Nevada Department of Transportation Hazardous Commodity Flow Study

SERC Meeting – February 27, 2019

February 27, 2019

presented to

Nevada Department of Transportation

presented by

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NEVADA DOT SAFE AND CONNECTED

CAMBRIDGE SYSTEMATICS Think Forward

Overview

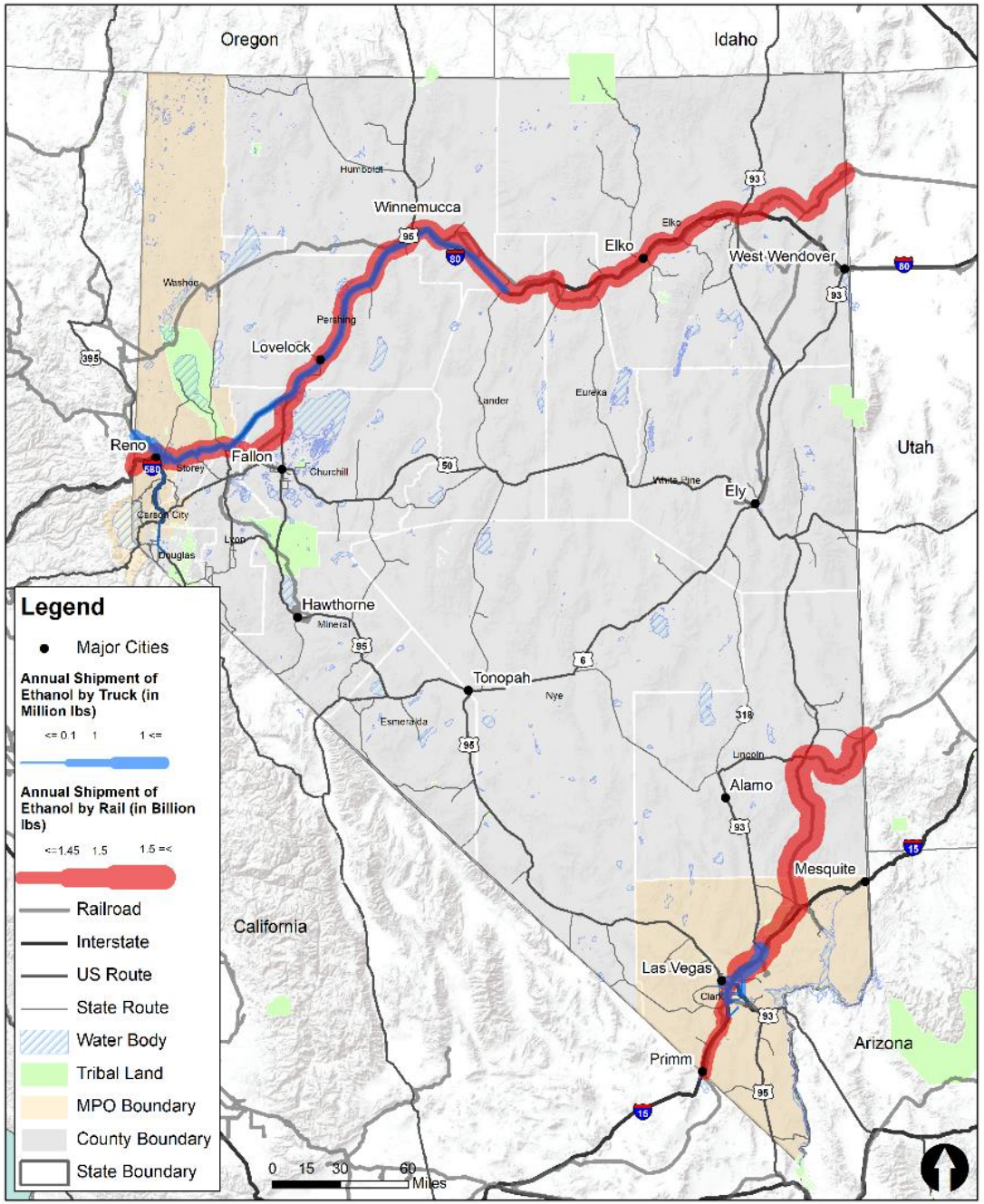
- Top Ten Chemical Update
- Petroleum Supply Chain Results
- Hazmat Roadside Survey Results
- Questions

