The Emerging U.S. Rail Industry: Opportunities to support American manufacturing and spur regional development

This paper examines the current state of the U.S. rail transit industry along with its manufacturing supply chain and provides recommendations about potential changes for policy makers and NIST MEP to consider. These recommendations are the opinions of the authors and are based upon the data and information collected and analyzed in the conduct of this study. The views expressed in the paper are those of the authors and do not necessarily represent the views or recommendations of the National Institute of Standards and Technology.

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Executive Summary

A number of factors have come together to heighten the importance of rail transit to the U. S. economy. These same factors present new opportunities for domestic manufacturers of rail cars and equipment to benefit, however, historical and structural barriers to seizing these opportunities exist. In brief, the scenario can be described as follows:

Rail ridership is strong and growing. Amtrak enjoyed its strongest year since its inception with ridership growing to 31.2 million passengers in Fiscal Year 2012, a 3.5% increase over the previous year, with July 2012 representing the single best month in Amtrak history. Overall ridership on commuter, light and heavy rail grew by 72% over the period from 1995 to 2008 and U.S. cities have added 29 new light rail and 20 new commuter rail systems in the last three decades.

Demand has led to new investment. In recent years Federal investments in rail passenger cars and locomotives have totaled several billion dollars. Efficiencies built into procurement policies for programs such as the High-Speed Intercity Passenger Rail initiative and implementation of the Next Generation Corridor Equipment Pool Committee hold promise for continuing Federal awards. There have been parallel investments at the state level, for example, California's investment of $8 billion to develop America's first high speed corridor.

These factors create opportunities for U.S. rail manufacturing, but challenges exist. Consistent with provisions in the American Reinvestment and Recovery Act (ARRA), and previous legislation, these recent rail procurements contain "Buy America" provisions that require the use of goods manufactured in the United States. Currently, however, most rail equipment manufacturers are foreign-owned and limit U.S. activities to some final assembly work. Decades of limited business opportunities in rail manufacturing have created significant gaps in both the capability and capacity of the domestic rail supply chain.

Innovation and intelligent investment can help capitalize on these opportunities. Public agencies, as the primary buyers of new rail cars and equipment, can use their power as "smart buyers" to support demand driven innovation strategies. Looking to tap unutilized capacity in the existing manufacturing sector through supplier scouting efforts, investing in supply chain connectivity, and leveraging ongoing efforts to develop a more competitive manufacturing workforce can all aid the domestic rail industry's competitiveness. Examples from overseas present a variety of strategies that can accomplish these goals.

Networking supply chains, such as the Supplier Scouting work of the Manufacturing Extension Partnership program, represents a promising practice. The Hollings Manufacturing Extension Partnership (MEP) program, housed at the National Institute of Standards and Technology, has utilized its network of 60 MEP centers around the country to develop business intelligence on rail transit supply chain needs. These centers can rapidly reach out to their network of tens of thousands of small and mid-sized manufacturers to meet emerging needs for domestic suppliers. A full description of the effort is included.

Rail manufacturing has potential as a driver of regional economic development. By combining top-down policies with a bottom-up approaches to viewing rail manufacturing as an economic development strategy communities and regions could generate significant synergies. Investments in rail infrastructure reduce costs and pollution while increasing efficiency of transportation, access to goods, and career options. Helping local manufacturers capitalize on the business opportunities represented by such investments would build on manufacturing's strong multiplier effect and ripple these benefits out into the region in the form of new jobs, more dynamic businesses, and a prosperous and diverse local economy.

This paper explores each of these areas in detail and makes recommendations to policy makers on how they might best support a strong and growing domestic supply chain for the rail transit industry.

1.0 Introduction

After decades of negative headlines, American manufacturers are enjoying some positive news. Media stories herald the "renaissance" of American manufacturing, with think tanks, business consultants and communities devising strategies for the reshoring of American manufacturing jobs.

Capitalizing on the potential for an American manufacturing renaissance requires a host of investments and policy reforms to help build a more competitive innovation ecosystem for American manufacturers.[1] This shift also requires a forward looking mindset that seeks to identify emerging market opportunities for both existing and new American manufacturing firms. It is not enough to simply recapture markets or contracts lost to foreign competition. American manufacturers must also develop new capacities to capture new market opportunities.

The list of these potential new markets is sizable. The President's Council of Advisors on Science and Technology (PCAST) has identified eleven emerging growth sectors in fields such as additive manufacturing, nanomanufacturing, and industrial robots. Critical investments in these emerging sectors are essential, but opportunities also exist in numerous existing industries and sectors. Rail transportation falls into this latter category, and has been identified by many leading experts as a sector with great growth potential for new jobs, new innovations, and new business opportunities. For example, the Apollo Alliance's 2010 Transportation Manufacturing Action Plan projected that new investment programs in transit and inter-city passenger rail could create as many as 600,000 new manufacturing jobs.[2]

Communities across the US are hoping to capitalize on these opportunities---as a means to spur new manufacturing jobs and to address pressing transportation concerns. Over the past few years, regions across the U.S. have expressed growing interest in developing passenger rail as a core part of their local transportation systems and infrastructure. This growing interest stems from multiple factors, including frustration with traffic congestion, increasing demand for a wider variety of transportation choices, and concern about climate change. In the late 2000s, these trends were accelerated by the Obama Administration's major investments in High Speed Rail (HSR) and other next generation rail and transit projects. While funding is not yet stable or certain, the basic market fundamentals that are driving the expansion of U.S. passenger rail remain in place.

Advocates for expanded rail investment make a compelling social and economic case. They note that passenger rail projects help reduce congestion, ease the movement of goods and people, and help create other economic spin-offs. They note, but often fail to emphasize, that expanded U.S. rail infrastructure also offers tremendous opportunities for American manufacturers.

New rail projects require new locomotives and rail cars, new equipment, new orders of iron and steel and new infrastructure. Where possible, all of these innovative products, services, and technologies can and should be supplied by American manufacturers. These new market opportunities can generate new economic development opportunities in communities across the U.S.

This rail renaissance offers an opportunity to rebuild the U.S. rail industry—a global leader for much of the 20th century, but a neglected and declining sector since the 1970s. Rail manufacturing is a big U.S. employer today, providing jobs for roughly 90,000 workers. Yet, it is difficult to speak of a cohesive and organized U.S. rail manufacturing industry. Most major original equipment manufacturers (OEMs) and leading suppliers are foreign-owned. They perform final assembly and conduct some manufacturing in the U.S., but their high-value activities and most of their market focus is devoted to larger overseas markets. Meanwhile, because major rail procurements have been so rare, smaller

[1] For recent recommendations, see the President's Council of Advisors on Science and Technology, Report to the President on Capturing Domestic Competitive Advantage in Advanced Manufacturing, Washington, DC: Executive Office of the President, July 2012.

[2] Apollo Alliance, Make it in America: The Apollo Clean Transportation Manufacturing Action Plan, San Francisco: Apollo Alliance, 2010.

manufacturers of key components such as castings, parts, and wiring have understandably focused on other markets such as aerospace and the automobile industry.

Given these dynamics, it is unlikely that a strong U.S. rail manufacturing industrial base will emerge on its own or through market-driven behaviors. Key federal, state and local agencies should act to spur the development of stronger supply chain connections and capacities. As the primary buyers of new rail cars and equipment, public sector agencies can use their power as "smart buyers" to support new demand-driven innovation strategies. They can invest in R&D and pro-actively build closer connections within the rail supply chain. These agencies can also leverage existing programs and investments to develop a more competitive manufacturing workforce. Efforts to develop new training tools and strengthen occupations that are core to manufacturing will aid the rail industry's competitiveness.

As these efforts move forward, rail manufacturing can become a core focus of local economic development efforts. Investments in rail infrastructure are widely recognized as drivers of local economies. New rail stations spur real estate development, and improved mobility makes it easier and cheaper to move people and goods. The creation of new manufacturing jobs and stronger manufacturing clusters are an added and less well-understood part of the economic benefits generated by new rail transportation investments.

These suggested activities are not completely new in concept or practice. The current U.S. rail supply chain has benefited greatly from "Buy America" rules (dating back to the original 1933 Buy American Act of 1933[3]) that have required foreign original equipment manufacturers (OEMs) to manufacture in America and use American suppliers. These rules provide important guidelines, but the U.S. rail supply chain still contains many gaps. Addressing these gaps is one part of the mission of the National Institute of Standards and Technology Manufacturing Extension Partnership's (NIST MEP) Supplier Scouting Initiative. This effort links OEMs with new American suppliers who are identified via NIST MEP's national network of more than 1,200 field staff working with 30,000 plus American manufacturers each year. Supplier Scouting and its related programs generate numerous benefits: connecting OEMs to world-class suppliers; providing new business opportunities for small and medium-sized manufacturers; creating and retaining domestic jobs; and providing superior products, services and technologies to the rail industry and to transportation agencies at the federal, state, and local level.

This effort to rebuild America's rail industry offers a potential model that could be replicated in other industries across the U.S. This paper assesses the results of this work to date. It begins with an assessment of the U.S. manufactured rail industry, its challenges, and potential growth opportunities. It next turns to an assessment of the current policy environment surrounding rail manufacturing and the rail industry more generally. In general, American policy makers seem to operate with a very limited tool kit, especially in comparison to their overseas colleagues. Funding is tight, and programs to support rail manufacturing are quite limited. As a result, the potential for new rail manufacturing jobs is not well understood at the state and local levels. Very few economic and workforce development organizations target this industry. In fact, there is only one U.S. cluster organization with a focus on rail— the Long Island Forum for Technology's (LIFT) Rail Alliance. And, in this case, the LIFT Rail Alliance, based at a local MEP Center, has just begun operations. Meanwhile, dozens of such groups operate overseas, helping to create new jobs and new business opportunities.

The paper concludes with a series of recommendations on effective policies for strengthening the U.S. rail manufacturing supply chain and for utilizing these approaches in other sectors as well. We offer recommendations for key players at the federal, state, and local level. These include expanding R&D funding, developing local cluster initiatives focused on rail manufacturing, and expanding efforts to create stronger linkages between existing rail industry leaders and other manufacturing sectors. These efforts will not only spur a rail renaissance, but they can also be part of more comprehensive effort to rebuild America's manufacturing base.

[3] For background, see Apollo Alliance, "Buy American: Transportation Manufacturing and Domestic Content Requirements," May 2010.

