



American Highways

The Road to Sustainability

American Highway System

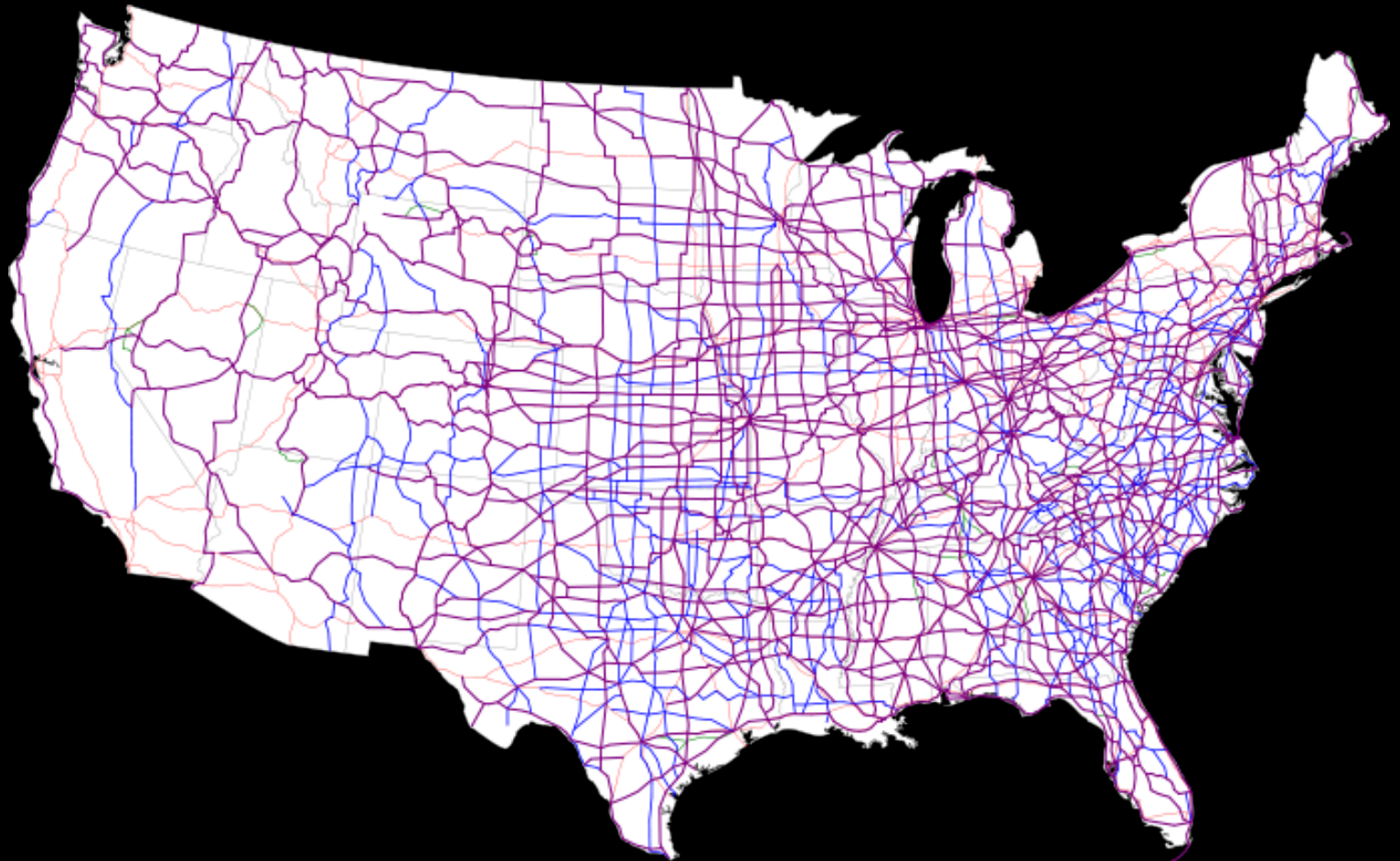
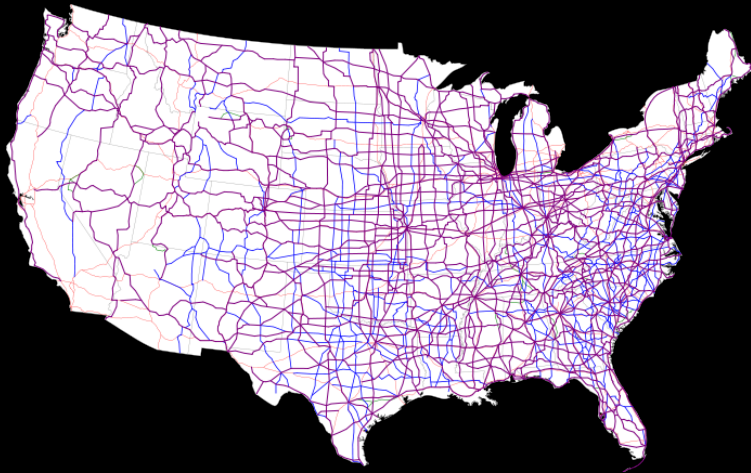


Image source: Wikimedia Commons. Wikipedia user SPUI, "Map of current US routes" 2006.

