RIDING THE RAILS TO SUSTAINABILITY

Facts About the Economics and Ecology of Rail Travel

SONORAN INSTITUTE

Shaping the Future of the West

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SONORAN INSTITUTE

Shaping the Future of the West

Mission

The Sonoran Institute inspires and enables community decisions and public policies that respect the land and people of western North America.

Vision

The Sonoran Institute contributes to a vision of a West with:

- *Healthy landscapes* – including native plants and wildlife, diverse habitat, open spaces, clean air and water – from northern Mexico to western Canada.
- *Vibrant communities* where people embrace conservation to protect quality of life today and in the future.
- *Resilient economies* that support prosperous communities, diverse opportunities for residents, productive working landscapes, and stewardship of the natural world.

A Collaborative, Community-based Approach

The nonprofit Sonoran Institute, founded in 1990, works across the rapidly changing West to conserve and restore natural and cultural assets and to promote better management of growth and change. The Institute's community-based approach emphasizes collaboration, civil dialogue, sound information, local knowledge, practical solutions and big-picture thinking.

ACKNOWLEDGEMENTS

It's not your father's, or mother's, rail system that America needs today. In the 21st century, we must create an integrated transit system—everything from walking and biking to buses and rail—in order to break our dependence on cars and foster livable, sustainable communities. This recession is the perfect time to plan for this integrated transportation system, before the West's growth machine revives. To inform that effort, the Sonoran Institute has prepared this overview and evaluation of contemporary rail travel.

Several people deserve thanks for developing this publication. I am most appreciative of Nina Chambers and Dave Richins, a visionary and highly capable team at the Sonoran Institute, for bringing it to fruition. Our designer, Teri Bingham, also deserves high praise.

Above all, I would like to express our gratitude to the Nina Mason Pulliam Charitable Trust for recognizing the pressing need for rail travel insights and stepping forward to fund this valuable study.

Luther Propst
Executive Director Sonoran Institute
April 2010

RIDING THE RAILS TO SUSTAINABILITY

In the Beginning

Going back as early as the late 19th century, the United States made its mark in rail travel by pioneering high-speed rail and introducing the first train to break 100 mph. Continuing into the early 20th century, America led the world in development of mass transit systems (Litman, 2008). By the 1930s there were numerous rail lines across the nation that scheduled runs in excess of 100 mph (Vranich, 1991). Over the course of the 20th century, however, rail travel declined significantly. The rising prominence of the personal automobile along with the development of the Interstate Highway System, not to mention commercial aviation, played a key factor in the declining railway transportation system. In fact, the United States became an increasingly automobile dependent nation and the development of rail transit severely lagged behind other regions of the world such as Europe and Japan.

The new millennium would bring a new economic and environmental climate that would draw attention to transportation alternatives. America's transportation needs have changed dramatically since construction of the coast-to-coast Interstate Highway System more than a half-century ago. The new focus: cleaner, more affordable transportation options.

In fact, multi-modal transit options that include bus, light rail and commuter rail in an integrated transportation system are now recognized as critical to long-range planning in many western regions and cities. Such transportation infrastructure is important in guiding new growth and development. Transit-oriented development (TOD) also helps to promote regional connectivity, meet housing needs, encourage neighborhoods and create walkable communities (see "A TOD District" at right).

Is rail transit the option that will move the transportation system in the right direction? Cost-effectiveness and environmental impact are the key criteria to consider. Now is the time to explore a few misconceptions about rail travel and review the potential benefits.

A TOD District:

- Promotes new, well-integrated residential, commercial, office, institutional and other new development close to transit stations, while protecting and enhancing existing development.
- Ensures that new development takes advantage of compatible, high density, transit-friendly design opportunities in close proximity to transit systems to provide options for economic development and diversity.
- Encourages pedestrian orientation and human scale in new development and provides public infrastructure that supports transit use and mixed-use development.
- Manages parking and vehicular access utilizing shared parking and driveway access to avoid pedestrian conflicts.
- Encourages through design, configuration and mix of buildings and activities, a pedestrian-oriented environment which provides settings for social interaction and active community life.

Source: South Salt Lake City TOD Ordinance

Light rail and commuter rail in Utah connect the Wasatch Front's major cities. Integrated mass transit is directing growth.

Rail transit allows passengers to read, work on their laptops and share conversation.

Courtesy of METRO

PHOENIX-TUCSON PASSENGER RAIL

Serving Arizona's Sun Corridor

In a 2009 briefing to the 94th Arizona Town Hall on transportation opportunities, research economists and faculty from Arizona State University presented information and data focusing on long-distance passenger rail service between Phoenix and Tucson. The report by Matthew Croucher, Tim James and Eva Madly used data primarily from the Arizona Department of Transportation (ADOT) to explore the challenges and opportunities of intercity rail travel. This section includes highlights from their findings.

Is Commuter Rail Feasible?

In recent studies (ADOT Phase I, 2007 and Phase II, 2008), the Arizona Department of Transportation concluded that conventional rail with minor upgrades is the most feasible alternative to pursue between Phoenix and Tucson because it is the least costly and would take the shortest time to place in operation. This would involve making minor improvements to existing freight track and right-of-way, and using trains similar to existing Amtrak trains.

Annual ridership on the Phoenix-Tucson route is projected to be about 1 million riders per year. Here are other facts to help determine the potential size of this passenger-rail market:

- I-10 traffic between Phoenix and Tucson in 2008 averaged 45,000 vehicles per day.
- Greyhound operates 16 one-way trips per day (8 each from Phoenix and Tucson).
- Arizona Shuttle primarily serves airline passengers and operates 36 one-way trips per day (18 each from Phoenix and Tucson) and transports more than 100,000 passengers per year.
- The Tucson Airport Authority estimates that between 250,000 and 500,000 Tucson-related enplanements leave for Phoenix to begin their air travel there.
- Daily commuters among Pinal, Pima and Maricopa counties totaled 35,296 (see Table 1 below).

SUN CORRIDOR COUNTY-TO-COUNTY WORKER FLOWS

Residence County	Workplace County	Daily Commuters
Pinal	Maricopa	19,918
Maricopa	Pinal	7,751
Pinal	Pima	2,601
Pima	Pinal	1,974
Pima	Maricopa	1,838
Maricopa	Pima	1,214
Total		35,296

Source: ADOT Phase 1 (2007) report based on year 2000 Census Transportation Planning Package.

Table 1.

