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Executive Summary

Rail is ingrained in Denver’s history, character, and community. In a world-class city where everyone matters, safety in proximity to rail must be ingrained as well. The probability of incidents is low, yet not unprecedented. It is prudent to periodically review policies and resources and continue to invest in prevention, preparedness, response, and recovery as rail services increase and housing and other development near rail continues.

In November 2015, Denver Mayor Michael B. Hancock engaged a team of subject matter experts from City and County of Denver staff, external partners, and City Council to 1) review the City’s policies and practices around safety and hazard mitigation in areas near rail, 2) develop recommendations, and 3) report by July 1, 2016.

It is with a continued spirit of collaboration and solution-finding toward public safety and economic development that the Denver Mayor’s Railroad Safety Working Group presents this report. This report contains a summary of current City policies and practices and recommendations for the mayor’s consideration. Members of the Railroad Safety Working Group include City and County of Denver agencies and partners from the freight and passenger rail carriers, state government, and federal government. Page 30 of this report lists the Members of the Mayor’s Railroad Safety Working Group.

Current Practices

Prevention and Preparedness

- First Responder Training and Capabilities
- Education for Community Members
- Development Review Process and Special Events Review Process

Response and Recovery

- Evacuation Plans
- Response and Recovery Staffing and Resources
Recommendations

Communication and Feedback
- Continue Building Relationships and Communication Channels
- Measure Success with Metrics and Stakeholder Feedback

Prevention and Preparedness
- Continue to Invest in First Responder and Traffic Engineer Familiarization and Training
- Access Real-Time Data for First Responders and Emergency Managers
- Plan Multi-Agency Tabletop and Large-Scale Training Exercises
- Formalize Hazard Analysis and Plans for Incident Management and Evacuation
- Identify Areas for Targeted Community Outreach
- Create Education Partnerships
- Incorporate Proximity to Rail Screening into Development Review Process
- Broaden Proximity to Rail Screening in Special Event Review Process
- Explore Enhancing and Deputizing Enforcement
- Share Monitoring Systems

Response and Recovery
- Plan for Recovery
- Inventory Possible Response and Recovery Assistance

Further Research
- Research Funding Opportunities to Support this Work
- Seek Other Risk Analysis Data
- Share Knowledge

Attached to this report are:
- Appendix A: Resources for Community Members
- Appendix B: Policy, Partnership, and Data Resources
- Appendix C: Resources for First Responders and Emergency Managers
- Appendix D: Article about 1983 freight rail incident in Denver
Purpose and Background

In November 2015, Denver Mayor Michael B. Hancock engaged a team of subject matter experts from City and County of Denver staff, external partners, and City Council to 1) review the City’s policies and practices around safety and hazard mitigation in areas near rail, 2) develop recommendations, and 3) report by July 1, 2016. Members of the Railroad Safety Working Group include City and County of Denver agencies and partners from the freight and passenger rail carriers, state government, and federal government. Page 30 lists the members of the working group.

Rail came to Denver in June 1870, when the first Denver Pacific Railway car rolled along an iron road connecting the Queen City of the Plains to Cheyenne, the closest stop on Union Pacific’s transcontinental line (Noel, 1973). The Denver Pacific Railway effort involved competition with then-state capital city Golden, years of negotiations, multiple financial fits and starts, and more than two years of construction that began in May 1868. In retrospect, it demonstrates the National Council for Public-Private Partnerships’ keys for success for public-private partnership projects with shared risk and reward (National Council for Public-Private Partnerships, 2016). Territorial Governor John Evans was a champion from the public sector (and private sector, in what would certainly be a conflict of interest today). Stakeholders supported the effort. Congressional authorization enabled the statutory environment. Investors bought public county bonds, and private corporations negotiated operating agreements. Colorado historian Dr. Thomas J. Noel assessed, “Denver’s expansion after the arrival of the railroads cannot be questioned” (1973, p. 111). Denver’s population increased by only 10 residents in the decade between 1860 and 1870. After the Denver Pacific Railway opened, the population grew seven-fold from 4,759 in 1870 to 35,629 in 1880 (U.S. Census Bureau, 1883, cited in Noel, 1973).

Figure 1: Milestones in Denver Rail History

- 1868-1870 Denver Pacific Railway to Cheyenne built
- 1881 Union Station Opening
- 2004 Voters approve RTD FasTracks
- 2014 Union Station Grand Re-Opening
- 2016 RTD Opens A Line between Union Station and Airport
More than 130 years later, in 2004, voters in Denver and surrounding counties approved a regional sales and use tax increase to expand mobility options. The FasTracks package includes building 122 miles of commuter rail and light rail and redeveloping Union Station (RTD FasTracks, 2016a). While Denver’s population has not increased seven-fold with the build out of FasTracks as it did with the arrival of the Denver Pacific Railway, the number of people who live, work, and play in Denver continues to grow (U.S. Census Bureau, 2000 through 2016).

Today in Denver, Amtrak and RTD provide passenger rail service and BNSF Railway, Denver Rock Island Railroad, and Union Pacific Railroad provide freight service. With the April 2016 opening of RTD’s A Line commuter rail service, Denver is now home to short- and long-haul heavy freight rail, heavy passenger rail, light rail, and commuter rail. Tracks run both north-south through the dense, downtown urban core and northeast Denver and east-west through much of north Denver. Rail is ingrained in Denver’s history, character, and community. In a world-class city where everyone matters, safety in proximity to rail must be ingrained as well.

The probability of incidents is low, yet not unprecedented. It is prudent to periodically review policies and resources and continue to invest in prevention, preparedness, response, and recovery as rail services increase and housing and other development near rail continues.

It is with a continued spirit of collaboration and solution-finding toward public safety and economic development that the Denver Mayor’s Railroad Safety Working Group presents this report. This report contains a summary of current City policies and practices around hazard prevention and mitigation and recommendations for Mayor Hancock’s consideration.
The map in Figure 2 displays the location of rail lines in Denver City Council Districts.

Figure 2: Rail Lines in Denver

Table 1 describes characteristics of the rail carriers that serve Denver.

