EWEB's Approach to Resiliency Through Master Planning and Emergency Preparedness

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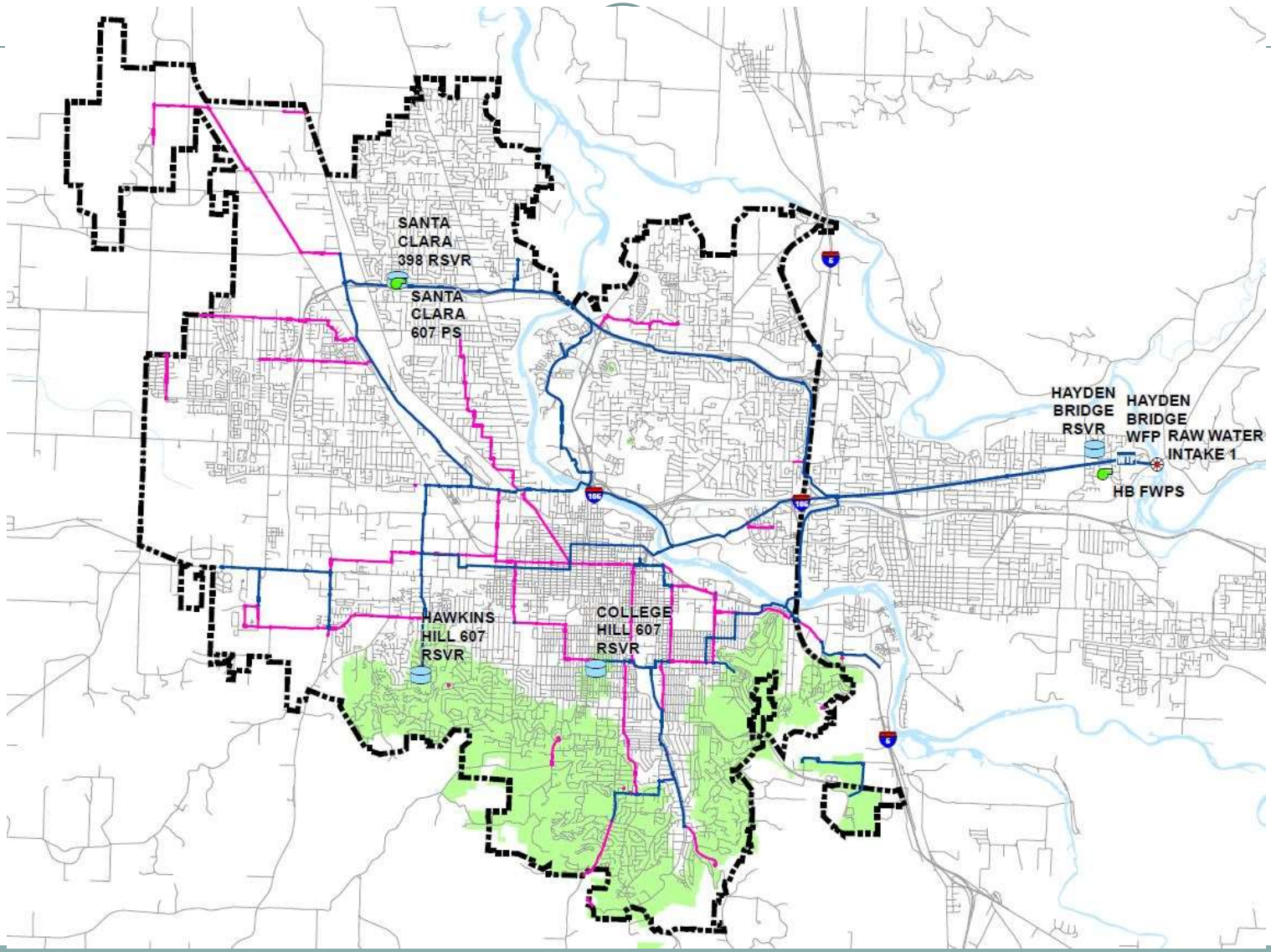
EWEB

