

Addressing America's Infrastructure Crisis

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Roadmap for the Presentation

America's Infrastructure Report Card



The National Environmental Policy Act and Its Effects on Infrastructure Development



Current and Recent Infrastructure Emergencies

United States Receives D+ Grade on Infrastructure

2013 Report Card for America’s Infrastructure

Conducted by the American Society of Civil Engineers

Sector	Grade	Sector	Grade
Aviation	D	Ports	C
Bridges	C+	Public Parks and Rec.	C-
Dams	D	Rail	C+
Drinking Water	D	Roads	D
Energy	D+	Schools	D
Hazardous Waste	D	Solid Waste	B-
Inland Waterways	D-	Transit	D
Levees	D-	Wastewater	D

Grading System

- A:** Exceptional/Fit or the Future
- B:** Good/Adequate for Now
- C:** Mediocre/Requires Attention
- D:** Poor/At Risk
- F:** Failing/Critical/Unfit for Purpose

The ASCE takes into account a multitude of attributes to grade infrastructure including **capacity, condition, funding, public safety, innovation, operation and maintenance**. The purpose behind the report card is to inform the public of the current condition of America’s infrastructure in a concise, easily accessible manner.

\$3.6 Trillion

The ASCE estimated that a total of \$3.6 trillion spread between 2013 and 2020 would be needed to adequately invest in our infrastructure to “maintain a state of good repair” which would earn the nation a B grade.

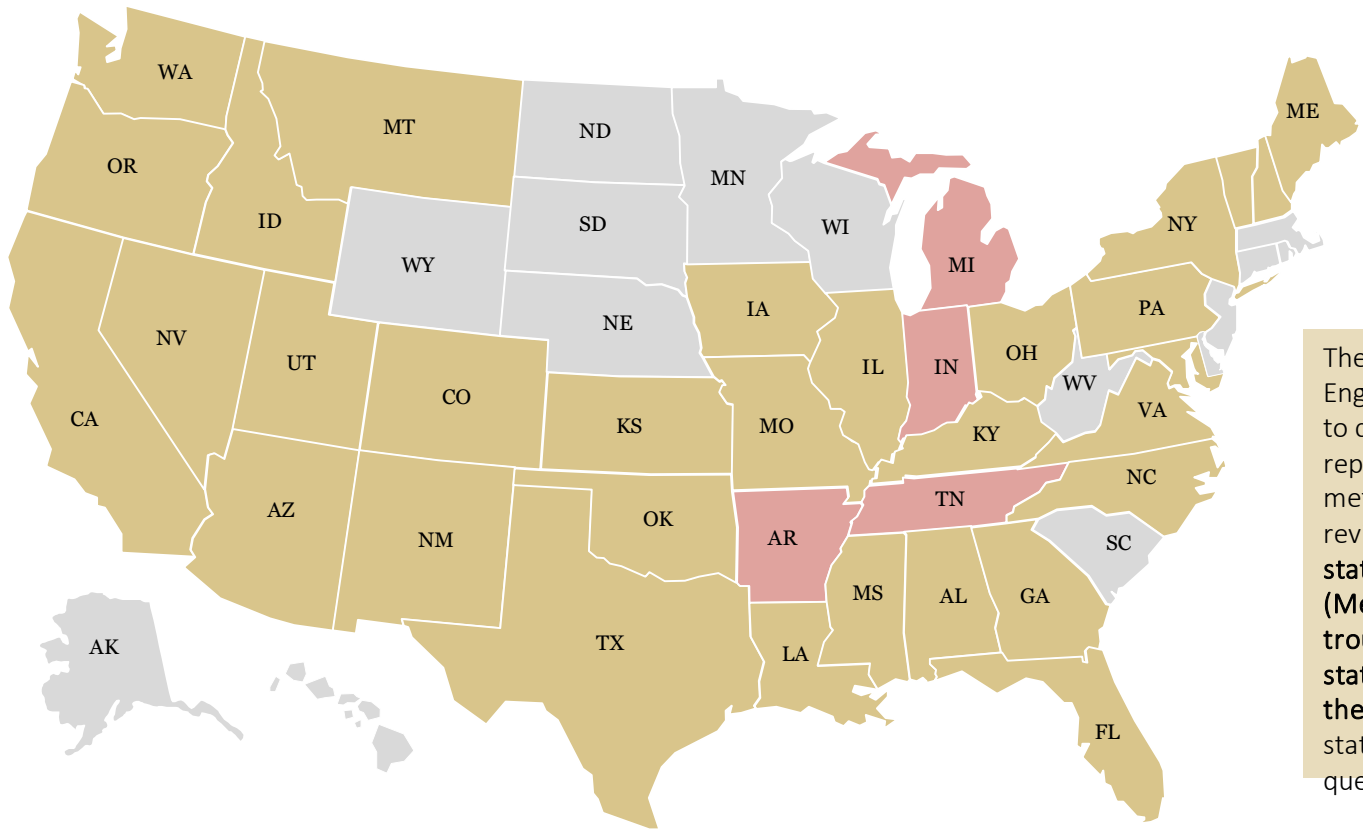
Source: American Society of Civil Engineers, “State Infrastructure Report Cards”, 2009-2013.

