



# OFFICE OF THE CITY ADMINISTRATOR



Gavin Newsom, Mayor  
Edwin M. Lee, City Administrator

City and County of San Francisco  
Citywide Post-Disaster Resilience and Recovery Initiative

## LIFELINES COUNCIL

Wednesday, October 14, 2009  
2:00 PM – 4:00 PM  
City Hall Room 305

*Lifelines are the systems and facilities that provide services vital to the function of an industrialized society and important to the emergency response and recovery after a natural disaster. These systems and facilities include communication, electric power, liquid fuel, natural gas, transportation (airports, highways, ports, rail and transit), water, and wastewater.*

*- American Society of Civil Engineering Technical Council on Lifeline Earthquake Engineering (TCLEE), 2009*

### CO-CHAIRS

**Edwin Lee**  
City and County of San Francisco  
City Administrator  
General Services Agency

**Chris Poland**  
Chair, NEHRP ACEHR  
Co-Chair, SPUR Resilient Cities Initiative  
CEO, Degenkolb Engineers

### REPRESENTED AGENCIES

AT&T  
BART  
California Public Utilities Commission  
CALTEL  
Caltrain  
Caltrans  
Comcast  
Department of Emergency Management  
Department of Public Health

Department of Public Works  
Department of Technology  
General Services Agency  
PG&E  
Port of San Francisco  
Recology  
San Francisco Airport  
San Francisco Fire Department

San Francisco Municipal Transportation Authority  
San Francisco Police Department  
San Francisco Public Utilities Commission  
SPUR  
URS  
Verizon Wireless  
Water Emergency Transportation Agency

## LIFELINES COUNCIL MEETING NOTES

### 1) Welcome and Introductions

*Edwin Lee and Chris Poland, Co -Chairs*

*Opening Remarks by Edwin Lee, City Administrator*

*What is the definition of Lifeline?*

Lifelines are the critical utilities essential to the City's ability to recover and restore in an accelerated fashion after a catastrophic event: water, sewage, transportation, gas, electricity and communication systems. These are the infrastructure and related resources required to restore business and services in the City.

*What is the Lifelines Council?*

The Lifelines Council is composed of representatives from those agencies critical to the recovery and restoration of the City. The Council seeks to accomplish the following objectives:

- Develop and improve collaboration in the City and across the region
- Understand inter-system dependencies to enhance planning, restoration and reconstruction
- Share information about recovery plans, projects and priorities
- Establish coordination processes for lifeline restoration and recovery following a major disaster event.

We shall confer, share information and ideas and collate data that provide the basis for coordinated response that will hasten the recovery, restoration and viability of our city. Our collective recovery goal is set in weeks and months. This Council represents the beginning of the conversation.

The San Francisco Lifelines Council is a passive meeting body pursuant to Administrative Code Section 67.4.

## 2) *Citywide Post-Disaster Resilience and Recovery Initiative*

*Edwin Lee, Co-Chair  
Heidi L. Sieck*

The Lifelines Council is a priority project of the Citywide Post-Disaster Resilience and Recovery Initiative (Recovery Initiative), a new program launched by the General Services Agency (GSA), Department of Emergency Management (DEM) and the Office of the Controller in partnership with the Harvard University Kennedy School of Government. The Recovery Initiative launched in August 2009 to identify and implement strategies, projects, plans and programs that will accelerate post-disaster, long term recovery and reconstruction. Organized in a standard Program Management structure, the Recovery Initiative has identified over seventy-five (75+) projects that will enhance emergency procedures already in place and determine what other elements will be necessary to begin the recovery after a disaster. For example, we discovered that the Controller, immediately after a disaster, should fly to New York to tell the world wide financing companies that San Francisco is recovering, and will be back in business quickly. This is a lesson learned from New Orleans.

The Recovery Initiative also considers the issue of governance. Who are the decision-makers after the event? Are the decisions being made quickly and efficiently? In the context of governance, decisions will need to be made with regard to rebuilding through partnerships in the Lifelines Council, e.g., what to expect in order to restore utilities and services as soon as possible.

### *Recovery Initiative Objectives*

- I. Focus on advance recovery - identify and implement programs, processes, practices, policies and ordinances before a major destructive event that will accelerate long-term recovery efforts.
- II. Develop and maintain a Program Plan that serves as comprehensive roadmap for accelerated post-disaster recovery and reconstruction.
- III. Align programs, processes and projects with the General Plan, Community Safety Element, All-Hazards Strategic Plan Target Capabilities List and other applicable regulations.
- IV. Implement programs, processes and projects that enable all public- and private-sector entities to contribute to post-disaster recovery in a productive and efficient way.
- V. Incorporate requirements from interested and affected communities to ensure that recovery efforts are culturally competent and inclusive of economic segments living, working, visiting and doing business in San Francisco.