2.0
The Rise and Fall of the U.S. Manufactured Rail Industry

Once a Global Leader

In the early 20th century, the United States boasted a passenger rail network that supported a thriving manufacturing sector responsible for supplying cars, equipment and maintenance to intercity rail and urban transit networks across the country. In fact, during the 1930s and 1940s, U.S. intercity passenger trains were leading the world in terms of innovations, miles of track, and speed. Inventions such as diesel-electric locomotives, lightweight cars, improved wheel sets, and reliable braking systems positioned U.S. manufacturers at the cutting edge of train travel. In 1934 Budd Manufacturing Co. created the Zephyr, a U.S. diesel-powered train that broke the world speed record traveling from Denver to Chicago at 77 miles per hour. The U.S. was poised to dominate the global rail industry.[4]

This competitive advantage quickly eroded after World War II as the automobile captured the American imagination, and people moved out of denser, more transit-friendly cities and regions. In 1956, the Federal Aid Highway Act expedited this process, dramatically shifting federal infrastructure spending to almost exclusively support highways, the private automobile industry, and a burgeoning air transport sector. The U.S. climbed to become a world leader in automobile and parts production, but, in the process, neglected key investments to build a diversified, multi-modal transportation economy. Over the next few decades, the automobile ruled, and by 1971, less than a fifth of the daily intercity trains that operated in 1954 remained in service.[5] In the 1980s, iconic rail manufacturers Budd Manufacturing Co. and Pullman-Standard closed their doors. Come the 1990s, U.S. passenger rail was a poster child for a forsaken sector of the U.S. economy, with a hollowed out passenger rail equipment supply chain, an inability to keep up with innovation, and aging rolling stock that traveled at slower speeds than their predecessors of 100 years earlier.[6]

The current rail manufacturing industry, especially firms at the lower tiers of the supply chain, has survived by

partnering with large foreign OEMs and by aggressively pursuing contract opportunities in transit and other transportation markets. The presence of stringent Buy America rules, requiring that at least 60 percent of the value of the subcomponents of transit vehicles and equipment be produced in the U.S., and that final assembly also occur here, have been noted as key lifelines for the industry. Without these rules, much of the existing U.S. rail manufacturing infrastructure would have likely disappeared.[7]

[4] Reuter, M. The Lost Promise of the American Railroad. The Wilson Quarterly, January 1994.
[5] Reuter, M. How America Led and Lost the High Speed Rail Race, ProgressiveFix.com, March 31 2010.
[6] Renner, M. and Gardner, G. Global Competitiveness in the rail and Transit Industry (Washington D.C.: WorldWatch Institute, 2010)
[7] Joan Fitzgerald, et al., Reviving the U.S. Rail and Transit Industry: Investments and Job Creation, (Washington D.C.: WorldWatch Institute, 2010), p. 13.

The Rise of Foreign Leadership

As the U.S. increasingly and almost exclusively focused on the automobile, other countries boosted their investment and support for the rail industry. France and Japan quickly used technologies developed originally in the United States to build faster electric trains, including the speed-breaking "bullet train" between Tokyo and Osaka in 1964. Over the next five decades, Europe and Japan consistently increased their commitments to rail with direct investments and policies to increase demand and major infusions of capital for new rail infrastructure. In the past decade, emerging market nations, such as the BRICS countries (Brazil, Russia, India, China and South Africa) and others, have followed suit, taking advantage of a domestic market created by a growing middle class and workforce that needs to move quickly, making investments that far surpass any in the U.S. Today's largest rail equipment manufacturers are therefore not American. They are Alstom (France), Bombardier (Canada), CSR and CNR (China), Siemens (Germany), and Kawasaki (Japan). Close behind them are CAF and Talgo (Spain), Transmashholding (Russia), Ansaldo-Breda (Italy), and Hyundai Rotem (South Korea).[8]

The rise to prominence by these foreign companies can be attributed to two factors—both of which are notably absent in the U.S. rail industry: substantial and sustained investment, aligned with forward-thinking public policy and planning. These strategies have succeeded in systems with vastly different political environments, governance structures, and industry dynamics. In Europe, the EU has implemented strong policies that harmonize national rail systems, align travel speeds and safety requirements, coordinate operations and management, and incentivize collaborative R&D efforts. Different EU nations have used differing investment approaches. For example, Germany has utilized revenue sharing between the Federal government and state governments. In Spain, a national development plan had guided investments. In Asia, strong industrial policies that emphasize R&D have created a rail manufacturing industry that was virtually non-existent in places like China and South Korea. On both continents, consistent private and public investment to support demand and supply have played a key role in growth. Instructive examples of success from each continent are highlighted here.

Lessons from Europe

Germany pioneered the integration of intercity rail and urban transit systems, largely by giving greater responsibility to states, and by creating a revenue sharing formula derived from federal crude oil taxes. As a result, riders easily transfer across regional lines and into urban transit. Finland, France, Italy, the Netherlands, and Spain are replicating this model. The number of riders in Germany has grown by 50 percent over the last decade. Despite having an extensive rail system, the Germans are relatively frugal when it comes to rail infrastructure, spending only $1.50 per $1,000 of GDP.[9] This level falls far below other developed economies, such as France (about 40% less), Spain (50% less) and China (200% less). However, this investment is massive in U.S. terms, with German rail infrastructure spending totals twice as high as the U.S. spends on all public transit infrastructures.

During the nineties, Spain was especially aggressive and launched the largest high speed rail construction effort in Europe. As Spain sought to harmonize its rail network with EU standards, it found huge variations across local areas in infrastructure quality, levels of traffic, harmonization with urban development, and integration of independent rail systems. To address this, the Spanish government in 2004 created a 15-year strategic plan for infrastructure and transportation. The plan (called PEIT – Plan Estrategico de Infraestructuras y Transporte) is a national development strategy that seeks to integrate rail with other transportation systems, to ensure underserved regions have high quality access to rail, and to adopt and apply the latest rail technologies to existing and new lines. Remarkably, the PEIT is funded by a public-private partnership with rail construction and financial institutions. The investment gave tremendous advantage to Spain's manufacturers in every sector of rail, including design, construction, and equipment related to signaling, ticketing, and operations. By 2010, six of the top ten transportation manufacturing companies in the world were Spanish. These companies have seen a fivefold increase in business since 2004; one estimate puts job creation in the Spanish rail manufacturing sector between 2005 and 2010 as high as 600,000.[10]

[08] Renner and Gardner.
[09] Ibid, p. 11.
[10] Ibid.

Lessons from Asia

Japan has long led the world in HSR. Its trains carry more than 300 million passengers annually, the highest HSR ridership in the world. Japan's relatively small size and high urban density have helped spur heavy HSR use, but the rail network also benefits from an integrated track and signaling system, a nearly flawless safety and on-time arrival record, far-reaching geographic coverage, and competitiveness with air travel speeds. Until 1987, the national government funded all rail construction. Today it covers two-thirds of the cost of non-HSR construction. Local governments cover the remaining third. Railroads are then sold to private operating companies to regenerate funds. HSR lines are funded by lease agreements, and therefore receive no public subsidies.

In contrast, China and South Korea both heavily subsidize large-scale rail investments, creating high demand and millions of domestic jobs. But beyond large public investments, these countries are also highly strategic in terms of technology acquisition and rapid localization of production. For example, Alstom provided South Korea with its first twelve HSR trains, but it also agreed to a technology transfer agreement that led Hyundai Rotem to produce the next 34 trains in Korea, using 58 percent domestic content. Similarly, China's CNR and CSR worked with Bombardier, Siemens, Kawasaki and Alstom to produce four train designs, but technology transfer contracts and stiff local content requirements (70-90 percent) resulted in mass reproductions in local factories.[12] China clearly uses its massive market to its advantage, luring in the world's top rail manufacturers to partake in even minor slices of the colossal demand, and then strikes tough deals to acquire key technologies and designs. As a result, CNR and CSR now join the ranks of top global rail equipment manufacturers, with their eye on U.S. markets such as California.

Perhaps unaccustomed to the label of "emerging market," the U.S. may be just that for the passenger transit and HSR sectors. Historically, where demand exists, private industry seeks to enter and capture these new markets. The U.S. potentially offers a huge market, assuming it is willing to replicate what it did for the automobile sector and what competitor nations are already doing with rail: building domestic demand and then encouraging the emerging domestic production market. Germany offers a model of Federal-State revenue sharing; Spain offers a sample national development plan; Spain and Japan offer prototypes for public-private financing; and China and South Korea, despite drastically different political and economic systems, provide key lessons on technology transfer and support for domestic suppliers to enter the world market.

[11] Ibid.
[12] Ibid.

3.0
Recent Developments in U.S. Passenger Transit and High Speed Rail

Regaining a Foothold in the U.S.

Despite chronic underinvestment and years of decline, the U.S. rail industry has tremendous potential for growth and diversification. The U.S. is still the largest national rail market in the world, mostly made up of freight. The U.S. freight rail sector is the hauling power that drives the country's ability to move goods, and it also owns most of the country's rail network, including that used by passenger rail. For example, freight operators own 97 percent of the 22,000 miles of tracks used by Amtrak, the only cross-country passenger rail service in the U.S. Expanding passenger rail will require building on these partnerships to add needed track capacity; to align schedules, communications, and safety requirements; and to establish shared liability rules.

Passenger rail in the U.S. is in the midst of a boom. Annual trips aboard Amtrak rose by 37 percent, from 21 million in 2000 to 28.7 million in 2010, the highest level ever. Ridership on commuter, light and heavy rail overall grew by 72 percent between 1995 and 2008, from 2.6 billion to 4.5 billion trips. Since 1980, U.S. cities added 29 new light rail systems and 20 new commuter rail systems.[13] The trends in ridership and added systems seem to support continued investment, as do rising energy costs, the need for job creation, population trends that are adding three million people per year to urban areas, and a potential cultural shift by young people away from America's long-term love affair with cars. Recent survey data suggest that younger generations are driving less and have much greater levels of interest in using passenger rail and other alternative forms of transit.[14]

Finding Signs of Life for the Passenger Transit and Highspeed Rail Sectors

Recent recognition by the Federal government and many states that passenger rail is a viable infrastructure investment and a potential job engine has led to increased dialogue and funding, providing some sense of optimism for growth. The 2009 American Recovery and Reinvestment Act (ARRA) provided $17.7 billion for transit and intercity rail programs, including $1.3 billion for Amtrak and $8 billion for new HSR corridors and intercity passenger rail.

This seems a drop in the bucket compared to investments in other countries, but a significant outlay relative to historic U.S. support. Unfortunately for HSR, the recent buzz quickly abated when $400 million for HSR in the FY 2010 U.S. Department of Transportation (DOT) appropriations were rescinded and zeroed out in FY 2011. According to the Rail Supply Institute, this served to confirm a longstanding concern by rail suppliers that any uptick in investment and demand is temporary and not a guarantee that shifting or expanding production lines will be profitable. Dependable multi-year investment is required if suppliers are to rebuild, innovate and expand.

