



Update on Activities of State of Nevada Agency for Nuclear Projects

Presentation to
Nevada Legislative Committee on
High-Level Radioactive Waste
Las Vegas, Nevada
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Office of the Governor

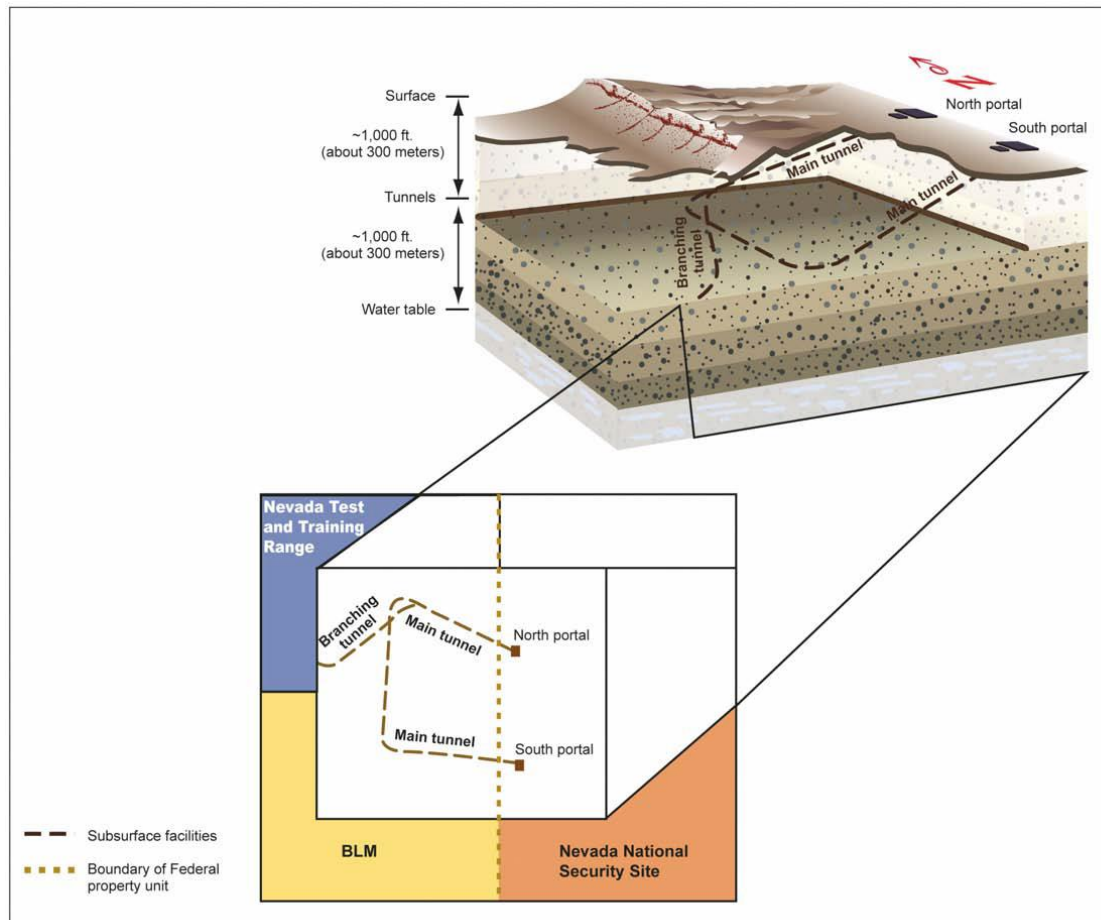
Nevada Agency for Nuclear Projects

Overview

- Yucca Mountain Repository Project Status
- Overview of US Nuclear Waste Policy
- Safety and Environmental Case Against Yucca Mountain
- Business Case Against Yucca Mountain
- Spent Fuel Transportation Issues



What Exists Today at Yucca Mountain



Sources: GAO analysis of GAO and DOE data.

Reality



- No construction authorization
 - No waste disposal tunnels
 - No receiving facilities
 - No waste handling facilities
 - No transport, aging or disposal casks
 - NO RAILROAD
- Existing 5 mile exploratory tunnel

Yucca Mountain Status

- DOE - Submitted license application to NRC (2008)
- DOE - Terminated project, moved to withdraw license application, requested no funding (2010)
- NRC - Suspended licensing proceeding (2011)
- Congress - Appropriated no funds for FY 2012 - 2014
- US Court of Appeals - Ordered NRC to restart licensing proceeding with available funds (8/13/13)
- NRC - Ordered licensing proceeding restart limited by available funds, hearings uncertain (11/18/13)
- State of Nevada – Will fully participate in any NRC proceeding, in opposition to DOE license application