Table 1: Denver’s Rail Carriers

<table>
<thead>
<tr>
<th>Carrier Name</th>
<th>Passenger</th>
<th>Freight</th>
<th>Rail Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amtrak X</td>
<td>X</td>
<td></td>
<td>Heavy Rail</td>
</tr>
<tr>
<td>BNSF Railway X</td>
<td></td>
<td>X</td>
<td>Heavy Rail</td>
</tr>
<tr>
<td>Denver Rock Island Railroad X</td>
<td></td>
<td></td>
<td>Heavy Rail</td>
</tr>
<tr>
<td>RTD East Rail Line, Gold Line, first segment</td>
<td>X</td>
<td></td>
<td>Commuter Rail</td>
</tr>
<tr>
<td>Northwest Rail Line, North Metro Rail Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTD Southeast corridor, Southwest corridor, Central corridor, West Rail Line</td>
<td>X</td>
<td></td>
<td>Light Rail</td>
</tr>
<tr>
<td>I-225 Rail Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Union Pacific Railroad</td>
<td></td>
<td>X</td>
<td>Heavy Rail</td>
</tr>
</tbody>
</table>

(RTD FasTracks, 2016b)
The map in Figure 3 shows the rail crossings in the City and County of Denver: Of 303 total crossings, 197 are at grade, 34 are overpasses, and 72 are underpasses.

Figure 3: Rail Crossings in Denver
Current State

Introduction

Housing and commercial buildings exist along active rail lines in Denver, and building will continue. Generally, the perceived risk of danger in these urban areas is low for several reasons.

- Areas near the rail tracks are vibrant, attractive places for constituents to live and work.

- The City Fire Code, updated in 2011 and 2016, includes requirements for interior life safety. The Denver Fire Department engineering unit assures adequate access for emergency vehicles to any new development.

- City agencies and railroads have all-hazards emergency plans for response, notification, evacuation, etc., for multiple types and severities of incidents.

- While there have been heavy rail incidents in the Denver metro area, there have been no resultant deaths or serious injuries in recent years. The 1983 incident referenced in this report is the only major railroad hazardous materials incident in decades.

- Railroads publicize their safety records and policies.


- The Federal Railroad Administration requires freight trains carrying hazardous materials to travel at lower speeds when passing through all of Denver, which the Federal Railroad Administration categorizes as a “high-threat urban area.” This requirement makes incidents less likely in Denver.

U.S railroad safety has improved in recent years. Freight train derailments in 2014 were nearly half of what they were in 2004 (Rubinkam & Mulvilhill, 2015). Table 2 lists 2014 federal data on freight train derailments and large truck crashes for comparison.

Table 2: Federal Data on 2014 Freight Train Derailments and Large Truck Crashes

<table>
<thead>
<tr>
<th>Type of Incident</th>
<th>Number of Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight Train Derailments</td>
<td>1,210</td>
</tr>
<tr>
<td>Large Truck Fatal Crashes</td>
<td>3,744</td>
</tr>
<tr>
<td>Large Truck Injury Crashes</td>
<td>88,000</td>
</tr>
<tr>
<td>Large Truck Property Damage Crashes</td>
<td>346,000</td>
</tr>
</tbody>
</table>

(Rubinkam & Mulvilhill, 2015; U.S. Department of Transportation, Federal Motor Carrier Safety Administration, 2016)
Growth in Denver’s population and economy translates into more activities and services: more marriage licenses, building permits, business licenses, 911 calls, Denver International Airport passengers, and rail movements. With more rail movements comes the possibility of more incidents, even while railroad safety rates continue to improve.

A 2015 U.S. Department of Transportation (DOT) statistical projection for the timeframe 2015 to 2034 predicted increased shipments by rail and, therefore, the potential for increased incidents. The projection shows the possibility of 278 crude oil or ethanol train mainline derailments, or an average of 13.9 derailments per year in the United States of America. Eighty-five incidents (30 percent) are projected to result in at least one carload of flammable liquid igniting and causing fire. Twelve derailments (13 percent) are projected in the United States to result in at least 230,000 gallons of flammable liquid released per incident (7 to 8 carloads) and ignite large area fires continuing for hours or days.

A derailment in an area with higher population density, congregation, and more urban development has the potential for more impact than a derailment in a less populated, less developed area. The DOT statistical projection includes 93 derailments (33 percent) in densely populated areas in the United States. The DOT projects two derailments in the United States to be High Consequence Events of scale similar to or exceeding the 2013 derailment in Lac-Megantic, Canada, which resulted in 47 fatalities and more than $1.5 billion in non-fatality damages (U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, 2015).

The map in Figure 4 displays the location of freight main lines, or the principal artery of the freight rail system in Denver. The zones of 150 feet, 1,000 feet, and half-mile were derived using recommended protective action distances for materials known to be toxic by inhalation found in the Pipeline and Hazardous Materials Safety Administration (PHMSA) 2016 Emergency Response Guidebook.
Figure 4: Map of Main Freight Rail Lines in Denver
Table 3 describes the areas adjacent to the main freight rail lines in Denver as of January 12, 2016.

<table>
<thead>
<tr>
<th>Type</th>
<th>150 feet</th>
<th>1,000 feet</th>
<th>½ mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential population</td>
<td>1,465</td>
<td>22,153</td>
<td>75,030</td>
</tr>
<tr>
<td>Total housing units</td>
<td>856</td>
<td>9,753</td>
<td>32,162</td>
</tr>
<tr>
<td>Total households</td>
<td>766</td>
<td>8,689</td>
<td>29,146</td>
</tr>
<tr>
<td>Bridges</td>
<td>120</td>
<td>221</td>
<td>329</td>
</tr>
<tr>
<td>RTD stops</td>
<td>29</td>
<td>288</td>
<td>645</td>
</tr>
<tr>
<td>Open spaces</td>
<td>10</td>
<td>41</td>
<td>88</td>
</tr>
<tr>
<td>Light rail stations</td>
<td>9</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Parks</td>
<td>8</td>
<td>45</td>
<td>82</td>
</tr>
<tr>
<td>Public assembly locations(^1)</td>
<td>4</td>
<td>10</td>
<td>58</td>
</tr>
<tr>
<td>Health facilities</td>
<td>2</td>
<td>10</td>
<td>29</td>
</tr>
<tr>
<td>City-owned facilities</td>
<td>1</td>
<td>32</td>
<td>58</td>
</tr>
<tr>
<td>Facilities with Risk Management Plans(^2)</td>
<td>0</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Fire stations</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Police stations</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Sheriff offices</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Hospitals</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Trauma centers</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Denver Public Schools</td>
<td>0</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>Non-public schools</td>
<td>0</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Libraries</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Nursing homes</td>
<td>0</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Residential care facilities</td>
<td>0</td>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>Lakes</td>
<td>0</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>Historic landmark structures</td>
<td>0</td>
<td>7</td>
<td>65</td>
</tr>
</tbody>
</table>

\(^1\) Includes Sports Authority Field at Mile High, Coors Field, Pepsi Center, Elitch Gardens, etc.

