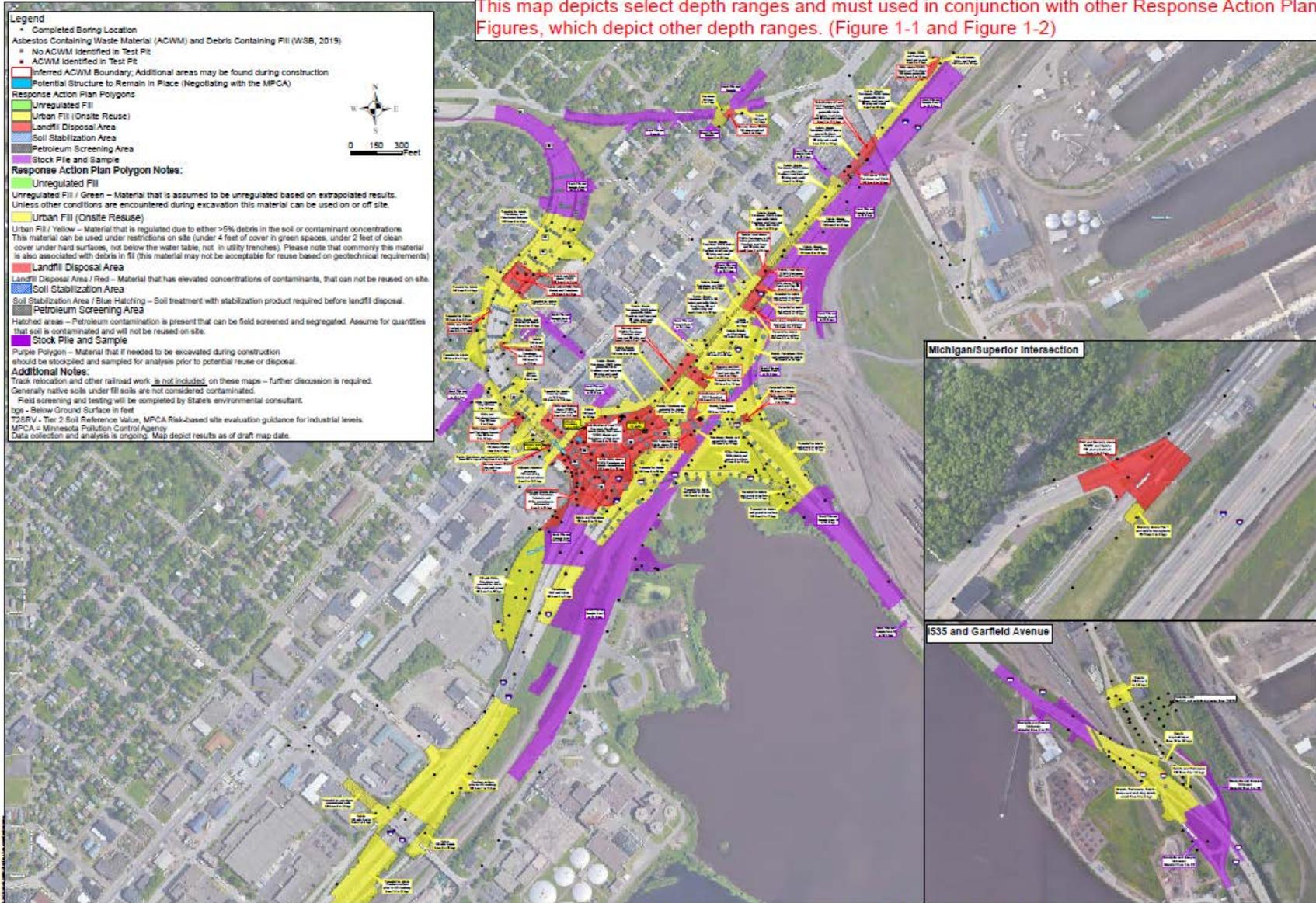
BRIDGE NO.  
**69X19**

# Contaminated Materials

- Contaminated materials – soil and water; determining the details of how to handle the materials and the cost associated with it
  - Soil – must be tested and hauled to approved landfill if cannot be re-used on project
  - Water
    - Can pump some to WLSSD
    - Some may need an onsite treatment
      - Very expensive to have an onsite treatment plant