No States Receive Higher Than C Grade for Infrastructure, 15 States Have Yet to Be Graded

ASCE Infrastructure Report Card Grades, by State

Assessments conducted by state chapters of the American Society of Civil Engineers

■ A (Exceptional) ■ B (Good) ■ C (Mediocre) ■ D (Poor) ■ F (Failing)





The American Society of Civil Engineers relies on local chapters to conduct state infrastructure report cards following the methodology of the national review done by the ASCE. **No state received above a C (Mediocre) grade.** Even more troubling is that roughly a third of states have not been graded by their local chapters, making the status of their infrastructure questionable.

Source: American Society of Civil Engineers, "State Infrastructure Report Cards", 2009-2013.

America Has History of Poorly Graded Infrastructure, 2013 Stands As A Year of Improvement

ASCE Report Cards for America’s Infrastructure 1988-2013

Sector	1988	1998	2001	2005	2009	2013
Aviation	B-	C-	D	D+	D	D
Bridges	-	C-	C	C	C	C+
Dams	-	D	D	D+	D	D
Drinking Water	B-	D	D	D-	D-	D
Energy	-	-	D+	D	D+	D+
Hazardous Waste	D	D-	D+	D	D	D
Inland Waterways	B-	-	D+	D-	D-	D-
Public Parks and Recreation	-	-	-	C-	C-	C+
Rail	-	-	-	C-	C-	C+
Roads	C+	D-	D+	D	D-	D
Schools	D	F	D-	D	D	D
Solid Waste	C-	C-	C+	C+	C+	B-
Transit	C-	C-	C-	D+	D	D
Wastewater	C	D+	D	D-	D-	D
America’s Overall GPA	C	D	D+	D	D	D+

 = Grade Improved
 = Grade Fell

Analysis

- Despite poor grades, 2013 was a year highlighted by improvement, grades improved across seven different sectors while all others retained the same grade.
- The US is has seen its best improvements in the realm of solid waste disposal, most likely as a result of successful recycling programs and a heightened focus on environmental activism.
- Despite improvements, ten sectors still hold a “poor” rating.

Source: American Society of Civil Engineers, “State Infrastructure Report Cards”, 2009-2013.

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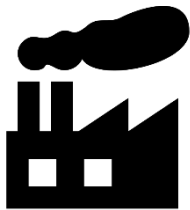
The National Environmental Policy Act is Designed to Address All Possible Impacts Prior to Construction

Basics of the National Environmental Policy Act



The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970 and requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. The legislation was passed in advance of the formation of the EPA which occurred in December of that year.

NEPA was enacted to...



