


KANE DRIVE WASHOUT: ENGINEERING IN AN EMERGENCY

Jeremy Provenzola, MS, PE
Senior Engineer

CITY OF GRESHAM

Kyle McTeague, PE
Principal Engineer

murraysmith

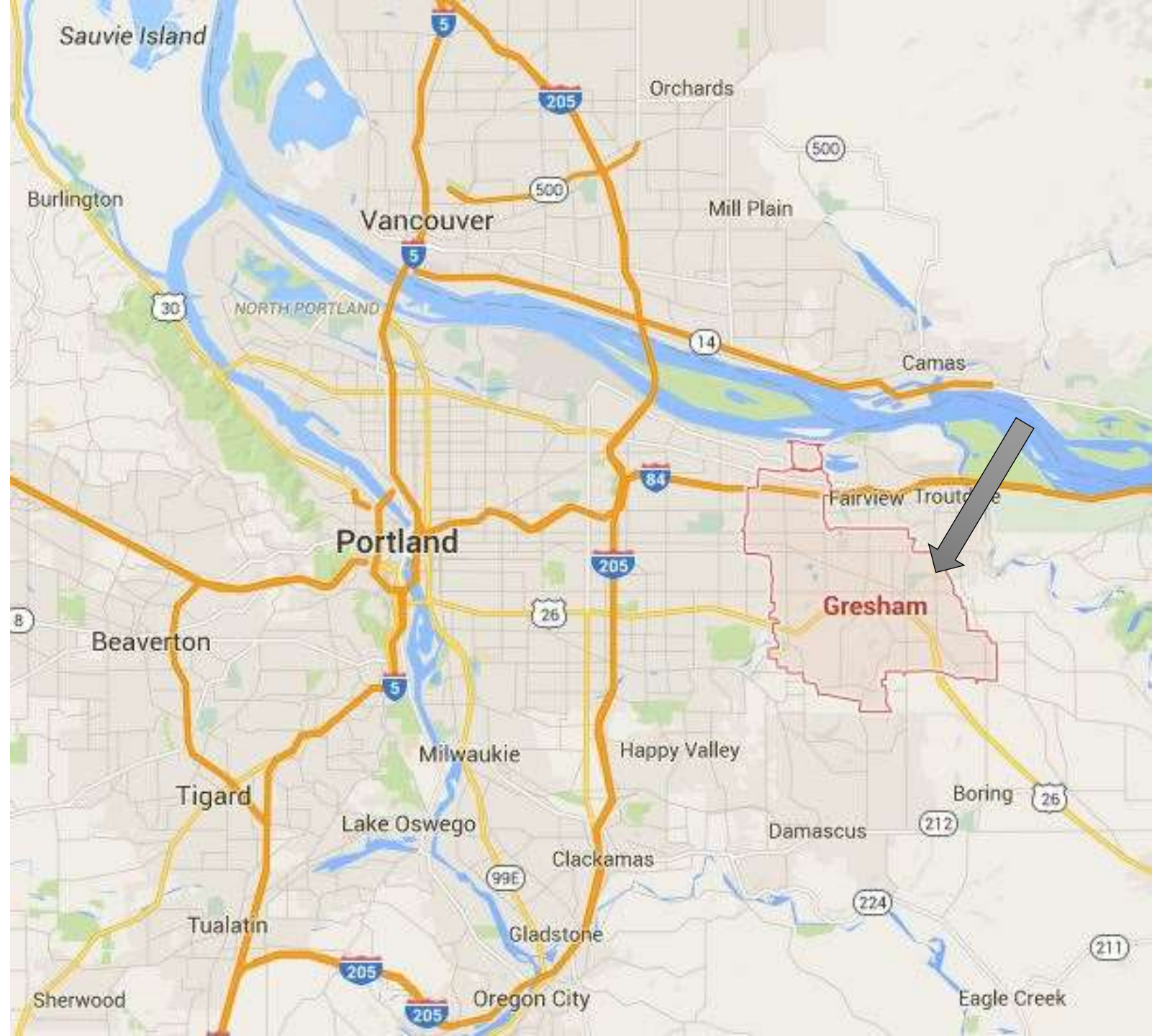
An aerial photograph of a road construction site. A large circular overlay is positioned on the left side of the image, containing the word 'Agenda' and a list of seven bullet points. The background shows a road with yellow double lines, a construction area with a yellow excavator, and a rocky drainage ditch. The sky is overcast and grey.