# Contaminated Materials

This map depicts select depth ranges and must be used in conjunction with other Response Action Plan Figures, which depict other depth ranges. (Figure 1-1 and Figure 1-2)



**Legend**

- Completed Boring Location
- Asbestos Containing Waste Material (ACWM) and Debris Containing Fill (WSB, 2019)
  - No ACWM Identified in Test Pit
  - ACWM Identified in Test Pit
- Inferred ACWM Boundary, Additional areas may be found during construction
- Potential Structure to Remain in Place (Negotiating with the MPCA)

**Response Action Plan Polygons**

- Unregulated Fill
- Urban Fill (Onsite Reuse)
- Landfill Disposal Area
- Soil Stabilization Area
- Petroleum Screening Area
- Stock Pile and Sample

**Response Action Plan Polygon Notes:**

- Unregulated Fill
- Unregulated Fill / Green – Material that is assumed to be unregulated based on extrapolated results. Unless other conditions are encountered during excavation this material can be used on or off site.
- Urban Fill (Onsite Reuse)
- Urban Fill / Yellow – Material that is regulated due to either >5% debris in the soil or contaminant concentrations. This material can be used under restrictions on site (under 4 feet of cover in green spaces, under 2 feet of clean cover under hard surfaces, not below the water table, not in utility trenches). Please note that commonly this material is also associated with debris in fill (this material may not be acceptable for reuse based on geotechnical requirements).
- Landfill Disposal Area
- Landfill Disposal Area / Red – Material that has elevated concentrations of contaminants, that can not be reused on site.
- Soil Stabilization Area
- Soil Stabilization Area / Blue Hatching – Soil treatment with stabilization product required before landfill disposal.
- Petroleum Screening Area
- Hatched areas – Petroleum contamination is present that can be field screened and segregated. Assume for quantities that soil is contaminated and will not be reused on site.
- Stock Pile and Sample
- Purple Polygon – Material that if needed to be excavated during construction should be stockpiled and sampled for analysis prior to potential reuse or disposal.