CHARACTERISTICS OF RAILROAD DEVELOPMENT ALTERNATIVES IN ARIZONA			
	Conventional rail with minor upgrade	**Conventional rail with major upgrade**	**High-speed, partially elevated electric rail**
Type of rail tracks	**Use of existing train tracks**	**Use of existing train tracks**	**Exclusive track**
Top Speed	110 mph	125 mph	175 mph
Average Speed	62 mph	88 mph	125 mph
One-Way Trip Time	117 minutes	82 minutes	61 minutes
Construction Costs	$800 million	$1.57 billion	$5.2 billion
Number of One-Way Trains/Day	7	18	18
Seats per Train	520	500	480
Operating and Maintenance Costs (Annual)	$34.1 million	$130.8 million	$190.4 million
One-Way Fare	$20.00	$44.00	$51.00
Annual Users	1,002,000	1,332,000	1,409,000
Annual Fare Revenue	$16.0 million	$46.9 million	$57.5 million
Farebox Recovery	50%	36%	30%
Annual Subsidy Needed	$18.1 million	$83.9 million	$132.9 million
Time Saved Compared to Automobile	-14 minutes	21 minutes	42 minutes
I-10 Vehicle Miles of Travel Savings (Annual)	98,550,000	193,450,000	219,000,000
Population at End-Points [15] (Metro Areas)	Phoenix: 4,179,424 Tucson: 967,089		
Population Along the Route	47,704		
Total Population	5,194,220		
Employment at End-Points [16] (Metro Areas)	Phoenix: 1,891,210 Tucson: 379,560		
Source: ADOT: 1998 report, 2007 Phase I report, 2008 Phase II report, and author's calculations.			

Table 2.

Three alternatives for establishing a passenger railroad between Phoenix and Tucson are outlined in Table 2. All assume that the proposed line utilizes the existing Union Pacific alignment.

Benefits and Challenges: Phoenix-Tucson Passenger Rail

BENEFITS

Opportunities associated with the proposed Phoenix-Tucson railroad include:

- **Population Growth:** According to projections issued by the Arizona Department of Economic Security, Arizona's population will reach 10 million by 2028. A large portion of this population increase will occur in Maricopa and Pinal Counties, where rail service is expected to run.
- **Productivity:** Though difficult to quantify, societal benefits result from people using inter-city passenger rail services instead of driving. For example, passengers can work on their laptops, read or simply rest during the train ride.
- **Employment:** Currently, 85 percent of Arizona's employment opportunities are in Phoenix and Tucson. This is expected to continue because a large portion of the population growth in the state will occur in these two metropolitan areas.
- **Cultural and Economic Centers:** The two metropolitan areas house nearly all of the state's major governmental, educational, cultural, medical, recreational and financial institutions.
- **Tourism:** In 2007, 75 percent of all tourism expenditures in Arizona were in Maricopa, Pinal and Pima counties. Passenger rail service between Phoenix and Tucson will increase access to these areas for tourists. *Source: Arizona Department of Tourism.*
- **Air Travel Substitute:** Air passengers between Phoenix and Tucson will switch to rail if it is at the right price and speed. Current travel by airplane between Phoenix and Tuscon is expensive and time consuming when bag check, security and baggage claim are factored in.
- **I-10 Congestion:** Passenger rail would reduce traffic on I-10 between Phoenix and Tucson and make widening the freeway less imperative.
- **Environment:** Moving automobile drivers and air passengers to trains is environmentally friendly. Switching from road or air to rail will decrease CO_2 output by thousands of tons each year. According to the ADOT Phase II report, anticipated environmental effects appear to be minimal. In fact, there could be substantial environmental benefits in the long run from reduced local air pollution and climate change.

CHALLENGES

- **Costs:** Phoenix-Tucson commuter rail faces $800 million in construction costs, excluding real estate, and requires ongoing subsidies to operate.
- **Travel Time:** Passenger rail service must be fast enough to compete with the automobile.
- **Track Congestion**: Passenger rail would interact with an expanding freight system where the number of rail lines is limited and freight owns the infrastructure.
- **Infrastructure**: Existing train stations must comply with regulations or new ones must be built.
- **Safety**: Safety at grade crossings needs to be improved, given the additional number of trains and their higher speeds.
- **Environment**: Environmental impacts need to be estimated, and a National Environmental Policy Act (NEPA) analysis performed.

Arizona's Take on Transportation

TOWARD AN ARIZONA STATE RAIL PLAN

In January 2010, the Arizona State Transportation Board officially accepted bqAZ: Building a Quality Arizona - Statewide Transportation Planning Framework, which identifies a long-range rail vision for Arizona and a comprehensive list of strategic opportunities. The bqAZ process began in early 2008 to quantify transportation needs statewide and identify the full range of options to address those needs.

The Arizona State Rail Plan is the next step in implementing the Statewide Rail Framework for passenger and freight rail transportation in Arizona. Building on the Statewide Rail Framework, the plan is expected to be completed in summer 2010. It will achieve the following objectives:

- Identify 20-year rail projects and initiatives.
- Prioritize rail investments that need to be made to achieve Arizona's vision and goals.
- Develop the decision-making process for rail investments.

* * * * *

In an Arizona Republic op-ed article that appeared May 19, 2009, Pinal County (Arizona) Supervisor David Snider talks about an incomplete and threatened transportation system and calls on Arizonans to help. Following is a reprint of the article:

FEDERAL HIGHWAY FUNDS NEED TO 'SHARE THE ROAD'

By David Snider,
Pinal County Supervisor – District 3

Just as the latest auto craze has shifted from rear fins to hybrids, America's transportation needs have changed dramatically since construction of the coast-to-coast Eisenhower Interstate System more than a half-century ago. Our federal highways were built to accommodate a growing dependence on cars and cheap oil to fuel them. Fifty years later, changes in our nation's economy, gasoline prices and community growth patterns demand that today's highway network share the road with cleaner, more affordable transportation options – such as intercity trains, urban light rail, buses, regional commuter air, walking and biking.

It's a fact that our aging roads and bridges are crumbling and need repair. Restoring existing infrastructure must be a transportation priority. However, when it comes to building new roads, an overwhelming majority of Americans believe that expanding and improving bus, rail and other public transportation should take precedence, according to a January 2009 survey sponsored by the National Association of Realtors and Transportation for America, a coalition of diverse interests focused on creating a 21st century national transportation program.

Respondents to the survey recognized that America has become too dependent on overseas oil and fluctuating prices determined by volatile markets. At the same time, decades of unplanned urban growth have forced families to seek the fringes of urban areas in search of affordable housing—and

the result is often costly commutes and out-of-balance housing markets contributing to the current U.S. foreclosure crisis.

The recent stimulus bill passed by Congress was a down payment toward badly needed infrastructure reconstruction and repair. It also focused on alternative transit needs. This summer, when federal legislators consider reauthorizing the nation's federal highway bill, we need to follow that lead. Renewal of this federal transportation legislation provides an opportunity to leverage those dollars in support of stronger state laws that encourage integrated regional and local transportation planning—and limit the negative impacts of sprawl.

The Maricopa Association of Governments' (MAG) now famous maps for growth in Arizona, which provide a graphic representation of a population that is expected to increase from 6 million people today to 16 million by 2050.

The need for a transportation overhaul is particularly acute in Arizona. First, we need to get back at least as much as we donate to the federal system—receiving only 92 cents for every dollar Arizona sends to Washington is just not enough. Second, our counties, towns and cities need to rethink how and where we live, work and play. We need to emphasize smart growth principles and establish livable communities that promote use of transportation alternatives to connect employment and shopping to walkable neighborhoods with plenty of sidewalks and bike lanes—in other words, people working where they live. Third, our local communities need to be networked via a regional transportation system—such as the proposed intercity rail between Tucson and Phoenix—so that Arizonans can move easily throughout the Sun Corridor region.