Proposed Top Ten Chemicals

	Chemical Name	Score	Chemical Uses	Facilities	EHS
1	Ammonia, Anhydrous	4	Refrigerant, fertilizer	18	Yes
2	Butane	4	Fuel and blending	6	No
3	Chlorine	7	Water treatment	6	Yes
4	Ethanol	1	Biofuel	5	No
5	Hydrofluoric acid	4	Manufacturing	8	Yes
6	Nitrogen Dioxide	6	Catalyst, oxidizing agent	2	Yes
7	Potassium Cyanide	4	Mining and electroplating	2	Yes
8	Propane	3.5	Fuel and heating	7	No
9	Sodium Cyanide	4	Mining operations	18	Yes
10	Titanium tetrachloride	4	Titanium, whitening	4	Yes

Top Ten Chemicals Update

- Identified hazmat facilities storing top ten chemicals
- Identified distribution centers and manufacturers
- Conducting outreach to top ten hazmat facilities
- Developing top ten chemical maps



Ethanol Transportation

- **Ethanol Transportation**
  - » Transported primarily by rail from Midwest states to Reno and Las Vegas by rail and exported from California
  - » Blended with gasoline before being distributed by to retail stations
  - » More stations selling E-85
- Ethanol Emergency Response
  - » Ethanol (grain alcohol) produces a nearly invisible flame
  - » Presents challenges for fire fighters because of different placards used and the need for alcohol-resistant foam