US Nuclear Waste Policy

- 1957 - National Academy of Sciences proposes geologic disposal in mined repository in deep salt formation
- 1972 – Lyons, Kansas salt disposal project abandoned
- 1982 - Nuclear Waste Policy Act directs DOE to study many sites and construct 2 repositories (East & West)
- 1987 - Nuclear Waste Policy Amendments Act directs DOE to study one repository site only, Yucca Mountain
- 2012 - Blue Ribbon Commission on America's Nuclear Future recommends consent-based siting, new agency, other major changes in waste program
- 2013 – Nuclear Administration Act (S.1240) proposes implementation of most BRC recommendations



U.S. Senate Considering S. 1240

- Committee on Energy and Natural Resources has been preparing for mark-up in 2014
- Nevada concerns are (1) continuation of Yucca Mountain licensing proceeding and (2) inadequate transportation safety and security provisions
- Sen. Reid and Sen. Heller working on possible amendments to (1) require the same written consent agreement for Yucca Mountain as for other sites & (2) require implementation of NAS 2006 transportation recommendations and reporting thereon

Prospects for passage uncertain



Safety and Environmental Case Against Yucca Mountain

- The site is not suitable for development as a geologic repository
- The DOE license application is incomplete, inaccurate, and no longer valid
- The DOE Yucca Mountain transportation impacts are unacceptable
- The DOE environmental impact statement (EIS) does not comply with the National Environmental Policy Act (NEPA)



Key Nevada Licensing Contentions

- ☐ Appropriate representation of future climate in area;
- ☐ Selection of models to characterize water flow;
- ☐ Chemical composition of the water that would contact the drip shields (if installed) & waste packages;
- ☐ Corrosion resistance & failure mechanisms of drip shields and waste packages;
- ☐ Sorption of radionuclides to minerals in the rock;
- ☐ Behaviour of radionuclides in the biosphere;
- ☐ Vulnerability of surface facilities to military aircraft crashes;
- ☐ Vulnerability of site to future volcanic events; &
- ☐ NEPA transportation issues



Business Case Against Yucca Mountain

- Obtaining a license to construct a repository at Yucca Mountain will be time-consuming, costly, and cannot be assumed to succeed
- Constructing and operating a repository at Yucca Mountain would cost \$95-100 Billion (2007\$), including \$15 billion already spent
- Terminating Yucca Mountain and developing another site could save \$13-28 Billion (2007\$)



Spent Fuel Assemblies Are Lethally Radioactive during Transportation

Age (years)	Activity (curies/assembly)	Surface Dose Rate (rem/hr)	Lethal Exposure (time)
1	2,500,000	234,000	7 seconds
5	600,000	46,800	35 seconds
10	400,000	23,400	1.2 minutes
50	100,000	8,640	3.2 minutes
100	50,000	2,150	12.5 minutes

Spent fuel activity and surface dose rates are provided in DOE-NRC, Waste Confidence Proceeding, Statement of Position of the U.S. Department of Energy, DOE/NE-007(April 15, 1980) Table II-4, p.II-56. NRC defines lethal dose as the dose of radiation expected to cause death to 50 percent of an exposed population within 30 days, typically 400 to 450 rem (4 to 5 sieverts) received over a very short time. See <http://www.nrc.gov/reading-rm/basic-ref/glossary/lethal-dose-ld.html>.

Revised 2.12.2013

DOE Yucca Mountain FSEIS Evaluated Transportation Radiological Impacts

- Incident-free exposures to members of the public;
- Incident-free exposures to transportation workers;
- Release of radioactive material as a result of the maximum reasonably foreseeable transportation accident; &
- Release of radioactive material following a successful act of sabotage or terrorism

Nevada contentions demonstrate that DOE underestimated transportation radiological impacts in every category.

Source: Halstead and Dilger, ANS IHLRWMC 2011, Albuquerque, NM, April 10-14, 2011, Pp. 410-411.

