

Passenger Rail's Economic Duality: Why Rail Projects Are Expensive or You Get What You Pay For

By Rich Sampson

If you're a supporter of passenger rail of any kind in North America, you've surely had that moment. It might have just happened the other day. You glance at a headline or click on a link expecting the worst, and all your fears are instantly confirmed: the latest price tag for the rail project you're following has just skyrocketed. The sticker shock – usually involving the word billions – quickens your heart rate and your palms grow clammy – and you're one of the project's biggest defenders! How will the rest of the community take the news?

The dilemma of massively rising project costs is becoming a recurring concern for passenger rail advocates, community leaders and elected officials, with the survival of these projects at stake. The recent mayoral contest in Cincinnati was won by a candidate who [campaigned heavily](#) on cancelling the city's already under-construction streetcar line due to its rapidly rising costs. There are votes to win, funding to secure, public support to build, and billions upon billions are the antithesis of an easy sell. And it all comes down to a very simple, yet perplexing question: why is it so expensive to build passenger rail systems these days?



Starting At the Beginning

Much of America's transportation infrastructure legacy is tied to the course of the industrial revolution and immigration patterns of the late 19th and early 20th centuries. As factories and industries roared to life – and urban areas swelled with workers and their families to make them churn – new infrastructure was needed to move both the

people and goods necessary for the staggering economic output. Those massive projects – such as substantial rail transit networks in places like New York City, Boston, Chicago and Philadelphia – seemingly appeared overnight without much consternation at the time over of how much they cost. So, what's different between then and now?

Of course, the answer to that question is multifaceted, including cheap, available la-



bor, inexpensive materials, fewer legal hurdles and less bureaucracy. These legacy systems, too, were completed before cars even existed. The lure of steady employment and a better quality of life drew scores of immigrants to the United States throughout the industrial revolution. Competition for jobs among job seekers was intense. And what we would now consider extremely low wages were still far superior to pay available elsewhere around the world. That combination of competition for jobs and meaningful pay meant labor was available at very affordable rates. Benefits – such as health insurance and pension plans – were virtually non-existent for most workers. Construction of the original 9.1-mile, 28 station [Interborough Rapid Transit](#) (IRT) line of the New York City subway took the lives of 16 workers alone in 1902 and 1903. It cost \$60 million (\$1.4 billion today) to build. Today, the [Second Avenue Subway](#) project in New York is 8.5 miles long and is expected to cost \$17 billion.

At the same time, the sort of resources

needed for large infrastructure projects – materials like steel, concrete, copper – were plentiful and easy to secure. The rapidly-growing railroad network moved goods quickly and efficiently. Demand was skyrocketing, but so was supply. In 1900, the price of iron ore – required to manufacture steel – was \$20.80 per metric ton, according to [U.S. Geological Survey records](#). In 2013, a metric ton of iron ore [trades at \\$112](#) on the global market.

Lastly, while America's legal process has always been well-utilized, there were substantially less legal and regulatory barriers to advancing infrastructure projects. Elements such as environmental controls, occupational safety standards and property acquisition – among other aspects – were essentially unregulated during the late 1800s and early 1900s. Along the same lines, judicial branches were less accommodating to private and corporate lawsuits that threatened project development. That lack of an overarching procedural atmosphere produced an infrastructure production climate that allowed projects to move quickly from concept to reality.

“We used to excessively use eminent domain – especially in the Interstate Highway System era of the 1950s and ‘60s – but we don't do that anymore, and for good reason,” says Joshua L. Schank, President & CEO of the [Eno Center for Transportation](#), a neutral, non-partisan think-tank that promotes policy innovation in the transportation industry. “The bad news is higher project costs because we treat people fairly.”

While the historical context of industrial-era

infrastructure development might only provide rough parallels for today's labor, resources and procedural environments, understanding those lessons are essential in responding to our contemporary challenges. Needless to say, that the bulk of the difference between then and now correlates with substantially superior quality of life for workers, vastly improved environmental protection and important legal safeguards to protect individual rights. At the same time, all these byproducts of our society's success have nonetheless increased the timeframes and budgets associated with infrastructure projects and to massive degrees.