American Highway System



- Federal Aid Highway Act of 1956
- Economic reasons
- Defense reasons (National Interstate and Defense Highway Act)
- 164,000 miles (2006)

Highway Dependence & Consequences

- Growth!
- Social
 - Urban sprawl
 - Horizontal Development
 - Location-inefficient neighborhoods
 - Urban renewal & Splintering urbanism
- Environmental
 - Traffic
 - Air pollution
 - Noise pollution
 - Heat island effect
- Economic
- \$80 billion to maintain and upgrade the system

Solution: INVEST

Make highways more sustainable

- Federal Highway Administration INVEST program
 - Triple bottom line
 - Social
 - Environment
 - Economic



Solution: INVEST

Criterion Number and Title	Triple Bottom Line Principles		
	Social	Environmental	Economic
	SP-1: Integrated Planning: Economic Development and Land Use		
SP-2: Integrated Planning: Natural Environment		X	
SP-3: Integrated Planning: Social	X		
SP-4: Integrated Planning: Bonus	X	X	X
SP-5: Access & Affordability	X	X	X
SP-6: Safety Planning	X		X
SP-7: Multimodal Transportation and Public Health	X		X
SP-8: Freight and Goods Movement	X	X	X
SP-9: Travel Demand Management	X	X	X
SP-10: Air Quality	X	X	
SP-11: Energy and Fuels	X	X	X
SP-12: Financial Sustainability			X
SP-13: Analysis Methods	X	X	X
SP-14: Transportation Systems Management & Operations	X	X	X
SP-15: Linking Asset Management and Planning		X	X
SP-16: Infrastructure Resiliency	X	X	X
SP-17: Linking Planning and NEPA	X	X	X

Image source: www.sustainablehighways.org

Solution: INVEST

Criterion Number and Title	Triple Bottom Line Principles		
	Social	Environmental	Economic
PD-1: Economic Analyses	x	x	x
PD-2: Life-Cycle Cost Analyses		x	x
PD-3: Context Sensitive Project Development	x	x	x
PD-4: Highway and Traffic Safety	x		x
PD-5: Educational Outreach	x	x	x
PD-6: Tracking Environmental Commitments	x	x	
PD-7: Habitat Restoration		x	
PD-8: Stormwater		x	
PD-9: Ecological Connectivity	x	x	x
PD-10: Pedestrian Access	x	x	x
PD-11: Bicycle Access	x	x	x
PD-12: Transit & HOV Access	x	x	x
PD-13: Freight Mobility		x	x
PD-14: ITS for System Operations	x	x	x
PD-15: Historical, Archaeological, and Cultural Preservation	x		
PD-16: Scenic, Natural, or Recreational Qualities	x		
PD-17: Energy Efficiency		x	x
PD-18: Site Vegetation		x	x
PD-19: Reduce and Reuse Materials		x	x
PD-20: Recycle Materials		x	x
PD-21: Earthwork Balance		x	x
PD-22: Long Life Pavement Design		x	x
PD-23: Reduced Energy and Emissions in Pavement Materials	x	x	x
PD-24: Contractor Warranty		x	x
PD-25: Construction Environmental Training	x	x	
PD-26: Construction Equipment Emission Reduction	x	x	
PD-27: Construction Noise Mitigation	x	x	
PD-28: Construction Quality Control Plan		x	x
PD-29: Construction Waste Management		x	x

Image source: www.sustainablehighways.org

Solution: INVEST

Operations & Maintenance Criteria by Sustainability Principle			
Criterion Number and Title	Triple Bottom Line Principles		
	Social	Environmental	Economic
OM-1: Internal Sustainability Plan	x	x	x
OM-2: Electrical Energy Efficiency and Use		x	x
OM-3: Vehicle Fuel Efficiency and Use	x	x	x
OM-4: Reuse and Recycle		x	x
OM-5: Safety Management	x		x
OM-6: Environmental Commitments Tracking System	x	x	
OM-7: Pavement Management System		x	x
OM-8: Bridge Management System		x	x
OM-9: Maintenance Management System	x	x	x
OM-10: Highway Infrastructure Preservation and Maintenance	x	x	x
OM-11: Traffic Control Infrastructure Maintenance	x	x	x
OM-12: Road Weather Management Program	x	x	x
OM-13: Transportation Management and Operations	x	x	x
OM-14: Work Zone Traffic Control	x	x	x

Image source: www.sustainablehighways.org

Solution: The Boulevard



Source: <http://www.preservenet.com/freeways/FreewaysEmbarcadero.html>

Solution: The Boulevard



Source: slate.



Solution: The Boulevard

- Reduction in crime
- Reduction in traffic
 - increase in walking, biking, & public transit use
- Frees up land for new businesses
- Strengthens community
- Increases public space for parks and recreation and sport

References

A renewed focus on infrastructure. U.S. Department of Transportation Federal Highway Administration. <http://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/intro.cfm>

Armbruster, A. (2005). The Interstate Highway System. Eastern Michigan University. <http://www.emich.edu/studentorgs/place/Officers/andrew/Econ%20375%20-%20The%20Construction%20of%20the%20IHS-B.pdf>

Federal-Aid Highway Act of 1956: Creating the Interstate System. NationalAtlas.gov. http://www.nationalatlas.gov/articles/transportation/a_highway.html

Handfield, R. (2006, July 5). A brief history of the highway transportation system in the U.S. North Carolina State University. <http://scm.ncsu.edu/scm-articles/article/a-brief-history-of-the-highway-transportation-system-in-the-u.s>

INVEST. US Department of Transportation. Federal Highway Administration. <https://www.sustainablehighways.org/>

Lind, D. (2013). Cities without highways. Next City. <http://nextcity.org/daily/entry/cities-without-highways>

Our nation's highways 2011. U.S. Department of Transportation Federal Highway Administration. <http://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/>

Roads to somewhere. (2006, June 22). The Economist. <http://www.economist.com/node/7087458>

Scope of the American transportation system. NationalAtlas.gov. <http://nationalatlas.gov/transportation.html>

Sustainable Highways Initiative. US Department of Transportation Federal Highways Initiative. <http://www.sustainablehighways.dot.gov/overview.aspx#quest2>