Demand-side Developments

In 2011, the U,S. DOT Federal Railroad Administration (FRA) awarded two grants to the California Department of Transportation (Caltrans) for a total of $168 million (matched by $42 million of state funds) for the purchase of 42 passenger cars and 6 locomotives. FRA also awarded the Illinois Department of Transportation (IDOT) a $268.2 million grant for the purchase of 48 rail passenger cars and 7 locomotives for the benefit of Illinois and other Midwest States, including Michigan, Missouri, Indiana and Iowa. FRA previously awarded Illinois a $1,142.4 million grant for the Chicago-St. Louis corridor that contained funding for 30 passenger rail cars and 12 locomotives, and is preparing the award of a $230 million Chicago-Iowa City corridor grant that will contain funding for an estimated 10 passenger rail cars and three locomotives. In September of 2012, Caltrans, on behalf of the departments of transportation from Illinois, Michigan and Missouri, awarded a contract worth $352.3 million to Sumitomo Corporation of America to design, build and deliver 130 bi-level railcars to be used in regional intercity rail corridors in California and the Midwest. The pooling of the resources for this multi-state joint procurement allowed for the purchase of the equipment at lower cost. This is a potentially powerful public policy tool. Consistent with FRA High-Speed and Intercity Passenger Rail (HSIPR) program goals, a single joint procurement will ensure a wider swath of competitive bids, and will provide a forum for equipment and parts standardization.

[13] The Case for Business Investment in High Speed and Intercity Passenger Rail, American Public Transportation Association, February 2011.
[14] Frontier Group and U.S. PIRG Education Fund, Transportation and the New Generation, April 2012.

The joint California-Illinois procurement also puts into action the activities of the Next Generation Corridor Equipment Pool Committee, mandated by the Passenger Rail Investment and Improvement Act (PRIIA) of 2008, and launched by Amtrak in January 2010. The Committee is comprised of representatives from Amtrak, the FRA, host freight railroad companies, passenger railroad equipment manufacturers, state representation, and other passenger railroad operators. Its purpose is to design, develop specifications for, and procure standardized next-generation corridor equipment. The Committee's first task was to develop, assess and finalize bi-level car specifications. Their final approval on August 31, 2010 represented the first standardized specifications developed by a public-private partnership of rail stakeholders, and a landmark event for rail manufacturing. The Committee will continue to serve as a forum to create specifications for single-level cars; diesel locomotives; fleet management strategies; ownership and organizational structures; and interoperability and safety standards.[15]

In July 2012, HSR advocates received a boost when California Governor Jerry Brown signed legislation to invest up to $8 billion to construct America's first HSR corridor to operate between San Francisco and Los Angeles. The California project has been highly controversial, generating significant criticism for its hefty price tag. Yet, the project is expected to generate huge economic dividends, creating 100,000 construction jobs per year during build-out, and an additional 450,000 permanent jobs upon project completion. Studies of the regional impacts of California's HSR program project major local economic benefits in terms of direct job creation and in making the region a more attractive location for new business investments. [16]

Supply-side Developments

As orders go out for the first generation of new trains, the promise of job creation in rail manufacturing remains high. Yet, the presence of new investment must be supplemented by other actions. Investment is not the only challenge; the industry's current structure and business practices also significantly complicate matters. Systemic barriers prevent suppliers from growing, including detrimental boom and bust procurement cycles, significant variation across procurement opportunities, and a lack of knowledge about the true capacity of existing domestic suppliers. Typically, component suppliers directly solicit or respond to requests for products from individual transit agencies. Procurement becomes a vicious cycle: the highly customized ordering process results in more expense per unit at all procurement levels; more time needed for proposal review and funding; more time and expense required for manufacturers to produce unique items; and higher warranty costs for items with unproven technologies.[17] Additionally, a general lack of awareness by suppliers about procurement opportunities, and in turn by transit agencies about domestic suppliers, creates a system in which all players operate on limited information.

A number of efforts to address these supply chain issues are now underway. These efforts, such as the NIST MEP Supplier Scouting initiative and the Rail Connectivity Forums, are discussed in Section IV.

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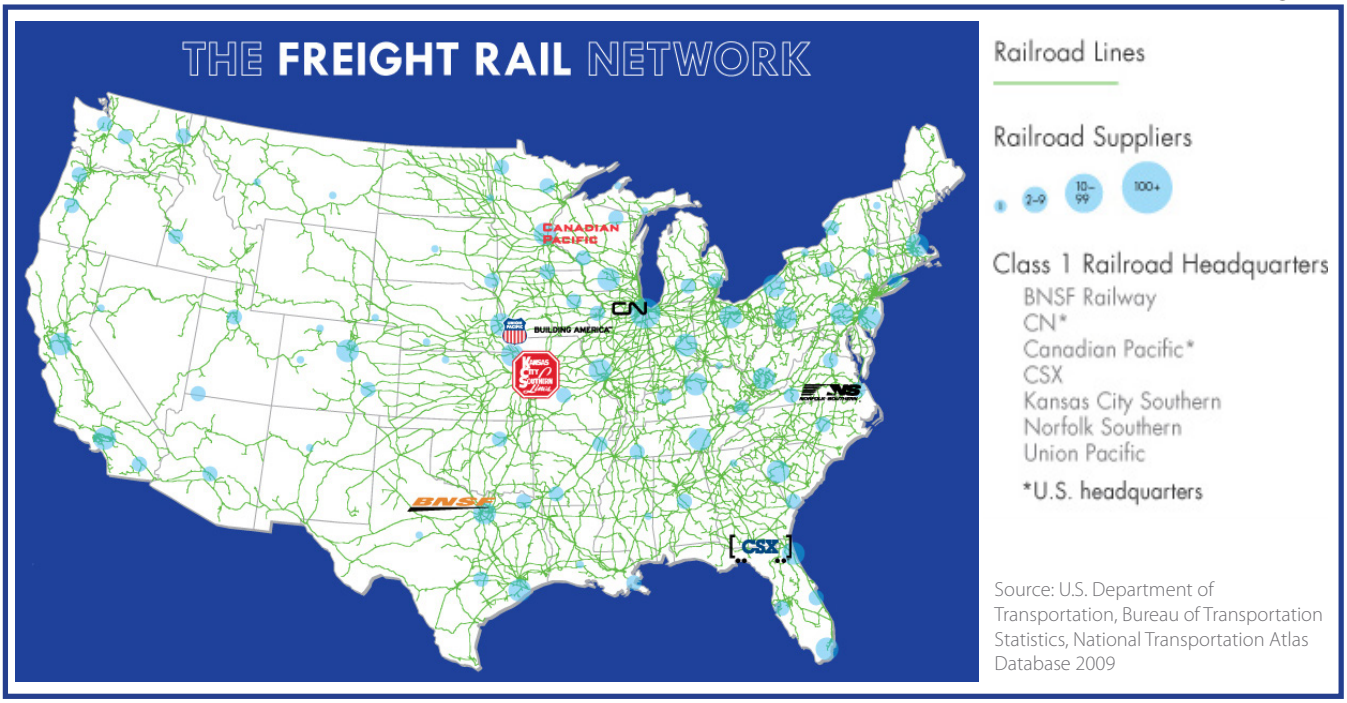
15 PRIIA Section 305 Next Generation Corridor Equipment Pool Committee P(NGEC), Background and Activities Update, 2-29-12.

16 See, for example, Bay Area Council Economic institute, High Speed Rail: Economic Benefits and Impacts in the San Francisco Bay Area, October 2008 The California High Speed Rail Authority has commissioned economic impact studies for all of the regions potentially affected by the HSR projects. These studies can be accessed at: http://www.cahighspeedrail.ca.gov/regional_econ_studies.aspx

17 For background, see Apollo Alliance, "Buy American: Transportation Manufacturing and Domestic Content Requirements," May 2010.

Understanding the Gaps and Opportunities in the Rail Value Chain

Figure 1



Success in the U.S. rail sector requires a better understanding of the existing gaps in the entire supply chain. The large OEMs are systems integrators, typically focused on the shell (body), design, and final assembly of rail cars and locomotives. They are supplied by hundreds of subcontractors. Tier 1 suppliers develop major systems, while Tier 2 suppliers tend to focus on electronics, propulsion, and body and interior work. Tier 3 and 4 suppliers provide raw materials, parts, and host of other items.

In 2010, researchers at Duke University mapped the U.S. supply chain for six passenger and transit rail types: intercity passenger, high speed, regional, metro, light rail and streetcars. The researchers found that the current North American Industrial Code System codes (NAICS) does not effectively capture current rail industry dynamics. However, by using interviews and other original research, the team identified a domestic network of 20 OEMs-- 15 railcar builders and 5 locomotive builders that have U.S.-based manufacturing. Researchers found a total of 159 Tier 1 and Tier 2 suppliers that provide the main systems that go into rail vehicles. The study did not include a mapping of other suppliers and the researchers thus suggest that these figures represent a significant undercount of America's rail supplier base.[18] Figure 2 displays a detailed summary of their findings and analysis.[19]

Firm-level data show that railcar builders range from large global companies (such as Bombardier) to small U.S.-based niche firms that rebuild heritage streetcars (such as Kasgro). In Tier 1, the 20 firms identified include 10 rail car builders, three heritage streetcar niche firms, two new U.S. firms, and five locomotive firms. As a general rule, railcars and locomotives are manufactured near their largest markets. The U.S. is the largest rail equipment market in the world,

[19] The researchers did not track Tier 2 suppliers for infrastructure-related equipment (such as steel track or signaling and electrification systems) or Tier 3 suppliers, responsible for providing main raw materials such as aluminum, iron, and steel, as well as input parts to major systems, such as air compressors and brake parts. It is likely that this lower tier supply base likely includes hundreds, if not thousands, of firms that serve the rail industry and many other manufacturing related sectors

[20] Lowe, et. al. U.S. Manufacture of Rail Vehicles for Intercity Passenger Rail and Urban Transit, A Value Chain Analysis (Center of Globalization Governance and Competitiveness, Duke University, 2010).

thanks to a highly developed freight rail system, but because the U.S. market for passenger and transit rail is comparatively smaller than in other countries, most global Tier 1 OEMs build their railcar shells outside the U.S. Four of the world's leading OEMs build their car shells in the U.S. but are non-U.S.-owned (Alstom builds metro shells in Hornell, NY; Bombardier builds metro cars in Plattsburgh, NY; Kawasaki builds metro car shells in Lincoln, NE; and Siemens builds light rail transit shells in Sacramento, CA). Three of these (Alstom, Bombardier and Kawasaki) each hold 25 percent of the U.S. market share for all six rail categories in the study combined. To meet Buy American requirements, often just the final assembly occurs in the United States. These OEMs tend to keep their higher value activities such as design, engineering and systems integration in their home countries, or in locations nearer to much larger markets. Typically a non-U.S. OEM will keep only a small engineering staff in the U.S., and instead relies on consultants, creating a uniquely larger than typical market of consultants in the U.S. than in Europe or Asia.