A Passenger Rail Project Chronology

Let's take a hypothetical look at how a passenger rail project unfolds in this contemporary atmosphere. At some point, some person, group or entity proposes a new passenger rail project. Hopefully that has occurred in response to some sort of needs assessment or projections of future growth. If so, those processes require investment to produce meaningful and technical studies, starting the calculator on the aggregate project cost. A recent [statewide rail plan in Colorado](#) came in at \$782,000.

From there, a community involvement effort begins. Meetings are held in community halls, libraries and boardrooms, gathering input – inclusively – and guidance from the community and key stakeholders. Money is spent securing meeting space, printing maps and

flyers and promoting the events. Feedback from that outreach is sent along to planners, whether they're located in-house at a public entity like a transit agency or metropolitan planning organization or an outside consultant. Sometimes those people are both in-house planners and outside consultants. Those planners are paid salaries or awarded contracts for their work, which often takes several years. The project cost keeps rising.

"Involving consultants, no doubt, increases the cost of project planning, but the entire process has also become too complicated," says a consultant currently involved with a large project in the western U.S., who points to the federal [New Starts program](#) as particularly cumbersome. "Many communities don't have the latent capacity to orchestrate a massive project, so they turn to consultants for their expertise." To be sure, beginning in the 1950s, inexpensive, off-the-shelf passenger rail expertise began to dwindle as new rail construction ground to a halt.

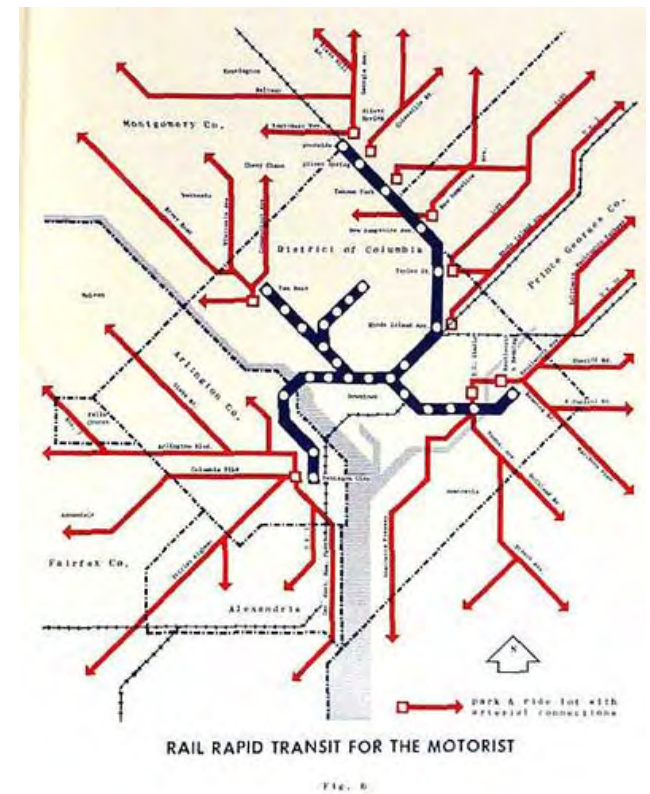
After the planners devise their initial plans, they fall into several stages required by the [National Environmental Planning Act of 1969](#) (NEPA), comprised of alternatives analysis, draft and final environmental impact assessments and preliminary and final engineering. To be clear, the NEPA process is a vitally-needed safeguard to not only protect environmentally-sensitive areas and wildlife, but also mandates a deliberate process for community engagement and cultivation of public and political support. Throughout all these stages, community input is required and fund-

ing discussions begin with federal, state and/or local elected leaders and public officials. The process is long (anywhere from 5 - 10 years), cumbersome (more staff time and consultants) and expensive (sometimes running tens of millions of dollars). Most rail projects have easily exceeded a million dollars at this point, before any property has been purchased or tracks have been laid. An [environmental impact study](#) jointly conducted by the Federal Railroad Administration and the Arizona Department of Transportation on linking Phoenix and Tucson with intercity passenger rail service ran a cool \$2 million in 2008.

