San Francisco
Water
Power
Sewer

Emergency Firefighting Water System Government Audit & Oversight Committee

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March 15, 2017

Supplemental
Item 5

San Francisco Fire Department – Emergency Firefighting Water System

- Partnership with SFPUC for co-managing Emergency Firefighting Water System memorialized in MOU (2015) following transfer to the SFPUC (2010).
- Performance standards formalized:
  - SFPUC maintains engineering standards, seismic performance of components must be same or greater.
  - Other parts of MOU outline coordinated emergency response and maintenance expectations.
  - SFPUC funds 50% of SFFD position to monitor the system.

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SFPUC Management / Stewardship

Enhance readiness of Emergency Firefighting Water System

Work to date:

- Improved operability of Seawater Pump Stations
- Increased storage refill capacity (10 times higher)
- Reduced leakage by 500,000 gallons/day
- Reduced backlog of deferred maintenance
- Capital upgrades / repair with ESER bond funding

Adhere to MOU requirements related to system, operations & maintenance, performance specifications, etc.

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SFPUC Management / Stewardship

Inventory management:

- Ensure availability of components to accommodate expansion and development.
- Immediate availability to conduct repairs.
- Refurbish/re-use older inventory when possible.

Design standards:

- Updating standards with oversight by 3rd-party seismic experts.
- Same or better design criteria.
- Increase available suppliers.
- Eliminate use of pipe connectors utilizing lead.

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Bond Funding

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

- 2014 ESER bond measure approval included $55 million for system

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Technical Advisors

- ESER 2010
  - Thomas O'Rourke, Cornell University
  - Charles Scawthorn, U.C. Berkeley
- ESER 2014 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

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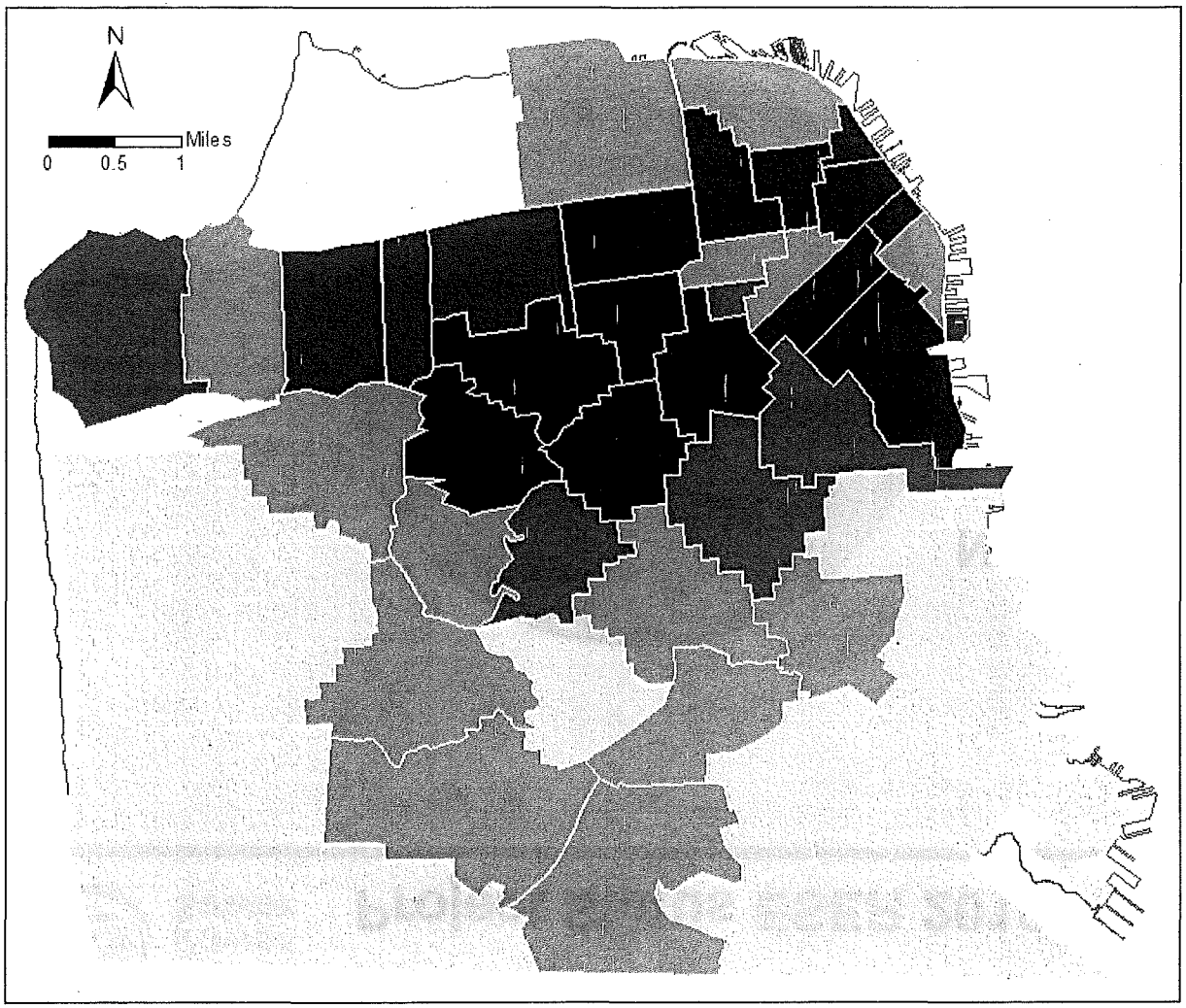
Fire-Fighting Reliability – Before 2010