Supporting a new federal transportation law that redirects highway dollars toward trains, light rail and other transportation alternatives will save us money at the gas pump and reduce our dependence on foreign oil. It will create jobs and help get our economy going. Most of all, it's one investment we can count on—guaranteed to create more livable and resilient communities for Americans, and Arizonans, of tomorrow. For more information about how you can help, visit http://t4america.org.

David Snider has been a Pinal County Supervisor since January 2005 and lives in Casa Grande, Arizona.

* * * * *

A story by Sean Holstege, reporter for The Arizona Republic, summarizes findings from three studies of commuter rail service in central Arizona commissioned by the Maricopa Association of Governments. Following is a reprint of the article:

FUTURE COMMUTER-RAIL SYSTEM IS ENVISIONED FOR THE VALLEY

Enough people would board a train in the Valley's suburbs that a future commuter-rail system would be as popular as some of the busiest lines in the West, new studies have found.

A trio of yearlong rail studies, in nearly final form, indicates commuter rail could carry almost 18,000 passengers a day by 2030. Planners at the Maricopa Association of Governments say, based on the findings, they favor a 105-mile, X-shaped system that could feature 33 stations and cost roughly

$1.5 billion. That's a little more than the Valley's 20-mile, light-rail starter line.

The commuter-rail network would use existing freight track through downtown Phoenix, with lines from Queen Creek to Buckeye and from Chandler to Wittmann. The northeast Valley, whose light-rail line lacks funding, would remain without commuter rail.

The studies are expected to be final in two months. MAG's board must then approve them and include them in the official regional-transportation plan before the agency can seek state or federal funding.

The soonest a commuter rail could realistically open would be the second half of the next decade. Planners say it takes three to five years to complete a system once the money has been found. There is no current funding.

If built, commuter rail would attract passengers who complain light rail is too far away or too slow.

While light rail is designed for urban settings with frequent trains and stops, commuter rail features larger, longer and faster trains that stop less frequently and carry people longer distances. A commuter system would operate independently from the Valley's light-rail system, which opened nearly a year ago, or any of its planned extensions, planners say.

Project consultant Richard Pilgrim, vice president at URS Corp., a major U.S. engineering firm, likens rail service to a bag of golf clubs: "If light rail is a 5 iron, this is more like a 3 wood."

It's no surprise that the busiest line would be in the southeast Valley. The far-flung edge of the area is growing quickly and drives to work sites are long. Independent Metro light-rail studies have shown people will drive for miles from east Mesa and Gilbert to board that system.

MAG's rail study shows the busiest station would be near Phoenix-Mesa Gateway Airport, which is slated to be one of state's biggest employment centers.

The response has been positive in a series of briefings with about 200 city, community and business leaders this year, says David Schwartz, whose partnership, Goodman Schwartz, was hired to conduct public outreach.

"People are just hungry for this," Schwartz said. "It's no longer about if we should do it. It's about when and how fast."

Rail-service market

MAG's rail studies show there is a market for commuter-rail service in Arizona.

Based on MAG's computerized travel models, the tracks to Queen Creek, Chandler and Wittmann would each pick up more passengers per mile in 2030 than the national average. By that measure, the Queen Creek track would outperform Los Angeles' Metrolink threefold.

Planners assume the trains will recoup about 40 percent of their expenses, based on the national average for similar service. The average fare would be about $6 to $7, Wallace said, although no detailed study has gone into fares. Generally, rates would go up the farther the trip.

Planners favor a conventional double-decker train, capable of speeds of 79 mph. Each car could carry 130 people with ample seating, tables and electrical outlets for laptop computers and communications devices.

MAG says trains would be five to seven cars long and would run about every 30 minutes during rush hour. The lines are relatively short. They range from 18 miles in south Tempe to 36 miles along Grand Avenue.

Planners say the cost of construction is similar to that of other systems.

The estimated cost to convert existing freight lines into ones shared by passenger trains runs from $10 million per mile in the West Valley to $18 million in Tempe. That would include all the stations, trains, signals and engineering of street crossings. By comparison, a commuter-rail line between Tacoma and Seattle, which carries more passengers on each train than any system in the country, cost $18 million per mile.

The light-rail system here cost $70 million per mile.

The estimated operating cost would be in the ballpark of other systems in the West. Because the track to Queen Creek is expected to carry almost half the potential ridership, it would cost about $9 per rider, a little less than the busy Los Angeles Metrolink. The Buckeye service would be the least efficient, about four times as expensive.

Major hurdles

The commuter-rail vision faces two big obstacles: lack of money and obtaining right-of-way from freight-railroad companies.

Arizona faces mammoth budget problems and has no money to build a rail network. MAG is scaling back, postponing or canceling billions of dollars of highway and transit projects because the recession has wiped out much of the county sales-tax revenue, which funds the work. In Washington, Congress is paying for transportation month to month until a new bill is passed.

Rail funds would have to come from a new voter initiative, federal sources or a combination of the two. Federal money almost always needs to be matched and has strings that can mean delays.

Even if money can be found, officials would have to negotiate use of existing freight track. Four of the five Valley tracks are owned by Union Pacific Railroad. The other, along Grand Avenue, is owned by BNSF Railway.

In other states, rail agencies had to negotiate with the freight giants, whose primary concern was keeping tracks open to haul freight for their clients. Those negotiations involve paying for time slots on freight track, buying track or right-of-way and compensating the railroads for losses due to station and trackside construction.

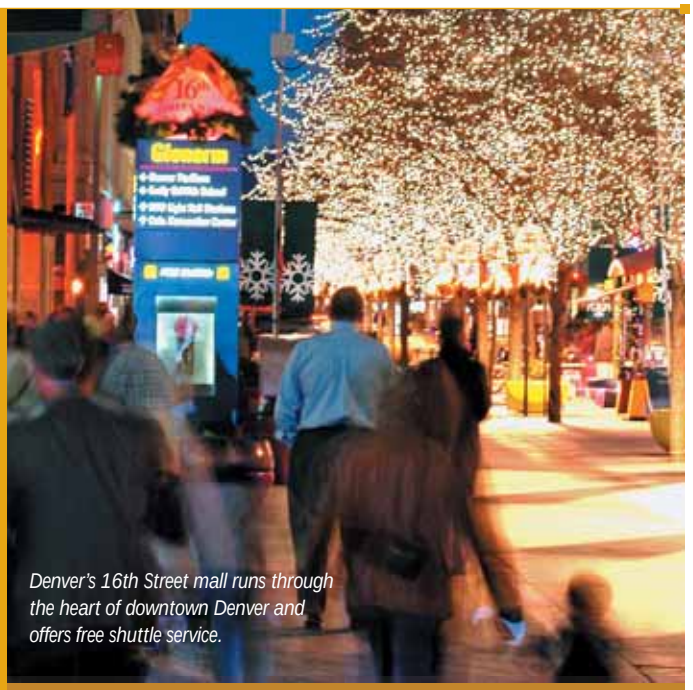
“These are private railroads,“ MAG planner Kevin Wallace said. “If they don't want to play with us, they don’t have to.“

The bright spot is that Union Pacific runs just two trains a day between downtown Phoenix and Buckeye, even though the company considers it a “core line,“ Wallace said.

