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ASSESSING THE ECONOMIC BENEFITS OF INCREASED INVESTMENT IN LOS ANGELES'S PUBLIC TRANSIT INFRASTRUCTURE

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Much has been said about how increased infrastructure investment at the national level can help counteract the lingering effects of the Great Recession. Numerous studies have highlighted the United States' enormous backlog of infrastructure needs (Heintz, Pollin, and Garrett-Peltier 2009), the high return to investment of this type of fiscal stimulus (Economic Development Research Group 2009), and the tremendous role that public investment has in improving and sustaining long-term economic health (Bivens 2012). Yet it is important to also recognize that well-targeted infrastructure investments can be used at the regional level to strengthen local economies and help revive regional industries where job losses were particularly severe.

The Los Angeles County Metropolitan Transportation Authority (LA Metro) is in the process of undertaking the 30/10 Initiative, which "would accelerate construction of 12 key Metro expansion projects originally scheduled to be built over three decades—and complete them by 2019" (LA Metro 2010). This type of targeted public investment in transit infrastructure can significantly boost the regional economy over the near term and also provide myriad benefits to the region's residents and businesses over the long term.

This issue brief discusses the potential economic impacts of the 30/10 Initiative in three parts: a short explanation of the benefits of greater investment in Los Angeles's regional transit infrastructure; an analysis of the employment losses suffered by the Los Angeles region as a consequence of the Great Recession; and a projection of the national, state, and regional economic effects expected from one component of the 30/10 Initiative—LA Metro's purchase of 235 transit railcars for expanded regional transit rail capacity (to which the county has committed $1.1 billion through 2019).

This issue brief finds that:

- The Los Angeles region experienced significant job losses as a result of the Great Recession, with larger percentage declines in employment and higher unemployment rates than the country as a whole.
- Construction and manufacturing—sectors likely to benefit considerably from public transit investment—had the largest proportional losses of all major industry groups in the Los Angeles region. Total peak-to-trough employment in construction fell by 36.7 percent, while employment in manufacturing fell 18.8 percent.
- Transit rail expansion and investment in railcars have the potential to generate a significant number of jobs. At the national level, a $1.1 billion purchase of transit railcars from U.S. producers could generate as many as 8,200 jobs (excluding jobs created by increased household spending). This serves as a "best-case scenario" estimate of the national employment effects of such a purchase.
- The jobs impact on the Los Angeles region of a $1.1 billion purchase of transit railcars would vary based upon the railcar manufacturing firms' inclusion of regional businesses in their supply chains. Estimates based upon a purchase of this size from U.S. producers indicate that as many as 2,400 regional jobs, including jobs created by increased household spending, could be supported by such an investment. This serves as a "best-case scenario" estimate of the regional employment effects of such a purchase.
- Using data from the three employment plans submitted to LA Metro during the bidding process for the railcar contract, we estimate that the winning bid, submitted by Japan-based Kinkisharyo, will create 536 jobs in the Los Angeles region. This is about equal to the estimated 529 regional jobs that would have been created under the CAF USA proposal, but fewer than the 1,488 jobs we predict would have been created by the Siemens proposal.[1]
- To maximize the near-term job creation effects of transit infrastructure investments such as the LA Metro railcar order, it is important to utilize U.S.-based manufacturers wherever possible. Given currently high unemployment levels, capturing the maximum labor market benefits from infrastructure projects is just as important as realizing the longer-term improvements in productivity, efficiency, and quality of life that result from increased public transit investment.

The numerous benefits of investing in Los Angeles's public transit infrastructure

Los Angeles[2] would benefit enormously from increased public transit investment. The region is consistently listed as the most traffic-congested area in the United States, and the economic costs of this gridlock are significant. Regional drivers face average travel times that are 35 percent longer than if roads were free-flowing (INRIX 2010). Traffic congestion reduces fuel efficiency, increases motor vehicle accidents (Litman and Fitzroy 2012), and leads to higher emissions of carbon dioxide (Barth and Boriboonsomsin 2010) and other particulates that are damaging to public health (Krzyzanowski, Kuna-Dibbert, and Schneider 2005).