\(^2\) The U.S. Environmental Protection Agency requires facilities that store more than a specific quantity of regulated chemicals to create risk management plans and coordinate them with local authorities.
On Easter Sunday in 1983, an incident at a Denver railroad switching yard spilled approximately 20,000 gallons of nitric acid, which vaporized into a gas and wafted because of wind. As the Denver Police Department directed people to evacuate the area, the American Red Cross sheltered residents in schools. Authorities closed portions of I-25 and I-70. First responders worked for nearly six hours to neutralize and suppress the gas using soda ash and a commercial snowblower from Stapleton International Airport. The acid burned three firefighters. The gas caused minor injuries for at least 16 people, and hundreds more people called or visited hospitals for medical advice. A small fire caused power shortages in the area. Some acid reached the sewer system. Appendix D attached to this report provides more detail.

Since that 1983 incident, industry regulations, rail car technology, track maintenance, railroad safety practices, and first responder training have improved considerably. In 2015, the train accident rate in the United States was down 78 percent from 1980. In the year 2014, 99.999 percent of hazardous materials shipments by rail reached their destination without a train accident releasing materials, and accident rates for hazardous materials shipments by rail were down 95 percent since 1980 (Association of American Railroads, 2016).

Denver-specific statistics in Figure 5 show a downward trend in the number of heavy rail incidents from 1996 to 2015. During this time, three people were injured in 320 railroad accidents involving heavy rail (excluding highway-rail incidents and light rail). Reportable damage from 1996 to 2015 exceeded $14 million (Figure 6). Derailments accounted for the most incidents with 216 incidents, and human error was the most frequent cause with 213 incidents (Table 4).
Figure 5: Number of Heavy Rail Incidents in Denver, 1996 to 2015

(Federal Railroad Administration Office of Safety Analysis, 2016)
Figure 6: Reportable Damage from Heavy Rail Incidents in Denver, 1996 to 2015

(Federal Railroad Administration Office of Safety Analysis, 2016)
Below are a map (Figure 7) and table (Table 4) showing incidents involving heavy rail in Colorado counties from 1996 to 2015. As Denver is both the state’s primary rail hub with the highest amount of rail traffic and the densely populated state capital, it is expected that Denver County would experience more incidents than any other county.

Figure 7: Heavy Rail Incidents in Colorado by County, 1996 to 2015

(Federal Railroad Administration Office of Safety Analysis, 2016)
### Table 4: Heavy Rail Incidents in Colorado by County, 1996 to 2015

<table>
<thead>
<tr>
<th>County</th>
<th>Totals</th>
<th>Type of Accident</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accts</td>
<td>Kis</td>
<td>Inj</td>
</tr>
<tr>
<td>ADAMS</td>
<td>41</td>
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</tr>
<tr>
<td>ALAMOSA</td>
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<tr>
<td>ARAPAHOE</td>
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</tr>
<tr>
<td>BACA</td>
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<td>BENT</td>
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<td>CHEYENNE</td>
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<td>CONEJOIS</td>
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<td>DELTA</td>
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<td>DENVER</td>
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<tr>
<td>PUEBLO</td>
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</tr>
<tr>
<td>SEDGWICK</td>
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</tbody>
</table>

Derailments are one area for concern; other areas include the type, size, and proximity of developments in relation to rail and crossings; signage at crossings; and driver and pedestrian behavior. The built environment, placemaking, and zoning practices can also play a role. When businesses with high levels of commercial delivery or customer traffic locate next to rail, it can increase the number of vehicles traveling over rail crossings and potential for incidents. When a pedestrian tunnel lacks lighting to draw attention to it, an at-grade crossing becomes more tempting for pedestrians. In some cases, drivers and pedestrians disregard warning signs and flashing lights at rail crossings. According to the Operation Lifesaver education group, a crossing incident involving a train and either a person or vehicle occurs about every three hours in the United States (Operation Lifesaver, 2016). In Denver, recent police records show that officers have responded to between 23 to 46 train incidents per year involving automobiles, pedestrians, or bicycles (Table 5).

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Denver Police Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>23</td>
</tr>
<tr>
<td>2011</td>
<td>25</td>
</tr>
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<td>2012</td>
<td>28</td>
</tr>
<tr>
<td>2013</td>
<td>25</td>
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<tr>
<td>2014</td>
<td>46</td>
</tr>
<tr>
<td>2015</td>
<td>33</td>
</tr>
<tr>
<td>2016 (through June 9)</td>
<td>13</td>
</tr>
</tbody>
</table>

Below is a summary of current City and County of Denver practices around railroad safety and hazard mitigation.

**Prevention and Preparedness**

**First Responder Training and Capabilities**

First responders have a myriad of education opportunities, and City and County of Denver safety agencies continue to invest in them.

- The Denver Fire Department hazardous materials team instructs both fellow Denver Firefighters and firefighters across the nation at Denver’s Rocky Mountain Fire Academy and at national and international conferences.
RTD conducts tabletop drills and a live exercise annually. The agency also offers a PowerPoint and video about equipment and overhead wires.

A subsidiary of the Association of American Railroads operates the Security and Emergency Response Training Center in Pueblo. It trains railroad officials, first responders, and others on rail incidents involving hazardous materials. Participants may take classes online or in person.

BNSF Railway, Union Pacific Railroad, and Amtrak offer classes for first responders with no tuition costs. The railroads recommend specialized training opportunities to enhance working knowledge of railroad incidents and response capabilities. These training opportunities include computer-based modules, tabletop exercises, drills, classroom lecture, local hands-on activities, and railroad-sponsored training at remote facilities such as the Security and Emergency Response Training Center in Pueblo and Texas A&M Engineering Extension Service in Texas.