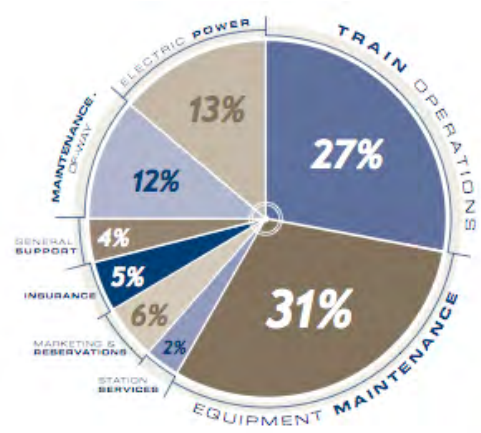
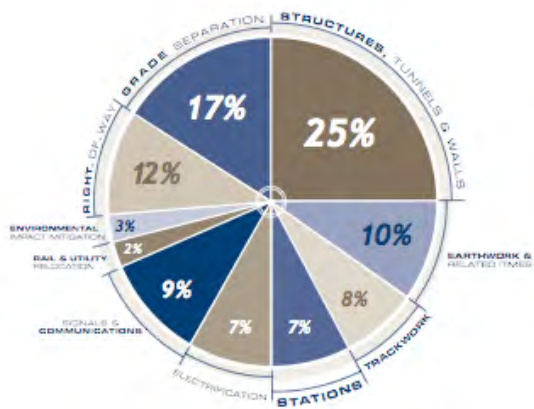
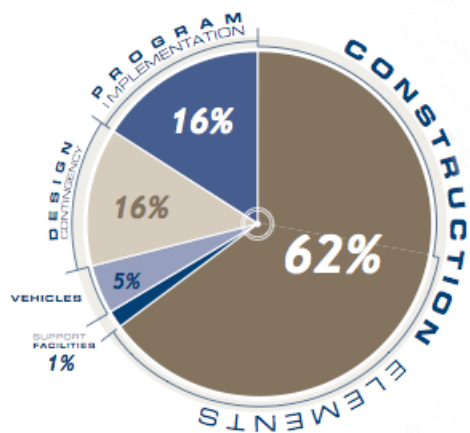
Bart Reed, Executive Director of [The Transit Coalition](#) - which advocates for better transit options in Southern California - notes the substantial impact that people who live near proposed projects, or *Not In My Back Yard* (NIMBYs) opponents, can have on driving up project costs through the planning process.

"Neighborhood opponents could request additional mitigation that was unheard of when a project was first conceived," says Reed. "NIMBYs in particular use such efforts in an attempt to stop a project outright, not necessarily to make the project interact better with the community. In an attempt to address or at least placate NIMBY concerns, the agency in charge of building a rail project may have to build ancillary projects that can easily drive up the original project's costs."

Assuming the planning process has satisfied all the regulatory requirements, attracted requisite levels of community and political support and attracted investment sources, it's



finally time to solicit bids to actually build the project. Contracting firms - or, more likely, teams of contractors - submit extensive proposals, requiring more time and money to assess. Ultimately, one firm or group is selected to construct the infrastructure. Hopefully by that point, the public entity in charge of the project has assembled all the real estate, property and alignments necessary in the rail corridor, undoubtably adding millions to the price tag. Land acquisition costs for the [Honolulu Authority for Rapid Transportation](#) (HART) heavy rail project were pegged at \$129 million in 2009 dollars. Surely now we're ready for tracks to be laid and sta-



tions to be built. Not quite. Before any track beds are graded, there's often scores of utility nodes – such as electric cables, gas lines, sewers – that need to be relocated to make way for the rail line. Once again, this is not accomplished quickly or cheaply. For instance, recent estimates for utility relocation work in downtown Los Angeles to introduce the city's first [streetcar line](#) in more than a half century have [grown to \\$166 million](#). Contrast this with the building of underground rail systems, which had far fewer such relocations.

