

Regulating Development Near Rail to Mitigate Risks – Background September 9, 2021

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Denver is built around rail lines and rail yards. As rail lines and yards consolidate, lands previously used for industry are being developed to high density uses including residential. This paper discusses mitigation of risks of development near rail to help facilitate safe and protective redevelopment.

Rising shipments of hazmat by rail trigger regulatory responses: Rail has always had risks of derailments, accidents and release of hazardous materials being transported. The rise of US domestic oil production, ethanol transport and other factors increased transport of flammable liquids and other hazmat by rail over the last two decades. Derailments, releases of hazardous materials and fires became more notable to the public and to governments at local, state and federal levels.

In 2013 a train of over 70 tank cars of crude oil from North Dakota, destined for Nova Scotia, derailed in Lac-Mégantic, Quebec just before it would have crossed into Maine. 70 of the tank cars derailed and burned for days, killing 47 and eliminating several blocks of the downtown area. The disaster set off a series of rapid regulatory responses from US DOT and Transport Canada that changed how crude oil and ethanol were transported by rail. This culminated in the US DOT High Hazard Flammable Trains regulation issued in 2015 and the phase out in US and Canada of older model flammable liquid tank cars, among other requirements. Several states investigated and reported on crude oil transport by rail across their jurisdictions. Citizen activists and local government sent letters and petitions demanding that transport of oil and dangerous chemicals through their towns be stopped.

Hazmat by rail in Denver and the Mayor's Railroad Safety Working Group: Within months of Lac-Mégantic it was evident that trains carrying dozens of flammable liquid tank cars were routinely staged and transiting downtown and in other areas of Denver. One common location downtown where tank cars are staged is behind Union Station. The very short setback of high-density residential buildings from the rail lines in this vicinity leaves little room for a derailment or hazmat release to avoid directly involving the residential or commercial buildings. Management of some of these buildings contacted City Council and Denver agencies and raised these concerns.

Denver Councilwoman At-Large Debbie Ortega had a series of meetings over a year with Denver's Office of Emergency Management and Homeland Security (OEM) and several City agencies to discuss protecting new development near rail. Mayor Hancock formed the Railroad Safety Working Group, which developed findings and recommendations on rail safety in 2016. Following are significant findings generated by these efforts:

- **Volume of Hazmat Rail Shipments in Denver:** Denver's Office of Emergency Management and Homeland Security reported up to 82,000 hazmat rail car shipments by rail in Denver annually, with up to 225 hazmat rail car shipments by rail car in Denver per day. The most common hazmat shipments were flammable liquids, such as crude oil and ethanol. (*Initial Analysis of Hazardous Materials by Rail, Denver Office of Emergency Management and Homeland Security, 1/13/2016*).
- **Heavy Rail Incidents 1996-2015:** There were 320 heavy rail incidents in Denver during this 20 - year period, more than any other county in Colorado. Of these, 216 incidents were derailments,

26 were collisions, 213 were human -caused and 14 were caused by equipment. (*Federal Railroad Administration, Office of Safety Analysis 2016*).

- **DOT projections, crude or ethanol -carrying train mainline derailments, 2015-2034:** DOT projected 278 mainline derailments of crude oil or ethanol -carrying trains for this 20 -year period (*not including derailments of other hazmat, other derailments, or other rail hazmat incidents*). These include: 93 (33%) in densely populated areas; 85 (30.4%) with at least 1 carload of released flammable liquid igniting and causing fire; 12 (13%) with at least 230,000 gallons of released flammable liquid (7-8 tank carloads) and large fires; and 2 derailments projected to be high consequence events (range estimate 1-5 events). (*Final Regulatory Impact Analysis [Docket No. PHMSA-2012-0082] (HM-251) High-Hazard Flammable Trains Rule*).
- **Local government role in dealing with freight rail:** It was found that federal laws preempt state and local governments on most matters concerning how railroads conduct their operations. Two important regulatory areas for local governments as to rail operations emerged: Emergency preparation and response, headed by Denver Fire Department with OEM support; and regulation of land use near railways.
- **No US models or standards found for development near rail corridors:** Working Group participants including Denver Fire Department, railroads and Federal Railroad Administration were affiliated with national entities in their subject matter areas. National League of Cities activities at the time were reviewed. But no US models to regulate development near rail were identified. Railroads, however, made us aware of guidelines developed by the Federation of Canadian Municipalities and the Railway Association of Canada, discussed below.
- **Working Group recommendation – incorporate proximity to rail screening into Development Review Process:** Community Planning and Development modified the Development Application form and process to indicate if a proposed development was within 200 feet of a railway. In 2018 over 20 Development Applications were reviewed by agencies for projects within 200 feet of rail. No comments were generated by agencies on any concerns or protective measures for any of these applications. Inquiry to Denver Dept. of Public Health and Environment and Community Planning and Development revealed they lacked regulatory authority to require mitigations or protective measures.

