Emergency Firefighting Water System Capital Planning Committee

March 27, 2017

David Myerson, SFPUC

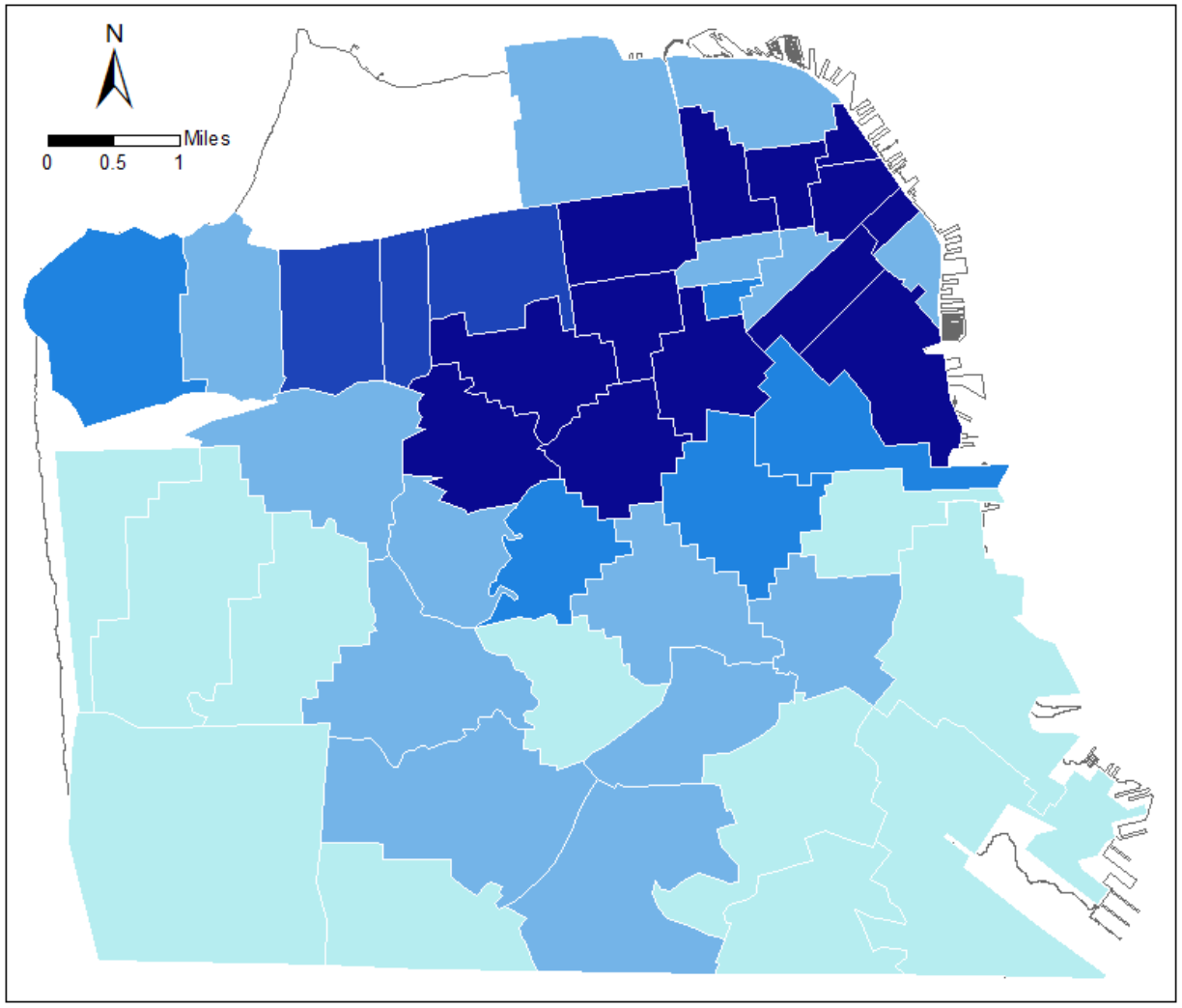
Bond Funding

- Earthquake Safety & Emergency Response (ESER) 2010 bond measure approval included $104.2 million for system
- ESER 2014 bond measure approval included $55 million for system

Technical Advisors

- ESER 2010
  - Thomas O'Rourke, Cornell University
  - Charles Scawthorn, U.C. Berkeley
- ESER 2010 Pipeline Assessment
  - Jack Baker, Stanford University
  - Michael O'Rourke, Rensselaer Polytechnic Institute
  - Thomas O'Rourke, Cornell University
  - Charles Scawthorn, U.C. Berkeley
- ESER 2014 and future bonds
  - Charles Scawthorn, U.C. Berkeley

