

# Linking Transportation, Planning, and Economic Growth: Lessons for Metropolitan Las Vegas

Robert Puentes and Adie Tomer<sup>1</sup>

November 2015

## I. Overview

In the aftermath of the Great Recession, a dramatic change is occurring in how metropolitan areas plan for their future. In these places, a dedicated set of civic, corporate, political, and philanthropic leaders are explicitly making the connection between transportation planning and investments with economic growth. This is a new form of transportation planning and placemaking that does not leave growth to chance, but starts with an overarching economic vision based on a true assessment of their strengths, challenges, and opportunities. It represents a deliberate and intentional set of tactics and strategies.

Metropolitan Las Vegas can be part of this new cohort of metropolitan innovators, but it will require a well-designed combination of transportation and regional planning that recognizes state-of-the-art practices from across the world. As a regional economy highly susceptible to national business cycles, it has a generational opportunity to build off its existing assets and dynamic tourism industry by acting with purpose and clarity.

The purpose of this white paper is to illustrate how leaders can put forth a strategic and visionary—yet grounded and pragmatic—approach to planning regional transportation to support both economic development and modern urban planning.

## II. Linking Transportation, Planning, and Economic Growth

Transportation is widely recognized as a key component in urban economic growth. Much of this is intuitive. Over 27 percent of all personal trips are social or recreational in nature. Everything else is in some ways related to economic productivity, such as commuting and work related trips (17 percent of all trips), shopping and running errands (45 percent), and trips to school (10 percent).<sup>2</sup>

By enabling workers to reach employment, moving citizens to and from areas of service and opportunity, facilitating global trade, and shipping products between producers and consumers, economic growth and transportation are closely linked (Porter, 2000). Improving physical access to economic opportunity enhances the efficiency of labor markets, brings public services within reach of all citizens, and generally can improve quality of life (Litman, 2011).

It is important to note that while there is agreement about the connection between transportation and the economy, the relationship is complex. Does a region begin to invest in transportation to boost its economy, or does a region first have to establish an industrial base before it invests in its transportation infrastructure? Transportation is certainly a *reflection* of economic activity, inasmuch as products must

---

<sup>1</sup> Robert Puentes is a senior fellow with the Brookings Institution's Metropolitan Policy Program where he also directs the program's Metropolitan Infrastructure Initiative. Adie Tomer is a fellow at the program.

<sup>2</sup> School and church trips are combined. See Federal Highway Administration, "Summary of Travel Trends: National Household Travel Survey," 2009.

be moved to markets but the causality of these relationships is unclear: transportation influences economic conditions, and economic conditions influence transportation.

A review by the National Academy of Sciences of recent models for assessing the relationship between transportation and the economy found that there is a suggestion of a relationship. (NRC, 2002). But the relationship is tenuous given the question of causality. At certain times, investments in the transportation system, such as the rapid creation of passenger rail networks in Europe in the late 19th century and the completion of the U.S. interstate highway network in the 1950s, are associated with major increases in productivity. However, this only occurs when the improvements are genuinely transformative. Instead, most transportation improvements will have an incremental (but not insignificant) impact on productivity and growth. Therefore the detailed linkages between transportation and other sectors should be the focus of attention for policy makers in advanced economies, as they will guide policy toward making the most effective improvements.

The best investigation into transportation as a means to improve economic performance comes from a 2007 British study that identified seven micro-economic drivers that may serve as gateways for transportation's impact on economic productivity. (UK Department for Transport, 2008). A well performing transportation network would:

1. Increase business efficiency, through time savings and improved reliability for business travelers, freight and logistics operations.
2. Increase business investment and innovation by supporting economies of scale or new ways of working.
3. Support clusters and agglomerations of economic activity. Transportation improvements can expand labor market areas, improve job matching, and facilitate business-to-business interactions.
4. Improve the efficient functioning of labor markets, increase labor market flexibility, and the accessibility of jobs.
5. Increase competition by opening up access to new markets.
6. Increase domestic and international trade by reducing the costs of trading for services and freight.
7. Attract globally mobile activity to a region by providing an attractive business environment and good quality of life.

The focus on the seven micro-drivers suggests that only well-targeted transportation investments would have the expected results. In other words, the right level of investment is less important than where transportation projects are funded and how they are chosen. In this way, investments in congested or growing areas, chosen in a transparent, prioritized manner, based on a full appraisal of their benefits and costs, should be the mainstay of any metropolitan transportation policy.

Beyond these drivers, we do know that transportation also supports American workers, providing millions of jobs each year to build and maintain the structures and facilities that power our economy. Brookings' analysis of data from the Bureau of Labor Statistics reveals that nearly 7 percent of all workers in metropolitan Las Vegas are directly employed in fields related to transportation offering many employment opportunities that have low barriers to entry and are projected to grow over the next decade. This includes everything from highway maintenance workers, to bus drivers, to transportation engineers. (Kane and Puentes, 2014.)

Freight and goods movement is perhaps the clearest example of how transportation impacts economic growth. A major review of "a century of data" for found positive relationships between public

infrastructure investments and economic productivity—especially in the freight and industrial sector. The benefits and savings for trucking alone justify one-third to one-half of the federal highway investments between 1950 and 1973. (HLB 1999). Swift, highly reliable, and relatively inexpensive trucking facilitated the adoption of just-in-time logistics practices during the 1990s by firms across the economy, in both the manufacturing and service sectors. This is clearly evident in the continental supply chains that connect American firms to Canada and Mexico, the United States’ largest trading partners. Those supply chains could not operate without reliable truck and rail connections between and within the countries (Parilla and Berube, 2013).