That pales next to the heavily trafficked transcontinental track that runs through the town of Maricopa to the south.

Rail Transportation Quick Facts

- Public transportation produces significantly less air pollutants per passenger mile.
- Availability of rail transit reduces the probability of vehicle use.
- Rail travel consumes much less energy than bus or automobile travel.
- Cities with rail systems recover more transportation costs from fares.
- Public transportation helps the United States become more energy independent.
- People save significantly more money on transportation costs when rail service is available.
- Rail transportation often costs less per passenger mile than other forms of transportation.



Denver Metro Convention & Visitors Bureau

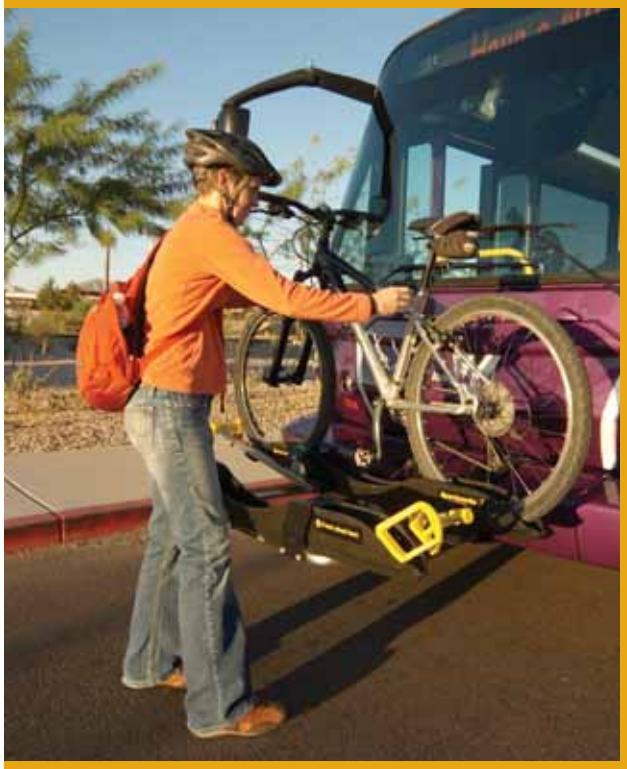
Denver's 16th Street mall runs through the heart of downtown Denver and offers free shuttle service.

Economic Benefits

The following benefits of public transportation also translate into economic savings, according to the American Public Transportation Association:

- Eases traffic congestion
- Provides mobility for seniors
- Saves money
- Provides access for rural areas
- Creates and sustains jobs
- Improves air quality
- Provides access to jobs
- Reduces energy consumption
- Stimulates economic development
- Enhances mobility during emergencies
- Boosts real estate value
- Ensures safety
- Fosters more livable communities

(Source: Albuquerque-Santa Fe Transportation Corridor Alternatives Analysis Final Report, 2005)



Courtesy of METRO

Phoenix area express buses encourage multi-modal transit with handy bike racks.

MEETING AMERICA'S TRANSPORTATION NEEDS

Transportation for America Promotes New National Policy

Every six years, Congress sets the country's transportation and infrastructure priorities —allocating hundreds of billions of dollars for projects that shape communities for generations. In September 2009, the multi-year reauthorization for federal highway and transit programs expired. Since then, a series of short-term extensions have kept the funding flowing.

Just as the interstate highway bill answered some of the most pressing mobility needs of the nation in the mid-20th century, a new federal transportation bill must answer the vastly different needs of America in the 21st century. Americans are paying record prices at the pump and feeling stuck with costly commutes and congestion. Americans need options that are cheaper, faster and cleaner.

Transportation for America Campaign (T4America) has formed a broad coalition of housing, business, environmental, public health, transportation, equitable development and other national, state and local organizations calling for a national transportation program for the 21st century. T4America is seeking to align transportation policies with an array of issues like economic opportunity, climate change, energy security, health, housing and community development—issues that will play a key role in strengthening the foundation of the nation and give families and individuals greater, more appealing options.

Rich Grant for the Denver Metro Convention & Visitors Bureau

A highway in Colorado.

Steve Crecelius for the Denver Metro Convention & Visitors Bureau

In Denver, the light rail conveniently stops at the Colorado Convention Center.

Where and how investment in transportation is made—the second biggest federal discretionary spending category—will have deep impacts on housing and job markets, public health, energy needs, climate, economic competitiveness and nearly every other pressing issue facing the country today.

Campaign Platform

The next transportation program must set about the urgent task of repairing and maintaining the existing transportation assets, building out the transportation network and making the current system work more efficiently. Modern and affordable public transportation, safe places to walk and bicycle, smarter highways that use technology and tolling to better manage congestion, land use policies that reduce travel demand by locating more affordable housing near jobs and services, and long-distance rail networks all have the potential to help reduce oil dependency, slow climate change, improve social equity and public health, and fashion a vibrant new economy.

As Congress develops the next transportation authorization, these six priorities should guide them:

1 Establish accountability for responsible investment.

Under the current system, most federal transportation dollars go to state departments of transportation, with few questions asked. DOTs remain largely geared toward building highways between metropolitan areas rather than providing multiple options for mobility within metropolitan areas. This is despite the fact that the United States population is highly urbanized, with 80 percent of citizens living in metropolitan areas and 85 percent of the nation's economic activity occurring within them. The current law assigns metropolitan areas responsibility for transportation planning, but it does not give them real authority to implement those plans.

MYTH OR FACT? Highway and air travel receives 50 times more funding than passenger rail: ***Fact***.

The government's investment in highway and air travel is staggering compared to its funding of rail travel (Figure 1, U.S. Department of Transportation).

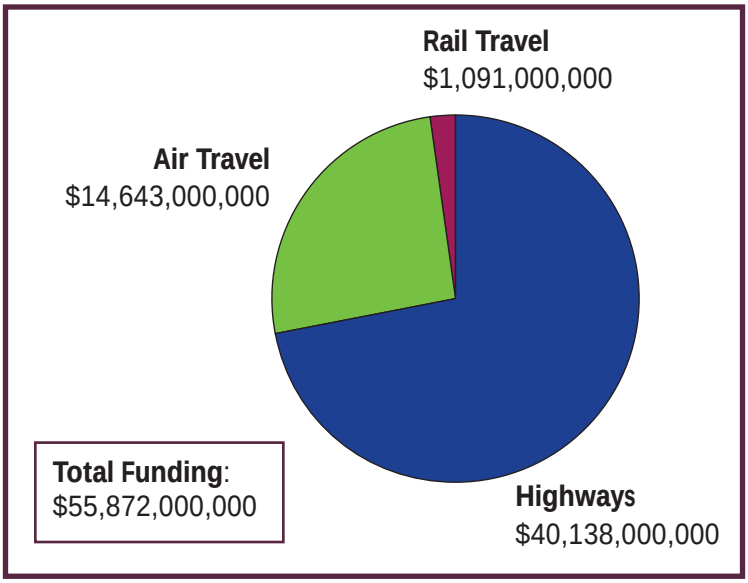


Figure 1. Comparison of government funding for highways, air and travel.