High levels of traffic also result in additional wear on regional roads, leading to larger maintenance costs—costs ultimately borne by taxpayers. This added wear also makes operating a vehicle on these roadways more costly for individual motorists. In fact, Los Angeles has the second-highest vehicle operating costs of any U.S. region as a consequence of poor-condition roads[3] (TRIP 2010). The American Public Transportation Association estimates that the average resident driver in the Los Angeles region would save about $893 a month, or $10,712 annually, if she could use public transit in place of a private automobile (American Public Transportation Association 2011).

The cost savings for drivers and governments in the region from reducing traffic congestion present considerable incentives for expanding regional transit options. However, the economic benefits of increased transit investment go beyond those gained from traffic alleviation. Many studies have shown that public infrastructure investments lead to faster economic growth and larger productivity gains, and can encourage a "crowding in" of greater private-sector investment. (See Bivens 2012 for a summary of the literature.) Investments in public transit systems have also been shown to raise both residential and commercial property values (Weinstein and Clower 1999; Garrett 2004; Cervero and Duncan 2002), and the presence of a public transit access point can encourage business clustering and regional agglomeration[4] (Treasury 2012). Finally, increasing the availability of public transit can improve regional labor markets by helping to overcome "spatial mismatch" among jobless low-income individuals. In other words, public transit provides these would-be jobseekers with access to job markets outside their immediate communities of residence (Holzer and Stoll 2001).

As a policy tool for job creation, public transit investments are also particularly effective. They typically are labor-intensive and relatively well-paying. In addition, they require low- to moderately skilled workers, many of whom are in sectors that have suffered disproportionately in the Great Recession and its aftermath (Treasury 2012). This latter point is particularly true of the Los Angeles region, as is shown in the following sections.

The Los Angeles regional labor market suffered particularly heavy losses in the Great Recession and its aftermath

The job losses Los Angeles has incurred since the onset of the Great Recession provide another argument for increased public transit investment in the region. Nearly every U.S. state and region experienced significant job losses as a result of the Great Recession; however, job losses in the Los Angeles region and the entire state of California were particularly severe. As shown in **Table 1**, the Los Angeles region lost 555,000 jobs between its peak level of employment in July 2007 and its low point in March 2010.

As the table shows, this loss of 9.8 percent of the region's jobs is larger in percentage terms than the 9.0 percent peak-to-trough loss that California experienced, and much larger than the 6.4 percent loss experienced by the country as a whole. By March 2012, the region had recovered some of the jobs lost; however, total employment was still 451,800 jobs (8.0 percent) below its peak level. In comparison, as of March 2012, overall employment in California was 6.5 percent off its July 2007 peak, while total U.S. employment was 3.8 percent below its January 2008 peak.

The Los Angeles region's employment losses are compounded by the area's considerable population growth since before the Great Recession. After taking into account growth in the regional working-age population since July 2007, Los Angeles's jobs deficit (the difference between the current number of jobs in the region and the number necessary to reach its prerecession peak employment rate) is 725,000 jobs—meaning a 13.9 percent

TABLE 1

Employment changes in the Los Angeles region, California, and the United States, 2007–2012

	Peak employment	Lowest employment	Current
Los Angeles region	July 2007	March 2010	March 2012
Employment level	5,653,400	5,098,400	5,201,600
Difference from peak	-	-555,000	-451,800
Percentage change from peak	-	-9.8%	-8.0%
California	July 2007	February 2010	March 2012
Employment level	15,223,100	13,849,800	14,237,300
Difference from peak	-	-1,373,300	-985,800
Percentage change from peak	-	-9.0%	-6.5%
United States	January 2008	February 2010	March 2012
Employment level	138,023,000	129,244,000	132,821,000
Difference from peak	-	-8,779,000	-5,202,000
Percentage change from peak	-	-6.4%	-3.8%