### *Scope and Program Plan*

The Recovery Initiative seeks to identify projects, programs, legislation or other activities, either existing, in progress or proposed, that meet the objectives of advance planning and accelerated post-disaster recovery. The Recovery Initiative will support these efforts and initiate projects as directed by the Program Steering Committee and authorized in the Program Plan. The current Program Plan includes over seventy-five (75) projects and activities to better prepare San Francisco to recover.

The Lifelines Council is Priority #1 in the Infrastructure category of the Recovery Initiative Program Plan. For additional information or copies of the Program Charter or Program Plan, contact Heidi Sieck at [heidi.sieck@sfgov.org](mailto:heidi.sieck@sfgov.org).

### 3) *The Resilient City - Role of Lifelines in Resilience*

Chris Poland, Co-Chair  
Chris Barkley, SPUR Resilient City

San Francisco Planning and Urban Research (SPUR) embarked on a comprehensive Resilient City planning initiative that seeks to establish recommendations for pre-event mitigation, emergency response and recovery efforts. Much of the Recovery Initiative is based upon this great foundation. The Lifelines Council is one of the primary recommendations of the Resilient City Initiative.

#### *Overview of Resilient City Initiative*

*How much damage can a city endure?*

San Francisco 1989: Moderate-sized earthquake; the City' response worked well. The city went back to work and recovered quickly. But in a larger sized earthquake, this would not be the case. We must expand our perspective so that the minimal damage to San Francisco, caused by Loma Prieta does not lull us into a false sense of security.

New Orleans 2005: The city was devastated and is still struggling to rebuild.. New Orleans lost infrastructure because it could not restore the neighborhoods, and people could not return to work. The businesses that relocated could not jump start the economy because the workforce was gone. Major medical institutions moved out along with other industries never returned. We do not want this to occur in San Francisco.

China 2008: The earthquake destroyed whole cities and many buildings were unusable. The solution was to move twenty miles away and completely rebuild immediately. This can be done in China but not here.

L'Aquila 2009: The construction goes back almost 1000 years with great engineering and sustained little damage. The buildings were in good shape, industries started back up easily and lifelines effectively were restored. However, 70,000 people left and only 10,000 people returned because the majority of residents feared for their safety.

#### **SPUR Resilient City - Part I**

*(excerpt from paper)*

The SPUR Resilient City paper was distributed to all members and attendees of the Lifelines Council and can be found at <http://www.spur.org/disasterplanning>.

*When is a building safe enough?*

- Before a disaster we have to work on mitigation policy – things we can do to minimize impact
- Refine disaster planning so that we can respond effectively during a disaster
- After a disaster, rebuild San Francisco
- This is what the Lifelines Council and Recovery Initiative address

*What is seismic resilience?*

- Ability of contain the effects of the earthquakes, not eliminate it
- Ability to carry out recovery activities in a way that minimizes social disruption
- Ability to rebuild in way that was mitigated before the earthquake
- Ability and resources we need to recover as quickly as we need to

*Phases of Recovery*

- Phase 1: 1-7 days: response and construction
- Phase 2: 7-60 days: workforce housing restored
- Phase 3: 2-36 months: long term reconstruction where most of the city is rebuilt

*Target states of Recovery for SF Building and Infrastructure*

- A. Safe and operational – hospitals, fire stations, police stations, lifelines etc
- B. Safe and usable – neighborhoods, doctors offices, schools etc.
- C. Safe but not repairable – industrial, commercial buildings

*Upgrading lifelines to ensure SF earthquake resilience - Complexity of these lifelines are a challenge for the City*

- Lifelines are complicated and interdependent
- Absolutely essential for response and survival
- May have financial resources but little progress because of complexity issues
- Need restoration planning
- Inability to plan takes longer recovery time
- Reduce financial issues upfront
- Increase the potential for recovery by ensuring backup systems

*Potential Risks to Lifelines*

- Ground shaking, liquefaction zones, linear components (pipelines)
- Lifelines may be displaced or closed due to landslides
- Additional hazards associated with national gas systems

*Challenges for Establishing Resilience*

- No commonly understood standards for performance
- Many lifelines are independent and have unique standards for restoring particular service
- Lack of coordination between and among sectors
- Disincentives to collaborating to resolve problems - federal and state regulations that discourage collaboration
- General public does not always understand risks and implications of failure.
- Different calculated expectations for lifelines: utilities, power, roads etc. all have different standards and priorities.