Citywide reliability 47%

27 FRAs below 50%

Legend

- High
- Low

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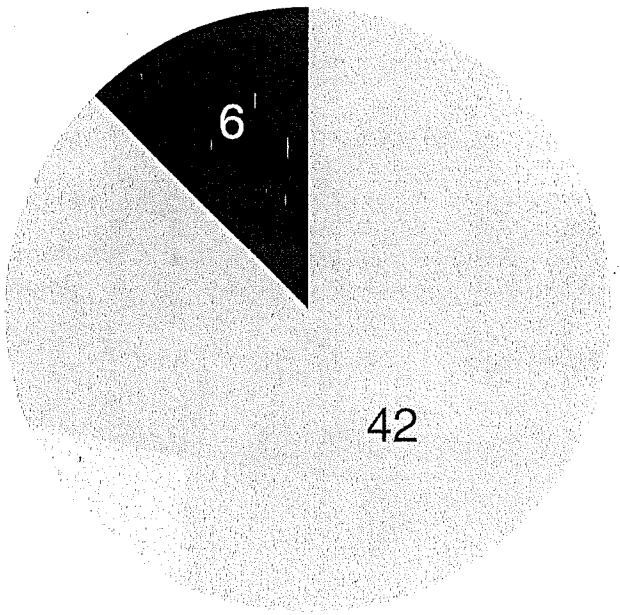
Project Status ESER 2010