Presentation Outline

- EWEB's Water System
- The Oregon Resiliency Plan
- Our Approach Toward Resiliency
  - Master Planning - Defining our Resilient Spine
  - Building Redundancy
  - Strengthening our Existing System
  - Ensuring Strength in our Future Improvements
  - Emergency Preparedness
  - Emergency Water Distribution
- Questions

EWEB's Water System



EWEB's Water System

- Founded in 1911
- Serves a population of ~185,000.
- One large base level with 5 smaller higher pressure zones
- 19 storage reservoirs, 1MG to 20MG
- 34 pump station
- ~800 miles of distribution pipelines
  - 50% Cast iron
  - 32% Ductile
  - 4% Asbestos cement
  - 9% PVC
  - 5% Other

Oregon Resiliency Plan

Reducing Risk and Improving Recovery for the Next Cascadia Earthquake and Tsunami

- Completed in February 2013
- Included a phased approach to system recovery
- Approach built upon having 'hardened backbone' of key treatment, transmission, and distribution elements
- Elements would be upgraded over 50 year timeframe
- Targets are included:
  - Supply source: 80-90% Operational in 1-2 weeks (Coast 3-6 Months)
  - Main transmission system: 80-90% Operational in 24 hours
  - Water available at distribution centers: 80-90% in 7 days

Resiliency – The power or ability to return to the original form, position, etc

Master Planning

- Before spending a lot, needed a plan on what to do.
- Timing was right – 2015 Water Master Plan Update Underway
- Change from previous plans – Added a Resiliency Section
- Looked at numerous hazards: earthquake, landslide, flood, etc.
- Defined ‘system backbone’ and areas of concern
- Presented recommendations for improvements:
  - Seismic evaluations and upgrades, restrained pipe joints

