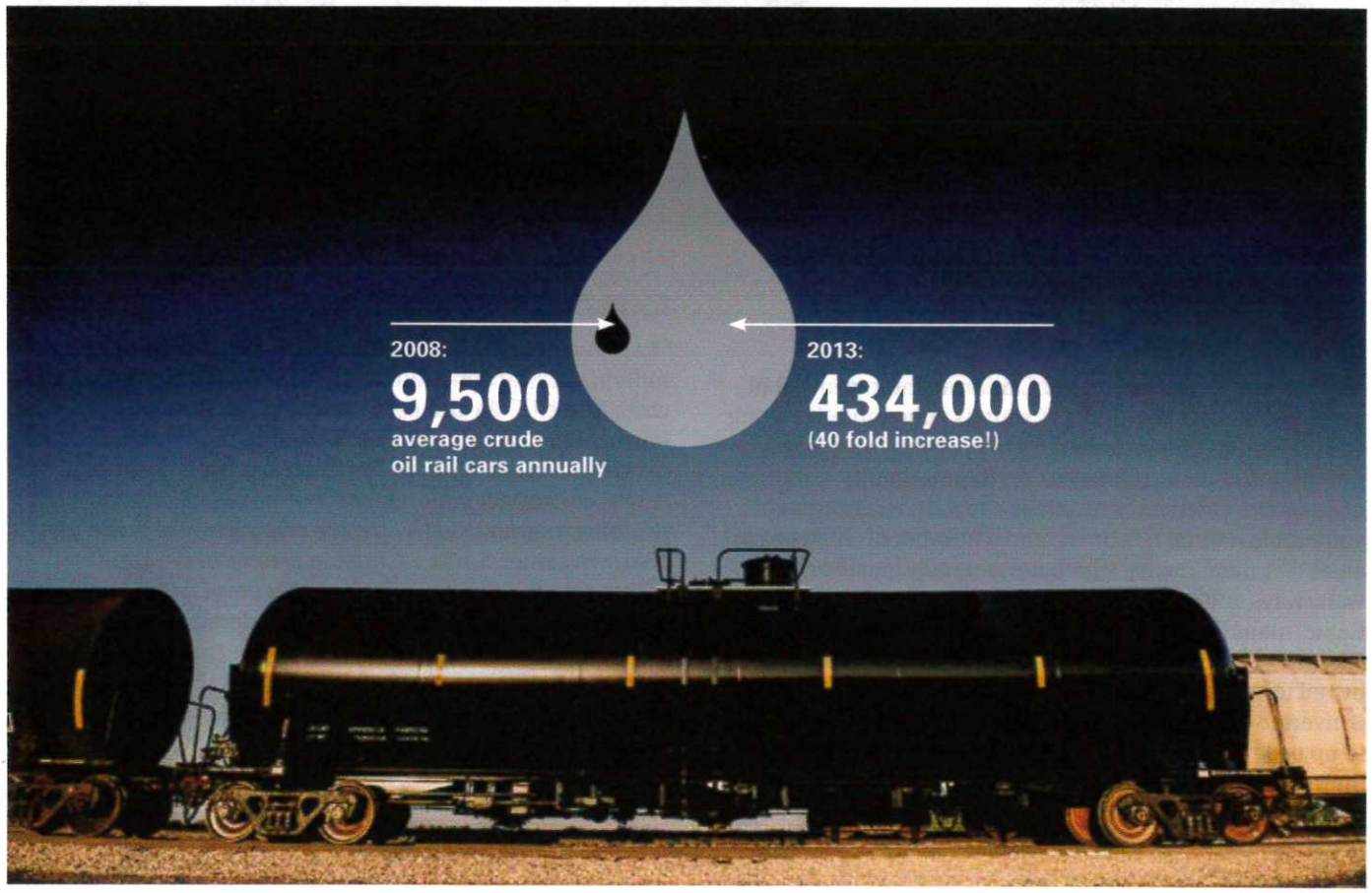
It Could Happen Here:
The Exploding Threat of Crude by Rail in California

Soda cans on wheels. That's what some call the dangerous rail tank cars that have suddenly become ubiquitous across the American landscape. In the rush to transport land-locked unconventional new crude oil sources, old rail lines running through communities across America are now rattling with thousands of cars filled with crude oil. Neither the cars nor the railroads were built for this purpose. Worse, federal regulators have few safeguards in place to protect communities and the environment from accidents, spills and explosions resulting from the race to move millions of barrels of crude by rail.

