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Emerging travel trends, high-speed rail, and the public reinvention of U.S. transportation

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ABSTRACT

By examining emerging travel trends and the resurgence of rail transport in the United States, this paper suggests that deploying high-speed rail (HSR) in the U.S. could help accelerate a transportation paradigm shift that is already underway, increase density, improve the service and sustainability of transportation, and accelerate economic activity. This shift is especially notable among young Americans who are driving less, buying fewer cars, and settling in urban areas where they can walk, bike, and use public transport. Meanwhile, baby boomers, though driving more than previous generations did at the same age, are joining this urbanizing trend and, as they grow older, seeking mobility alternatives to car dependence. Other trends, such as the transformation of society by mobile communication and digital technology, are also affecting change and forcing planners to re-think the current imbalance of the U.S. transport system. Using the success revealed by passenger rail services in the Northeast Corridor, this paper examines how high-speed rail and its station hubs could enhance urbanization and help to rebalance the three main passenger modes—road, air, and rail—so that each flourishes within its most sustainable niche. In these ways, the benefits of HSR extend beyond rail service itself to include this mode's ability to reinvent the transportation system in ways that better serve the needs of a changing society while urgently addressing livability and sustainability.

1. Introduction

In many countries in Europe and Asia, high gas taxes result in prices that better reflect the fossil fuel's true cost. In these countries, the higher cost of driving encourages both the government and the public to develop and use transportation alternatives, including public transit, rail, walking, and biking. In the U.S., which was mostly built after the rise of the car, fewer options for mobility are available. Moreover, government policies make driving easy and affordable, leading taxpayers to forget that freeways are not "free" and that, in the long run, reliance on the automobile is neither environmentally sustainable nor reflective of wise energy or economic policy.

Despite substantial opposition to high-speed rail (HSR), coupled with the indifference of a society accustomed to a reliance on cars and planes, signs of enthusiasm for the kind of transportation HSR offers are emerging from the traveling public. Young Americans, in particular, are losing interest in driving and owning cars; instead, they are taking conventional trains, riding buses, sharing cars and biking. Baby boomers are rethinking the car-dependent lifestyle they grew up with and moving away from car-reliant suburbs. These two large demographic groups want access to more transportation choices, a trend that is forcing planners to re-think the current imbalance of the U.S. transport system.

Addressing availability of options for mobility concerns can be accomplished by replacing the high dependence on cars and the high environmental costs of planes with alternative modes, including trains and HSR. Making a radical shift from a carbon-heavy and inefficient transportation system to one that integrates strategically located HSR running on electricity from renewable sources, will be necessary to re-balance the current lopsided system, which like a broken stool, rests precariously on just two legs (cars and planes), while neglecting to fix a third leg (trains) that could provide crucial stability.

This paper examines the emerging travel trends in the U.S. and explores the potential that HSR could play to help reinvent the U.S. transportation. It looks at significant signs of change that are now emerging from the traveling public, whose behavior reflects dissatisfaction with the transportation status quo and a growing demand for more sustainable alternatives such as an efficient rail transport system. Using the success of passenger rail services in the Northeast Corridor (NEC), it examines the resurgence of rail transport and discusses the role that HSR could play in addressing and meeting the emerging demand of the U.S. travelers and

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supporting policies that will foster livable communities. It concludes that by repairing the modal imbalance between automobile, air, and rail, the U.S. could significantly improve environmental sustainability in transportation while improving the quality and efficiency of travel and contributing to economic growth. With HSR stations acting as intermodal hubs, this addition to the U.S. transportation system will also help grow urban transit service, encourage smart growth, and energize local economies.

2. A transportation tipping point

Based on historical patterns and transportation's growing share of greenhouse gas (GHG) emissions, transportation planners might presume that this growth trend would continue indefinitely into the future. However, over the past decade, travel statistics began to show a change: Various measures indicated that driving, in particular, was in decline across all age groups in the U.S. Transportation experts, energy agencies, and oil and auto industry forecasters all recognize this downward trend and have adjusted their predictions and plans accordingly. In its forecast for the coming decades, the Energy Information Agency (EIA) expects that "with improved efficiency of energy use and a shift away from the most carbon-intensive fuels, U.S. energy-related carbon dioxide (CO_2) emissions will remain more than 5% below their 2005 level through 2040 (U.S. Energy Information Administration, 2013)." The EPA (Evironmental Protection Agency, 2013), found that U.S. transportation emissions increased more than 17% over the extended period between 1990 and 2011, but from 2008 to 2011 emissions of CO_2 *decreased*, with 2008 seeing an especially sharp drop of 5% from the previous year. As shown on Fig. 1, the index to 2008 level of CO_2 Equivalent reflects this drop in GHG emissions since 2005 and the index to 1990 level shows the 17% increase in GHG emissions between 1990 and 2011.