Source: Author's analysis of Current Employment Statistics data

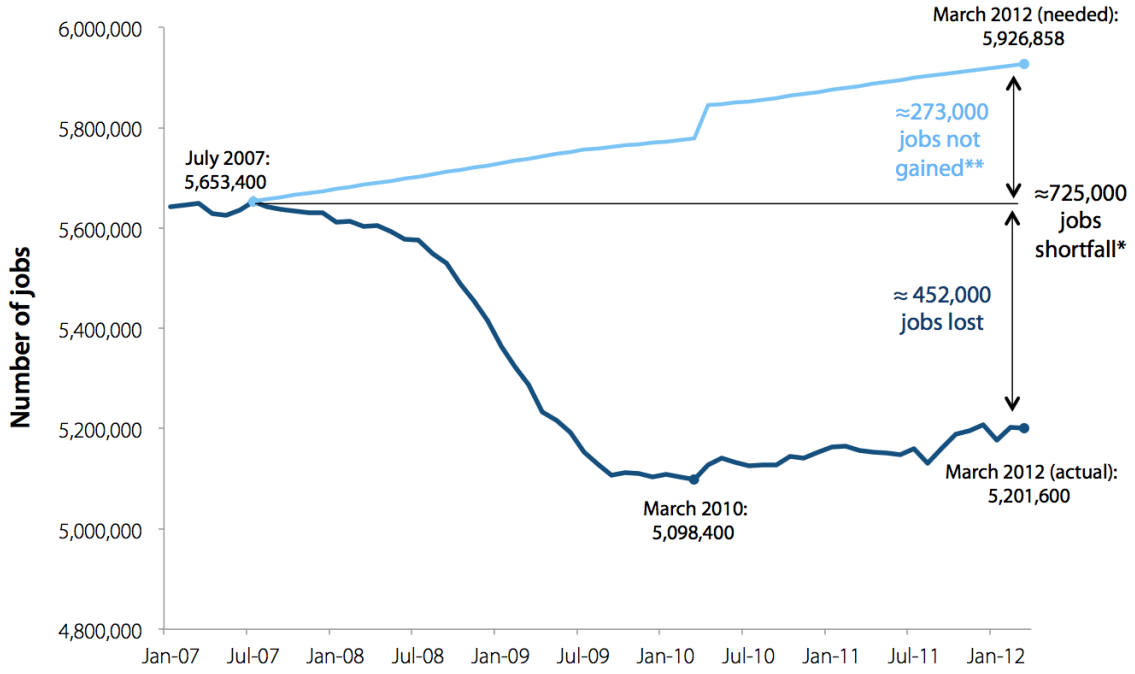
increase would be needed from current employment levels.[5] (See **Figure A**.) This is about 4 percentage points larger than the region's peak-to-trough employment change, indicating that job growth in Los Angeles since the regional labor market "bottomed out" in March 2010 has not even kept pace with population growth.

As would be expected, these acute job losses have resulted in unemployment rates well above the national average. The unemployment rate in Los Angeles peaked at 12.5 percent in July 2010, 3 percentage points higher than the national unemployment rate of 9.5 percent at that same time, and 2.5 points higher than the national peak of 10 percent in October 2009 (see **Figure B**). Los Angeles's peak unemployment rate was essentially the same as the overall California peak of 12.4 percent, also in July 2010.

As of March 2012, Los Angeles's regional unemployment rate had fallen to 10.9 percent—again essentially the same as California's 11 percent. This is still considerably higher than the national average of 8.2 percent. Moreover, because regional job creation has not even kept pace with population growth, we can conclude that the reduction in the regional unemployment rate is entirely due to individuals exiting the labor force.[6] The region could thus stand to benefit significantly from the jobs that would be created via increased investment in transit infrastructure.