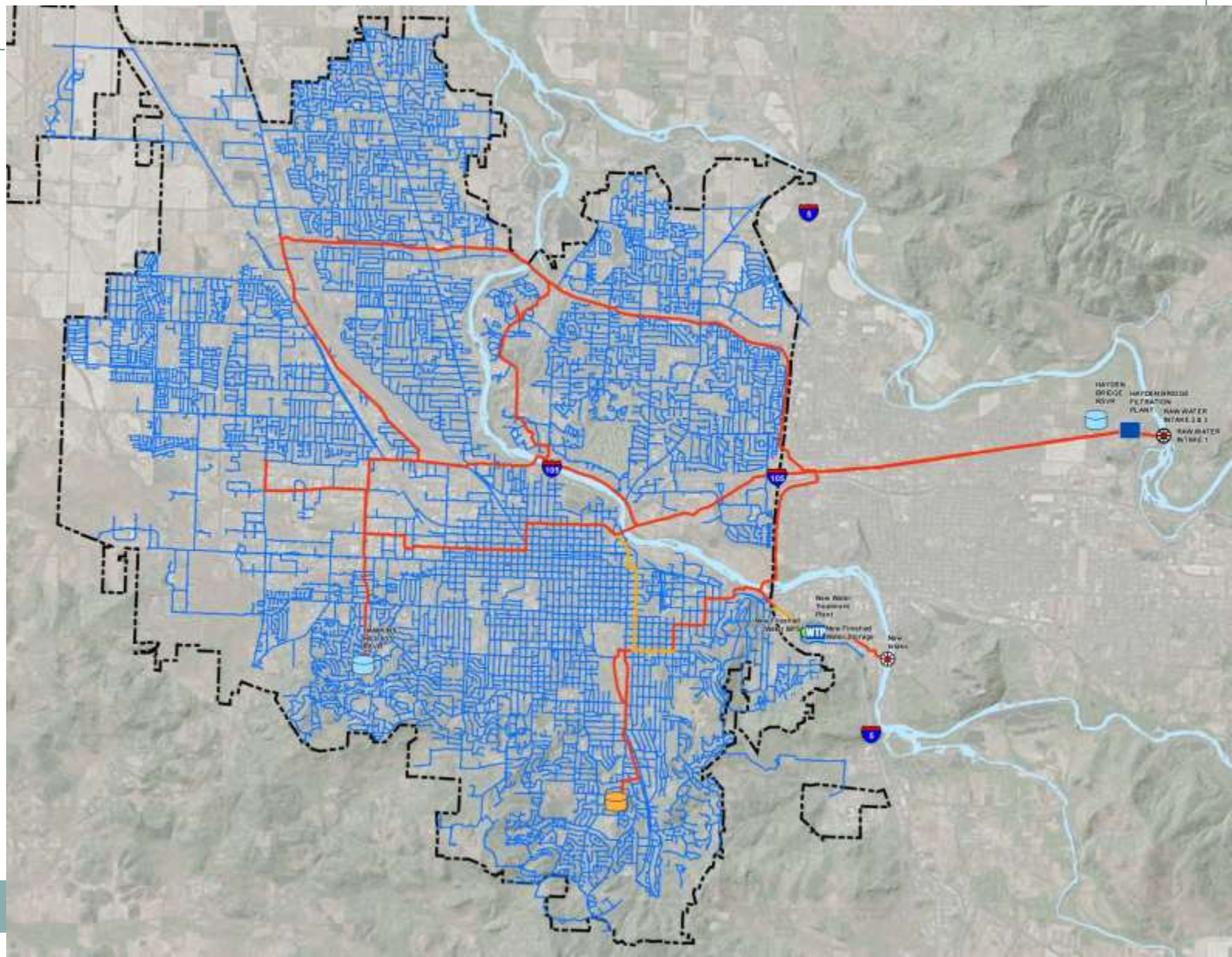
Master Planning

First Priority:

Source, Base Level & Trans. System

Second Priority:

800 Level



Master Planning

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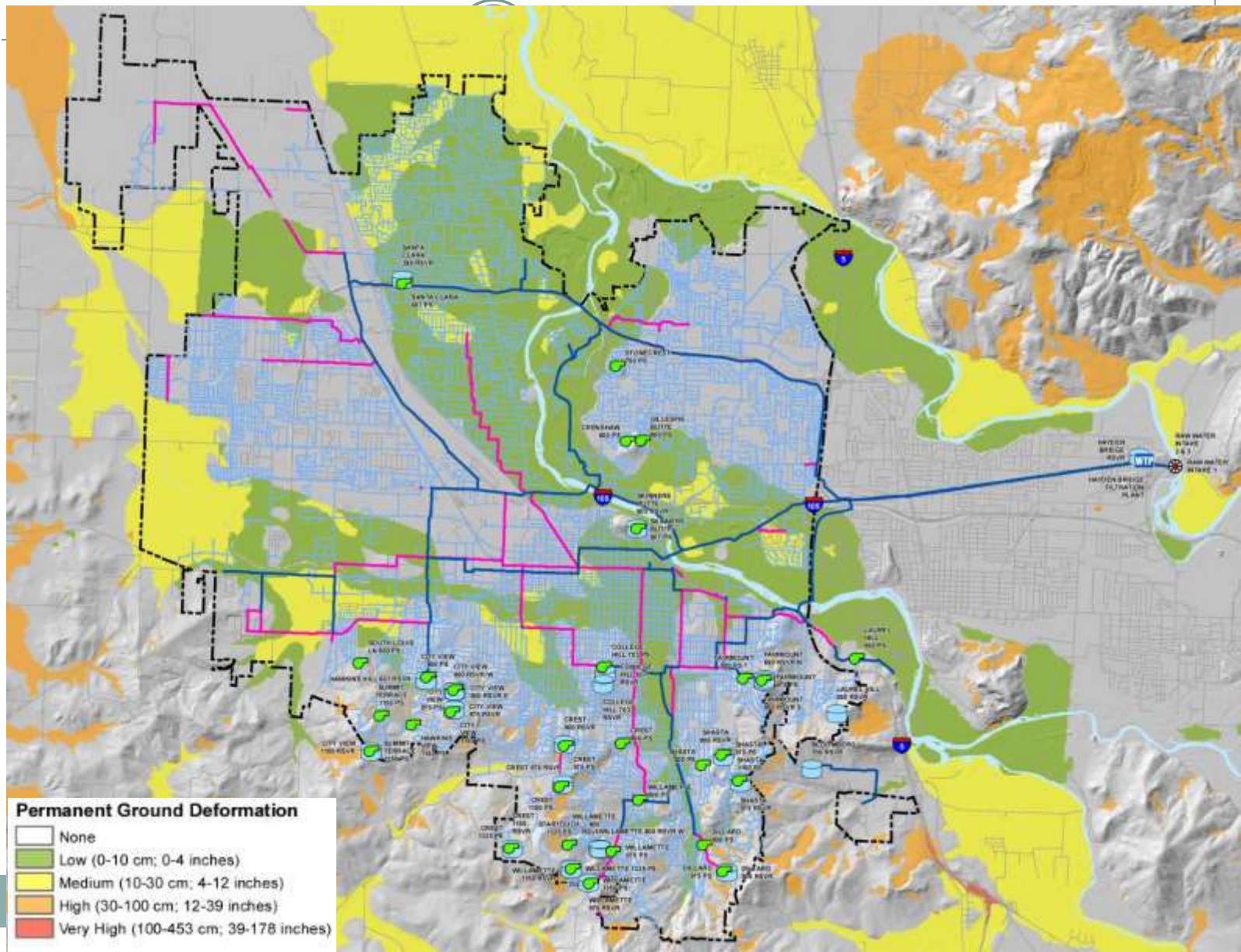