The Denver safety agencies assign personnel to attend trainings, then hire other personnel on overtime to ensure 24/7 coverage on the streets.

Education for Community Members

Both the Denver Office of Emergency Management and Homeland Security and RTD conduct Community Emergency Response Training (CERT) classes for residents in disaster preparedness and response. These classes cover a variety of hazards and scenarios. Participants can learn to extinguish small fires, conduct light search and rescue, assist injured people, set up medical treatment areas, assist emergency responders, and identify and reduce hazards in the home, school, and workplace.

In Denver and across Colorado, the nonprofit Operation Lifesaver rail safety education group provides free presentations by volunteers for schools and civic and community organizations to help people stay safe around railroad property and crossings. Union Pacific Railroad, BNSF Railway, and
RTD fund the program in Colorado. Presenters include Federal Railroad Administration Grade Crossing Managers, Amtrak Regional Emergency Managers, and RTD.

Development Review Process and Special Events Review Process

At present, most of the City's development review processes do not evaluate plans or permit requests for properties adjacent or in close proximity to rail operations, facilities, or crossings differently than those properties that are not. The Denver Fire Department engineering unit reviews all development plans for emergency vehicle access to new structures; for development adjacent to railroad lines, that review includes assuring continued emergency access to rail lines. The Office of Special Events reviews event applications for impacts to public transit, including RTD light rail and commuter rail services.

Response and Recovery

Evacuation Plans

Amtrak, BNSF Railway, Union Pacific Railroad, and RTD have formal emergency response and evacuation plans for yards, facilities, trains, and systems. Federal regulations guide much of this planning.

In the event of an emergency, the City and County of Denver agencies can provide shelter-in-place or evacuation instructions to residents via the news media, social media, and Swift 911 emergency notification services (reverse 911).

Response and Recovery Staffing and Resources

The railroads employ emergency response teams and incident management teams with surge capacities. They contract for additional services to mitigate environmental hazards and provide specialized equipment including oil spill trailers and capping kits. Federal regulations require railroads to conduct post-incident analysis and after-action reviews.

As the largest city in Colorado, Denver maintains robust emergency services with a number of special response teams. As the hub of a metropolitan area, Denver can request mutual aid from surrounding jurisdictions should the need arise. State and federal government partners will also assist in both emergency response and in the recovery that follows. The Federal Railroad Administration can – and often does – respond to railroad incidents. At the request of Denver leaders, the U.S. Environmental Protection Agency has the ability to address all hazardous materials and oil-related releases, conduct emergency responses, and deploy monitoring and response equipment. EPA staff can assist Denver with recovery efforts through assessments, investigations, cleanups, and decontamination. EPA’s local resources include air monitoring; sampling of air, soil, water, groundwater; commercial laboratory analysis; a mobile laboratory; and spill response contractors (e.g., oil spill containment, clean up of spilled materials, etc.). EPA contractors can provide specialized expertise for
investigating, monitoring and analysis, and short- and long-term cleanup and decontamination. EPA national assets include teams with specialized expertise in fields such as oil spill assessment and cleanup, radiation, air modeling, hydrogeology, and other subjects; real-time air monitoring by the Trace Atmospheric Gas Analyzer mobile vehicle; and the ASPECT plane (Airborne Spectral Photometric Environmental Collection Technology), which provides chemical and radiological detection, and infrared and photographic imagery. Other assets are merely a phone call away: For example, the Agency for Toxic Substances and Disease Registry can assist with public health concerns, and the National Oceanic and Atmospheric Administration conducts air modeling.

Nonprofit organizations including the American Red Cross and Salvation Army may also respond to incidents with the help of trained volunteers.

Recommendations

In the spirit of continuous improvement, the Mayor’s Railroad Safety Working Group identified additional opportunities for the City, its partners, and community members to protect Denver residents, businesses, and property near rail lines.

Communication and Feedback

Continue Building Relationships and Communication Channels

The Working Group created a contact list and recommends Denver Office of Emergency Management and Homeland Security staff maintain and update the list. Both the contact list and emergency planning and exercises should also incorporate:

- American Red Cross of the Mile High Area
- Colorado Division of Homeland Security and Emergency Management
- Colorado State Emergency Response Commission
- Colorado Department of Public Health and Environment
- National Guard Civil Support Team
- Federal Emergency Management Agency

In addition, including railroad partners in Denver’s Local Emergency Planning Committee and the Colorado Information Analysis Center will help to continue relationship building and information sharing.

Measure Success with Metrics and Stakeholder Feedback

The Working Group recommends designating a point person or group to design and monitor evaluation components with defined metrics, feedback mechanisms for stakeholders and customers, and review dates. The Working Group should reconvene to check in on progress and effectiveness.
Prevention and Preparedness

Continue to Invest in First Responder and Traffic Engineer Familiarization and Training

Railroad partners suggest scheduling regular walkthroughs for first responders at yards and facilities for familiarization, conducting evacuation drills with first responders present, practicing joint command between rail partner emergency teams and first responders, and sharing response plans with the Denver Fire Department, Denver Police Department, and Local Emergency Planning Committee. Railroad partners offer the following resources:

- The Amtrak Police Department, New York Police Department, and the Transportation Security Administration developed Amtrak’s Operation RAILSAFE. It offers both online and in-person courses to instruct law enforcement officers on railroad awareness and incident reporting.

- The Amtrak Emergency Management team is available to travel to Denver for one or two weeks to host – free of charge – multiple training sessions with police units, firefighter crews, and the local American Red Cross chapter. The City of Aurora has participated in similar programs. Denver representatives may also wish to observe Amtrak exercises in other communities across the country. While Amtrak currently offers computer-based first responder training modules (1.5 hours in total), Amtrak staff are also willing to collaborate in creating Denver-specific videos or other computer-based training. Amtrak also could be a resource in developing an enterprise-wide system for tracking authorized personnel at a rail-related incident.