Fire-Fighting Reliability – Before 2010



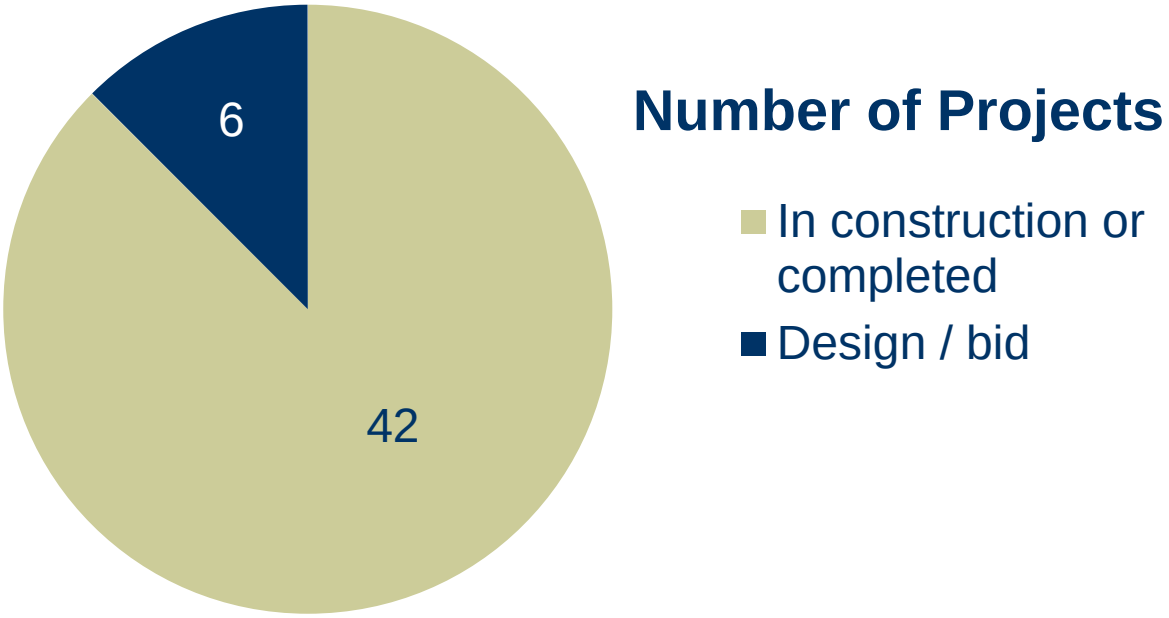
Citywide reliability 47%

27 FRAs below 50%

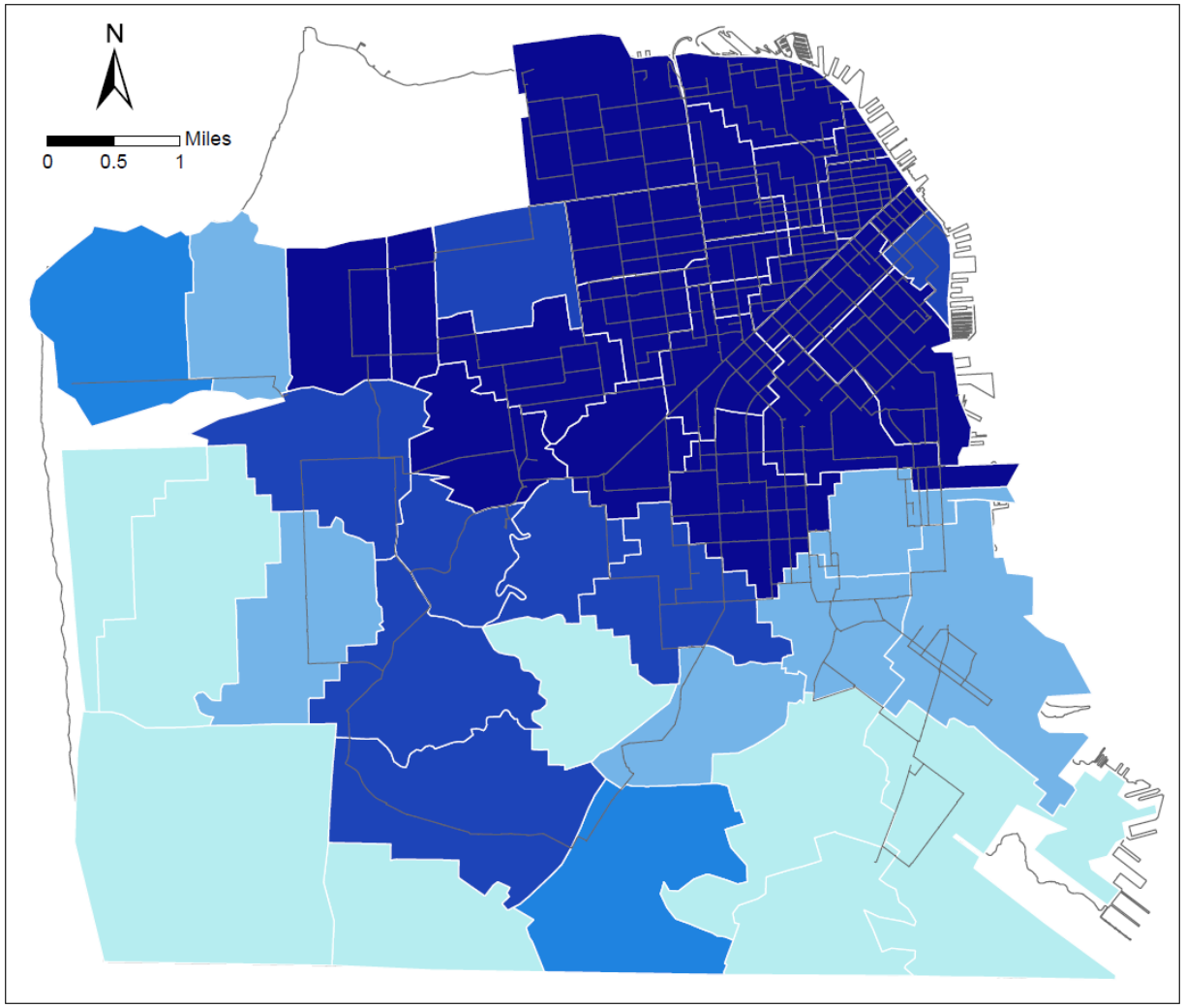
Legend

- High
- Low

Project Status ESER 2010



Fire-Fighting Reliability – After ESER 2010



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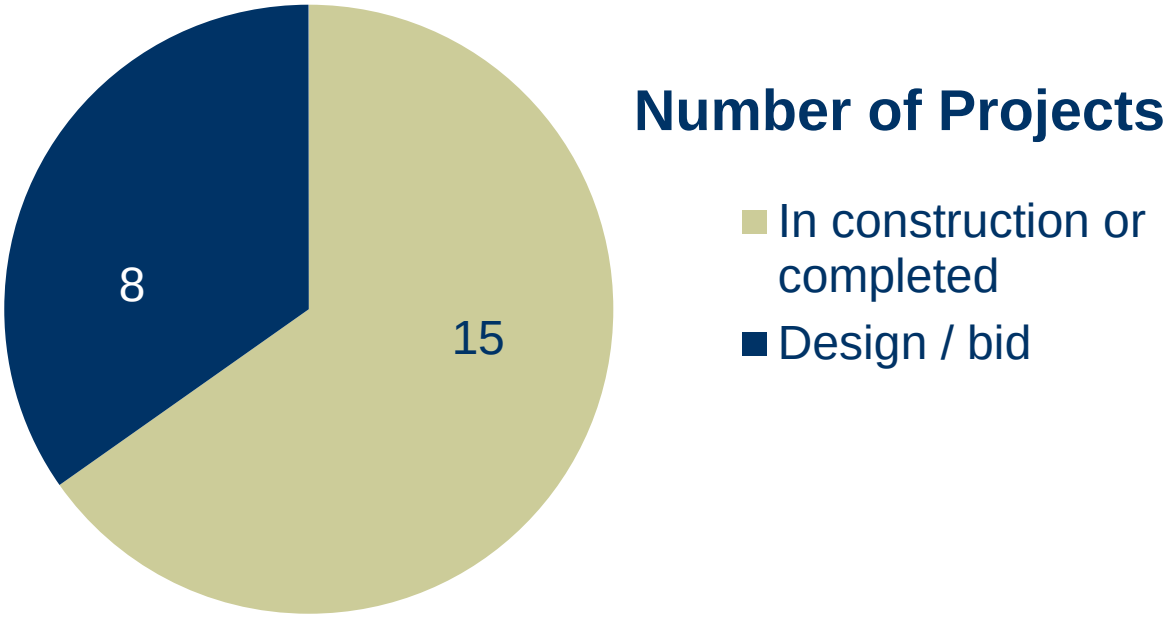