Number of Projects

In construction or completed

Design / bid

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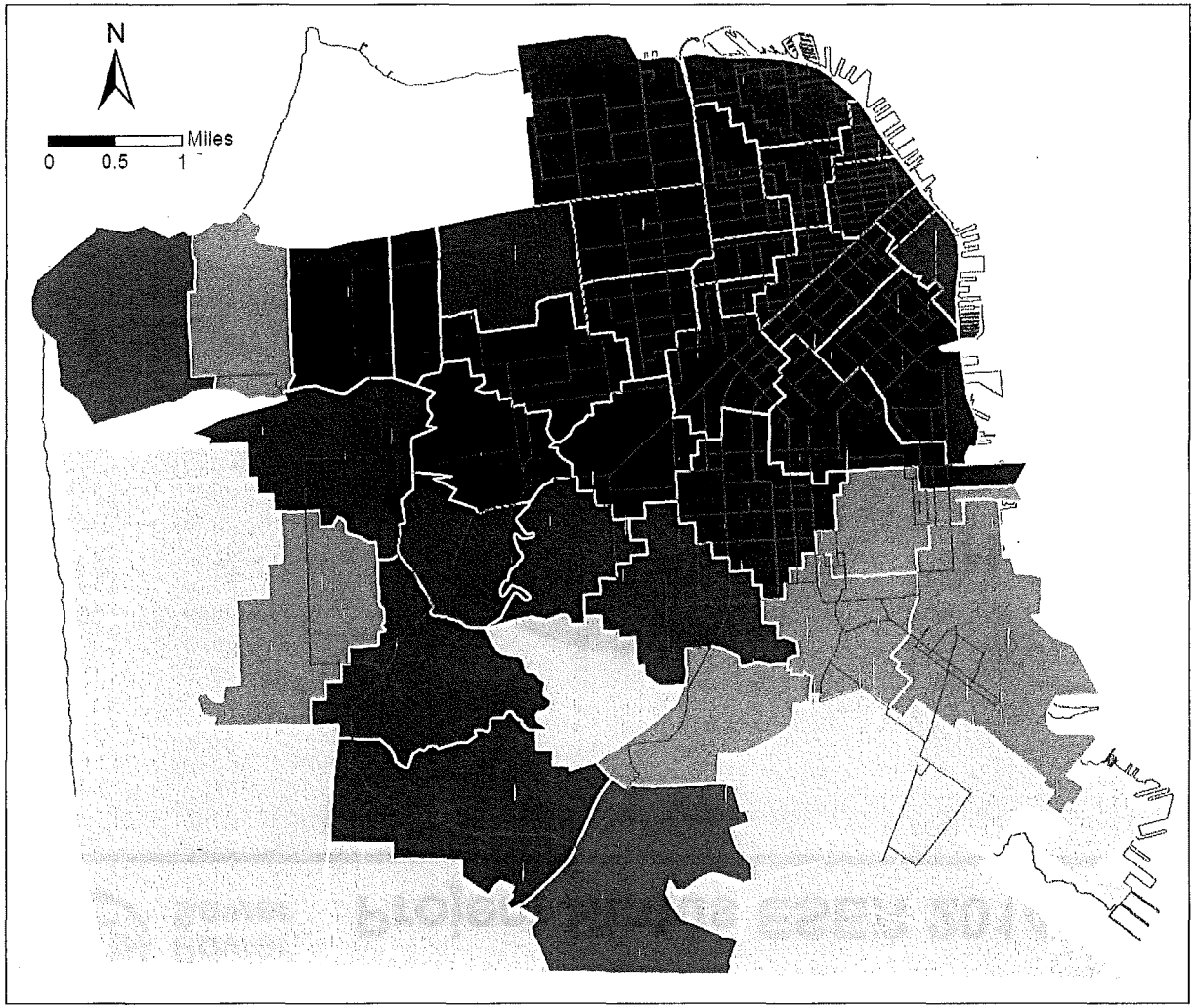
Fire-Fighting Reliability – After ESER 2010



Citywide reliability 67%

16 FRAs below 50%

Legend

- High
- Low

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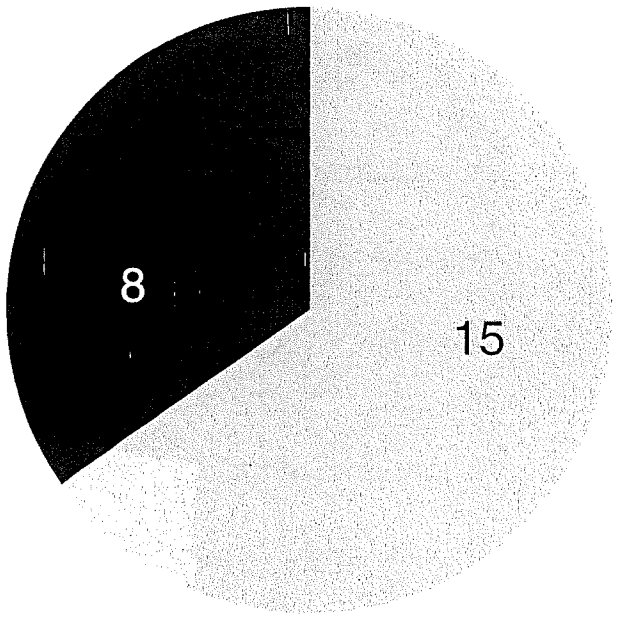
Project Status ESER 2014