Ethanol Blends Determine Placard Identification

Ethyl Alcohol
E-100

E11 – E99

E95 – E-99 Denatured

E-1 -E10

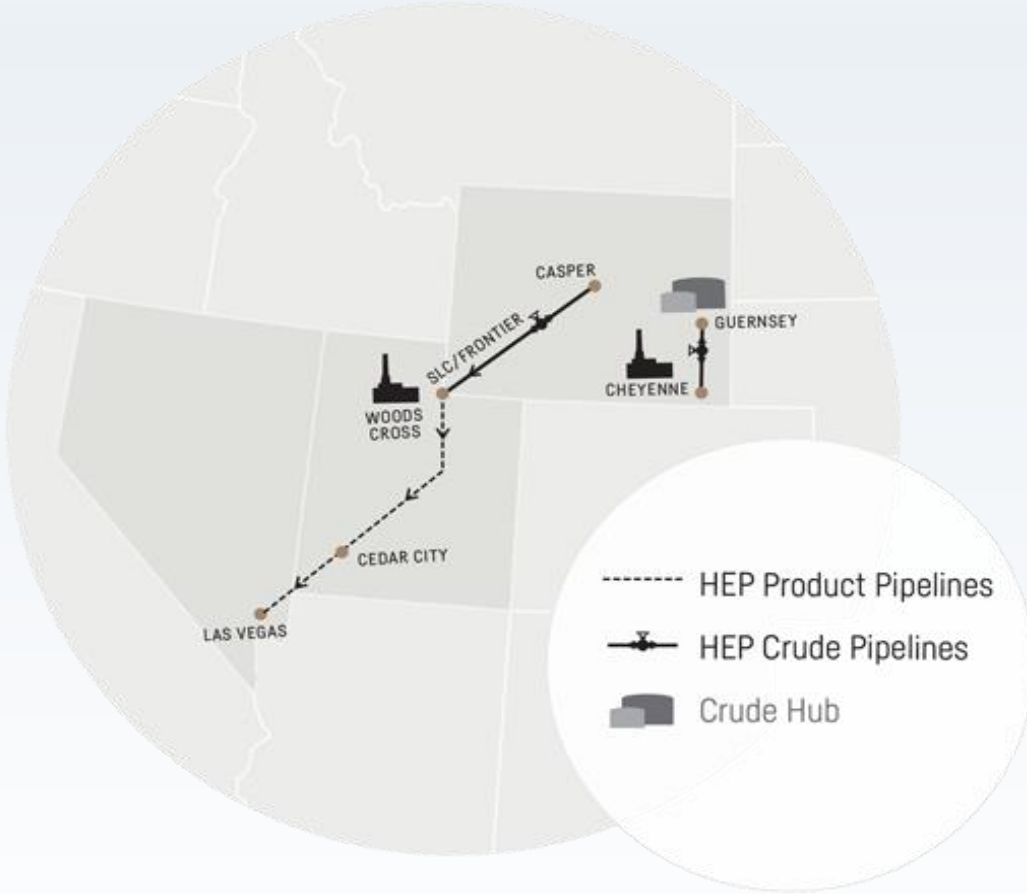
NFPA Diamond

Sources: IEM, ERG, CS, CAMEO

Petroleum Supply Chain Methodology

- Nevada refined petroleum is mostly produced in California and Utah
- Refined Petroleum is transported to Nevada via pipelines
- Petroleum is primarily stored in Reno and Las Vegas
- Trucks transport refined petroleum to retail facilities

Petroleum Sources



Las Vegas Petroleum Storage

- Pipelines into Las Vegas have the capacity to transport roughly 200,000 barrels per day
  - 53% gasoline
  - 27% diesel
  - 20% jet fuel
- Storage terminal capacity in Las Vegas is 10 times more than the pipeline capacity (2 million barrels)

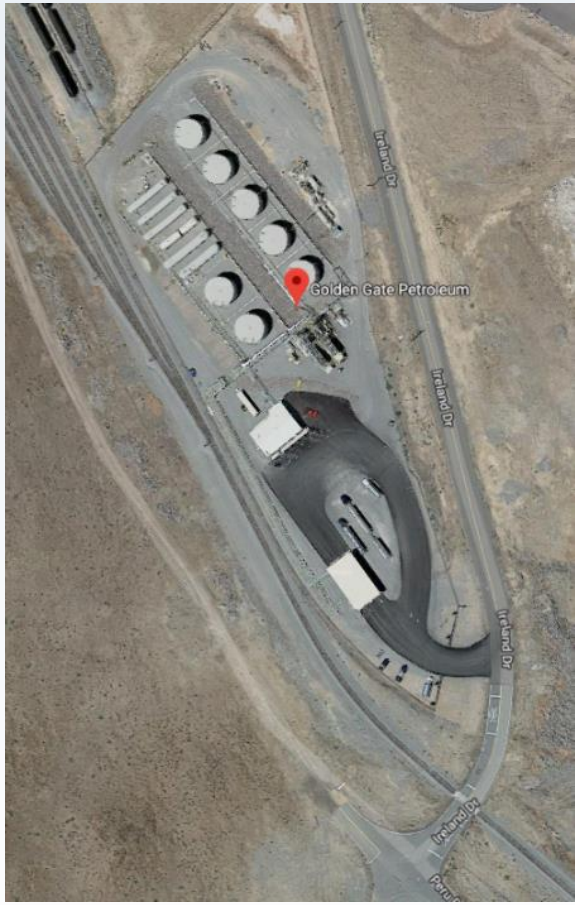
Reno Petroleum Storage

- Pipeline into Reno has the capacity to transport roughly 50,000 barrels per day
  - 40% gasoline
  - 40% diesel
  - 20% jet fuel
- Storage terminal capacity in Reno is 15 times pipeline capacity (750,000 barrels)

