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Locomotive Idling, Air Quality, and Blocked Crossings

When a train is not moving but its engines are running, it can present risks and disruptions for the surrounding community. Locomotives emit fuel exhaust that degrades air quality and generates noise and vibrations. If the idling train is stopped at a highway-rail grade crossing, local road transportation could be significantly impacted, especially if the nearest open railroad crossing is not close by. This could create serious conditions if first responders are unable to reach emergencies on the other side of the tracks.

Why Do Locomotives Idle?

Train engines generate thousands of horsepower and take an hour or more to warm up before they can start pulling rail cars. This is one reason there is reluctance to turn them off. Also, particularly relevant for a locomotive attached to a train, the brakes on the cars in the train do not work without power. The locomotive must run to keep the air pressure brakes on a train applied (the equivalent of keeping a car in park). In temperatures below 40 degrees Fahrenheit, the engine has to be kept warm for engine fluids to work properly, as antifreeze cannot be used in locomotive engines. Engines are also kept running to provide air conditioning or heat for the crew, which may be aboard even if the train is idling in a yard.

Why Do Trains Block Crossings?

When trains are moving at different speeds or in opposite directions along a single-track rail line, one train will usually have to wait on a side track or on the nearest two-track segment until the other train has passed; if a road crosses these tracks, the crossing will be obstructed until it is safe for the train to proceed. In many cases, these waits are planned and meant to be brief, but unforeseen delays due to an oncoming or passing train can mean a stationary train must remain in one place for an extended period. Railroad crews, bound by hours-of-service limits, may not be permitted to move the train, which then must wait until a fresh crew can relieve them. Railroads try to schedule crew changes in convenient locations, but service disruptions occasionally make this impossible, forcing trains to stop midway through a journey. Train stoppages are also sometimes caused by mechanical failures.

Once a train has been idle for over four hours, or if any cars were removed or added while stopped, regulations require crew to perform an air brake test prior to proceeding to the next destination, a process that can take several minutes.

Freight trains can reach lengths of 2 miles, meaning it can take several minutes to completely pass a crossing even when rail traffic is moving. Where equipped, warning lights or gates will engage some time before a train reaches a crossing and will remain engaged for some time after a train has passed, somewhat prolonging the traffic obstruction.

Selected Recent Blocked Crossing Incidents

There are no national statistics on the frequency or severity of blocked crossings, but recent incidents have received media coverage:

- June 2018: a Canadian National Railway (CN) train broke down in the town of Barrington, IL, blocking all four railroad crossings in the town for nearly an hour. Ambulances transporting victims of a highway collision were delayed in reaching the hospital (their injuries were non-life-threatening).
- February 2018: a CSX freight train in Tonawanda, NY, was stopped on a crossing for over two hours due to a crew shortage.
- April 2017: Senator Charles Schumer and Ulster County Executive Michael Hein called on CSX to resolve issues of trains idling at crossings in Kingston, NY, which cuts off certain businesses from the rest of the city entirely if they are located on dead-end streets.

Possible Responses to Locomotive Idling

Technology to Reduce Idling Noise/Emissions

The Environmental Protection Agency (EPA) has the authority to regulate locomotive engine noise under the Noise Control Act (42 U.S.C. §4916) and limit emissions under the Clean Air Act (42 U.S.C. §7547). In a 2008 rulemaking (73 *Federal Register* 37096), EPA set stricter emissions requirements for locomotive engines built or remanufactured after 2012. It also required new locomotives to be equipped with an AESS (automatic engine start/stop system) that will shut down the engine after 30 minutes of idling.

A second device, called an auxiliary power unit (APU), is a small engine that can keep the locomotive's main engine warm, the batteries charged, and the brakes applied, and therefore allow the main engine to be turned off without endangering the crew or the equipment. An AESS can be programmed to trigger an APU automatically, without requiring a rail worker to activate the locomotive on/off switch. EPA opted not to require the use of APUs in the 2008 rulemaking. However, the emission cap regulations offer a fairly strong incentive to install them (40 C.F.R. 92.132(a)(4)).

EPA does not have authority under the Clean Air Act (CAA) to require APUs or AESSs to be installed on existing locomotives. To require railroads to install idle reduction equipment on all existing locomotives, which typically have service lives of 40 years, it would be

necessary to either enact freestanding legislation or to amend the CAA.