Figure 2

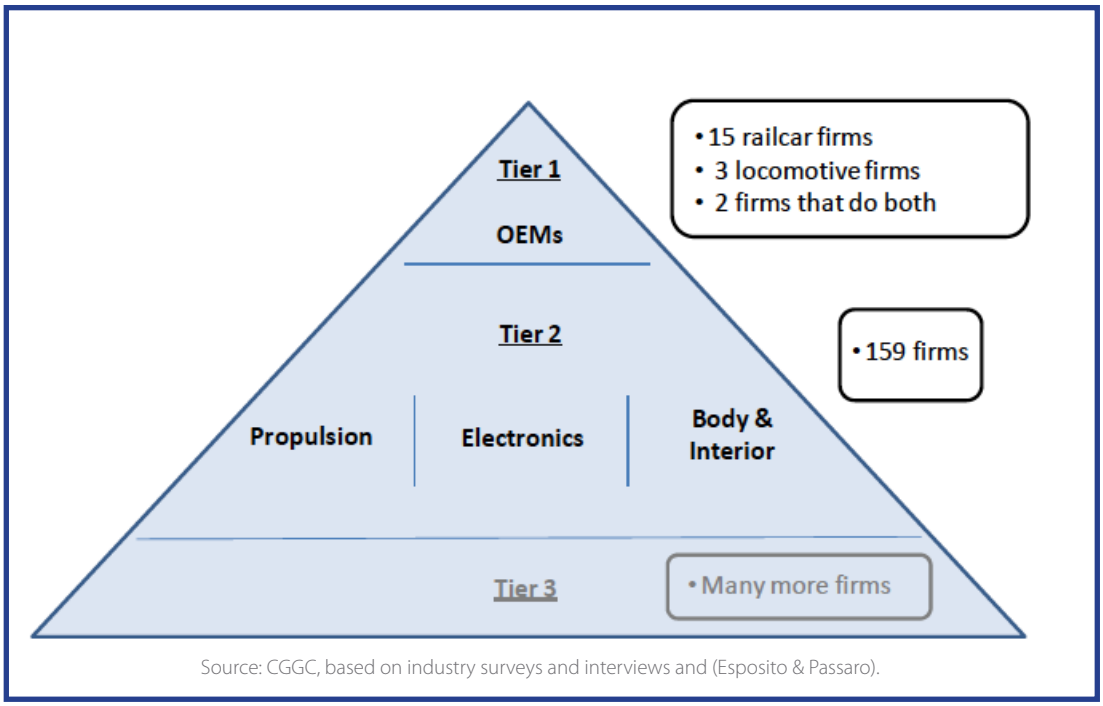
Rail car and Locomotive OEMs serving the U.S. market, with international footprint

Builder	Intercity Passenger Rail	High Speed Rail	Regional Rail	Metro Rail	Light Rail	Streetcar
Alstom	■	■	■	■		
AnsaldoBreda			■	■	■	
Bombardier	■	■	■	■	■	
Brookville						■
CAF USA				■	■	
EMD[a]	L		L			
Gomaco						■
GE	L		L			
Hyundai Rotem			■			
Inekon Trams[*]						■
Kasgro Rail Corp.[b]						■
Kawasaki			■	■	■	
Kinkisharyo					■	
Motive Power	L		L			
Nippon Sharyo			■		■	
Siemens			■	■	■	
Skoda[c]						■
Talgo[d]		■				
United Streetcar						■
US Railcar	■		■			

■ Firm serves U.S. railcar market L Firm serves U.S. locomotive market ■ Firm serves non-U.S. market

Source: CGGC, based on company websited, interviews and news releases. Image source: (Richtom80, 2007)

Figure 3



Source: CGGC, based on industry surveys and interviews and (Esposito & Passaro).

Eight of the total 20 OEMs are U.S. firms, including General Electric, EMD, and Motive Power, which make intercity and regional rail locomotives; Brookville, Kasgro, and Gomaco, which are vintage streetcar firms; United Streetcar, a new entrant that makes modern streetcars; and U.S. Railcar Company, a new entrant that plans to make diesel multiple units for regional rail. Interviews indicate that large OEMs manage their own network of hundreds of suppliers worldwide but prefer local suppliers where available and prefer suppliers that are vertically integrated or who provide whole systems rather than individual components.

The 159 Tier 1 and Tier 2 suppliers in the U.S. provide three types of systems to OEMs, including propulsion, electronics and body/interior parts and materials. Ninety-one use their domestic manufacturing facilities to provide propulsion systems; 64 provide electronic systems and 125 provide body and interior parts. Most (135 total) have their headquarters in the U.S. Tier 1 and Tier 2 firms tend to be diverse, serving more than just the rail industry, a necessity since the demand for rail systems is inconsistent. Castings firms, for example, typically serve a variety of industries, and 24 firms reported serving the motor vehicle industry.

Additional findings indicate that while some small domestic Tier 2 suppliers (20-160 employees) provide select products for rail systems, many suppliers must compete directly with OEMs who build integrated systems in-house. Electronic systems, for example, are dominated by large international companies such as Alstom and Bombardier, which also do much of their actual parts sourcing elsewhere. Driving control systems (supplied by several U.S. firms) are a unique exception. In other areas, the findings are mixed. Small manufacturers of wheel sets, suspension and sanding systems compete with in-house integrated truck systems (the undercarriage systems) of large railcar OEMs, but the U.S. does have a few medium to large steel casting companies, including Bradken Steel Castings (2,800 U.S. employees) and Columbus Steel Castings (750 employees). Brake systems are supplied by two U.S. firms (Tec Tran and Wabtec). A third firm, Knorr Brake, is German but maintains large U.S. operations. Additionally, researchers note that U.S. standards are vastly different from those in Europe and Japan because foreign passenger rail operates on its own dedicated rail lines. In the U.S., passenger and freight rail share the same infrastructure. This practice requires different safety standards, and thus requires firms to make

extensive adaptations. These differing practices may serve to create an area of potential comparative advantage for expansion by existing U.S. firms.

Other specific gaps identified varied among the six target rail types. For car shells, four of the 10 well established railcar OEMs build in the U.S. with U.S. labor, and two new U.S. firms are entering the market for transit and commuter cars. Body shells for high speed rail, however, are lighter and made of aluminum, and represent a significant gap in the U.S. Researchers found that this specific manufacturing type requires welders with specific expertise in aluminum welding, an expertise lacking in sufficient quantity in the United States. Fabricated trucks (the undercarriage of wheels, suspension, brakes, and traction motors – also called "bogies") represent another gap in the U.S. value chain. These trucks are used in HSR, metro, light rail and street cars. They require complex equipment and special skills, so companies typically only invest in this capacity where large markets exist. Siemens and United Streetcar build these products in the US, but the vast majority of fabricated truck systems come from Europe and Japan. Similarly, only three of the large OEMs (Alstom, Bombardier and Siemens) and one Tier 2 firm (Mitsubishi Electric) supply integrated propulsion systems. In modern streetcars, a new entrant (Rockwell Automation in Milwaukee) represents the first and only propulsion system supplier. Rockwell is partnering with United Streetcar to share this technology. Finally, doors are also considered to represent a specific gap for HSRI despite the fact that for other rail types many firms have U.S. manufacturing locations for doors and door systems (including Vapor Bus International, a subsidiary of Wilmerding, PA-based Wabtech).

It is clear that many elements of a comprehensive supply chain are in place, but that important gaps also exist. The 2010 Duke study represents the most comprehensive study so far of strengths and weaknesses of the U.S.-based value chain supporting the passenger rail industry. OEMs participating in a series of Next Generation Rail Supply Chain Forums, co-hosted by the U.S. DOT and NIST MEP in 2012, discussed specific supply chain gaps in raw aluminum milling, electronics and cabling, precision machining, painting and circuit board wiring, and confirmed overall that additional supply chain studies are needed to understand where the opportunities are for U.S. companies to grow and emerge. If existing suppliers can retool and expand, and if new entrants continue to emerge, the opportunity to rebuild the rail value chain exists across multiple levels, including filling current gaps; meeting future demand created by enforcement of Buy America provisions and procurement; and in simply repairing and replacing the current fleet of aging rolling stock across the country.

The U.S. is almost certainly at an inflection point for rebuilding its manufacturing base across multiple industries, including rail. To ensure that base is rebuilt on high-value-added manufacturing, the U.S. will need to identify and implement policy interventions and incentives that build on polices already showing success but that accelerate domestic growth at a much faster rate.

4.0
Rail Manufacturing and Economic Development Opportunities

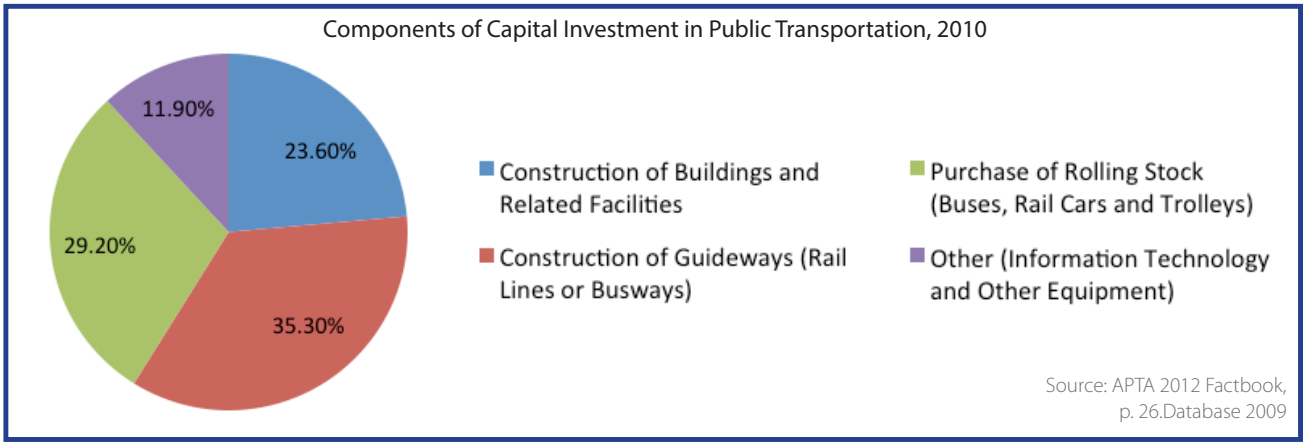
The emergence of new rail infrastructure and development programs creates significant new opportunities for regional economic development. Researchers have developed a wide base of evidence on these economic impacts.[20] Research prepared for the American Public Transportation Association (APTA) suggests that 36,000 jobs are supported each year by every $1 billion invested in public transportation capital and operations.[21]

These economic impacts take many forms. On an indirect basis, improved transportation infrastructure helps improve productivity growth through effects such as reduced traffic congestion, enhanced mobility, and lower transportation costs. New rail infrastructure can also spur real estate development, and attract new businesses and a more talented workforce to a region.