PROPOSED TARGETS FOR THE CITY'S SEISMIC PERFORMANCE GOALS									
SERVICE	WHEN RESTORED								
	4 hrs	12 hrs	24 hrs	72 hrs	30 days	60 days	4 mos	36 mos	36+ mos
85% of residents back in their homes	N		E					⊗	
95% of residents back in their homes		N	O		E			⊗	
100% of residents back in their homes					N		O E		⊗
Medical provider offices		N			O	E		⊗	
Schools back in operation		N			O E		⊗		
90% of neighborhood retail services		N			O	E			⊗
50% of offices and workplaces back in operation	N						O	E	⊗
95% of neighborhood retail services		N					O E	⊗	
All businesses open					N		O E	⊗	⊗

Source: SPUR analysis

Targets and estimates of recovery are for the "expected" level of earthquake ground motion.

- O** Overall goal
- N** Goal for new buildings
- E** Goal for existing buildings
- ⊗** Current situation

*How do we define resilience?*

Measure how quickly lifelines are restored

Category 1: 100% services restored in 4 hours (water systems)

Category 2: 100% restored within 48 hours

Category 3: 100% restored within 72 hours

Restored to substantial capability for usage

Ex: 90% services restored to 90% of customers

*SPUR Recommendations*

- Establish lifelines council
- Establish/maintain understanding of potential lifeline performance
- Establish plan for mitigation
- Establish partnerships with real estate and private entities

#### 4) Lifelines Council Case Study Process

Edwin Lee and Chris Poland, Co-Chairs

The Co-Chairs proposed that the structure of the Lifelines Council proceed with the major utilities presenting case study presentations so that other groups can assess how to interact with each other and not make assumptions about preparedness and priorities. Additionally, participants can identify areas of needed support with regard to interaction with government and among each other.

#### LIFELINES COUNCIL CASE STUDY QUESTIONS

What are the agency design standards for their lifelines and services?  
To what criteria does the agency manage its risk – i.e. size of earthquake, performance standards, operational level?  
To what extent do the existing systems meet the current design standards?  
What are the agencies' response and recovery priorities?  
What assumptions do agencies have about the performance and restoration of other lifeline services?  
What do the agencies hope to gain from being a part of the Lifelines Council?

#### *Case Study: San Francisco Public Utilities Commission Interdependencies*

Michael Carlin, Deputy Director

The San Francisco Public Utilities Commission (SFPUC) is a department of the City and County of San Francisco that provides four distinct services: Regional Water, Local Water, Wastewater (collection, treatment and disposal), and Power to municipal agencies (MUNI, SFO, city buildings, etc.). Under contractual agreement with 28 wholesale water agencies, the SFPUC supplies water to 1.6 million additional customers within three Bay Area counties: Northern Santa Clara County, San Mateo County, southern Alameda County.

#### *Lifeline Interdependencies*

The SFPUC system has four primary interdependencies: Water-Power-Transportation-Communication-Fuel Distribution. For example, the upgraded radio system is only effective with charged batteries and power. Regional transportation routes are needed not only for employees to come to work but to able to move equipment to needed location. Fuel is critical for both emergency power and equipment for reconstruction.

#### *Water System Improvement Program (WSIP) and Mitigation Projects*

SFPUC is currently undergoing a massive \$4.3 billion system-wide upgrade to improve backbone of the system. The WSIP includes 40 projects locally including seismic upgrade to reservoirs, rebuilding all pumping stations and pipelines. Additionally, the PUC is working with the Fire Department to finalize a programmatic upgrade to the Auxiliary Water Supply System (AWSS).

#### *Design Standards*

SFPUC selects seismic standards based on service goals which are applied to new facilities and retrofits. Structural performance depends on critical nature of the facility. SFPUC has utilized outside expert panels to define seismic standards with separate design standards for different earthquake events: San Andreas Fault Event, Hayward Fault Event, Calavaras Fault event.

Facilities are divided into three categories: Standard, Important, Critical. Critical facilities *must* operate and survive every event. Recovery and restoration goals are built into all design standards and WSIP projects.

### *Water System Service Goals and Priorities*

Service goals are based on the measurement that an average person uses average of 8 gallons per day (215 million gallons) in normal conditions; 215 million gallons water per day for personal use.

Program level service goals:

Maintain basic service capabilities after an earthquake.

Perform temporary repairs to restore average delivery after 30 days.

➤ Restoration Priorities:

- 1) Firefighting
- 2) Other lifelines – power, transportation, communication
- 3) Critical facilities such as hospitals, mass care facilities, schools
- 4) Residences and businesses

### *SFPUC Assumptions Regarding other Lifelines Providers*

SFPUC expects a temporary interruption of other lifelines, but not permanent. SFPUC strives for initial response self sufficiency for operations using short term backups and contingency plans: material stockpiles, back-up generators, staffing plans, pipe rolling centers. Additionally, SFPUC has additional continuity systems in place that could provide some longer-term support. For example,

- Portable water system including bladders and water bagging equipment.
- Redundant communications - microwave systems and fiberoptic systems
- Backup servers in multiple locations of the region so that PUC can operate water valves from alternative locations
- Cross training personnel for multiple jobs and locations

### *Coordination Through Lifelines Council*

SFPUC hopes to better understand interdependencies of lifelines and how to overcome interdependencies in order to adjust recovery plans accordingly. SFPUC hopes to work jointly to focus on restoration of high-priority services and is committed to collaboration and open sharing of information about these matters.