In spite of this elaborate and thorough inland distribution system, the distance to an international gateway—an airport, a land border, or a seaport—is still enormously important for potential exporters (Gries and others, 2009). All things being equal, exporting firms that are closer to a gateway have an advantage over those that are more distant. For firms that export high-value products by air, proximity to a major international passenger gateway (e.g., Los Angeles, Miami, Chicago, New York) or cargo hub (e.g., Memphis or Louisville) will provide a distinct advantage over a location from which a lengthy truck trip or additional airborne segment is necessary to reach a major airport. For exporters by sea, there is great advantage in being close enough to a marine terminal (or an “inland port” offering nonstop intermodal rail service to a major seaport) that a drayage truck can, within a single day of service, make a round trip between their loading dock and the port. If manufacturing increases as a share of U.S. exports, metros that host one or more such gateways will have a distinct advantage over those that do not. In turn, the portions of metros that have the greatest access to such gateways will receive the lion’s share of growth in the sectors that utilize them most (Tomer and others, 2013).

But while the connection between transportation and *economic* growth is well understood, successful cities and metropolitan areas in the U.S. and around the world also need to recognize the fundamental relationship between transportation and *physical* growth.

Today, transportation planning and capital programming have as much to do with how places grow and develop as any other suite of public policies. Yet the transportation network in cities and regions is not an ephemeral concept and with few exceptions American cities fail to consider growth and development dynamics in transportation on the proper scale: the metropolitan level. Land use and most transportation planning remains hyperlocalized with spot improvements made to ameliorate specific problems. For its part, metropolitan transportation plans are mostly just aggregations of local projects.

This is despite the fact that the relationship between the built environment and transportation has been one of the most active areas of inquiry for urban planning scholars since the mid-1990s (Muro and Puentes, 2004; Ewing and Cervero, 2010). Lately, attention has returned to the potential usefulness of urban planning and design in reducing greenhouse gas emissions by reducing the necessity of automobile usage. This is a major focus of the upcoming Paris Climate Change Conference, for example.

This connection between transportation and physical form is important because land use and density in and of itself is no guarantee of spatial efficiency (Gordon and Richardson, 1997). Los Angeles is by some measures the nation’s most densely populated metro, due to the lack of significant difference in population density between the central city and its suburbs, as well as a dearth of open space within urbanized portions of the metropolitan area. It provides an excellent and cautionary example of a densely developed yet automobile-dependent region, with prevailing land-use patterns (long blocks, wide arterial roads, strict functional separation of primary land uses) that discourage walking and consequently inhibit the development of transit ridership outside the lowest socioeconomic strata

(Eidlin, 2005). That region is now embarking on some of the most advanced, intentional planning to link up transportation and land use in order to reconcile these past generational mistakes. (City of Los Angeles, 2015).

Careful urban planning, with a particular eye to factors that impact residents' willingness and ability to use alternatives to the automobile for many trips—or at least minimize the length of car trips—can be a powerful tool for reducing transportation's contributions to regional problems (e.g., carbon emissions, spatial mismatch, traffic congestion.) Even in suburbs where the vast majority of commuting occurs by automobile, individuals who live near pedestrian-oriented shopping districts are more likely to walk to shopping than those who live in automobile-oriented areas (Boarnet et al., 2011). While the collocation of housing and shopping can reduce vehicle travel significantly, the collocation of housing and employment yields even greater reductions in driving (Cervero and Duncan, 2006).

One key strategy is to develop plans for creating walkable urban places—mixing offices, retail space, and residences at a pedestrian scale—at highly accessible locations (Leinberger, 2010). The downtowns of older streetcar and commuter rail suburbs like Naperville, Illinois, and Bethesda, Maryland, have been the primary sites of such development. However, the success of many “town center” projects, which have transformed numerous moribund indoor shopping malls into pedestrian-oriented outdoor shopping centers with offices and apartments next door—effectively providing downtowns to suburbs often devoid of them—demonstrates the potential for developing walkable places in locations with no previous history of pedestrian orientation.

It is not a coincidence that many prominent industry clusters exist either at the pedestrian scale in highly accessible central business districts (e.g., fashion in Manhattan, financial engineering in the Chicago Loop), or at the automobile scale along major regional highway corridors and at their intersections (e.g., information management along the Dulles Toll Road in the western Washington suburbs, biotechnology along I-5 north of downtown San Diego and I-270 in the northern Washington suburbs). Given the failure of so many “black box” attempts to form clusters through the provision of physical space in highly accessible locations, though, cheap office space near a freeway interchange clearly does not provide a sufficient precondition for a sustainable cluster to form (Muro and Katz 2010).

However, simply designating a place to be a pedestrian oriented retail node does not mean it can be sustained by low-density residential areas surrounding them. Instead, most visitors arrive by automobile, often leading to conflict between business districts and their surrounding residential areas over parking and through traffic. While many places have some scope for densification (e.g., by replacing single-story retail structures with multistory mixed-use buildings), often suburban retail clusters have street plans and surrounding land use patterns that make accommodating denser development difficult. Any plan to redistribute commercial activity to these nodes will need the accompaniment of a new mobility and accessibility strategy encompassing pedestrian and bicycle facilities and local circulator transit—especially critical given the tendency of walkable centers to increase property values nearby, and thus reduce affordability for low-income populations.<sup>3</sup>

---

<sup>3</sup> It is also necessary to develop strategies to overcome the hostility of many residents to residential structures other than single-family houses and garden-style apartment and townhouse complexes (Levine 2006). This line of inquiry is well traveled, with conclusions too lengthy to summarize here.

How and where development occurs—those crucial preoccupations of smart, intentional planning—matters. Reducing urban sprawl, promoting urban focus, and encouraging more compact development (along with providing good transportation links) may well enhance outcomes. This occurs through the deliberate and integrated use of the planning, regulatory, and fiscal authority of state and local governments to influence the pattern of growth and development in order to meet projected needs. Included in this definition are such tools as comprehensive planning, zoning, subdivision regulations, property taxes and development fees, and other policy instruments coupled with infrastructure and transportation investments that significantly influence the development of land and the potential regional economic outcomes.