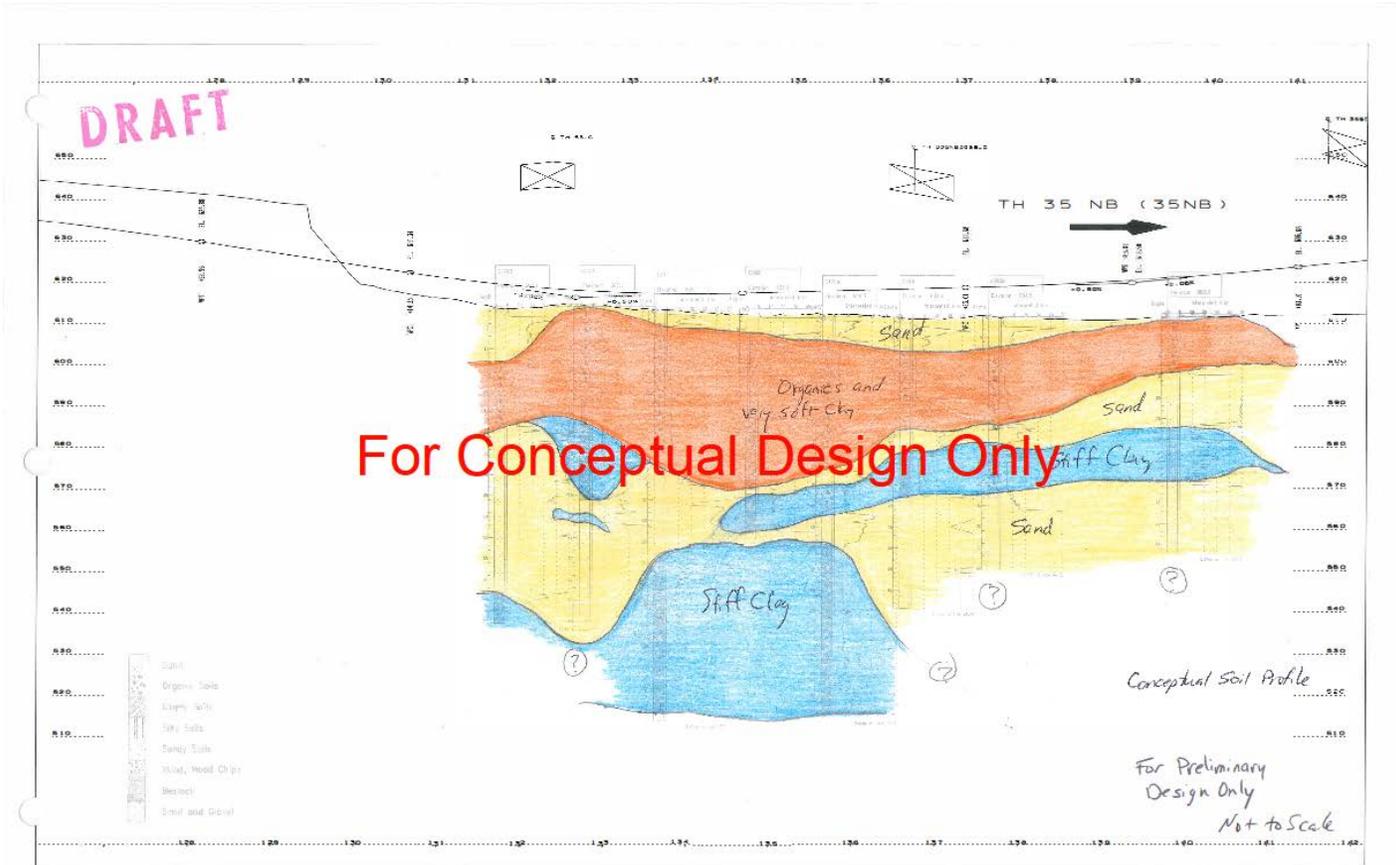
**Additional Notes:**

- Track relocation and other railroad work is not included on these maps – further discussion is required.
- Generally native soils under fill soils are not considered contaminated.
- Field screening and testing will be completed by State's environmental consultant.
- bgs - Below Ground Surface in feet
- 225RV - Tier 2 Soil Reference Value, MPCA Risk-based site evaluation guidance for industrial levels.
- MPCA - Minnesota Pollution Control Agency
- Data collection and analysis is ongoing. Map depicts results as of draft map date.