### *SFPUC Comments and Questions*

What is your biggest fear in a major event?

Some of the pipes in the San Francisco are over 100+years old and the AWSS has resiliency limitations.

Can you bypass other locations to move water through the city?

The system is linear although there is 450 million gallons of water storage (about four days worth) in the reservoirs: Crystal Springs, San Andreas, San Antonio, Calaveras. As another alternative, SFPUC can also pass water back and forth from other neighboring water districts.

Do you have a similar preparedness level for the waste water system?

Wastewater is not as resilient as the water system with the treatments plants built in 1952. There is substantial storage - 200 million gallons – if the plants are disrupted. There is not much redundancy and no interconnections from the east to west parts of San Francisco. A repair system is in place and a capital planning process is in place with a program proposal targeted in the next six months.

## **5) Interdependency Response from Agencies (Discussion)**

All Participants

In response to the presentation of the SFPUC and case study questions presented to Council, attendees then engaged in an open forum on interdependencies, major concerns, effective methods, and expectations:

Comcast - Steve LaBlanc

- Interdependencies with transportation and electricity
- Similar performance criteria set up to meet service levels with 72 hour minimum generators and systems.

San Francisco Water Emergency Transit Authority - Keith Stahnke

- WETA is a relatively new agency focused on emergency coordination. Ferries will be an essential transportation channel and can easily get overwhelmed depending on available transportation routes. San Francisco is in good shape with standards and the number of facilities, but the East Bay has only a few facilities to utilize for ferries to dock WETA is working on improving these partnerships.

Port of San Francisco - Andres Acevedo

- The Port has many challenges with regard to emergencies. The Port has 19 million square feet of property. However, the underlying piers had a use capacity of 80 years and most are older than that - replaced during 1906. There is high liquefaction zones and seawall breach possibilities.

Sunset Scavenger Recology - John Legnitto

- Transportation and fuel are the primary interdependencies.
- A primary concern is health risks from collected debris or refuse.

AT&T - Chris Salked

- AT&T has a comprehensive and long-standing program for response and recovery before, during, and after an event. The company is extensively regulated and requires pre-existing partnerships with other communications companies, FCC and CPUC.
- Interdependencies are power, transportation, fuel and water. Water is both a necessity and a challenge as communications lines can co-exist close to water sources, resulting in flooding and unsafe situation.
- AT&T strives for a 72 hours generating capacity.
- AT&T hopes to communicate to one another about needs before an event and increase their ability to make requests with local government for services they need.

BART - Rudy Crespo

- BART is heavily dependent on PG&E
- BART has effective emergency service planning including pre-established partnerships and communications lines with Caltrain and MUNI etc.
- BART hopes to gain more of an understanding for customers in this forum.
- BART is designed to withstand 7.0 earthquakes and has been further retrofitted since the Kobe earthquake and other earthquakes.
- BART can partition the system based on what is needed.

CALTEL - Sarah deYoung

- CALTEL is an association of competitive carriers including Level 3 Communications which connects a huge portion of long-distance and internet communications. The networks are very extremely interdependent on all lifeline providers.
- Most customers are businesses but also include critical facilities such as hospitals and medical services.
- Telecommunications companies are required to meet performance standards.

PG&E - Edward Salas, SVP

- Much of PG&E San Francisco service is dependent on infrastructure in the East Bay. Primary restoration issues are connectivity, transportation and distribution.
- PG&E is concerned with how to move people and equipment.

Verizon Wireless - Ken Fattler

- Major concerns include transportation and access to locations (including City's permission) to conduct repairs on public and private property. Key is to get permission from various entities ahead of time.

## **6) Lifelines Council Structure and Scheduling**

*Edwin Lee and Chris Poland, Co -Chairs*

The Council agreed to have quarterly meeting with presentations from another major utility on plans, measures, and dependencies based on the Case Study Questions.

- Are there any tactical elements to interact with each other in the City? This aspect of working together will be evolving as tactical has largely been handled in the response planning under the Department of Emergency Management. Lifelines Council will evolve as these information sharing needs become clearer.
- We will identify barriers and work to find solutions as we go along. Comfort levels will change as we discuss needs and resolve issues.
- Lifelines Council could divide into working subgroups - telecommunications, power utility, water, etc. based on needed focus or interdependencies.
- Other agencies to consider: Highway Patrol, Red Cross
- Other areas of interest: FEMA reimbursement eligibility for utilities

## **6) Adjourn and Reconvene at the Call of the Co-Chairs**