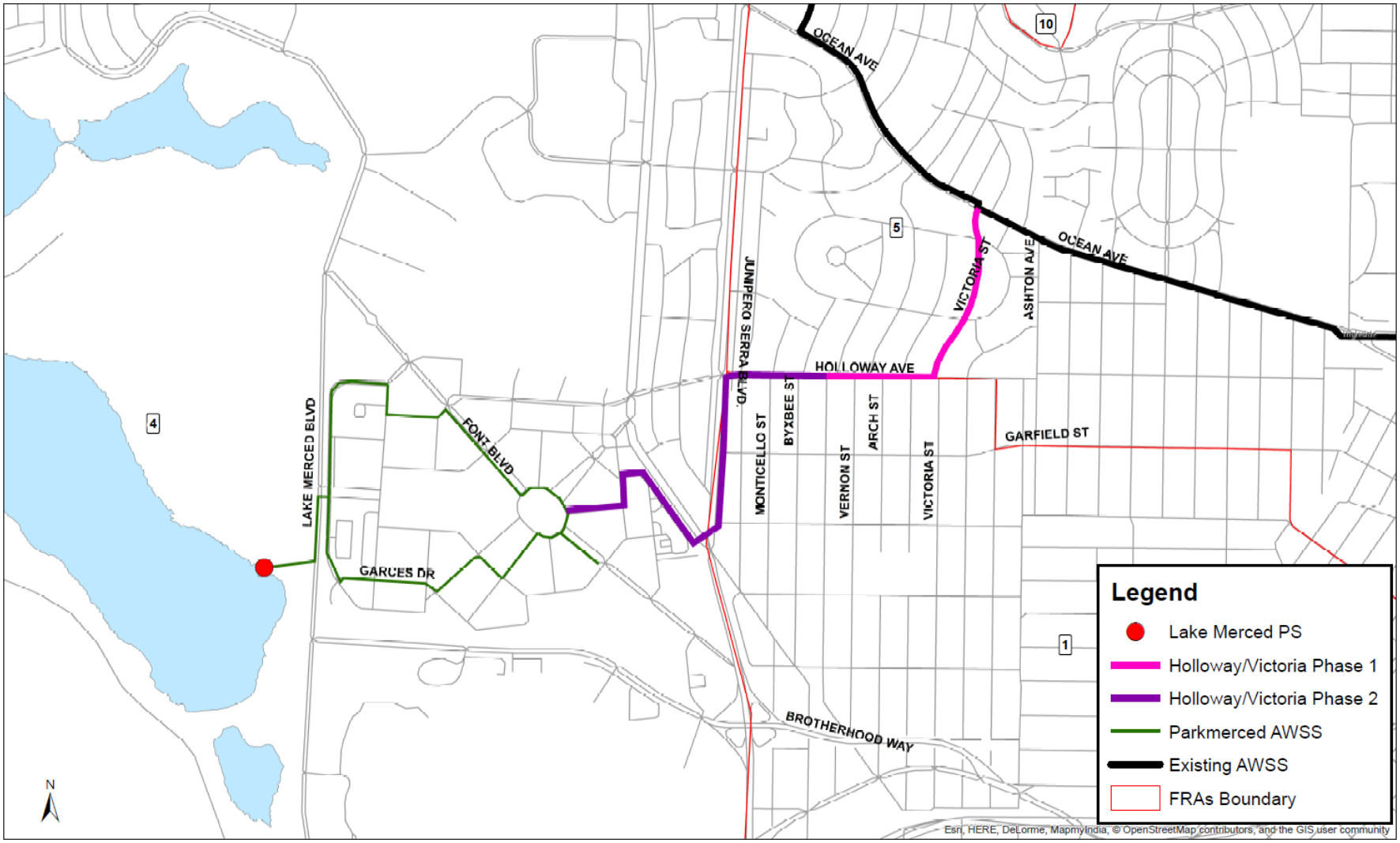
Flexible Water Supply System (FWSS)

- Packaged pump units and hose units (12” diameter)
- Deployed after an earthquake where needed
- Challenges
  - Deployment And Response Time
  - Storage - No structures funded, limited space at McLaren
  - Maintenance
  - Hose testing and replacement
  - Effectiveness
- Implement New Projects:
  - AWSS pipeline – Victoria Street / Holloway Avenue
  - Potable co-benefits pipeline – Sunset & Richmond areas

Comparison of Study Recommendations

	CS-199 AWSS	CS-199 AWSS Plus	2014 Spending Plan	Current Plan
Total Capital Cost (millions)	$321	$283	$147+	$234+
Citywide Reliability %	92	94	93	96
AWSS	✓	✓	✓	✓
Potable Co-Benefits		✓	✓	✓
Potable Transmission Mains		✓		
Flexible Water Supply System			✓	