Number of Projects

In construction or completed

■ Design / bid

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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

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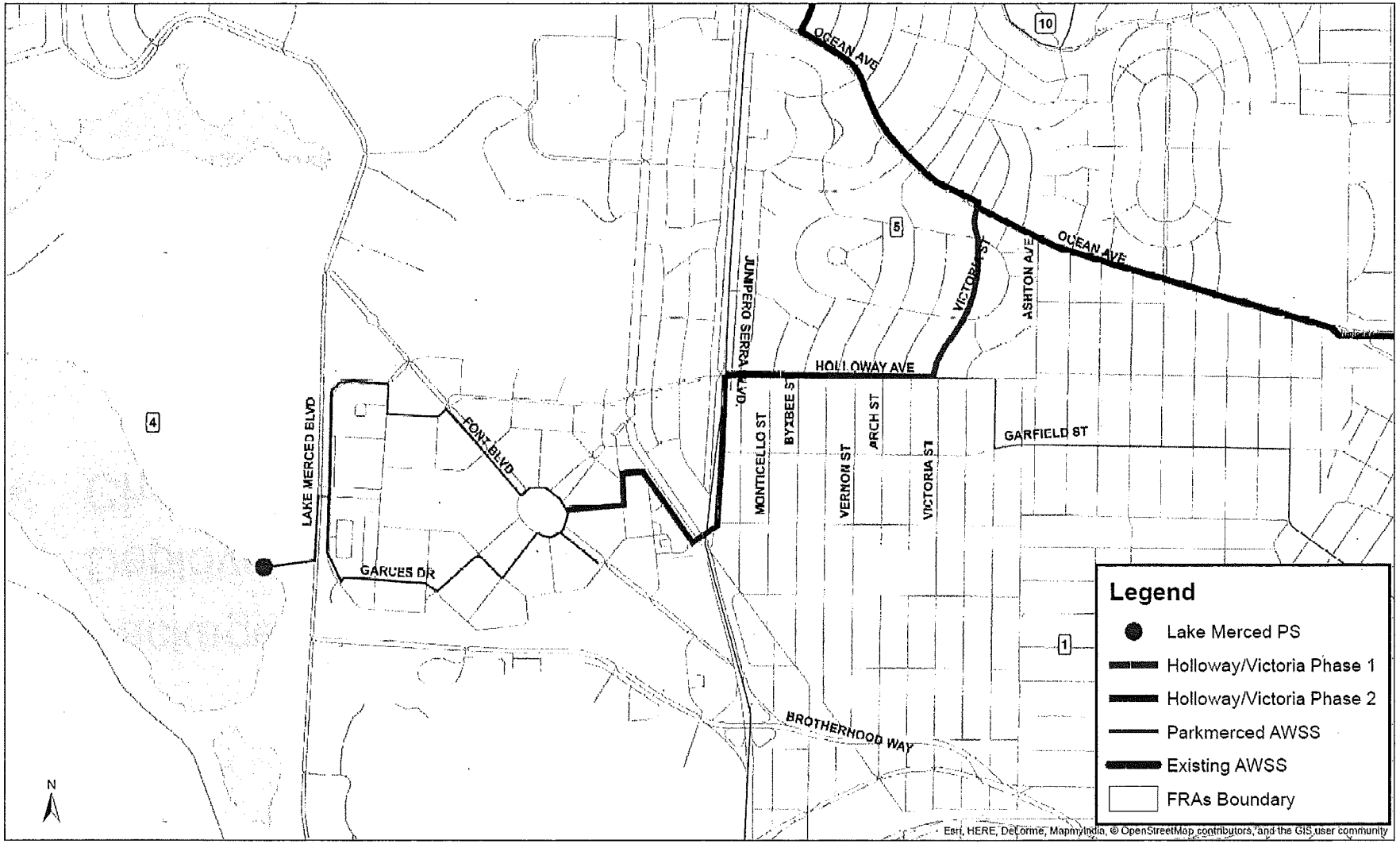
Holloway/Victoria AWSS Pipeline