More crude oil was transported by rail in North America in 2013 than in the past five years combined, most of it extracted from the Bakken shale of North Dakota and Montana.[1] In California, the increase in crude by rail has been particularly dramatic, from 45,000 barrels in 2009 to 6 million barrels in 2013.[2] As "rolling pipelines" of more than 100 rail cars haul millions of gallons of crude oil through our communities,[3] derailments, oil spills and explosions are becoming all too common. Between March 2013 and May 2014, there were 12 significant oil train derailments in the United States and Canada. As oil companies profit, communities bear the cost.



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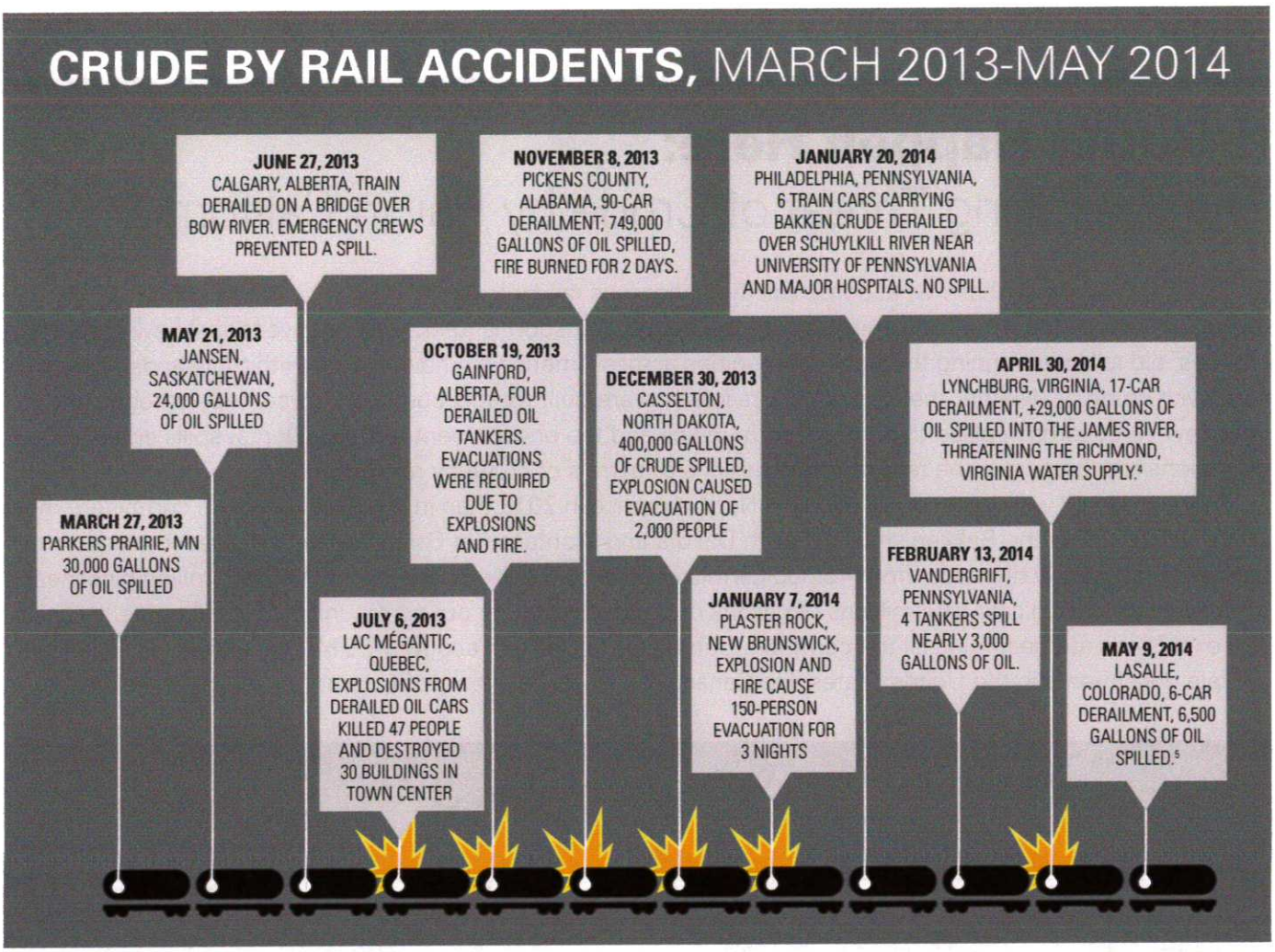