Prevent Pollution and endorse more environmentally friendly alternatives



Safeguard endangered species and important historical landmarks



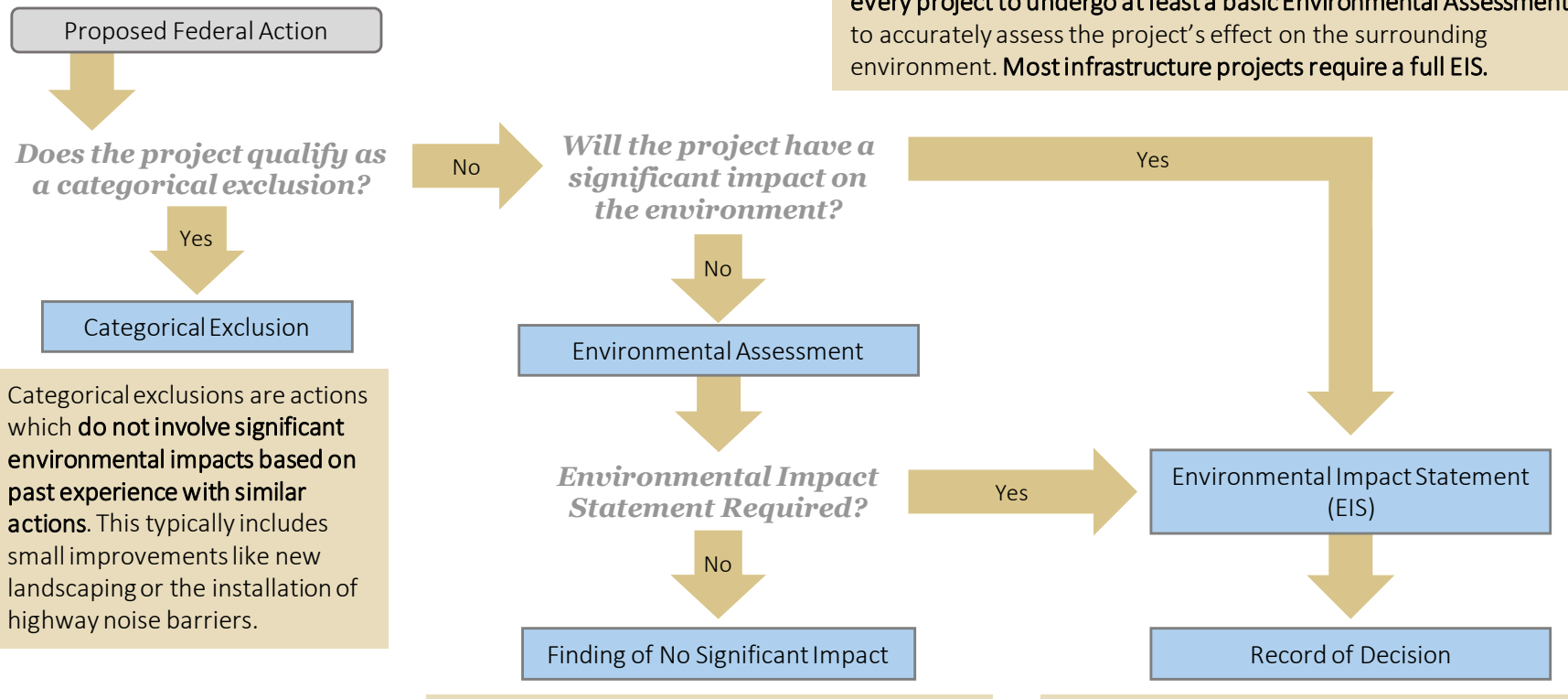
Prevent discrimination and civil unrest

While NEPA grew out of efforts to strengthen environmental regulation, the legislation also passed as a result of frequent and contentious highway revolts experienced in the 1960s. Many large infrastructure projects built pre-NEPA tended to negatively impact surrounding communities causing widespread civil unrest in cities. Following NEPA's enactment in 1970, **the legislation became one the most effective legal weapons for disadvantaged communities to prevent the destruction of their neighborhoods for infrastructure projects.**

Sources: US Environmental Protection Agency, "National Environmental Policy Act Review Process," November 2, 2015; Raymond A. Mohl, "The interstates and the Cities: The U.S. Department of Transportation and the Freeway Revolt, 1966-1973," The Journal of Policy History, Vol 20, No. 2, 2008; Icons created by Amelia Wattenberger and Elizabeth Lopez, made available through The Noun Project.