Agenda

- Background
- The storm
- How it happened
- Initial response
- Compressing the timeline
- Engineering your way out
- Takeaways

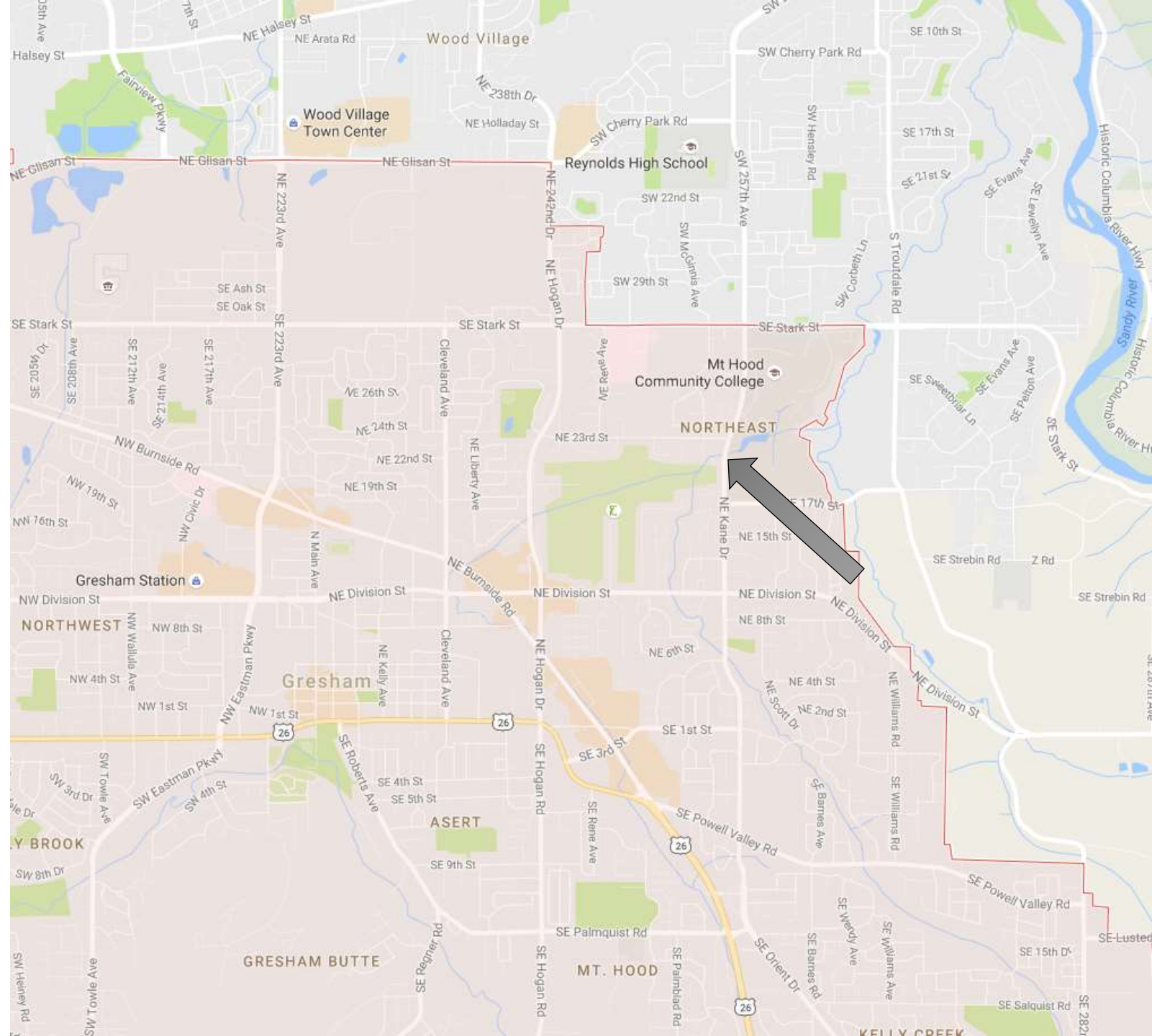
City of Gresham

- Incorporated 1905
- 4th largest city in Oregon
- Population \approx 110,000



City of Gresham

- Incorporated 1905
- 4th largest city in Oregon
- Population \approx 110,000