CALIFORNIANS LIVING NEAR CRUDE BY RAIL ROUTES

A new report from the State of California Interagency Rail Safety Working Group outlines serious vulnerabilities along California rail lines including close proximity to many population centers, numerous earthquake faults, a shortage of adequate emergency response capacity, many areas of vulnerable natural resources, and a number of "high hazard areas" for derailments, which are generally located along waterways and fragile natural resource areas.[6] Millions of Californians live near crude by rail routes and could face extreme safety risks. Currently, there are five major new crude by rail terminals in the planning stages and two recently converted crude oil rail terminals that could collectively bring in up to seven or more mile long trains each day through metropolitan areas like Sacramento, putting up to 3.8 million people in harm's way.[7] The following table and accompanying maps illustrate the extent to which crude by rail routes impact many California cities, showing how many people live within the half mile federal evacuation zone for crude oil tanker train accidents and within the one mile recommended isolation zone for those accidents where fires occur. Dozens of schools also fall within those potential impact zones.

EXPLOSIONS AND SPILLS THREATEN LIVES[8]

"Each tank car of crude holds the energy equivalent of 2 million sticks of dynamite or the fuel in a widebody jetliner," write Russell Gold and Betsy Morris in the Wall Street Journal.[9] In July 2013, an unattended oil train carrying 72 carloads of crude oil from North Dakota exploded in the center of Lac-Mégantic, Quebec, near the U.S. border.[10] The resulting inferno killed 47 people and destroyed much of the town center. Some 1.6 million gallons of crude oil was spilled.[11] In the months following this devastating event, several more North American oil train derailments [see sidebar] illustrated the sobering recurring public safety and environmental threats of catastrophic derailments due to the virtually unregulated surge in crude by rail. In 2013, railcars spilled more crude oil than nearly the previous four decades combined (1.14 million gallons in 2013 compared to 800,000 gallons from 1975 to 2012).[12]

Population and Schools at Risk from Proposed Crude by Rail Projects				
	Population at Risk from Crude by Rail Routes		Area Schools at Risk from Crude by Rail Routes	
City	**Within ½ mile**	**Within 1 mile**	**Within ½ mile**	**Within 1 mile**
Sacramento	136,000	256,000	>100	>175
Bakersfield	76,000	167,000	>50	>75
Richmond	55,000	76,000	>35	>60
Davis	26,000	45,000	7	9
Pittsburg	25,000	40,000	12	19
Martinez	13,000	24,000	5	11
Benicia	4,500	12,000	3	4
And many other communities				
Total	**2,000,000**	**3,800,000**		

Sources: Population estimates are based on the U.S. Census 2010 Block Centroid Populations. Estimates were calculated within 0.5 and 1.0 miles of active rail lines within city limits. Schools include all public and private education centers serving children (K-12): https://portal.gis.ca.gov/geoportal/catalog/main/home.page. Estimates are based on schools within the greater area and within 0.5 and 1.0 miles of active rail lines. Rail lines are based on the 2013 National Transportation Atlas Database. The U.S. DOT recommends a standard evacuation zone of 800 meters (0.5 mile) for accidents involving railcars filled with flammable liquids and gases, and an isolation zone of 1600 meters (1.0 mile) in all directions around any railcar filled with those materials if they are on fire.