Compliance with NEPA is Extensive, Has Positive Benefits But Slows Infrastructure Development

Review Process Required by NEPA



Unless a project qualifies as a categorical exclusion, NEPA requires every project to undergo at least a basic Environmental Assessment to accurately assess the project’s effect on the surrounding environment. Most infrastructure projects require a full EIS.

Categorical exclusions are actions which do not involve significant environmental impacts based on past experience with similar actions. This typically includes small improvements like new landscaping or the installation of highway noise barriers.

If a project can prove there will be no significant impact to the surrounding environment, construction can begin without a full EIS.

After preparing an EIS, the reviewing agency will release a Record of Decision which may require addendums or another draft of the EIS to be prepared to address concerns raised.

Sources: Environmental Protection Agency, “National Environmental Policy Act Review Process,” November 2, 2015; U.S. Government, “Environmental Impact and Related Procedures, Title 23: Highways,” U.S. Government Publishing Office – Electronic Code of Federal Regulations, 2016.

Several Drafts of EIS, Public Comment Periods Make Full Compliance Process Lengthy

Step-by-Step Process for Completing an Environmental Impact Statement



Scoping Period – The leading agency invites the larger community to comment on the range of alternatives, areas of impact and mitigation measures that should be evaluated in the EIS. This allows public input into the process before the first draft of the EIS is crafted.



Draft EIS – Following the scoping period, the leading agency prepares a Draft EIS, specifying the purpose of the project, the effects and impacts on surrounding communities as well as possible alternatives and the accompanying effects and impacts resulting from each alternative.



Comment Period(s) – After the Draft EIS is completed and released to the public, the surrounding community is allowed a period of time to comment on points of interest in the Draft EIS through both hearings and electronic submissions. Comment periods typically last for 45 days. While a comment period is required following the completion of a Draft EIS, there may be several comment periods throughout the entire EIS process. After each comment period is over, the leading agency must review and address each comment individually.



Final EIS and Proposed Action – Following the comment period, the lead agency must explain how the proposed action and its alternatives were modified, make factual corrections, explain how their analysis was improved and identify new alternatives that were created.



