FINAL TECHNICAL REPORT

Workshop to Promote the Development and Uses of Earthquake Scenarios and Develop Guidelines for Use by Jurisdictions

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TABLE OF CONTENTS

Final Report	1
Appendix 1: Steering Committee	5
Appendix 2: Agenda for Workshop	6
Appendix 3: Workshop Participants	8
Appendix 4: Workshop recommendations from break-out sessions	13
Appendix 5: Proposed structure of the website	46

Workshop to Promote the Development and Uses of Earthquake Scenarios and Develop Guidelines for Use by Jurisdictions

The Earthquake Engineering Research Institute (EERI), under the auspices of the National Earthquake Hazards Reduction Program (NEHRP), received a contract to convene a workshop on earthquake scenario planning. In addition, EERI developed a guidance plan and prototype for the provision of guidance for community-based scenario development and use. As noted in the contract language:

> Earthquake scenarios offer an opportunity to project likely impacts of a specific event on specific geographic areas, focusing on building types and structures, communication and lifelines networks, and population characteristics common to that area. Done well, they can be powerful tools, serving as a force for political change, and generating new policies and programs to mitigate the impact of future earthquakes. They provide a conduit from research to application, and offer a vehicle that transforms current scientific and technical knowledge into socially beneficial uses.
>
> To be credible, however, earthquake scenarios must be based on the latest scientific and engineering knowledge. Scenarios have been increasingly recognized as valuable tools to heighten awareness within local jurisdictions at risk from earthquake damage and to provide general guidance for planning and development in order to reduce risks from future earthquakes.

A steering committee (Appendix 1) was created to develop the workshop structure, identify workshop participants and suggest techniques that would be effective in promoting the further development of scenarios. The workshop was held in San Francisco on September 17/18, 2008. Underlying assumptions for the workshop included:

- Scenarios enable communities to improve their understanding of earthquakes and their own specific level of risk. Community leaders and individuals are able to adopt the most appropriate techniques, policies, and programs to reduce their risk.
- Scenarios can provide opportunities to examine alternative futures and stimulate creative thinking about the need for new policies and programs.
- Scenarios should incorporate the latest scientific, engineering and societal knowledge about a region's seismic hazard, building types, lifelines, and population characteristics.
- The process of scenario development can result in greater understanding and improved communication between members of the scientific, engineering, emergency management, and policy communities resulting in a "new community" dedicated to seismic risk reduction.
- Today, we have the ability to integrate science, engineering, public policy, and emergency management with excellent loss estimation programs.

Given these basic assumptions, it was decided that the workshop should bring together individuals who had been involved in the development of recent scenarios with those who were beginning to move forward with plans for their own scenarios, as well as with representatives from communities that were just beginning to consider the possibility of embarking on such a journey. The workshop drew upon the skills that were developed in recent scenario efforts to enable participants to determine the scope and goals of their own

scenarios. It included initial presentations by those who had already developed scenarios and provided guidance on how to gather specific information. The workshop also provided opportunities to share experiences in small groups dealing with scenario organization, leadership, consensus building, administrative support, logistics, ownership, promotion, PR, and fund raising.

See Appendix 2 for the agenda for the workshop, and Appendix 3 for the list of workshop participants.

The presentations on the first morning focused on the experiences of various scenario efforts, while the presentations on the second morning focused on tools that could be helpful to a community in building its own scenario. The break-out sessions focused on four components of the scenario process:

- **Implementing** the scenario (to discuss the purpose of scenario planning, what is it that the scenario should accomplish, what is required in order to best implement a scenario)
- **Launching** the scenario (to discuss what is involved in launching a scenario)
- **Organizing** the Scenario (to discuss organizing the planning effort --schedule, workgroups, leadership, management, funding)
- **Constructing** the scenario (to discuss components of the scenario--earthquake event, estimating damage and impacts, response and recovery, beyond the earthquake, what tools to use)

The group as a whole also discussed how to ensure that a scenario is effective and that it reaches its intended audience.

After the workshop, the notes from each of the break-out groups were summarized and combined (Appendix 4), and used to develop the structure of the website (Appendix 5). It was decided by the group that the website would be the most effective way of sharing information on various scenario efforts and encouraging communication among scenario developers.

The prototype website (www.nehrpscenario.org) lays out scope and goals for communities embarking on their own scenario development process, identifies needed human and financial resources, discusses successful strategies used in previous efforts and provides a plan for the successful completion of scenarios. The guidance, through the website, is available to workshop participants and others who wish to embark on their own community-based scenarios. The website has been developed as a living resource, with the ability to add more scenarios as more are created. Short video clips are interspersed throughout the site to give more of a "live" feel to the points being expressed. The site currently has three scenarios underway and nine major scenarios that have been completed. In addition, there are smaller case studies that are interspersed in the site, including using scenarios for a NEHRP post-earthquake investigation exercise, using scenarios for rebuilding decisions the New Orleans area, and using scenarios as part of the resilient city (San Francisco) and resilient state (Oregon) concept. The most extensive scenario ever developed (the Great ShakeOut in southern California) is described, as well as HAZUS runs for various communities in Utah and Nevada. It is intended that these guidelines will have utility not only in the earthquake community, but will be useful in developing other natural and technological hazard scenarios to guide mitigation efforts.

Further development of the website could create a blog or discussion forum where scenario developers can discuss ideas and issues among themselves. Workshop participants and others will also be encouraged to submit materials as they are developed to share on the site.

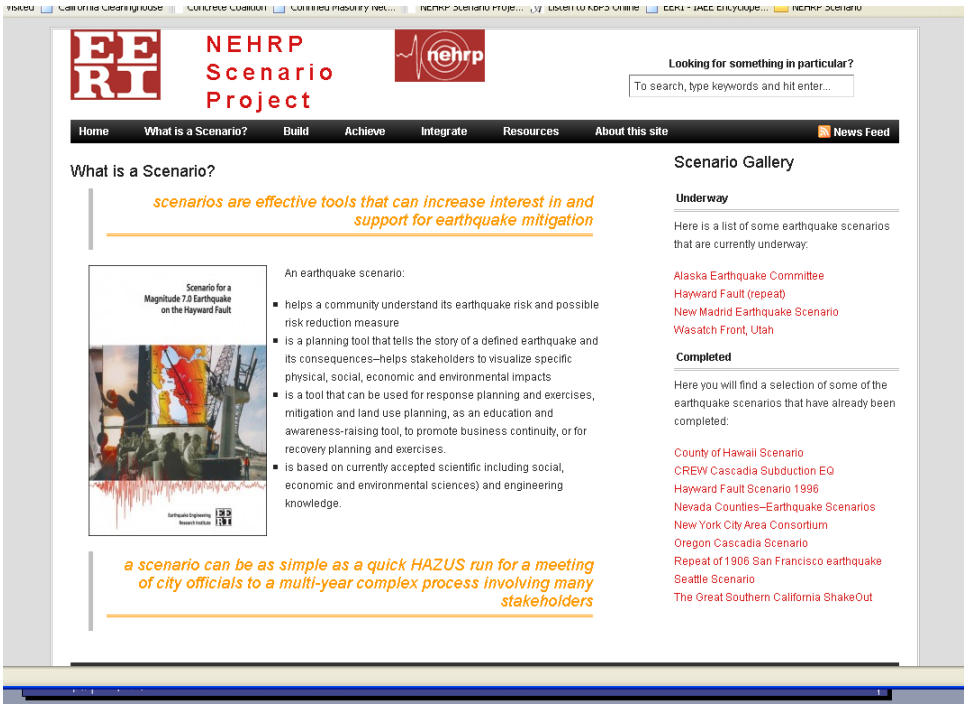

Figure 1: Short definitions and points to remember are highlighted throughout the site.

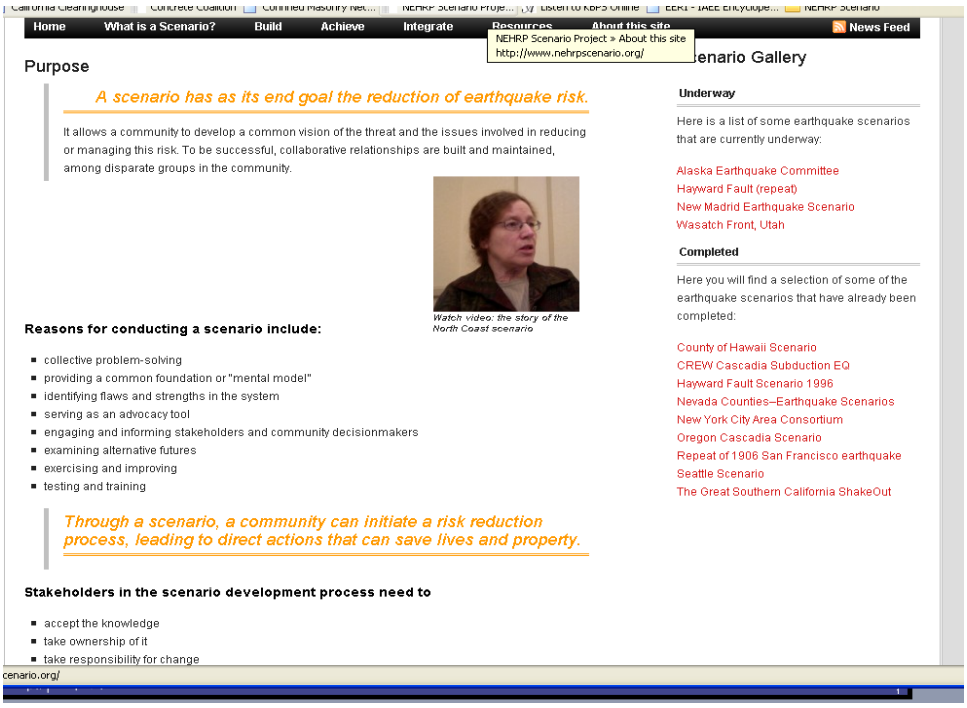

Figure 2: Links to videos are interspersed throughout the site.

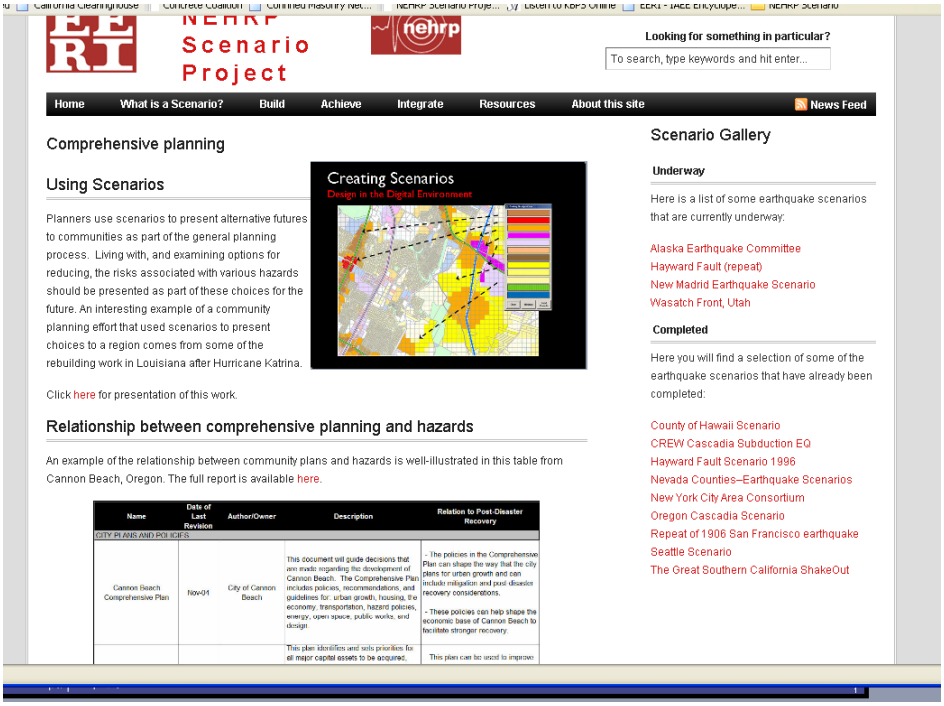

Figure 3: The site reminds communities of how scenarios are used in the planning process.

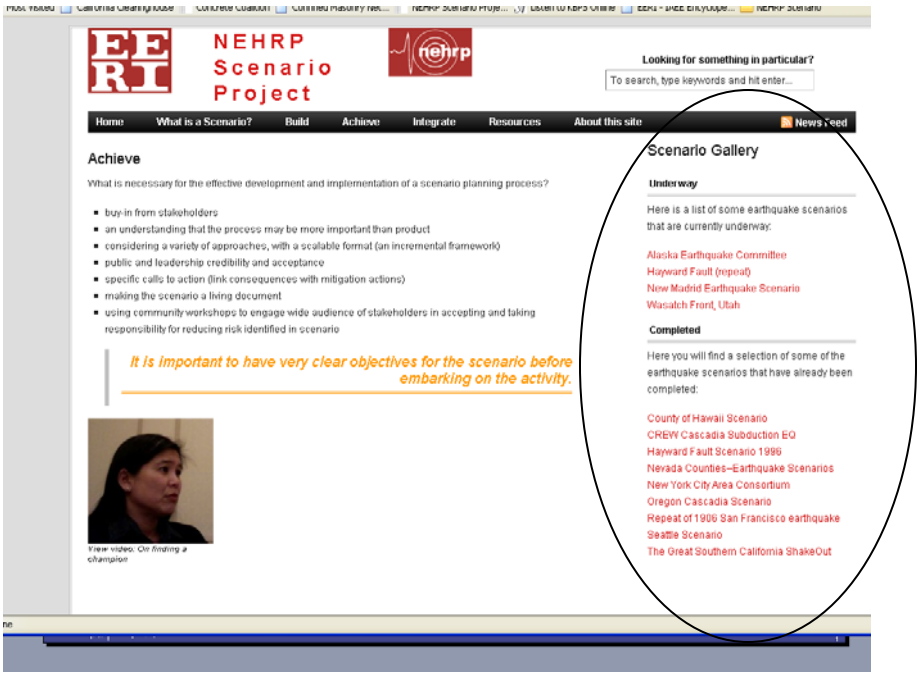

Figure 4: Wherever you are on the site, it is always easy to refer back to the gallery of scenarios underway or completed.