While much of the empirical work is still emerging, urban economists have long theorized that urban form influences economic outcomes. And now, researchers have actually begun to demonstrate that such key goals as compactness, density, well-integrated land-use and transportation, growth management systems, and rejuvenated urban centers may each be associated with enhanced economic growth.

#### *Fast Tracking Transportation in Denver*

In 2004, residents in metropolitan Denver voted for a multi-billion comprehensive plan, FasTracks, to build more than 122 miles of new light rail, commuter rail, and bus rapid transit lanes serving 60 new transit stations. It includes the redevelopment of Union Station as a multi-modal hub in downtown Denver. Other communities around the new transit stations changed zoning laws to allow tighter, taller development near the rail stops, providing the density that enables more residents to reap the rewards of this great public investment.

In making the link between deliberate urban planning and infrastructure development, the *Denver Post* noted that FasTracks “would be no more than a jumble of rail and concrete without careful zoning and transportation planning by the cities and counties served by the project.” This is critically important because the region is expected grow 50 percent by 2035. During peak construction, the plan is estimated to create over 7,000 jobs. Once completed, FasTracks will add \$150 million a year in wages and salaries to the Denver metro economy. (Katz and Bradley, 2013).

The project is expected to cost \$6.8 billion, and is funded from a variety of sources including sales tax bonds, federal Transportation Infrastructure Finance and Innovation Act (TIFIA) program loans, federal New Starts, local contributions and public-private partnerships. In 2004, residents of the Denver region approved a four-tenths-cent sales tax increase, used as collateral against bonds to finance the plan. To design, build, finance, operate and maintain the combined Gold Line and East Line (known as the Eagle Project) RTD contracted with a concessionaire in a public-private partnership. Local communities impacted by the program will contribute 2 percent of the total projects costs, about \$95 million.

Recent increases in construction costs and significant decrease in sales taxes revenue due to the recession have delayed the progress of the project, leaving a \$2 billion gap to finish the build out in the next decade. The project has support from a variety of stakeholders in the region, and project developers are working with the private sector to design, build, and operate portions of FasTracks, as well build transit-oriented development (TOD) communities around stations to serve as examples of public-private collaboration.

### **III. *Designing a Transportation System Around Economic Outcomes***

The Great Recession was a wake-up call to metropolitan America. Debt-fueled consumption defined the economic approach of the prior decades, with metropolitan areas competing to steal businesses from one another and making big bets on speculative real estate (Katz and Bradley, 2013). This left regions particularly vulnerable to drops in aggregate consumption or tighter capital markets.

This was especially the case in Las Vegas, which was one of the metro areas most affected by the downturn. By nearly every key economic indicator, Las Vegas struggled—and by some measures continues to do so. Overall metropolitan GDP peaked in mid-2007 and continued to fall until mid-2012—and GDP is still lower than it was during the pre-recession peak. Similarly, total employment is still lower than the 2007 peak and unemployment is still over 1 percentage point higher than the national average. Even house prices are just over half of their average value in 2007 (Friedhoff and Kulkarni, 2015).

Fortunately, Las Vegas and its peers have recognized the need for a new economic growth model, one that focuses on the core productivity drivers that made regional economies successful for centuries: tradable industries, social equity, and environmental resiliency. And across each of those three drivers, the physical landscape and transportation play a critical role.

Trade has always been the economic foundation of cities (Jacobs, 1992). It creates a marketplace for a metro area's goods, bringing new value into the community through the financial assets paid for locally-produced exports and value creation through low-cost and/or high-value imports that cannot be locally produced (Tomer and others, 2013). In the case of Las Vegas, it would be impossible to imagine the desert oasis ever growing to nearly 2 million people if it couldn't sell its world-leading brand of entertainment services or a hospitable climate for new residents. In each metro area, their own unique collection of tradable industries power the regional economy by paying higher wages, attracting new investment capital, and recycling money through their own procurement of local services like food, education, and healthcare (Parilla and Berube, 2012).

But to grow these tradable sectors, metropolitan areas need physical access to markets and strong connections within them. Getting all of those tourists to Las Vegas requires a globally-connected airport and seamless access to hotels. Sheltering, feeding, and entertaining all of those out-of-town guests—plus the millions that permanently live in Las Vegas—requires freight corridors that bring construction materials, fresh food, electronics, and other consumer goods. Likewise, the innovation and productivity benefits generated by dense clusters of firms—known as agglomerations—rely heavily on buildings in close proximity and the infrastructure assets that make such business districts possible (Muro and Katz, 2010). Transportation is the great enabler of tradable industries.

While growing tradable industries is fundamental to metropolitan economic health, access to economic opportunity is equally important. Unfortunately, inequality is a continual problem in metropolitan America. Too many Americans are not only poor but also live in what are neighborhoods of concentrated poverty, which themselves are associated with higher crime rates, worse health outcomes, failing schools, and fewer job opportunities (Sharkey, 2013). While the majority of these high-poverty neighborhoods are still in center cities, the majority of all poor households now live in the suburbs—and those communities tend to not offer the same social services that previous generations had available in central cities (Kneebone and Berube, 2013). High levels of employment decentralization also complicate

the ability for historically under-employed workers to connect to job opportunities now spread all across the expanded metropolitan boundaries (Kneebone, 2009).

Here again, transportation and urban planning play a critical role in both creating and addressing inequality. The vast distances between where people live and where they work, study, and shop compels low income households to take on the added cost of owning and maintaining a car (Tomer 2011). This introduces a far higher household expense than riding transit, biking, or walking, but the alternative for many individuals is the lost time it takes to travel by non-private vehicles. One major reason why the majority of poor households live in the suburbs and must travel such long distances is a pursuit of affordable housing. This reflects a failure of the planning practitioners to provide enough affordable housing in neighborhoods that offer the kind of connectivity where people can choose to not own a car. In response, planners must do a better job using land-use and transportation tools to enhance opportunities for traditionally disadvantaged populations.