- Amtrak and BNSF Railway created a 26-minute video about emergencies involving passenger trains. BNSF Railway and Union Pacific Railroad offer training at no cost. BNSF Railway has taught hazardous materials and response classes since 1995, and Union Pacific Railroad teaches hazardous materials response, tank cars, and general rail safety. BNSF Railway and Union Pacific Railroad staff can also create customized trainings ranging from 20 minutes to four hours.

- The nonprofit Operation Lifesaver provides education programs to prevent collisions, injuries, and fatalities on and around railroad tracks and high-rail grade crossings. Operation Lifesaver, the Federal Railroad Administration, and RTD offer guidance to traffic engineers and law enforcement investigators to improve safety around crossings.

- City staff can work with the Federal Railroad Administration, RTD, Operation Lifesaver, and the railroads to conduct a proactive safety risk assessment and “officer on the train” safety enforcement and evaluation events.

- Denver Public Works and the Denver Police Department could collaborate with the Colorado Department of Transportation’s Maintenance Team and Colorado State Patrol’s Traffic Incident Management partnership, a planned and coordinated program to detect and remove incidents and restore traffic capacity as safely and quickly as possible. The Federal
Highway Administration also offers an online National Traffic Incident Management Responder Training course for first responders.

Appendix B and Appendix C at the end of this report provide lists of resources for traffic engineers, first responders, emergency managers, and other City staff.

**Access Real-Time Data for First Responders and Emergency Managers**

City personnel can – and have begun to – access railroad partners’ data via the AskRail app for emergency responders. The invitation-only mobile application provides immediate access to real-time data about individual railcars on a train to help emergency responders make informed decisions about how to respond to the scene of a rail emergency. The Denver Fire Department plans to install the app on iPads used by District Chiefs and the hazmat team. This may require funds for iPad upgrades.

The free Rail Crossing Locator mobile application by the Federal Railroad Administration (FRA) is available on iTunes and Google Play. Users enter a specific location, which then allows them to locate highway-rail grade crossings in their area and retrieve important information, such as the physical characteristics of a crossing and the type of traffic control devices used. Users can also report information about grade crossings to the FRA to ensure the most accurate and up-to-date information is available.

Denver first responders can request advanced notification from the State Emergency Response Commission when certain petroleum shipments of 1 million gallons or more on a single train will travel through Denver. By December 4, 2016, pending federal Fixing America’s Surface Transportation (FAST) Act regulations will also allow local first responders to request advanced notification from the State Emergency Response Commission of certain information from rail carriers for High Hazard Flammable Trains.

**Plan Multi-Agency Tabletop and Large-Scale Training Exercises**

The Denver Office of Emergency Management and Homeland Security can incorporate exercises specific to this hazard into its multiyear training and exercise plan, which includes coordination with the Denver Police Department, Denver Fire Department, and Denver Health. Staff can expand the multiyear training and exercise plan to include railroad partners. One such exercise could include an incident pre-plan day in which Amtrak and RTD can identify locations for passenger reception centers and family assistance centers. Small group tabletop meetings of first responders and railroad partners in the Denver Emergency Operations Center can test existing plans. Larger exercises could involve mock Emergency Operations Center activations of the incident command post and joint information center.

The Federal Emergency Management Agency, U.S. Environmental Protection Agency, and the TRANSCAER (Transportation Community Awareness and Emergency Response) organization can
assist with large training exercises and advise on safe transportation and handling of hazardous materials, educating communities, and emergency response planning. All exercises should include post-exercise incident analysis and improvement planning.

**Formalize Hazard Analysis and Plans for Incident Management and Evacuation**

To increase Denver’s disaster preparedness and resilience, the Working Group recommends the Denver Office of Emergency Management and Homeland Security:

- Include areas near rail in the City’s Hazard Identification and Risk Assessment, which the City must update every five years to be eligible for state and federal grant and assistance programs and the Emergency Management Accreditation Program.

- Conduct rail corridor safety reviews with City planners, first responders, emergency managers, the Federal Railroad Administration, and the railroads.

- Engage the Colorado Division of Homeland Security and Emergency Management, Federal Emergency Management Agency, and U.S. Environmental Protection Agency for access to additional risk analysis and planning tools including Toxicology Excellence for Risk Assessment (TERA) and CAMEO software applications.

- Ensure all City evacuation, shelter, and crisis communication plans address potential hazards around rail.

- Continue to develop and maintain a resource list specific to this hazard.

- Work with the state fusion center to review annual rail carrier security plans, route analyses, and safety and security risk analyses for hazardous materials as permitted in the Code of Federal Regulations 49 CFR Part 172.820.

- Monitor statistical information regarding shipping data, incident data, etc., from the state fusion center, railroad partners, railroad industry groups, and the Federal Railroad Administration.

- Develop a community outreach strategy and printed and electronic materials in collaboration with partners.
Identify and Prioritize Areas for Targeted Community Outreach

There are 303 rail crossings in the City and County of Denver across heavy rail, commuter rail, and light rail tracks: 197 crossings at grade, 34 overpasses, and 72 underpasses. Sometimes, drivers and pedestrians cross tracks unsafely at these points and others. For example, near the intersection of 47th and York, children climb between train cars on their way to and from school. Anecdotal information from railroads and neighbors paired with data analysis of incident reports can identify additional intersections of concern and target education programs to nearby neighborhoods, schools, and organizations.

The Denveright planning processes for Land Use & Transportation, Parks & Recreation, Pedestrians & Trails, and Transit should include in their conversations concerns specific to neighborhoods near rail.

At the end of this report, Appendix A: Resources for Community Members provides a starting point for education and outreach planning.

Create Education Partnerships

The Working Group recommends incorporating railroad partner instructors into existing City programs such as the Denver Community Emergency Response Training (Denver CERT) and sharing the ensuing curriculum resources with The CELL’s Community Awareness Program. The Working Group also recommends developing a partnership with Operation Lifesaver rail safety education via railroad partners. The Operation Lifesaver website provides education materials, including videos, which existing Denver Community Emergency Response Training (Denver CERT) can incorporate into current curriculum. Amtrak’s regional representative works in Oakland, California, and could travel to Denver for week of events planned with local partners. Educators should update the curriculum periodically to reflect new developments and other changes in the community. Possible partners include:
• Denver Public Schools  
• School resource officers  
• Denver Housing Authority  
• Safe Routes to Schools  
• North Denver Cornerstone Collaborative  
• Registered neighborhood organizations  
• Business improvement districts  
• American Red Cross of the Mile High Area

Incorporate Proximity to Rail Screening into Development Review Process

The Working Group recommends incorporating proximity to rail operations into conversations and advice around development plans or permit requests. A new Development Services Director will begin work in August. He or she should engage the development community and stakeholders in this discussion. Specific recommendations include:

• Create opportunities for Development Services staff to attend all possible seminars by railroads and City agencies.