APPENDIX 1

NEHRP Scenario Project Steering Committee

NAME	AFFILIATION
Ivan Wong, Chair	URS Corp
Doug Bausch	FEMA
Rod Combellick	State of Alaska
Rich Eisner	Fritz Institute
John Filson	USGS
Jack Hayes	NIST
Greg Hempen	URS Corp
Andre LeDuc	Oregon Partnership for Disaster Resistance
Elizabeth Lemersal	USGS
Ines Pearce	CREW Board (private)
Mike Reichle	CGS
Hope Seligson	MMI Engineering
Susan Tubbesing	EERI
Yumei Wang	State of Oregon
Barry Welliver	BHW Engineers
Marjorie Greene	EERI staff

APPENDIX 2
NEHRP WORKSHOP:DEVELOPING EARTHQUAKE SCENARIOS

September 17 and 18, 2008

Sir Francis Drake Hotel, 450 Powell St.
San Francisco, CA

AGENDA

Wednesday, September 17

Mezzanine	7:00 am	Breakfast and Registration
Franciscan Rm	8:00 am	Welcome and Introductions
	8:30 am	**Session 1**: **Major Lessons from Past & Ongoing Scenario Efforts** (5 min overview of scenario; positive/negative lessons; partnerships used; resulting changes in risk reduction)
	8:30 a.m.	Repeat of 1906 Scenario (Rich Eisner)
	8:55 a.m.	Seattle Fault Scenario (Mark Stewart)
	9:20 a.m.	Southern California Shakeout (Dale Cox)
	9:50 a.m.	The Oregon Experience—Changing Awareness, Policy & Legislation (Yumei Wang)
Mezzanine	10:20 am	Break
	10:40 am	**Session 2: Major Lessons from Past/Ongoing Scenario Efforts**
	10:40 a.m.	Small Community in Oregon (Tom Manning)
	11:05 a.m.	Catastrophic Scenario planning in the Midwest (Bob Bauer)
	11:30 a.m.	Wasatch Front scenarios (Bob Carey)
	11:55 a.m.	Development of Community Scenarios (Mark Shorett)
Mezzanine	12:20 pm	Lunch
Franciscan Windsor Monterey Cypress	1:30 pm	**Session 3: Designing an Effective Scenario Process—Implementing the Scenario** **Part A**: Break into 4 small groups (see group assignments) to discuss the purpose of scenario planning, what is it that the scenario should accomplish, what is required in order to best implement a scenario
Mezzanine	2:45 pm	Coffee Break
Franciscan	3:00 pm	**Part B**: Reconvene in plenary session—each group reports back, group discussion (including recommendations that could be included in guidelines and/or in web resource)
	4:00 pm	Break
Franciscan Windsor Monterey Cypress	4:05 pm	**Session 4: Launching the Scenario** **Part A**: Break into 4 small groups (see group assignments) to discuss what is involved in launching a scenario
	5:05 pm	Break
Franciscan	5:10 pm	**Part B**: Reconvene in plenary session—each group reports back, group discussion (including recommendations that could be included in guidelines and/or in web resource)
	6:15 pm	Adjourn for day

Thursday, September 18

Mezzanine	7:30 am	Continental Breakfast
Franciscan	8:30 am 8:30 a.m. 8:55 a.m. 9:20 a.m.	**Session 5**: **Useful Tools for Scenario Planning** Earthquake Scenario Simulation using CISN Display (Dave Oppenheimer) U.S.G.S. ShakeMap and Related Real-Time Tools (David Wald) Overview of HAZUS--using default data, user groups, etc. (Hope Seligson)
Mezzanine	9:50 am	Coffee Break
Franciscan Windsor Monterey Cypress	10:00 am	**Session 6**: **Organizing the Scenario** **Part A**: Break into 4 small groups (see group assignments) to discuss organizing the planning effort (schedule, workgroups, leadership, management, funding)
Mezzanine	11:00 am	Break
Franciscan	11:05 am	**Part B**: Reconvene in plenary session—each group reports back, group discussion (including recommendations that could be included in guidelines and/or in web resource)
Mezzanine	12:00 pm	Lunch
Franciscan Wndsor Monterey Cypress	1:00 pm	**Session 7: Constructing the Scenario** **Part A**: Break into 4 small groups (see group assignments) to discuss components of the scenario (earthquake event, estimating damage and impacts, response and recovery, beyond the earthquake, what tools to use)
Mezzanine	2:00 pm	Break
Franciscan	2:05 pm	**Part B**: Reconvene in plenary session—each group reports back, group discussion (including recommendations that could be included in guidelines and/or in web resource)
Mezzanine	3:00 pm	Coffee Break
Franciscan	3:15 pm	**Session 8**: **Strategies for Presenting the Scenario** Plenary discussion**.** How to ensure that a scenario is effective & reaches its intended audience
Franciscan	4:00 pm	**Session 9: Wrap-up Plenary Session**—Brainstorming on Communications Strategy and Next Steps
	5:00 pm	Adjourn

Appendix 3
EERI/NEHRP Workshop on Developing Earthquake Scenarios
September 17-18, 2008
Participant List

John L Aho
CH2M HILL Inc
301 W Northern Lights Blvd Ste 601
Anchorage, AK 99503-2662
907-646-0203

Thalia Anagnos
San Jose State University
San Jose, CA 95192-0205
408-924-3861

Scott Ausbrooks
Arkansas Geological Survey
3815 W Roosevelt Rd
Little Rock, AR 72204
501-683-0119

Don Ballantyne
MMI Engineering
1915 63rd St NE
Tacoma, WA 98422
(253) 952-4512

Robert Bauer
Illinois State Geological Survey
615 East Peabody Dr
Champaign, IL 61820
217-244-2394

Steve Besemer
MO State Emergency Mgmt Agency
PO Box 116
Jefferson City, MO 65102
573-526-9232

Maiclaire Bolton
Provincial Emergency Program
2261 Keating Cross Rd
Saanichton, BC V8M 2A5 Canada
250-952-4891

Oliver S Boyd
US Geological Survey
3876 Central Ave Ste 2
Memphis, TN 38152
901-678-3463

Tom Brocher
US Geological Survey
345 Middlefield Rd - MS 977
Menlo Park, CA 94025
650-329-4737

Bob Carey
Utah Division of Homeland Security
Rm 1110 - State Office Bldg
Salt Lake City, UT 84114
801-538-3784

Gary Carver
Carver Geologic Inc
PO Box 52
Kodiak, AK 99615
907-487-4551

Arrietta Chakos
Kennedy School of Government
"Acting in Time" Advance Recovery Project
Cambridge, MA 02138
510-316-8924

Gary Chock
Martin & Chock Inc
1132 Bishop St Ste 1550
Honolulu, HI 96813
808-521-4513

Gary Christenson
2861 E Morgan Dr
Salt Lake City, UT 84124
801-278-0595

David A Cole
Dowl Engineers
4041 B St
Anchorage, AK 99503
907-562-2000

Rod Combellick
Alaska Division of Geological & Geophysical Surveys
3354 College Rd
Fairbanks, AK 99709
907-451-5007

Mary C Comerio
University of California Berkeley
232 Wurster Hall
Berkeley, CA 94720-1800
510-643-0946

Ken Cooley
City of Rancho Cordova
2729 Prospect Park Dr
Rancho Cordova, CA 95670
916-851-8700

Appendix 3
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September 17-18, 2008
Participant List

Dale Cox
US Geological Survey
3020 State University Dr E
Sacramento, CA 95819
916-278-3033

Craig dePolo
NV Bureau of Mines & Geol
University of Nevada - MS 178
Reno, NV 89557
775-784-6691

Rich Eisner
Fritz Institute
50 Fremont St Ste 1150
San Francisco, CA 94105
510-407-7784

Teresa Elliott
City of Portland Water Bureau
1120 SW Fifth Ave Rm 600
Portland, OR 97204
503-823-7622

Mark Ellsworth
Office of the Governor
4755 SW Griffith Dr
Beaverton, OR 97076
503-526-2656

Tina Faecke
National Institute of Standards and Technology (NIST)
100 Bureau Dr - MS 8630
Gaithersburg, MD 20899
301-975-5911

Johanna Fenton
FEMA RIX
1111 Broadway Ste 1200
Oakland, CA 94607
510-627-7233

John R Filson
US Geological Survey
MS 905
Reston, VA 20192
703-648-6785

Ted Fox
Shelby County
160 N Main Ste 801
Memphis, TN 38103
901-545-4266

Jim Goltz
Governor's Office of Emergency Services
California Institute of Technology
Pasadena, CA 91125
626-356-3810

Paula L Gori
US Geological Survey
908 National Center
Reston, VA 20192
703-648-6707

Nathan C Gould
ABS Consulting Inc
77 Westport Plaza Ste 210
St Louis, MO 63146
314-819-1550

Rebekah Green
Western Washington University
516 High St - MS 9079
Bellingham, WA 98225-9079

Marjorie R Greene
EERI
499 14th St Ste 320
Oakland, CA 94612-1934
510-451-0905

Rich Hansen
Colorado Division of Emergency Management
15220 S Golden Rd - Bldg 70
Golden, CO 80401
303-273-1713

Paul Hardwick
SDSU Research Foundation
5250 Campanile Dr - MC 1933
San Diego, CA 92182
619-594-8992

Jack Hayes
National Institute of Standards & Technology (NIST)
Bldg & Fire Research Laboratory
Gaithersburg, MD 20899-8610
301-975-5640

Victor Huerfano
UPRM - Geology
PO Box 9017
Mayaguez, PR 00681
787-833-8433

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Theresa Jefferson
Virginia Polytechnic Institute & State University
1101 King St Ste 610
Alexandria, VA 22314

Lori King
US Geological Survey
525 S Wilson Ave
Pasadena, CA 91106

Keith Knudsen
URS Corp
1333 Broadway Ste 800
Oakland, CA 94612
510-874-3120

Andre LeDuc
University of Oregon
Community Service Center
Eugene, OR 97403-1209
541-346-5833

Elizabeth Lemersal
US Geological Survey
905 National Center
Reston, VA 20192
703-648-6716

Tom Manning
Tillamook County Emergency Management
5995 Long Prairie Rd
Tillamook, OR 97141
503-842-6238

Matt Morgan
Colorado Geological Survey
1313 Sherman St #715
Denver, CO 80203
303-866-2066

Daniel O'Brien
NYS Emergency Management Office
1220 Washington Ave
Albany, NY 12226-2251
518-292-2468

Dave Oppenheimer
US Geological Survey
345 Middlefield Rd - MS 977
Menlo Park, CA 94025
650-329-4792

Gary L Patterson
University of Memphis
3890 Central Ave
Memphis, TN 38152
901-678-5264

Joy M Pauschke
National Science Foundation
4201 Wilson Blvd Ste 545
Arlington, VA 22230
703-292-7024

Ines Pearce
Pearce Global Partners
5419 Hollywood Blvd Ste C-466
Los Angeles, CA 90027
877-898-9747

Mark Petersen
US Geological Survey
1711 Illinois St
Golden, CO 90401
303-273-8546

Keith Porter
University of Colorado
428 UCB
Boulder, CO 80309-0428
626-233-9758

Jay Raskin
City of Cannon Beach OR
368 Elk Creek Rd
Cannon Beach, OR 97110
503-436-2162

Mike Reichle
California Geological Survey
1605 Falcon Hill Ct
Cardiff-by-the-Sea, CA 92007
916-718-4352

Kevin Richards
State of Hawaii
3949 Diamond Head Rd
Honolulu, HI 96816-4495
808-733-4300

Adam Rose
University of Southern California
650 Childs Way
Los Angeles, CA 90089
213-740-8022

Dale Rose
Fritz Institute
50 Fremont St Ste 1150
San Francisco, CA 94105

John Ruiz
American Red Cross
3901 Broadway
Oakland, CA 94611

Jonathan Salomon
NESEC
1 W Water St Ste 205
Wakefield, MA 01880

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Participant List

415-538-3317

510-595-4471

781-224-9876

Jean Savy
Risk Management Solutions Inc
7015 Gateway Blvd
Newark, CA 94560
510-608-3398

Amy Schultz
NY City Office of Emergency Management
165 Cadman Plaza E
Brooklyn, NY 11201
718-422-8946

Hope A. Seligson
MMI Engineering
2100 Main St Ste 150
Huntington Beach, CA 92648
714-465-1390

Kim Shoaf
UCLA Center for Public Health & Disasters
1145 Gayley Ave Ste 304
Los Angeles, CA 90024
310-794-0864

Mark Shorett
ARUP
901 Market St Ste 260
San Francisco, CA 94103
415-946-1680

Mark Stewart
WA Military Dept
Bldg 20 - MS: TA-20
Camp Murray, WA 98430-5112
253-512-7072

Kate Stillwell
16 Roslyn Ct
Oakland, CA 94618-1945
650-303-7906

Patti Sutch
Western States Seismic Policy Council
801 K St Ste 1436
Sacramento, CA 95814
916-444-6816

Tom Tobin
Tobin & Associates
444 Miller Ave
Mill Valley, CA 94941
415-380-9142

Susan K Tubbesing
EERI
499 14th St Ste 320
Oakland, CA 94612-1934
510-451-0905

Robin Wagner
National Institutes of Health
6705 Rockledge Dr
Bethesda, MD 20892
301-443-5234

David Wald
US Geological Survey
Denver Federal Center
Lakewood, CO 80225
303-273-8441

Yumei Wang
Oregon Dept of Geology & Mineral Industries
800 NE Oregon St Ste 965
Portland, OR 97232
971-673-1551

Anne Wein
US Geological Survey
345 Middlefield Rd - MS 530
Menlo Park, CA 94025-3561
650-329-4263

Barry Welliver
BHW Engineers
13065 South 132 East Ste 210
Draper, UT 84020
801-553-0162

Ivan Wong
URS Corp
1333 Broadway Ste 800
Oakland, CA 94612
510-874-3014

Nate Wood
US Geological Survey
1300 SE Cardinal Ct
Vancouver, WA 98683
360-993-8951

APPENDIX 4

SEPTEMBER 2008 NEHRP WORKSHOP
DEVELOPING EARTHQUAKE SCENARIOS
THE WORKSHOP REPORT

1. DESIGNING AN EFFECTIVE SCENARIO PROCESS—IMPLEMENTING THE SCENARIO.

FLIPCHART Notes

1. Purpose & Audience & What to Accomplish

- to give decision makers info to make decisions →show risk
- broad audience
- have broad project plan→1st step
  purpose
  mission
  steps
- Advertising scenario, then it stops → need to keep momentum once scenario is done
- No one purpose
  awareness
  priorities for reducing vulnerability
  response planning

2. Audiences

land use
e.m.
general public

- use to inspire planning & mitigation all levels
- small scale scenarios can be effective if not available for shake-out level effort
- may need multiple scenarios for extreme & likely events
- frequently occurring event may bring in more participants & succeed better than the BIG one
- small economic impact statements can accomplish awareness, etc.