Finally, protecting a region's environmental health and fostering resiliency is of paramount economic import. High-profile natural disasters, such as Superstorm Sandy, elevated the profile of American cities' susceptibility to major environmental events. The combination of washed-out roads, flooded train stations, and shorted electrical circuitry highlighted the economy's reliance on these networks and the poor and aging condition of many of these important systems. At the same time, the climate imperative creates new opportunities in the "green economy," or those advanced industries like solar panel manufacturing and architectural design that will develop the products and plans that facilitate a transition to a lower-carbon future.

Yet it's impossible to achieve long-run sustainability and resilience without an environmentally-coordinated transportation system. Due to the sheer volume of cars on the road, the distances they drive, and their near sole-reliance on fossil fuels, transportation is the single-largest polluting sector. The physical design of transportation facilities also harms the environment, most notably through the impervious surfaces on roads and in parking lots that cause excessive stormwater runoff. Plus, by continuing to build roads that promote outward growth, humans consume open land that provide natural habitats to other animals and whose vegetation offer natural offsets to carbon emissions. By building denser and with better street design, transportation planning can reduce energy consumption and mitigate environmental impacts.

Transitioning to a more productive economic model is already underway in Nevada. The state is pursuing an aggressive approach to growing tradable industries and improving STEM education to boost future economic opportunities (Lee and others, 2014). The new Tesla battery "gigafactory" in Reno has positioned the state as a national leader in both advanced industries and the green economy. Las Vegas is similarly seeking to diversify the regional economy, like with the development of the new UNLV medical school. Many other high desert economies already look to Las Vegas for its innovative water conservation efforts.

Yet what can't be overlooked by local leaders are the transportation investments that will unleash the potential of these foundational economic decisions. Equally important to a reformed economic vision is recalibrating their planning models and finding innovative ways to pay for new investments.

### *Move Seattle: Using Transport to Build a Modern Urban Economy*

By any measure, the Seattle economy is booming. The combination of advanced manufacturing through firms like Boeing and the modern digital technology boom led by Microsoft and Amazon has helped Seattle secure clear comparative advantages in the global economy and an enviable amount of high-paying jobs. Seattle is also consistently one of the fastest-growing large cities in America, adding nearly 100,000 residents between 2000 and 2015.

But all this *economic* growth has caused significant *physical* growth pains. While Seattle is world-famous for its inimitable skyline, it is easy to forget that stunning view is partially due to serious geographic constraints. The city is hemmed-in by Puget Sound to the west and Lake Washington to the east. Downtown is on the skinniest land mass, creating an effective funnel for commuters in all directions. It may be beautiful, but it is hard to fit all those new people and growing businesses in such a tight space.

*Move Seattle* is the city's plan to both support the region's long-term economic health and address those physical limitations. First off, the plan itself does not start with transportation objectives—it described the alignment of the city's core values (e.g., safety, vibrancy, affordability.) Second, it recognizes that the city is largely built-out and there is no room for more major roadways. As a result, the best way to connect people to economic opportunity is to support a more competitive transportation landscape. That means improved multimodal options like more bike lanes, greater transit access, and improved sidewalks. Building from the region's industrial base, the plan also recognizes the disruptive potential of new transportation technology like mobile traveler information and shared vehicles and considers the potential impacts on the built environment (Seattle DOT, 2015).

But this is more than just a smart plan—it now has the financial support to achieve implementation. Seattle city voters approved a \$930 million ballot referenda in November 2015 to fund the program (Kroman, 2015). The new property tax revenues will allow Seattle to immediately start work on these transformative projects. If implementation goes well, Seattle may soon be known as much for how its transportation identity as the planes and software it builds.

Establishing an economic vision clarifies the outcomes a metro area hopes to achieve through its transportation system and urban plans. Moving forward, that must include efforts to improve pedestrian access, high-capacity transit and bicycle infrastructure alongside efforts to improve automobile movement. Metro areas must go multimodal to achieve their economic objectives.

To implement such a mode-neutral approach, economists, planners, and engineers refer to **accessibility** as the ease of reaching valued destinations (jobs, shops, schools, entertainment, and recreation), typically by measuring the total number of places reachable in a given amount of time. That permits simultaneous consideration of residential, commercial, and industrial real estate concerns when making transportation-based decisions. It is also designed to be outcome-oriented metric, meaning accessibility can effectively reflect transportation's economic and social impact (Geurs & van Wee, 2003). Or to put it another way, accessibility better reflects how individuals think when planning their trips: "can I get to that new job from here?; how far is the closest grocery store?; can my children walk or bike to a park?"

While the mobility model continues to serve American metros as a method to design new investments, that model is flexible enough to include an accessibility lens. For example, comparing the amount of jobs reachable in 60 minutes between private vehicles and transit shows an extreme advantage for vehicles



(Owen and Levinson, 2014). Accessibility models help explain why older cities with more defined street grids—such as Washington, DC and Boston—exhibit far higher rates of walking and bicycling than peer cities with more suburban designs—such as Nashville and Detroit (McKenzie, 2014).

Many of these same communities that deliver the highest accessibility levels to their residents and visitors alike also share another vital characteristic: they value and foster the development of public spaces.

Consider some of the great public spaces, many of them tourist hubs, synonymous with popular global cities. The great cathedrals, pedestrian-only streets, and public squares of European cities like Vienna, Milan, and Barcelona have long attracted tourists and local residents for their aesthetic charm and mix of retail and food options. But these places are also *alive*, as people live and work in the same place. The same applies to many great American neighborhoods, from Manhattan's Village to Chicago's River North to San Francisco's Embarcadero. Places with a true mix of uses, oriented to serve people and not necessarily their cars. In contrast, consider the archetypal American communal space of the later twentieth century: the mall. Itself a walled garden of retail options surrounded by a veritable moat of parking, the mall is effectively a private commercial castle.