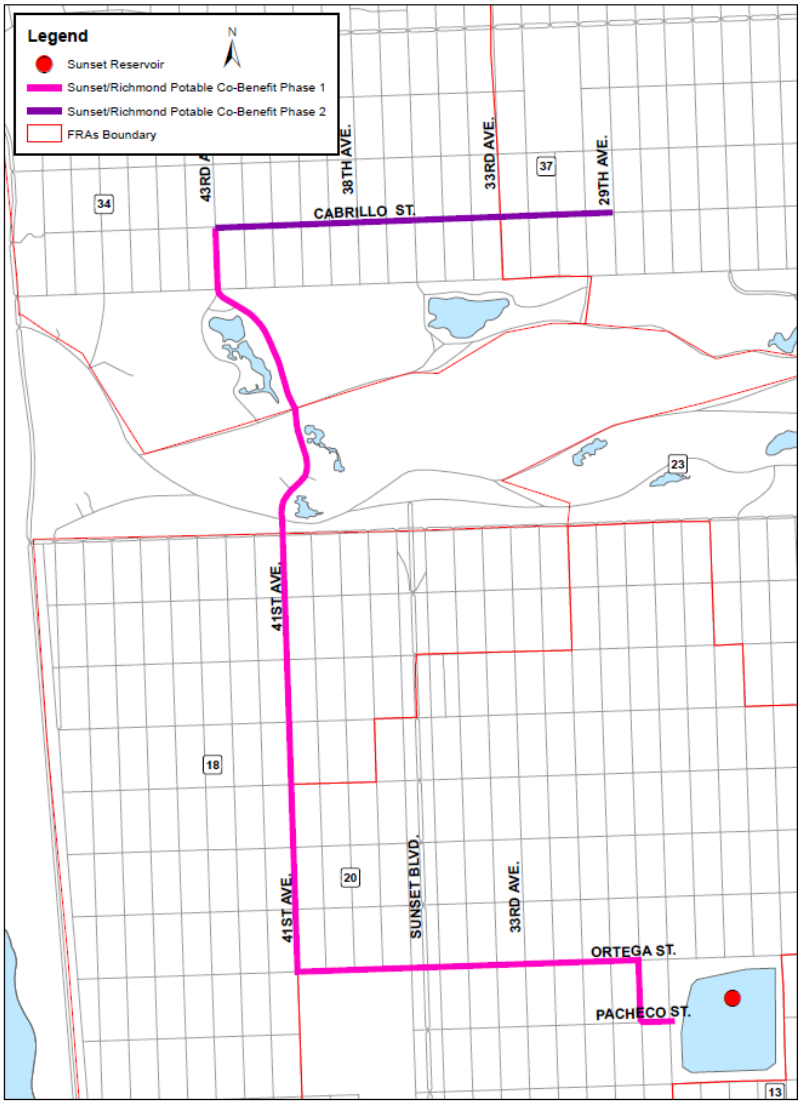
Holloway/Victoria AWSS Pipeline



Potable Co-Benefits Pipeline

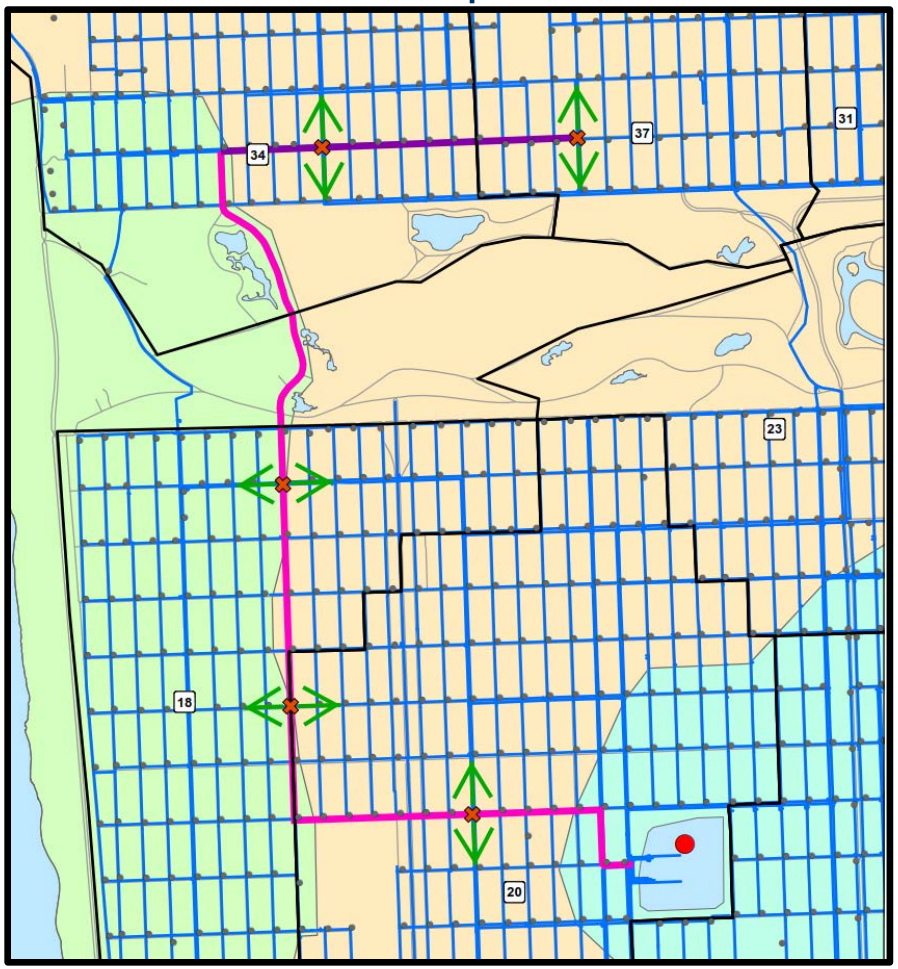
- Pressure in the seismically-resilient main pipeline and hydrants can be increased for improved fire suppression
- Automatically isolates the main pipeline from service connections after an earthquake
- Delivers potable water to residences and businesses daily
- Allows leveraging of resources from both bond funding and water rates
- Less underground space requirements than separate pipelines