• Add new questions to submittal forms regarding a project’s location with respect to railroad tracks, rail crossings, facilities, and operations.

• For a project that is adjacent or in close proximity to rail activities, Development Services project coordinators should scrutinize the project more carefully for allowed uses, emergency access, location on site, utilities, right of way improvements, infrastructure needs, etc., and make recommendations to better protect safety and property. City staff should add railroads as referral agencies to review the application. Each railroad will determine and provide the correct point of contact for the review process.

• Development Services should acquire and maintain an up-to-date electronic library of educational materials. Topics include rail-related emergencies, enhancing building safety, options and examples of protective measures, and strategies for minimizing the impacts of drainage, noise, and vibration. Project coordinators should disseminate the information to appropriate applicants in the development process. Appendix B: Policy, Partnership, and Data Resources at the end of this report provide a starting point for this electronic library.

Broaden Proximity to Rail Screening in Special Event Review Process

City staff should review special event applications to determine proximity to rail operations and add railroads as potential referral agencies. Each railroad will determine and provide the correct point of contact for the review process. To foster community awareness, City staff should encourage organizers of events near rail lines to invite Operation Lifesaver and rail carriers to participate with educational displays at public events such as neighborhood or business improvement district festivals, walks/runs, and parades.
Explore Enhancing and Deputizing Enforcement

Operation Lifesaver’s “officer on a train” curriculum can provide guidance to the Denver Police Department to increase enforcement for trespassing and unsafe driver and pedestrian behavior at rail crossings. Other jurisdictions allow railroad personnel to write tickets to drivers who drive cars across tracks after railroad warning lights begin to flash. The Working Group recommends the Executive Director of Safety and City Attorney’s Office explore the possibility of granting or expanding railroad agents the jurisdiction to write citations.

Share Monitoring Systems

RTD uses video monitoring systems on trains and at commuter rail crossings and is willing to share with Denver and neighboring cities. Providing access to this video feed for the Denver Emergency Communications Center could assist with enforcement and monitoring in emergencies. Denver Rock Island Railroad also would like to make its video feed available to Denver officials.

Response and Recovery

Plan for Recovery
The Denver Office of Emergency Management and Homeland Security should ensure all City recovery plans address potential hazards near rail. City staff should identify organizations and resources, particularly in the private sector, to assist with short-term and long-term recovery efforts.

Inventory Possible Response and Recovery Assistance

Further Research

The Working Group recommends further research into the following subjects.

Research Funding Opportunities to Support this Work

All of the recommendations in this report require staff time; some recommendations also require hard costs such as printing, course fees, or ensuring continuity in emergency response services when staff members attend trainings. For example, when the City provides training for police officers or firefighters, often the City must staff the streets with personnel on overtime to backfill and ensure...
24/7 emergency coverage. The Working Group recommends investigating possible funding sources for planning, training, and outreach. This report can serve as the basis for a grant application. Possible funding sources might include:

- Association of American Railroads
- National Fire Protection Association
- Local Emergency Planning Committee and Colorado Division of Homeland Security and Emergency Management
- Colorado Department of Transportation
- U.S. Environmental Protection Agency
- Federal Railroad Administration and U.S. Department of Transportation
- U.S. Conference of Mayors
- National League of Cities
- Union Pacific Foundation
- BNSF Railway Foundation

Seek Other Risk Analysis Data

Other organizations and industries possess risk analysis data that can inform the City and County of Denver’s efforts. For example, the national Insurance Service Office (ISO) assigns ISO Public Protection Classification ratings that can influence property insurance rates. ISO assigned the entire City and County of Denver – including areas along rail corridors – a high rating of 2 (on a scale of 1 to 10). Possible sources of additional data include other insurance companies and industry groups, banks and lenders, investors, U.S. Department of Housing and Urban Development funding programs, landowners, real estate agents, and developers.

Share Knowledge

Several Working Group members researched how other cities currently address urban safety issues related to properties near rail lines. Denver appears to be a leader among U.S. cities with its approach. The Working Group recommends not only sharing this report with other cities, but also continuing to monitor and share knowledge with other communities via the Colorado Municipal League, Colorado Counties, Inc., U.S. Conference of Mayors, National League of Cities, National Association of Counties, and emergency management and first responder industry groups.
Members of the Mayor’s Railroad Safety Working Group