3.
- starting with simple scenario could serve to benchmark additional data needs
- HAZUS
- e.m. cmty is often audience & used for ex planning
- pre-disaster MT plans & response planning → HAZUS not used for these

- Scenario chosen needs to be credible to local audiences
- Gathering as-is building data can be a long & difficult process

4.
- Presenting data to politicians is vital – they don't want a lot of data & will not ask about uncertainties, so don't wait till data is perfect & complete to use to get political attention
- Follow up after scenario is complete is essential
- Community resilience & critical infrastructure → Oregon focus
- To test pre-disaster planning that has already occurred; can spur locals to review plans on the shelf; or spur locals to develop response plans: adds reality
- Purpose needs to be tailored to awareness level of area in question
- Clear & unified message s/b presented consequences of events sell public & decision makers on M7

5.
- HAZUS vs RVS: which to use?
- Response has been focus→shake map, but decision makers need economic, education, etc. consequences so focus needs to be beyond response & on what decision makers need
- Response tools can be a start to providing info about consequences to appeal to decision makers
- Social scientists, economists needed to provide long-term consequences
- Scenarios inform a set of strategies to reduce future losses
- Scenarios can be used to test existing policies such as flood plain construction limits, evacuation plans should be used more than once to accomplish such testing

6.
- many authors & audiences for scenarios are possible; past developers & users – audiences should not guide how & who scenarios are developed & used in future
- if focus on decision makers be certain to define exactly who so that scenario is designed to educate & persuade to mitigate
- many different tools can provide useful as scenarios (HAZUS, Shake-maps etc.)
- Losses presented in Shake map can be appealing as good info to audiences beyond responders
- Defining hazard & consequences often useful beyond intended audiences
- Science behind scenario or consequences must be defendable but need not be rigorous to be effective

7. These factors will shape complexity, rigor, of scenario & products:
accepting cmty
skeptical cmty
regular EQs
damaging EQs
major EQ
single vs multiple purpose
e.m., plng, decision maker, policy makers

Use for exercises
Planning/mitigation
Policy decisions

Preparedness for actual events
Better sense of what could happen & how to deal with it
Empowering responders, jurisdictions, etc

Engage & inform decision makers
Policy analysis
Preparing for emergencies
Improving community awareness

Put in plain English
Can have more people at your workshop
Don't have to use HAZUS

1. Implementation
- Community involvement
- Stake-holder buy-in
- Compatible team
- Local specifics
- Public credibility/acceptance
- Need "champion"
- Needs to be somebody's "day job"

2. Implementation
- link consequence to mitigation action
- involve policy makers and action options or examples
- keep it simple!
- scientists/engineers etc speak w/1 voice – vet
- long-term time margin

3. Implementation
- specific calls to action <10 reinforce existing needs
- consider scenarios at various levels
- start w/manageable events, plausible, stressing event
- "Living" document, adaptable to new results. Explainable to other participants.

4. Implementation
- scenario should be seen as means not an end
- pub & exercises for focus

- benchmark
- Scenario narrative to give individual response and action.
- WEB resource to follow-up.

1. Purposes
- ID HZ and consequences, should be dispensable
- plan for and mitigate HZ
- mobilizing advocates
- drive exercise
- ID grps (all kinds)
- Uniform loss est.
- Provide basis for policy (actionable)
- Promote resilience
- Vehicle for risk owners, policy makers, pub edu.

2. Purposes
- promote inter & intra state coop
- Interagency & discipline coop
- create mitigation community
- prioritize risk reduction steps
- advance science ID gaps
- improve implementation/application of science

3. Purposes
- ID cascading failures
- clarify response role, responsibilities, resources
- promote spontaneous (public) response
- ID hospital needs
- few purposes

Purpose of scenario planning?
1. Build collaborative relationships in the community
1b. Use as an exercise, expanding community
2. City Planning
3. Promote mitigation (save lives)
3b. Outline the problem
4. Identify the flaws when used in an exercise
5. Serve as an advocacy tool
6. Compelling & credible story telling creditable

7. Provide common foundation
8. Resource planning
9. Engage in formal decision makers
10. Be well prepared
11. Reality check/statistics

What should scenario accomplish?
1. Specific to who is asking the question/answer questions
2. Create new mitigation policies
3. Move public & decision makers to action & ownership/acceptance responsibility
4. Create picture of problem
5. Identify capability limitations
6. Provide view of alt. outcomes
7. Determine areas of success & improvement
8. Testing & training
9. Develop effectiveness/where are the dollars
10. Affect positive change

Don't overthink scenario planning – develop a range/spectrum of scenario iterations

What is required to best implement/develop a scenario?
1. Buy-in (stakeholders)

- Defining stakeholder involvement 2-way street
- Chapter on using scenarios
>variety of approaches
>scalable format (incremental framework)
- Questions emanate re: "acceptable risk" & problem solving options > prioritizing risk consequences
- Defining purpose, scope, define limits of challenges/tests to physical, social systems

Question 1

What is scenario?
1. Provide a common foundation of education/understanding of local/regional risk in order to discuss affects and then propose relevant, effective mitigation measures to reduce risk.
2. The basis for an exercise
3. Test effectiveness of a plan

Top 3 reasons for scenarios
1. Compelling & credible storytelling to public
2. Speed informed disaster reaction
3. Public Safety planning

1. To model & present in simple terms the local hazards presented by EQ threats
2. To engage & educate key stakeholders on these local hazards
3. To serve as an advocacy tool to secure funding & resources for solutions to the hazards laid out in the scenario

1. Help identify & cover basics for the unexpected
2. Build a planning team who will actually work together (familiarity) during an event
3. Use as an instrument to identify shortfalls in protocols & processes

1. Education & awareness to make hazards real
2. Identify weak points in system (i.e. community, infrastructure, economy
3. Initiate a risk-reduction process

1. Planning (city)
2. Plan response to event
3. Mitigation of hazard(s)

1. Expose shortfalls of current system
2. Outline needs through bounding a problem
3. To promote mitigation, advocate for improvement of system (through awareness)

1. Promote mitigation
2. Test existing response plans/infrastructure
3. Build political support for mitigation

1. Communicating risk
2. Implementing policy
3. Mitigating hazards (implementing projects)

1. Develop & share a credible picture of what might happen
2. Build collaborative relationships in the community
3. Provide basis for exercises, funding, legislative change, etc

1. Emergency response & recovery exercising
2. Public awareness & educational materials
3. Urban planning & natural hazard interface

What is required to best implement a scenario?
1. Community buy-in ($$$) from day one
2. Preparedness to deal with problem (ears open, etc)
3. Ability to exercise from it & see what can be changed w/it (mitigation→response→recovery)

1. Clear identification & communication to proper & different audiences
2. Exercise (preparedness & response)
3. Continued monitoring fund updates

1. Interdisciplinary team stakeholder involvement (inclusive)
2. process > product
3. Give results – how to ensure success, co-produce results, continue support of the delivery of information

1. Get buy in from the political apparatus
2. Identify & get participation by one or more high profile champions
3. Be as inclusive & as diverse as possible with all potential stakeholders

1. Audience buy in
2. Inclusive
3. How make positive

1. Audience buy in, inclusive with all potential stakeholders
2. Collaborative effort

1. Buy in of the audience at the start

1. Leadership

1. Partnership (multi-discipline)
2. Participatory

1. Political buy-in & follow through
2. Resource allocation

1. Engagement of stakeholders at all stages of scenario development, rollout & implementation
2. Inclusion of multi-disciplinary experts
3. Inclusion of broad spectrum of public including vulnerable populations

1. Identification of user & their goals
2. Understanding of legal, political, economic, and social context of implementing & advocating change

1. Buy-in from all users by describing results in terms they understand & need

SEE APPENDIX A FOR SUMMARIES FROM GROUP PRESENTATIONS

2. LAUNCHING THE SCENARIO.

FLIPCHART Notes

1. Launching the scenario
- Focus groups (stakeholders) – what do you want? (need)
- Form action groups – task force
- advise politicians of plans
- don't have public "Kick-off"
- helps to have "icon" event – develop plausible event

2. Launch

- Have idea of planning event – Icon?
- contact possible participants
- focus groups
- work through existing EQ safety groups
- policy buy-in/support (businesses)
- Overall leader/manager, admin asst
- Discipline leaders
- Clearly stated goals & objectives

3. Launch

- Detailed planning & budget management
- Detailed what-when-how much
- Detailed deadlines/milestones
- Conflicts of interest?
- Customize to local conditions, politics
- Community as consultants, depends on purpose
- Identify "Choke Points" – iconic risks
- Professional – PR

4. Launch

- Media person on team
- Contact NGO's, Ham Ops, Service Groups
- Requires dedicated core. Sci, Eng
- Societal consequences, surveys SSCS, Econ, Health, Mitigation, response

Question 2

What should scenario accomplish?
1. Create new mitigation programs (actions, money, policies, to save lives)

2. Provide a basis for preparedness development (focus $/energy) create a common perception/framework of the problem.
3. To answer unknowns that policy makers need.

1. Education of public & decision makers
2. Promote mitigation by provide a view of outcomes alternative future/with & without mitigation

1. Common understanding of the problem
2. Identify links
3. Mitigation actions (implementation)

1. Test plans
2. Identify what works & areas that need improvement
3. Practice working together

1. Provide credible base for planning, funding requests, etc
2. Tool to test plans

1. Identify problem areas & shortfalls
2. "Shake out" who should do what, when & how
3. Template for an exercise

1. Response community to handling events
2. Educate public
3. Move policy

1. The audience members should take action
2. Strategies improved
3. A realistic & common understanding

1. Provide a complete picture of the event & related events or at least fully discuss the item to be tested
2. Document assumptions, known errors etc
3. Scientific integrity – buy in from science, utilities, transportation & other infrastructure, medical community etc

1. Determine areas of success & room for improvement in plans, training, education, roles, solutions, policy
2. Affect positive change

1. Reveal connection in disasters unfolding
2. Identify response bottlenecks/capability limitations
3. Support asset allocation advocacy (budget priority)

1. Model range of risks presented by hazard

2. Distill risks into combo of graphs & narrative that are presented in simple & clear manner
3. Be useful to multiple audiences, defined before being written
4. Move public & decision makers to action

1. Community members & officials accept/internalize threats & options to reduce risk
2. Identify weak points in human systems relative to a specific threat

1. Answer the questions ask (or needed) by the user group(s).

Launching the scenario
have the meeting at the capitol
sell the project

What's in it for them?
pre-developed slides
promote scenarios
message consistent across geographic region

Outreach in some areas
public relations
scenario led by people whose job it is – <u>outreach – fulltime job</u>
tap into local pl. process-→
ex. of Hawaii/5 exercises
Seattle-→integrated through pe process at city level
incorporated public works, pl, etc
city event -→
shake out including all people who have to respond
Seattle – look at website
tax residents so have money for mitigation
DMA 2000 – integrate mitigation plans, emergency mgrs
budget – part should be dedicated to <u>follow up</u>
discuss at launch
how to proceed of follow up
get natural (Oregon) hazards plans integrated into community development
tie into mitigation plan
importance of scenario being dynamic
1-2 pg briefing papers
syndicate the risk
sell benefits
have consistent messages

this is the function of govt -
govt funds roads, sewers, stand up on bully pulpit – push public duty & agenda
What can you do w/a scenario
how to engage
give them tools
talk about expense
who to involve – strong leader, should person be paid
champion
marketers – folks who know how to entice people to action
experts
involve dissenters – create process for hearing lots of opinions
what resources required – HAZUS, geog info – crystal ball, shake map, inventory data, interest level among professionals
sources of money – nonprofits
best bang for $
getting accurate geologic, inventory, lifelines descriptions
biggest gaps
human impacts
leader & manager
import to develop a detailed pl & budget document – who is going to do what – how much will it cost
work w/iconic events – like SF 1906 eq or iconic risk – choke point at ??? Pass

SEE APPENDIX B FOR SUMMARIES FROM GROUP PRESENTATIONS

3. ORGANIZING THE SCENARIO.

FLIPCHART Notes

1. Organizing the Scenario

Schedule

- don't make planned schedules, especially when using volunteers
- have event that required completion – EQ anniversary, exercise date
- management needs to be able to decide when to compromise on deadlines
- participants scale back or drop out
- scenario has to be part of a larger process or goal
- coordination role
- document should be expanded to include milestones
- work into schedule that it will take longer – 2x estimate

loss database can be worked in parallel w/hazard analysis

- management flexibility key
- make clear assumptions & incorporate into timelines

2.

- be realistic with volunteer time
- document needs
- "chartering meeting" to set expectations
- scalable schedule according to tasks
- timeliness of completion
- goals need to be clearly defined first
- major measurements of success → milestones
- next steps of scenario need to be defined in the overall context of the scenario
- some examples of lessons learned
- difficulties in accomplishing mgmt structure in smaller regions
- recommendations & resources for "bottom up" first-time user
- after action evaluation report to review
- coordinating budget with deliverables
- frequent schedule updates
- changes in schedule from task manager rolled up to p.m.
  include review time, meetings

3.