Sunset/Richmond Potable Co-Benefits Pipeline

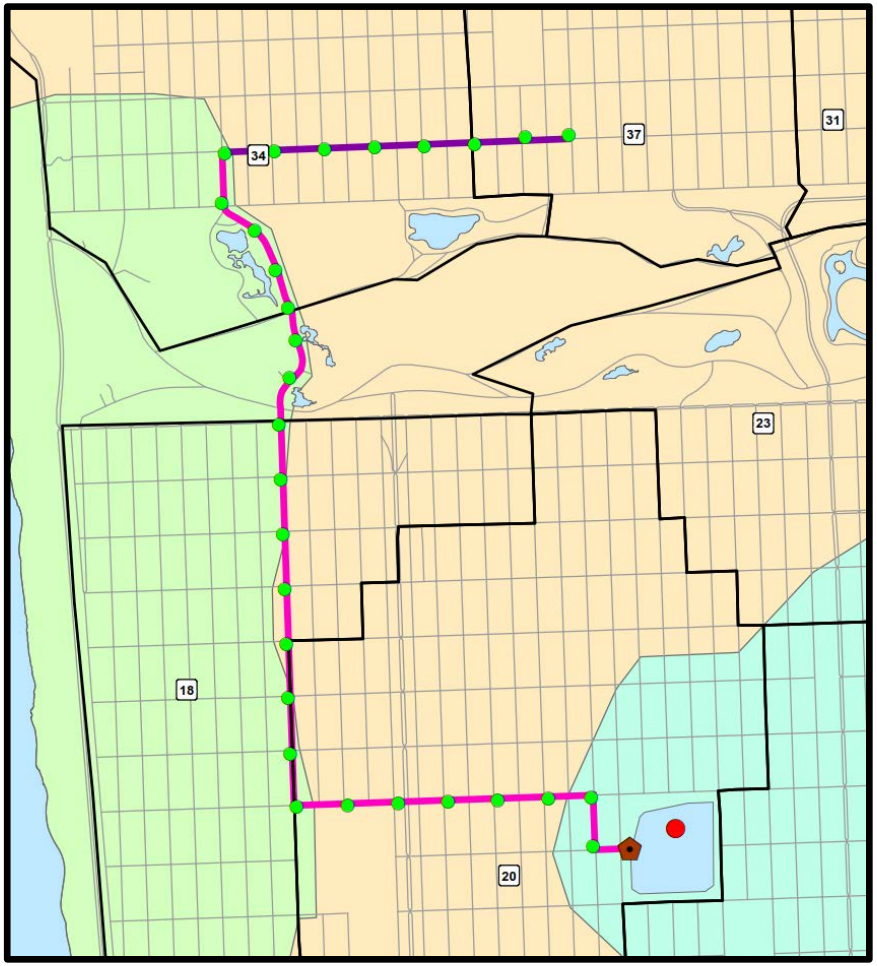


Potable Co-Benefits Pipeline

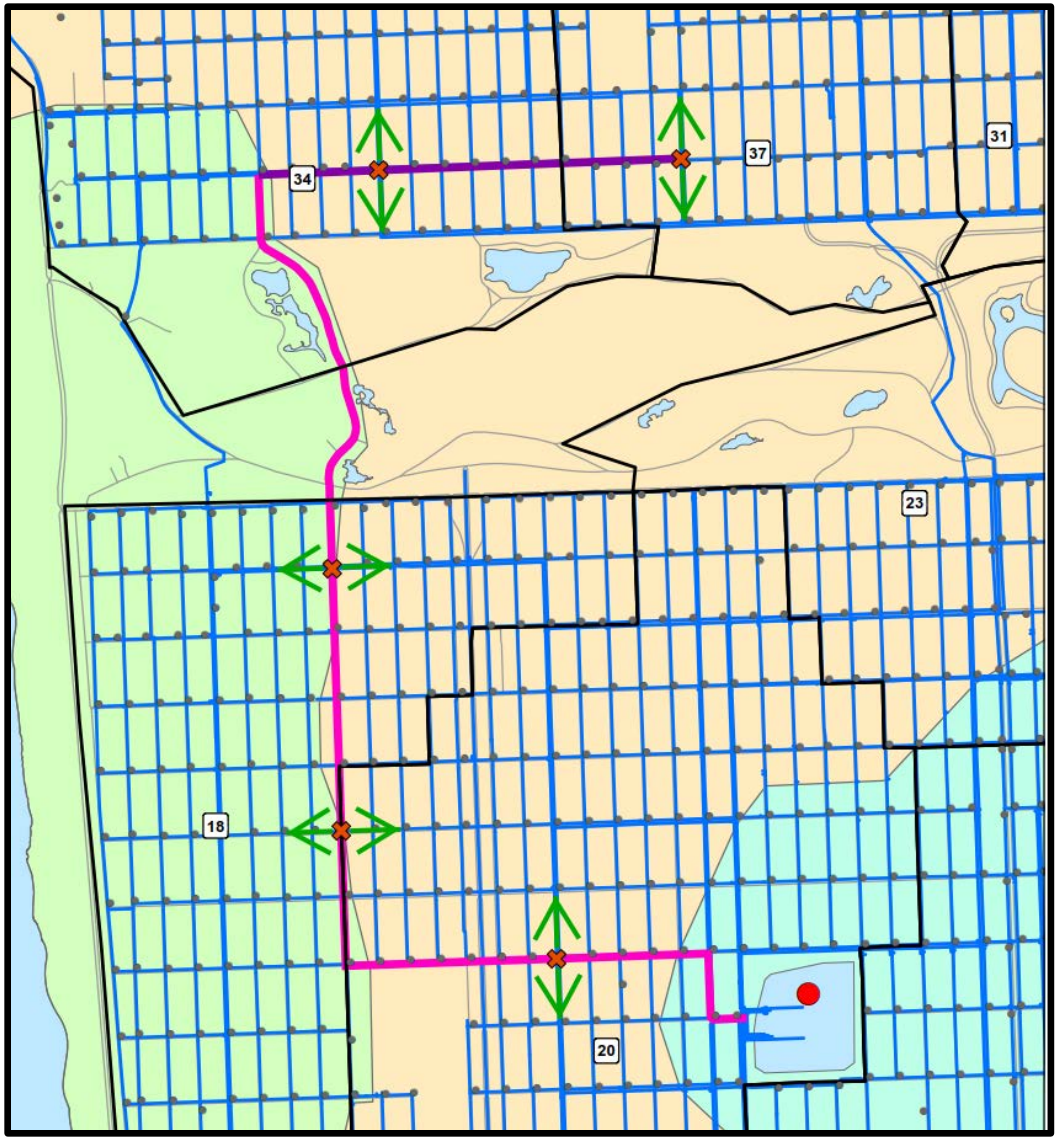
Normal Operation



Emergency Operation



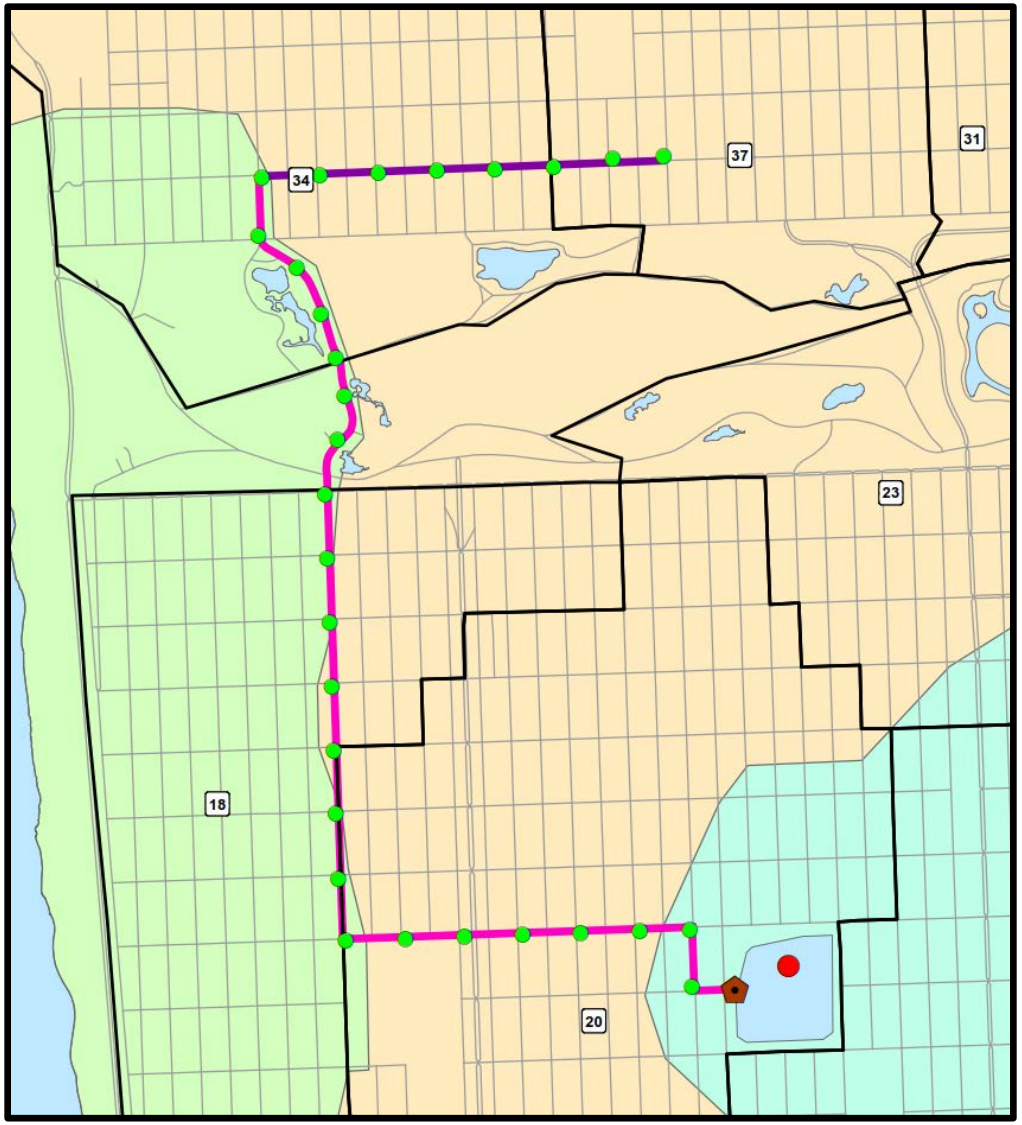
Potable Co-Benefits Normal Operation



- Connected to service lines at 5 locations, each with seismic isolation valves

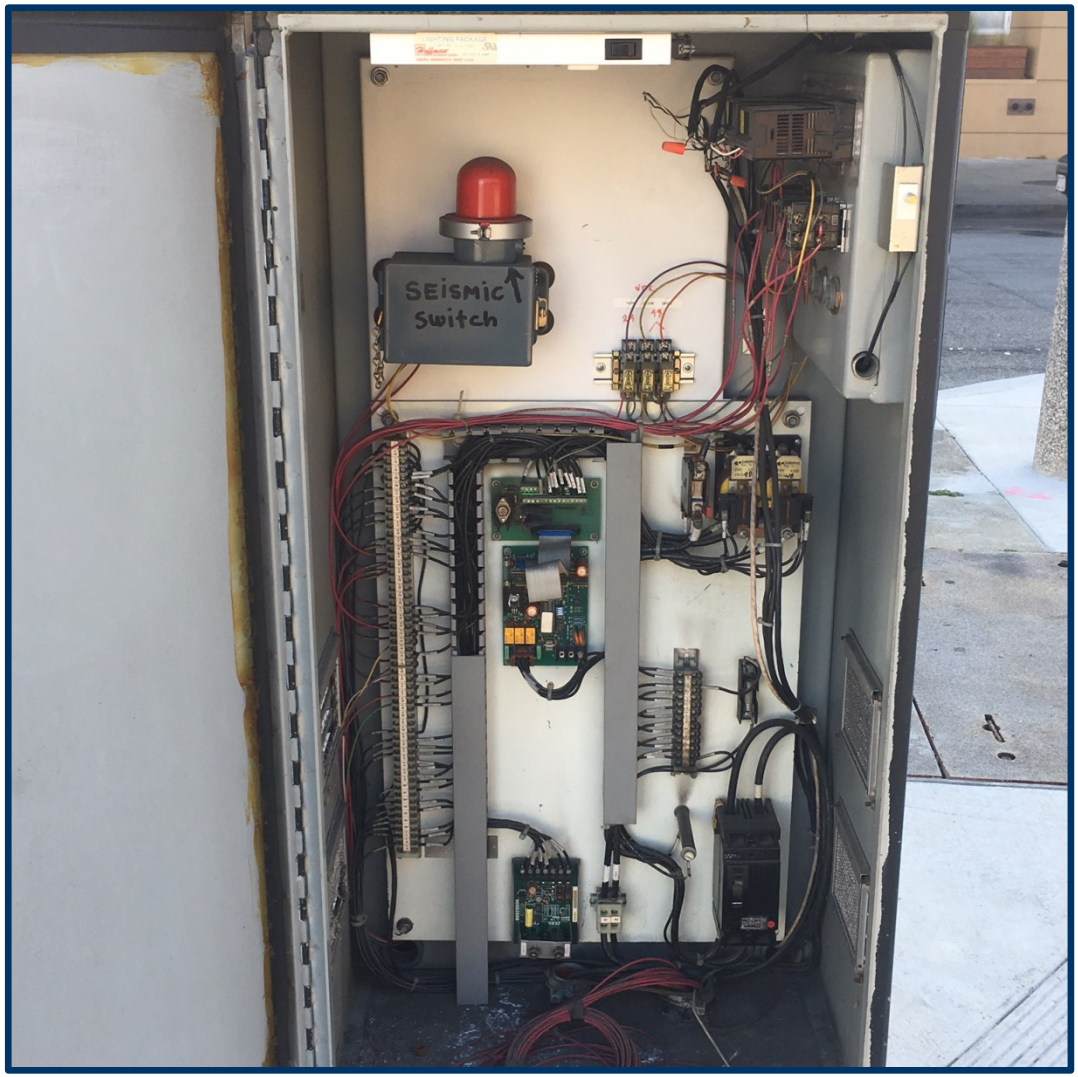
Potable Co-Benefits Emergency Operation

- Potable system connections closed
- Pump at reservoir activated
- High-pressure hydrants available for use



Motorized Valve – Existing AWSS

Seismic Switch – Existing AWSS



Valve Batteries – Existing AWSS