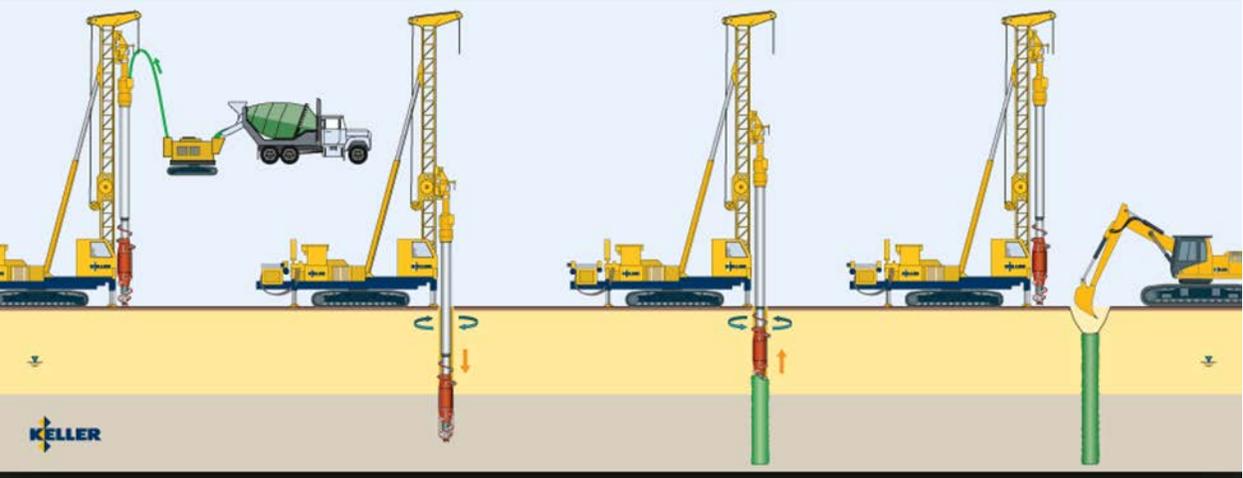
- **Red** to landfill
- **Yellow** can be re-used if there is an engineering purpose and there is no debris in it.
- **Purple** not able to drill, or not drilled yet. Stockpile and test during construction.

# Foundations/Ground Improvements

- Geotechnical—
  - Very poor non-uniform soils, mostly old fill and debris
  - Ground improvements and cost associated with them were not known at time of planning;
  - Design as advanced and the foundation costs have become more defined.

