install automatic gas shutoff valves. In past earthquakes, gas leaks have played a significant role in fueling post-earthquake fires. Automatic gas shutoff valves, either triggered by shaking or excess flow, can play a role in reducing this fire risk.

Recommendation 11: Track evaluations and retrofits in a database system.

The City should include information relating to seismic evaluations and retrofits in DBI's updated database system to allow tracking progress of mitigation activities and recording inventories, evaluation reports and retrofit information.

Recommendation 12: Provide technical assistance for building retrofits.

The City should help residents and building professionals to evaluate and seismically retrofit buildings efficiently and in accordance with City codes. Training programs and other technical assistance can help make retrofitting easier and contribute to high-quality work.

Recommendation 13: Enact a façade ordinance.

An ordinance should require periodic inspection of façades, parapets and decorative features fixed to building exteriors, and require repair of materials found to be falling hazards. Parts of building façades can fall off and kill passers-by during earthquakes or at any time.

Recommendation 14: Promote development and implementation of effective ideas on earthquake risk reduction.

The City should encourage efforts to improve knowledge relevant to San Francisco about building performance and effective ways to reduce earthquake risk. Knowledge about earthquake risk reduction is developing rapidly from ongoing research, retrofitting experience, and studies following large, damaging earthquakes.

Recommendation 15: Evaluate measures to reduce post-earthquake fires.

Multiple City departments should work together to evaluate and implement measures to reduce fire ignitions and spread, and improve fire suppression capacity following earthquakes. Fires triggered by earthquakes pose a serious risk that transcends City departments.

Recommendation 16: Address the hazards from damage to building systems, appliances, equipment and non-structural building elements.

Damage to building systems, such as fallen ceilings and fixtures, broken pipes, and overturned equipment, cause serious problems in every earthquake, including deaths, greatly increased economic losses, and making buildings unusable. DBI should initiate a comprehensive program to encourage, and in some instances, require measures to reduce these hazards.

Recommendation 17: Periodically assess progress and implementation of these recommendations.

The preceding sixteen recommendations in this report call for significant new policies and programs to improve the earthquake resilience of San Francisco's building stock. The City should commission an assessment at least every five years to review progress and the consequences of the resulting program and to make recommendations for improving seismic programs.

This plan is a call to action to invest in the City's future. San Francisco will always have earthquakes in its future, but with foresight and effort, the consequences of

Table 1 Recommended Actions Categorized By Mitigation Objective

Recommended Mitigation Actions	Objective				
	(1)	(2)	(3)	(4)	(5)
1. Require evaluation of all wood-frame residential buildings of three or more stories and five or more units, and retrofit of those that are vulnerable to earthquake damage.	X	X	X	X	X
2. Inform the public of risks and ways to reduce risk.	X	X	X	X	X
3. Adopt updated code standards.	X	X	X	X	X
4. Require all buildings to be evaluated for seismic risk.	X	X	X	X	X
5. Require retrofits of vulnerable buildings.	X	X	X	X	X
6. Assist community service organizations to reach earthquake resilience.		X		X	
7. Establish clear responsibility within City government for preparing for and reducing risk from earthquakes.	X	X	X	X	X
8. Adopt improved post-earthquake repair standards.	X	X	X	X	X
9. Offer incentives for retrofit of buildings.	X	X	X	X	X
10. Require gas shut-off valves on select buildings.	X	X		X	X
11. Track evaluations and retrofits in a database system.	X	X	X	X	X
12. Provide technical assistance for building retrofits.	X	X	X	X	X
13. Enact a façade ordinance.				X	X
14. Promote development and implementation of effective ideas on earthquake risk reduction.	X	X	X	X	X
15. Evaluate measures to reduce post-earthquake fires.	X	X		X	X
16. Address the hazards from damage to building systems, appliances, equipment and non-structural building elements.	X	X		X	
17. Periodically assess progress and implementation of these recommendations.	X	X	X	X	X

Mitigation objectives:
(1) Residents will be able to stay in their own homes
(2) Residents will quickly have access to important privately-run community services
(3) No building will collapse catastrophically
(4) Businesses and the economy will quickly return to functionality
(5) The City's sense of place will be preserved

Recommendation 13: Enact a façade ordinance. An ordinance should require periodic inspection of façades, parapets and decorative features fixed to building exteriors, and require repair of materials found to be falling hazards.

Parts of building façades can fall off and kill passers-by during earthquakes or at any time. Many cities have passed laws requiring regular inspection of façades and other building elements that could fall, and requiring maintenance of deficient conditions. San Francisco should have such an ordinance. San Francisco enacted measures in the 1970's to brace parapets and to prevent exterior building elements from falling on the sidewalks or adjacent buildings. These measures should be extended to address building façades and cladding vulnerable to falling, as many aging buildings have increased hazards due to corrosion and general deterioration.