Greater accessibility is also connected with higher land values, signifying its economic value to residents, businesses, and—due to the greater tax returns per square mile—government (Hansen, 1959). In particular, many of the most accessible neighborhoods also include stops along high-frequency transit lines, and the transit-oriented development surrounding these stops tends to deliver higher land values and substantial capitalization benefits (Cervero and Duncan, 2002). Somewhat ironically, the same neighborhoods with high levels of accessibility and higher land values tend to have permanent automobile congestion. Consider that Manhattan is congested at any time of day, but it's that very clustering of economic activity that make it such a desirable place to live, work, and visit.

Of course, cars will continue to be a valuable transportation component of every American metro area. The key moving forward is to reverse the directionality of planning practice, by starting with to the promotion of economic outcomes and then considering those options through the lens of all transportation modes. For example, communities around the world from Berlin, to London, to Seattle have removed mandatory parking minimums for downtown buildings and other activity centers, in their place using spatial planning techniques, improved transit operations, and new bikelane striping to attract a mix of transportation modes and reduce the parking burden. This kind of planning is especially important as the rise of on-demand ride services, e-commerce, and other technology-fueled trends may reduce total individual trips, thereby requiring less future road space and parking (Been and others, 2012).

Las Vegas is well-positioned to implement an accessibility-based approach to complement its focus on mobility, urban planning, transportation investment, and placemaking. The Regional Transportation Commission of Southern Nevada's (RTC) certification as the official metropolitan planning organization (MPO) for the region—to go along with its prior responsibilities for transit operations, traffic management, and construction funding—makes it an ideal central actor to coordinate a metropolitan-wide strategy for improved accessibility. Meanwhile, the Southern Nevada Strong Regional Plan provides a clear blueprint for building a productive, inclusive, and sustainable economy. Finally, the region's impressive tourism industry offers a captive audience interested in non-automobile travel.

### *Munich's Tourism: Made Possible by Transportation*

Long the hub of German economic strength, Munich is nothing short of a global manufacturing powerhouse. The sector generates over \$37 billion in output per year, produced through a mix of multinational firms like BMW and small- and medium-enterprises focused in complementary industries (Parilla and Others, 2015). It complements this manufacturing base with strong tradable industries in finance and information communication technologies. This results in one of the highest disposable incomes across Europe, an apprenticeship system to maintain a pipeline of talented workers and managers, and strong trade connections throughout the world. (Clark and Moonen, 2014).

But Munich is much more than just an industrial center—it is also one of the world's great tourist cities. Rebuilt after World War II, Munich offers an enviable collection of physical assets: one of the most charming city centers in Europe, grand public squares and parks, remarkable art museums, and modern event centers like the Allianz Arena. Supporting these physical assets is a first-class set of programmed activities, most notably Oktoberfest, classical music series, and a film festival. As a result, tourists continue to flock to the Bavarian capital: it hosted 6.6 million overnight visitors in 2014, up 57 percent since just 2005 (Bavaria, 2015).

Moving all of these local workers and visitors within one of Europe's largest cities isn't easy, but Munich offers a promising model for how coordinated transportation investments can simultaneously support a diversified economy and heavy tourism activity.

The backbone to this system is an extensive transit and non-motorized travel system that seamlessly connects all of those major tourist attractions. The Munich Transport and Tariff Association manages 32 fixed rail lines and over 280 miles of bus routes—for a metro area of only 3.9 million people—and uses multilanguage signage and focus on service reliability to attract tourist ridership (Kinsella and Caulfield, 2011). Meanwhile, well-marked bike lanes, well-maintained sidewalks, and pedestrian-only streets help tourists spend more time seeing sites than simply traveling between them. Combined, this helps tourists save money by staying out of cars—rental or taxi—and leaving more road space available for commuters and local freight. Research also confirms that these transit-rich investments help attract tourists to the mobility options (Le- Klähn, Gerike, and Hall, 2014).

However, it would be impossible to maintain a system of this scale without clear utility for the majority of its users: local residents and businesses. Those same train and bus lines stretch deep into the suburbs and far beyond the center-city tourist attraction, connecting local residents to job opportunities, schools, and other key services. The Hauptbahnhof offers high-speed rail connections to the rest of Europe, facilitating business travel alongside tourist flows. Finally, Munich Airport connects the city to the rest of the world via the Lufthansa operational hub and direct connections to 68 countries.

Munich proves that a city needn't choose between a diverse economy and strict tourism focus. Instead, any city looking for that kind of economic dynamism must not forget to invest in a multimodal transportation network.

#### ***IV. Paying for It: Transportation Planning in an Era of Fiscal Constraint***

Most transportation and urban planning issues are inextricably tied to a range of funding, finance, and budget considerations, including the capital and operating costs and related pricing/cost recovery options. Today, state and local governments are increasingly constrained by limited financial resources and other competing spending priorities to accelerate transportation investments. Nevada is particularly constrained in this regard with a recent UNLV report projecting a \$377 million annual deficit in the state highway fund by 2030 if additional revenues are not raised. (Brown and Maravich, 2013).

There are several reasons for this shortfall in investment. A primary culprit is that motor fuels taxes at the federal and state levels (which comprise the largest single source of transportation revenue for federal and state governments) are not producing adequate revenue to meet system needs. Motor fuels tax receipts are levied on a per-gallon basis, and unless the tax rate is regularly increased or indexed to account for inflation, fuels taxes can face eroding purchasing power. Nevada, for example, has not raised its fuel tax for 23 years. (ITEP, 2015).<sup>4</sup> This shortfall is particularly acute because the cost of construction and materials has been rising and is projected to continue rising. The result is that the purchasing power of the federal government and many state governments has been declining at the same time demand is increasing.

So states are also looking at debt finance tools such as state infrastructure banks to leverage their existing resources and accelerate projects. For example, state infrastructure banks (SIBs) can operate revolving loan funds and typically have a board that uses specified criteria to make strategic investments in transportation. After they are provided initial capital, they can provide a revolving revenue source to fund priority projects and supplement existing revenue sources. Since established in the 1990s SIBs have provided billions in financing for more than 1,000 projects. However, this activity is highly concentrated in just a few states as many are underutilized or inactive. Kansas and Georgia are the only states in the United States that operate state-only capitalized transportation banks (i.e., no federal money.)