COMMUNITIES LACK INFORMATION AND CONTROL OVER HAZARDOUS RAIL SHIPMENTS

Municipalities across the country are demanding increased communication about rail shipments of crude oil through their communities. However, crude oil—and other hazardous materials shipped by rail—have been exempted from the disclosure requirement of the Emergency Planning and Community Right-to-Know Act (EPCRA).[13] While the federal government finally directed rail companies to disclose this critical information to emergency responders,[14] the general public remains in the dark about the nature of mile long tanker trains hurtling through their backyards at dangerous speed. Nobody has a choice about what gets transported through their community, how dangerous the cargo is, how frequently it goes through or whether it could be rerouted to more remote areas. Of the more than 3.8 million Californians who will be put at risk by proposed new crude by rail terminals, most are unlikely to even be aware of the significant new risks that they face.

OUTDATED AND DANGEROUS TANK CARS ARE USED TO CARRY CRUDE

Most of the rail tank cars used to carry flammable liquids, including crude oil are old "DOT-111s," which are widely known to be unsafe. Speaking at a farewell address at the National Press Club in April 2014, outgoing National Transportation Safety Board (NTSB) chairwoman Deborah Hersman repeated a long-held NTSB position that unmodified DOT-111 tank cars—non-pressurized rail tank cars that accident investigators report are easily punctured or ruptured during a derailment—are not safe to carry hazardous liquids. "Carrying corn oil is fine, carrying crude oil is not," she said.[15] Thus, in 2009, the NTSB recommended these tank cars be equipped with additional safety features.[16] Since October 2011, new rail tank cars built for transporting crude oil have incorporated these features, such as the use of head shields, thicker tank material, and pressure-relief devices. Yet regulators have not eliminated the use of the older, unmodified DOT-111 cars for carrying oil—out of 39,000 DOT-111 tank cars now used to carry crude, two-thirds still do not meet these modern safety standards.[17] The Department of Transportation, simply recommended that shippers stop using these cars to transport oil, but they do not require it.[18]

COMMONSENSE SAFEGUARDS FOR CRUDE-BY-RAIL ARE OVERDUE

In the longer term, our health depends on cleaner, renewable energy and moving away from fossil fuels. In the immediate term, we must tighten safety regulations on the rail transport of crude oil, or run the risk of devastating consequences. NRDC calls on lawmakers to expedite rules mandating commonsense practices, including but not limited to the following:

1. **Remove Defective, Dangerous Tankers from Crude by Rail Service:** The existing fleet of dangerous DOT-111 tank cars must be taken out of crude oil service immediately.
2. **Impose Safer Speed Limits:** Crude oil unit trains must adhere to speed limits that significantly reduce the possibility of an explosion in the event of a derailment.

LAC-MEGANTIC QC - JULY 8: Search teams carry a large white bag out of the rubble in the town centre of Lac-MÈgantic during their search for the dead Monday evening. 47 people died from the tragedy after a train derailment caused a massive explosion early Saturday morning. (Lucas Oleniuk/ Toronto Star via Getty Images)

3. **Reroute Around Sensitive Areas:** The National Transportation Safety Board recommendation that crude oil trains avoid heavily populated areas and otherwise sensitive areas must become mandatory.[19] Require Disclosure: Information regarding the content of all shipments and relevant risks and emergency procedures should be made accessible to local residents.[20]
4. **Provide Emergency Responder Resources:** States should assess fees on shippers and carriers to fully cover the costs of providing emergency response services and safeguarding the public from oil trains, and ensure that there is adequate emergency response capacity.
5. **Make Additional Operational Safety and Oversight Improvements:** Unit trains of crude oil and other hazardous materials should be placed in the highest risk category of Hazmat shipments; and many other operational improvements should be made.[21] Additional inspections of crude oil trains are also critical, including the funding necessary for more rail safety personnel.[22]
6. **Exercise Local Government Powers:**
   - Local governments and states can require cumulative risk analysis of crude oil rail infrastructure and increased rail traffic.
   - Local governments should thoroughly evaluate all of the environmental and public health and safety risks of crude oil rail terminals that require land use permits or other forms of local approval.
   - Local governments should reject any new crude oil rail terminals within one mile of sensitive sites such as homes, schools, daycares, and hospitals.