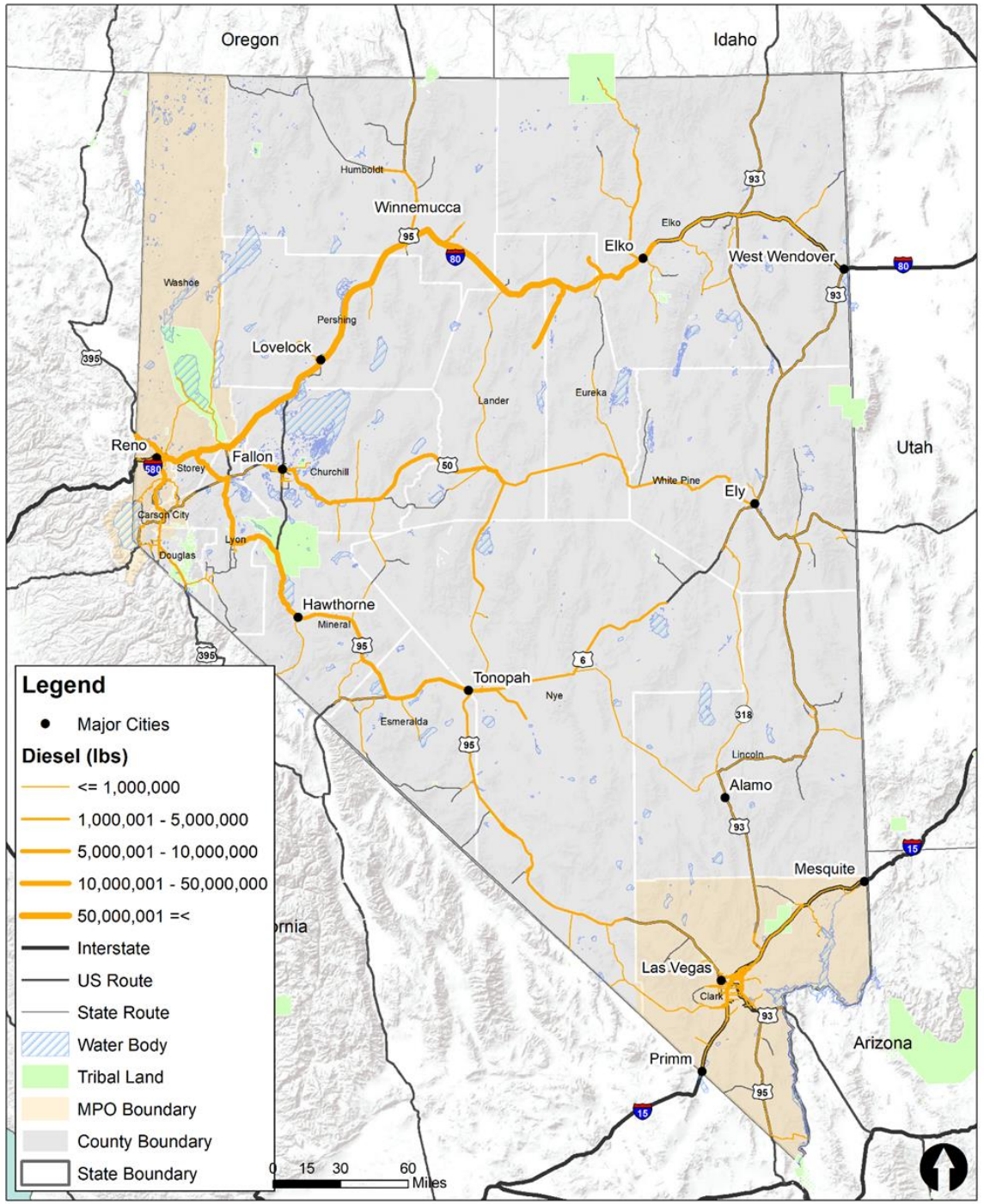
Refineries in Nevada

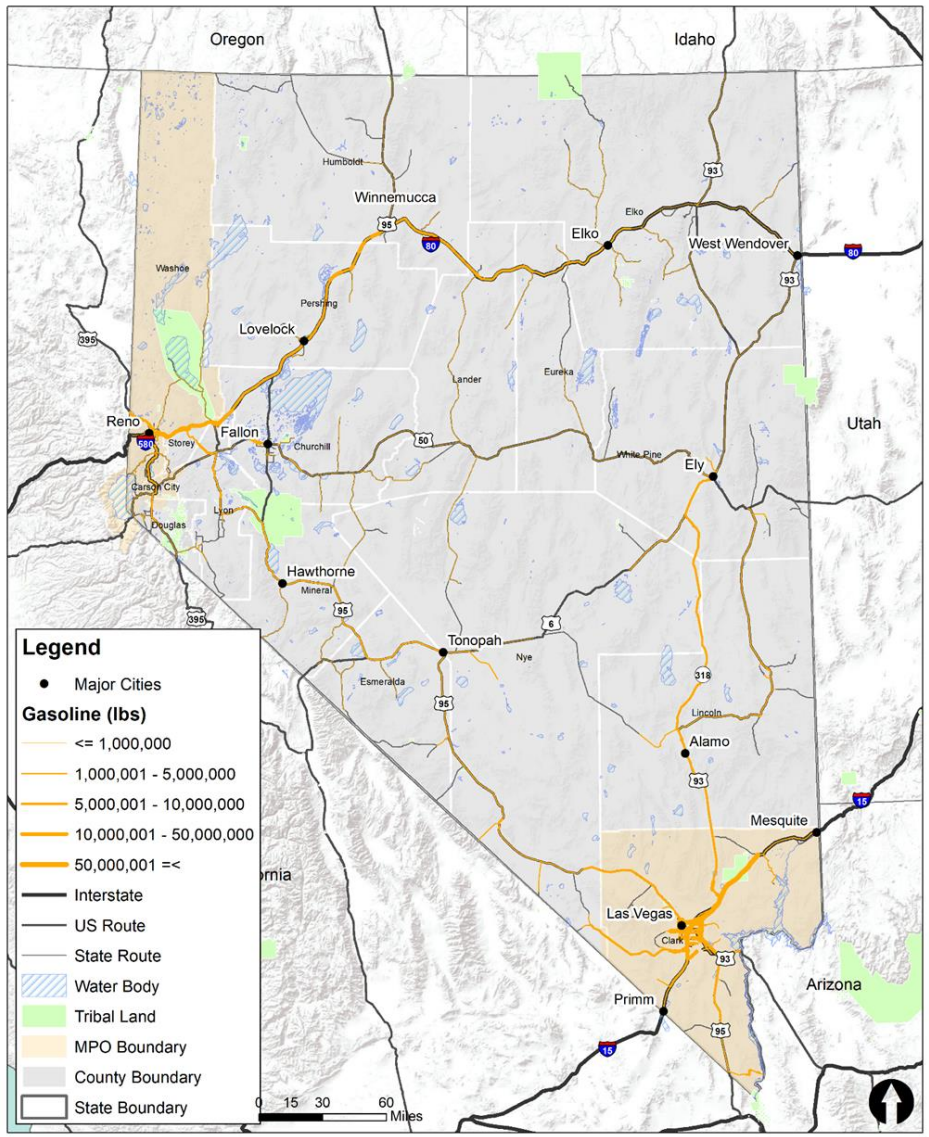
- Foreland Eagle Springs Refinery southwest of Ely
  - » Refines local crude from Gabbs oil field
  - » Consumes gasoline and diesel for operations
  - » Produces asphalt and fuel oil

- Golden Gate Petroleum Refinery east of Reno
  - » Receives transmix by rail
  - » Produces diesel, gasoline, and natural gasoline
  - » Distributes to retail stations in Northern Nevada