Shipping Cask Vulnerability in Severe Accident Fires is an Ongoing Debate

MacArthur Maze - 2007

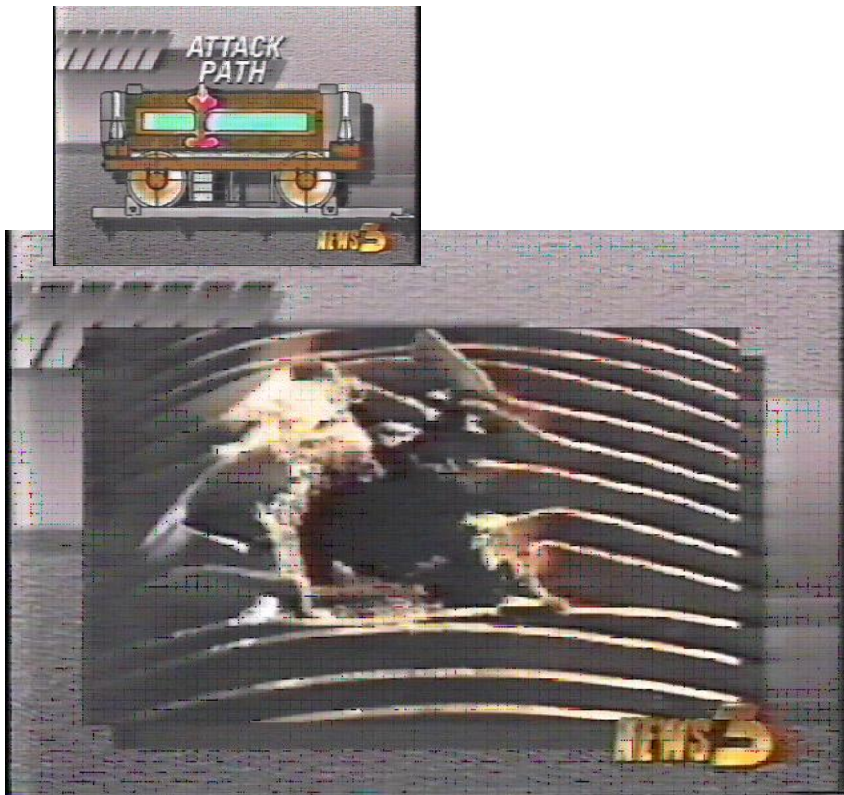


Baltimore Rail Tunnel - 2001

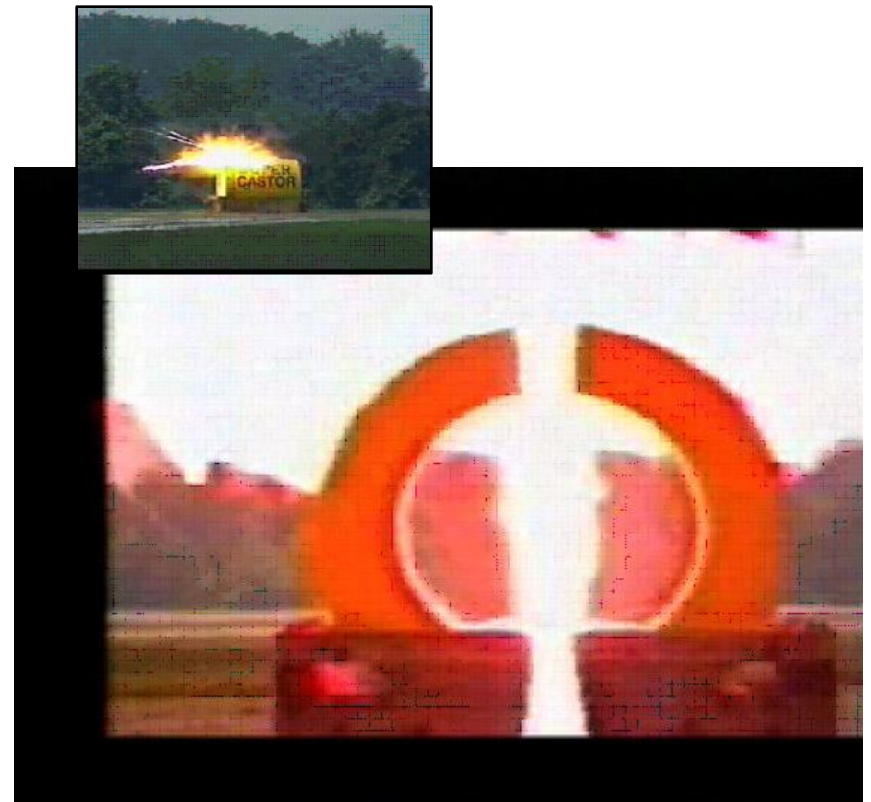


Tests Show Shipping Casks Are Vulnerable to Terrorist Attacks

Truck Cask Test, 1982



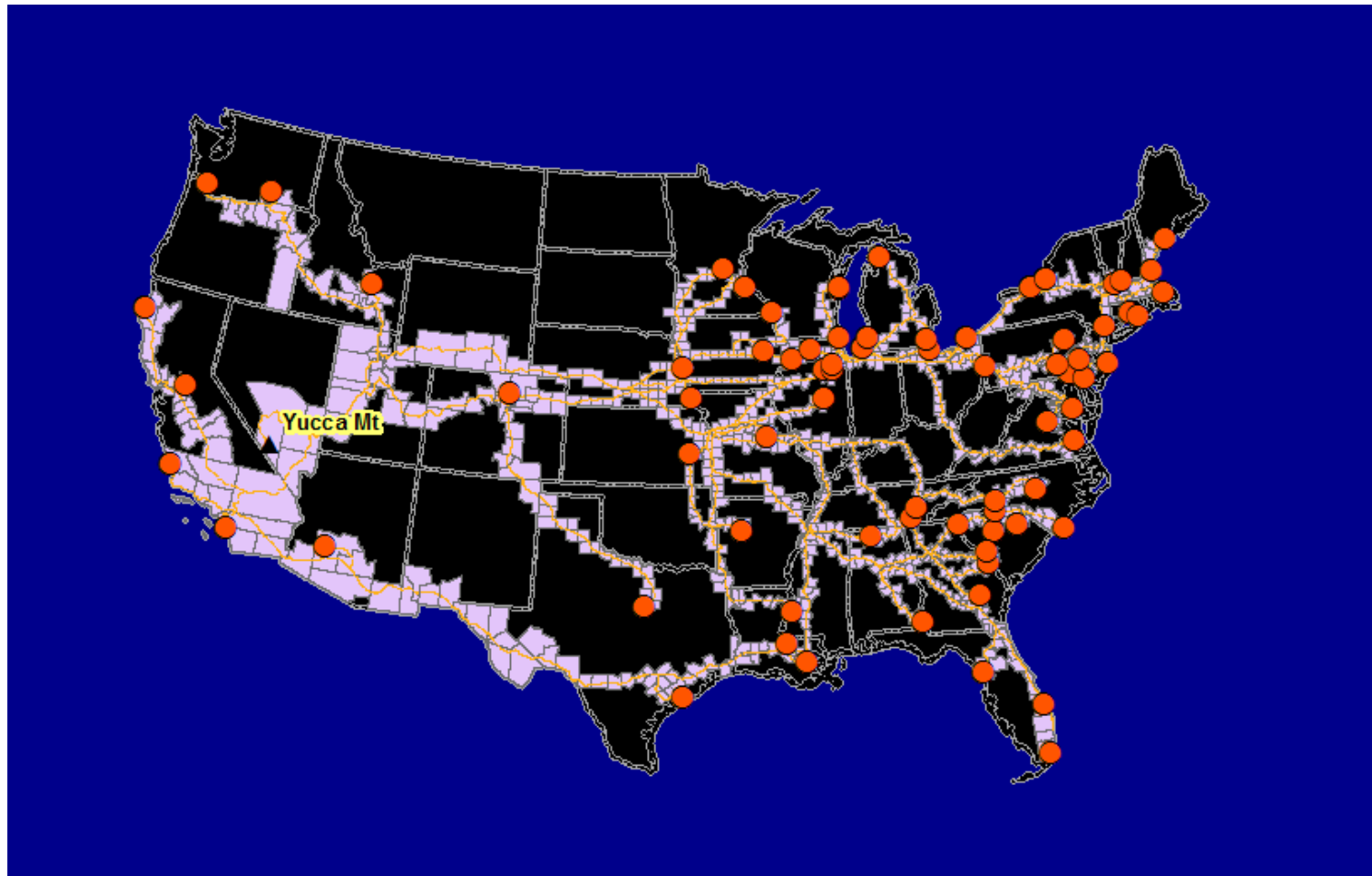
Rail Cask Test, 1998



DOE Yucca Mountain FSEIS Planned Daily Cross-country Shipments for 50 Years

- Ship 9,495 rail casks (2,800 trains) & 2,650 truck casks over 50 years
- If No 2nd Repository: 21,909 rail casks (about 6,700 trains) & 5,025 truck casks
- Average 1-3 trains (3-5 casks per train) & 1-2 trucks (1 cask per truck) per week for 50 years
- Every day, for 50 years, one or more loaded casks on rail or road, from 76 shipping sites to a single national repository or storage site

DOE Yucca Mountain FSEIS Shipping Routes



DOE Yucca Mountain Shipments Would Be A Matter of National Concern

- SNF & HLW currently stored at 76 sites in 34 states
- SEIS “representative routes” to Yucca Mountain would have traveled 22,000 miles of railways and 7,000 miles of highways
- SEIS “representative routes” to Yucca Mountain would have traversed 44 states, the District of Columbia, 33 Indian nations, and about 850 counties with a population of about 177 million (2010 Census estimates)
- Routes to Yucca Mountain would have affected most of the nation's congressional districts (400 in the 113th Congress).