The December Storm



LIVE

>> IT IS A BAD SITUATION.
THERE ARE PEOPLE AT THE

WEATHER ALERT

Widespread Flooding

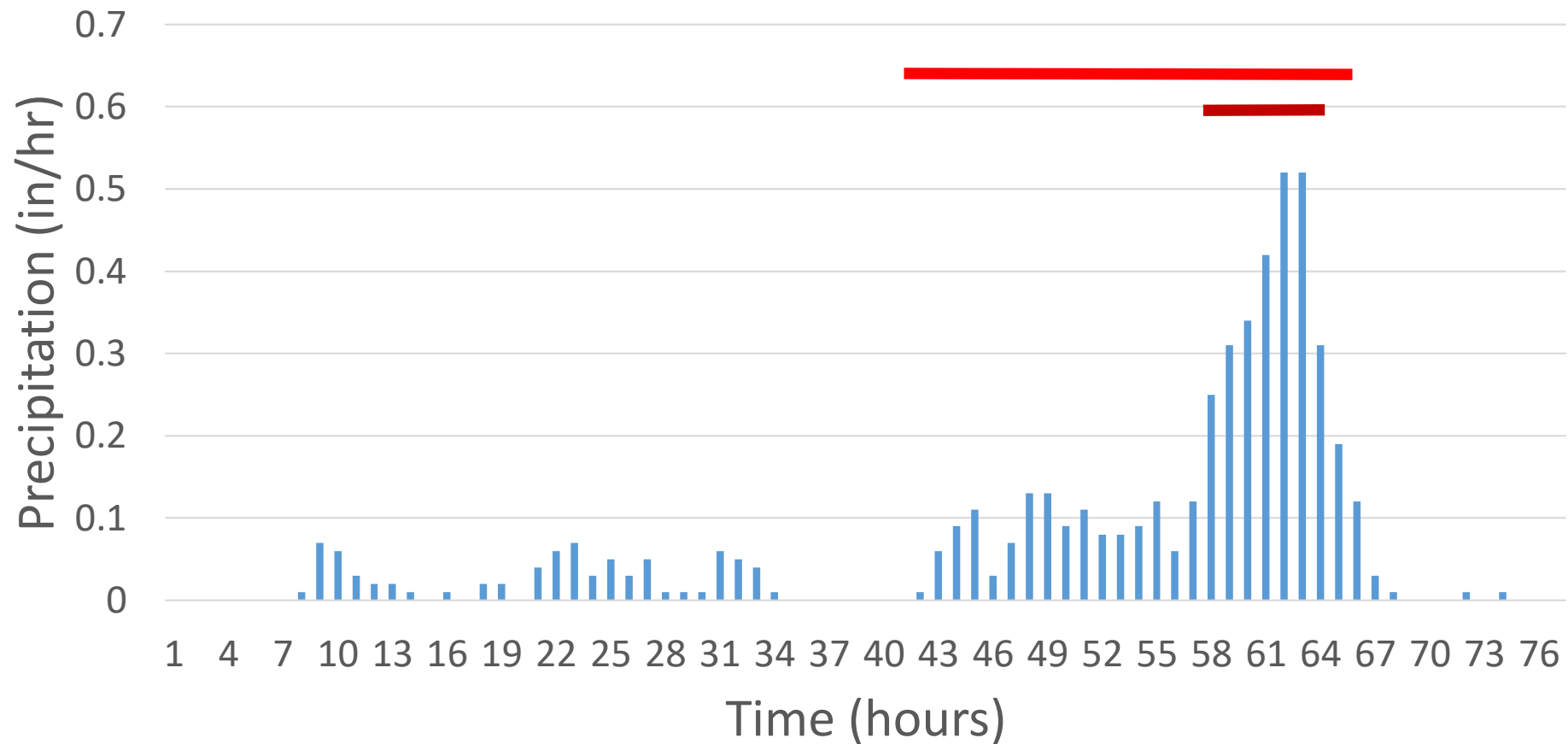
GRESHAM

16
12:05 47°

How big was the storm?

Rainfall

- 24-hr amount (4.35") was a return interval of 25-50 years
- 6-hr amount (3.16") was a return interval of more than 100 years