2 Invest to compete in the 21st century.

Poorly planned transportation investments, combined with spread-out development patterns, has forced families to spend 20 percent or more of their household budgets for transportation. Many spend hours driving in congestion every day, reducing their productivity. America's heavy reliance on oil leaves the nation's economy vulnerable to inevitable price shocks. The absence of high-speed rail lines and sophisticated, long-distance freight systems common in other nations puts the United States at a competitive disadvantage. The aging infrastructure is placing a strain on state and local budgets, often leaving metropolitan areas with few resources to remake transportation networks that can revitalize cities and towns. Without smart, strategic investments in modern transportation systems, America will be supplanted as the world's most productive economy.

MYTH OR FACT? More people use public transit when rail travel is an option: ***Fact***.

Alternate	Percent
Drive	23%
Ride with someone	22%
Taxi	12%
Not make trip	21%
Walk	18%
Bike	4%

Table 3. The next choice of transit users if no public transportation were available.

There are a number of reasons why rail travel is a more agreeable and more widely used form of public transportation. Often, rail travel is faster and more comfortable than other public transportation, such as buses. The comfort and attractiveness of rail travel often result in increased ridership from patrons who would otherwise be driving or riding in automobiles, in turn, reducing vehicle travel.

Transit users who own automobiles are known as discretionary riders and are an important user group because they are likely to directly reduce vehicle travel on roadways. Many rail travel patrons indicate that if rail travel were not an option, the next most viable form of transport would be an automobile (Table 3, Litman, 2008).

When a city is highly invested in rail travel, citizens are likely to use rail transit on a regular basis. For example, in large cities with rail systems, citizens log nearly three times the number of miles on public transit as compared to cities having only bus systems (Figure 2, Litman, 2008.) Also, usage figures show that commuters in large cities with rail systems use rail transit more than do commuters in small cities having rail (Figure 3.)

The availability of railways and a strong rail network can be a catalyst of transit oriented development (TOD) (Litman, 2008). TODs are characterized by the integration of public transportation into the design and development of housing within close proximity to rail stations and hubs. Citizens who live in TODs are more likely to own

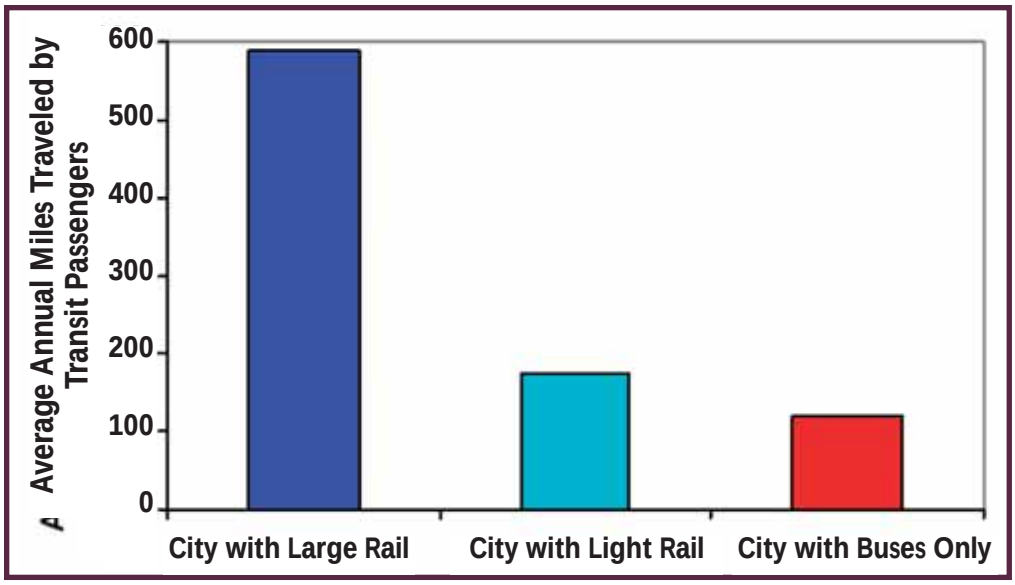


Figure 2. People with access to rail in their city ride more public transportation per capita.

fewer cars than other citizens and to use public transportation more, even though those living in TODs often have higher incomes (Litman, 2008).

During the latter part of the 20th century, ridership on public transportation declined in United States urban areas. From 1970 to 2000 there was a 12-percent decrease in the number of citizens who used public transportation (Renne and Wells, 2005). In developments where public transport, namely rail travel, was incorporated, decline in public ridership was notably less. This suggests that citizens in TODs are more likely to use public transportation as compared to citizens in other development types.

In the United States, transportation's contribution to air pollution, energy use and environmental degradation is immense. Americans use vast amounts of energy and cause significant pollution daily, much of it produced through transport (Shapiro et al., 2002). The degree to which emissions could be influenced through modified transportation policy is underappreciated in the United States. As compared to automobile travel, rail transit uses about one fifth of the amount of energy per passenger mile (Figure 4, Litman, 2008).