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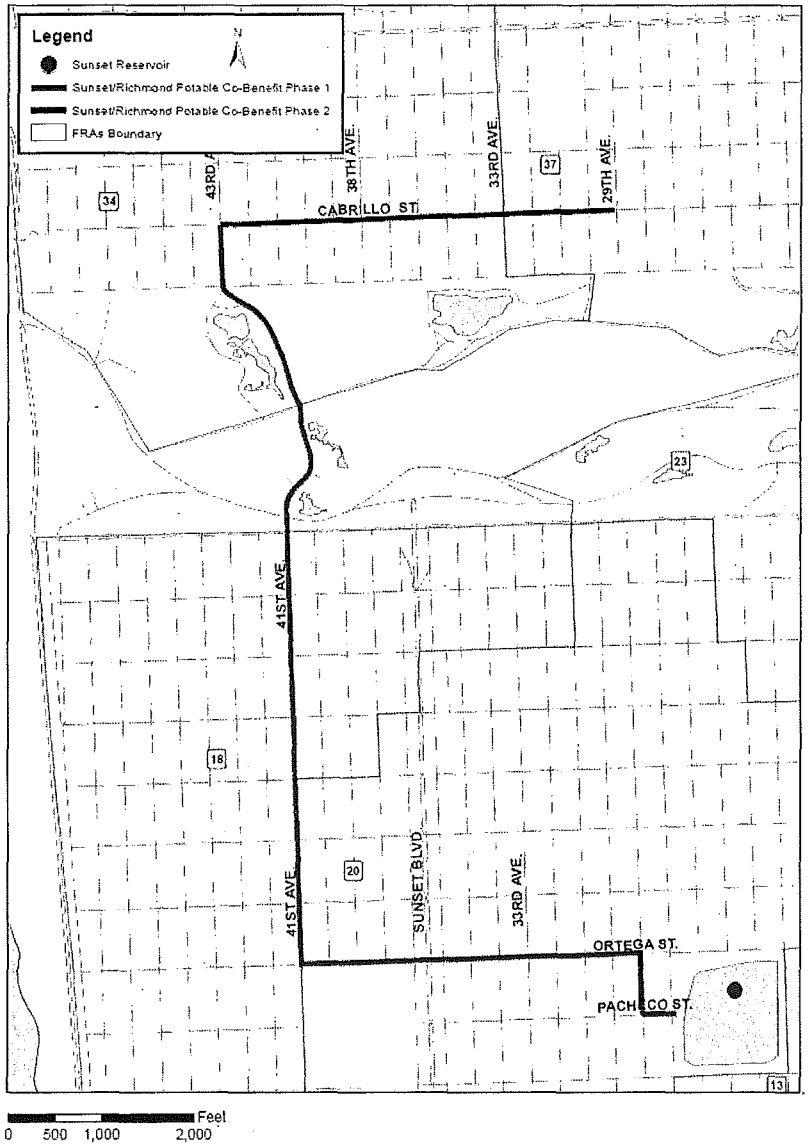
Sunset/Richmond Potable Co-Benefits Pipeline



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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