While some observers attribute the drop in fossil-fuel use and emissions to the effects of the economic crisis of 2008, indicators show that the turn began several years earlier. Since 2004, vehicle miles traveled per capita have fallen 7% as illustrated on Fig. 2. The drops in vehicle mile traveled (VMT) could be attributed to many factors such as the downturn of the economy and the cost of driving and owning a car. The prices of gasoline have been increasing in the past decade and the average cost to own and operate a car in the U.S rose as well [Fig. 3]. The EIA (U.S. Energy Information Administration, 2013, p. 2) attributes this decline to "the adoption of fuel economy standards, biofuel mandates, and

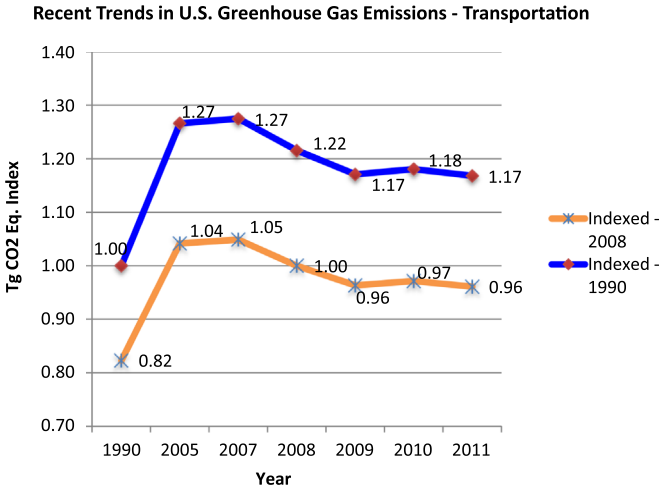

Fig. 1. Recent trends in U.S. greenhouse gas emissions.

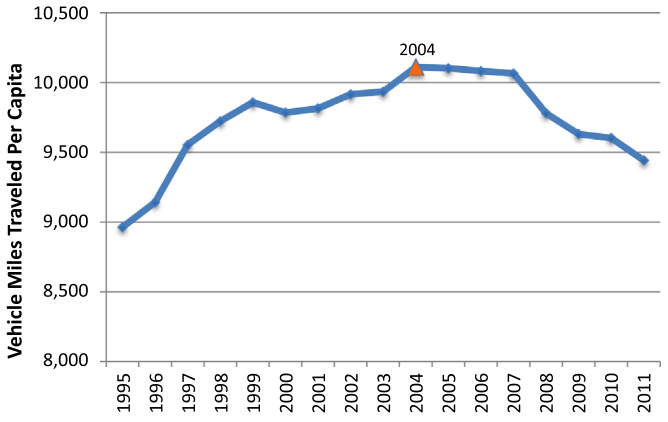

Fig. 2. U.S. vehicle miles traveled per capita.

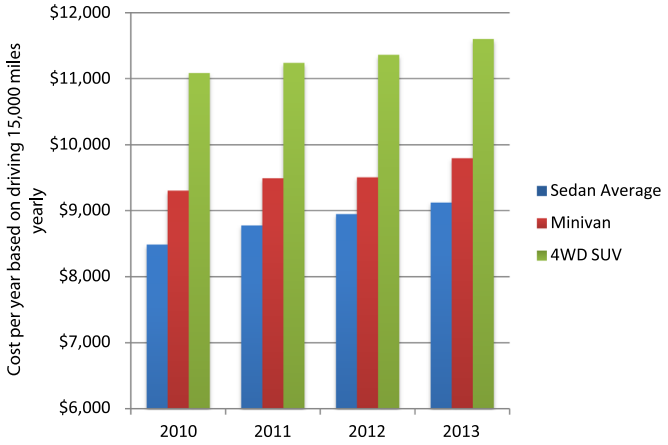

Fig. 3. Cost per year on driving $15,000 mile yearly of a passenger vehicle.
Source: American Automobile Association, 2014.

shifts in consumer behavior". The behavioral change is especially important because even better fuel economy standards, alternative fuel use, and improved vehicle efficiency will be insufficient to counteract an expected increase in air and road traffic due to population growth. Moreover, better fuels, cleaner cars, and more fuel-efficient planes cannot by themselves solve the broader problems created by the current transportation system, including a high death toll on its roads and the negative health, environmental, economic, and social costs of an over-paved landscape and unsustainable sprawl. Addressing all of these concerns can be accomplished by replacing the high dependence on cars and the high environmental costs of planes with alternative modes, including trains and HSR. Already, significant sectors of the public are showing more interest in trains, transit, biking, intercity buses, and walking. Unfortunately, this shift among the traveling public is ahead of the available infrastructure, especially for rail, which had been the most important transportation mode in the U.S. until it was allowed to decline as automobile and air travel came to predominate.

3. The transportation paradigm shift: demographic, social, and cultural change

Together, the urbanizing trend and the shift from cars and planes to trains and transit can help address the sustainability challenges the U.S. transportation system faces, especially as it seeks to meet the needs of a population whose numbers are growing and whose average age is rising. Fostering a transition