Source: Strengthen our Existing System

- Work Already Underway
- Focus on Hayden Bridge Intakes & Filtration Plant
- Significant Investment In Last Eight Years
  - 2009 Expansion
  - 2010-2016 Filter Upgrades
  - 2014-2016 Seismic Upgrades
  - 2013-2015 Intake Upgrades
  - Upgrades to almost all other systems and structures
- $30M+ 2007- 2016

Source: Strengthen our Existing System

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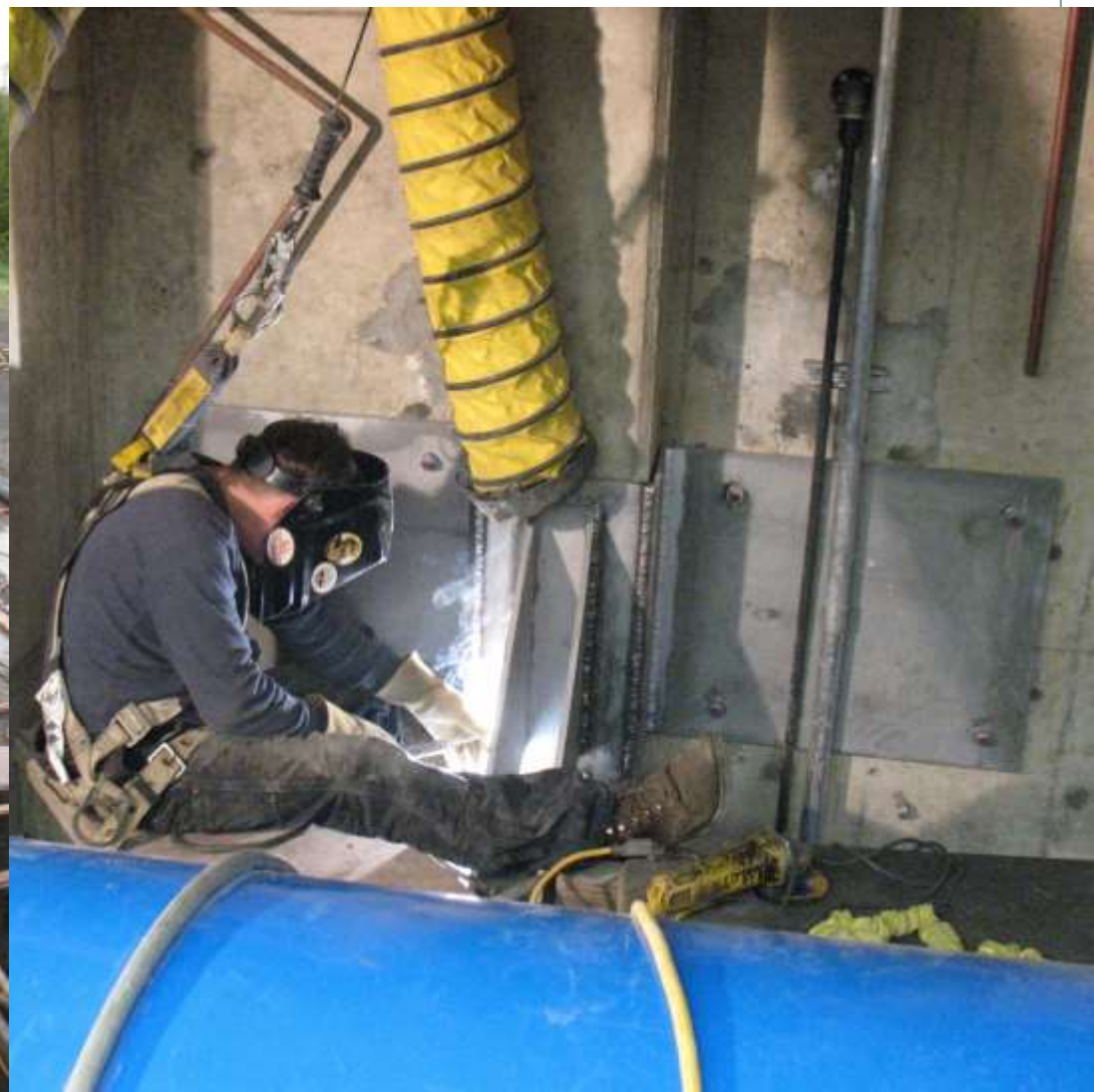