- archiving project documents – how will that be accomplished?
- include timeline with specific information
- w/increased enhancements, include time estimates
- certain sequencing of tasks important to pull out of schedule
- plan closure and follow up of project at beginning including effectiveness of scenario & assessment
- #2 Workgroups
- major task leaders in subgroups e.g. (utilities) have relationship w/that subgroup
- make goals clear to task leaders → chartering, meeting
- process document for chartering meeting could be included
- include discussion of different types of group organization – non-profit vs government vs volunteer
- include graphics & administrative assistants in the process
- identify contributors & distinguish from users
- examples of tracks – limited scope vs complicated scope w/example timelines

4. Management Team
- task leaders – technical expertise
- project manager – leader of project – vision
- multidisciplinary teams select leader from the teams - one model (vs. top down)
- PM selects team members
- include PR into projects, esp large ones

Budget
- track budget & schedule with hours and product

1. Who to involve in developing? What are required resources? How to build & maintain commitment?
Who

Strong project mgr & champion
pay them, at least part time
lead
keep on track
not necessarily main champion
strong-facilitator
Media star (may not be facilitator too)
external person (to process) w/ recognized identity, credibility, marketer: have from beginning to assure catchy & compelling

Long-term commitment is key

Be respected & credible within community

2. Need to address divergent opinions during development
- Use existing teams – such as seismic safety commission
- Any one agency unlikely to have all experts needed
- Consistence depth of info needed
- New Madrid: MAE Center big DHS funded effort → contractor to gather info
- seismologists
- architect
- engineers
- Social Sciences (econ, business devel, housing)
- Utilities
- Base who on what type of decisions want scenario to result in → goals
infrastructure data can be very difficult to get so need to seek generalities of info

3. Admin support
- GIS
- graphic designer
- recovery experts
- emergency manager for involved jurisdictions

- land-use planner
- health care
- business owners
- team leaders who know who has data & how to get the data

Resources

- HAZUS expertise
- GIS expertise (often not HAZUS savvy)
- Shake Map
- Hazard data
- Crystal Ball – software for range of outcomes
- bldg stock inventory
- interns, others who can dedicate to specific tasks

4. May build core of some component of data first without a larger plan

- expertise to look at community infrastructure & its vulnerabilities

→HAZUS doesn't do this

- volunteer effort can be difficult to develop

- $: zero to use shake map & default HAZUS → needs to be reviewed for appropriation
- grant for geology→NEHRP (USGS)
- year end $ from FEMA Regional office
- funds from non-profit (if not influencing outcomes)
  -pre-existing
  -could be setup specifically for scenario devel with source of funds from corporations & wealthy individuals
- FEMA pre disaster mitigation grants – add geologic mapping w/ MT projects
- educ., outreach funds from insurance co pol
- DHS - response planning
- FEMA – scenario

5. state targeted funds
- in kind from local, state, fed agencies
- Homeland Security grants – annual to states infrastructure eval
- broad definition – can include shelters = schools (be creative)
- Homeland Security special projects grants

Most important data: Hazard, Geology
economic loss
injuries, deaths
hospitals
- Relationships with those that have data is key

- Use funded efforts for other hazards to gather data, then use any funds from other sources to focus on EQ data & scenario development COOP COG

6. Momentum – how to maintain
- project mgr – to stay on task for scenario development
- task leaders with knowledge of field & connected
- need strategic plan to encompass efforts & goals during & after scenario is complete; w/chronology; include how $ & resources, including in-kind, will be sought; recognize
- Client of scenario & beyond e.g. CAPS →Bldg Dept
- Scenario is tool to reach a particular outcome(s) include measures of success, both small & large
- Decision makers will make decisions with or without event consequences, so seek to provide the consequences

ORGANIZING

Who is critical?

depends on purpose
why do you want scenario?
rural vs urban
ex of librarian – key person
familiarity w/all groups
emergency mgmt director
difference btwn vetting & buy-in
who are "opposers"? real estate industry
working grps w/technical experts & policy implementers

2.
different levels of participation
core group pushes
currently discussion "owned" by natural scientists
end pt-resilience of human system-need that leadership
less prescriptive-more performance measures
principles of leadership
framework
to sell something – have to own it
tied to funding
ultimately, political officials responsible
communication & outreach group

3. bring key leaders in at front end
at end – convene day long session to talk through scenario – gets group reflecting on what might happen
end result – to make communities safer
sometimes have no political buy-in at front -
scenario framework must be flexible

dynamic life to scenarios (Craig's ex-NV)
needs to be peer review* - at each stage (can cause delays)
buy-in at beginning – impt for credibility
champion scenario – move it forward – next champions
was it accepted/did it change policy – performance measures

4. Flexibility – use enthusiasm of people you have
advisory cte
issue of scientists & public
hire facilitators (Robin's ex of program)
leadership for scenario-writing-need multidisciplinary
no wrong way to do this *
owner might change over time or multiple owners
ideally bring in everyone at beginning
great opportunities w/mitigation plans
what are the needs of the local community first?
package of ideas – help it acquire following
think strategically
focus on stressors on system

5. political participation early on
time is vital element – takes time to get buy-in
interpret in terms of
- consequences – what does community value
- community resilience
- what can I do?
DHS program on community resilience
Charleston, Memphis
ultimately will certify if community is resilient
opportunities assoc w/ disasters

SEE APPENDIX C FOR SUMMARIES FROM GROUP PRESENTATIONS

4. CONSTRUCTING THE SCENARIO

FLIPCHART Notes

from Group 1. Constructing the Scenario
Components
- EQ magnitude, location, shaking duration, depth
- single or multiple events with description/explanation
- model catastrophic and/or credible EQ
- selection of EQ can still be arbitrary e.g. direction of rupture
- clearly describe choice(s) of event
- use of matrix to prioritize
- development of criteria to select event
- objectives have to convey reason for selection
- hazards should drive scenario development
  "plausible events" – defensible choice
- provide statement about deterministic nature of EQ choice
- blind thrust → use ground motions in region
  still gives credible input

2.
- initial investment in bldg inventory – as more scenarios are run, cost decreases
- planning consequences of modeling plausible event vs catastrophic event
- request state departments to make estimates of damage based on ground motions
- expertise may not be in house
- difficulty of not having bldg inventory & vulnerability curves
- use of comparisons in smaller scale scope with population exposure, schools, e.g.
- inclusive of guidelines for other countries
- insurance companies have data, don't share, non-representative sample, limited EQ insurance coverage

3. Estimating damages & impacts
- important to decide on scale & scope
- sample description of what is easy to do & what isn't
- relationships w/key individuals in key agencies
- time frames for levels of impacts → define user goals
- levels of impacts client-defined
- inclusion of capacity to recover
- damages caused by secondary effects – fire flooding, lost roads/infrastructure, landslides
- accompanying narrative for secondary effects by experts
- complex interdependencies – difficult to quantify
- might only be able to identify secondary effects, not model them

Response & Recovery
- Response better known than recovery
- Recovery long term, few experts
- housing, jobs, transportation, school, healthcare
  networks & interrelationships
- funding relationship

4. – displaced population dynamics not well known
- educating transient populations pre & post event
- identify expertise & outcomes and link them
- identify economic base – whether manufacturing, small business, etc.
- Response – start identifying needs that can lead to pre-packaged mission requests
- Declining populations stressed beyond ability to recover
- Short fall between needs and funding from Presidential Disaster declaration
- Focus on resilience
- Suite of economic strategies <insurance, fed gov, vacancy & poverty rates> how does it affect ability to recover
- Different economic benefits from different size EQ using funding received: Net gain from EQ Benefits
- Impacts may be elsewhere. May be difficult to recover
- Capitalize on current EQs – Have plans on the shelf
- Use competitive advantages
- Personalize the impacts of the scenario
- Alternate approaches – start with community (projected)

Constructing the scenario

Top issue – using credible historical evidence – trigger
Inviting scientists
Use existing inputs – shake maps, hazard maps
HAZUS runs for each community visionary seed/tool
Take advantage of tools – USGS, ANSS
Consider local vs regional. Really want likely event should event mirror current design standards choice of most likely event vs worst case
Mini case studies documented – web sites
Audience determines which to use – worst case (Congress) vs likely to happen (public)
Put scenario in terms of risk to get public to buy-in
Include guidelines on how definitions vary (risk analysis/consequences) be more explicit
May not want to use percentage of change (probability) happening – could be discounted
Ties to audience/purpose
Definitions vary – risk, likely, credible
Include page on how to choose scenario talking points
Emerging managers want something that will test their systems
Different levels of risk acceptance (different perspectives)
Be intellectually honest
Need multi-disciplinary group up front
Make risk relative
Read/teach people about event
Peer review – are these the right systems
Need reality check with tools available
If you want a certain event, make sure you are covering it with correct disciplinary organizations
Real-time assessment, but be sure to include caveats to qualify data

Look at resources available up front
Due to uncertainty, use range of nos.
Can't include just certain kinds of data
Pull-out boxes – think of it from design concept (consider graphics)
Icon for google, data issues
Pros & cons of doing lots/how to mix
Degrees of scenarios
What do we mean by "risk driven" - define up front, not in back of document
Think of scenario development as a "recipe"
Subject matter expert panels
Tools: Redars 2 "REDARS 2" Tool, newspaper, medical community, CATS, different industries
Impacts: Determine whether wealthy or non-wealthy community, political impacts? Gap analysis/need analysis, transportation not nec category under lifelines. What are the constraints? Will guide recommendations.
Model: "STAPLEE" social, technological...
Recovery ordinances (long term)
City of LA/State of Florida examples
Ecological impacts
Small scenarios can lead to big change
Estimate damage impact to understand recovery
Emergency mgmt/business continuity – "new school" of training for emerg. mgrs. emap stds. "NFPA1600" – free download std.
Educate scientists that new programs are leading admin & business continuing functions
Call to Action
Resilient communities invent in advance & reduce recovery
Beyond the EQ – looking for opportunities during recovery phase
Read book "Resilient City" – how people respond (book written by historian)
Include cultural aspects
Won't go back to normal
Mental distress needs to be considered at a community level during recovery

Importance of clear definitions

- Scenario
- Exercise

- (scenario can't be "implemented")

Reasons for Scenario Planning

- **Build collaborative relationships**
- Use for exercises
- Initiate a risk reduction process
- Collective problem-solving across levels of govt—using it as an exercise
- (collaborative is both horizontal & vertical)
- used in the city planning process
- **to promote mitigation**
- should lead to direct actions taken that save lives
- outline the problem

Reasons for Scenario Planning (2)

- identify the flaws in the system when used in an exercise
- to serve as an advocacy tool to get resources
- **compelling & credible story-telling**
- provide common foundation
- resource planning
- **engage & inform decisionmakers**
- preparedness for an actual event
- system-testing

What should scenario accomplish?

- Should be specific to who is asking the question.
- Lead to the creation of mitigation policies.
- **Move public and decisionmakers to action—acceptance/ownership/responsibility**
- Provide picture of the problem.
- Identify capability limitations for response.
- Provide a view of alternative outcomes—with & without mitigation
- Determine areas of success & improvement

What should scenario accomplish? (2)

- Answer the questions asked
- Provide a complete picture of the event
- Who should do what, when and how—locals are in charge.
- **Testing and training of community to respond.**
- Combination of scientific integrity and get buy-in from a lot of different groups

What is required to best implement

- Local buy-in from day one
- Process is more important

EERI Breakout Session: Designing an effective scenario
Rod Combellick
Gary Patterson
Mezzanine, 1:30
Purpose: <u>based on the EERI guidelines</u>, make suggestions to address real world needs and experience

What is a scenario? Different views for different groups.
Two definitions came out of the work in Alaska: one for Planning, and one for Response
Discussion:
A. The definition can be simple but it depends on how the scenario is to be applied.
B. Must be a collaborative effort to provide information to Prevent or mitigate losses.
C. Scenario is a story that designates a place, magnitude and Consequences of a hypothetical event. It can be inclusive that can be used for planning or exercises, but it doesn't have to be a process
D. A realistic description of the anticipated impacts of an event. Details are determined on the purpose, which could be mitigation, planning, or emergency response

Definition cont'd
E. Needs to be simple

Recommendation: **definition should be established early in the Document**

Scope
Discussion:

A. All plans will be different. For emergency responders, many of the details are based on the functional elements of the plan that will be exercised. What MESL's are anticipated?

B. not all scenarios are developed for emergency response…. Some are to motivate/inform political entities.

What are the components of a scenario in general terms? (Planning)

A. A statement of purpose, scope, audience, and underlying assumptions
B. Description of the earthquake rupture and the distribution of ground shaking and secondary effects
C. Description of the engineering effects that contribute to losses.
D. Description of possible social and economic consequences
E. Preliminary damage and loss estimates
F. Provide a strategy for mitigation, preparedness, and recovery analyses…. "lessons learned"

Scenario Development Process

A. Must involve a multidisciplinary team that can adequately capture all the elements characterized in the specific scope

Designing an Effective Scenarios Process – Implementing the Scenario

Session 3 Part B

Group 3

Purposes

- Identify hazard and consequences (should be transparent and defensible)
- Plan for mitigation and risk reduction measures
- Drive planning exercises
- Identify gaps
- Uniform loss estimates
- Provide basis for actionable policies
- Promote resilience
- Vehicle for educating risk owners, public, policy makers
- Promote cooperation between disciplines and states and counties
- Create mitigation communities
- Prioritize risk reduction actions

Implementation

- Community involvement
- Stakeholder buy-in
- Compatible team
- Local specifics
- Public credibility and acceptance
- Needs to be somebody's "day job"
- Link consequences to mitigation actions
- Scientists, engineers, etc must be on the same page
- Long term usefulness
- Specific calls to action (less than ten)
- Consider scenarios at various levels, stress systems but not "chicken little" – plausible events
- Living document expandable and amenable
- Need publications and exercises for focus
- Web resources
- Improve science
- Identify cascading failures
- Clarify response roles and responsibilities
- Guide spontaneous public response
- Identify hospital needs

Summary: Breakout Group 4
Session 3: Implementing the Scenario

- What are the purposes of the scenario?
- Who is the audience?
- What should the scenario accomplish?

Purpose

- Empower risk-reducing decisions
- Promote Awareness
- Inspire planning
  - Test existing land use planning policies
- Response exercises / response planning
- Benchmarking / Identify data gaps
  - consider starting small

Purpose

- Purpose varies depending on:
  - Region
  - Scale / funding
  - Community acceptance of hazard
  - Intended audience (response v. mitigation)
- Scenario can be repurposed

Audience

- "Decision Makers"
  - Definition depends on your context
- Policy makers
- Emergency planners and responders
  - Potential mismatch with policy makers
- Political Champion
- Media

- General public (may come later)

Accomplishments

- Quantitative, tangible facts
- Qualitative "story"
- Credibility
  - you can stand behind it regardless of use
  - both science and scale
- Follow-up actions
- Little efforts can have big impact
- Long-term consequences
  - need broader involvement

Launching The Scenario

Session Part B

Group 1

Meeting Desired?

- Existing templates
- Communities involved
  - Participants
  - Users
- Core people invested for success
- Policy people involvement early (place and timing)
- Purpose developed beforehand
- What's different about this meeting? Build excitment

Launch Meeting

- Who is invited? Canvas appropriate agencies for recommendations
- Who's not here?
- Construction of team
  - Initial group decisions
  - Expand the word about scenario by exposure to other groups
- Non-experienced areas approach (who are experts?)
  - Motivated advocates…how do they organize effort?
  - Seek and find experts
- What is the motivation for attendance/participation? Answer the question.
- Constancy of core individuals throughout
- Media exposure early and periodic (direct coaching for message rollout)
- Using PIO's for project exposure/guidance
- Integrate scenario message into the regular decision-making processes in communities (away from compartmentalization)
- Follow-on opportunities to influence current planning (start planning these early)
- Budgeting for follow-on opportunities discussed at launch
- Earthquake Scenario influencing risk management NHMPlans. State and local mitigation plan
- What value is given to the community/state by scenario?
- Dynamic and expandability needs.
- Timeframe for this effort?