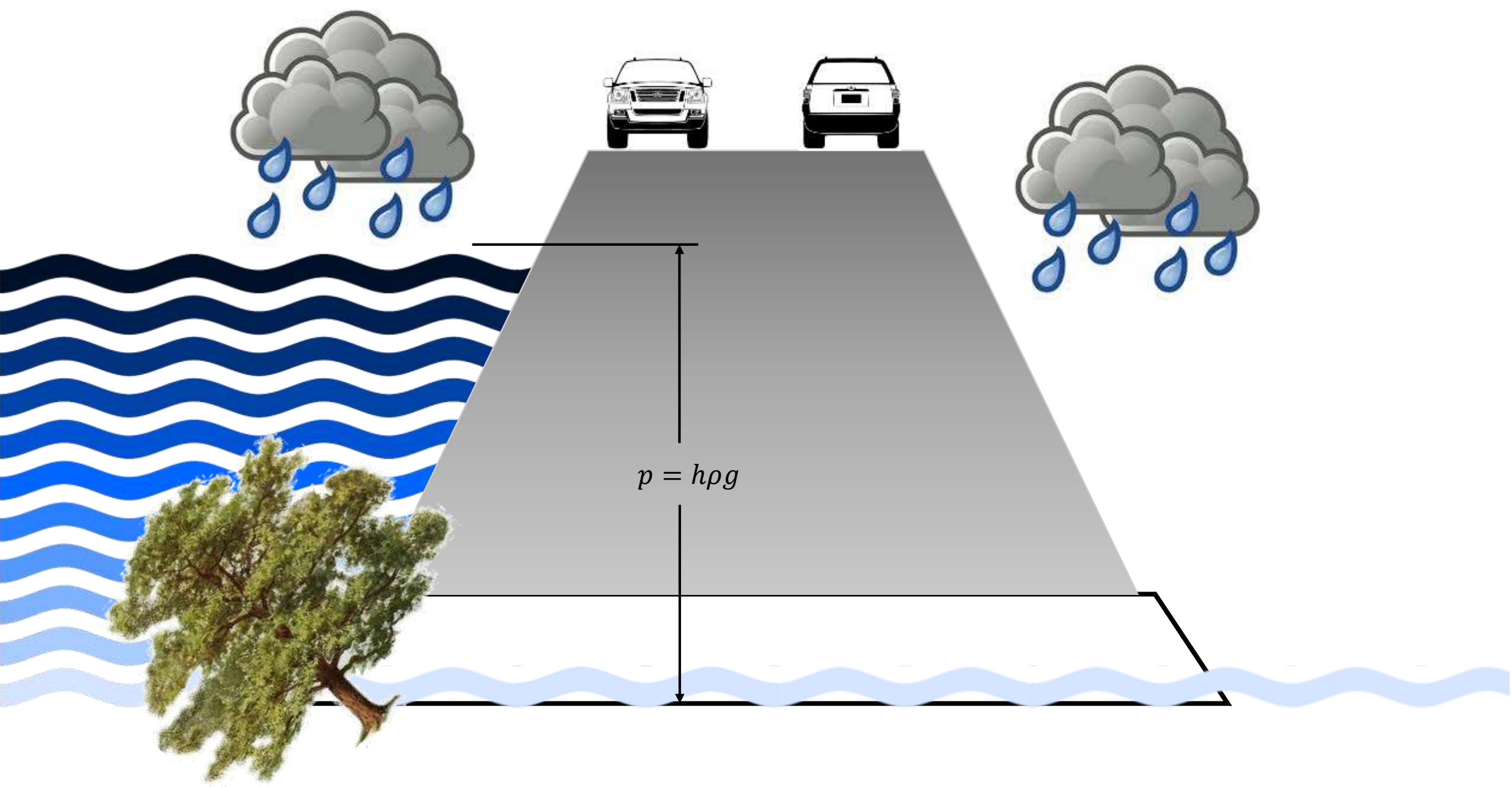


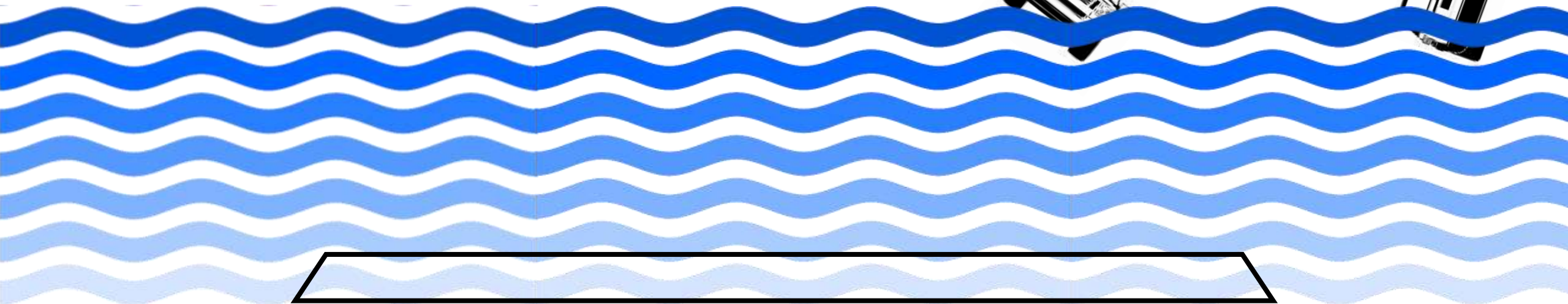














Background

An aerial photograph of Kane Drive, a multi-lane road with white lane markings. A large, dark, rectangular structure, identified as a culvert, is visible in the center of the road. The surrounding area includes trees, utility poles, and a sidewalk.