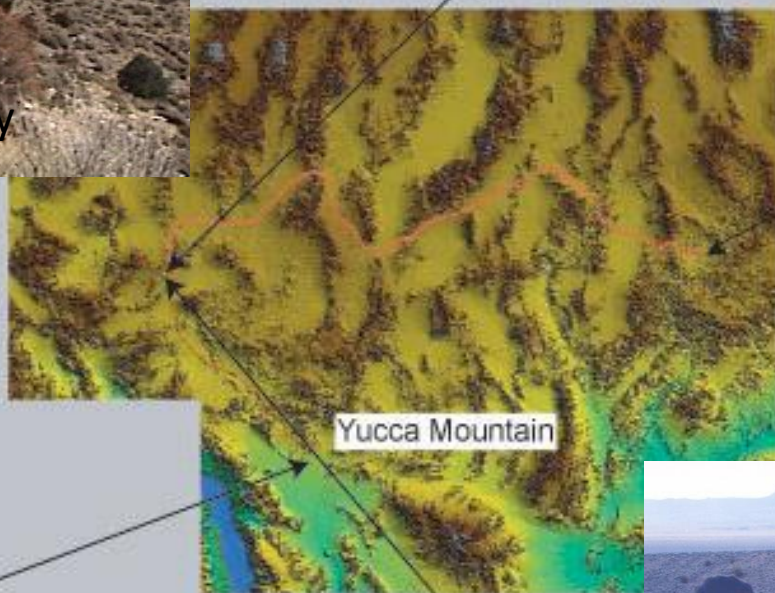
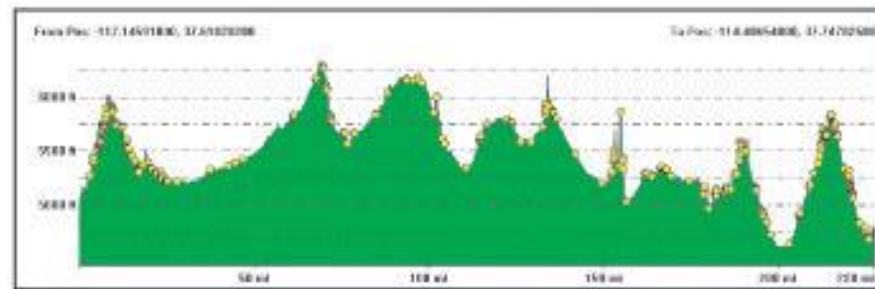
Nevada Concerns About DOE Yucca Mountain Transportation Plans

- Proposed Caliente rail alignment
- Shipments through Las Vegas
- DOE failure to accept Nevada safety recommendations adopted by NAS in 2006 and BRC in 2012 (Oldest fuel first, full-scale cask testing, selection of shipping routes)
- DOE shipments exempt from key NRC safety & security regulations (10 CFR 73.37)

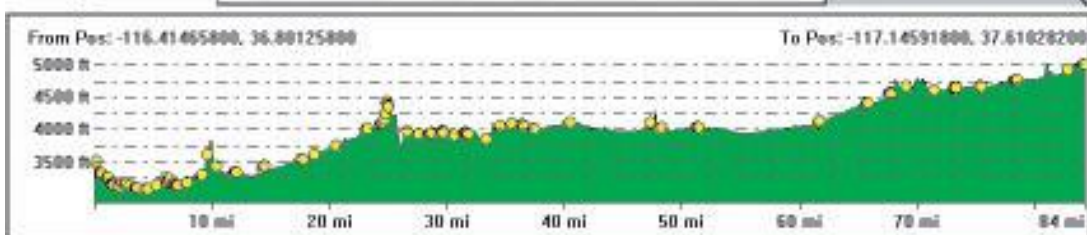
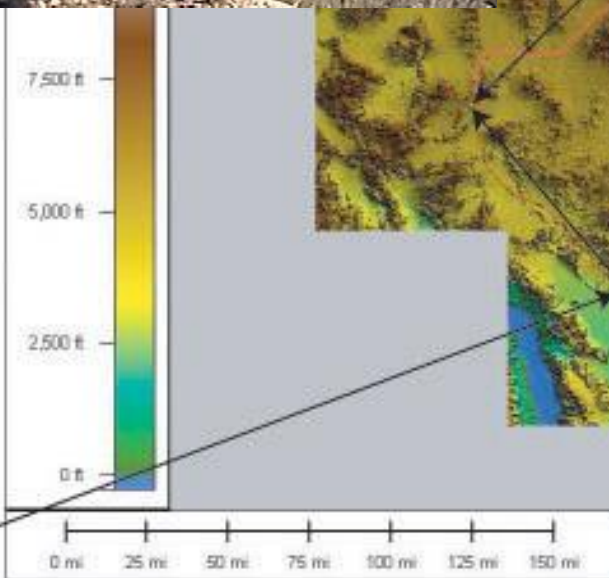
Caliente Rail Profile