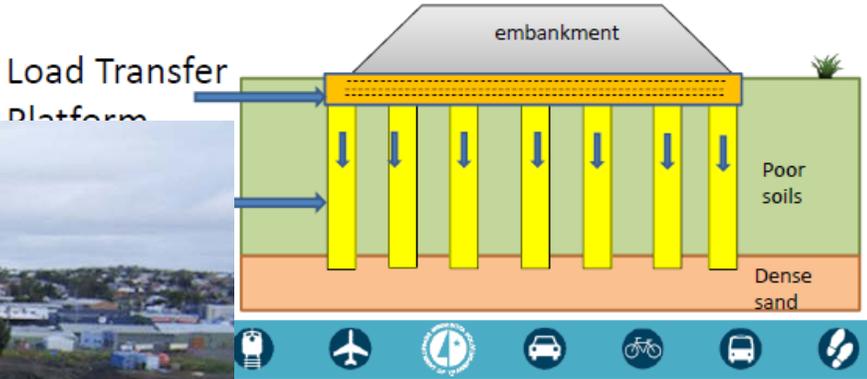


# Foundations/Ground Improvements

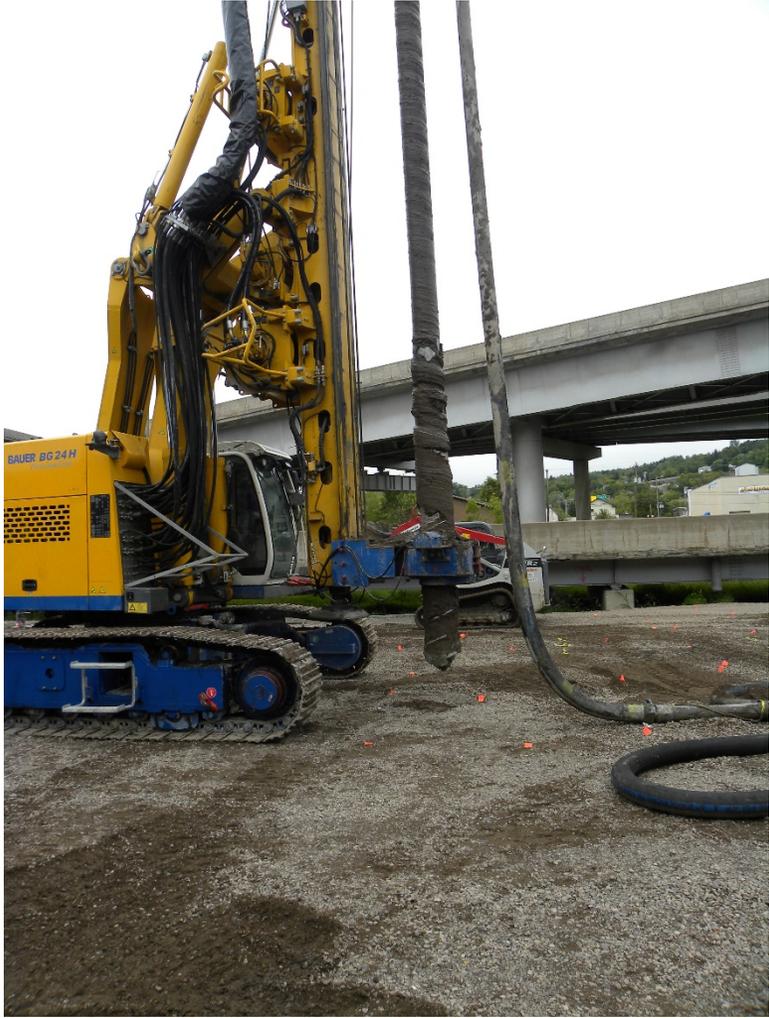


## Load Transfer

- Column or Pile Supported Embankment



# Foundations/Ground Improvements



# Foundations/Ground Improvements – Test Section



# Limited area to work, store materials, etc.

- Confined Work Area
  - Limited areas for laying down construction materials
  - Limited areas for storing soil
  - Some double handling of materials will be necessary