Crude oil train accidents are preventable. All Californians should be calling for the crude oil and rail safety standards listed here.

Communities that have challenged Crude by Rail:

Albany County, NY recently placed a moratorium on the expansion of the processing of crude oil at the Port of Albany pending a public health investigation by the Albany County Health Department. The City of Seattle passed a resolution a few weeks ago urging adoption of state legislation and federal regulations; state assessment of risks; railroad company restriction of petroleum transport through Seattle; and update of city incident response plans to address the potential safety, environmental, and economic impacts of petroleum transport by rail. Similar efforts are under way in Spokane. Berkeley and Richmond, CA passed resolutions in March 2014 against crude by rail, and Davis, CA followed suit in April 2014. In June, the City of Vancouver, Washington rejected a major Crude by Rail project.

ENDNOTES

1 Lorne Stockman, Oil Change International, *Runaway Train: The Reckless Expansion of Crude By Rail in North America,* May 2014, http://priceofoil.org/2014/05/28/new-report-outlines-rise-crude-rail-north-america/

2 California Senate Environmental Quality Committee, Safe Rail Transport of Crude Oil: What's On the Horizon, and Are We Prepared? (hereinafter "Safe Transport of Crude Oil"), p. 1 (February 24, 2014). Note: The largest sources of crude by rail in California are Bakken and Canadian crudes.

3 Richard Wronski, "Area Poorly Prepared For Crude Oil Train Fires," Chicago Tribune, May 25, 2014, http://articles.chicagotribune.com/2014-05-25/news/ct-railroad-tankers-foam-met-20140525_1_foam-aid-box-alarm-system-fire-chief

The Association of American Railroads noted the heightened risks of long "unit trains" with more than 20 tank cars of crude oil: http://www.boe.aar.com/CPC-1258%20OT-55-N%208-5-13.pdf

4 Alex Rohr, "DEQ serves violation notice to CSX for Lynchburg oil spill," *The News & Advance,* Lynchburg, Virginia, May 23, 2014, http://www.newsadvance.com/news/local/deq-serves-violation-notice-to-csx-for-lynchburg-oil-spill/article_6cba29de-e1e6-11e3-974f-0017a43b2370.html

5 "Colorado Oil Train Spill Put At 6,500 Gallons," *The Big Story,* Associated Press, May 10, 2014, http://bigstory.ap.org/article/colorado-oil-train-spill-put-6500-gallons

6 State of California Interagency Rail Safety Working Group, Oil by Rail Safety in California: Preliminary Findings and Recommendations, June 10, 2014; http://cdfgnews.wordpress.com/2014/06/10/oil-by-rail-report-highlights-need-for-sustainable-funding-and-close-coordination-to-protect-public-safety/

7 CA Interagency Rail Safety Working Group, 2014, with corrections based on project EIRs, the 7 crude by rail terminals include:

1. Kinder Morgan, Richmond, repurposed ethanol railyard; operating.
2. McClellan, Sacramento, repurposed ethanol terminal; operating.
3. Valero, Benicia: 70,000 barrels per day; DEIR pending.
4. WesPac, Pittsburg: 242,000 bpd; FEIR pending.
5. Alon, Bakersfield: 150,000 bpd; DEIR.
6. Plains All American, Bakersfield: 140,000 bpd; under construction/related pipeline pending DEIR.
7. Phillips 66, Santa Maria: 52,000 bpd; RDEIR pending.

Impacted population data was calculated within one mile of the rail lines from Roseville to Santa Maria and Sacramento to Bakersfield, using standard GIS software and census data.