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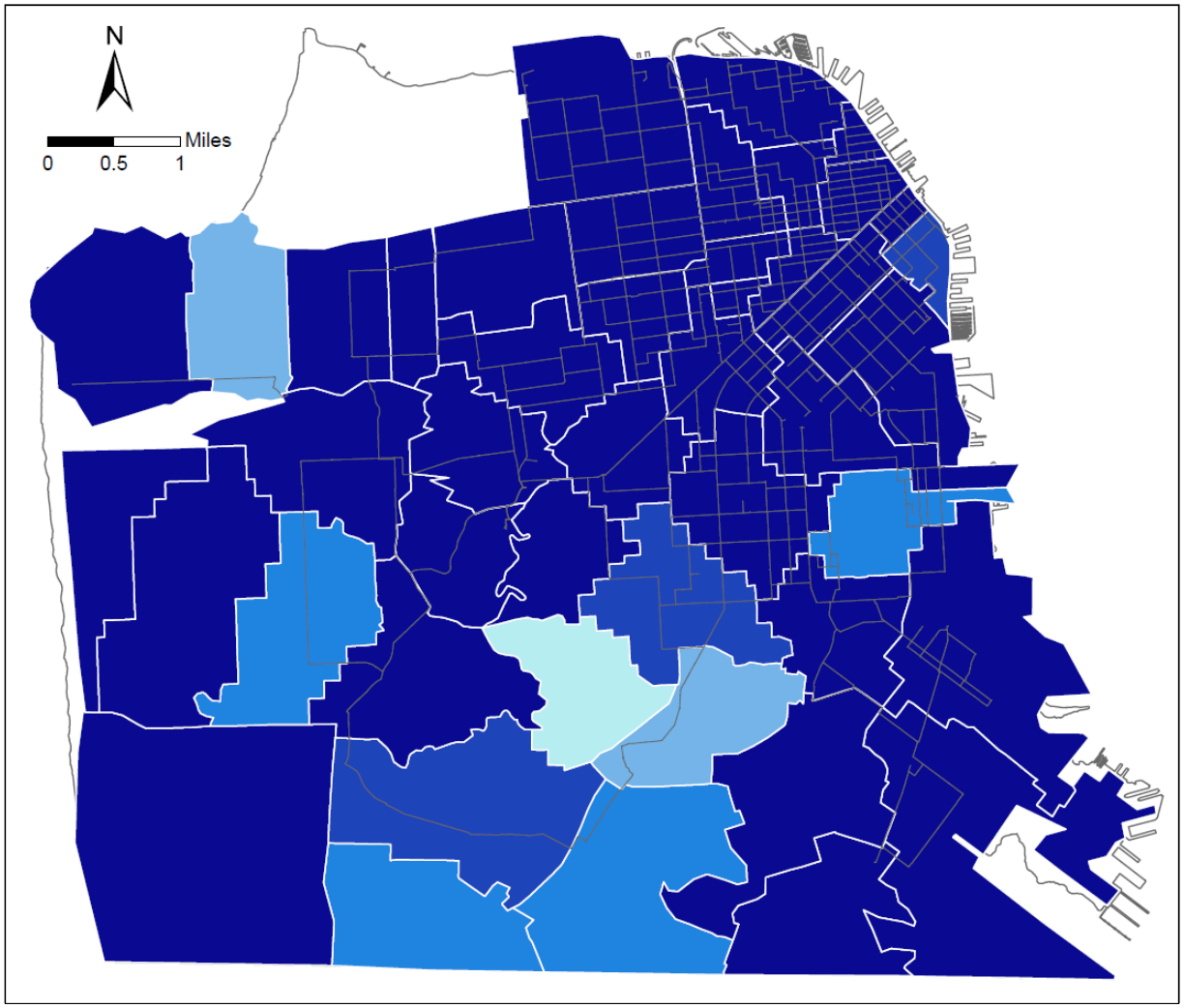

Citywide reliability 87%

5 FRAs below 50%

Legend

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Future Projects ($ millions)

	Project Cost	Water Rates	Developer	Future Bonds
AWSS High Pressure System				
Existing pipeline improvements	TBD			TBD
Pipeline – Diamond Street	4			4
Pipeline – Holloway/Victoria Phase 2	14			14
Pipeline – University Mound West	13			13
Structural Improvements – Physical Plant	TBD			TBD
Other Projects				
Land development projects	TBD		TBD	TBD
Potable Co-Benefits Pipeline				
McLaren	52	39		13
Richmond	13	10		3
Total	**96 + TBD**	**49**	**TBD**	**47 + TBD**