High-density residential projects near rail: Since taking up review of rail safety and flagging developments near rail for special review, Denver has approved or is processing numerous applications for high-density residential projects near freight rail lines. ***For these applications, no consideration has been given to the special risks of derailments and hazmat-by-rail incidents. If Denver does not act now to mitigate risks from new residential development near rail, future buildout near rail will be without appropriate protections. Additionally, when City Council approves rezoning applications that include a staff report stating that “health, safety and welfare” have been addressed, the information above contradicts that statement.***

Responsibility to protect: The 2019 Colorado Local Emergency Planning Committee Annual Conference was hosted by Colorado Division of Homeland Security and Emergency Response. An attorney who counsels Colorado’s Emergency Planning Committee advised attendees that, in a post-Hurricane Katrina environment, elected officials are legally responsible to ensure actions are taken to protect people and

property. He directed attendees to review the FEMA Comprehensive Preparedness Guide, November 2010, where the first sentence of Chapter One reads: *“The elected and appointed leaders in each jurisdiction are responsible for ensuring that necessary and appropriate actions are taken to protect people and property from any threat or hazard.”*

Risk mitigation models for new development near rail: The disaster at Lac-Mégantic and subsequent hazmat rail incidents reverberated across Canada and its local governments. At least two approaches have been implemented to mitigate the risks of development near rail:

- **Federation of Canadian Municipalities/Railway Association of Canada “Guidelines for New Development in Proximity to Railway Operations” (FCM/RAC):** A standard mitigation was developed through collaboration between the Canadian rail sector, local governments, and consultant experts. It consists of a 30-meter setback from Main Line railroad property lines to new high-density residential buildings; a 2.5 -meter high earthen berm in between with 3 -meter acoustical fence on top; and a chain link fence at the rail property line to deter trespass to rail tracks. 300-meter setback is recommended from rail yards and 15-meter setback from Branch and Spur Lines. The 30-meter setback is recommended because it exceeds the length of most rail cars that can potentially derail off the track. FCM/RAC guidelines have been adopted area-wide by the Montreal Agglomeration Council in Quebec and other local governments across Canada.
- **Calgary Baseline Risk Assessment and Development next to Freight Rail Corridors Policy & Implementation Guide:** City of Calgary developed a risk-based land use planning policy to manage the risks of development adjacent to freight rail corridors. It was developed in collaboration with stakeholders including rail companies, developers and community associations and with public information sessions. The Rail Policy is based on the findings of the Baseline Risk Assessment report. The risk profile of all parcels along each rail corridor is identified, and Calgary outlines what can or cannot be built with or without mitigation. The higher the risk of derailment to a given property, the narrower that new development for high-density residential and commercial buildings and sensitive uses must be within a “Rail Proximity Envelope (RPE). The RPE for safety is measured 30 -meters horizontally from the rail corridor and 7 -meters in height from grade. The RPE for noise increases in height to 64 meters. The Rail Policy does not apply outside the RPE. Every parcel along freight rail lines has been assigned maximum building and use widths that can be viewed on an interactive GIS map [[Interactive Map](#)]. The maximum building and use widths are calculated to reduce risk profiles below public fatality risk criteria issued by the Major Industrial Accidents Council of Canada (MIACC). These criteria, accepted by Calgary’s Council in enacting the Freight Rail Corridors Policy, specify a tolerable annual probability of a train derailment leading to a fatality for an individual parcel is one in 1,000,000 for High Density Residential and Commercial Uses and one in 3,333,333 for Sensitive Uses.

Proposed ordinance for Denver: Denver should reduce the likelihood that derailed freight train cars contact new high-density residential buildings and sensitive uses and increase the working space for emergency operations around a derailment, collision or hazmat release by rail.

- Provide proper regulatory authority for Community Planning and Development and other agencies as needed to regulate new development near freight rail, which includes access to the

tracks and their vicinity by railroads and local government emergency responders if an incident were to occur;

- Interim requirement of 30 -meter setback from rail property line for new high-density residential buildings and sensitive uses. Uses other than these and otherwise allowed for a property are permitted within the setback. The distance of 30 meters is consistent with the 30-meter hazard zone identified by both FCM/RAC Guidelines and Calgary Policy and is longer than most rail cars that may potentially derail;
- Within one year city agencies develop recommendation(s) for Council to consider that mitigate risks of new development near rail, based on review of the Canadian approaches and any identified in the US or elsewhere.

Considerations in developing Denver's risk mitigation strategies:

Information update: Information will likely need to be updated since the Mayor's Working Group has not met since 2016, such as OEM data on rail traffic and hazmat shipments in Denver, DOT information and other baseline information.

Outside consultants: Technical subject matter experts may be of value in reviewing potential risk mitigation models and potentially in developing Denver -specific risk information. Calgary recommended it is critical to involve a subject matter expert to develop a Denver -specific rail policy. A decision to proceed with a "standard" mitigation approach such as the FCM/RAC and Montreal approach may not need much outside analysis because the mitigations are standard and fixed. However, a standard mitigation may not be context specific as applied to Denver and this should be carefully evaluated. A decision to proceed with a "risk management" approach such as Calgary might need outside consultants to assess rail segments in Denver and recommend mitigations that sufficiently reduce risks. Calgary reported they spent \$300,000 to \$350,000 on outside consultants to develop their Baseline Risk Assessment. However, they reported this included noise and vibration studies that could be separated out from hazard risk assessment and reduce costs.