Petroleum Distribution



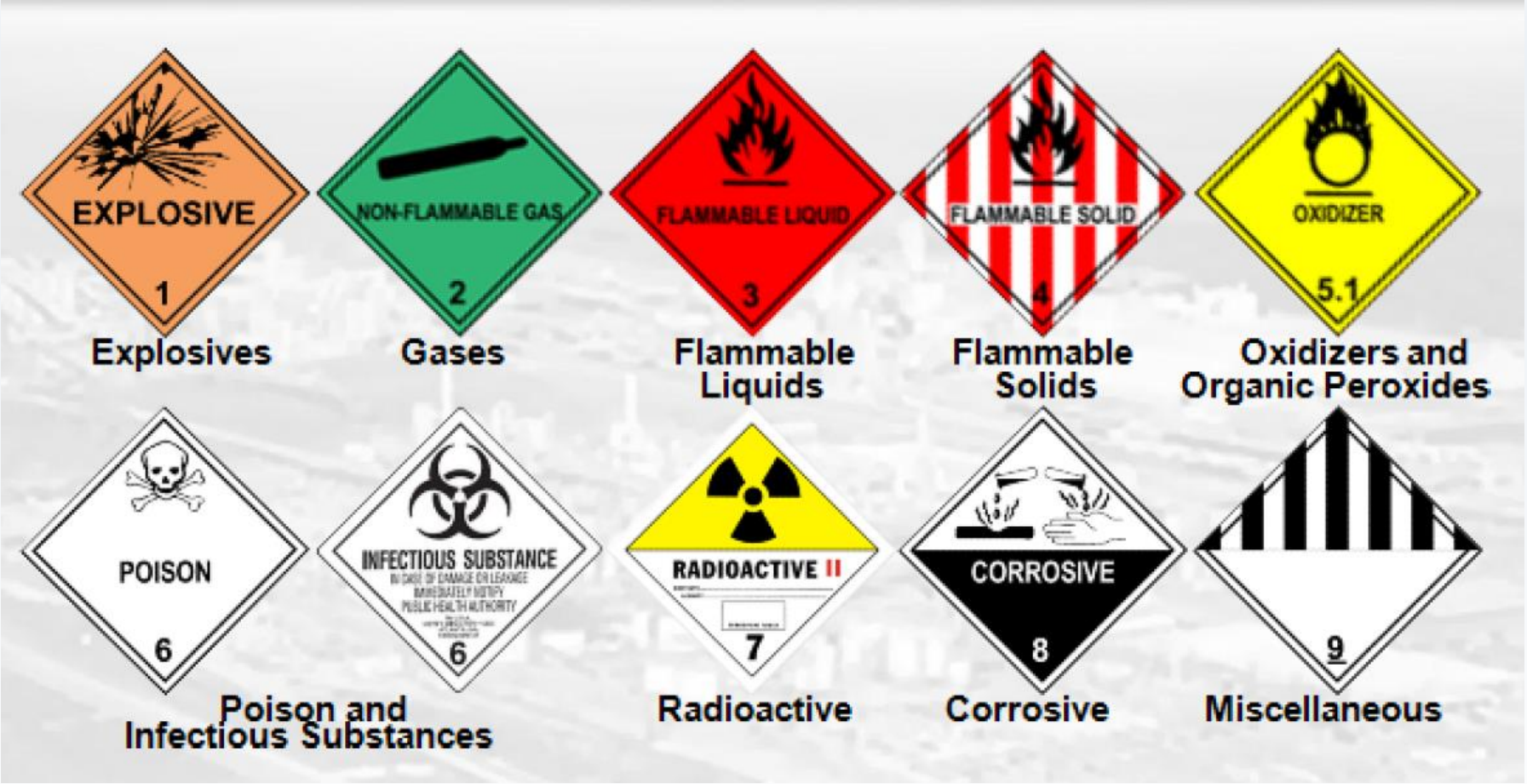


Roadside Hazmat Surveys

Roadside Placard Surveys

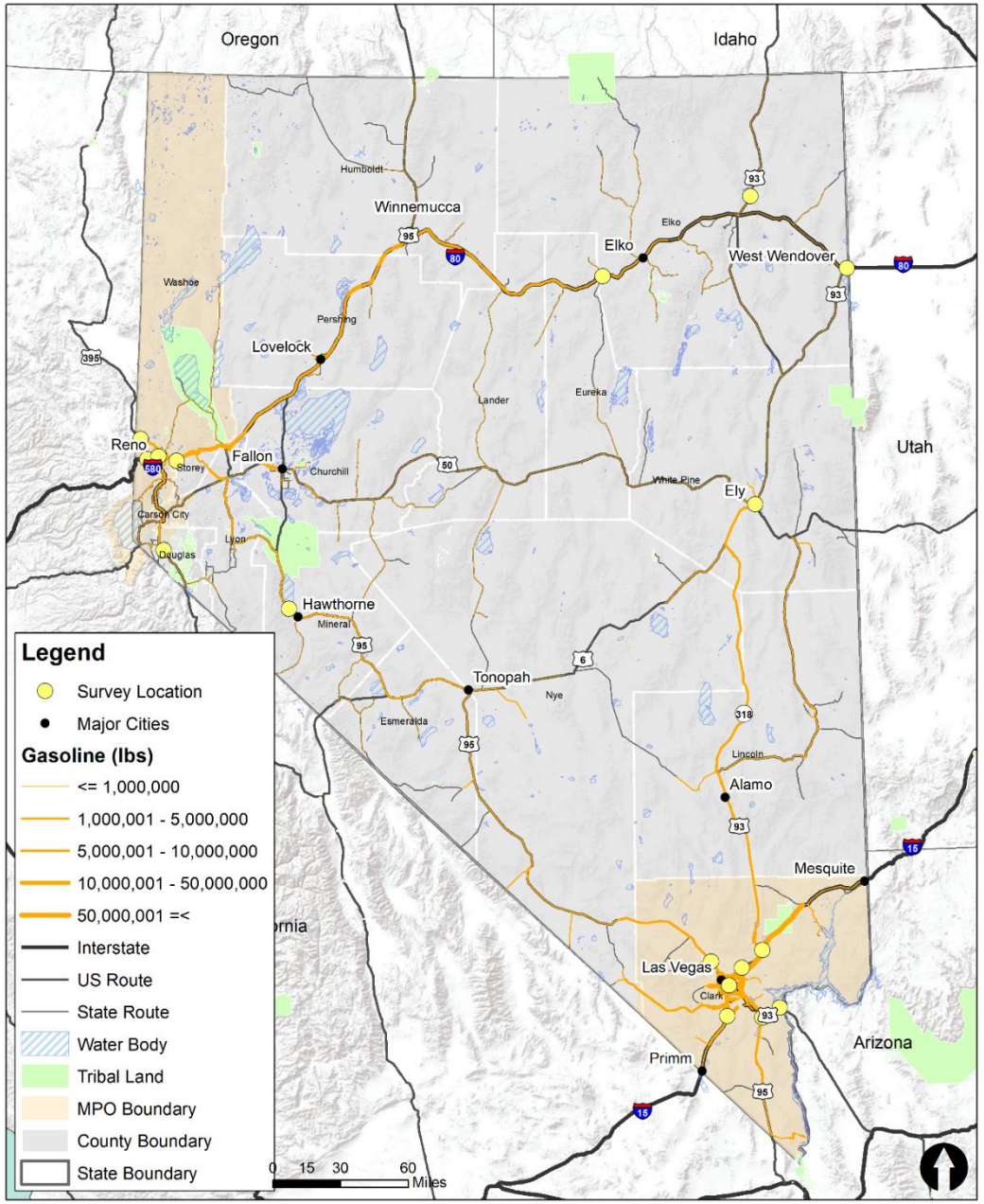
- Two hour bi-directional counts of trucks displaying hazmat placards
  - ID truck volumes, types and hazmat placards
  - Conducted on weekdays and daylight hours
- 18 count locations
  - 7 in Las Vegas area
  - 5 in the Reno area
  - 6 in rural areas