- **Eric Tade**, Chief of Department, Denver Fire Department – Executive Sponsor
- **Diane Barrett**, Chief Projects Officer, Denver Mayor’s Office – Chair, Development Subgroup
- **Troy Morelli**, Assistant Chief, Denver Fire Department – Chair, Public Safety Subgroup
- **Sarah Moss**, Outreach Program Manager and City Council Liaison, Denver Fire Department – Facilitator and Writer
- **Joyce Ackerman**, On-Scene Coordinator/START P.O., Region 8, U.S. Environmental Protection Agency
- **Evelyn Baker**, Deputy Director, Denver Community Planning and Development
- **Paul Bedard**, Environmental Public Health Manager, Denver Environmental Health
- **Patrick Brady**, General Director Hazardous Materials Safety, BNSF Railway
- **Jessica Brody**, Assistant City Attorney, Denver City Attorney’s Office
- **Luke Chavez**, Exercise Coordinator, Master Exercise Practitioner, Region 8, U.S. Environmental Protection Agency
- **Jolon Clark**, Denver City Councilman, District 7
- **Joyel Dhieux**, Federal On-Scene Coordinator, Region 8, U.S. Environmental Protection Agency
- **Steven J. Fender**, Regional Administrator, Region 6, Federal Railroad Administration, U.S. Department of Transportation
- **Pamela Fischhaber**, Section Chief – Rail and Transit Safety, Colorado Public Utilities Commission, Colorado Department of Regulatory Agencies
- **Joseph Gonzales**, Division Chief of Fire Prevention, Denver Fire Department
- **Scott Hoftiezer**, Railroad Program Manager, Colorado Department of Transportation
- **Steven Jankowski**, Grade Crossing and Trespasser Safety Manager, Region 6, Federal Railroad Administration, U.S. Department of Transportation
- **Damon Ladingham**, Police Officer First Grade, Denver Police Department
- **Forrest Mars**, CEO/Senior Vice President, Denver Rock Island Railroad
- **Russel McNamara**, Regional Hazardous Materials Supervisory Safety Specialist, Region 6, Federal Railroad Administration, U.S. Department of Transportation
- **Jim Metzger**, Deputy Chief of Emergency Management, National Railroad Passenger Corporation – Amtrak
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- **Deborah Ortega**, Denver City Councilwoman, At-Large
- **Tyler Parker**, Hazardous Materials Manager, Denver Region, Union Pacific Railroad
• Jack Paterson, Aide, Office of Denver City Councilwoman Deborah Ortega
• John Perry, Transit Police Commander for Field Operations, Regional Transportation District
• Justin Piper, Director, Hazardous Materials, BNSF Railway
• Scott Prisco, Building Official, Denver Community Planning and Development
• Ryan Risdon, Manager, Hazardous Materials Field Operations and Emergency Response, BNSF Railway
• James Rose, Police Officer First Grade, Denver Police Department
• Marc Scherschel, Deputy Chief of Operations, Denver Health Paramedic Division
• Michael Shepherd, Assistant Chief, Denver Fire Department
• Becky Simon, Senior Engineer, Major Projects, Denver Public Works
• Henry Stopplecamp, Acting Asst. General Manager Capital Programs, Regional Transportation District
• Sharon Terranova, Senior Transit & Rail Planner, Colorado Department of Transportation
• Sara Thompson Cassidy, Director, Public Affairs for Colorado and Wyoming, Union Pacific Railroad
• Mark Williams, Regional Chief Inspector, Region 6, Federal Railroad Administration, U.S. Department of Transportation
• With gratitude to Dr. Tom Noel for historic research assistance
Appendix A: Resources for Community Members

Denver Office of Emergency Management and Homeland Security trainings
www.denvergov.org/DenverCERT

• Denver Community Emergency Response Training (Denver CERT) is an emergency/disaster preparedness and response training. At the completion of this training, participants are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in our community. We would like to have all of our Denver communities trained to help within their own communities and respond to each other.

• Teen Community Emergency Response and Recovery Training (Teen CERT) - Denver Disaster Ready Club – This training teaches teens about potential disasters that could affect the Denver metro area and how to safely and responsibly respond to and recover from these disasters. The teens will learn how to extinguish small fires; conduct light search and rescue, assist injured people, set up medical treatment areas, assist emergency responders, identify and anticipate hazards, and reduce hazards in the home, school, and workplace. This FREE training is open to youth ages 14 to 18 years of age. They must attend all class sessions (three days) to receive a certificate for 24 hours of community service.

• Face 2 Face program – The National Weather Service (NOAA) will be presenting SKYWARN® storm spotters who are part of the ranks of citizens who form the nation's first line of defense against severe weather. These volunteers help keep their local communities safe by providing timely and accurate reports of severe weather to the National Weather Service.

Swift 911 emergency notification services (reverse 911)

Denveright is a community-driven planning process that challenges residents to shape how they want to evolve in four key areas: land use, mobility, parks, and recreational resources.
www.denvergov.org/denveright

Denver Local Emergency Planning Committee (LEPC)
www.denvergov.org/content/denvergov/en/office-of-emergency-management/local-emergency-planning-committee.html

RTD Community Emergency Response Training (CERT) two-day course trains people in emergency preparedness and basic disaster skills including fire safety, light search and rescue, team organization, and disaster medical operations. www.rtd-denver.com/CERT.shtml

Operation Lifesaver is working to change people’s behavior around railroad tracks and crossings with a national public awareness campaign. www oli org and www oli org/education-resources/for-kids

Union Pacific Railroad safety information, presentation request form, and event notification
www.up.com/aboutup/community/safety/


Community Awareness Program via the Counterterrorism Education Learning Lab (The CELL) is an interactive course taught by members of the public safety community. It provides citizens with the basic tools needed to recognize and help prevent criminal activity and terrorism in the United States while preserving civil liberties protected by the U.S. Constitution. www.thecell.org/cap

Federal Railroad Administration Office of Safety Analysis data: The purpose of this site is to make railroad safety information including incidents, inventory, and highway-rail crossing data readily available to the public. http://safetydata.fra.dot.gov/officeofsafety/default.aspx

Rail Crossing Locator free mobile application by the Federal Railroad Administration is available on iTunes and Google Play. Users enter a specific location, which then allows them to locate highway-rail grade crossings in their area and retrieve important information, such as the physical characteristics of a crossing and the type of traffic control devices used. Users can also report information about grade crossings to the FRA to ensure the most accurate and up-to-date information is available.

The American Red Cross Emergency app is available on iTunes and Google Play and lets residents monitor more than 35 different severe weather and emergency alerts in their own cities and others to help keep them and their loved ones safe.

The Salvation Army Intermountain Division Emergency Disaster Services has the ability to provide both immediate emergency assistance and long-term recovery help. Residents may also sign up as volunteers. http://imsalvationarmyeds.org/

American Red Cross of the Mile High Area helps individuals and communities prepare for, respond to and recover from disasters; teaches lifesaving skills to tens of thousands of individuals; provides transportation for the critically ill and elderly; offers support to U.S. service members and their families in Colorado; and provides lifesaving information to immigrant and migrant communities, promote international Humanitarian Law and reconnect families separated by war or disaster. www.redcross.org/local/colorado/about-us
Appendix B: Policy, Partnership, and Data Resources


Rail Crossing Locator free mobile application by the Federal Railroad Administration is available on iTunes and Google Play. Users enter a specific location, which then allows them to locate highway-rail grade crossings in their area and retrieve important information, such as the physical characteristics of a crossing and the type of traffic control devices used. Users can also report information.