Surface Transportation Board Remedies

The Surface Transportation Board (STB) reviews the construction of new rail lines and transactions involving existing lines. STB can impose environmental mitigation measures, including those related to locomotive idling, as part of this review process. For instance, when CN acquired the so-called “J” Line around Chicago in 2008, STB recognized that a moderately used shortline railroad would become a heavily used main line track. STB, after a review from its Office of Environmental Analysis, required CN to take a number of measures to mitigate the adverse impacts of increased train traffic on local communities. These included

- construction of two road overpasses to eliminate blocked crossings at heavily trafficked locations;
- accelerated acquisition of new locomotives that would meet EPA emissions requirements for idling reduction systems and new procedures to shut down locomotives when not in use and when temperatures are above 40 degrees; and
- measures to keep railroad noise below a certain level for nearby residents by constructing berms or installing vegetation along the tracks.

Possible Responses to Blocked Crossings

2006 Blocked Crossings Study

Under a 2005 law, the Secretary of Transportation was tasked with undertaking a study of the impact of blocked highway-railroad grade crossings on emergency responders. The final report, published in August 2006 by the Federal Railroad Administration (FRA), noted that there is no uniform national data collected on blocked crossings or on emergency responder delays.

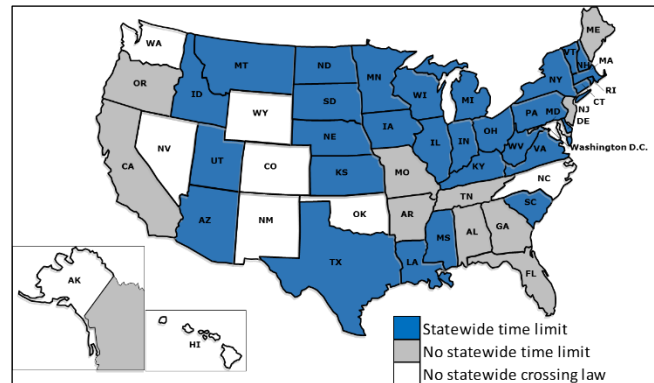
The report recommended forming close relationships between the railroad and the community so that each may be made aware of the other’s concerns. In particular, if the railroad is aware of the locations of critical public safety facilities, such as fire and ambulance stations, it may be able to adjust the location at which trains stop in order to ensure a nearby grade crossing is not blocked. There are some actions railroad companies can take in order to minimize time spent at crossings, including shortening trains or building additional infrastructure. However, the general tendency has been for railroads to run longer trains for economic reasons, which may lead to lengthier delays at grade crossings and more blocked crossings when a train is stopped. Railroads can also adopt a policy of creating a gap in a stopped train so as not to block a crossing, though the process of creating the gap is time-consuming and would require the crossing to be closed for that time.

State Laws Regarding Blocked Crossings

There are no federal laws or regulations specifically concerning blocked highway-rail crossings. According to a 2013 report compiled by FRA and subsequent research

conducted by CRS, 40 states and the District of Columbia have laws in effect regarding obstructed crossings (**Figure 1**). Many of these set a time limit on trains to occupy crossings, ranging from as little as five minutes to as much as 20 minutes. Other states do not impose a statewide time limit, but shield railroad employees who block crossings based on orders from their supervisors.

Figure 1. States with Blocked Crossing Laws



Source: Federal Railroad Administration (FRA), *Compilation of State Laws and Regulations Affecting Highway-Rail Grade Crossings, Sixth Edition*, 2013, <https://www.fra.dot.gov/StateLaws>.

Notes: Congressional Research Service (CRS) verified the status of laws in 12 states not named in the FRA report.

However, federal courts have found that some of these laws are preempted by one or more federal laws, rendering them unenforceable. The Federal Railway Safety Act of 1970 grants states the ability to enact their own rail safety laws only if neither the U.S. Department of Transportation (DOT) nor the Department of Homeland Security has issued regulations “covering the subject matter of” the state law. States are further restricted from enacting laws that burden interstate commerce. Railroad companies have successfully argued in court that laws setting time limits at crossings are functionally the same as regulating railroad business practices such as train length and speed or infrastructure construction, which states are not permitted to do.

Grade Crossing Improvements

One effective but expensive way to resolve the issue of blocked crossings is to construct grade-separated over/underpasses so that rail traffic does not interfere with road traffic. The 2015 surface transportation law, the FAST Act, added “projects at grade crossings to eliminate hazards posed by blocked grade crossings due to idling trains” in the list of approved uses for the “Section 130” highway-rail crossing safety program, which receives over \$200 million per year. These funds are then allocated to states by a formula that slightly favors states with a disproportionately large share of public grade crossings.

Certain grade separation projects are also an eligible use of funds from the Better Utilizing Investments to Leverage Development discretionary grant program, known as BUILD (formerly TIGER), and from the Consolidated Railroad Infrastructure and Safety Improvement program (CRISI), both administered by DOT.

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