Launching a Scenario
(Group 2)

Define or clarify what a scenario is (framework)

Define what you want to test

Define time horizon

Define spectrum/range (staff time, budget)

Simplify guidance (don't over think scenario planning) – energize people; don't burn them out

Focus on the event and how it will challenge others

Layered approach – vetting opposed to telling people what to do

Add a chapter on how to use scenarios

Risk consequence: perform an assessment on what is the acceptable risk and problem solving options

Haddon Matrix

	Pre-Event Phase	Event Phase	Post-Event Phase
Host Factors			
Built Environment			
Behavior		Scenarios	
Social Political Dimension			

Impact and response depends on pre-event, even though the scenario concentrates on the event.

Organizing The Scenario

Session 3 Part B

Group 1

Organizing the Planning Effort

- Different type of Flow chart need
  - Beginning points (organizational)
  - Goals/milestones
- Different schedules for different scopes of work
- Alternate approaches using examples of existing scenarios (recipes) Helps segregate workgroups
- Explanation of work flow (what comes first and why)
- Web based product could direct your effort through link jumps. (scalable efforts)
- How to assemble the pieces (not linear)
- Sample "engineering centric" consider social economic and other inputs
- Include sidebars from existing efforts
- Follow-on to be included as task in flow chart
- Peer review
- Dissenter (skepticism) reviews
- Workshop(s) for outside review

Workgroups

- Two types of lists
  - Expertise (academics, engineers,geologists, responder, etc.)
  - Organizations
- Public policy inclusion in workgroup
  - High level, governor, legislators, etc.
  - Local level, mayors, councils, building departments, etc.
- Emergency responders
- Reorganize title to reflect participants/users
- Non-profit organizations
- Building owners; utilities and lifelines
- State level ESF (emergency support functions)
- Tabular list to show multi levels
- Military
- Federal Agencies
- GIS professionals
- Private sector – businesses
- Technical writers, outreach expert (careful)

Workgroup Leaders
Management Team
Project Director

- Public face (individual)
- Leadership and management roles (separate or one?)
- Target of scenario may help determine "face" organization/person
- Manager – public servant not consultant
- Non-engineer/non-scientific
- State Seismic Safety Commissions

Funding

- Existing grants
- In kind contributions
- Recognize funds likely to come from many sources
- Case studies with breakdown of costs
- Develop a project budget
- Identify cost points and scale your scenario accordingly (or seek more funding)
- Non-profits
- Foundations
- Seismic Safety Commissions

APPENDIX D

OTHER THOUGHTS FROM SPEAKERS/CONVERSATIONS IN BREAKS

Definition of scenario – lacking
depending on groups, language can be different
need sidebar that talks a lot diff languages
credible & compelling – must fit on 1 page for decision makers
purpose of scenario can depend

In presentation you make – need to know audience
do both – make a publication
go out & shop it in presentations
list audiences -
    key decision makers
    lifelines
needs to be understandable
map needs to be personal – speaks to a person
damage photos can be compelling

visualizations – very helpful

using web -

explore beyond 2 dimensional

comet????.ed – training materials on line
visualization/video
how do we push toward scenarios online
using youth – make scenarios attractive

What's evolving -
social networking sites
disseminating to people not typical audience

16/18 yr old help develop

include 90 yr olds

is it effective to cite loss in dollars? depends who you are making pitch to

degree of uncertainty – how to deal w/public

if tell an insurance person, lifelines, govt official – should be interested in loss estimates

Sept 18
USGS Tools:

PAGER – estimate of pop exposure to sig eq shaking
www.cisn.org/software

in developing scenarios – use tools that will be available afterwards
possible (web pages)
active(notifications)

could put out a simulated did you feel it for scenario

ShakeMap downloads:

Maps	Data
instru. intensity	??? files
peak ground acc	HAZUS
etc	

Collection of scenarios for all parts of country like Atlas of Shake Maps

Can put in site conditions for scenarios anywhere in the world

Shake Cast – combines Shake Map w/inventory databases
projects damage

google – Shake Map manual – has RGB #s for colors

Doug Bausch – FEMA tool ??? SAR
extra
casualty calibration

Grant sources
OAWSI (?)
AWASI
HMGP
DHS

Hawaii – database of indiv university bldgs

CDMS comprehensive data mgmt system tool to update source data

Some discussion on secondary impacts (fire, etc)
focus on resilience
figure out what results will be most usefufl to audience
develop scenario plan so if there is event that occurs, can pull it off shelf
w/event – more narrative
ties back to audience – worst case good for Congress
how to help them make decision
level of detail will tie back to audience

Kim
appendix – choose certain # from categories
ex of map that shows power outages for diff durations
tools option
    expert interpretation
    need SE in interpreting results of HAZUS
think in diff time frames
resilience, repair

Lessons Learned
diff analysis tools available

FEMA lists all funded exercises
    link to the calendar

Univ of Pittsburg – website, super course, public health site – Eric Noji

Jay Raskin
scoring
giving tools for proceeding
realizing govt has very diff scales
scenario on Cannon Beach – tool to get other levels of govt to take on their responsibilities
the scenario is becoming the event
events are too big to wait – make scenario the event
this is about sustainability
reaching out to community interested in sustainability

Tsunami Advisory Committee (Oregon)

almost no talk about earthquake – NOAA talks a lot tsunami but not earthquake

in New Madrid –
scenario will test work that has been done
Ted Cox, county mayor really wired in terms of disaster prep
Memphis

1. Dept Homeland Security – resiliency
   3 test cities – template for resiliency
   Gulfport MS
   federal funds, federal expertise
   define resiliency
   how is it measured

2. Katrina
   Mirror New Orleans
   7 mayors almost a year to decide on message to residents
   if want to reach them – use TV
   on own for 72 hrs/need to prepare
   we will help you get there

3. 1 yr program:
   12 mo where media has agreed to help us educate
   what will sound bites be
   all related to preparedness
   will have kick-off
   Grover from Sesame St

4 x 8 version of shake map
had mayors sign it
knew it would be put on wall

for dollars →include bottom line

Seattle – incremental success w/scenario
go back – use some of data
??? greater assistance & some of those communities w/mitigation funds
??? product & report
shown to Gary in Memphis

USGS OFR – temporary publication
will turn it into full blown scenario

Seattle used a lot of existing studies

in Nevada – Craig is champion. ??? in using/disseminating scenario

job of effective communicator – what is in head of recipient?
think about Ike/Katrina -
what are capabilities of community to respond?
    public safety, durable goods, power
do best you can to characterize event
what are other groups – how will it effect them?
start shopping your scenario to those groups
broadcasting → narrow casting

political time scale -
    every 12 months
    lead people through it ??? size segments
2nd vice president of league of (CA) cities - ??? in National

put together 1 pg doomsday package for Memphis
46% nat. gas that goes to NE through Memphis
5 ??? A railways
etc
asked for 800K
    600K from feds

relooking at codes
education
??? pl

Leverages work already done by CERI, MAE Ctr

4. Asisisi Foundation – look at mass sheltering
will allow them to test their planning & assumption

still not clear what goal is of scenario
education is great but not goal of scenario

how do you prepare, how successful – these can be measured

for mo of December –
give of preparedness
vendors will be stocking preparedness kits

people use planning scenarios to mobilize communities to reduce risk

increase social capital
prioritize risk mitigation (get rid of URM schools)

tools to reduce risk to pass bond measures, etc

Phase

Pre-event	Event	Post-event
Host Factors		
Built Environment	X	
Behavior		
Social Political		

1a. Minimum application
Severity & distro

1b. define EQ (shaking)
Today/yr
which fault? soils/slops return plausible period
surface rupture
Qls, liq
tsunami, seiche

2. Exposure
inventory (bldg) economics
crit facilities
demographics
lifelines (trans)
ecosystems/resources

3. Vulnerability (damage functions)
independent
interdependent
didn't fit tooli focus
incl special/historic structures ???

4. Consequences
direct property damage
indir property damage

structural & nonst
(fire, hazmat, Q's)
direct BI
multiplier effects on BI
deaths, injuries, other...
displ pop
service interruption (duration & location)
utilities, transport
human & social services
EOps

cascading failures

5. Tools (guidelines doc could provide info)

Shake
CISN
MAEVIZ
HAZUS

Export interp

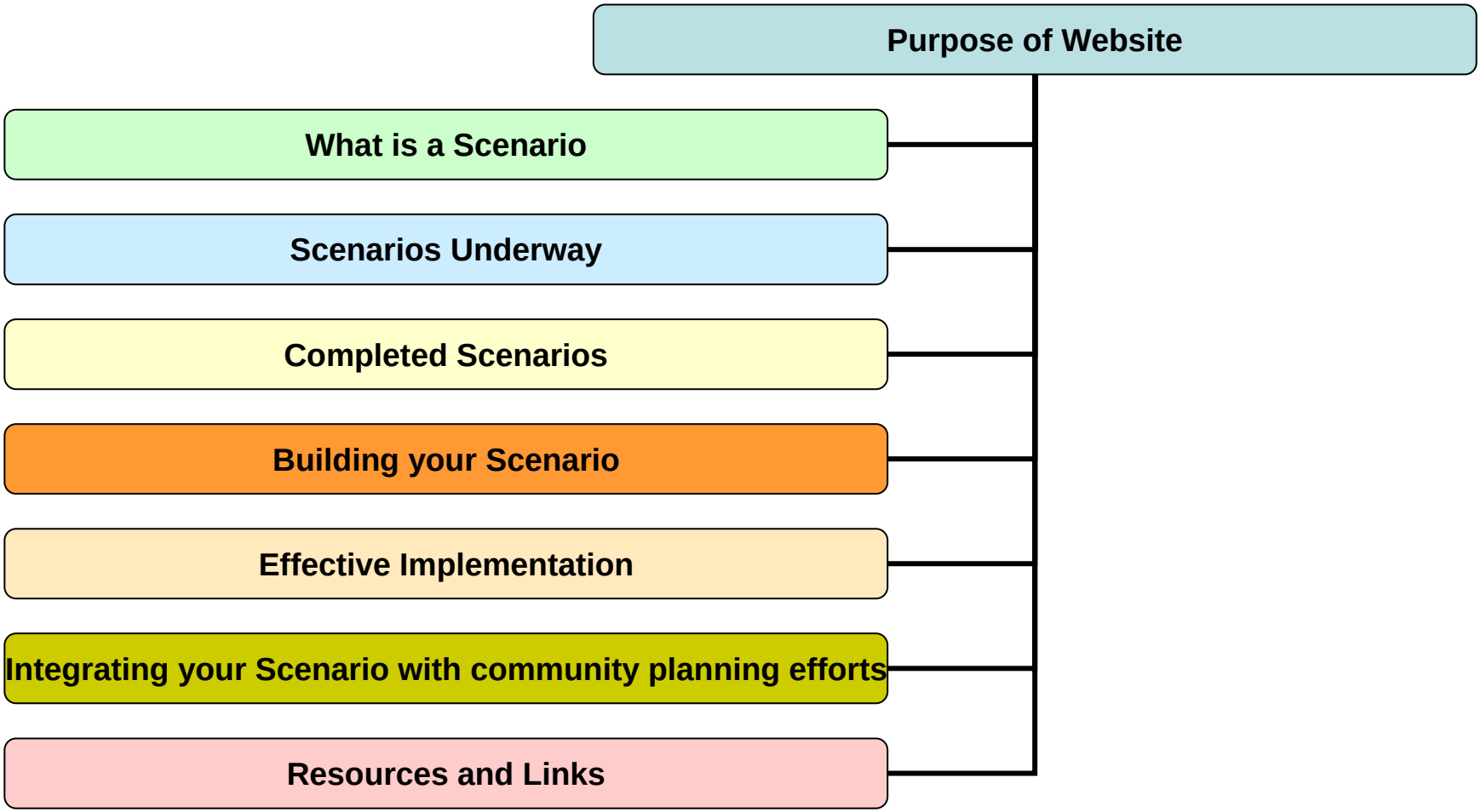
6. post event (diff time frames)
response
recovery
resilience
repair & reconstruction
incorporate mitigation

Document

incl lessons learned/examples
discuss analysis tools

APPENDIX 5
Proposed structure of website

(go to each subsequent page of this outline to see proposed content for each category)



PURPOSE OF WEBSITE

Introduce concept and use of scenarios—as planning and exercise tools for emergency response and recovery (and community land use planning)

TO BEST USE THIS SITE—ANSWER SET OF QUESTIONS

- Purpose of your scenario?
- Who is audience/stakeholder?
- What expertise and information are available?
- What are the financial resources available?

Emphasize that a good scenario can be very simple—this website provides info. from simple to the very complex—perhaps have a separate tree for minimum, medium and maximum effort.