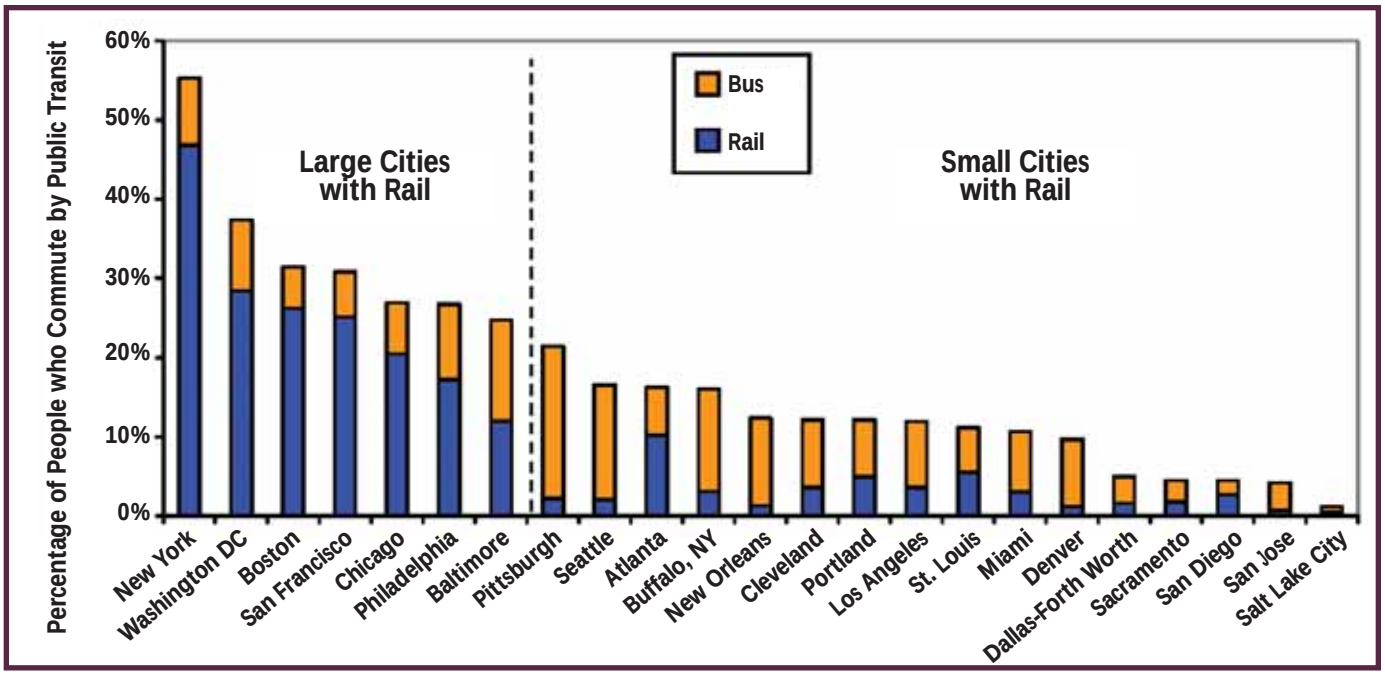


Figure 3. Commuters in large cities with well-developed rail systems use rail transit more frequently than commuters in smaller cities.

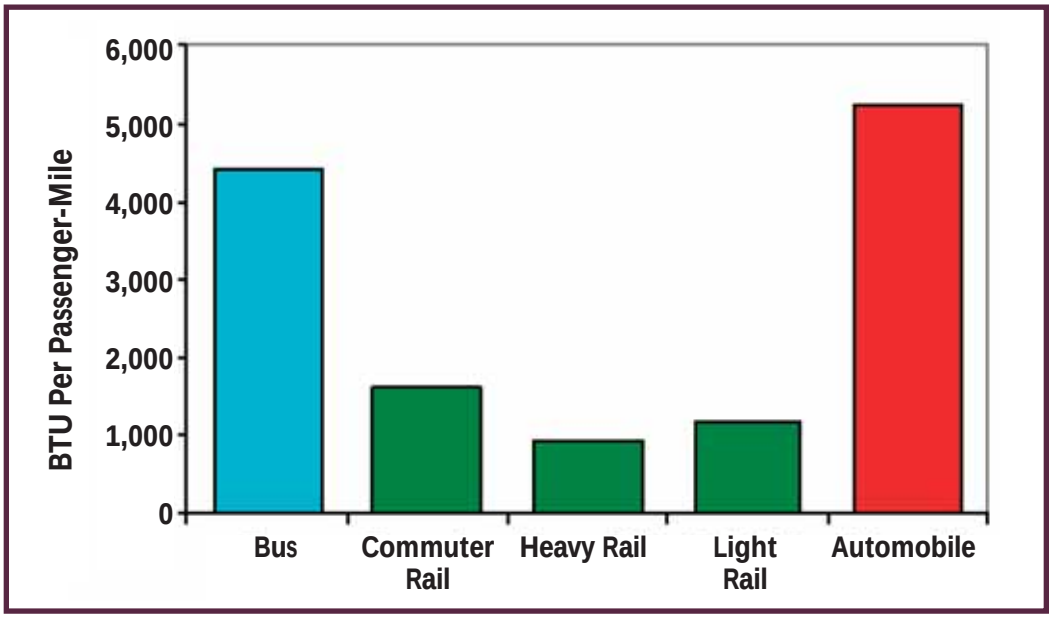


Figure 4. Rail travel consumes much less energy than bus or automobile travel.

3 Invest for multiple payoffs in solving energy, air quality and climate challenges.

Federal transportation investments can work simultaneously to end an overwhelming reliance on oil, reduce greenhouse gas emissions, clean up polluting ports and trucks, and help Americans save money.

MYTH OR FACT?

If Americans used more public transportation it would decrease dependency on foreign oil: ***Fact***.

Public transportation helps the United States become more energy independent. Current public transportation saves 855 million gallons of gasoline per year, a number equal to the total amount of oil imported from Saudi Arabia each month (Shapiro et al., 2002). Public transportation produces significantly less air pollutants per passenger mile than does private vehicle transportation. If Americans used public transportation more than they currently do, energy savings would be even greater. For example, if Americans used public transportation for 10 percent of their daily travel needs, United States dependency on foreign oil would be reduced by 40 percent (Shapiro et al., 2002). This is the equivalent of all annual oil imports from Saudi Arabia. This would also reduce carbon dioxide emissions by 25 percent of what is mandated under the Kyoto Protocol (Shapiro et al., 2002).