American Association of Railroads data [www.aar.org/data-center](http://www.aar.org/data-center)


Colorado Information Analysis Center at the Colorado Division of Homeland Security and Emergency Management [www.dhsem.state.co.us/prevention-security/ciac](http://www.dhsem.state.co.us/prevention-security/ciac)

Denver Local Emergency Planning Committee (LEPC) [www.denvergov.org/content/denvergov/en/office-of-emergency-management/local-emergency-planning-committee.html](http://www.denvergov.org/content/denvergov/en/office-of-emergency-management/local-emergency-planning-committee.html)


Planning and Environmental Linkages study process, Colorado Department of Transportation [www.codot.gov/programs/environmental/planning-env-link-program](http://www.codot.gov/programs/environmental/planning-env-link-program)

BNSF Railway Foundation [www.bnsffoundation.org](http://www.bnsffoundation.org)

Union Pacific Foundation [www.up.com/aboutup/community/foundation](http://www.up.com/aboutup/community/foundation)

Union Pacific Railroad safety information, presentation request form, and event notification [www.up.com/aboutup/community/safety/](http://www.up.com/aboutup/community/safety/)
Appendix C: Resources for First Responders and Emergency Managers

BNSF Railway online hazmat training [www.bnsfhazmat.com]

BNSF AskRail app for emergency responders [www.bnsfhazmat.com/askrail]

Union Pacific Railroad First Responders page [www.up.com/media/cbr/prevention/index.htm]

Federal Railroad Administration – Rail Safety for Emergency Responders [www.fra.dot.gov/Page/P0001]

Grade Crossing Collision Investigation course for law enforcement officers by Operation Lifesaver rail safety education [www.oli.org/training/law-enforcement-community]

National Traffic Incident Management Responder Training online course [www.nhi.fhwa.dot.gov/training/course_search.aspx?course_no=133126]

Operation RAILSAFE training for first responders by Amtrak [www.railsafe.net]


Rail Crossing Locator free mobile application by the Federal Railroad Administration is available on iTunes and Google Play. Users enter a specific location, which then allows them to locate highway-rail grade crossings in their area and retrieve important information, such as the physical characteristics of a crossing and the type of traffic control devices used. Users can also report information.

Security and Emergency Response Training Center in Pueblo [www.sertc.org]

Texas A&M Engineering Extension Service [www.teex.org]

TRANSCAER (Transportation Community Awareness and Emergency Response) [www.transcaer.com]

Appendix D: Article about 1983 freight rail incident in Denver

Tank car spews acid cloud in Denver
April 4, 1983
From Chicago Tribune wires

A railroad tank car loaded with nitric acid ruptured in a rail yard, sending a dangerous mustard-colored cloud over the city Sunday and forcing as many as 3,000 people from their homes.

By midafternoon emergency teams said they had neutralized the 20,000 gallons of nitric acid that spilled by using a snowblower to smother the acid with ash. Nine hours after the initial spill, people were being allowed to return to their homes.

The acid spewed a cloud of poisonous vapor that drifted over a wide area of the city. At least 16 people were taken to hospitals for treatment of eye irritation and breathing problems, according to Dr. John Marx at Denver General Hospital. Most were treated and released, and no serious injuries were reported.

Three firefighters sustained minor burns when they came in contact with the acid, hospital officials said. Hundreds of people called or walked into hospitals or to the Rocky Mountain Poison Control Center for medical advice.

Earlier in the day, a fire official had estimated that 25,000 people were forced to leave their homes, but that estimate was discounted later by police officials and by Errol Stevens, an aide to Mayor William McNichols.

Crews in masks and protective clothing used shovels and a commercial snowblower with revolving blades, borrowed from Stapleton International Airport, to spread 700 tons of alkaline soda ash over the spill. “We really didn’t know how the snowblower would work, but it went very, very well,” said James Garner, director of the Office of Emergency Preparedness.

Fumes from nitric acid, which is used in production of fertilizer, drugs and explosives, is highly irritating to the lungs and mucous membranes and could be fatal if inhaled excessively. “We had chemists come in, and they said we had to get people out of there,” said Assistant Fire Chief Ralph Johnson.

“If you get into the heavy part of the cloud, it can eat away at the flesh,” he said. “It has a very high corrosive power.”

The acid spilled in the Denver & Rio Grande Western Railroad switching yards when a 14-by-6-inch hole was slashed in the tank car during switching.
“They were switching cars, and during the switching operation a coupler went up through the bottom of the tank car and made a hole,” Johnson said.

The orange gas cloud became dark rust yellow as it rose, and it was pushed by light winds to the southeast.

Some acid spilled into the city’s sewer system, but officials said all of it had been contained and posed no danger to groundwater. As the acid spilled, it ignited a small fire and sent a thick, billowing cloud that caused explosions in some electrical transformers. The explosions caused some power shortages in the Denver area.

When the emergency began just before dawn, residents of the area were warned by Civil Defense sirens, radio broadcasts and police knocking on doors. The section of the city where the spill occurred is dotted with warehouses and other commercial buildings.

Those evacuated from the three-square-mile area northwest of Denver’s downtown were taken to schools for shelter. People left their homes and boarded 10 Regional Transportation District buses ferrying people from the affected area. Two children showed up carrying their candy-filled Easter baskets.

Dorothy Young, who arrived at one of the schools with her 10 children, said: “We were just waking up and we just had to grab everything and leave home. Everybody was upset. You could see this orange cloud in the sky, and there was a bitter taste in my throat.”

But the cloud wasn’t the big crisis for her children, she said. “The kids were crying and saying, ‘We’re not going to have Easter! We’re not going to have Easter!’ I told them we had got to get out of there or we might die.”

Cleanup work was suspended late Sunday and was expected to continue Monday. Meanwhile, the National Transportation Safety Board and the Federal Railroad Administration began an investigation into the incident. Gordon Inglis, a board specialist on railroad safety, said preliminary indications were that the spill was caused by an undisclosed mechanical failure.

The acid was being shipped by the Hercules Chemical Co. from Cosgrove, Mo., to the Trojan Powder Co. in Gomex, Utah, Slocum said. Two officials of the company, which is based in Louisiana, arrived Sunday to assist in the cleanup.
References Cited