In some communities, even the initiation of construction isn't enough to hold-off determined opponents of projects. Election outcomes, delays in the process or well-organization opposition groups can all threaten projects already in motion, which can produce real cost consequences. The implications of Cincinnati's election of incoming Mayor-Elect John Cranley could mean Cincinnati may not only lose federal investment currently flowing to the streetcar project, but also be [required to reimburse](#) federal coffers for funds already spent on construction and implementation. In Hawaii, the refusal of former Governor Linda Lingle to certify the HART project's final environmental impact statement [may have ultimately increased its final price tag](#) by \$129 million. Lingle – a staunch opponent of the HART project – was succeeded by Neil Abercrombie, a supporter of the currently under-construction rail system.

It's not enough for a passenger rail project to win at the ballot box once, or even twice. Opponents often muster continuous opposi-

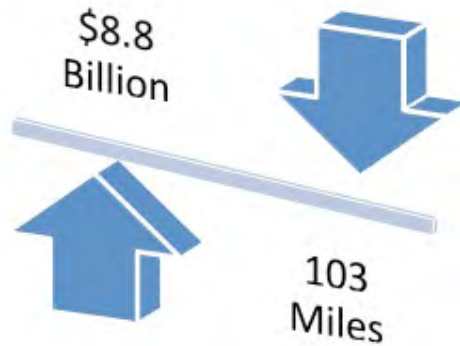
tion, spanning decades and only needing to win with voters once. These continuous campaigns also raise costs.

The number of specialists needed to shepherd a passenger rail project from the outset just to the point of construction beginning is staggering. Each project requires numerous technical specialists – everything from noise abatement experts to community support firms – that simply were not needed a century ago. The costs associated with these specialists are impossible to ignore.

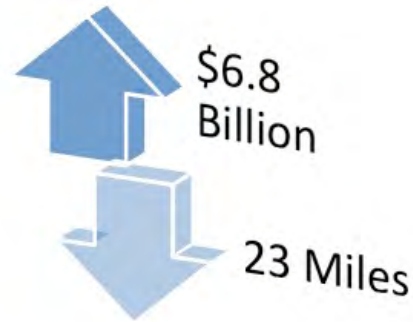
Alright, it's finally time to begin honest-to-goodness construction. The contractor hires labor – often required by state law to be unionized workers – purchases materials like steel, stone and concrete, brings in heavy equipment and the rail line starts to emerge. Here's where the millions and billions really pile up. Meanwhile, the public entity has led the process to secure rolling stock to provide the service – things like railcars and locomotives. Nearly all passenger rail vehicles come with a sticker price of a million dollars each, often substantially more – although there is great value in large-volume orders. This effort also requires its own planning, engineering, bidding and contracting process, adding more time and expense. The current total cost for the [California High-Speed Rail network](#) – by far the most substantial passenger rail project in North America – stands at \$91.4 billion, including all construction, materials and equipment costs.

After a period of several years of hard work – involving negative impacts to local

Original Washington Metrorail System (1969 – 2001)



Silver Line Metrorail Project (under construction)



transportation networks, business communities and environmentally-sensitive areas, all of which require costly financial remediation – it's almost time to begin service on the new line. But before that can happen, thorough testing is required to ensure the new infrastructure is safe and operating efficiently. At the same time, the larger community needs to be informed of exactly how the service will function and marketing efforts are engaged to attract riders. Fortunately, by this point the bulk of the project's budget has been spent and the promise of the new rail line begins to generate optimism as bulldozers and cranes retreat and life returns to normal.