8 Major sources:

"Accidents Involving Trains Transporting Crude Oil," *The Big Story,* Associated Press, January 23, 2014, bigstory.ap.org/article/accidents-involving-trains-transporting-crude-oil

"Significant Crude by Rail Accidents in North America, 2013-2014, Data compiled by Amanda Stephenson, Edmonton Journal, http://www.edmontonjournal.com/news/train-derailments/index.html?cid=dlvr.it-twitter-edmontonjournal

9 Russell Gold and Betsy Morris, "Secrecy of Oil-by-Train Shipments Causes Concern Across the US," Wall Street Journal, May 22, 2014, http://online.wsj.com/news/articles/SB10001424052702303749904579577861760037536

10 http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/a-pipeline-on-wheels-how-a-changing-industry-brought-disaster-to-lac-megantic/article15711624/?page=all

11 "Accidents Involving Trains Transporting Crude Oil," *The Big Story,* Associated Press, January 23, 2014, bigstory.ap.org/article/accidents-involving-trains-transporting-crude-oil.

12 Safe Transport of Crude Oil; February 2014

13 http://www.scribd.com/doc/221224576/Crude-Oil-Report (at p. 106)

14 But only for trains carrying a million gallons or more of Bakken crude oil.

http://www.dot.gov/briefing-room/emergency-order

15 Patrick Ambrosio, "Communities Not Prepared for Worst-Case Rail Accidents," Bloomberg, April 22, 2014

http://www.bloomberg.com/news/2014-04-22/communities-not-prepared-for-worst-case-rail-accidents-ntsb.html

16 Richard Wronski, "NTSB head: Oil Tanker Rail 'Safety Has Been Compromised', Chicago Tribune, April 22, 2014,

http://articles.chicagotribune.com/2014-04-22/news/chi-ntsb-oil-tanker-rail-safety-20140422_1_ntsb-hersman-railroad-tank-cars

17 Edward McAllister and Nia Williams, "New U.S. rail rules will not revamp old oil tank fleet," *Reuters,* February 28, 2014, http://mobile.reuters.com/article/idUSBREA1R1YU20140228?irpc=932