Source: Strengthen our Existing System

- It is not just seismic work that is required to strengthen your system
- Need to consider all aspects:
  - Pipelines
  - Support systems – chemical feed to networks
  - Power

Source: Building Redundancy

- EWEB currently has a single source of supply
- Alternatives such as, groundwater & interties are limited
- Have been working on water rights for years
- In 2014 obtained water right for a POD on the Willamette

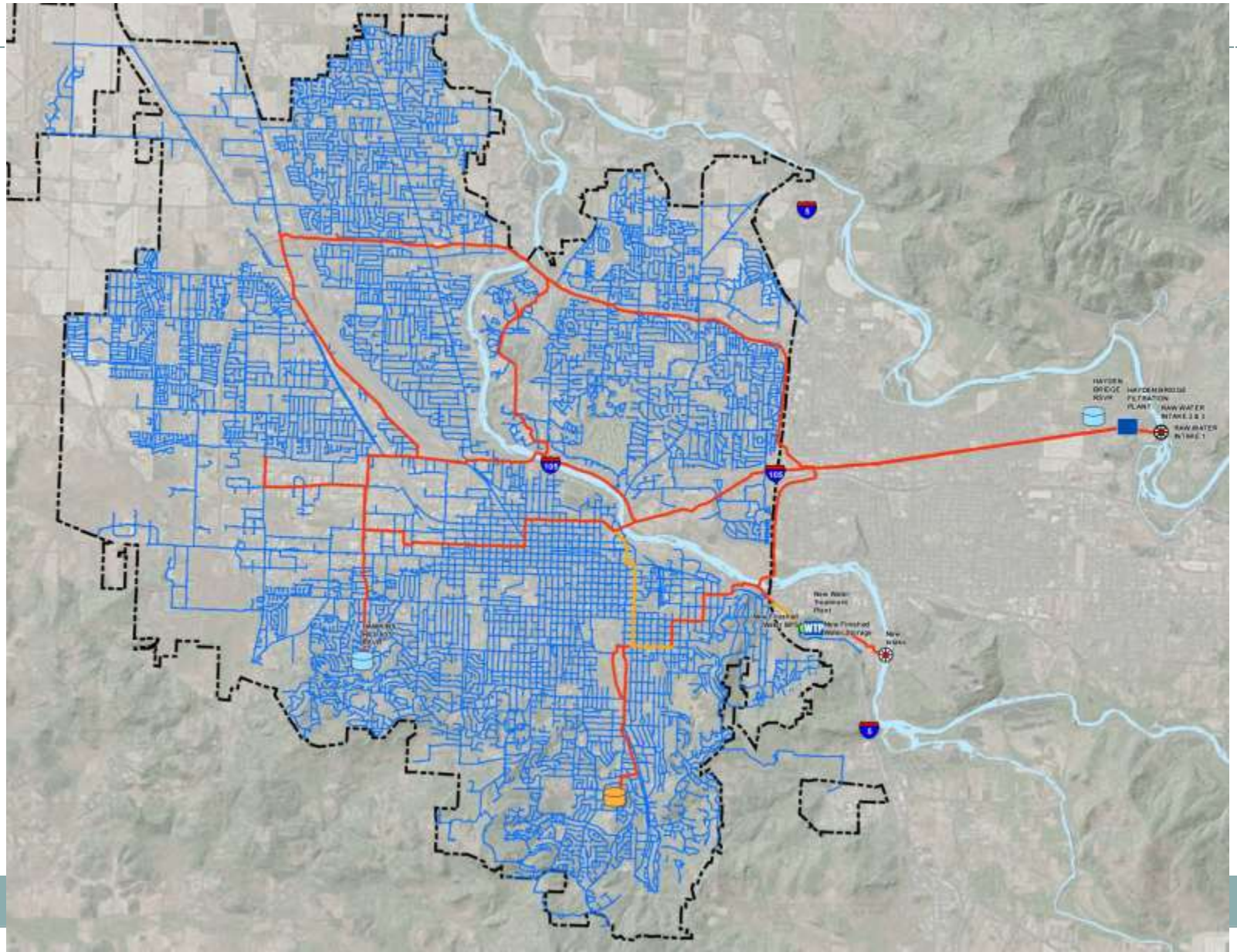
Source: Building Redundancy

- Currently working towards development of second source
- Property acquisition/due diligence in progress
- Will begin permitting for the intake this summer.
- New intake and treatment plant operational by 2022

Transmission and Base Level Storage

- Numerous elevated crossings need study and retrofit
- Alternative bypass scenarios are being modeled
- How to distribute water throughout your system when high risk crossings fail?

Transmission and Base Level Storage



Transmission and Base Level Storage

- 2 out of our 4 base level reservoirs need significant work
- Master Plan considering distributed storage approach – more smaller reservoirs