Significant direct economic impacts are generated by capital investments that produce manufacturing jobs, construction jobs and jobs tied to the operations and maintenance of rail infrastructure. In 2010, 32% of all US public transportation spending was devoted to capital investments in vehicles and equipment.[22] As new and planned projects, such as California's HSR network, move ahead, the scale of these capital investments is expected to increase.

Within these capital investments, approximately 59% of funds support the construction of guideways (rail lines and busways) and related buildings and facilities. The remaining portion of funds supports the purchase of buses, rail cars, and supporting equipment.

Figure 4



New transportation investments have a pronounced impact in creating new production jobs. Research for APTA finds that the majority of jobs generated by new capital investments are in production and transportation-related occupations, with smaller shares in management, sales or service.[23] These investments produce a distinctive and more production-focused occupational mix than is found in other sectors of the U.S. economy. In other words, new transportation investments can generate outsized impacts on a region's manufacturing base.

Despite these significant economic benefits, few communities or regions make explicit connections between transportation investments and economic development. Recent Good Jobs First studies have found very few programs that tie economic development incentives to transit-oriented development projects.[24] Programs that connect these investments to regional manufacturing support efforts are even rarer.

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[20] See, for example, Glen Weisbrod and Arlee Reno, "Economic Impact of Transportation Investment," Paper prepared for the American Public Transportation Association, October 2009; Stefania Radopolou, Sevara Melibaeva, and Teng Huang, "Literature Review of Papers Relevant to the Topic of Development Impacts and Economic Evaluation Methods of High Speed Rail." Massachusetts Institute of Technology Engineering Systems Division Working Paper, Updated August 2011.

[21] Weisbrod and Reno, p. ii.

[22] American Public Transportation Association, 2012 Public Transportation Factbook, (Washington DC: APTA, 2013), p. 26. Weisbrod and Reno, p. 26.

[23] Weisbrod and Reno, p. 37.

[24] Sarah Grady with Greg LeRoy, Making the Connection: Transit-Oriented Development and Jobs. Washington, DC: Good Jobs First, 2006.

5.0
Turning Vision into Reality: The Policy Environment for Rail Manufacturing

Compared to past decades of relative neglect, Washington's current focus on supporting rail transportation and rail manufacturing is a welcome change. However, policy makers face a daunting environment with declining funding levels, limited policy levers, and limited opportunities to test new approaches or strategies.

Declining funding levels clearly represent the most pressing challenges. When compared to the past, recent industry investment levels seem promising. In addition to the large rail procurements noted above, other parts of the market are also growing. Between 2007 and 2011, the rail industry saw $120 billion in new capital expenditures.[25] The short-term outlook for passenger rail markets is also optimistic. According to Railway Age, 2012 will likely be one of the industry's best years and projections for coming years are also strong.[26] In 2012, Federal, state and local purchasing agencies plan were projected to invest $3 billion to purchase new rail cars. They also forecast purchases of an additional 4,000 cars between 2013 and 2017. California's decision to proceed with its HSR project has also generated much optimism.

These encouraging market projections are somewhat clouded by recent cutbacks in Federal investment in passenger and HSR. Meanwhile, cuts in HSR projects and other passenger rail and transit initiatives are troubling. Investments in rail infrastructure are also lagging leading Standard & Poor's to report that the current funding situation represents a "perfect storm." [27] The U.S. DOT recently found similar shortfalls in transit infrastructure investment. Its latest infrastructure status report projected that roughly $20-24 billion in annual investments is needed to maintain current U.S. transit infrastructure over the next two decades. Yet, current funding levels are around $16 billion per year with no plans on how to close this gap.[28]

Even in a more robust funding environment, available funds fall far short of addressing critical infrastructure needs. In recent years, a number of newly introduced programs, such as the DOT's TIGER (Transportation Investments Generating Economic Recovery) have seeded important projects. But, the long-term prognosis for continuation of these grant funds remains uncertain. For this reason, many key policy makers and industry leaders are examining new tools for rail infrastructure financing. These include proposals such as a new National Infrastructure Bank; authorization of new tax credit bonds or Build America bonds; and revisions to existing financing tools, such as those supported by the Transportation Infrastructure and Finance and Innovation Act (TIFIA) program.

In addition to limited funding for essential infrastructure, the U.S. rail industry also suffers from shortfalls in R&D funding. At present, the U.S. DOT invests approximately $1.5 billion in R&D and related technology investments that cover the full spectrum of transportation options.[29] Rail R&D efforts are led by the FRA's Office of Railroad Policy and Development, which invests in a variety of focus areas.[30] A large portion of these funds are invested to support safety enhancements, and only a tiny portion appears to have long-term focus on generating new industry innovations. The ARRA provided FRA with $25 million to invest in R&D projects related to HSR. However, a recent Transportation Research Board evaluation of FRA R&D programs noted that, because they were funded with ARRA dollars, nearly all of the HSR-related research projects were focused on projects of "relatively short duration." [31]

Policy makers are also operating with a limited tool kit as they seek to build a more robust domestic supply chain. At present, various Buy American rules serve as the primary policy lever to build a stronger U.S. rail manufacturing capability. Various Buy American rules have been applied to the transportation sector, and today, nearly every local, state, and federal transportation procurement includes some preference for U.S. or locally-sourced products and services. These Buy American rules are widely recognized as

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25 Anne Canby, One Rail Coalition Presentation, May 2012. Available at www.onerail.org
26 Luther S. Miller, "2012 Passenger Rail Outlook: In Troubled Times, Still Growing," Railway Age, January 15, 2012
27 "S&P: Transportation Infrastructure Needs Fixing, Financing," Passenger Transport, April 20, 2012
28 U.S. Department of Transportation, Report to Congress: Status of the Nation's Highways, Bridges, and Transit-Conditions and Performance, March 2012
29 American Association for the Advancement of Science, AAAS FY2013 Budget Report, http://www.aaas.org/spp/rd/rdreport2013/13pch12.pdf p. 126
30 A list of current projects is available at: http://www.fra.dot.gov/downloads/TRB_2012_RPD_Quad%20Charts_FINAL.pdf
31 Transportation Research Board, Report of the Committee for Review of the FRA's Research, Development, and Demonstration Programs, May 8, 2012, p. 8. Available at: http://onlinepubs.trb.org/onlinepubs/reports/frar&d_May_2012.pdf

a primary factor in the survival of the U.S. rail manufacturing sector in the period since the 1970s. These rules helped sustain smaller suppliers, and also encouraged foreign OEMs to locate facilities in the U.S.

Rail procurements must comply with a complicated mix of rules and regulations that have become increasingly complex over time. Stringent Buy America rules cover purchases of many key inputs, especially iron and steel inputs. Rail infrastructure projects typically require 100% of iron and steel be produced in the U.S. However, Buy America thresholds for manufactured goods differ by agency and by product. For example, current FTA rules mandate that rolling stock components (trains, busses, ferries, etc.) must have 60% domestic content, with final assembly occurring in the U.S.[32] Differing rules create challenges for contractors and suppliers as many projects use a mix of funding sources and must thus comply with differing thresholds and procedures for Buy America compliance.

Provisions that allow for waivers of domestic purchasing add further complications. In general, waivers can be issued for three purposes:

1. When domestic preferences are deemed "inconsistent with the public interest."
2. When the product is not available in the U.S. in sufficient quantities or of sufficient quality.
3. When domestic purchases would increase total project costs by more than 25 percent.

Each agency manages its own Buy America review and waiver process, but the basic procedures are similar. When a grantee is unable to find a domestic source of needed products, services, or technologies, it formally requests a waiver and authority to use a foreign source of supply. As a result of new rules, these waiver requests are formally reviewed by agency personnel and publicly released so that existing U.S. suppliers are made aware of potential opportunities. If a U.S. supplier emerges or the waiver request is deemed unreasonable, the waiver is denied. If no domestic source can be identified and the request is justified, the waiver request is granted.

In addition to formalizing waiver request procedures, the new rules requiring formal waiver review have also brought more transparency to the process. Several agencies, such as the FRA and the U.S. Department of Energy (DOE), have been especially active on this front. By formally publicizing waiver requests on the web and in the Federal Register, these agencies have made it easier for domestic manufacturers to learn of waiver requests and to respond to claims that products or materials are insufficiently available or not available at a reasonable price.

In the past, waiver requests were frequently made and often granted. For example, a recent study by Rep. Chris Murphy (D-CT), a strong Buy America advocate, found that the U.S. Department of Defense (DOD) received more than 39,000 Buy-American waivers in 2010. Between 2007 and 2010, more than 161,000 waiver requests were granted.[33] Overall, 92 percent of all waiver requests were approved. Because of their smaller procurement budgets, most other Federal agencies, including the DOT, receive a much smaller volume of waiver requests. For example, as of June 2012 only three waiver requests were posted on the FRA's Buy American notification page.[34]

The extensive use of these waiver authorities has generated much criticism. On Capitol Hill, a House Buy American Caucus has advocated for a tightening of rules governing Buy American waivers. Several bills supporting these moves have also been introduced. For example, the Buy American Improvement Act (HR 2722), introduced by Rep. Dan Lipinski (D-IL) would tighten waiver rules and also increase current thresholds for domestic content to 75 percent. Various outside advocacy groups, such as the Railway Supply Institute, the BlueGreen Alliance, the Alliance for American Manufacturing, and leading labor unions also support these efforts.

Current leaders at the DOT and in the rail and transit industries share a strong commitment to a more robust rail manufacturing industry. However, their ability to support the industry is limited due to budget constraints and to a restricted set of policy options for revitalizing rail transit. Few in Washington or in state or local government have extensive experience in nurturing domestic rail manufacturing capacity. New tools and approaches will need to be developed or rediscovered.