South Carolina's infrastructure bank is one of the nation's oldest and most active, investing nearly \$2.8 billion since its creation in 1995 and overcoming the loan capacity issues of other SIBs by leveraging its capitalization. South Carolina's bank receives dedicated state revenues pledged to bond repayments: \$25 million from the state gas tax, \$35 million from car registration fees, and \$60 million from truck registration fees. The South Carolina SIB supports projects through grants and loans, giving preference to those with a strong local match. Although Nevada has a state revolving loan fund for water infrastructure, it does not have one for transportation. (Puentes and Thompson 2012).

Over the long-term, states may have an interest in replacing the motor fuel tax as a primary source of revenue for transportation. One possible replacement states can look to is a vehicle miles traveled fee (using GPS or other technology to charge users for every mile driven). A miles traveled fee could provide a technological platform for greater use of congestion pricing and could be more effective in managing demand than the motor fuel tax. It also would be applicable regardless of fuel source, whereas the current motor fuel tax does not apply to many alternative fuel or electric vehicles, which are only becoming more common in the future. Nevada is one of the national leaders in terms of studying the

---

<sup>4</sup> Metropolitan Las Vegas is unique nationally given the Clark County fuel revenue indexing program, which links the local gas tax to inflation. The special assessment will expire at the end of 2016, when it will rise to 10 cents per gallon.

potential application of a VMT fee but prospects for application in the near future are unknown (Baker, 2014). So far, VMT fees are only implemented in Oregon in a limited pilot that began earlier this year, and in Germany for use on trucks.

These new and traditional models are being considered at a time when policymakers at all levels work to alleviate the public's concern that taxpayers will bear the total costs of transportation improvements. Which is why the use of alternative financing approaches, such as public-private partnerships (PPPs), attract so much attention given their real ability to help spread risk and offer flexibility for public agencies, accelerating the completion of many infrastructure projects over time (Gatti, 2013).

While PPPs are neither a solution to all America's infrastructure challenges nor a corporate takeover of public assets, a well-executed PPP can be a valuable tool for attracting private sector capital and project expertise in order to move forward on priority projects. One type of public-private partnership, an asset lease, has the potential to provide significant upfront capital that can be used to fund a number of transportation priorities. However, these partnerships often require either new user fees or private collection of existing user fees (such as tolls) that provide a return on investment to the private partner. (Sabol and Puentes, 2014).

Another example on the local level is the creation of the Chicago Infrastructure Trust (CIT), a market-oriented institution that attracts private capital interested in steady returns and makes investment decisions based on merit and evidence rather than politics. Like California's I-Bank it cuts across different types of infrastructure such as transportation and telecommunications, and like Connecticut's Green Bank it emphasizes the generation, transmission, and adoption of alternative energy. The CIT will be capitalized through direct investments from private financing organizations some of which have expressed interest that could reach \$1 billion or more in total investment capacity.

On an even larger scale, the West Coast Infrastructure Exchange is building a pipeline of projects across infrastructure types for California, Oregon, Washington, and British Columbia by identifying and preparing assets for PPP procurement (Kim 2014). These are the types of markets where the private sector will devote its time and resources for the foreseeable future. Indeed, a new Intermountain Infrastructure Exchange was recently launched between Colorado, Utah, and Arizona (Hendee 2015).

An example of linking transportation planning with private sector resources is the expansion of transit-oriented development. This type of development, aided by careful and deliberate planning processes, gives cities and metropolitan areas the ability to promote more accessible transport options and complementary land uses. But it also reveals how additional value can be captured from these properties to fuel future infrastructure improvements. After all, investments in transportation infrastructure create value for land owners near the investment. So how can that value be captured to fund the investment in the first place?

The term for this—value capture—refers to a type of financing where non-transportation users, primarily adjacent property owners who benefit from transportation projects, contribute to the costs of such projects (Istrate and Levinson, 2011). It is often proposed as a way to use public taxing authority to help finance investment in transportation through taxes on nearby private development, in some ways mimicking the link between private rail transit and private land development a century ago.

The idea is that rail systems, by improving accessibility, will increase land values. The increment over any pre-existing property value can then be taxed, thereby “capturing” the benefit that accrues to private

landowners by virtue of the public rail investment and helping to defray rail construction or operating costs. Although the idea of value capture has been discussed in policy circles for years, it is employed in relatively few places and most prominently in the form of benefit assessment districts in metropolitan areas like Miami, Florida; and Los Angeles, California. (O'Sullivan, 2014).

For example, construction of a transit station is likely to increase land values in the walking radius near the area. The local government could choose to dedicate the taxes from the incremental increase in property values to repaying bonds issued for its construction, an approach known as tax increment financing (TIF). Alternatively, private property owners could choose to create a special tax district that would allocate costs of the project to beneficiaries. The \$7 billion Silver Line rail project in Northern Virginia was partially financed this way (Roukouni and others, 2014).

#### *Capturing Value in Public Assets: Virginia Air Rights*

As cities and states continue to look for sources of revenue, new efforts are emerging to capture the enormous value in the land the public sector already owns. Boston used this value capture technique to derive revenue from the Central Artery/Tunnel Project (the "Big Dig"). New York pursued a similar contract to build out a portion of the Barclay's Center in Brooklyn. Today, an idea in Arlington, Virginia, could literally pave the way for a new, economically integrated, model of air rights development.

The idea of pursuing a partnership on air rights came out of a drive to secure new revenues for the state. Fortunately, Virginia's Office of Transportation Public Private Partnerships (OTP3) already has a strong track record in negotiating a wide range of risk and capital sharing projects between the state and the private sector. Notably, OTP3 successfully negotiated the complex high occupancy toll lane project on Virginia's portion of the Washington beltway with a private partner, Transurban, as well as more than \$6.3 billion in other projects within the last two years. However, the air rights project required the state to fundamentally change the way it normally thinks about what it owns and controls, not just as a steward and a builder, but also as property owner and redevelopment partner.