  - Very tight quarters to construct the project

# Limited area to work, store materials, etc.



# Railroad Work

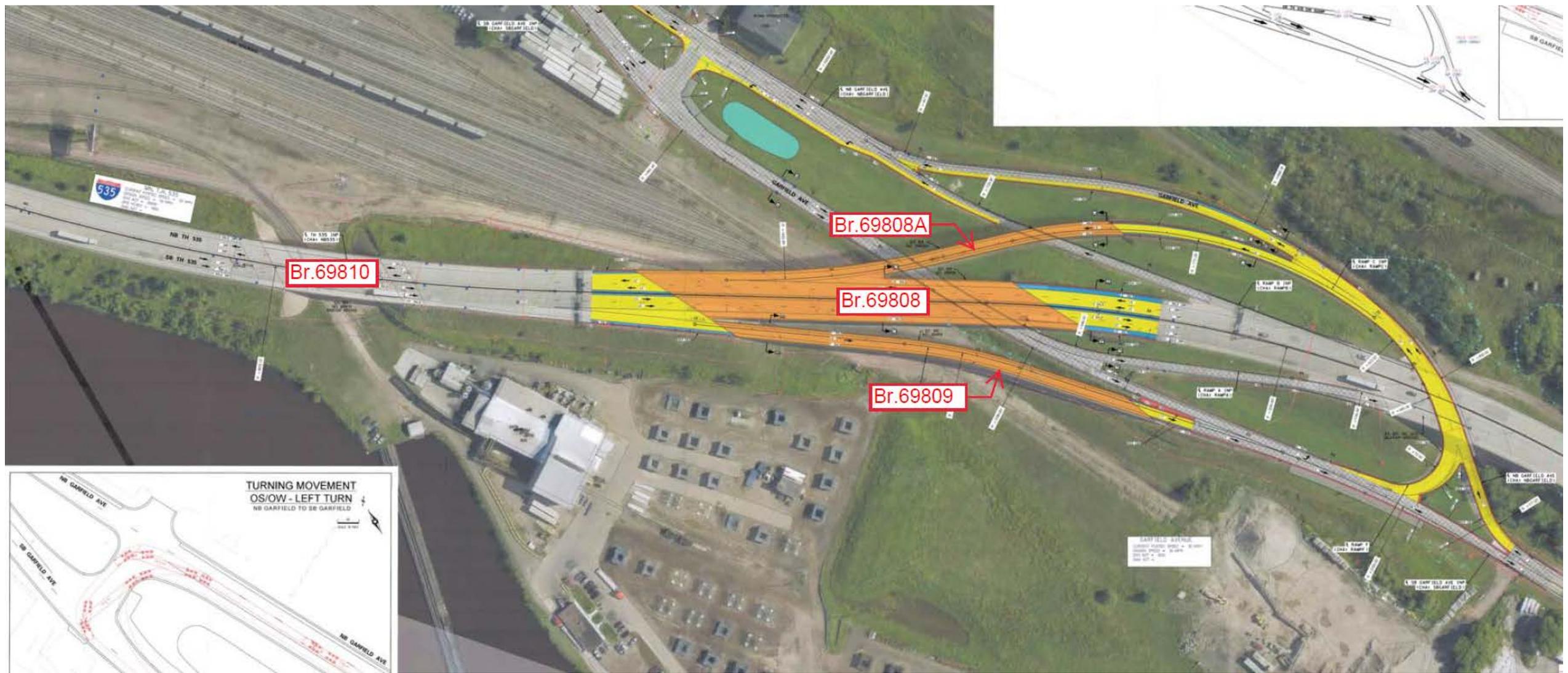
- Railroad Work
  - Required work not known at time of budgeting
  - Design has progressed what railroad work is necessary to relocate bridges, shift I-35 and replace the Miller Creek culvert
  - Example – Miller Creek installation will require multiple track relocations – must maintain train movements at all times