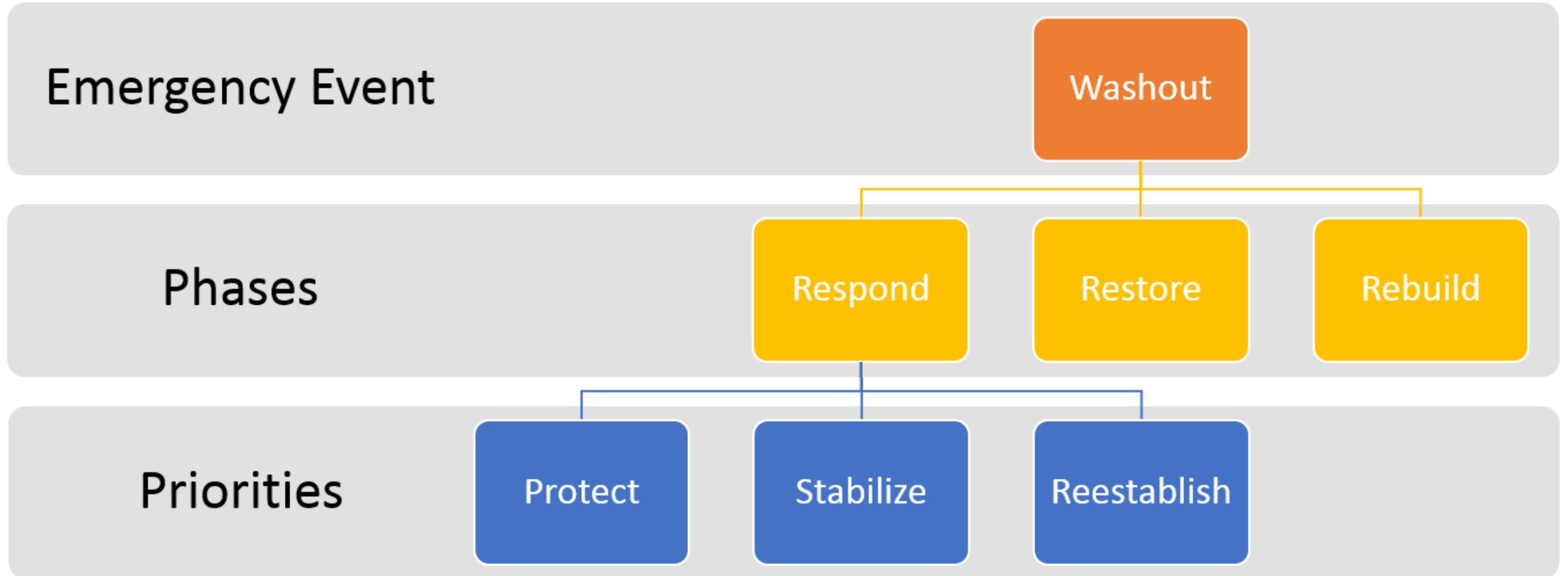
Kane Drive

- 30k – 35k ADTs
- Major N-S arterial
 - Freight corridor
 - Trimet route
 - I-84 – US26 connection
 - MHCC