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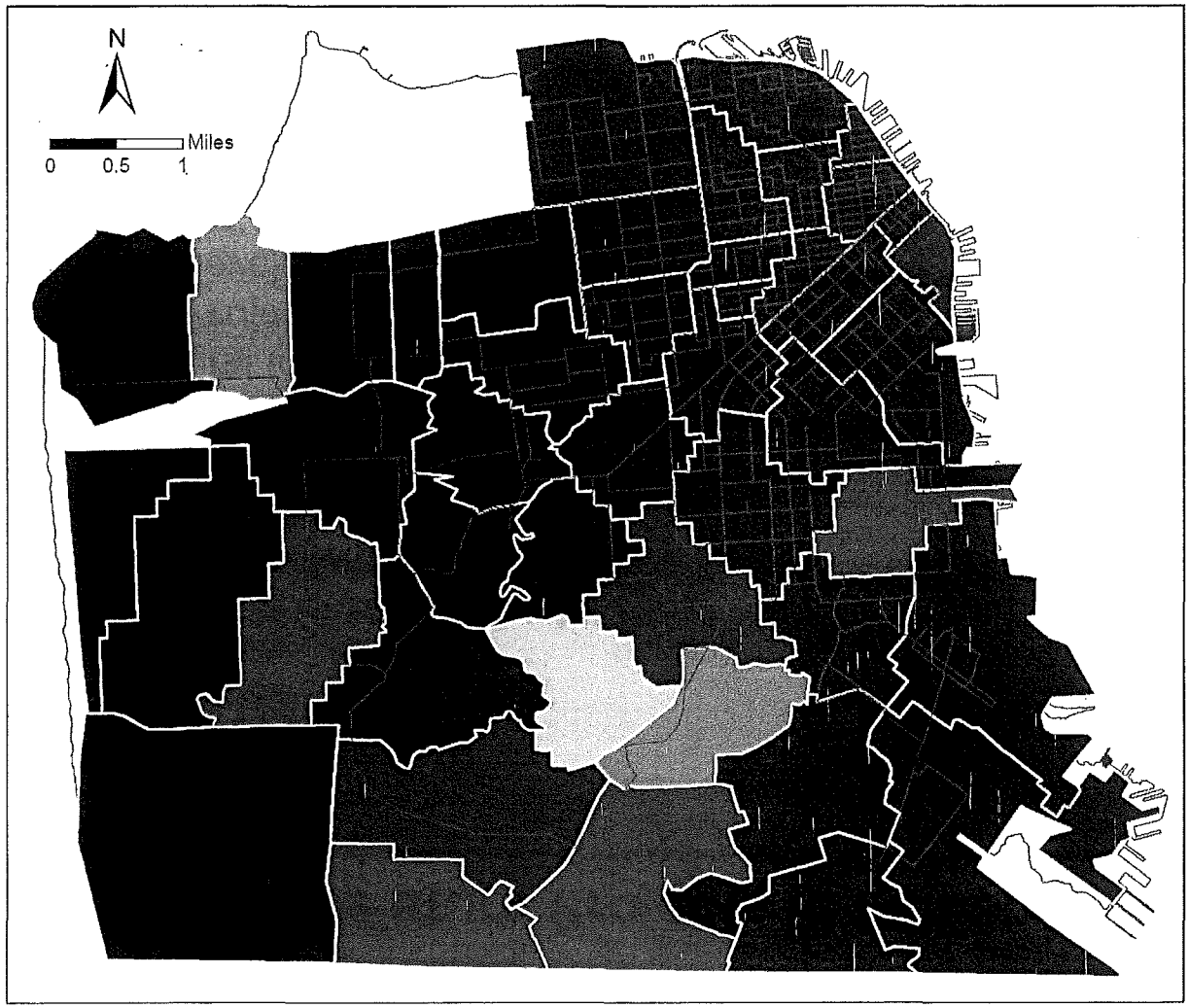
Fire-Fighting Reliability – after ESER 2014



Citywide reliability 87%

5 FRAs below 50%

Legend

High

Low

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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	11			11
Pipeline – University Mound West	11			11
Structural Improvements – Physical Plant	TBD			TBD
Other Projects				
Land development projects	TBD		TBD	TBD
Potable Co-Benefits Pipeline				
McLaren	51	38		13
Richmond	22	16		6
Total	**99 + TBD**	**54**	**TBD**	**45 + TBD**