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[32] A comparison of various Buy America rules and regulations by leading U.S. Department of Transportation agencies can be found at: http://www.dot.gov/sites/dot.dev/files/docs/buy_america_provisions_side_by_side.pdf

[33] http://www.chrismurphy.house.gov/images/stories/chris_murphy_buy_america_waiver_report.pdf

[34] http://www.fra.dot.gov/Pages/251.shtml Accessed on June 15, 2012

6.0
New Policy Opportunities and Directions

As noted above, it is still difficult to speak of an organized U.S. passenger rail industry. Because the past several decades have been devoid of new business opportunities, few U.S. firms have focused on the rail industry as a potential growth sector. Buy America rules have helped support small bases of domestic contractors and suppliers, but U.S. firms are not generally viewed as world leaders in the rail sector.

The emergence of new business opportunities in the passenger rail industry has generated significant interest among U.S. manufacturers. Yet, on its own, this market opportunity is insufficient to stimulate the creation of a strong rail manufacturing base here at home. New policy directions and approaches are needed.

These new efforts should focus on three broad directions: **1)** Capitalizing on unused industry capacity; **2)** Identifying new capacity and suppliers for the rail industry; and **3)** Seeding new innovations in the industry.

1. Capitalizing on Unused Capacity

Current and potential rail industry manufacturers are presently operating below capacity. Firms must manage workloads that are sporadic and episodic, leading to long periods of downtime followed (hopefully) by periods of accelerated expansion.[35] Continued steady growth in rail procurement activity is the best and most straightforward means to help these firms expand and to reduce the downsides of the current cyclical market. Yet, they could benefit from other support efforts—around business development and workforce development—as well.

These strategies should target firms already operating in the rail industry, as well as companies with competencies in other manufacturing sectors that can be adapted to the rail industry. The aerospace and automotive industries represent two important potential targets. For example, a recent survey of automotive suppliers found that 78% of surveyed firms were taking action to increase sales from outside the industry.[36] However, firm executives also identified many barriers to successful diversification, including intense competition, limited understanding of new industries, and differing quality standards. Time was identified as a primary constraint; succeeding in new markets takes time and requires extensive investment. An Ohio Aerospace Institute study found that it takes an average of four years for auto suppliers to see profits from diversifying into aerospace.[37]

Most of these firms operate in industries designated in a recent Booz Allen Hamilton study (completed on behalf of NIST MEP) as "sectors on the edge."[39] These sectors face significant global competition, and major market challenges. To succeed, the researchers suggest that these firms need "better government support" in the form of simplified regulations and permitting rules along with more market certainty to help spur investment in new plants, equipment, and retooling of older facilities.

Succeeding in this challenging marketplace requires that small manufacturers are able to identify and understand the needs of customers in new industries, and that they can access sufficient capital to support new product development and the costs of retooling to serve new markets.

Small manufacturers recognize that they need outside support to pursue new markets and new business opportunities. The 2011 Next Generation Manufacturing Survey found that more than 85% of surveyed firms identified process improvements and customer-focused innovation as "very important."[39] Nonetheless, a large share identified major "execution gaps" in areas such as company strategy and supply chain management. Smaller firms are unlikely to address these execution gaps on their own. Outside business services, from public, non-profit, or private service providers, can help them access needed expertise and support. In addition to business development challenges, many smaller manufacturers face pressing capital access gaps as well. The Booz Allen Hamilton analysis found that smaller manufacturers presented significantly strong capital demands for working capital, machinery/equipment purchases, and for innovation and R&D.[40]

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35 See, for example, Bob Clark, "Alstom Plans for 'Slower Period,'" The Hornell (NY) Evening Tribune, May 29, 2009. Available at: http://www.eveningtribune.com/news/x313664053/Alstom-plans-for-slower-period?zc_p=0

36 Helper et al, The U.S. Auto Supply Chain at a Crossroads

37 Ibid, p. 47.

38 Arvind Kaushal, Thomas Mayor, and Patricia Reidl, "Manufacturing's Wake-Up Call," Strategy & Business, August 2011, p. 8.

39 Manufacturing Performance Institute, 2011 Next Generation Manufacturing Study, (Shaker Heights, OH, The MPI Group, 2011), p, 6

40 Booz Allen Hamilton, Small Manufacturers Capital Access Inventory and Needs Assessment Report, Report prepared for NIST MEP, November 2011, p. 21

The report identified more than 100 Federal programs that are available to small manufacturers, yet it also noted that most of these programs were not easily accessible and did not address the unique capital needs of smaller manufacturers. At a time when commercial lending to these firms is also declining, major capital gaps may still remain and may in fact be increasing.

As firms pursue new market opportunities, they must also recognize a challenge facing all U.S. manufacturers—the pressing need to upgrade the skills of their existing and future workforce. Dozens of recent reports have detailed the looming skills gap and skills shortage and its potential effect on U.S. manufacturers.[41] Rail manufacturers face similar pressures. The key skill gaps identified in the Manufacturing Institute's 2011 Skills Gap report in skilled production and production support occupations are also critical occupations in rail manufacturing and other related industries. As such, any efforts to address overall manufacturing-related skills gaps will also generate benefits for the rail sector and vice versa.

2. Identifying New Capacity and Suppliers

Most of these products and technologies generated at all levels of the rail sector supply chain are not unique to the rail sector, and could be supplied by firms new to the industry. Indeed, Northeastern University researchers have projected that the following sectors would enjoy the greatest job growth in the event of major new rail procurements: railroad rolling stock, architectural and structural metals, electrical equipment, machine shops, and aerospace products and parts.[42] These sectors form the heart of America's manufacturing base, and are also facing market pressures due to recent turmoil in the automotive industry and impending cuts in DOD procurement spending.

These market trends produce an interesting scenario: the emergence of strong unmet demands in the rail industry at the same time that many qualified U.S. manufacturing firms are aggressively seeking to identify new market opportunities. Yet, because these firms have no past experience and limited knowledge of the rail industry, major market barriers exist. Meanwhile, OEMs are unfamiliar with the capabilities of these new suppliers, and may lack the resources and capacity to find new suppliers, especially at lower tiers of their supply chains.

NIST MEP's Supplier Scouting initiatives seek to close this market gap. Supplier Scouting seeks to build connections between OEMs and new U.S.-based suppliers with latent capabilities for diversification into the rail transit sector. A description of the program can be found at pp. 19 The current rail supplier scouting effort operates via two approaches. First, FRA and NIST MEP are aggressively publicizing new rail procurement opportunities. In 2012, the agencies sponsored five Rail Connectivity Forums with more than a thousand participants. These events match OEMs with hundreds of potential suppliers around the U.S. Important new business linkages are being created.

These forums are further supported by outreach through the NIST MEP national network. When a Buy American waiver request is filed, the NIST MEP network is activated. Staff at MEP's 350 field locations work with more than 34,000 manufacturers each year. Center staff members know their local firms and their capacities, and can serve as a critical link to key market opportunities. As MEP staff and partners connect suppliers to opportunities, they also provide several other critical services:

- They help to identify and provide technical business assistance to suppliers who are capable of meeting the stringent quality requirements demanded by world class OEMs.
- They work with local manufacturers to alter processes, products, services or technologies so that they align with the needs of the rail industry.
- They work with firms to reverse-engineer products and produce the technical data needed for production.

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[41] See, for example, Deloitte and the Manufacturing Institute, Boiling Point: The Skills Gap in U.S. Manufacturing, (Washington DC: Manufacturing Institute, 2011)
[42] Fitzgerald/Northeastern Rail study, p. 24

While Supplier Scouting is a relatively new initiative, it is already generating important connections and leads for smaller manufacturers.

NIST MEP Make it in America Supplier Scouting

The National Institute of Standards and Technology's (NIST) Hollings Manufacturing Extension Partnership (MEP) works with small and mid-sized U.S. manufacturers to help them create and retain jobs, increase profits, and save time and money. The nationwide network provides a variety of services, from innovation strategies to process improvements to green manufacturing. One of these services provided is Supplier Scouting where NIST MEP utilizes its nationwide network of more than 1,200 field staff that work with over 30,000 U.S. manufacturers annually to identify and pre-qualify suppliers to fill gaps in existing supply chains.

The Buy American component of these Supplier Scouting efforts evolved in response to provisions in the American Reinvestment and Recovery Act (ARRA) that required projects funded with federal dollars utilize goods manufactured in the United States. Waiver provisions to this requirement were included in the act, should there not be domestic sources of production capable of providing a sufficient quality or quantity, or if the use of domestic goods would increase the total cost of a project by more than 25%. In order to perform due diligence in identifying domestic suppliers and to introduce more transparency into the procurement process, federal agencies began to turn to NIST MEP.

Utilizing the MEP Network of manufacturing assistance centers across the country, NIST MEP was able to supply a number of services to other federal agencies to support these goals. These included:

- A standardized format utilizing information captured in the waiver requests submitted to the federal agency, which can also be used by the NIST MEP field staff to scout for potential suppliers. This included detailed technical specifications, the potential market value of the current procurement, the prospects for future purchases of the item, and other technical and business related items.

- Access to the national network of small and medium-sized manufacturing firms. By coordinating through MEP funded centers in all 50 states and Puerto Rico, items identified on waiver requests can be vetted through the system and potential supplier matches returned to the agency within two weeks. In the most recently completed project, exact or partial matches were found for 54% of the waiver requests submitted to the Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE).

- A mechanism for making good on the intention to deny waivers wherever possible, thereby signaling grantees that domestic manufacturing suppliers should be actively sought. In the EERE project above, this translated into waiver requests of only 0.25% for the $11 billion procurement.

The process also provided important intelligence to the network of MEP Centers and their client manufacturing firms on potential gaps and in some cases where there was R&D taking place in a variety of supply chains. These gaps may represent opportunities for product line expansion or adaptation of core competencies to new industries and/or markets.

With the 2012 release of the RFP for the procurement of Bi-Level Passenger Railcars in California and Illinois, an additional component was added to NIST MEP Supplier Scouting. This involved a proactive outreach approach to create awareness of the impending opportunities through a series of Next Generation Rail Supply Chain Forums where OEMs and Tier 1 suppliers were brought together with interested smaller manufacturers. The goal was for these potential lower tier suppliers to learn about the possible supply chain needs and supplier qualification processes prior to the actual release of the several hundred million solicitation such that relationships could be established that would minimize or eliminate the need for waivers and achieve the 100% domestic content target set by the Department of Transportation's Federal Railroad Administration.

3. Seeding Innovation

The rail sector is hungry for new technologies and tools. At present, the industry receives little outside investment to support R&D and innovation. Meanwhile, it operates with aging infrastructure and rolling stock. For example, despite strong growth in ridership, Amtrak has not purchased new equipment since 2002.[43] Its current fleet has an average age of 28 years, and it also includes many passenger cars that have been in operation since the 1970s and even earlier.

Policy needs to support activities that spur more innovation in the rail industry and related sectors. At present, funding for new innovations in the rail sector is quite limited. As noted above, a major infusion of R&D funds was part of the ARRA stimulus package. Meanwhile, regular R&D investments are limited to funding from FRA's Office of Rail Policy and Development along with a small number of SBIR grants awarded each year.