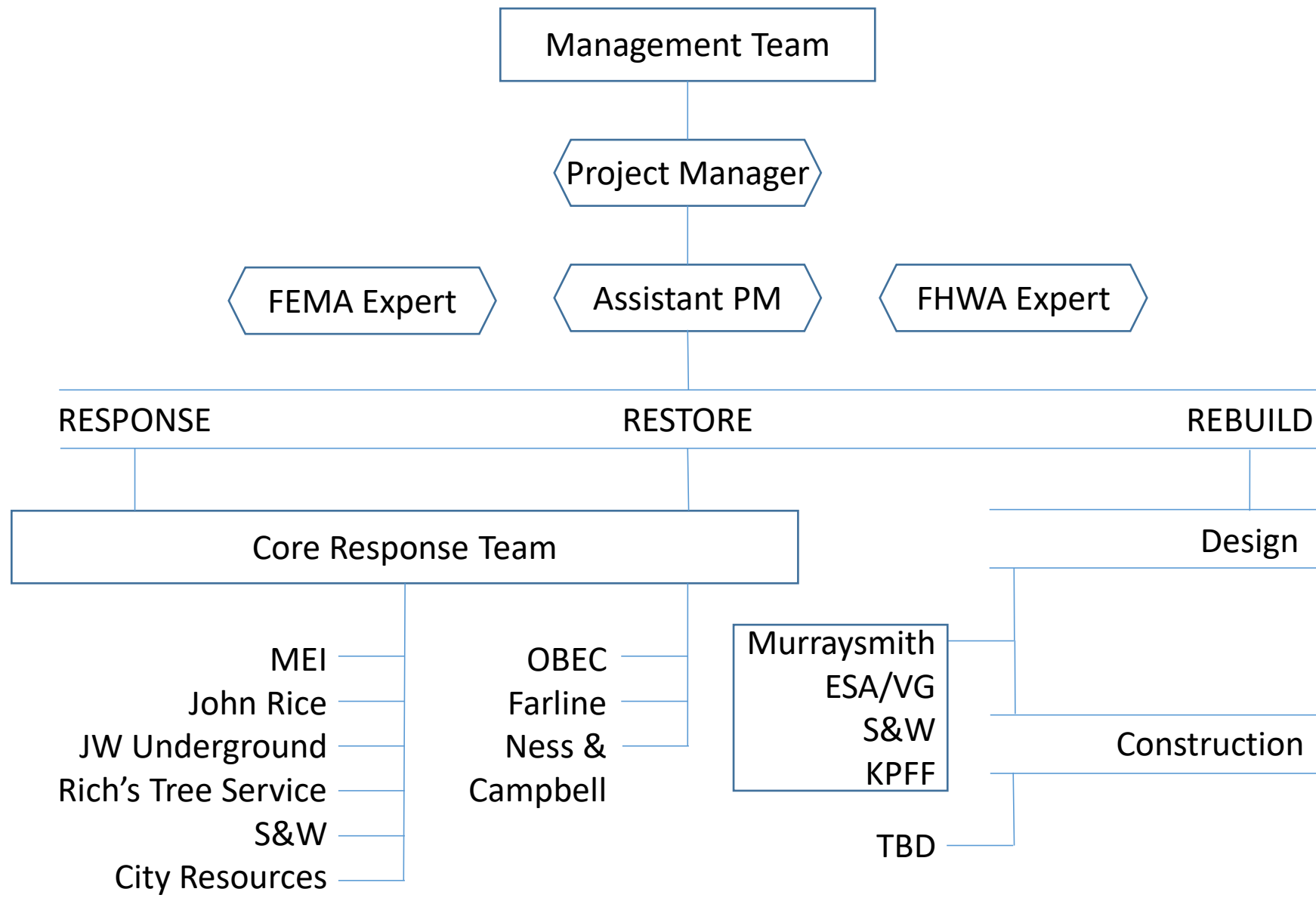
Culvert

- Built in 1968
- Flat-bottomed arch culvert (12'10" w x 8'4" h)
- Maintained and inspected by Multnomah County until 2012

Initial Response: What do you do?







Why change course?

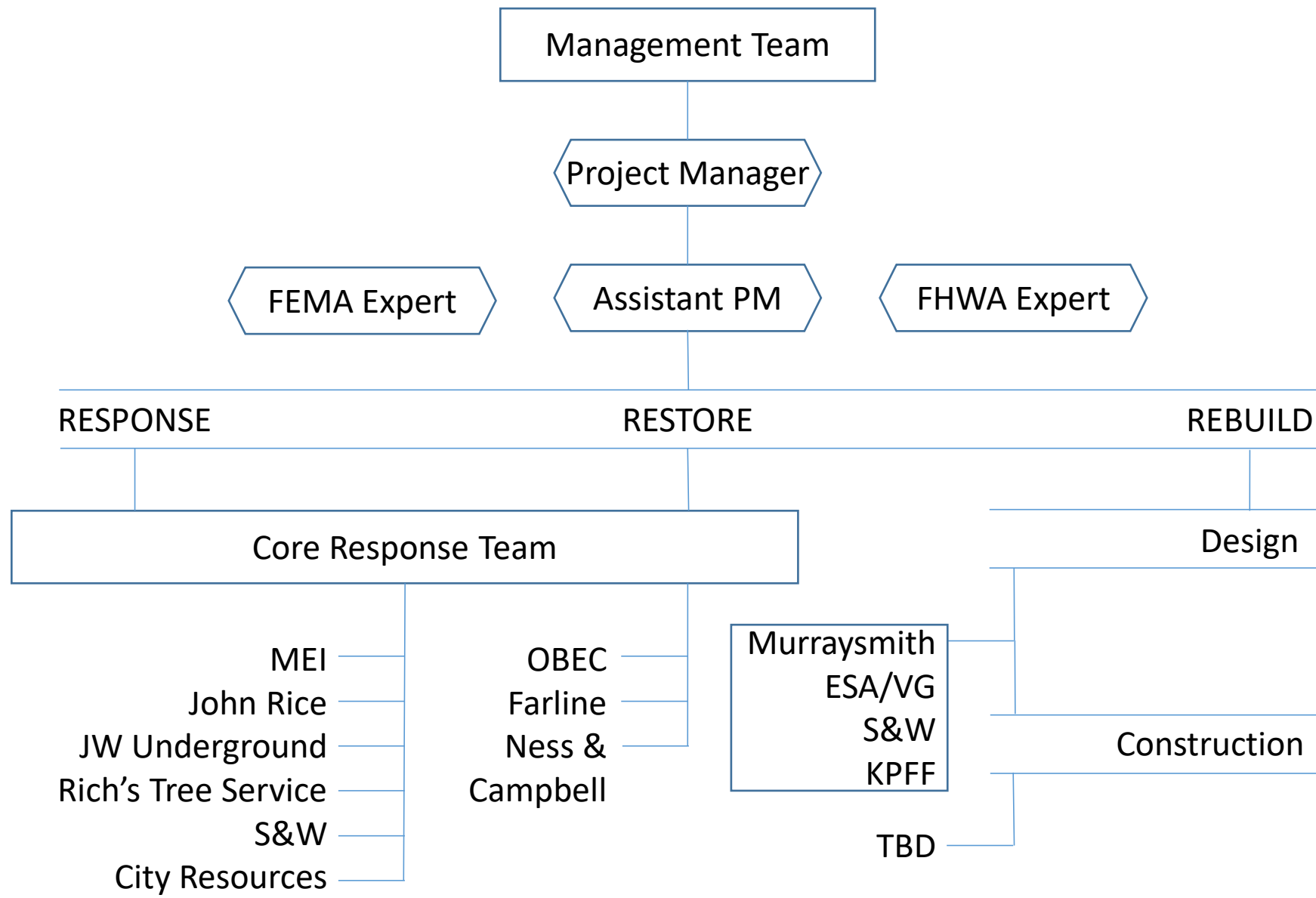
- FHWA eligibility and program structure
- Economic impact of delays