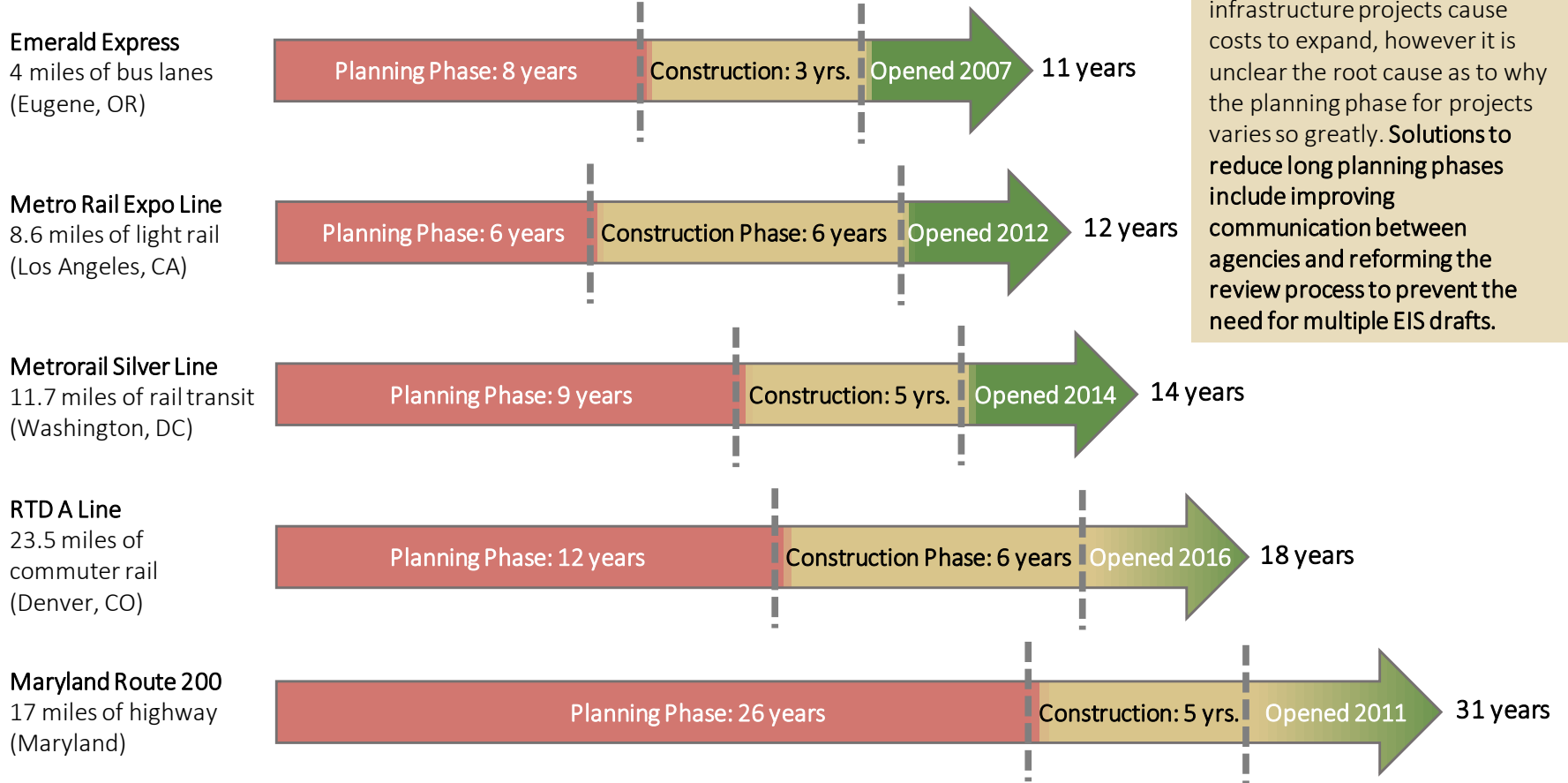
Record of Decision – Issued by the reviewing agency, the final document specifies whether the proposed action or a recommended alternative will be implemented.

A leading agency may need to issue a supplemental EIS after the Final EIS or Record of Decision is released. The supplemental EIS is typically issued if new impacts to the environment are discovered and require research. If a significant amount of time has passed between the final EIS and implementation a supplemental EIS may be required to assess changes in the environment.

Sources: Federal Highway Administration, “NEPA Documentation – Environmental Impact Statement,” 2016; Department of Ecology, “Environmental Impact Statement Process,” State of Washington, 2016. Images by Arthur Shlain, Eightemdi, Augusto Zamperlini and Keta Shah; made available through The Noun Project.

