

Illinois Climate Change Advisory Group
Subgroup: Transportation
Policy Name: #69 Passenger and freight rail upgrades
Policy Type: Other
Estimated 2020 Reductions Compared to BAU:
136,321 metric tons CO₂ (passenger upgrades only)
5/21/07

Affected sectors, subsectors or entities

For example:

Sector: Transportation
Subsector: Rail
Entities: Passenger and freight rail operators

Description

This straw proposal consists of two components 1) fully fund and implement passenger rail upgrades and service restoration throughout the state 2) fully fund and implement the CREATE freight rail improvement program.

Passenger rail upgrades

In this straw proposal, significant increases in funding and investment would be directed over the next five years to achieve the following:

- Complete all necessary upgrades to allow for 110mph high speed rail service between Chicago and St. Louis. This would reduce total trip time between these cities from 5.5 hours today to as little as 4 hours thus making rail faster than driving and competitive with flying.
- Increase ridership on existing Chicago-Downstate rail lines through investments in new equipment. By replacing aging locomotives and rail cars with ten new diesel trainsets, trip reliability and comfort would be vastly improved on these lines.
- Upgrade and streamline rail capacity on existing rail lines to reduce trip times between Chicago and Downstate. These upgrades would reduce trip times to make rail service more competitive with driving.
- Restore service from Chicago to Rockford, the Quad Cities, Decatur, and Peoria. These cities are four of the state's ten most populous metropolitan areas, but none has enjoyed train service for more than 20 years. Rail service will reduce vehicle miles traveled in these corridors and GHGs as well.

Freight rail upgrades

This straw proposal would also fully fund and implement the Chicago Region Environmental and Transportation Efficiency Program (CREATE). The program will enhance passenger rails service while also reducing emissions from idle freight trains and automobiles throughout the Chicago area by focusing rail traffic on five rail corridors. CREATE improvements would include:

- 25 new roadway overpasses or underpasses at locations where auto and pedestrian traffic currently crosses railroad tracks at grade level
- 6 new rail overpasses or underpasses to separate passenger and freight train tracks
- Viaduct improvements
- Grade crossing safety enhancements
- Extensive upgrades of tracks, switches and signal systems

The existing freight rail network's at-grade rail crossings diminish the reliability, capacity, and growth capabilities of commuter and intercity passenger rail lines, especially on the south and southwest parts of the Chicago region. CREATE's proposed rail-over-rail grade separations will enable service to be added to these lines, improving reliability and reducing travel times. Proposed grade crossing improvements and rail/rail and rail/road grade separations also will improve safety.

Rough estimate of reductions from BAU in 2020

Note: Relevant data needed for the calculation of emissions benefits from the CREATE program were not available for inclusion in this straw proposal. GHG reductions are likely to be significant and will be presented at the next subgroup call. GHG reductions from passenger rail improvements are presented below:

Based on results from similar capital improvements implemented in California, ELPC estimates that ridership would increase to 1,471,680 on existing lines from the passenger rail upgrade component of this recommendation assuming an overall 50 percent train load factor. This is a total increase in ridership 900,000 from current levels.

Assume that all new passengers would otherwise drive this route and that the total increase in ridership would translate into:

- 360,000 new passengers between Chicago and St. Louis
- 315,000 new passengers between Chicago and Carbondale
- 225,000 new passengers between Chicago and Quincy

Assume that no additional train trips are made to meet this new demand but instead, more train cars are added to existing scheduled trips.

Using common emissions factors and estimate trip lengths from Amtrak, total annual estimated GHG emissions from rail service on these lines would be: 31,980 metric tons.

Also assume that if each of these passengers drove each car would carry 1.2 passengers. Using driving distances from google maps, a fleet average fuel economy of 20.8 mpg (from IDOT) a CO2 emissions factor of 19.6 lb./gal. (from EIA) total emissions avoided by these rail upgrades based on the number of passengers presented above would be: 59,549 metric tons.

Thus the total emissions reduction in 2020 is the annual emissions from displaced car trips minus the annual emissions from new rail service:

59,549 metric tons – 31,980 metric tons = 27,569 metric tons.

Restoration of service from Chicago to Rockford, the Quad Cities, Decatur, and Peoria and all other upgrades.

The net GHG reduction on the Carbondale line is used as a proxy for achievable GHG reductions from restored service to these four cities. This net GHG reduction is approximately 13,594 metric tons annually.

However, overtime these reductions are assumed to double by 2020 as these cities have much higher populations than Carbondale. It is also assumed that each rail line will provide 2 round trips per day in 2020. It is important to note that rail GHG emissions do not increase as additional cars are added.

Based on these assumptions each restored service line will achieve twice the emissions reductions of the current Carbondale service expansion in 2020.

13,594 X 2 = 27,188 tonnes CO₂

27,188 tonnes CO₂ X 4 (restored rail lines) =
108,752 tonnes CO₂

Therefore total reductions from the passenger rail component of this straw proposal are:

27,569 tonnes CO₂ + 108,752 tonnes = **136,321 tonnes**

City	Population
Carbondale	24,806
Decatur	77,836
Peoria	112,936
Quad Cities	81,594
Rockford	150,115

Timetables, duration and stringency

January 1, 2011. High speed rail service upgrades are complete between Chicago and St. Louis.

January 1 2013. All other capital improvements are implemented.

Barriers to implementation

Additional resources will be required to complete upgrades and to purchase and maintain new equipment.