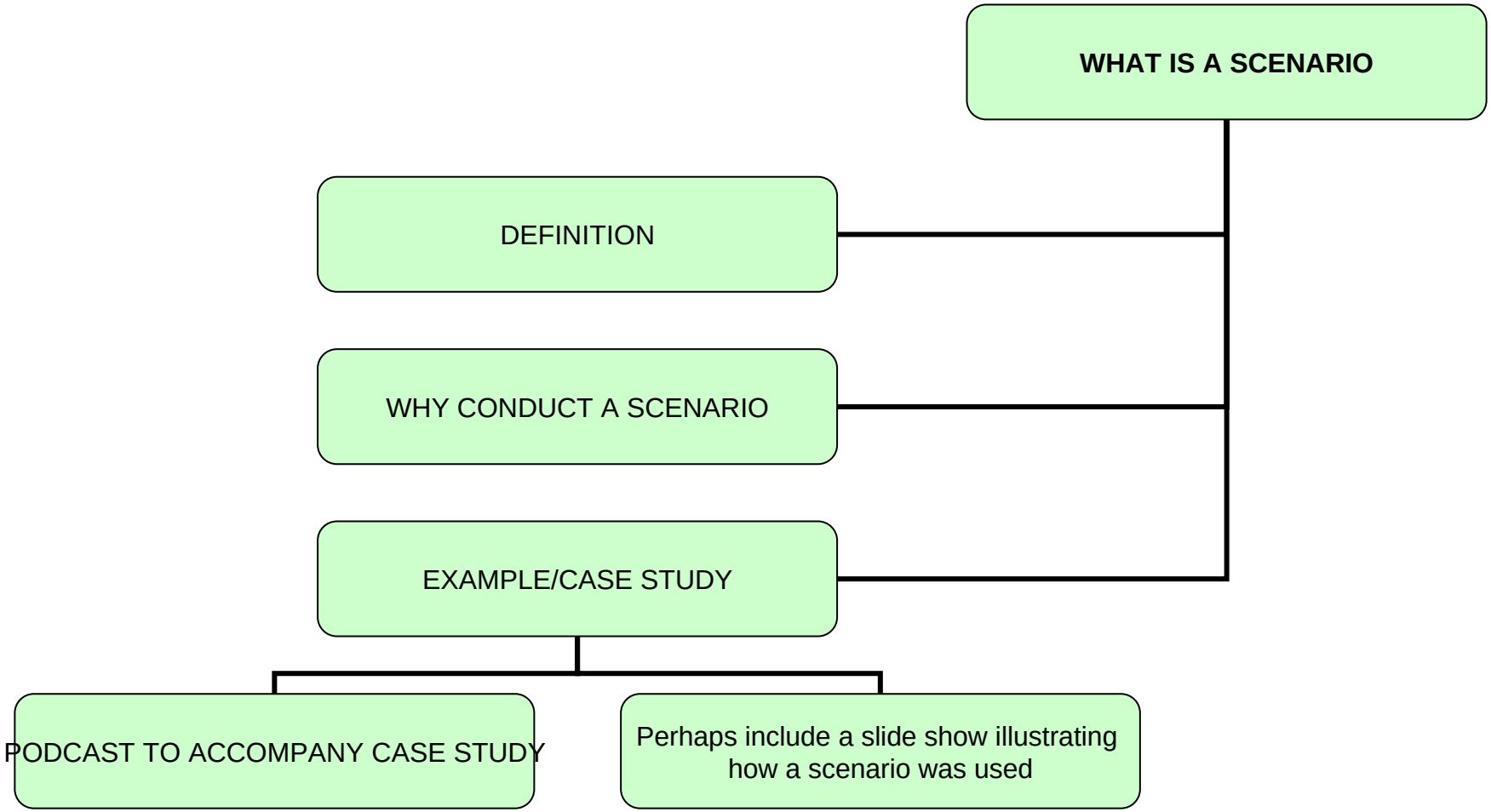
Provide resource information

Give examples of completed and ongoing scenarios

Facilitate communication among scenario developers

Depending on answers, user will be routed to different sections of site, or perhaps links to different sections will appear

Major category, off of main page



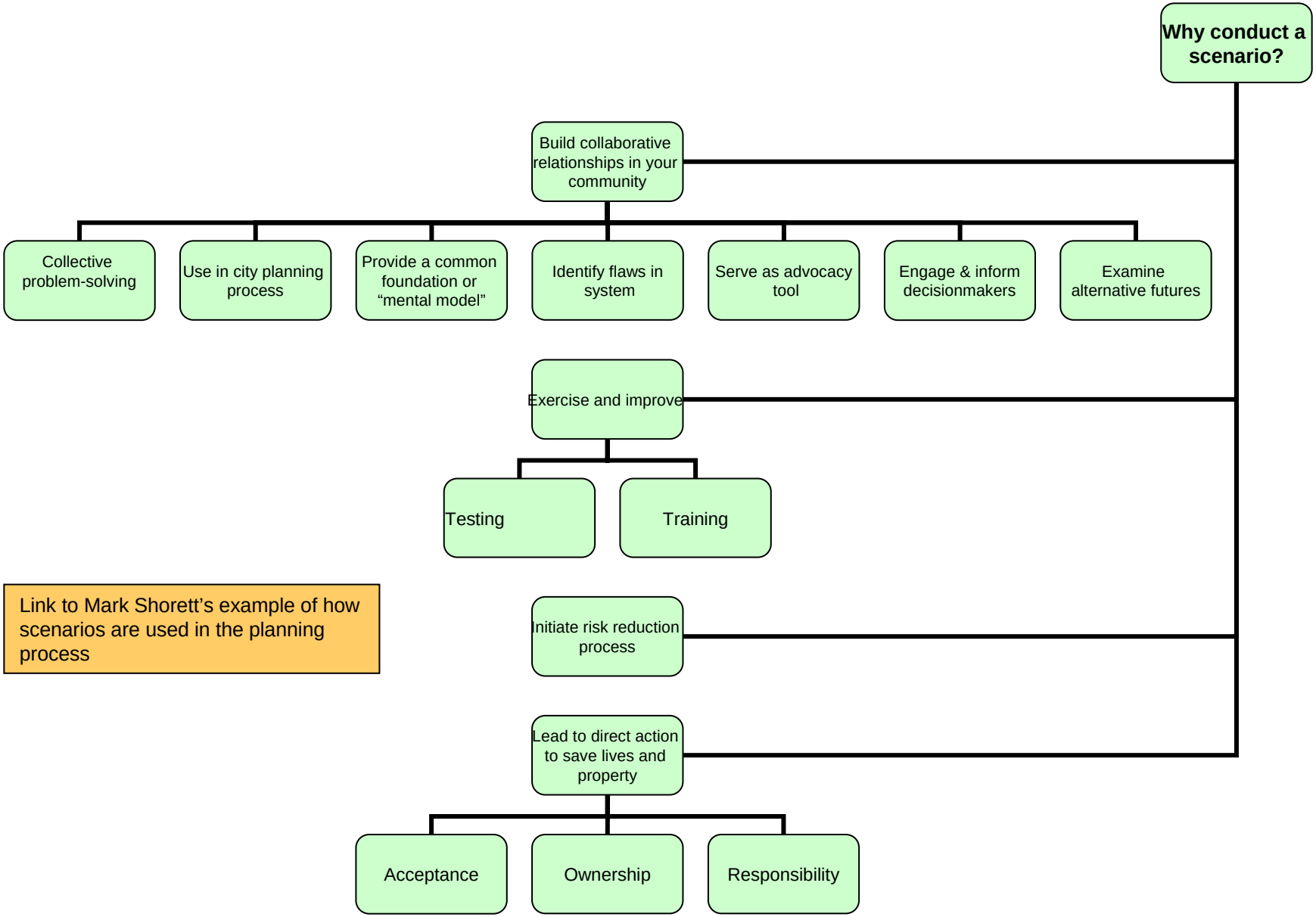
Definition

A planning tool that tells the story
of a defined earthquake
& its consequences?

Can be used for response planning &
exercise, mitigation & land use
or recovery planning & exercise

helps decision makers to
visualize specific physical, social, economic,
environmental impacts

based on currently accepted
scientific and engineering knowledge



Link to Mark Shorett's example of how scenarios are used in the planning process

Link to the Oregon story—how scenarios have been used to change awareness, policy and legislation

Example/Case Study

Perhaps all the examples/case studies could be in one place and there could be links from each subpage—so a link here

Examples should be distinguished by levels of support, purposes, geographic regions

Short slide shows summarizing several scenarios, perhaps short videos, podcasts?

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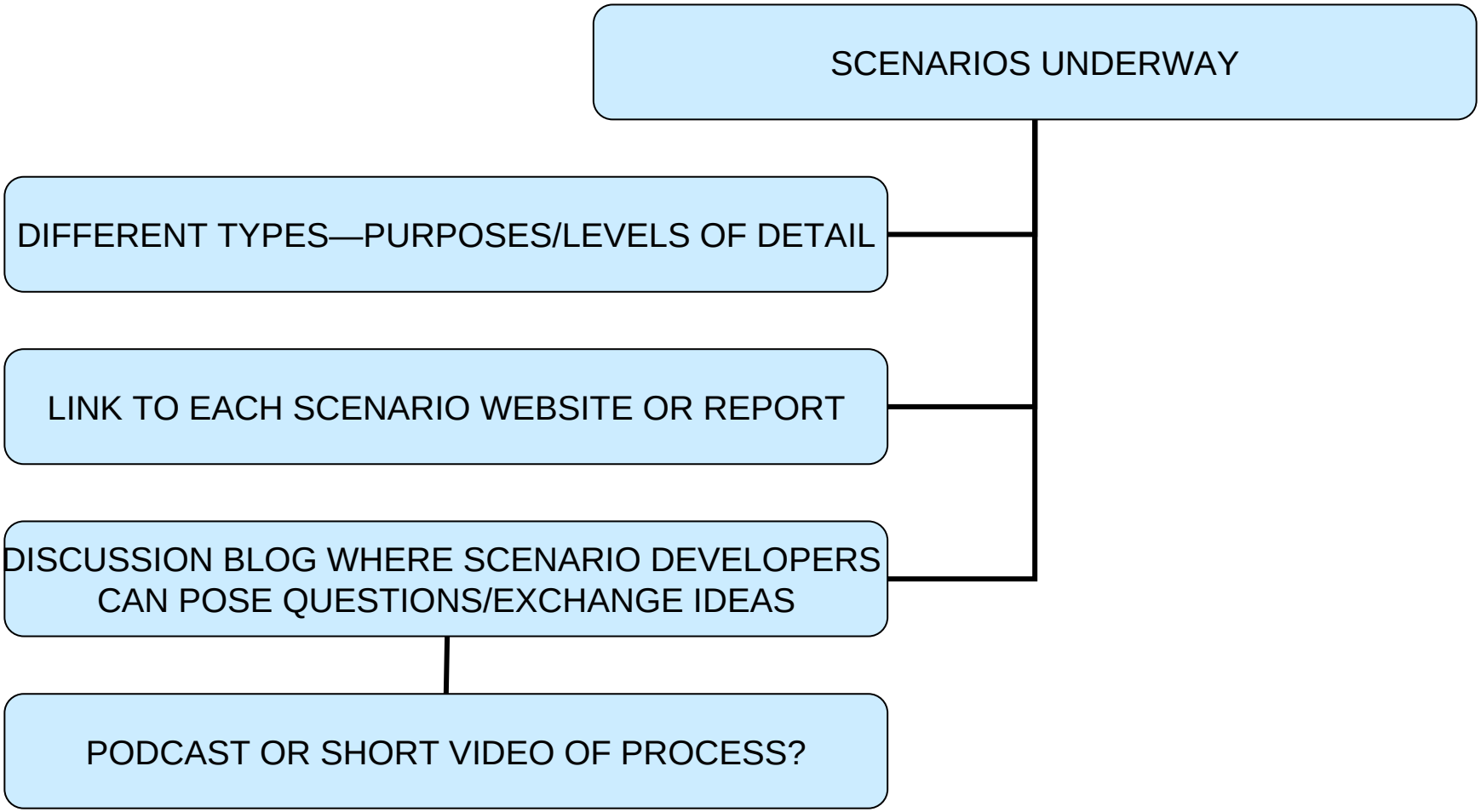

SCENARIOS UNDERWAY

SCENARIO EQ	Scenario type/purpose	Lead agency(ies)	Website/Resource Docs	
Cat planning in the Midwest	Response (exercise)	FEMA & states		
Wasatch Front	Planning	FEMA		
New Madrid EQ	Planning, test work that has been done			
Memphis	Test resiliency			
Hayward				

This page could also contain a password-protected blog site where developers can post questions and have discussion

This page could also contain links to short podcasts from scenario developers

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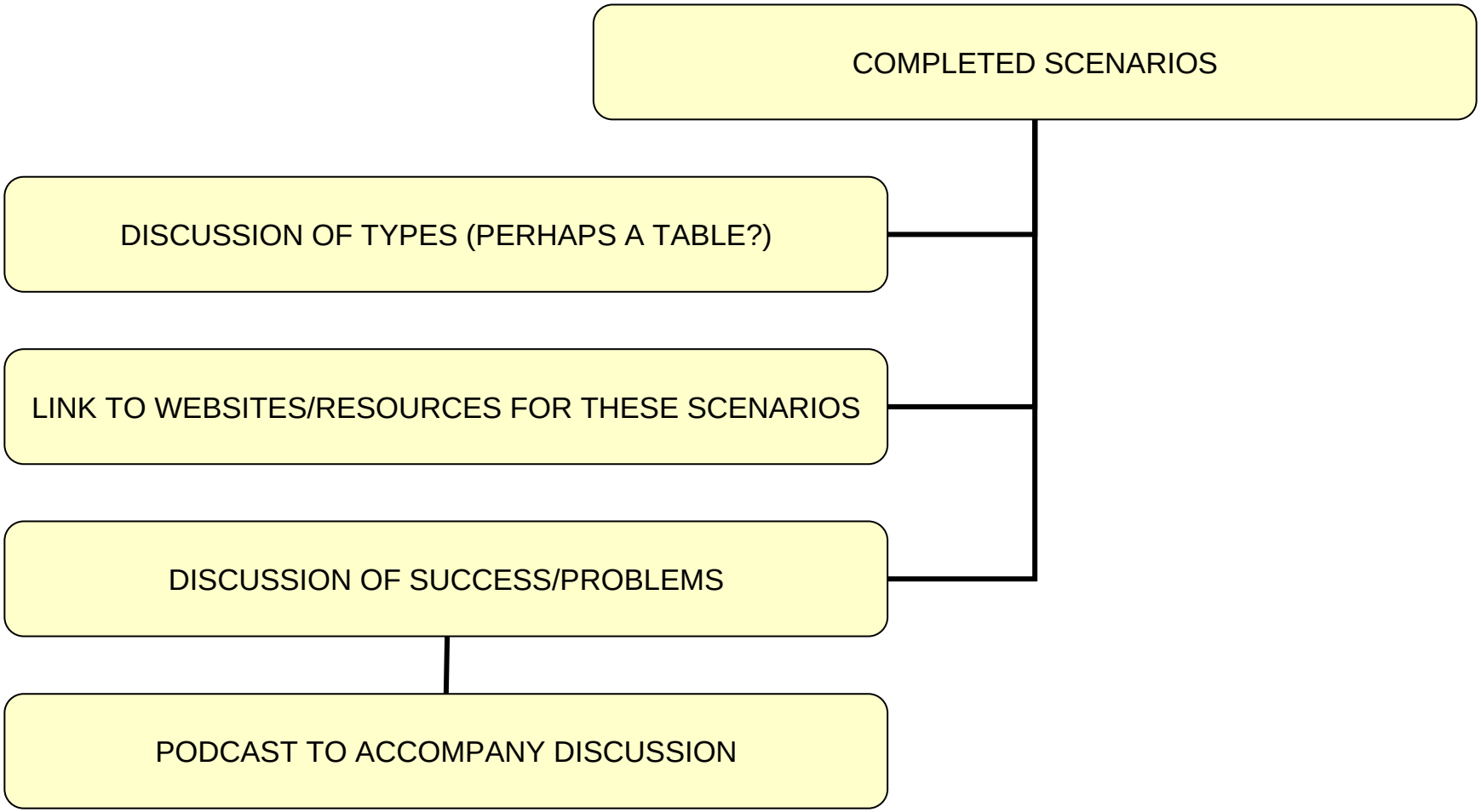