Most Infrastructure Projects Take Decades to Complete

Timelines for Recently Completed Infrastructure Projects



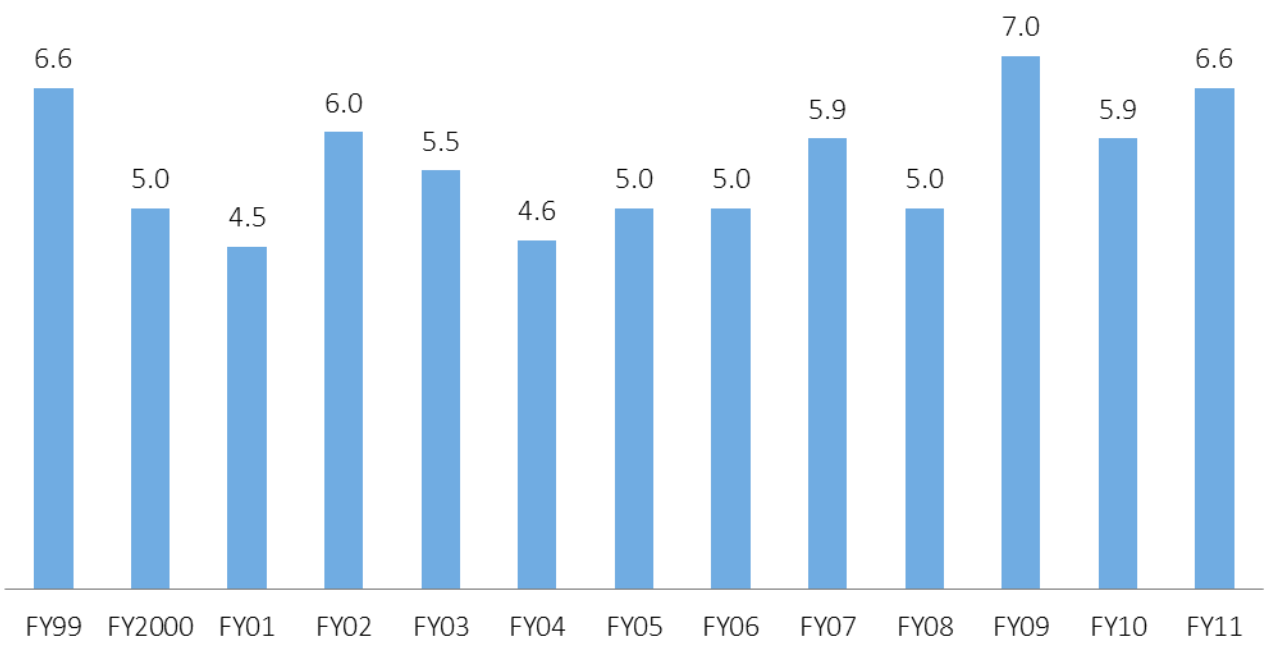
It's widely known that delays in infrastructure projects cause costs to expand, however it is unclear the root cause as to why the planning phase for projects varies so greatly. Solutions to reduce long planning phases include improving communication between agencies and reforming the review process to prevent the need for multiple EIS drafts.

Sources : Railway Gazette, "Urban Rail News in Brief – October 2010," October 3, 2010; Institute for Sustainable Communities, "Case Study: The Emerald Express, Overcoming Growing Pains and Opposition to Bus Rapid Transit," March 26, 2012; TheDenverChannel.com Team, "RTD Service From Union Station to DIA Scheduled to Start April 22," ABC7 – The Denver Channel, October 23, 2015; Ryan Mulligan, "East Corridor Groundbreaking!" Denver Infill, July 26, 2010; LA Metro, "Facts at a Glance," 2013; Los Angeles County Metropolitan Transportation Authority, "Mid City Westside Transit Draft EIS," 2000; John Spiers, "The Long and Winding Road: A History of the Intercounty Connector, 1950-2006," 2011.

Studies Find EIS Process is Consistently Lengthy, Process Gradually Taking Longer as Years Pass

Average Time Required for Highway Projects to Complete an EIS, in years

(EIS - Environmental Impact Statement)



While NEPA compliance naturally forces infrastructure projects to move along an extended regulatory timeline, other permitting and regulatory requirements often stall the EIS process as well. It is also unclear what specific elements of the environmental review process routinely delay project delivery making the identification of possible reforms difficult.

A separate study found that the time it took to complete an EIS ranged from less than 3 months to as long as 18 years.

Sources: Federal Highway Administration, "Estimated Time Required to Complete the NEPA Process," 2012; Piet deWitt and Carole A. deWitt, "How Long Does It Take to Prepare an Environmental Impact Statement?" Linda Luther, "The Role of the Environmental Review Process in Federally Funded Highway Projects: Background and Issues for Congress," Congressional Research Services, April 11, 2012.