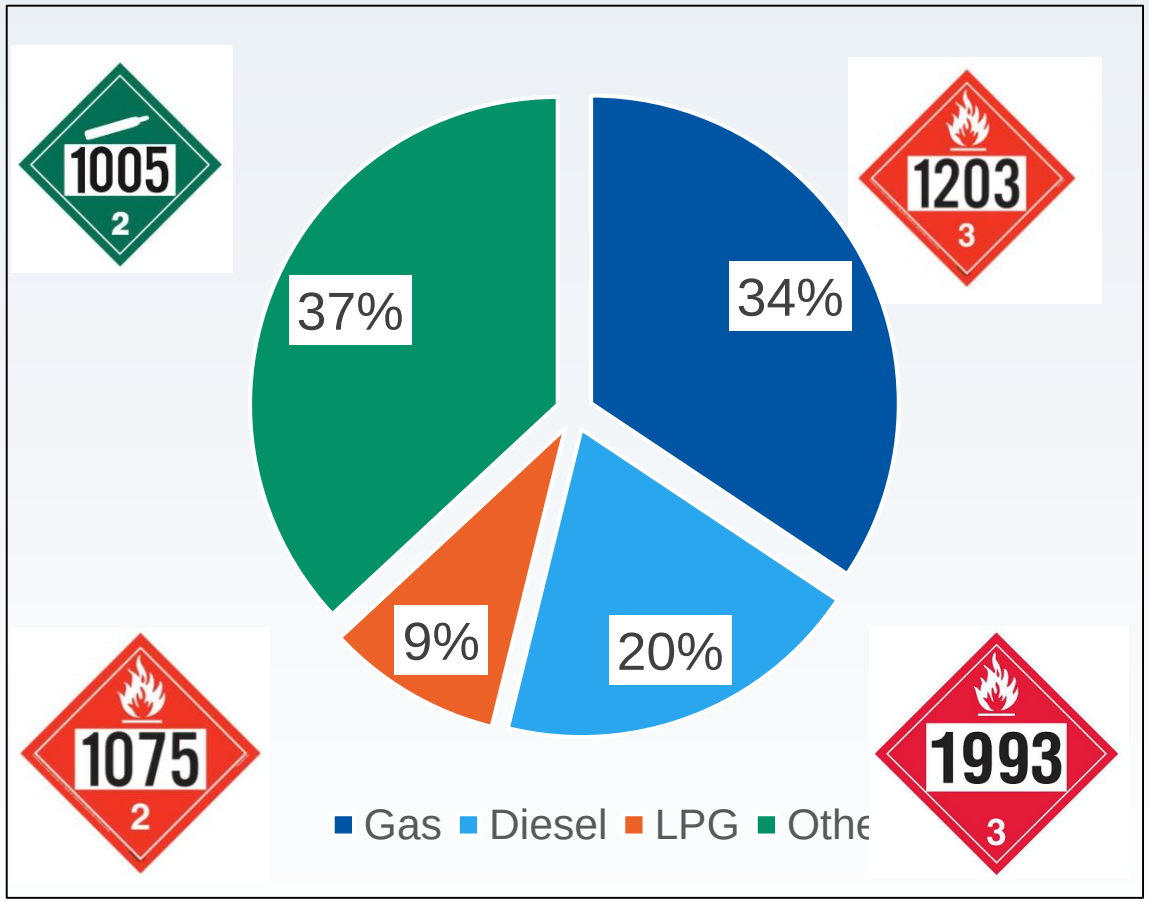
Hazmat Classifications



Survey Results

Primarily Gasoline, Diesel, LPG





Route	Site	Blank	1993	1824	1760	1207	1203	1803	1075	1903	2502	1206	1208	2014	1987	2350	1049	2107	2187	2305	3077	Total
I-15	Vegas	12	5				17		1													35
I-80	Reno	8	5			1	14	1	1										1			31
I-80	Reno	6	3				6		2	1	1	1	1									21
I-15	Vegas	7	4				6		3													20
US 93	Vegas	1	6				6		3													16
I-80	Rural	8	3	3	1																	15
I-80	Rural	1	3				5							1	1							11
US 93	Vegas	2					3		3											1		9
I-80	Reno	1	2				2		1							1						7
I-15	Vegas	2	3				1											1				7
US 95	Vegas	1					4		1													6
US 395	Reno	1	2						1								1					5
US-50/93	Rural			1			2		1												1	4
US 95	Vegas	2							1													3
US-95	Reno		1											1								2
US-95	Rural		1																			1
US-93	Rural	1																				1
US 395	Reno						1															1
Totals		53	38	4	1	1	67	1	18	1	1	1	1	2	1	1	1	1		1		195

Survey Location Details

- Total 195 Trucks
- Top five locations in Reno and Vegas
- 53 with no UN number but placard color identified

Additional Placards Observed

- 1206 Heptanes
- 1207 Hexaldehyde
- 1208 Hexanes
- 1760 Cleaning Liquids
- 1987 Ethanol (E-95)
- 1824 Caustic Soda
- 1913 Disinfectants
- 2014 Hydrogen Peroxide
- 3077 Hazardous Waste

Top Ten Hazmat Classes

		Classes	Description
1	Ammonia, Anhydrous	2.3, 8	Gas, corrosive
2	Butane	2.1	Petroleum gas
3	Chlorine	2.3, 5.1, 8	Poisonous gas, oxidizer, corrosive
4	Ethanol	3	Flammable liquid
5	Hydrofluoric Acid	6.1, 8	Poisonous, corrosive
6	Nitrogen Dioxide (Dinitrogen Tetroxide)	2.3, 5.1, 8	Poisonous gas, oxidizer, corrosive
7	Potassium Cyanide	6.1	Poisonous, corrosive
8	Propane	2.1	Petroleum gas
9	Sodium Cyanide	6.1	Poisonous
10	Titanium Tetrachloride	6.1, 8	Poisonous, corrosive

Observations and Findings

- 63% of trucks observed transported flammable liquids and gases
- 65% trucks observed were in Reno and Vegas (top 5 locations)
- Fuel additives such as heptanes and hexanes were observed near Reno

Questions

THANK YOU!

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