The Cost of Borrowing Money

Beyond the costs identified in each individual budget line, there's a less concrete – but just as important – factor in how much investment is needed for a given passenger rail project: the cost of borrowing money. Rarely does a community have large vaults of capital

ready to cover the entire financial outlay of a multi-year, multi-million dollar project. Even if dedicated funding sources are available, they're usually based on several years of revenue collection while money is needed to pay workers and purchase materials immediately. So, communities leverage that future revenue against immediate streams of capital from borrowed sources, most often in the form of municipal bonds.

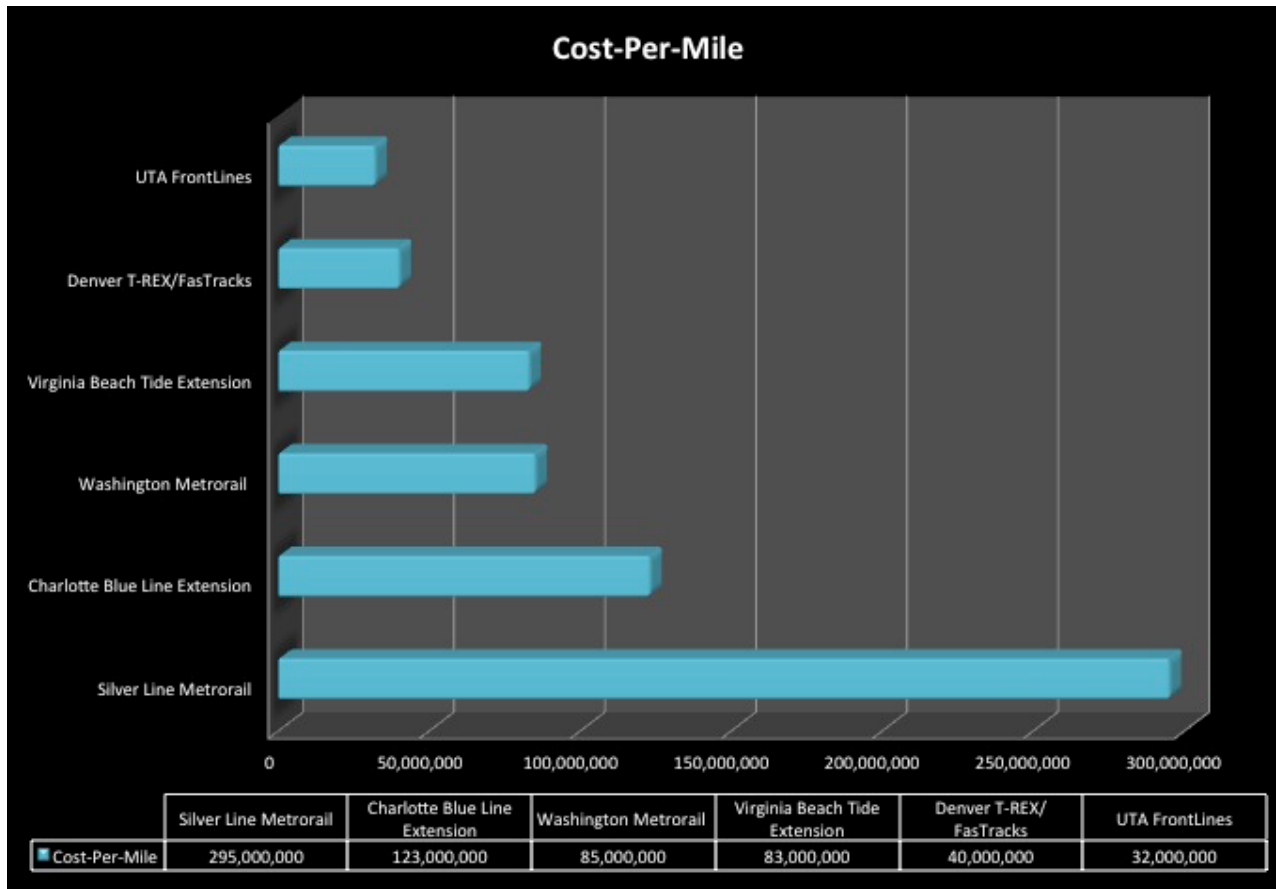
A variety of aspects determine how much interest accompanies a given bond portfolio, including the municipality's credit rating, the extent to which it's already released bonds for other activities and the degree of outside investment from other sources, such as federal or state funds, or private-sector involvement. While municipal bonds reliably deliver the investment level stipulated and agreed-upon returns to bond holders, there is nonetheless a very real cost of realizing that investment in the form of interest rates that, while certainly lower than those available through private lenders, contribute in substantial ways to the