Roadmap for the Presentation

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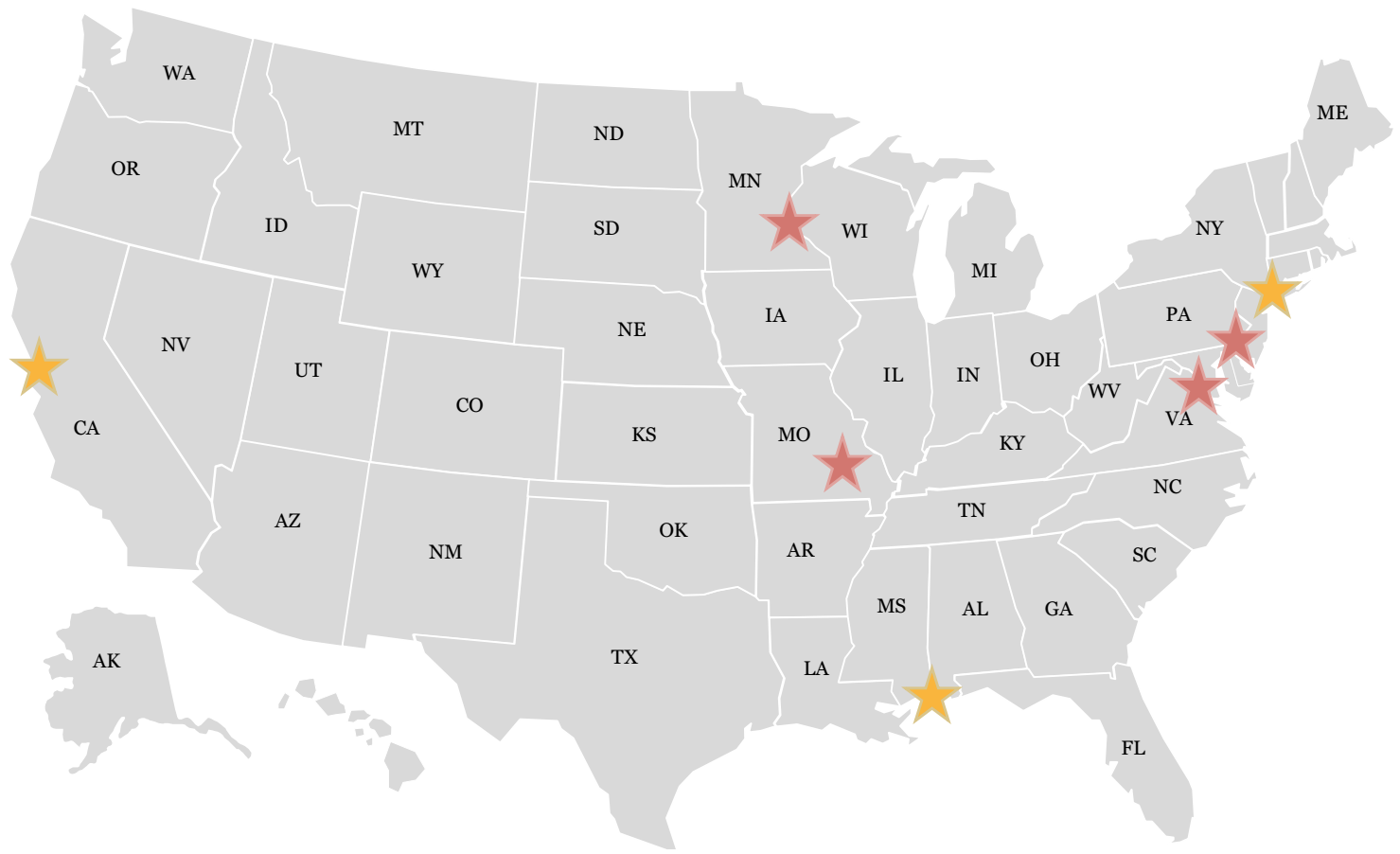
└─> **The National Environmental Policy Act and Its Effects on Infrastructure Development**

└─> **Recent Infrastructure Emergencies and Vital Infrastructure Projects**

New Infrastructure is Needed Across the US

Examples of Infrastructure Projects and Failures

■ Vital Infrastructure Projects ■ Previous Infrastructure Failure



Projects In Development Aim to Retain Competitiveness and Improve Resiliency Against Natural Disasters