FIGURE A

Los Angeles regional employment levels and jobs deficit, January 2007–March 2012



* The difference between the current number of jobs in the Los Angeles region and the number of jobs necessary to reach the region's prerecession employment rate

** The number of jobs needed just to keep up with population growth

Source: Author's analysis of Current Employment Statistics and Local Area Unemployment Statistics data

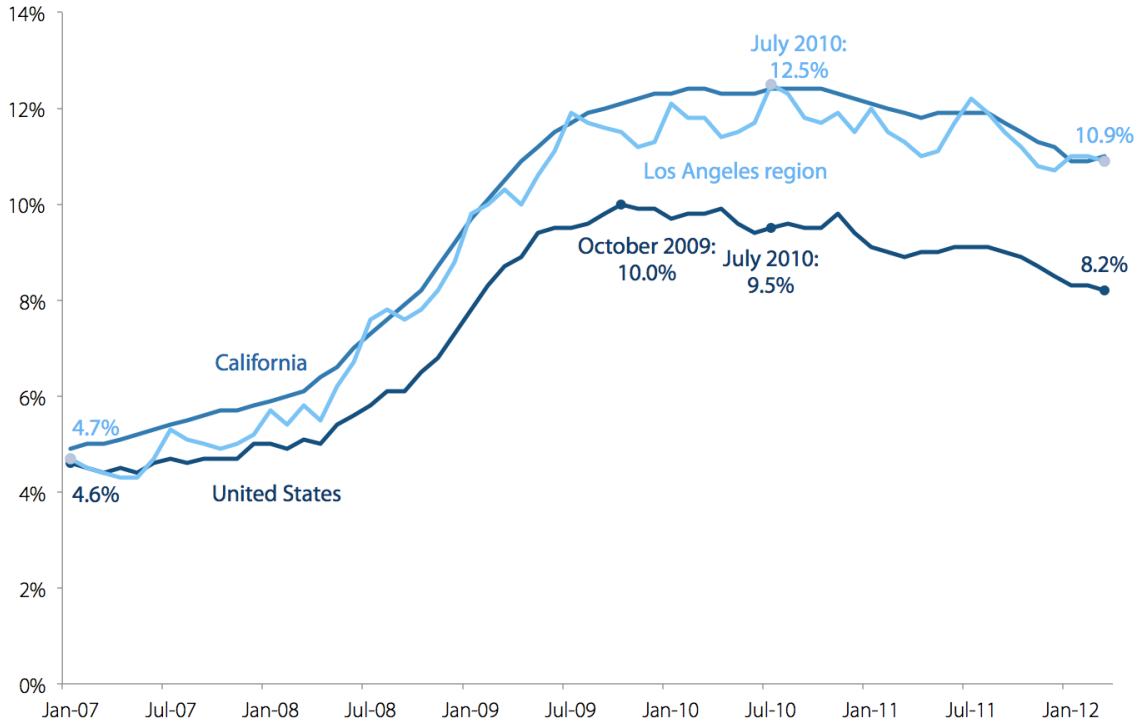
Transit infrastructure investments would target the sectors hit hardest in the downturn: construction and manufacturing

Though nearly every major Los Angeles industry lost jobs in the Great Recession and its aftermath, manufacturing and construction—industries likely to see significant increases in employment from transit infrastructure investment (Treasury 2012)—saw the largest percentage losses of all major industry categories. From peak to trough (the third quarter of 2007 to the first quarter of 2011), Los Angeles's construction industry lost 97,500 jobs, a decline of 36.7 percent. In comparison, the manufacturing industry lost about 119,000 jobs, representing 18.8 percent of peak sector employment, from the first quarter of 2007 to the first quarter of 2012.[7] As shown in **Figure C**, in percentage terms both of these sectors' regional losses are considerably larger than the region's and the country's overall job losses. It is also important to note that both national and regional overall employment levels have seen some modest growth since bottoming out, whereas employment in Los Angeles's construction sector has been essentially flat since reaching its January 2011 trough. Meanwhile, manufacturing employment reached its lowest level in the first quarter of 2012—an indication that Los Angeles may still be losing manufacturing jobs.