overall cost of a rail project. In 2012, the two-year passage of surface transportation law – MAP-21 – cost passenger rail projects significant resources because, due to only having two years of guaranteed federal funds, interest levels were raised.

It's important to note that passenger rail project budgets aren't always necessarily growing," says Kevin Brubaker, Deputy Director of the [Environmental Law & Policy Center](#), focused on protecting the natural environment – particularly in the Midwest – through sound public policy decisions. "Take the California high-speed rail project. While cost estimates have varied tremendously as plans have changed, when it came to actually putting the project out to bid, the bids came back significantly below what was expected."

Should We Build More to Save More?

As outlined above, there's no shortage of elements that combine to form significant expenditures for passenger rail projects. Moreover, several of those aspects are borne by larger societal questions – outcomes of elections, the role of unionized labor, legal protections for property and the environment – that are beyond the control of project champions and planners. In that context, it's incumbent on those advocating new or expanded rail networks to deliver the greatest return on investment. The experience shared by North American passenger rail projects throughout the history of the industry suggests the secret to greatest utility in public investments is when they're as large as pos-



than the original system, with the Silver Line reaching costs of more than \$295 million per mile while the original network averaging \$85 million per mile. What then explains the escalating cost? After all, the Silver Line is significantly a less invasive effort than the 103-mile system, with far less subway tunneling necessary and nearly all the property necessary already available on, above or below the Dulles Toll Road and other local roadways.

The clue to the Silver Line's higher costs likely lies within an economic truism apparent to any value-conscious consumer: its customarily cheaper to buy in bulk. When the original network was under construction, crews were assembled for long periods of time and the productivity of the construction apparatus was higher due to familiarity and repetition. Materials – ranging from rail to station platform paving tiles – were purchased at once to realize cost savings. A larger railcar fleet was ordered for the larger network, while a smaller order for new Silver Line cars makes each railcar more expensive.

Although the phenomenon of greater cost savings from a larger project scope is best illustrated through differences in the Washington area's Metrorail network, other recent examples also demonstrate the fiscal value of expansive systems rather than individual lines. In recent years, places like Denver, Dallas-Ft. Worth and Salt Lake City have all added or are adding multi-line expansions to their light-rail and commuter rail networks utilizing dedicated, long-term sources of local funds to maximize the project delivery

sible, maximizing economies of scale.

One metropolitan region, in particular, demonstrates the veracity of this concept. From 1969 through 2001, the Metrorail system was constructed to connect the region in and around the nation's capital of Washington, D.C. The original [103-mile system cost a total of \\$8.8 billion](#) in today's dollars. Certainly, that's a lot of money. However, the network – currently the second-busiest rail system in the United States, carrying more than 790,000 daily riders – looks like an absolute bargain

when compared to the costs required for an extension of the system currently under construction in Northern Virginia.