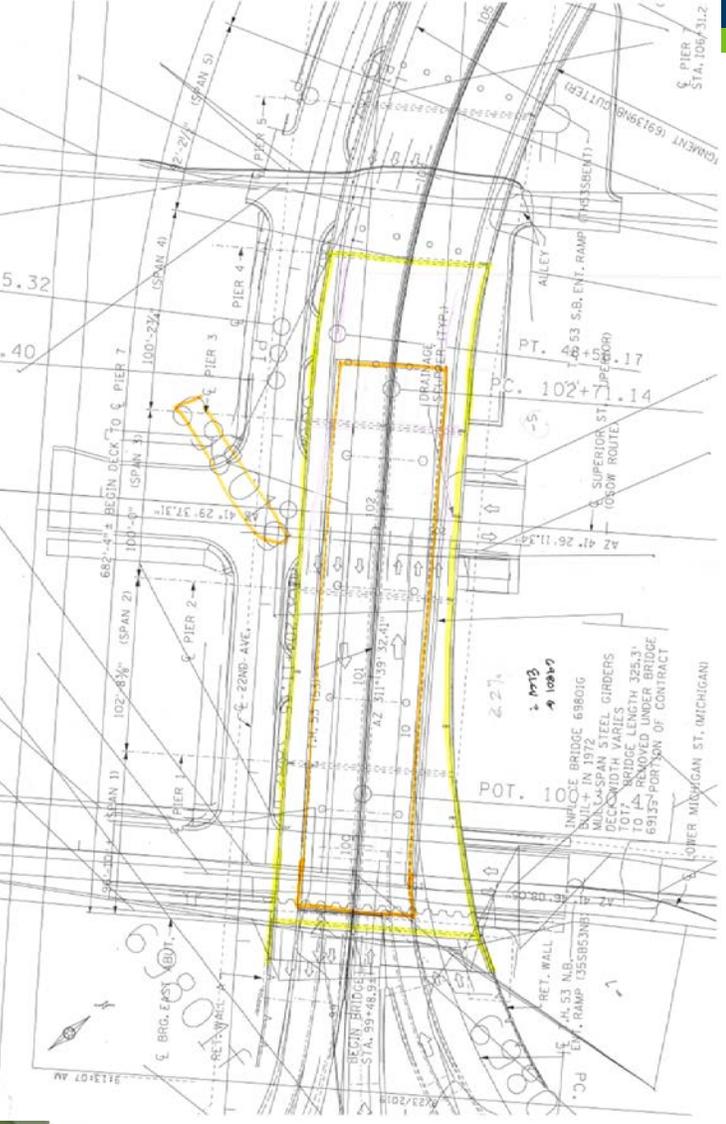
# What is the plan to deal with the budget gap?