Vital Infrastructure Projects in Development

Location	Infra Type	Responsible Agency	Description	Status
Mobile, AL	Auto Bridge	Alabama Department of transportation	The I-10 Bayway is currently two, two-lane bridges which cross the Mobile Bay to bring traffic into the city of Mobile Alabama. In 2001, a proposal was brought forth to build a bridge bypassing the congested Wallace Tunnel, as persistent congestion on the route hampers the area’s economic competitiveness and poses a problem for emergency evacuation situations.	<ul style="list-style-type: none"> • Environmental Impact Statement Submitted • Funding not yet secured
New York City- New Jersey	Rail Tunnel	Amtrak/NJ Transit	The Gateway Rail Tunnel Project has taken several forms over decades and currently consists of a \$24 billion project to build two new tunnels connecting NYC to NJ while rebuilding two existing tunnels as well. Current tunnels are over 100 years old and are in desperate need of repair following damage from Superstorm Sandy.	<ul style="list-style-type: none"> • Environmental Impact Statement not yet completed • Full funding not yet secured
East Palo Alto, CA (San Francisco Bay Area)	Auto Bridge	Caltrans (California Department of Transportation)	Plans to a replace US-101’s bridge across the San Francisquito Creek aim to address growing concern over flood protection. The current bridge structure has low flow capacity and endangers the surrounding areas should a strong storm surge cause water levels to rise rapidly	<ul style="list-style-type: none"> • Construction has begun and is expected to be completed in late 2017

Sources: Amtrak, “Gateway Program Factsheet” 2015; City of Palo Alto, “San Francisquito Creek Bridge Replacement Project,” March 18, 2016; Drew Buchanan, “The \$850 Million Solution That Could Finally Free Mobile of its Traffic Nightmare,” Pulse Gulf Coast, October 23, 2015; Melanie Zanona, “Five Infrastructure Emergencies,” The Hill, May 16, 2016.

Infrastructure Failures Highlight Dangers of Slow Development Process

Recent Infrastructure Failures

Year	Responsible Agency	Infra. Type	Location	Description
2005	Ameren Union Electric Company (AmerenUE)	Hydroelectric Dam	Missouri Ozarks	On December 14, 2005 the reservoir experienced a catastrophic failure resulting in the full contents of the reservoir draining into the Black River. The cause was found to be “imprudence on the part of UE.” No one was killed and a new reservoir was built and began operation in 2010.
2007	Minnesota Department of Transportation	Auto Bridge	Minneapolis, MN	During rush hour on August 1 st , the I-35W Mississippi River bridge collapsed killing 13 people and injuring 145. The cause was found to be design flaw that was aggravated by increased use and routine repaving of the road surface. Questions were raised as to why the flaw was not discovered in over 40 years of inspections.
2015	Amtrak	Rail	Philadelphia, PA	An Amtrak Northeast Regional train derailed injuring over 200 and killing 8. The derailment was caused by an inattentive train engineer travelling 102mph in a 50mph zone. The incident would have been prevented by Positive Train Control a computerized speed-limiting system that was planned to be implemented at the site of the crash but was delayed due to regulatory requirements.
Ongoing	Washington Metropolitan Area Transit Authority	Transit	Washington, DC	On May 6, 2016 the Washington DC Metro announced the “SafeTrack” initiative, following regular fire incidents that necessitated a temporary shutdown of the entire system. The rebuilding plan will require Metro to shut down many segments of its system for weeks at a time through March 2017.

Source: Melissa Gray, “Amtrak installs speed controls at fatal crash site,” CNN, May 17, 2015; Monica Davey and Matthew Wald, “Potential Flaw is Found in Design of Fallen Bridge,” The New York Times, August 8, 2007; Tom Roussey and Brianne Carter, “Metro Releases Final SafeTrack Plan; Orange, Silver, Blue Lines to Shut Down for 16 Days,” ABC7, May 19, 2016; Kevin A. Thompson and Steven C. Reed, “Staff’s Initial Incident Report,” Public Service Commission, State of Missouri, October 24, 2007.