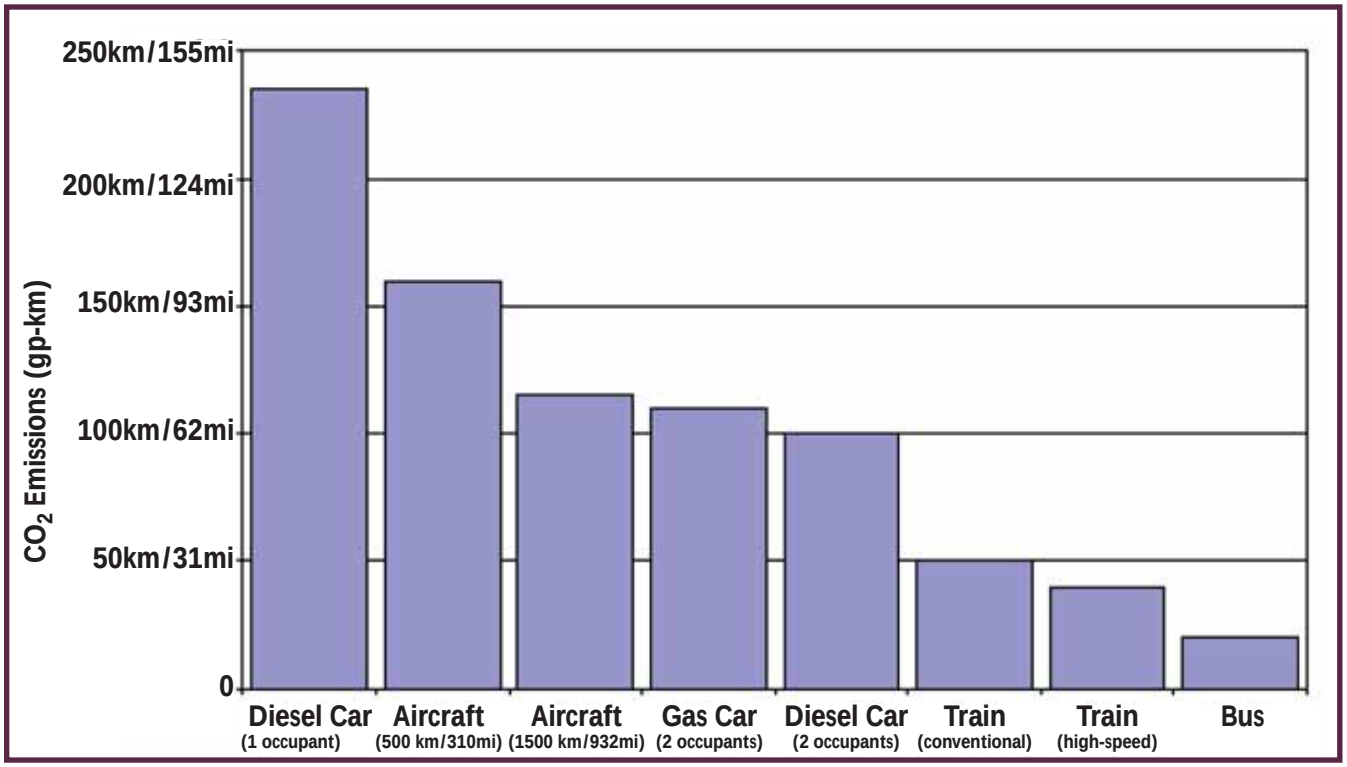


Figure 5. CO_2 Emissions (grams per km/mi) by transportation type.

4 Reward and support smart local land use planning.

More than 60 percent of the growth in driving is due not to population or economic growth, but to spread-out development. The nation can no longer afford the endless cycle of building roads, allowing them to become overwhelmed by poorly planned development, and widening or building again. The federal transportation program can encourage coordinated planning between transportation facilities and land use.

MYTH OR FACT?

People who live in cities with access to rail spend more on transportation: ***Myth***.

Citizens who live in cities serviced by rail transit save significantly more money on transit costs. In the United States, roughly 18 percent of total household expenditures are devoted to transportation costs (Bureau of Labor Statistics, 2007). In cities where citizens are able to utilize rail transit, these figures are considerably less. In large rail cities residents spend $2,808 annually on transportation compared to cities with only bus transportation where residents spend $3,332 annually. This difference in transportation costs is further reinforced by income differences between large cities served by rail and bus-only cities. On average, large cities served by rail have 7 percent higher incomes and a higher cost of living than bus-only cities, yet the average cost citizens pay for transportation is 15 percent less (Litman, 2008). When differences in transportation costs are totaled across the country, residents in large cities served by rail save $22.6 billion dollars annually as compared to bus-only cities (Litman, 2008).

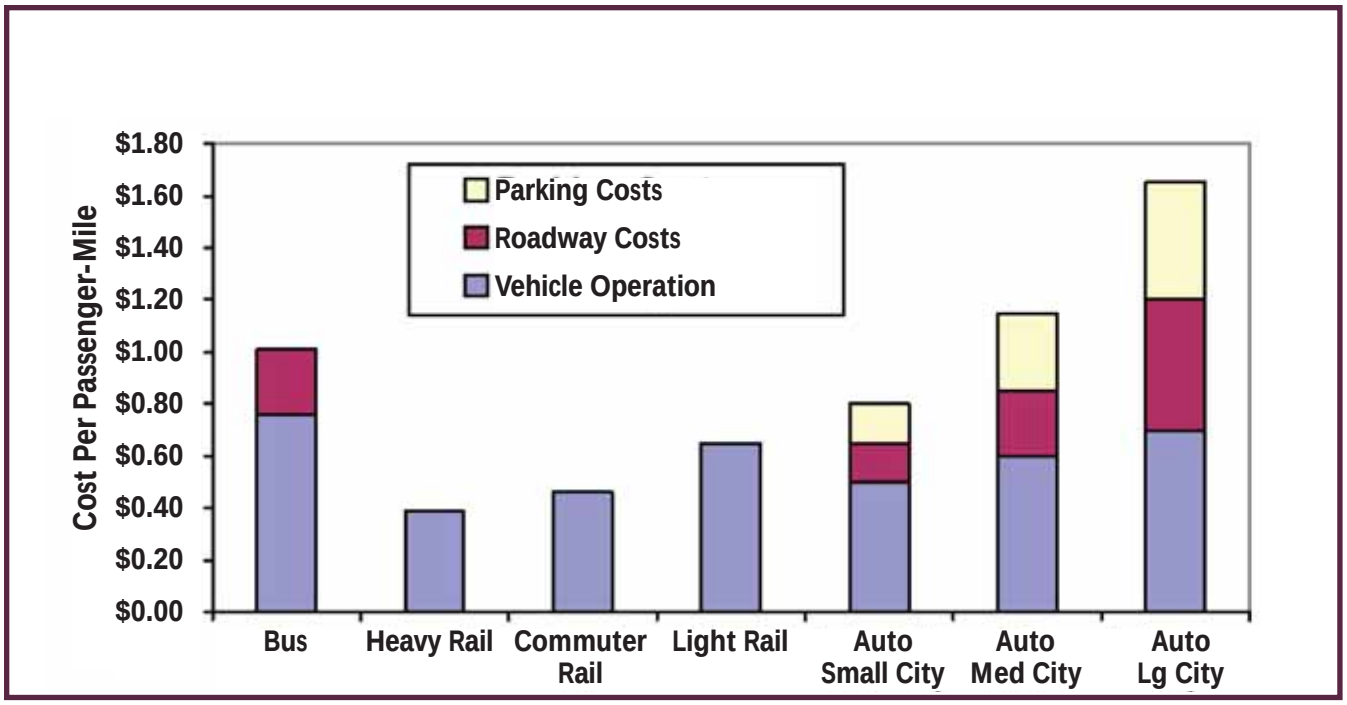


Figure 6. When costs for roads and parking are included in automobile costs per passenger mile, a heavy road subsidy is revealed.

Other costs associated with automobile and bus travel are often not considered in calculating total transportation costs. When parking and roadway costs are included in total estimates, automobile and bus transit can prove to be more expensive than rail travel in most cases.

Figure 6 details some of these cost breakdowns. Parking costs are a significant component of total automobile expenses for auto-commuters (Litman, 2008).

5 Invest for public health and safety.

The transportation system can do much more to foster human health and safety. While other countries have made strides on safety, traffic deaths in the United States hover around 43,000 people per year, with disproportionate deaths among older Americans, pedestrians and bicyclists. Millions of Americans, and particularly those in low-income communities, face asthma and other health problems caused by pollution from cars and trucks. Wide streets with fast traffic and no sidewalks or bike lanes discourage this physical activity, contributing to associated health effects. Local innovations in roadway design and operations have effectively reduced the rate of death and injury on streets, and should be encouraged across the country. The federal transportation program could also help get Americans moving with programs to make active transportation the cornerstone of a higher quality of life.