Because of their more robust rail networks, European policy makers invest much more heavily in support for transportation-related R&D. The European Rail Research Advisory Council (ERRAC) was established in 2001 to fund joint research "to revitalize the European rail sector and make it more competitive." ERRAC has members from 45 leading stakeholders including member states, EU officials, and rail manufacturers. In addition to supporting a host of specific joint research projects, ERRAC also developed the EU's *Strategic Rail Research Agenda 2020*, which guides current R&D investment priorities.[44] Current research priorities include intelligent mobility, environmental sustainability, personal security, and the development of new enabling technologies.

These national public sector efforts are supplemented by industry-led initiatives at the national, regional, and local levels. For example, the European Union's Cluster Observatory clearinghouse lists more than forty national and subnational cluster programs and other initiatives related to transportation technology. In addition, seven of the largest such networks collaborate in a European Railway Cluster Initiative. These groups collaborate on joint projects and to share best practices. The partners have also agreed to develop a joint innovation roadmap.

Great Britain's Rail Alliance is one of the more prominent European rail cluster initiatives, and its programs are fairly typical for these types of cluster initiatives. The Rail Alliance provides networking opportunities and also publishes research on trends in the rail industry. It also links members to business development opportunities, international partners, service providers, and sources of both public and private financing.

In Asia, industry cluster initiatives are less developed but are beginning to emerge.[45] In addition, key governmental agencies, such as Japan's Railway Technical Research Institute, China's Ministry of Railways, and Korea's Railroad Research Institute. In June 2012, the Australian Government released On Track to 2040, its own plan to revitalize its domestic rail industry and to create an Australian Railroad Research Institute.

In addition to direct funding efforts, these governments aggressively deploy demand-side innovation policies such as public procurement, regulation, standards, consumer policies, and user-led innovation policies.[46] Examples include the various technology roadmaps and procurement plans sponsored by ERRAC and other EU entities. In the U.S., programs like SBIR and Supplier Scouting are also considered demand-side innovation approaches.

Federal, state, and local agencies in the U.S. can also help spur innovations by becoming smarter buyers. The structure of the U.S. rail car market generates many inefficiencies and production challenges.[47] Rail car demand has been small and erratic, with multiple federal, state, and local agencies generating competing demands and specifications. Rail car designs are highly customized, reducing the ability to generate economies of scale.

The work of the PRIIA Next Generation Corridor Equipment Pool Committee is proving critically important on this front. Known as the Section 305 Committee, this group, which is composed of key industry stakeholders, was directed by Congress to "design, develop specifications for, and procure standardized next-generation corridor equipment." As noted above, the Committee's work was critical to the latest joint California-Illinois rail car procurements and its various subcommittees are continuing to develop new purchasing standards and procedures and to assess new financing options.

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43 Amtrak, "Amtrak Fleet Strategy 3.1," March 2012

44 European Rail Research Advisory Council, "Strategic Rail Research Agenda 2020," (Brussels: ERRAC, 2007). Available at: http://errac.org/IMG/pdf/SRRA-2007.pdf

45 Bernard Ganne and Yveline LeClair, Asian Industrial Clusters, Global Competitiveness and New Policy Initiatives, (Singapore: World Scientific Publishing, 2009)

46 For background, see Organization for Economic Cooperation and Development (OECD), Demand Side Innovation Policies, (Paris: OECD, 2011); VINNOVA, "Public Procurement as a Driver of Innovation and Change," VINNOVA (Sweden) Policy Paper, December 2007

47 U.S. Government Accountability Office, "Transit Rail: Potential Rail- Car Cost-Saving Strategies Exist," GAO Report #2010 10-730, June 2010

7.0 Implications and Recommendations

This section will provide policy recommendations for key players seeking to support a revitalized U.S. rail manufacturing industry.

For Washington

Market uncertainty is the greatest barrier to spurring new investments and new business opportunities in the rail manufacturing sector. When manufacturers see that Federal, state, and local transportation departments are committed to new procurements and aggressive upgrade and maintenance programs, they will take notice and respond accordingly. Thus, it is essential that additional procurement activity follow the current joint California-Illinois procurement.

A stable and steady investment program offers the best means to further stimulate a robust rail manufacturing supply chain. These investments should take the form of new funds for research and innovation, via expanded SBIR funding and additional investments by the FRA's Office of Rail Policy and Development. It should also include the development of new financing tools to support both infrastructure investment and new manufacturing investments. On the infrastructure side, new approaches might include creation of a new National Infrastructure Bank, or the authorization of new tax credit bonds or Build America bonds. On the manufacturing front, small and medium-sized manufacturers could benefit greatly from reforms such as those proposed in the American Manufacturing Bond Financing Act. This proposal, developed by the Council of Development Finance Agencies and key partners, would revise current rules for industrial development bonds to make it easier for states and localities to issue qualified small-issue manufacturing bonds for new facilities and capital investments. Finally, small and medium-sized manufacturers would benefit greatly from recently proposed reforms to increase flexibility of investment from the many public evolving loan funds (RLFs) backed by the Economic Development Administration, and the U.S. Departments of Agriculture and Housing and Urban Development. It is estimated that these RLFs presently manage more than a billion dollars that could be better used to support small and medium-sized manufacturers.[48]

Expanding on the work of the PRIIA Section 305 Committee could also pay huge dividends by helping Federal agencies become smarter buyers who not only procure a better product for taxpayers and passengers, but who also help seed important innovations in industry. Washington should continue to encourage product standardization in transit and rail procurement. Differing standards present a challenge to achieving economies of scale; they also affect production stability and reduce resources for R&D. These steps would facilitate more pooled purchasing initiatives like the California-Illinois joint procurement, and, in the process, help reduce unit costs, increase order volumes, and help achieve economies of scale.

In addition to standards setting, Federal rail and transit agencies could also create incentives to spur further action. These might include provision of incentives for projects that purchase compliant vehicles (i.e., increasing the federal share of transit capital purchases if the industry-recognized standards are adopted or by limiting the federal cost share on projects that fail to comply with industry recognized standards). In addition, FRA and other key DOT agencies should support the development of a procurement training curriculum that incorporates product standards, guidance on coordinating pooled purchasing, and detailed information on what will improve compliance with domestic content requirements. These efforts will help ensure that procurement officials at all government levels are all moving in the same direction.

Beyond support for a more stable investment climate and becoming a smarter buyer, Federal policy makers could also aid the development of the rail supply chain by clarifying current Buy American rules and regulations. At present, agencies within DOT and across the U.S. government

[48] National Association of Development Organizations, Economic Development Finance Service, "Public Sector Business Loan Funds: Views and Recommendations from Practitioners," May 2011. Available at: http://www.nado.org/public-sector-business-loan-funds-views-and-recommendations-from-practitioners/

operate with differing Buy American rules and regulations. All sides in the current debates support streamlining of these rules and greater transparency in the process of reviewing and approving domestic content waiver requests.[49] Much of this work is already underway. DOT and other Federal agencies are publicizing waiver requests and utilizing the NIST MEP Supplier Scouting program as a means to identify new domestic suppliers. Meanwhile, efforts to strengthen Buy America rules, by improving waiver transparency and requiring annual reports of waivers, were included in the recently enacted Surface Transportation reauthorization bill.

Beyond these Buy America-related steps, other strategies can help ensure that new technologies are manufactured in the U.S. These efforts could include support for the development of domestically produced prototypes, early stage commercial manufacturing to scale production, and testing of new vehicles and rail-related components.

Finally, Washington should invest in better data and understanding of the rail manufacturing supply chain in the U.S. A number of privately-funded studies, such as the 2010 Duke supply chain analysis, have shed light on the current supply chain. These rigorous studies should be updated, with researchers also assessing linkages between current and potential U.S. rail suppliers and the needs of the future U.S. defense industrial base. As defense spending declines in coming years, the health of the U.S. defense industrial base will become a growing concern.[50] Various DOD agencies are already sponsoring industrial base assessments,[51] and leading industry associations are seeking to identify new market opportunities and synergies across industries. Many of these defense suppliers boast capabilities that could supply the rail sector. Building these connections creates new business diversification opportunities as well as helping to preserve a more robust defense industrial base capability.

For States

State governments will also play a central role in the development of a robust rail manufacturing capacity. At the most basic level, state leaders must recognize the importance of the rail manufacturing sector. Rail manufacturers presently employ nearly 90,000 people with high concentrations of employees in states such as Illinois, Pennsylvania, New York, Texas, and Ohio. [52] In these key states, rail manufacturers are major employers and should be a core focus in statewide manufacturing strategies.

State transportation agencies can also help build a stronger domestic manufacturing base by continuing efforts to act as "smart buyers." Continued support and participation in the PRIIA Section 305 Next Generation Equipment Committee Is essential, and the continued commitment to consider joint state procurements similar to the California-Illinois efforts are needed. These efforts to promote standardization and to use joint procurements to build scale economies could create savings and create a more stable and predictable market for suppliers.[53]

State transportation agencies could create their own Buy America rules to complement current Federal regulations. In most cases, new rail car purchase or upgrades utilize Federal funds and are subject to Federal Buy America rules. Yet, there are some instances where these rules do not apply. In response, more than twenty states are considering such laws.

Finally, states should continue to invest in programs that help build a more talented manufacturing workforce. Efforts to improve worker competencies in manufacturing fields, especially cross-cutting disciplines such as industrial maintenance and precision machining, will generate benefits for rail manufacturers as well.

At the regional and local level, rail manufacturing offers tremendous economic development opportunities.

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49 See, for example, Rail Supply Institute, "Rail Supply Innovation and Buy American Requirements," April 26, 2011; and Apollo Alliance, "Buy American: Transportation Manufacturing and Domestic Content Requirements," May 2010."

50 National Defense Industrial Association, "Recovering the Domestic Aerospace and Defense Industrial Base, " White Paper, January 2012.