- MnDOT will need to defer some planned work in order to stay within our available budget.
  - MnDOT and FHWA want to ensure use of the BUILD Grant, so we will continue to move forward with a portion of this project in 2020.
- Plans are being modified and two portions of work will be deferred:
  - Garfield Avenue/I-535 Interchange
  - The Highway 53 bridge from West Superior Street to 19<sup>th</sup> Avenue West

# Defer: I-535/Garfield Avenue

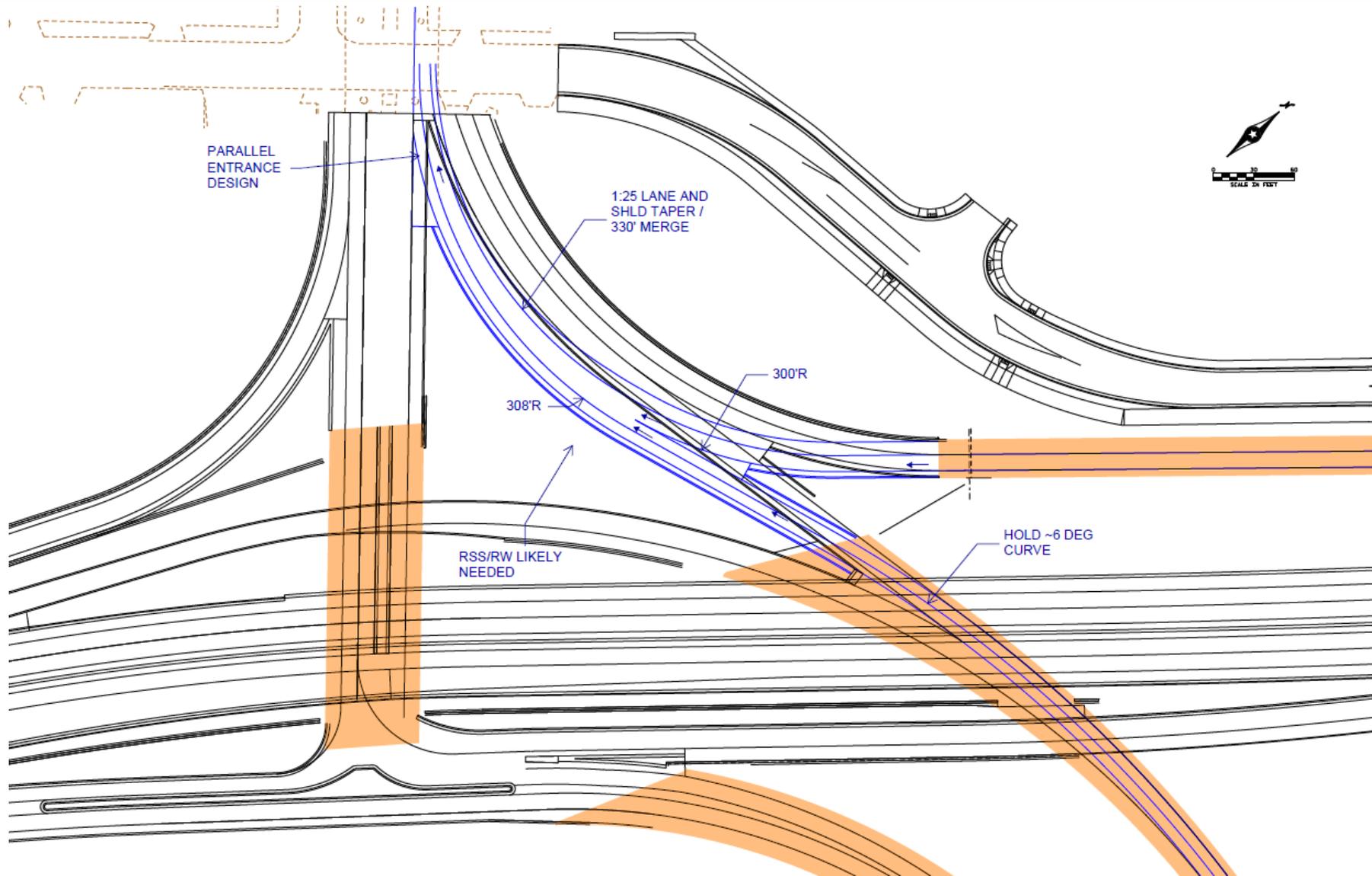


# Defer: Highway 53 Bridges



- Legend**
- Roadway (including turn lanes)
  - Paved Shoulder
  - Bridge
  - Raised Median and Curbs
  - Barriers
  - Walk
  - Traffic Control Signal System

# Defer: Highway 53 Bridges



# Deferred Work

- Replacement of the bridges at the Garfield Avenue Interchange is integral to meeting the stated project related goals regarding freight improvements, and will continue to be an agency priority.
- The bridge on Highway 53 is safe, but will need replacement soon. Ongoing monitoring and maintenance will be required because of the deferment, and MnDOT will do what is necessary to keep it safe and operational until we can replace it.
- Design engineering will continue on both deferred work areas to that construction plans will be ready when funding becomes available

# Funding Challenges

- The timeframe for funding the components is unknown at this time.
  - All funding coming into the trunk highway account is committed for the next four years to other projects throughout the region and state
  - The only options for funding this work in the next four years are:
    - To defer other already-programmed projects, which is not an ideal solution, OR
    - To secure new, dedicated transportation funding
- This is not the only project across the state experiencing a funding gap – which is a symptom of underfunding our state's transportation system.
- MnDOT will continue to advocate for new and dedicated funding to ensure we can complete critical projects like the Twin Ports Interchange and other major improvements statewide

# What will happen?

- Construction on I-35 and the main interchange will still take place in 2020-2023 and there are no changes being made to that work
- All utility work necessary to complete all phases – including Highway 53 and Garfield Avenue Interchange – will be completed as originally planned
- Engineering on the deferred work will continue so that the plans are ready when funding becomes available

# What will happen in 2020?

- Construction will begin in late May on:
  - Miller & Coffee Creeks
  - Lower Michigan Street
  - Railyard
  - 27<sup>th</sup> Avenue West
  - Piedmont and First Street
- Traffic will be restricted to a single lane in each direction on I-35.
- SB I-35 traffic will be diverted to Lower Michigan Street in late fall.

- Work will continue on I-35 and the bridges as planned.
- A temporary connection will be made to Hwy 53 to tie new to existing.
- Two lanes in each direction will be maintained on I-35 in 2021 and 2022.
- Final clean up in 2023 will require lane closures on I-35 in 2023.
- Ramp closures will vary by stage.
  - More details will be provided at future meetings.

# Upcoming Meetings

- Municipal Consent Hearing

Duluth City Council

City Hall Council Chambers

Monday, December 16, 2019 7:00 pm

- Advisory Committee – Thursday, January 9, 2020

- Public Update Meeting –Monday, January 13, 2020

- Clyde Iron

- 11:30 am -12:30 pm and 6:00 – 7:00 pm with presentations 11:45 am and 6:15 pm

# Questions/Comments?

Roberta Dwyer, Project Manager

[roberta.dwyer@state.mn.us](mailto:roberta.dwyer@state.mn.us) 218-348-7457

or

Patrick Huston, Project Director

[patrick.Huston@state.mn.us](mailto:patrick.Huston@state.mn.us) 218-348-9902