Garden Valley

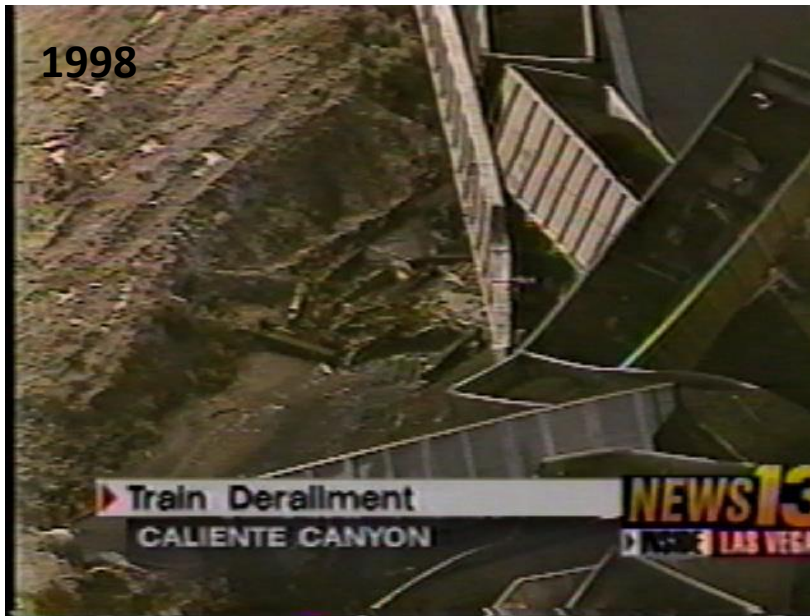


Yucca Mountain



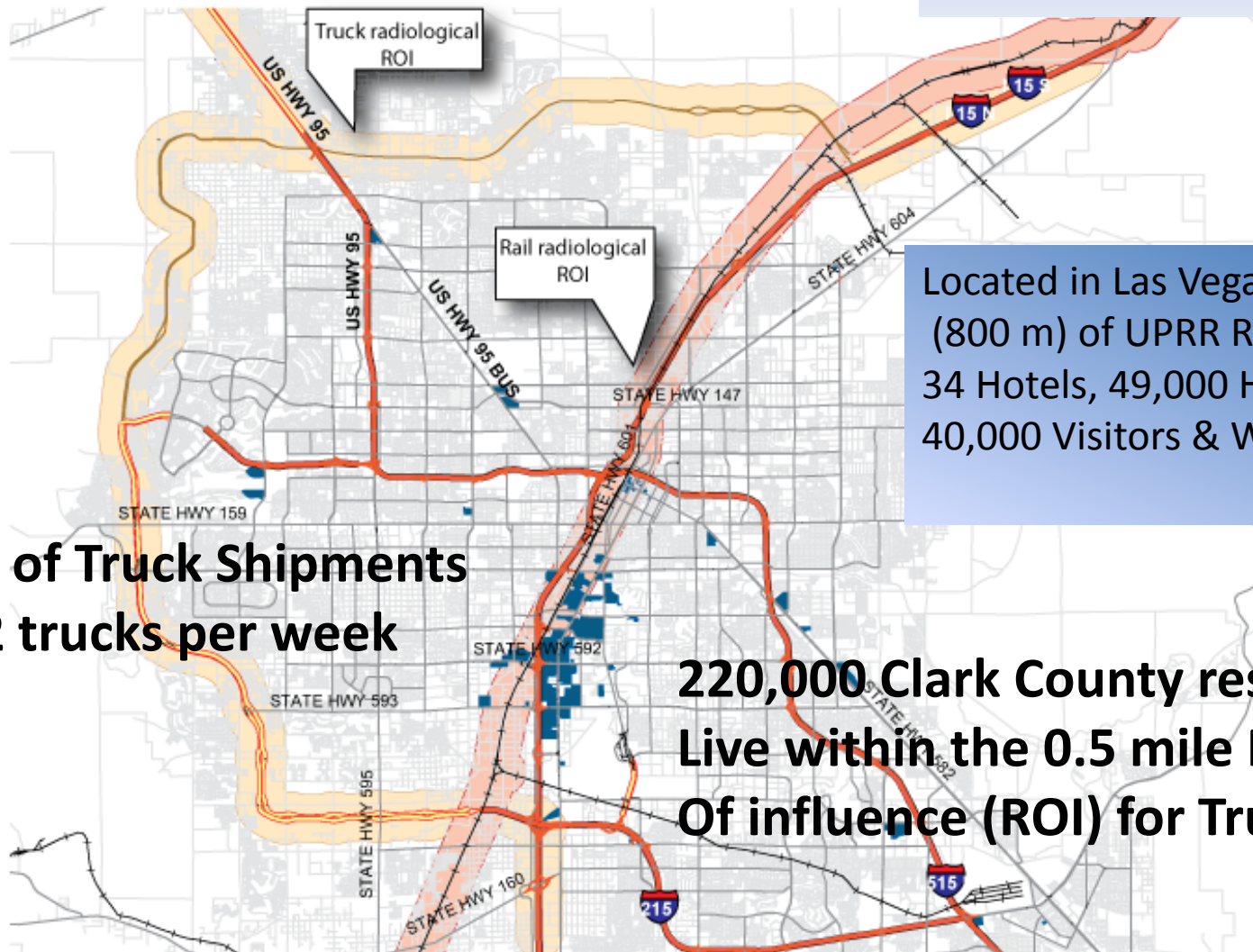
Cow Canyon, Reveille Valley

UPRR Mainline to Caliente: Challenging Route



Unacceptable Las Vegas Transportation Impacts

Rail through Las Vegas
to Yucca Mountain via Caliente
Up to 110 trainloads per year

