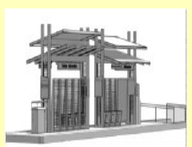
Impacts of Climate Change on U.S. Public Transportation: High Heat Projections

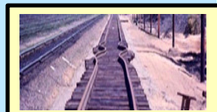
Portland:
Designed with the Pacific Northwest's historically mild climate in mind, Portland's light rail system experienced overheating of rail electrical systems, ticket vending machines, and the electrical equipment housed on the roofs of low floor vehicles during recent heat waves. The agency has also installed expansion joints to reduce track buckling.

Chicago:
Innovative Ways of Mitigating Heat Impacts
Chicago's Climate Action Plan calls for planting more than a million trees in the city by 2020 to reduce the impact of heat waves and the urban heat island effect. In particular, the city used satellite images to identify hot spots in the city where urban heat island reduction strategies will have the greatest impact. Many of the hot spots are areas with a notable percentage of transit dependent residents.

Rural Transit:
Rural transit agencies provide lifeline services to many senior citizens and individuals with disabilities who are particularly vulnerable to high heat.



Tucson:
Transit stops and other shelter facilities can provide shading and natural ventilation for passenger comfort and safety -- The station design for the new Tucson Modern Streetcar system incorporates a double - tiered shade structure that decreases temperatures by 10 to 15°F and provides shade at all times of day.



Washington:
Impact of High Heat on Rails
The Washington DC area rail system has already experienced multiple incidents in which extended high temperatures caused 'heat kinks' or buckling of the rails, leading to requirements to reduce speeds and to remove and replace sections of rail. Heat kinks pose safety risks and can even cause trains to derail. Heat waves in 2007 and 2010 also caused heat kinks and significant passenger delays in Boston and Philadelphia.

Phoenix:
A solar-powered cooling system is being built that will allow travelers to push a button at the 3rd Street/Washington light rail stop for a release of cool air. From May through September, fans will blow chilled air from a downtown district cooling system to help cool passengers.

By the end of the century, average temperatures in the United States are projected to increase by 7 to 11°F under a high emission scenario and 4 to 6.5°F under a low emissions scenario.
US Global Change Research Program

Legend

Transit
- Bus
- Bus and Ferry
- Bus and Rail
- Bus, Rail, and Ferry
- Rural Transit

Annual Average Increase in Number of Days Above 90° F (1961-1971 vs. 2080-2099)
- 0 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80- 100
- 100 +

Transit ridership (unlinked passenger trips), used to determine symbol size, from the National Transit Database (2008); one dot per urbanized area, which can reflect multiple transit agencies in that area. Change in number of days above 90 degrees based on data provided by NOAA's National Climatic Data Center, reflecting information presented in U.S. Global Change Research Program's Global Climate Change Impacts in the United States (2009); very high emissions scenario (a2). Climate change projections are simulation results from a subset of models of the World Climate Research Programs / Coupled Model Intercomparison Project 3 (WCRP/CMIP3). Alaska, Hawaii and Puerto Rico not included due to lack of data.

U.S. Department of Transportation
Federal Transit Administration

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