While many agree that Los Angeles would benefit from making additional public transit infrastructure invest-

FIGURE B

Unemployment rates of the Los Angeles region, California, and the United States, January 2007–March 2012



Source: Author's analysis of Local Area Unemployment Statistics

ments at any time, the region's exceptionally high unemployment rate, combined with the disproportionate job losses in the area's construction and manufacturing sectors, make this an ideal time to undertake such investments. This is particularly true because the majority of jobs created by infrastructure investment projects are typically in construction and manufacturing (Treasury 2012).

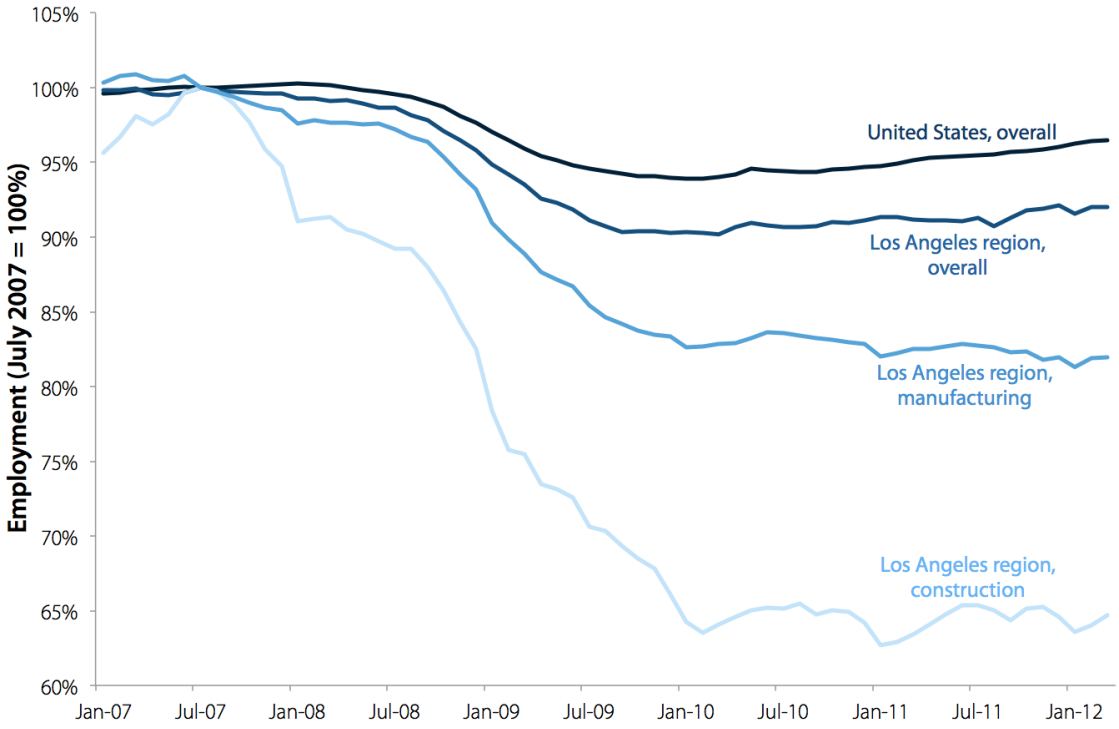
In broader macroeconomic terms, the Los Angeles area's high levels of unemployment represent idle resources in the regional economy. This means that mobilizing these resources now for public projects such as expanding the Los Angeles transit rail network would not require diverting labor resources from private projects. Thus, such public projects are likely to cost less now than in times of lower unemployment and higher private demand. Indeed, the depressed state of the Los Angeles and national economies and the current extraordinarily low borrowing rates mean that debt-financed infrastructure projects could essentially represent a "free lunch." In other words, the increased economic activity, increased tax revenue, and increased productivity that would result from these projects would offset at least some of the borrowing costs (Bivens 2012).