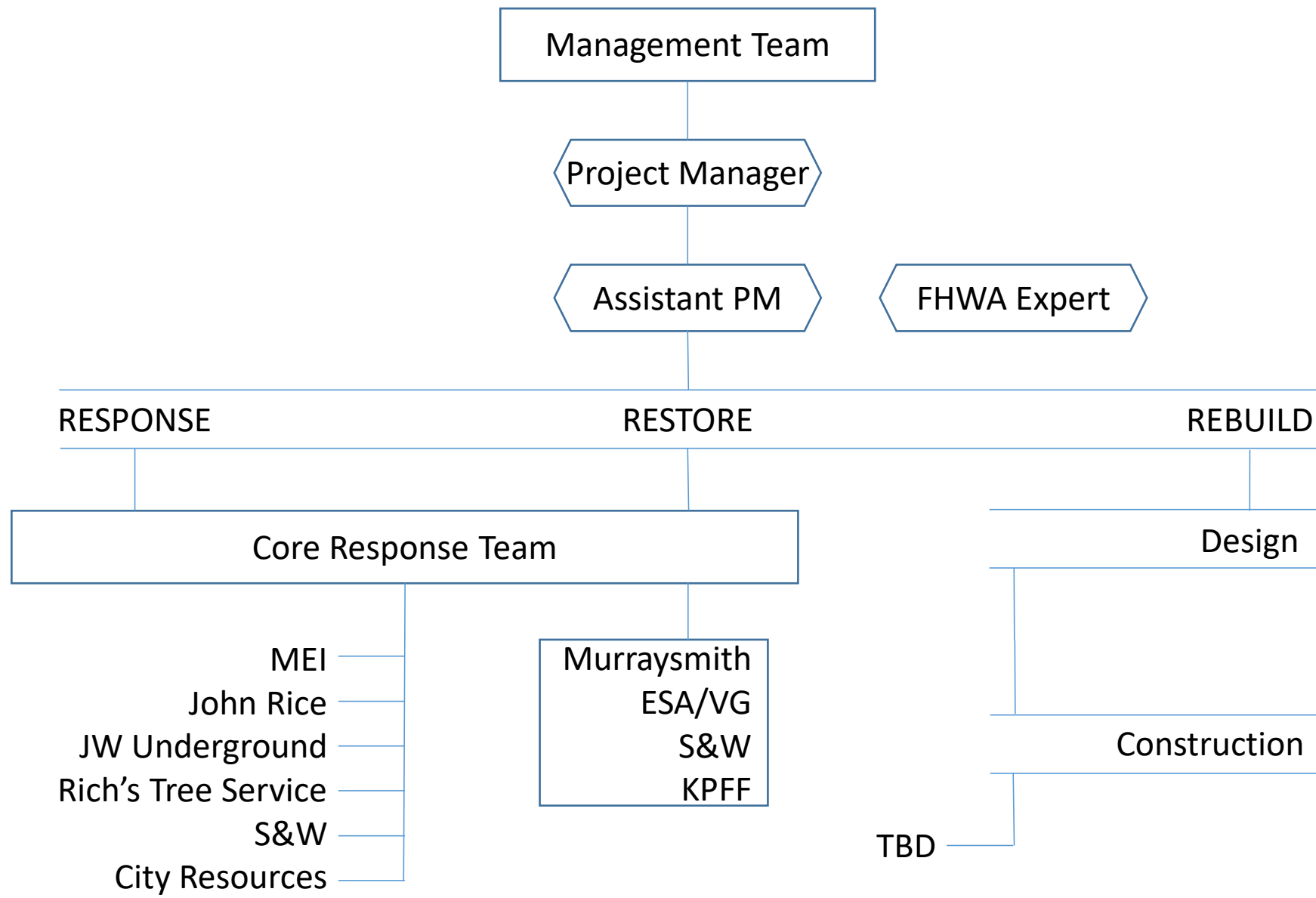
Cost per vehicle hour of delay	Average number of delayed vehicles	Average minutes delayed	Estimated economic cost per day
\$ 11.37	30,000	8	\$ 45,480.00

What needs to happen?