Completed Scenarios

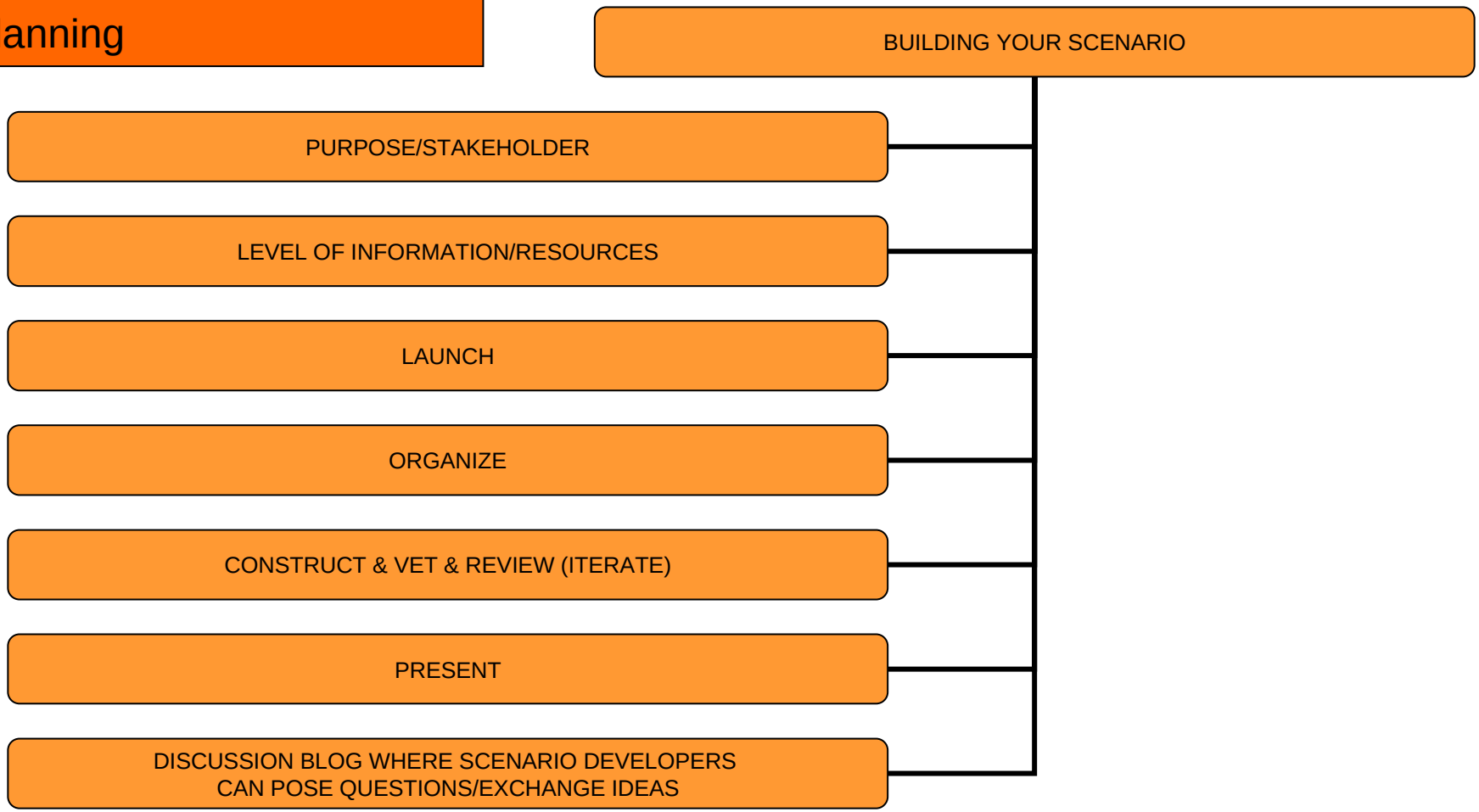
SCENARIO EQ	Scenario type	Lead agency(ies)	Website/Resource Docs	Lessons
So. Cal (ShakeOut)	Planning & response exercise	USGS		Include Anne Wein & Keith Porter's papers
Seattle Fault	planning	State of WA & EERI		Incremental success. . . .
Hayward Fault	planning	EERI		
Repeat of 1906	Loss modeling	OES & EERI		
Etc.				

Type of info that we could compile here—NEED TO COMPLETE LIST

This page could contain links to short podcasts from scenario developers

Major category, off of main page

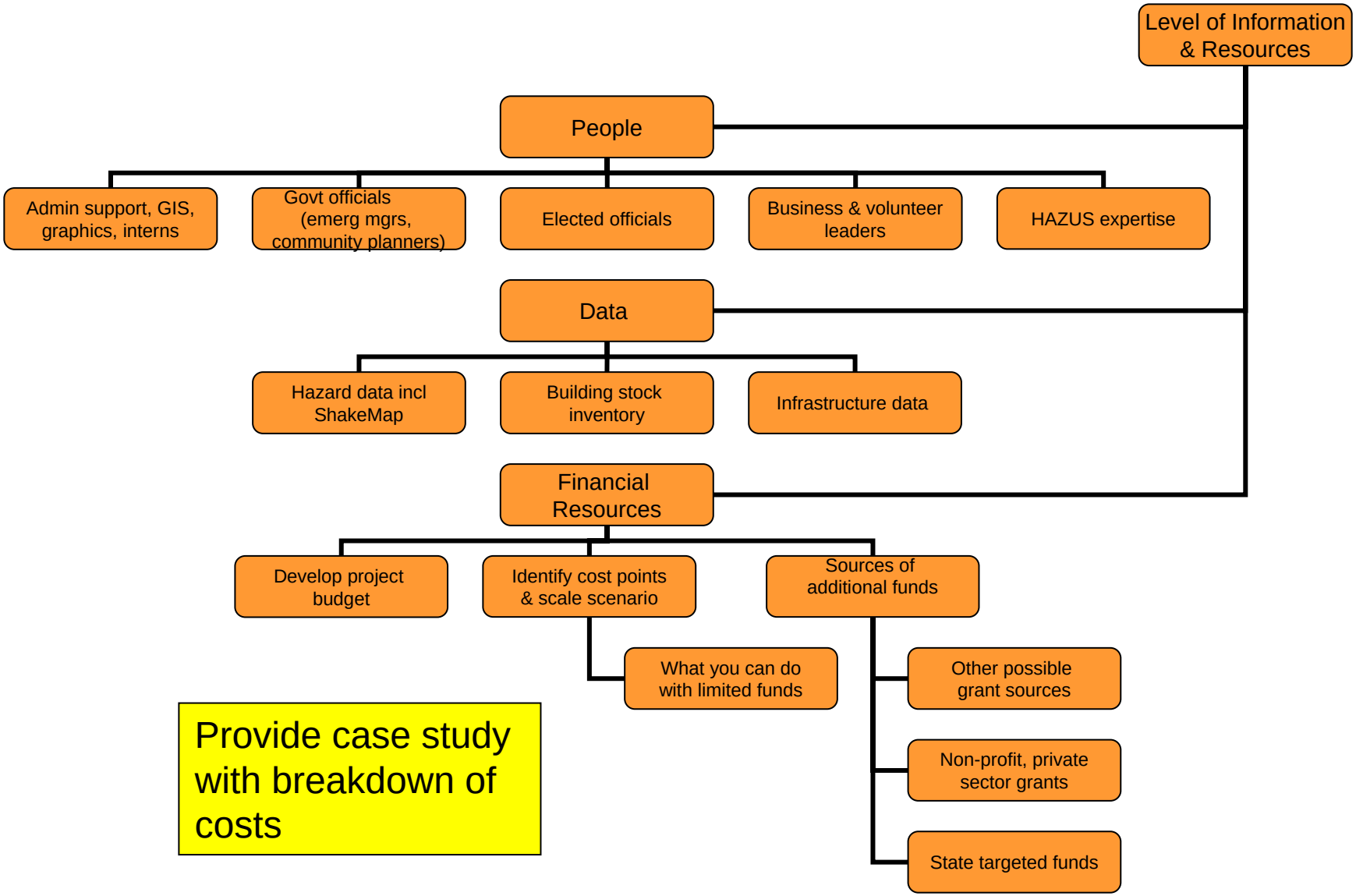
Don’t overthink scenario planning



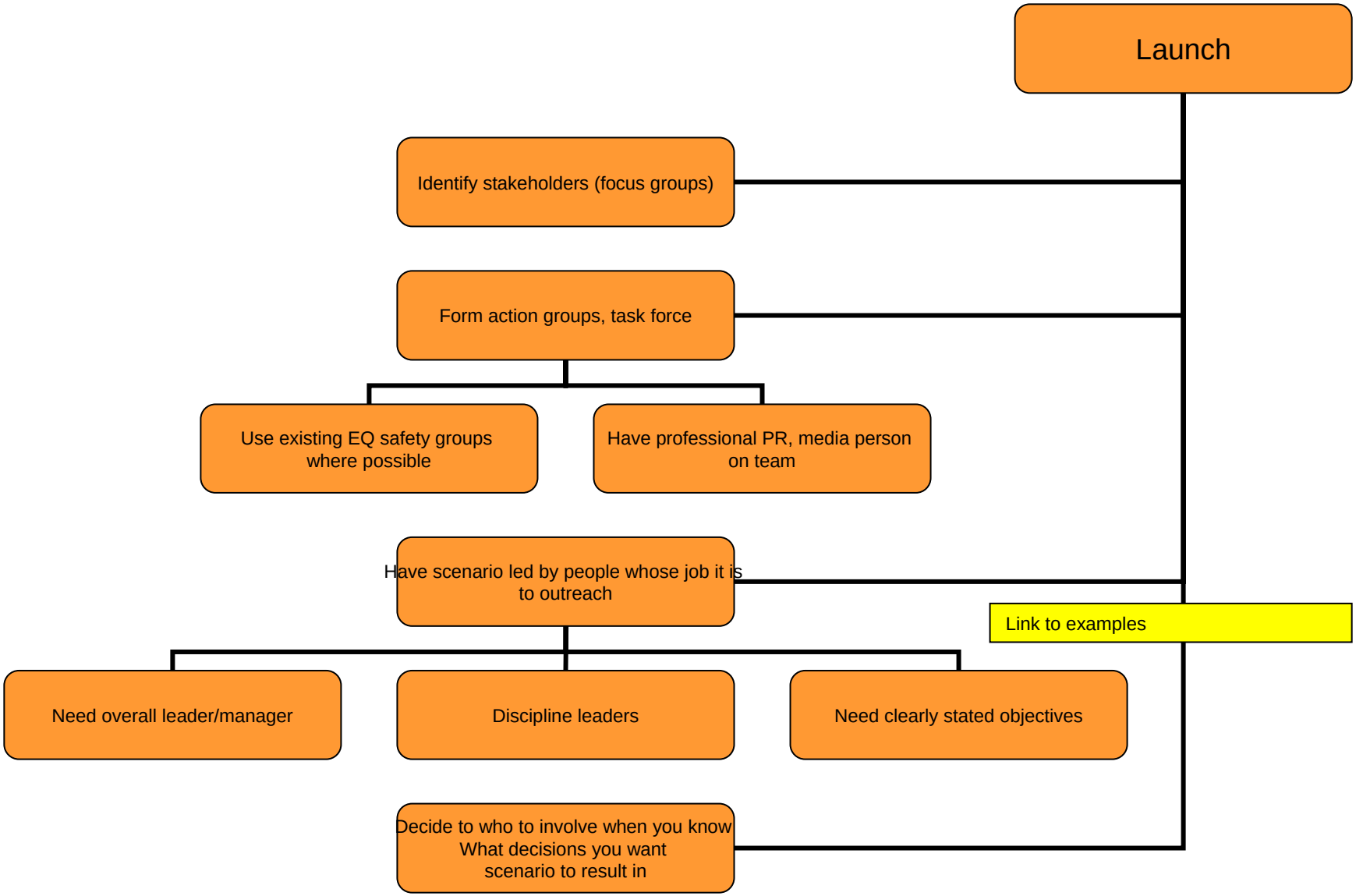
Audience Stakeholder

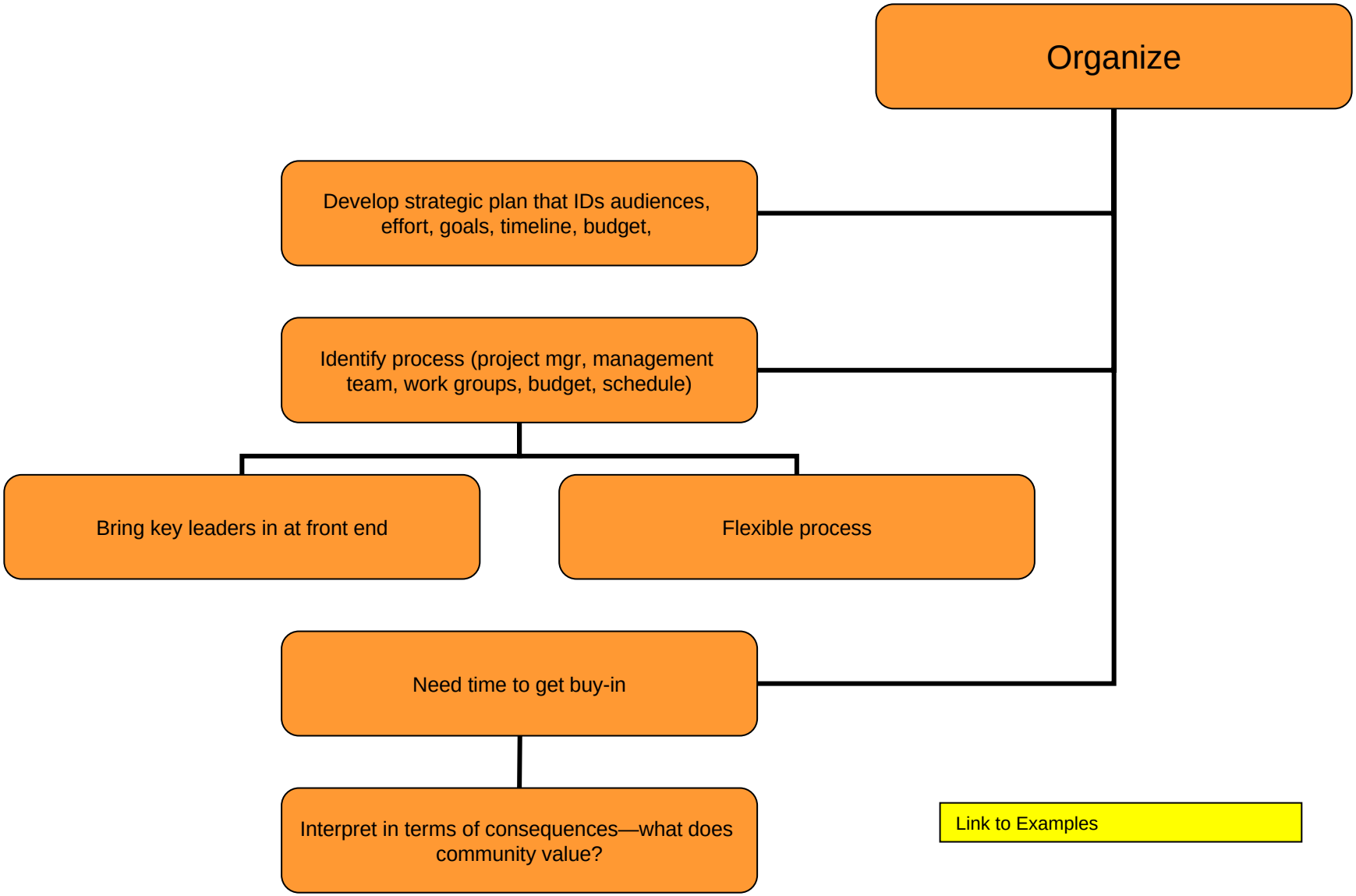
- Elected officials / decisionmakers
- Land use planners
- Emergency managers
- Engineers, Scientists, and other EQ professionals
- Utilities/Infrastructure & Business community
- School and hospital communities
- Media
- Political champions
- General Public