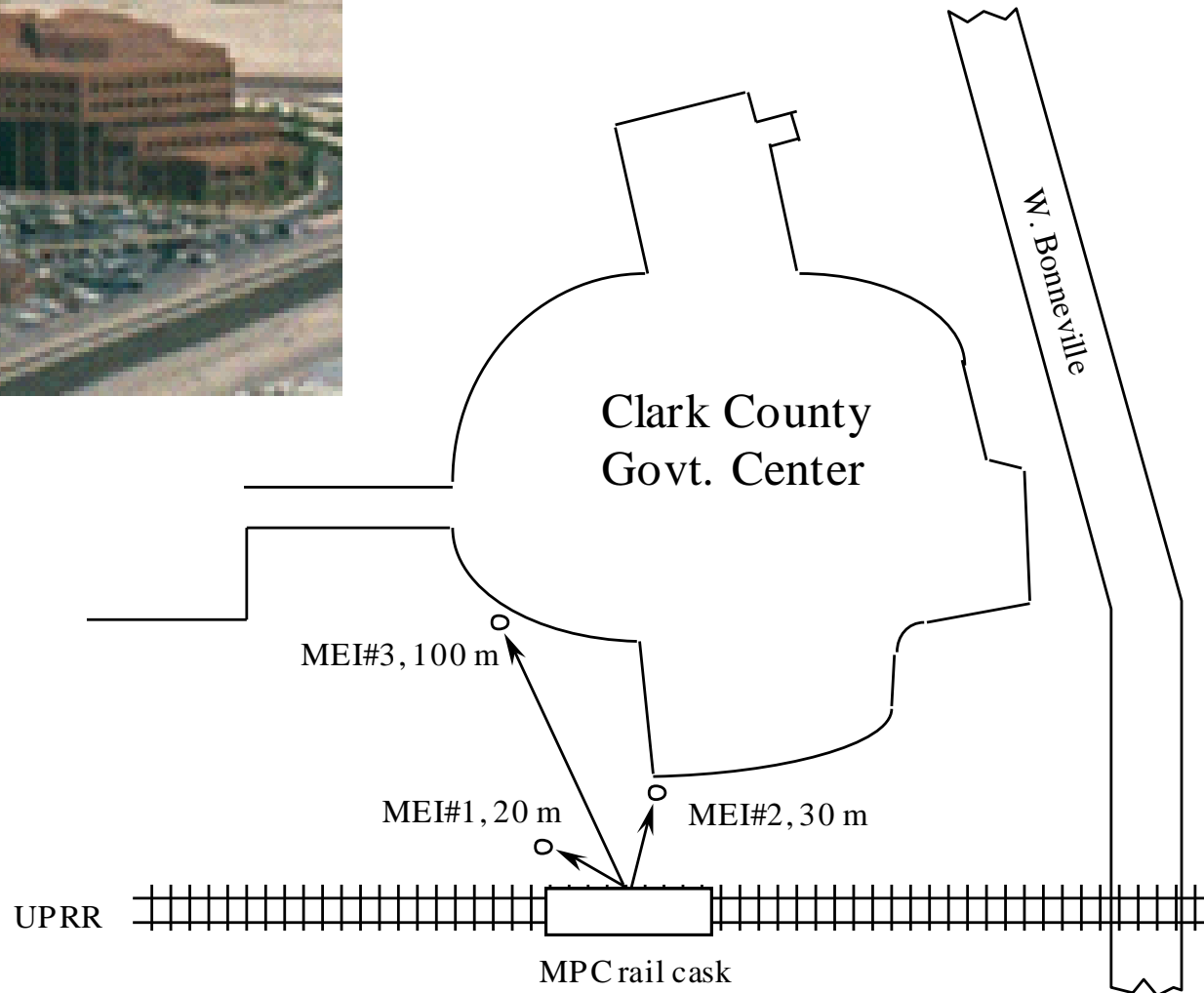


Located in Las Vegas within 0.5 mile
(800 m) of UPRR Route to Caliente :
34 Hotels, 49,000 Hotel Rooms
40,000 Visitors & Workers