An initial scan of the state's transportation assets surfaced a number of potential properties in dense urban areas. The most promising is above Interstate 66 in the Rosslyn area of Arlington. Directly across the Potomac River from Washington, D.C., Unfortunately, this center of business activity is isolated from the riverfront and the Capital by the busy urban freeway, limiting opportunities for Rosslyn's growth. Through an internal analysis, and in consultation with the real estate investment firm Jones Lang LaSalle, the state determined that it could potentially "create" over 10 acres of developable land, drive hundreds of millions of dollars in private sector investment, provide \$24 million in additional tax revenue for the county, and generate several million dollars a year in recurring revenue for the state. (Virginia OTP3, 2013).

#### **V. Conclusion**

Theory and practice have established a link between economic growth and transportation investments. However, the previous era of transformative, large-scale projects supported by a well-funded federal government is over. In its place, metro areas must take the lead on designing critical transportation projects, coordinating those investments with their land use plans, and locating the financial assets to move projects from blueprints to reality.

Lessons from across the country and world—from economic transformation in Seattle, to tourist-driven investments in Munich, to regional rail financing in Denver—confirm Las Vegas has the tools at its disposal to transform where its transportation network goes and the mobility options it provides through a 21st Century economic vision. If done well, the results are enviable: a more robust tourism industry, a more resilient economy, and improved economic opportunity for local residents. There’s no better time to make this vision real.

## REFERENCES

- Baker, Richard. "Vehicle Miles Traveled (VMT) Fees: Preliminary Report – Tasks 1 and 2." Study Report PRC 14-02-P. Texas A&M Transportation Institute (2014).
- Bavaria, Bavarian State Office for Statistics and Data Processing, Munich Tourism Statistics (2015).
- Been, Vicki and others. "Searching for the Right Spot: Minimum Parking Requirements and Housing Affordability in New York City." New York University Furman Center (2012).
- Boarnet, Marlon and others. "Retrofitting the Suburbs to Increase Walking: Evidence from a Land-Use-Travel Study." *Urban Studies* 46(1): 129–59 (2011).
- Brown, Stephen and Kylelar Maravich. "Funding Nevada's Roads and Highways." University of Nevada, Las Vegas, Center for Business and Economic Research (2013).
- Brueckner, Jan K. "Urban Sprawl: Diagnosis and Remedies." *International Regional Science Review* 23, no. 2: 160-171 (2000).
- Buehler, Ralph and John Pucher. "Making Public Transport Financially Sustainable." *Transport Policy* 18, no. 1: 126-138 (2011).
- Bureau of Labor Statistics. "Consumer Expenditures: 2014." (2015).
- Cervero, Robert and Michael Duncan. "Transit's Value-Added Effects: Light and Commuter Rail Services and Commercial Land Values." *Transportation Research Record* 1805: pp. 8-15 (2002).
- Cervero, Robert and Michael Duncan. "Which Reduces Vehicle Travel More: Jobs-Housing Balance or Retail Housing Mixing?" *Journal of the American Planning Association* 72(4): 475–90 (2006).
- City of Los Angeles. "Sustainable City pLAn." (2015).
- Clark, Greg and Tim Moonen. "Munich: A Globally Fluent Metropolitan Economy." Brookings Institution (2014).
- Dowling, Richard, et al. "Multimodal Level of Service Analysis for Urban Streets." National Cooperative Highway Research Program, Report 616 (2008).
- Downs, Anthony. *Still Stuck in Traffic: Coping with Peak-Hour Traffic Congestion*. Brookings Institution (2004).
- Eidlin, Eric. "The Worst of All Worlds: Los Angeles, California, and the Emerging Reality of Dense Sprawl." *Transportation Research Record* 1902:1–9 (2005).
- Ewing, Reid and Robert Cervero. "Travel and the Built Environment: A Meta-Analysis." *Journal of the American Planning Association* 76(3): 265–94 (2010).
- Federal Highway Administration, "Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance Report." (2013).
- Florida, Richard, *The Rise of the Creative Class, Revisited*. Basic Books (2012).
- Frey, William H. "Population Growth in Metro America since 1980: Putting the Volatile 2000s in Perspective." Brookings Institution (2012).
- Friedhoff, Alec and Siddharth Kulkarni. "Metro Monitor – July 2015." Brookings Institution (2015).
- Gatti, Stephano. *Project Finance in Theory and Practice, Second Edition: Designing, Structuring, and Financing Private and Public Projects*. Academic Press (2012).