Future System Improvements

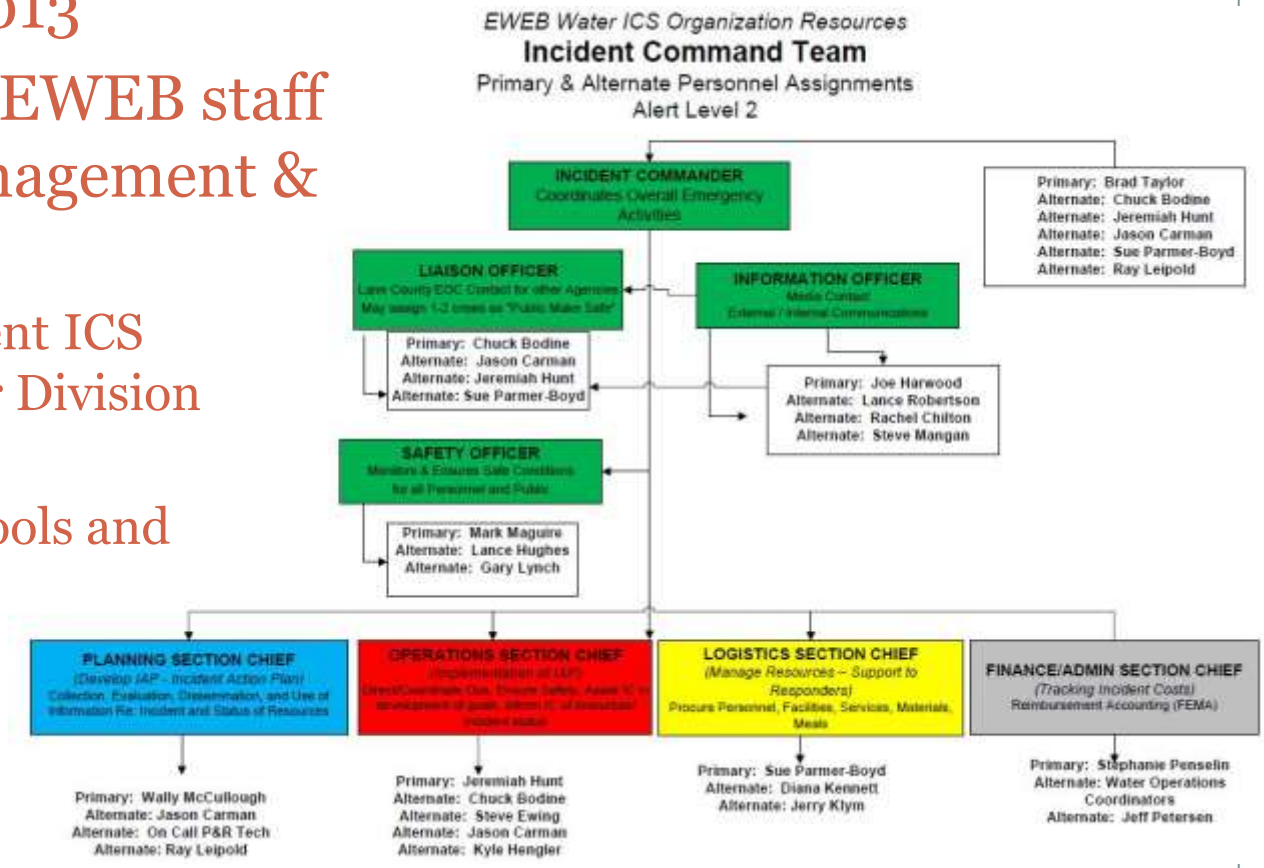
- Distribution system and select portions of upper Levels
- Currently reviewing design standards
  - Pipe restraint (does not have to be too expensive)
  - Reservoir details
  - Redundancy between levels
- Being selective on reservoir upgrades & replacements

Emergency Preparedness

- Building resiliency in your system takes time
- Even with a resilient system, still need to be prepared
- Two concurrent efforts underway at EWEB:
  - Preparing ourselves
  - Preparing our customers

Emergency Preparedness - Ourselves

- EWEB established WSSEP Committee in 2013
- Goal to prepare EWEB staff for incident management & recovery
  - Develop/implement ICS throughout Water Division
  - Develop incident communication tools and protocols
  - Budgeting for training and Equipment



Emergency Preparedness - Ourselves

- Focus - Preparing staff for incident management and recovery through the ICS structure
- Training on FEMA aligned ICS protocols
  - Multi-agency exercises
  - Event exercises to educate the public as well as staff
- FEMA alignment
  - Enhances multi-agency response
  - Increases eligibility for FEMA funds

Emergency Preparedness –Customers

- Focus
  - Household emergency preparedness
  - Community emergency preparedness
  - Shared responsibility, shared investment
- Market research revealed that EWEB was not seen as the credible educator about emergency preparedness
- Forged a partnership with the American Red Cross: the go-to credible educator

Emergency Preparedness –Customers

- Centered around emergency water supply containers
  - Tangible talking point
  - 3-gallon container reinforced core message
  - Camera ready
  - Easy to take action
- What your household can do discussion leads naturally into what EWEB is doing