Potential economic effects of increased transit railcar purchases

The 30/10 Initiative contains a range of transportation infrastructure projects aimed at accelerating the improvement of the region's transportation system. Several of

FIGURE C

Share of pre-recession jobs, by sector and area, January 2007– March 2012



Source: Author's analysis of Current Employment Statistics data

these projects involve expansion of the region's transit rail system. To accommodate this expanded rail service, the county put forth a request for proposals to expand LA Metro's railcar stock. Under LA Metro's *2009 Long Range Transportation Plan*, the county committed $1.1 billion through 2019 toward the purchase of 235 transit railcars to replace and augment the current rail stock. This issue brief will now examine the potential economic effects of this particular component of the 30/10 Initiative.

Before analyzing the Los Angeles-specific jobs effects of this proposal, it is instructive to first examine the national employment effects we would expect from a $1.1 billion increase in demand for railcars. Because the national economy contains virtually all elements of the railcar manufacturing process—railcar assembly plants, manufacturing plants, and parts suppliers—modeling the effects from railcar investments at the national level serves as a "best-case scenario" for total U.S. job creation.[8]

Using the Bureau of Labor Statistics' employment requirements matrix, **Table 2** shows that an additional $1.1 billion in final demand for railcars from U.S. producers would generate 8,226 gross full-time-equivalent jobs.[9] Of those 8,226 jobs, 4,632 (56.3 percent) would be "direct" jobs—meaning jobs within the rail rolling stock industry (the BLS industry category for railcar producers). The remaining 3,594 (43.7 percent) would be "indirect" jobs in industries that supply and support the rail rolling stock industry. (Note that the BLS employment requirements matrix does not include any estimates of jobs created by increased household spending by workers in affected industries.)

TABLE 2

Projected national employment effects of $1.1 billion* railcar purchase

Domestic jobs created**		**8,226**
Direct jobs (i.e., jobs in the railcar industry)		4,632
Indirect jobs (i.e., jobs that supply and support the railcar industry)		3,594
Top 20 domestic industries affected	**Domestic jobs created**	**Share of domestic total**
Railroad rolling stock manufacturing	4,632	56.3%
Wholesale trade	406	4.9
Architectural and structural metals manufacturing	325	4.0
Management of companies and enterprises	261	3.2
Electrical equipment manufacturing	180	2.2
Machine shops; turned product; and screw, nut, and bolt manufacturing	98	1.2
Employment services	97	1.2
Food services and drinking places	88	1.1
Services to buildings and dwellings	87	1.1
Truck transportation	81	1.0
Aerospace product and parts manufacturing	71	0.9
Spring and wire product manufacturing	57	0.7
Motor vehicle parts manufacturing	56	0.7
Foundries	56	0.7
Monetary authorities, credit intermediation, and related activities	55	0.7
Forging and stamping	54	0.7
Management, scientific, and technical consulting services	51	0.6
Accounting, tax preparation, bookkeeping, and payroll services	49	0.6
Iron and steel mills and ferroalloy manufacturing	47	0.6
Architectural, engineering, and related services	44	0.5

* In 2011 dollars

** Represents gross full-time-equivalent jobs

Notes: Industries in bold fall into the manufacturing and construction major industry classifications. Estimates use final-demand multipliers and do not include effects from household spending.

Source: Author's analysis using Bureau of Labor Statistics' employment requirements matrix

Table 2 also lists the top 20 domestic industries that would be affected by a change in demand for railcars. As the table shows, many of these industries—which appear in bold—fall into the manufacturing major industry category, which, as noted previously, suffered heavy job losses in Los Angeles over the past five years. (Because these estimates are based on increased demand for railcars, they do not project a significant increase in construction jobs. However, it is clear that other components of the 30/10 Initiative—such as extensions of various transit rail lines—would create a significant number of jobs in construction.)[10]

Looking next at the regional effects of this increased investment in transit railcars, we made use of the Bureau of Economic Analysis's Regional Impact Modeling System (RIMS II) to estimate effects on the Los Angeles economy.[11] It is important to note that although Los Angeles does have a large concentration of manufacturing firms, the region does not currently possess any railcar production facilities. However, as noted in the next section, transit railcar producers sometimes locate final assembly plants in the region where the assembled railcars will be used. This allows for easier transportation of the railcars' large components and creates a cadre of workers in the region with knowledge of the rail vehicles' construction who could potentially be employed by the transit system once the cars are put into operation. Nevertheless, the lack of any railcar production facility in the Los Angeles region will make the regional effects significantly smaller than would otherwise be the case, and smaller than those predicted by the national model.