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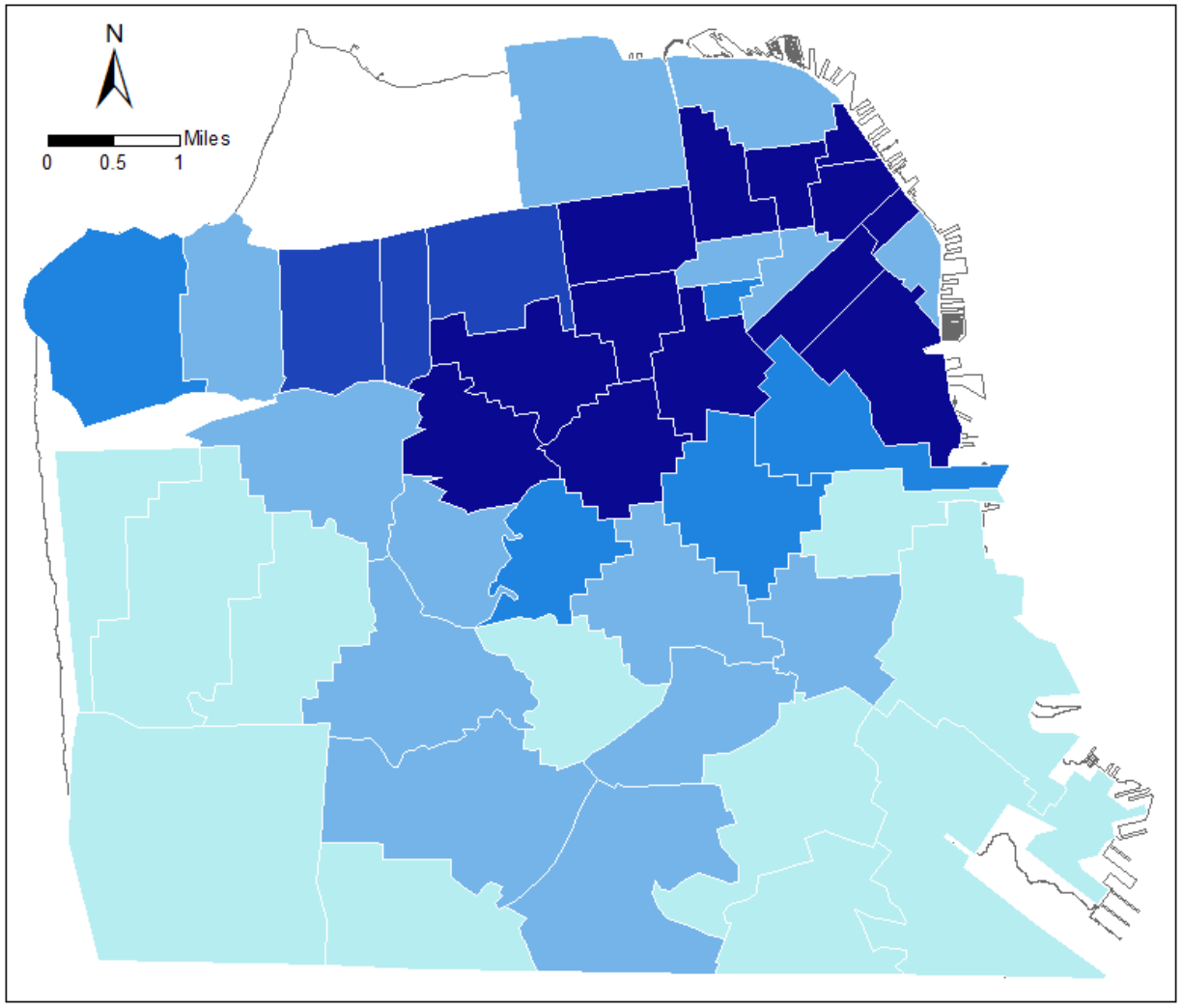

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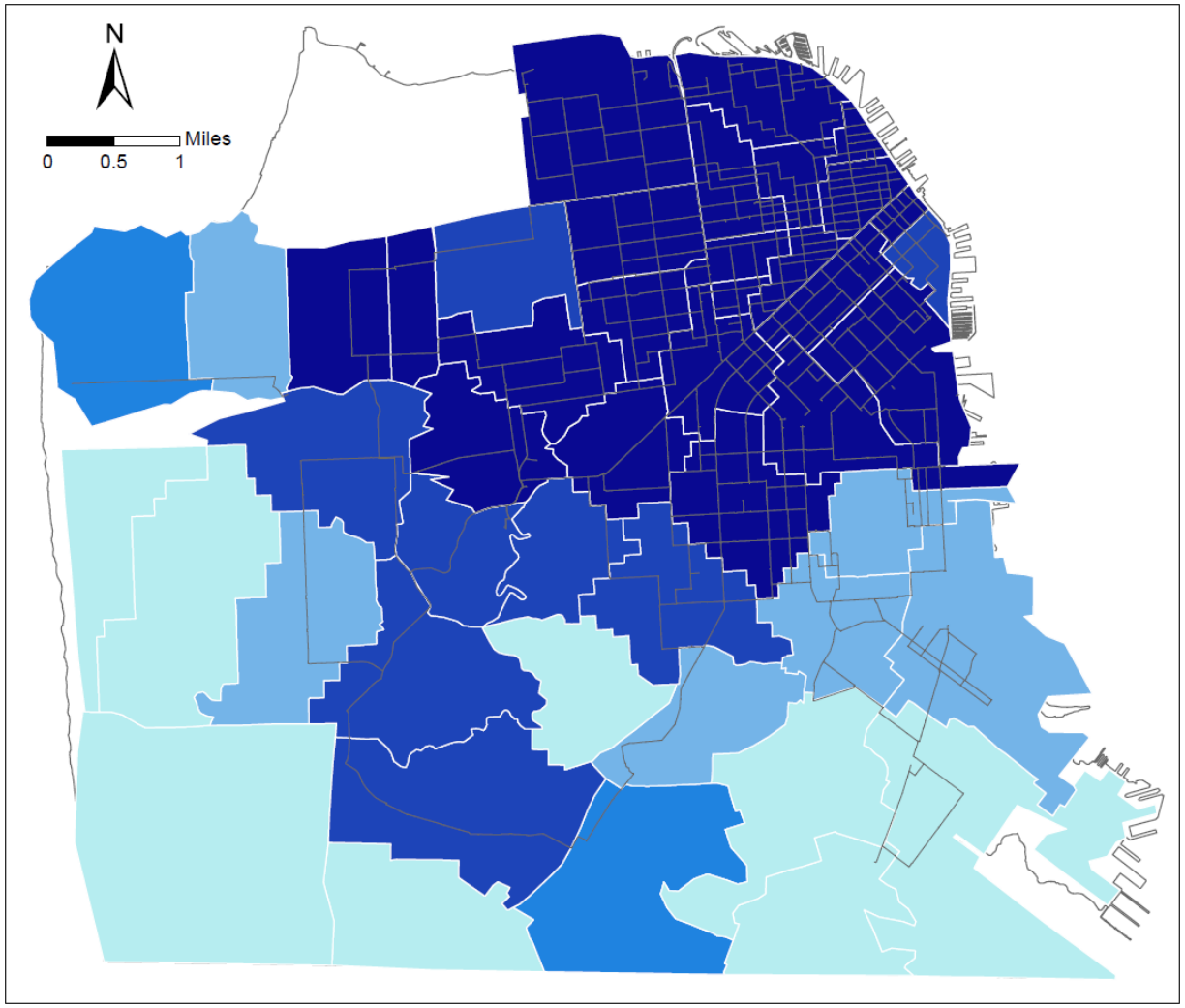