51 See, for example, Space Base Assessment and Department of Defense Annual report to Congress (http://www.acq.osd.mil/mibp/docs/annual_ind_cap_rpt_to_congress-2011.pdf)

52 RSI data (August 2011)

53 GAO 2010.

For Regions

Communities across the U.S. are recognizing that the renaissance of American manufacturing can help create new employment and business opportunities.[54] Recent research sponsored by the Brookings Institution tracked U.S. regions with heavy concentrations of manufacturing activity.[55] As part of this analysis, it assessed regional strengths in key manufacturing competencies, including a category labeled "planes, trains, automobiles, and ships."[56] More than 80 U.S. Metropolitan Statistical Areas (MSAs) have strong concentrations and specializations in this (admittedly broad) set of manufacturing industries. Even better, these sectors appear to be growing. A recent analysis from Economic Modeling Specialists Inc. (EMSI) found that jobs in key rail manufacturing sectors grew between 4 and 7 percent between 2010 and 2011.[57]

It is likely that most of these metro areas are home to large automotive or aerospace suppliers, but, in a few cases, large rail manufacturing capacities may exist. And, in these instances, the impact on local economy is profound. For example, in New York, the Metropolitan Transit Authority's recent capital program, which includes bus, rail, and other procurements, was projected to support 350,000 jobs across the state.[58] Similarly, a recent study of Erie-based GE Transportation's economic impact in Northwest Pennsylvania found that GE directly or indirectly supports one in eleven jobs in Erie County and one of every 357 jobs in the Commonwealth of Pennsylvania (more than 9,200 jobs).[59]

While the potential economic impact of rail industry jobs is quite pronounced, few communities are targeting these opportunities as part of their local economic development work. The U.S. Cluster Mapping Project, still under development as a joint project of the U.S. Economic Development Administration and Harvard Business School, lists no U.S. cluster organizations with a focus on the rail transportation sector. Several regions support freight rail activities, and a number of other regions are home to advocates for the development of new rail infrastructure. For example, the North American Steel Interstate Coalition advocates for the creation of new freight and passenger rail infrastructure to "realize for railroads what the Eisenhower Interstate Highway System achieved for roads."[60] This effort began in Virginia, but has now spawned a coalition of partner groups in a number of states.

At present, it appears that the Long Island Forum for Technology's (LIFT) Rail Alliance is the only such regional effort targeting passenger rail manufacturing opportunities. The LIFT Rail Alliance, managed by the region's MEP center, was started with support from Rep. Tim Bishop (D-NY) and has also received funding support from the U.S. Small Business Administration.

Local economic development agencies should support the development of regional networks to support and advocate for the rail and transit manufacturing sectors. These initiatives can take the form of new networks focused on rail and transit manufacturing (such as Long Island's LIFT) or could be connected to existing networks for small and medium-sized manufacturers.

These new networks should focus on several important functions. First, they should help firms identify and capture new market opportunities at home and abroad. Current export assistance programs should include a focus on rail supply opportunities.

Second, they should build stronger supply chain connections. This task typically involves a mix of effective publicity and communication along with enhanced transparency and connections between firms within the supply chain. Regular network events to connect suppliers and learn about industry trends are an important first step

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54 International Economic Development Council, Jobs in the Making: Economic Development Strategies to Grow Manufacturing, 2011

55 Susan Helper, Timothy Krueger, and Howard Wial, "Locating American Manufacturing," (Washington DC: Brookings Institution, May 2010). Available at: http://www.brookings.edu/~/media/research/files/reports/2012/5/09%20locating%20american%20manufacturing%20wialh/0509_locating_american_manufacturing_report.pdf

56 Ibid, pp. 44-51

57 Rob Sentz, "Top Manufacturing Sectors for 2011," New Geography Blog at: http://www.newgeography.com/content/002865-top-manufacturing-sectors-for-2011?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+Newgeography+%28Newgeography.com+-+Economic%2C+demographic%2C+and+political+commentary+about+places%29

58 Brian Lombardozzi, Timothy Mathews and James Parrot, "Building New York's Future: Creating Jobs and Business Opportunities through Transit Investments," September 2011, p. 16

59 Tripp Umbach, "Powering Pennsylvania: GE Transportation's Impact on the Economy and the Community at Large in Northwest Pennsylvania,' 2010

60 See concept summary at: http://steelinterstate.org/concept

in this work. The NIST MEP Rail Connectivity Forum events have provided excellent opportunities to develop these types of connections within the rail industry.

At the same time, economic and workforce developers should develop their own regional supply chain guides or maps that identify key suppliers, potential suppliers, and other industry opportunities. Supply chain maps of the rail sector have been developed by foreign governments. For example, Australia's On Track to 2040 strategy and Great Britain's Rail Value for Money study both contain very detailed and comprehensive assessments of their domestic rail supply chains.[61] Duke University's 2010 study on the passenger rail and urban transit supply chain provides similar analysis of the U.S.[62] This national level analysis should be updated on a regular basis and supplemented with studies that examine the regional, state, and local implications of current rail supply chain dynamics.

These national level analyses should be supplemented with local or regional assessments of potential supply chain opportunities. Mapping exercises have been successfully completed in many other manufacturing sectors. In recent years, the Great Lakes Wind Network, the Environment Law and Policy Center, and the Kansas's Advanced Manufacturing Institute have produced detailed analyses of various regional wind industry supply chains.[63]

Economic developers must also move beyond simply mapping supply chains to building deeper connections within these networks. Some regions are now experimenting with new online tools to help build these linkages. A new web tool, Connectory.com, offers great potential. The Connectory is a nationwide web-based network that contains profiles of companies in a host of industries and levels of the supply chain. In addition to its national database, the Connectory also includes specialized regional networks such as defense and aerospace suppliers located in San Diego or in the Pacific Northwest.

The NIST MEP Supplier Scouting efforts could benefit from closer connections to these regional initiatives, and other related local efforts. The effectiveness of Supplier Scouting would be amplified if the NIST MEP national network could be supplemented by networks of state/local manufacturing associations, cluster groups, and economic development entities.

These networks should link firms to needed tools and services, especially business development support and access to capital. In most cases, firms within these rail manufacturing sectors should be connected to existing and new MEP Center programs such as ExporTech, innovation engineering and lean product development. Connections to financing are also crucial. Firms entering new rail markets will need outside investment to purchase new equipment, provide necessary training, obtain needed certifications and the like. Without new infusions of working capital, their ability to retool could be hampered. The new investment tools described earlier could be deployed for this purpose.

In addition to providing support services to local manufacturers, these efforts should also be aligned with ongoing advocacy work at the national level, at groups like APTA and the One Rail Coalition, and in local efforts such as the Steel Interstate Coalition and Californians for High Speed Rail. Most of these groups tout the economic benefits of new rail investments, but their claims largely focus on the economic benefits of reduced travel time or local real estate development opportunities. They rarely stress the numerous economic benefits that could be generated by new local rail manufacturing opportunities. Connecting these opportunities can help increase public interest and support not only in expanded passenger rail opportunities, but in supporting the related industrial base as well.

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61 Australia National University (ANU) Edge, "On Track to 2040: Preparing the Australian Rail Supply Industry for Challenges and Growth," June 2012; United Kingdom Department of Transport, "Realizing the Potential of GB Rail," May 19, 2011

62 Lowe et al, 2010

63 See, for example, Advanced Manufacturing Institute, Kansas Wind Industry Supply Chain Survey, 2009, (Manhattan, KS: AMI, 2009).

8.0
What Does a Comprehensive Supply Chain Program Look Like?

The U.S. rail industry urgently needs new approaches to supporting supply chain development at regional and local levels. At present, most regions manage with a complex and cumbersome mix of support services and programs that do not meet the specific needs of targeted sub-industries and clusters. Fortunately, there are many existing models and best practices that contain key components of a comprehensive supply chain development program, described below.

Identification for both domestic and international government procurement opportunities.

Effective programs aid domestic manufacturers in accessing both domestic and international procurement opportunities. In Australia, for example, the Rail Supplier Advocate's Office (part of Australia's Department of Industry, Innovation, Science, Research and Tertiary Education) supports the development of new supply connections for Australia's rail suppliers. The office also sponsors overseas missions with special focus on opportunities in China and elsewhere in Asia.

Advocacy for the rail sector.

In Great Britain, the Derby and Derbyshire Rail Forum represents over 100 companies employing more 25,000 workers. The Forum advocates for local firms, much like a typical trade association, and also builds connections to key agencies at the local, regional, and national levels.

Provision of funding to support R&D and innovation activities.

In Europe, the European Rail Research Advisory Council coordinates investments in high priority research areas of interest across the European Union. Current ERRAC projects include research on "the greening of surface transport," "encouraging modal shift and decongesting transport corridors," and "encouraging sustainable urban transport."

Development of technology roadmaps and forecasting of future demand in key market segments.

In Great Britain, a number of private, non-profit, and public partners (including the UK Department of Transport and Transport Scotland) charted a Technical Strategy Advisory Group that in turn produced a 30-year rail technical strategy.[64] This road map presents key issues and technical challenges likely to affect the industry up to 2040.

Supplier Continuous Improvement and Business Development Programs

Effective rail supply chain programs must also engage broader manufacturing support programs. In the U.S., the NIST MEP programs provide critical support to rail suppliers and other manufacturers. However, similar programs operating overseas benefit from more robust funding and a wider menu of available support tools. These manufacturing support agencies are assuming growing importance across the developed economies. A recent global benchmarking study concluded that: "(g)lobal best practices have seen the manufacturing support agencies become the central hub, or delivery mechanism, for a comprehensive suite of services (for SMEs)."[65]

Coordination and Streamlining of standards and procurement processes.

In the U.S., the creation of the PRIIA Section 305 Next Generation Corridor Equipment Pool Committee is setting important precedents by promoting joint purchasing, such as the current California-Illinois joint procurement, and creating common standards for new equipment. These efforts will help create economies of scale and new efficiencies in the procurement process.

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[64] Technical Strategy Advisory Group, Consultation: Shaping the 30-Year Rail Technical Strategy, December 2010. Available at www.futurerailway.org.

[65] Stephen J. Ezell, and Robert D. Atkinson, "International Benchmarking of Countries' Policies and Programs Supporting SME Manufacturers," Washington, DC: The Information Technology and Innovation Foundation, September 2011, p. 9

9.0
Final Thoughts

For the first time in decades, the U.S. passenger rail industry is feeling a sense of optimism. Even with recent budget cuts for high speed rail, the overall prospects for industry are promising. Ridership and demand levels are growing and interest in rail transportation remains strong among younger Americans. Meanwhile, major new procurement opportunities are on the horizon.

These trends also open wider opportunities. Smart public policies can help ensure that U.S. rail manufacturers and suppliers become more competitive, and that new firms can enter the industry with new ideas, new products, new technologies and new services. An infusion of R&D investments and the development of updated rail infrastructure can expand capacity. Meanwhile, programs like MEP Supplier Scouting can help build strong and more resilient supply chains. Finally, local economic and workforce development leaders can invest to support new manufacturing clusters and to develop a more skilled and capable local talent base. These initiatives can help expedite a rail renaissance that not only creates new and more sustainable transportation options for American business and for individuals, but that also generates jobs and business opportunities for American manufacturing.

Key References

The sources listed below are key resources to learn more about leading trends in the rail manufacturing:

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