- Geurs, Karst and Bert van Wee. "Accessibility Evaluation of Land-use and Transport Strategies: Review and Research Directions." *Journal of Transport Geography* 12, no. 2 (2004): 127-140.
- Gordon, Peter and Harry W. Richardson. "Are Compact Cities a Desirable Planning Goal?" *Journal of the American Planning Association* 63(1): 95–106 (1997).
- Fries, Thomas, Wim Naudé, and Marianne Matthee. "The Optimal Distance to Port for Exporting Firms." *Journal of Regional Science* 49(3): 513–28 (2009).
- Hansen, Walter. "How Accessibility Shapes Land Use." *Journal of American Institute of Planners* 25, no. 1: 73-76 (1959).
- HLB Decision Economics Inc. and KPMG LLP. "Public Policy Impacts on Freight Productivity: Final Report with Annotated Bibliography," prepared for Federal Highway Administration (1999).
- Hendee, Caitlin. "New Program Seeks to Address Infrastructure Needs in Colorado, the West." *Denver Business Journal* (November 15, 2015).
- Hook, Walter and others. "More Development for Your Transit Dollar: An Analysis of 21 North American Transit Corridors." Institute for Transportation and Development Policy (2013).
- Institute on Taxation and Economic Policy (ITEP). "How Long has it Been Since Your State Raised Its Gas Tax?" (2015).
- Istrate, Emilia and David M. Levinson, "Access for Value: Financing Transportation through Land Value Capture." Brookings Institution (2011).
- Jacobs, Jane. *The Death and Life of Great American Cities*. Vintage Books (1992).
- Kahn, Matthew E. and David M. Levinson. "Fix It First, Expand It Second, Reward It Third: A New Strategy for America's Highways." Brookings Institution (2011).
- Kane, Joseph and Robert Puentes. "Beyond Shovel-Ready: The Extent and Impact of U.S. Infrastructure Jobs." Brookings Institution (2014).
- Katz, Bruce and Jennifer Bradley. *The Metropolitan Revolution*. Brookings Institution Press (2013).
- Kim, Julie. "Public-Private Infrastructure Cooperative: New Infrastructure Financing Paradigm." *Transportation Research Record*. No. 2450 (2014).
- Kinsella, James and Brian Caulfield. "An Examination of the Quality and Ease of Use of Public Transport in Dublin from a Newcomer's Perspective." *Journal of Public Transportation*, no. 14(1), pp. 69–81 (2011).
- Kneebone, Elizabeth and Alan Berube. *Confronting Suburban Poverty in America*. Brookings Institution Press (2013).
- Kneebone, Elizabeth. "Job Sprawl Revisited: The Changing Geography of Metropolitan Employment." Brookings Institution (2009).
- Kroman, David. "On Election Night, a Big Win for Seattle Normal." *Crosscut* (November 4, 2015).
- Le-Klähn, Diem-Trinh, Regine Gerike, and C. Michael Hall. "Visitor Users vs. Non-Users of Public Transport: The Case of Munich, Germany." *Journal of Destination Marketing & Management*, no. 3, pp. 152-161 (2014).
- Lee, Jessica A. and others. "Cracking the Code on STEM: A People Strategy for Nevada's Economy." Brookings Institution (2014).



- Leinberger, Christopher. "Walkable Urbanism." *Urban Land*, September/October (2010).
- Levine, Jonathan. *Zoned Out: Regulation, Markets, and Choices in Transportation and Metropolitan Landuse*. Resources for the Future (2006).
- Litman, Todd. "Evaluating Accessibility for Transportation." Victoria: Victoria Transport Policy Institute (2011).
- McKenzie, Brian. "Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012." United States Census Bureau (2014).
- Muro, Mark and Bruce Katz. "The New "Cluster Moment": How Regional Innovation Clusters Can Foster the Next Economy." Brookings Institution (2010).
- Muro, Mark and Robert Puentes. "Investing in a Better Future: A Review of the Fiscal and Competitive Advantages of Smarter Growth Development Patterns." Brookings Institution (2004).
- National Research Council. "Key Transportation Indicators: Summary of a Workshop." The National Academies Press (2002).
- O'Sullivan, Katie. "Land Value Capture for Mass Transit Finance: Strengthening the Land Use – Transportation Connection." University at Albany-SUNY (2014).
- OECD/International Transportation Forum. *Long-Run Trends in Car Use*. ITF Round Table 152. Paris: OECD (2013).
- Owen, Andrew and David Levinson. "Access Across America Research Series." Center for Transportation Studies, University of Minnesota (2014).
- Parilla, Joseph and Alan Berube. "Metro Trade: Cities Return to Their Roots in the Global Economy." Brookings Institution (2012).
- Parilla, Joseph and Alan Berube. "Metro North America: Cities and Metros as Hubs of Advanced Industries and Integrated Goods Trade." Brookings Institution (2013).
- Parilla, Joseph and Others. "Global MetroMonitor 2014: An Uncertain Recovery." Brookings Institution (2015).
- Porter, Michael. "Location, Competition, and Economic Development: Local Clusters in a Global Economy." *Economic Development Quarterly* 14, no. 1 15-34 (2000).
- Puentes, Robert and Jennifer Thompson. "Banking on Infrastructure: Enhancing State Revolving Funds for Transportation." Brookings Institution (2012).
- Rode, Philipp and Graham Floater. "Accessibility in Cities: Transport and Urban Form." London School of Economics (2014).
- Roukouni, Anastasia and others. "Is VCF a Relevant Alternative for Financing Transport Infrastructure?" Scientific Cooperations International Workshops on Engineering Branches (2014).
- Sabol, Patrick and Robert Puentes. "Private Capital, Public Good: Drivers of Successful Infrastructure Public Private Partnerships." Brookings Institution (2014).
- Salvucci, Fred. "Accessibility and Transportation Funding" in *Urban Access for the 21st Century: Finance and Governance Models for Transport Infrastructure*. Routledge (2014).
- Seattle Department of Transportation. *Move Seattle*. (2015).

- Sharkey, Patrick. *Stuck in Place: Urban Neighborhoods and the End of Progress toward Racial Equality*. University of Chicago Press (2013).
- Shoup, Donald C. "The High Cost of Free Parking." *Journal of Planning Education and Research* 17: 3-20 (1997).
- Stoll, Michael A. "Job Sprawl and the Spatial Mismatch between Blacks and Jobs." Brookings Institution (2005).
- Suzuki, Hiroaki, Robert Cervero, and Kanako Iuchi. "Transforming Cities with Transit." World Bank (2013).
- Tomer, Adie. "Transit Access and Zero-Vehicle Households." Brookings Institution (2011).
- Tomer, Adie and others. "Missed Opportunity: Transit and Jobs in Metropolitan America." Brookings Institution (2011).
- Tomer, Adie and others. "Metro Freight: The Global Goods Trade that Moves Metro Economies." Brookings Institution (2013).
- UK Department for Transport. "The Eddington Transport Study." 2008.
- Virginia Office of Transportation Public Private Partnerships. "Air Right Development Project Request for Information Response Summary." (2013).