Table 3 details the expected gross change in output, household earnings, and employment for all major industry categories in the Los Angeles region that would result from a $1.1 billion increase in demand for railcars from U.S. producers. The numbers reflect the sum of both *direct* and *indirect* effects, as well as the *induced* effects caused by the household spending of directly and indirectly affected workers (often called the consumption multiplier).[12] As with the estimates produced by the national model, these figures can be thought of as a "best-case scenario" for assessing the regional impact of a railcar purchase of this magnitude. The figures are also useful because they show the relative impacts across all major industry categories. As the table shows, the model predicts that a $1.1 billion increase in demand would result in nearly $593 million in regional economic activity. It would also lead to nearly $130 million in additional earnings to regional households, and the creation of 2,434 full-time-equivalent regional jobs.

As with any impact-modeling scenario, these figures represent one estimate in a range of estimates that could vary based upon how well the model's underlying data reflect current economic conditions and railcar manufacturing processes.[13] Nevertheless, the national and regional estimates presented in this section demonstrate that transit infrastructure investment has the potential for significant positive economic effects. These "best-case scenario" estimates also serve as a baseline against which we can evaluate the projected jobs and earnings effects of the specific bids put forth to fulfill the railcar order. These estimates are presented in the following section.

Estimated jobs and earnings effects based upon bidding companies' proposals

To better predict the effects of the 30/10 Initiative's railcar purchases, we also analyzed the bidding railcar companies' proposals submitted to LA Metro. By using employment and labor cost data supplied directly from the production firms, we have a better understanding of the true labor requirements of the project and can utilize the RIMS model's direct-effect multipliers, which more accurately predict regional impacts than the final-demand approach used in the previous section (U.S. Department of Commerce 1997).

Three companies reached the final bidding stages for the railcar order, and in late April 2012, the LA Metro board

TABLE 3

Projected economic effects on Los Angeles region of $1.1 billion* LA Metro railcar purchase, by industry

Industry	Increase in output (2011 dollars)	Increase in household earnings (2011 dollars)	Jobs created**
Manufacturing	$378,178,739	$66,275,824	1,145
Retail trade	13,677,464	4,443,600	152
Health care and social assistance	13,961,098	6,334,494	127
Administrative and waste management services	7,437,515	3,088,460	116
Professional, scientific, and technical services	17,868,945	7,910,239	106
Wholesale trade	24,329,499	7,311,456	105
Real estate and rental and leasing	31,767,014	2,489,677	104
Management of companies and enterprises	24,959,797	9,296,894	103
Food services and drinking places	6,429,039	1,985,438	97
Finance and insurance	23,856,775	6,807,217	97
Transportation and warehousing	9,013,260	2,962,400	63
Other services	8,288,417	2,395,132	51
Information	16,639,865	3,907,847	46
Arts, entertainment, and recreation	2,741,796	945,447	34
Educational services	2,016,953	787,872	26
Households	0	157,574	19
Accommodation	2,206,043	661,813	19
Construction	1,733,319	598,783	11
Utilities	6,555,098	1,103,021	10
Mining	661,813	126,060	1
Agriculture, forestry, fishing, and hunting	220,604	31,515	1
Total	**$592,543,054**	**$129,620,763**	**2,434**

* In 2011 dollars

** Represents gross full-time-equivalent jobs

Notes: Estimates use final-demand multipliers and include direct, indirect, and induced effects.