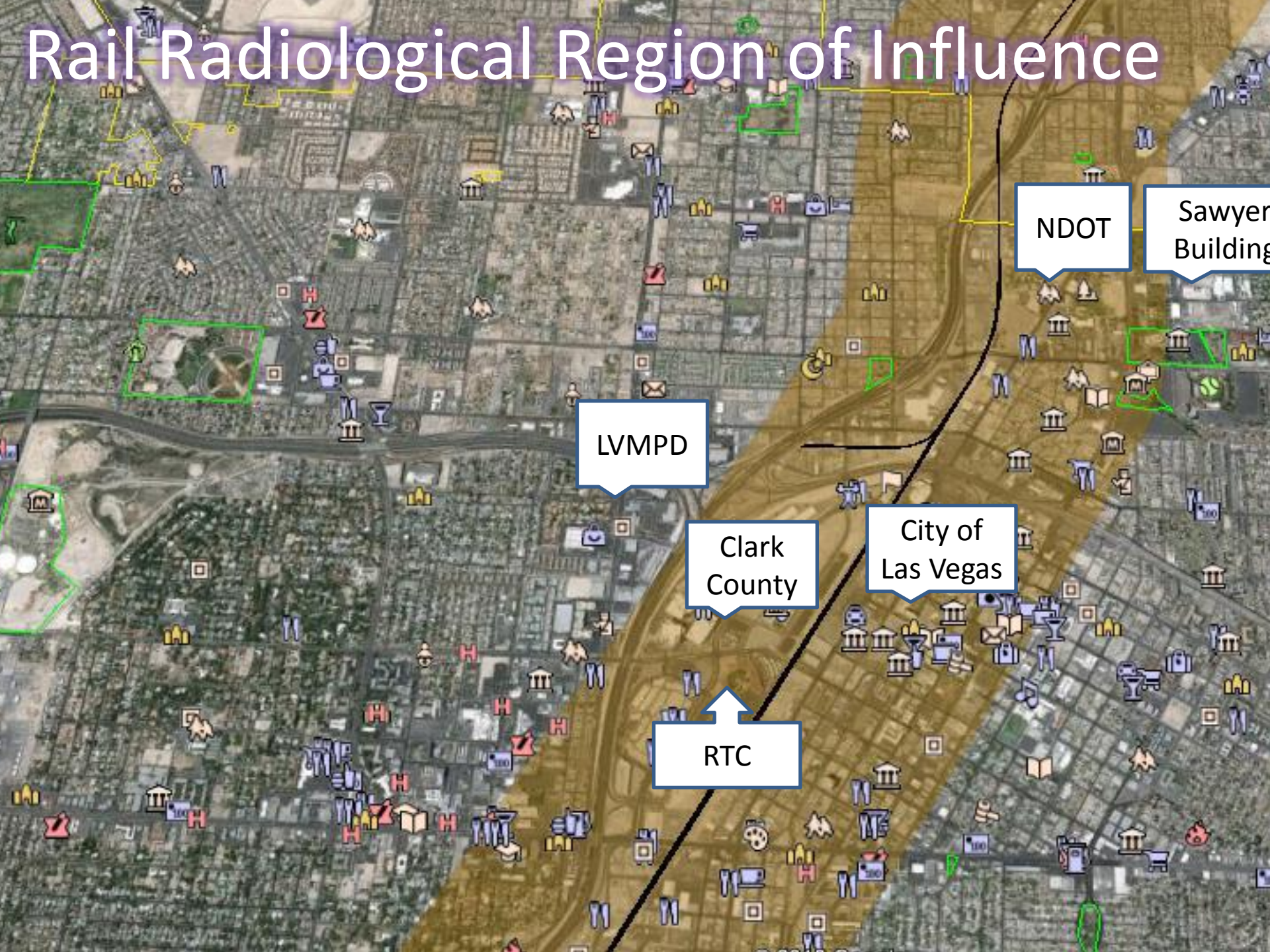
**100% of Truck Shipments
1 or 2 trucks per week**

**220,000 Clark County residents
Live within the 0.5 mile Region
Of influence (ROI) for Truck and Rail**

Potential for Exposures During Train Stops at Las Vegas Locations Along UPRR



Rail Radiological Region of Influence



NDOT

Sawyer
Building

LVMPD

Clark
County

City of
Las Vegas

RTC

Nevada Safety Recommendations

Adopted by NAS, BRC, & NRC; NOT by DOE

Organization Issue	Endorsement by National Academy of Sciences 2006 Report	Endorsement by Blue Ribbon Commission 2012 Report	Adoption by US Department of Energy 2008 FSEIS	Adoption by US NRC Through 2013
Oldest fuel first	Satisfactory	Satisfactory	Unsatisfactory	N/A
Dual Purpose Casks	Incomplete	Incomplete	Incomplete	N/A
Mostly rail	Satisfactory	Satisfactory	Satisfactory	N/A
Dedicated Trains	Satisfactory	Satisfactory	Satisfactory	Incomplete
Cask Testing	Satisfactory	Satisfactory	Incomplete	Satisfactory
Rail Access/NEPA	Unsatisfactory	Incomplete	Unsatisfactory	Satisfactory
Shipment Routes	Satisfactory	Satisfactory	Unsatisfactory	N/A
Section 180(c)	Satisfactory	Satisfactory	Incomplete	N/A
State, Local, & Tribal Regulation	Satisfactory	Satisfactory	Incomplete	N/A
Terrorism and Sabotage	Incomplete	Incomplete	Incomplete	Satisfactory