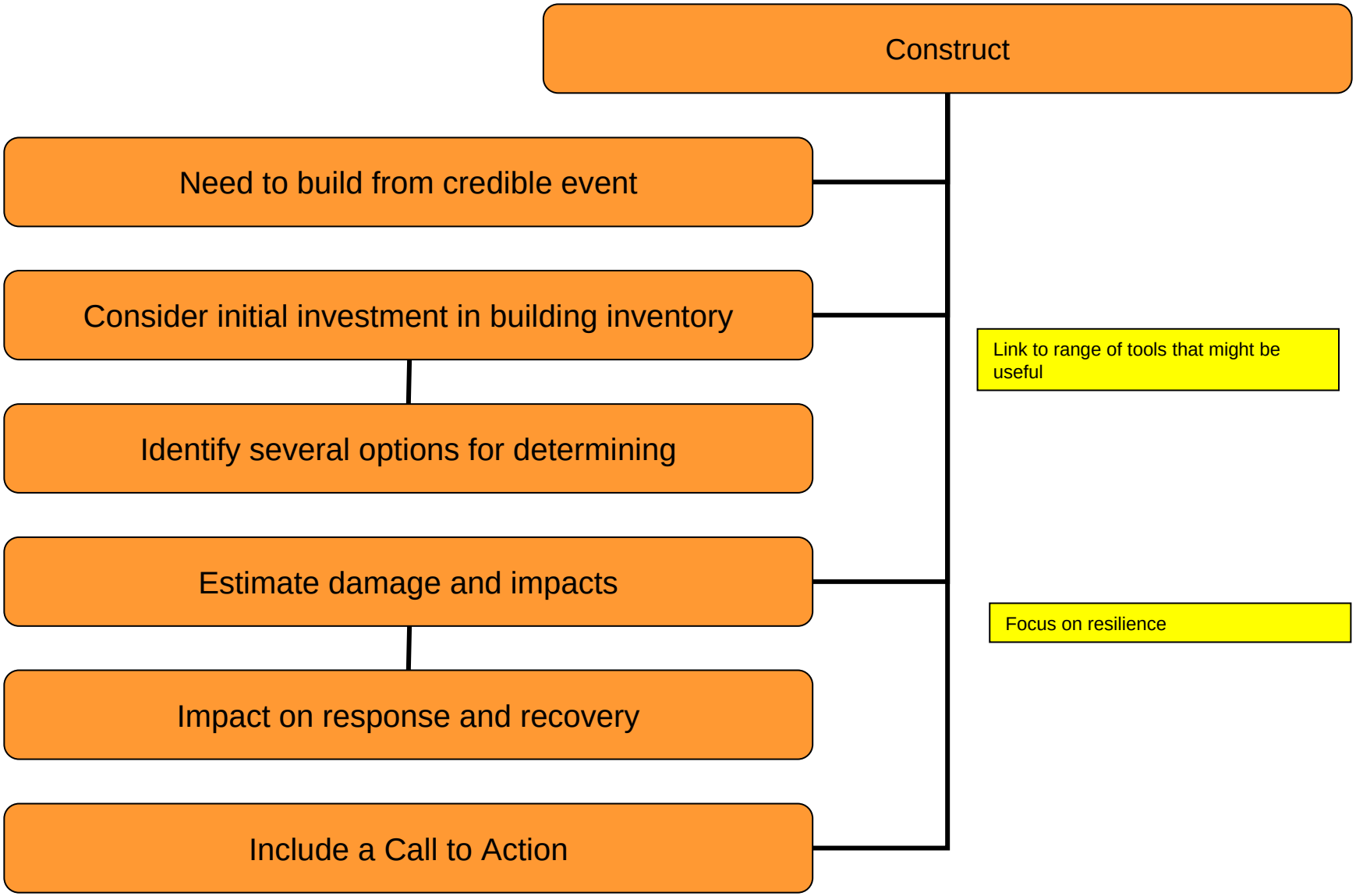
link this to discussion above on why conduct a scenario



Provide case study with breakdown of costs


Launch
Identify stakeholders (focus groups)
Form action groups, task force
Use existing EQ safety groups where possible
Have professional PR, media person on team
Have scenario led by people whose job it is to outreach
Link to examples
Need overall leader/manager
Discipline leaders
Need clearly stated objectives
Decide to who to involve when you know What decisions you want scenario to result in


Organize
Develop strategic plan that IDs audiences, effort, goals, timeline, budget,
Identify process (project mgr, management team, work groups, budget, schedule)
Bring key leaders in at front end
Flexible process
Need time to get buy-in
Interpret in terms of consequences—what does community value?
Link to Examples


Construct
Need to build from credible event
Consider initial investment in building inventory
Identify several options for determining
Estimate damage and impacts
Impact on response and recovery
Include a Call to Action
Link to range of tools that might be useful
Focus on resilience

Present

- Need to know audience to make correct presentation
  Different types of report, e.g., scientific, narrative
- Prepare 1 page summary for decisionmakers
- Make publication and go out and make tailored presentations
- Maps need to be personal—speak to a person, decisionmaker
- Explore beyond the 2 dimensional
- Push towards presenting scenarios online

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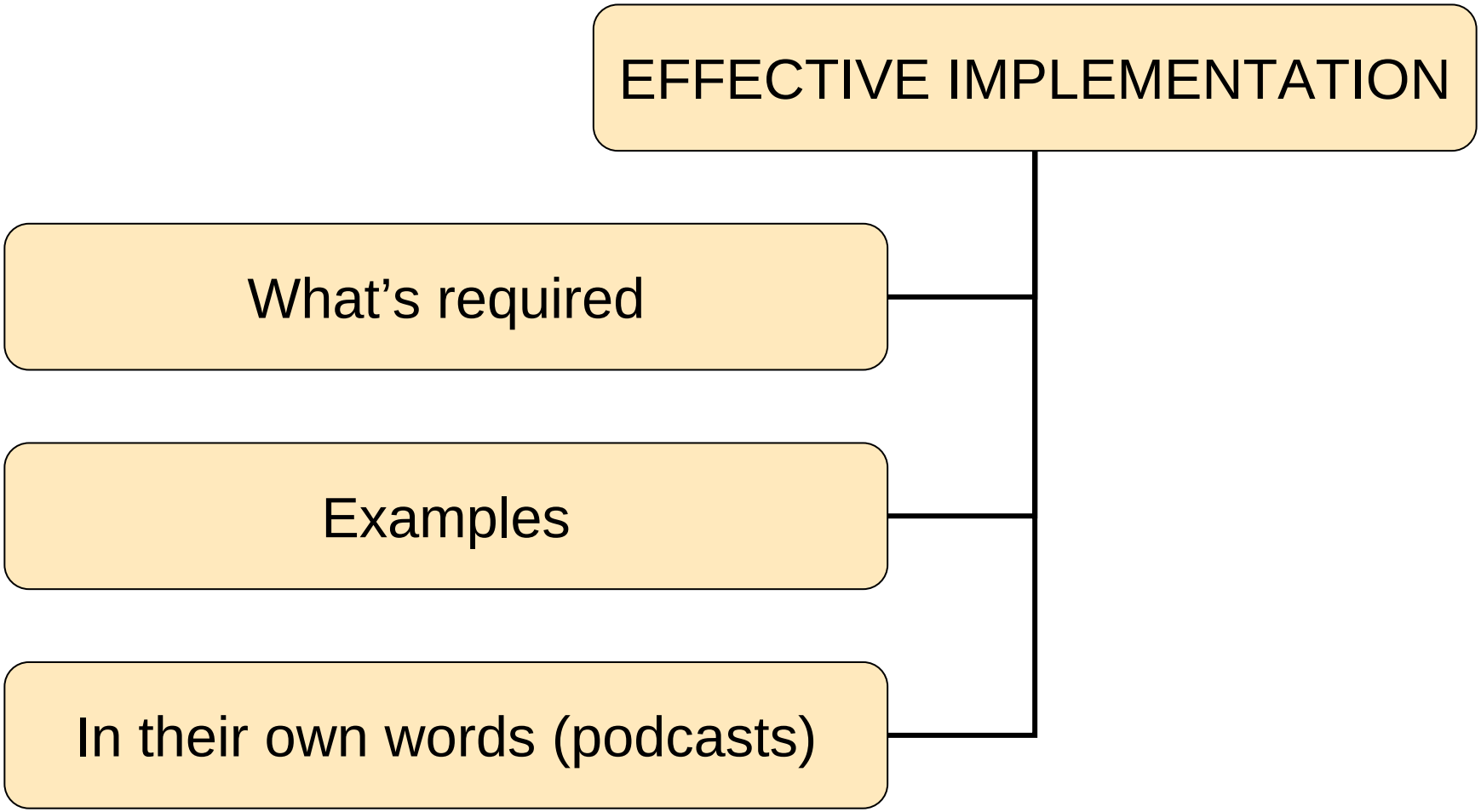


What's required for effective implementation

- Buy-in from stakeholders
- Process more important than product
- Variety of approaches—scalable format (incremental framework)
- Public & leadership credibility and acceptance
- Specific calls to action (link consequences to mitigation actions)
- Living document

Major category, off of main page

INTEGRATING YOUR SCENARIO IN COMMUNITY PLANNING EFFORTS

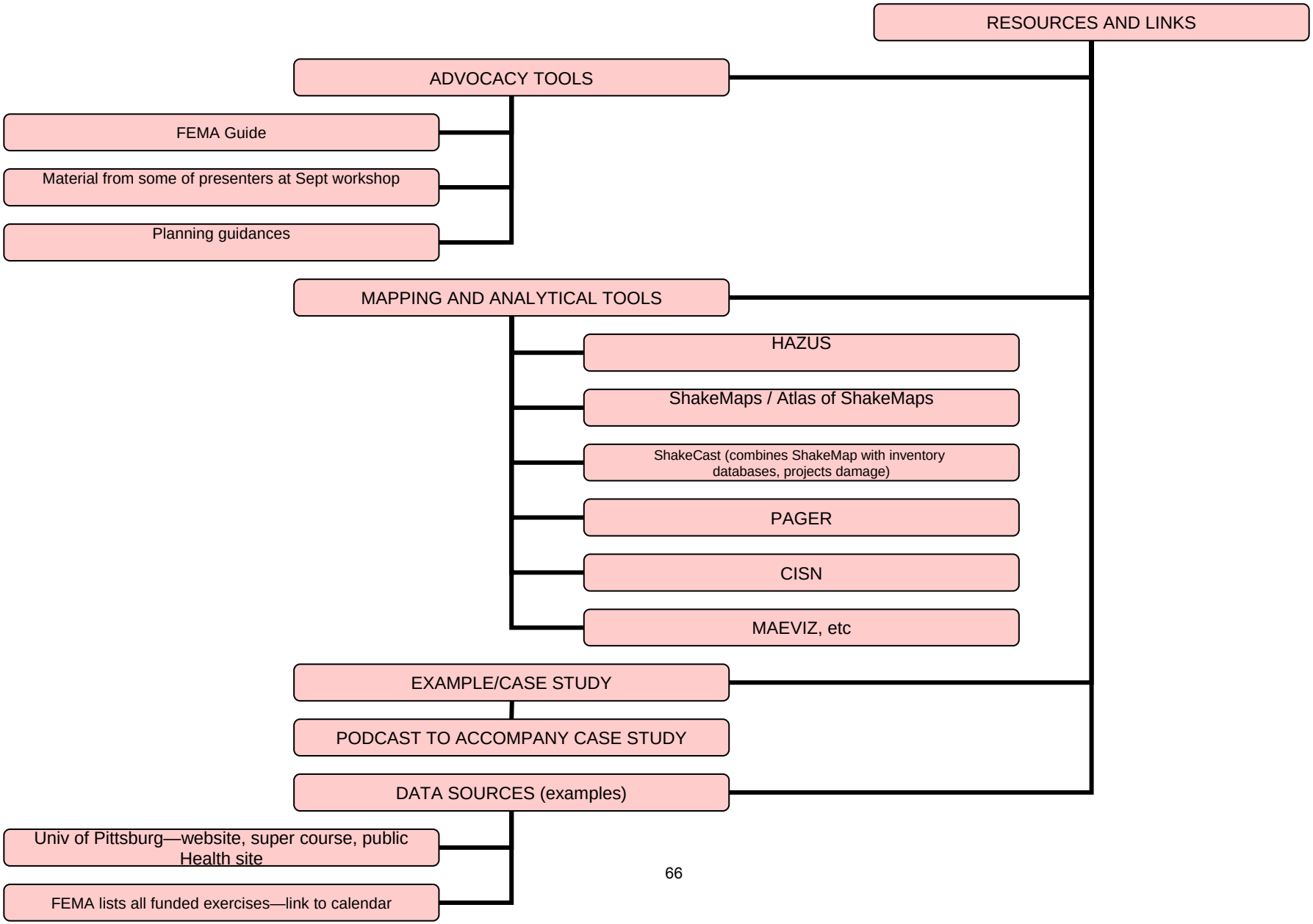
Hazard Mitigation Planning

Comprehensive Land-use Planning

Homeland Security response and recovery exercises

Media or public event following disaster

For each of these suggestions, provide examples

Example of Cannon Beach--Link to Jay Raskin's point about sustainability—& making scenario the event

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