18 FAQs, *The Dot-111 Reader,* dot111.info/faqs/

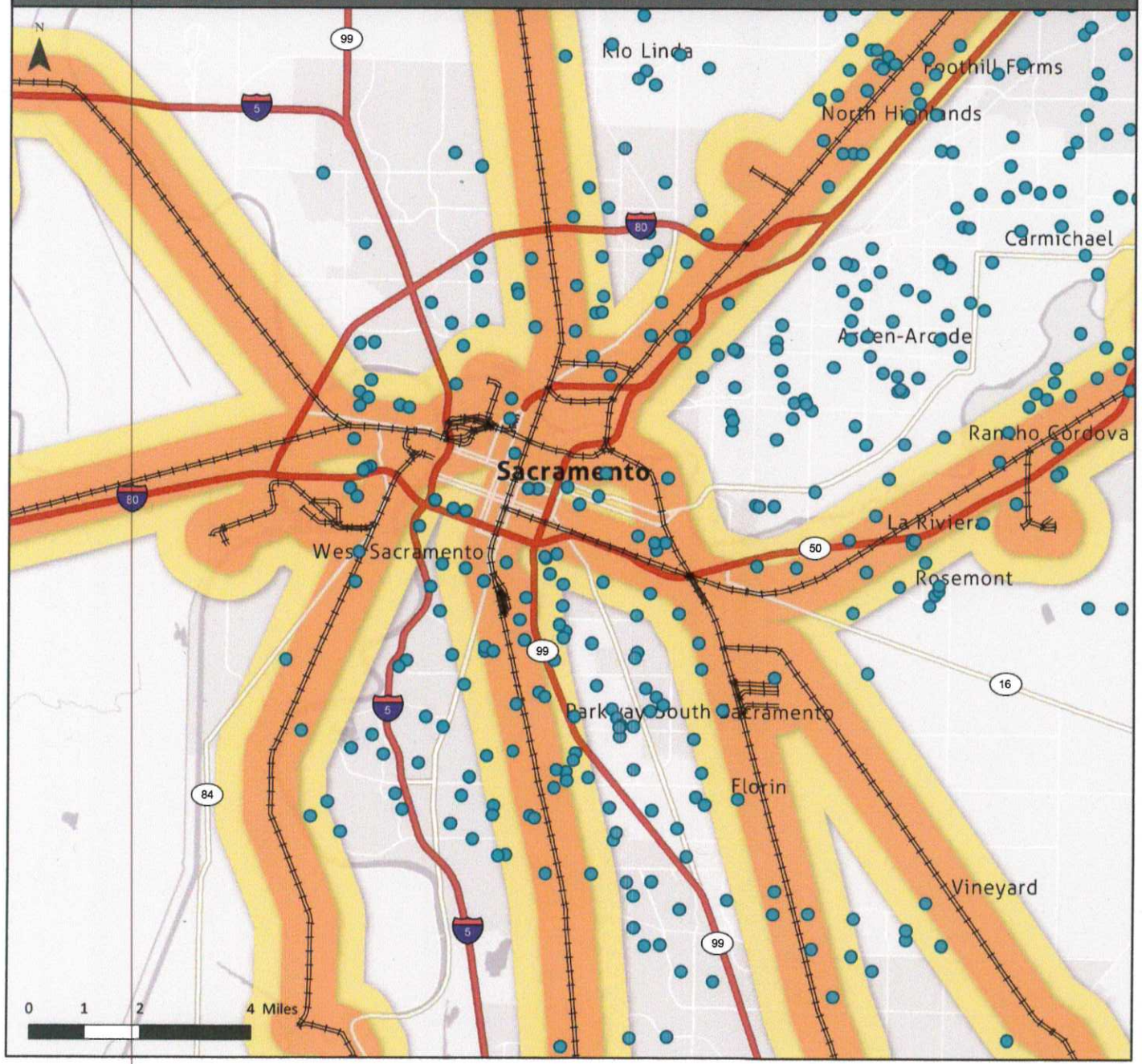
19 National Transportation Safety Board, https://www.ntsb.gov/news/2014/140123.html

20 The exemption for rail shipments of hazardous materials including crude oil from the disclosure requirement of the Emergency Planning and Community Right-to-Know Act ("EPCRA") must be removed.

21 In the context of the federal rail safety rulemaking, we recommend: two-person staffing should be required for all unit trains; "Positive Train Control" should be mandatory for all unit trains of crude oil and other hazardous materials; and audio and video recorders should be installed in the cabs of all unit trains carrying crude oil or other hazardous materials.

22 The Federal Railroad Association admits its inspectors are able to inspect less than one percent of the federally regulated railroad system. GAO Government Accountability Office, *Rail Safety: Improved Human Capital Planning Could Address Emerging Safety Oversight Challenges,* report to Congress, December 2013, http://www.gao.gov/assets/660/659536.pdf

Crude Oil Train Derailment Risk Zones in Sacramento, CA



Sacramento Population at Risk*

0.5 mile	135,864
1.0 mile	256,299

*The number of residents of the City of Sacramento living within these impact zones

Legend

- Schools (K - 12)
- Active rail lines
- 0.5 mile US DOT Evacuation Zone for Crude Oil Train Derailments
- 1.0 mile US DOT Potential Impact Zone in case of Crude Oil Train Fire

Sources:

Population (2010): Estimates based on US Census 2010 Block Centroid Populations. Estimates were calculated within buffers located within US Census "Place" boundary (not shown).

Schools: http://portal.gis.ca.gov/geoportal/catalog/main/home.page

NTAD Rail Lines: 2013 National Transportation Atlas Database http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_atlas_database/2013/polyline.html

Rail Line Buffers: Zones indicating risks around rail lines in the event of crude oil tanker car derailments, based on the US Department of Transportation Emergency Response Guidebook used throughout North America. This guidebook recommends a standard evacuation zone of 800 meters (0.5 miles) for accidents involving railcars filled with flammable liquids and gases and an isolation zone of 1600 meters (1 mile) in all directions around any railcar filled with those materials if they are on fire. http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/ERG2012.pdf