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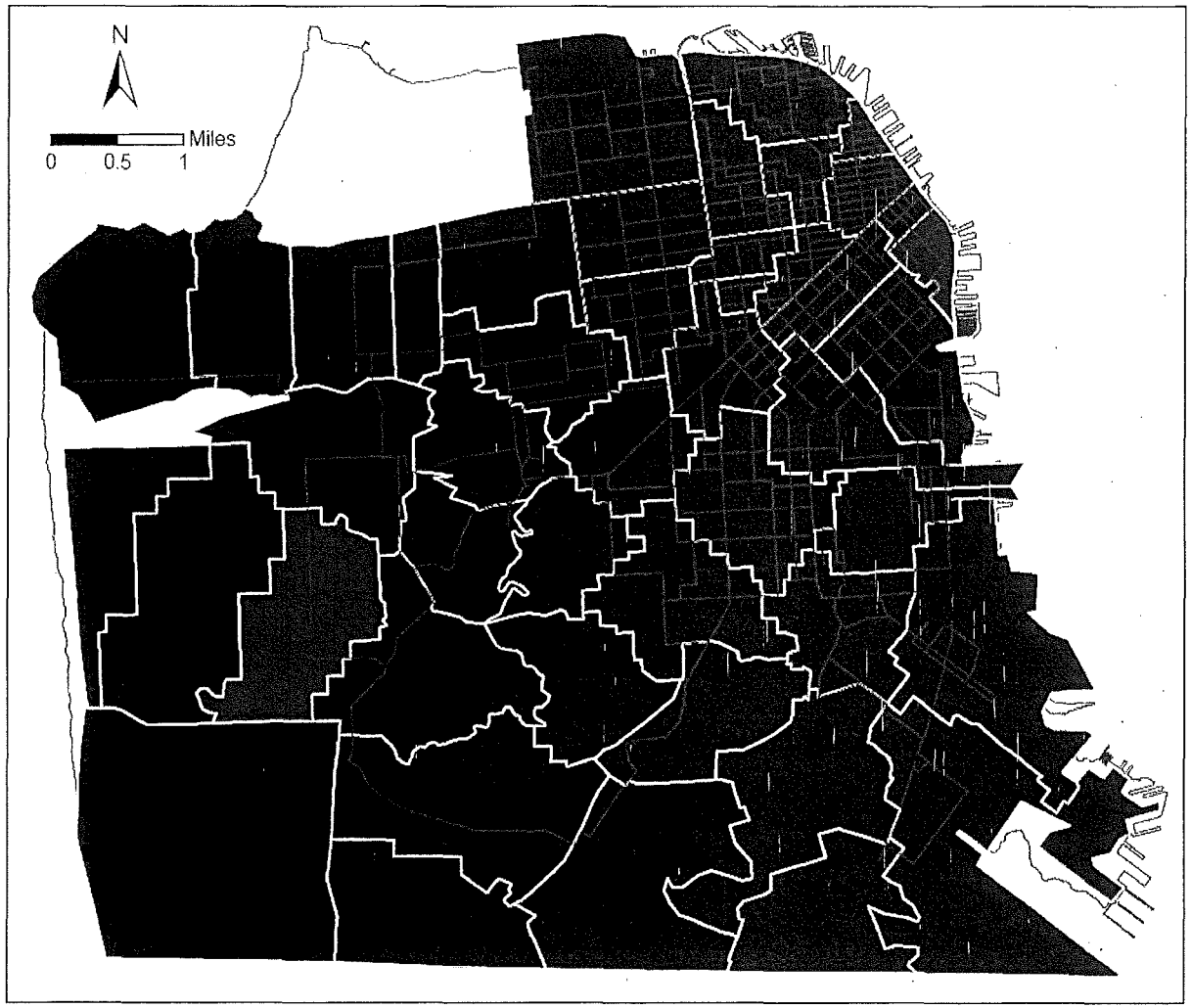
Fire-Fighting Reliability – after Future Projects



Citywide reliability 96%

0 FRA below 50%

Legend

High

Low

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Questions?