Emergency Preparedness –Customers

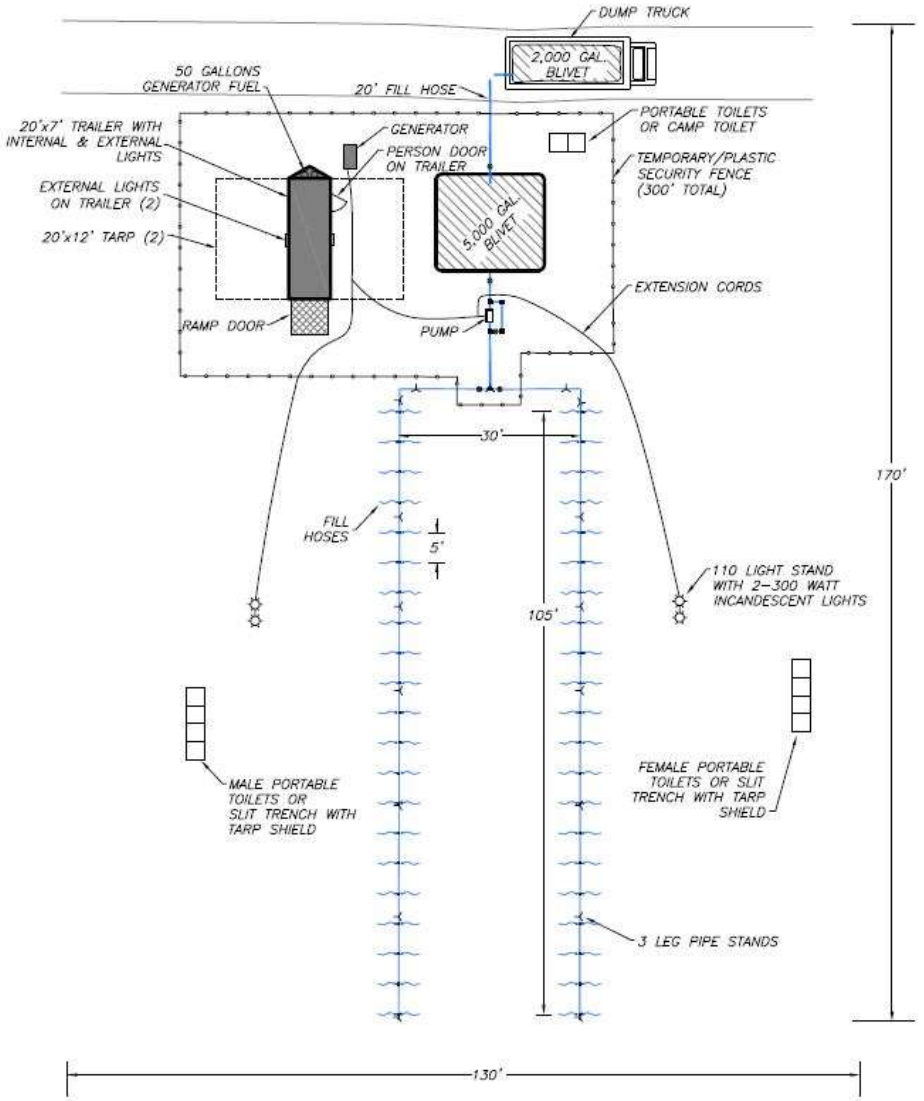
- Partnered with the American Red Cross at several emergency preparedness presentations and events
  - Neighborhood association meetings and picnics
  - Rotary clubs
  - Homeowner association meetings
  - Community Emergency Response Team meetings
  - Disaster Relief Trials Cargo Bike Race & Preparedness Village Fair

Disaster Relief Trials 2014

Incident Action Plan

Emergency Water Distribution

- Prepared Emergency Water Supply Plan in 2012
  - Goal: Distribute 1.5-2 gallons per person per day
  - Multiple distribution locations
  - Water supply from 'hardened reservoirs' and ?
- Logistics are Daunting
  - 300,000 gallons per day
  - How to deliver while fixing system?
  - How to configure an efficient distribution system?



Emergency Water Distribution

- Work completed to date
  - Did some research and purchased three trailers.
  - Completed plumbing and pump installation in one.
  - Tested, modified, tested some more.
  - Collaborated with other utilities

Emergency Water Distribution

- Future work
  - Testing, ensuring systems/equipment works prior to additional investment
  - Plumbing and pump installation in additional trailers
  - Potential purchase or build one with treatment capability
  - Lots of practice

EWEB's Approach to Resiliency Through Master Planning and Emergency Preparedness

QUESTIONS?