The [Silver Line](#) will add an additional 23 miles and 11 stations to the network in two phases, the first opening linking the existing East Falls Church station with Tysons Corner and Reston in early 2014 and the second reaching Herndon, Dulles International Airport and Loudon County by 2018. It also carries a [price tag of \\$6.8 billion](#), making the Silver Line 3.4 times more expensive per-mile

process while also realizing substantial systems in shorter timeframes. In Salt Lake City, three new TRAX light-rail lines along with an extension of FrontRunner commuter rail service to Provo added more 70 miles to the [Utah Transit Authority's rail network](#) at only \$32 million per mile. Similarly, the successive [T-REX](#) and [FasTracks](#) capital expansion programs in the Denver area will be responsible for growing the region's rail transit network through 139 miles of new light-rail and commuter rail lines for \$40 million per mile, less than half the cost of the Silver Line's per-mile rate. Additionally, in both Utah and Colorado, rail lines already completed under their respective programs have come in ahead of schedule and under budget. The recent defeat of Measure J in Los Angeles – intended to speed-up investment for long-range transportation projects – underscores the need for regional elected officials and transit leaders to work together to emphasize the value of strategic infrastructure programs (*to learn more about Measure J, see [page 27](#) – ed*).

“It's important to note that in both the Denver and Salt Lake City regions, there was a conscious decision by voters to expand their transit networks with dedicated investment,” says the Eno Center's Schank. “As a result, they're able to leverage economies of scale for more effective investments.”

Conversely, recent estimates for an [extension of Norfolk's existing Tide light-rail line to downtown Virginia Beach](#) – an approximate distance of 12 miles – have suggested the project's cost could top \$1 billion, aver-

aging \$83 million per mile. That projection is even more substantial when considering it does not include the value of the former freight rail right-of-way already purchased by Virginia Beach in advance of the project. Likewise, a [9.4-mile expansion of Charlotte's Blue Line LYNX light rail](#) will total \$1.16 billion, or \$123 million per mile. Other single-route projects fall within a similar range.

Nonetheless, there are mechanisms available to help projects both large and small in scope better contain costs.

“Agencies should have in place cost containment programs, especially ways to address disputes between agencies and builders that can stave off increases in materials, labor and litigation costs,” says The Transit Coalition's Reed.

Most crucial – according to the consultant

we spoke to currently out in the field – is the need for strong, proactive political leadership to shepherd a project from vision to reality.

“Political will has the most impact on how quickly and effectively a given project moves forward,” says the consultant. “If everyone from elected officials to community leaders to the business community is united – often by a charismatic figure to serve as its champion – projects take on an entirely different relationship with the community, one that leads to approval at the ballot box and reaffirmation throughout the process.”

Perspective Is Essential

In contemporary times, the costs of passenger rail projects seem to receive levels of scrutiny outsized to other projects of similar



scope, hardly a level playing field for significant infrastructure investments. Indeed, the nation's Interstate Highway System – often considered the most effective transportation project in history – was initially projected to cost \$27 billion. Thirty years after the first segment opened, the total capital cost exceeded \$200 billion. As a result, a healthy dose of perspective is always needed when confronting substantial passenger rail project budgets.

Communications, public image and project narrative are important components in developing the proper local perspective on a large-scale passenger rail project. Supportive elected officials, local rail leaders and project advocates must keep the public eye not only on the cost of these projects – but on the significant local economic impact. Who will it serve? How? Once this project narrative becomes solely focused on cost alone, public image invariably suffers. Expert, strategic communications strategies are crucial.

At the same time, the benefits side of same cost-benefit analysis that so many rail detractors emphasize is often marginalized at best and ignored at worst. To be fair, this is inherent in the premise of the calculus: costs require investment immediately, while benefits accrue over a much longer timeframe. Nonetheless, the cost of not acting is seldom given a full hearing in the deliberative process, which is startling considering the impacts are measured in billions of dollars and across hundreds of years.

“The important point of all this is that high costs are not just relegated to passenger rail projects,” says Reed. “Highway, aviation,



SUN small urban network

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freight and intercity passenger rail, maritime and pipeline projects require billions of dollars on an individual project basis. The truth is that any project that intends to improve transport in a significant and meaningful

fashion will cost well into the billions today. In transportation – as in life – you get what you pay for.” 