- Design
- Contractor
- Materials
- Diversion









Material excavated and hauled off:



5,921+
tons or
4,740+
cubic yards

Rock installed (backfill,
pipe zone, bedding,
slope protection, ac):

8,160+
tons or
5,640+
cubic yards

Total
truck trips:

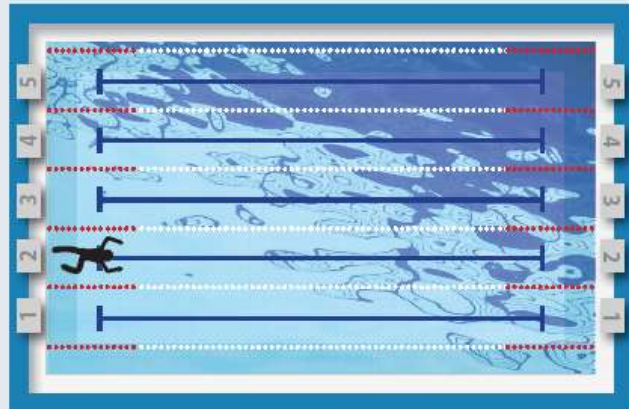


625



282

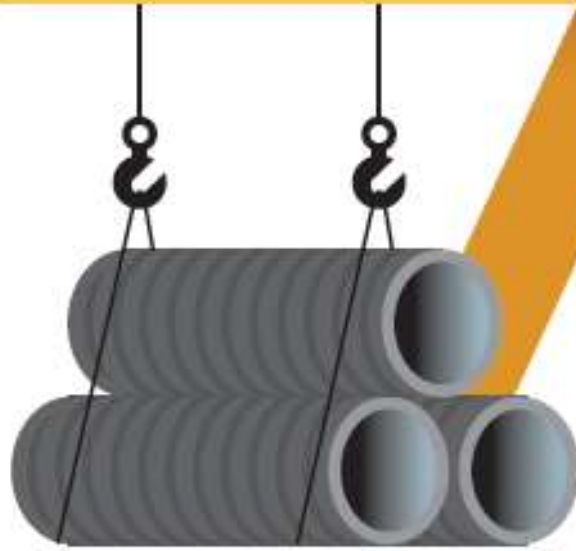
Total tons moved: 14,080 – The equivalent of 282 MAX light rail cars



Total cubic yards moved: 10,390 – Enough to fill over 3 Olympic-sized swimming pools

The new
temporary
pipes can
convey over 750
cubic feet per
second, enough
to fill that same
Olympic-sized
swimming pool
in less than 2
minutes.





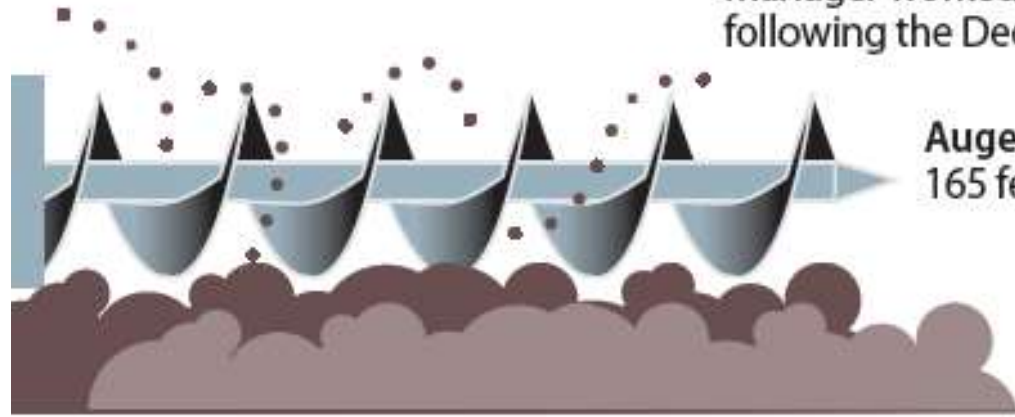
Installed 320 feet of corrugated metal pipe approximately 30 feet below the road.

The contractor was given their Notice to Proceed on 12/23, mobilized their equipment in on Christmas Eve, took Christmas day off, and worked every day since then through weekends and holidays, sometimes with work being done around the clock.



City staff and consultants worked through weekends and holidays and at all hours of the day or night. The project manager worked every day for 40 days following the Dec. 7 storm.

Auger-bored approximately 165 feet of 48" steel casing.



Truck miles traveled: 4,964 – Far enough to cover the distance between Gresham and Disneyland 5 times.





Takeaways

- **Teamwork:** Find your balance
- **Safety:** Protect the community
- **Reality:** Manage expectations
- **Timeline:** Understand your critical path
- **Collaboration:** Spread the load
- **Nimbleness:** Go with the flow
- **Risk:** Prioritize and manage
- **Communicate:** Keep the lines open
- **Leadership:** Trust your team

Thank you!
Any questions?



Jeremy Provenzola, MS, PE
Senior Engineer
City of Gresham
Office: (503) 618-2629
Email: Provenzola@GreshamOregon.gov



Kyle McTeague, PE
Principal Engineer
MurraySmith
Office: (503) 225-9010
Email: Kyle.McTeague@murraysmith.us