MYTH OR FACT? If Americans used more public transportation, our communities would be healthier: ***Fact.***

In regard to greenhouse gases, transportation accounts for 26 percent of global carbon dioxide or CO_2 emissions (Figure 7). Rail transport provides a means to mitigate the effects of both road transport and air travel, both of which are significant polluters to air quality. Rail transport is four times more efficient for passenger travel and twice as efficient for freight transportation (Chapman, 2007). Rail travel produces several orders of magnitude less CO_2 than do other forms of ground transportation such as automobiles and buses (Potter, 2003). Even for countries strongly dependent on automobile travel, a transition to rail travel can result in significant environmental improvements (Shaw et al., 2003).

Figure 7 details differences in carbon dioxide emissions by transportation type. As this figure shows, rail travel produces much less CO_2 than other forms of transportation. Reductions in CO_2 would be significant if a large number of automobile and air travel miles could be reallocated to rail travel.

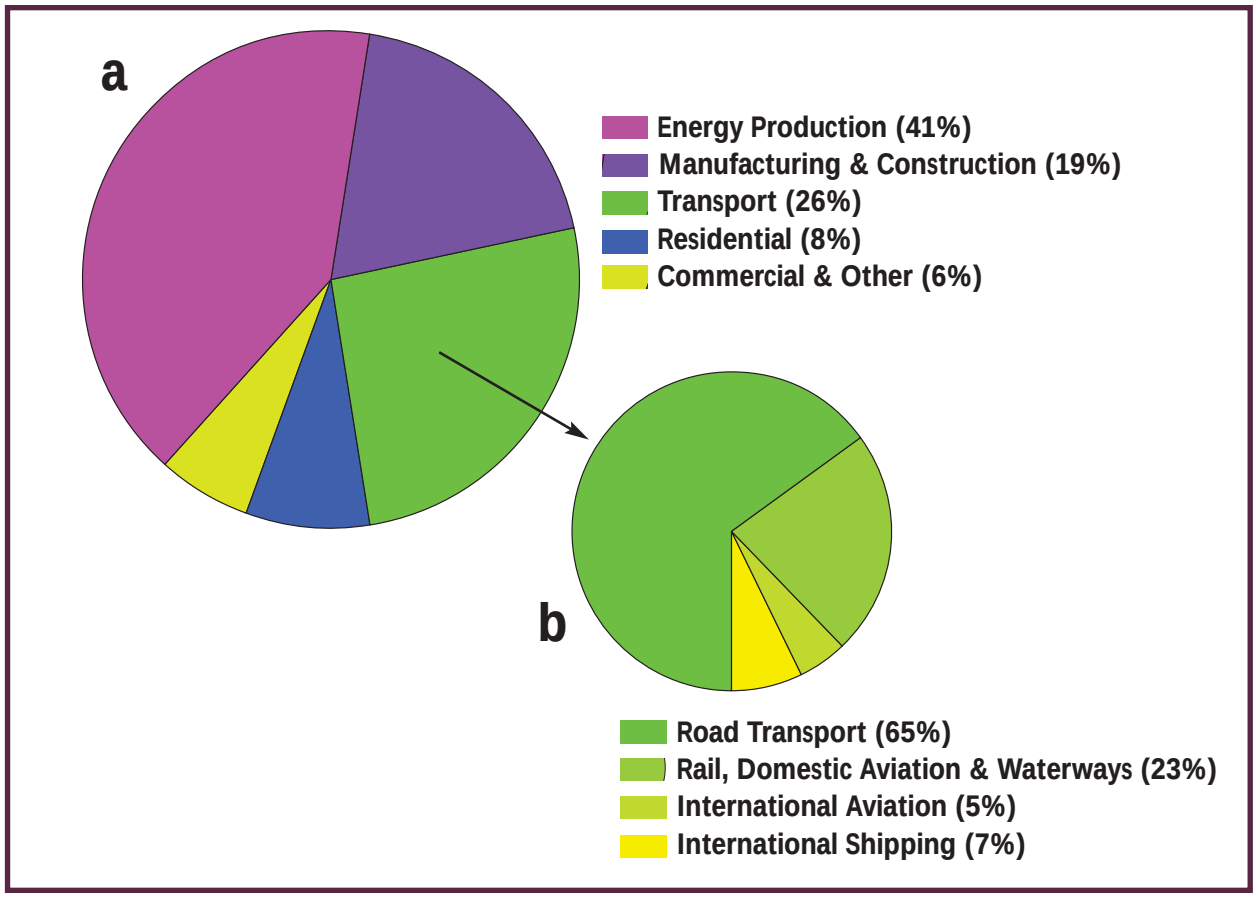


Figure 7. Global carbon dioxide emissions by (a) sector and by (b) transport type (Chapman, 2007).

6 Find new ways to pay for what we need.

Federal transportation funding has long relied almost exclusively on taxing each gallon of gas, but the limitations of this source have become clear. Congress has already supplemented the Highway Trust Fund with general funds. The situation could get worse if the drop in vehicle miles traveled that began in 2007 continues, draining expected revenues. Opposition to raising the tax is strong, as Americans already cope with high transportation costs. A revenue distribution scheme that rewards the states having populations that drive the most runs counter to other national goals. We need to develop new long-term revenue sources that are complementary to the nation's need for energy efficiency and continue to protect the investment in public assets. Transportation for American stands ready to support an increase in federal transportation investments if—and only if—they are directed towards the sorts of priorities and objectives outlined.

For more information about Transportation for America visit: http://t4america.org.

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About the Sun Corridor Legacy Program

Arizona is second only to Nevada as the fastest-growing state in the U.S. Over the next 20 years, Phoenix and Tucson – 100 miles apart – will grow together to become one of the country's 10 megaregions, home to more than 10 million people. Called the "Sun Corridor," this area's future prosperity – and that of the state – will be determined by how well it competes for human and financial resources in a global economy. To maintain a competitive advantage, Arizona must protect and enhance its quality of life.

Good Decisions for Land and People

To meet the West's challenges in the coming years, the Sonoran Institute is launching keystone initiatives in four specific landscapes to address growth and change and to serve as models for conservation, stewardship and sustainable development. One of the four is our Sun Corridor Legacy Program, which will cultivate collaborative approaches to better managing growth and development for rapidly urbanizing regions in the 21st century. The Sun Corridor Legacy Program is striving to achieve these five objectives:

- Promote a commuter rail system linking Phoenix and Tucson
- Create a new model for a sustainable desert community
- Advance a clean and secure energy future for the Sun Corridor
- Conserve more than one million acres of the Sonoran Desert
- Preserve three of the Sonoran Desert's remaining free-flowing rivers—the San Pedro, Santa Cruz and Verde

To find out more about the program's work, visit www.sonoraninstitute.org.

The Mesa Art Center will connect with the rest of the Valley via light rail by 2015.

Courtesy of METRO

Shaping the Future of the West

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