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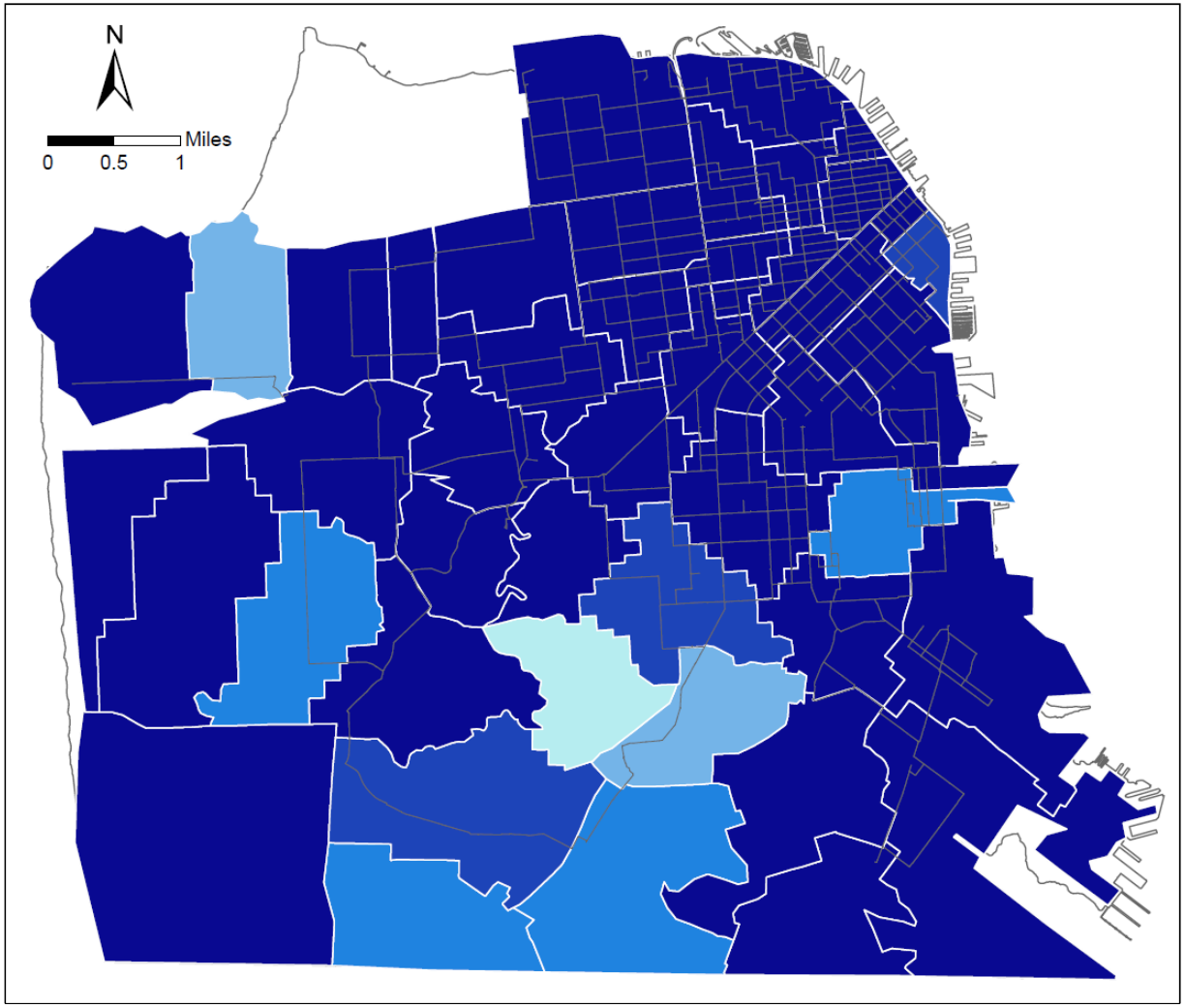

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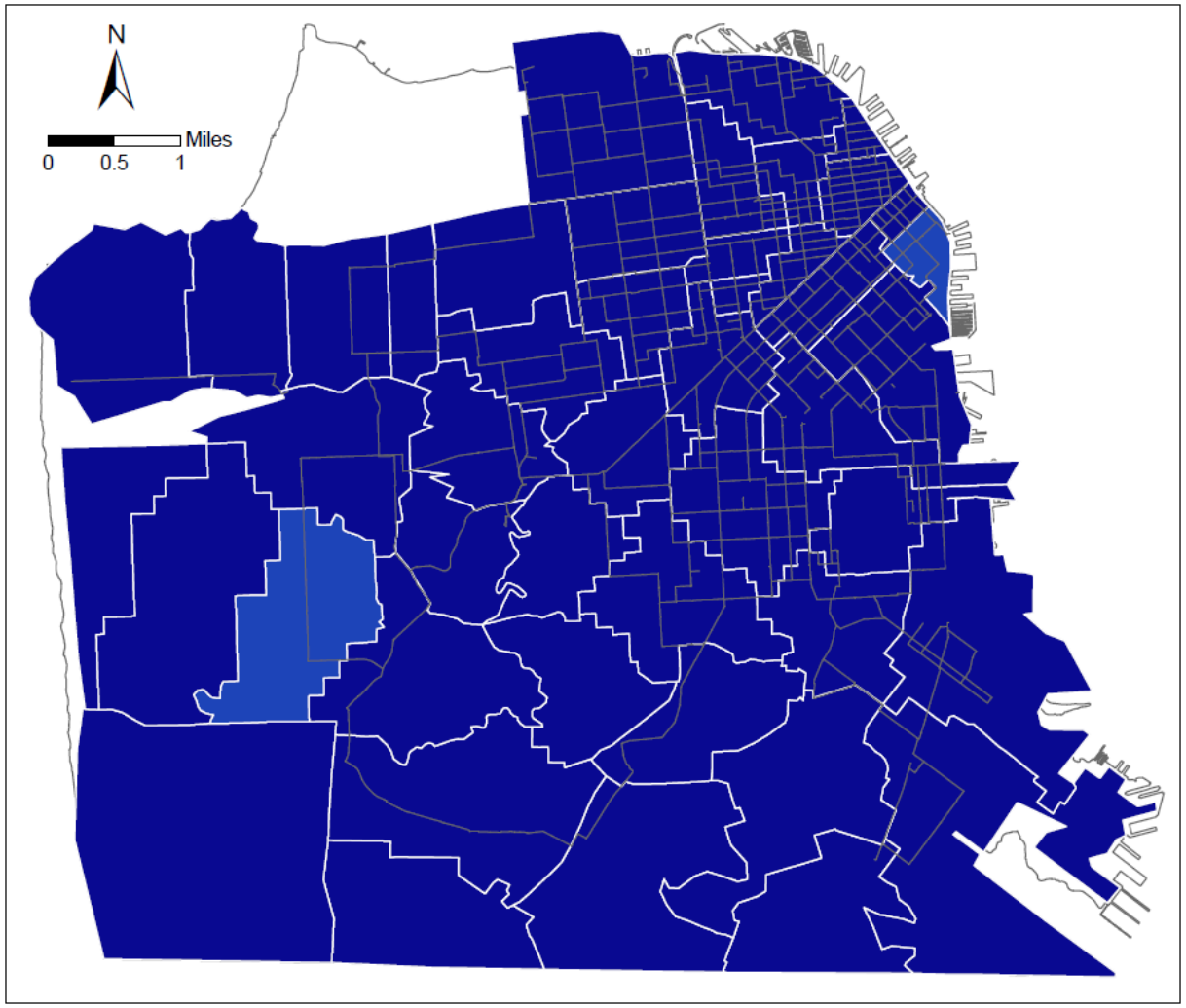
Fire-Fighting Reliability – after Future Projects



Citywide reliability 96%

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Discussion