Source: Author's analysis using Bureau of Economic Analysis's RIMS II regional model for Los Angeles and Orange counties

awarded the railcar contract to the Japanese firm Kinkisharyo (Weikel 2012). Although the contract has been awarded, it is still valuable to compare the job impacts that could have resulted from all three of the bidding firms' proposed employment plans. The level of domestic and regional inputs in the production process, as outlined

by each firm's proposal, varied considerably. As previously noted, these differences will greatly affect the domestic and regional economic effects of the railcar purchase.

All three of the bidding firms are non-U.S. companies with some existing U.S. presence. Kinkisharyo (based in Japan) has design and engineering facilities in Massachusetts. Siemens (based in Germany) has a railcar manufacturing facility in Sacramento, California, and a propulsion system and control production facility in Alpharetta, Georgia. CAF USA (whose parent company is based in Spain) has a railcar manufacturing/assembly facility in Elmira, New York. All of the firms source at least some of their component materials from various U.S. producers.

All three companies indicated their intention to manufacture the railcars by expanding capacity, or utilizing excess capacity, at existing production facilities outside the Los Angeles region. However, even if the major railcar components are manufactured outside the area, final assembly and testing of the cars can be done at a new facility in the Los Angeles area. This provides an excellent opportunity for regional job creation, particularly for the tens of thousands of manufacturing workers who have lost jobs since 2007.

In their proposals, the firms were required to include employment plans detailing the direct employment needs and associated labor costs of fulfilling the 235-railcar order.[14] The plans all assumed the construction of a final assembly and testing facility in the Los Angeles region. Using the employment and earnings projections from these plans, we have estimated the economic benefits for the Los Angeles region—and (where possible) for the state of California and the United States. **Table 4** displays these results.

It is estimated Kinkisharyo's proposal will generate 536 full-time-equivalent jobs and nearly $129 million in earnings in the Los Angeles region. In comparison, Siemens's employment plan would have created 1,488 jobs in the Los Angeles region, and these jobs would have resulted in roughly $121 million in increased earnings to regional households. CAF USA's plan would have led to 529 new jobs and about $151 million in additional household earnings in the region.

Kinkisharyo's proposal included employment and earnings plans from vendors and parts suppliers from various U.S. locations. The company also indicated that a portion of the railcar production will take place at an unspecified U.S. facility. Using state-level multipliers, we were able to estimate the employment and earnings impacts from Kinkisharyo's proposal for the state of California and the United States.[15] The Kinkisharyo plan is predicted to result in 833 jobs for the state of California and 1,344 jobs nationwide. California households will receive around $148 million in additional earnings, and nationwide household earnings will increase by about $206 million.

Siemens's proposal indicated the company would have manufactured the Los Angeles railcars at its Sacramento production facility. We applied state-level multipliers to the job creation and earnings estimates Siemens provided for this part of the order to assess the total employment and earnings impacts for the state of California from both the manufacturing and assembly of the railcars. It is predicted the Siemens plan would have supported 4,442 jobs within the state and generated about $261 million in state household earnings.

The estimates based upon the bidding firms' employment plans show job creation numbers well below the estimates predicted by the national and regional final-demand-change models in the previous section. This is likely the consequence of both technical limitations of the final-demand models[16] and the fact that all three bidding firms are non-U.S.-based producers. Indeed, the regional job creation projections based on Siemens's employment plan—the only bidding firm that had intended to manufacture the railcars entirely in the United States—are the closest to the employment projections from the regional final-demand models. This suggests that selecting a U.S.-based producer would have gone further toward realizing

TABLE 4

Projected employment and household earnings effects of bid proposals to manufacture 235 railcars for LA Metro

	SIEMENS		KINKISHARYO		CAF USA	
	Household earnings	Jobs created*	Household earnings	Jobs created*	Household earnings	Jobs created*
Los Angeles region						
Direct effects	$50,305,940	563	$52,856,989	200	$62,402,504	205
Indirect effects	38,120,456	416	41,038,166	152	47,931,540	144
Induced effects	32,729,357	509	34,753,470	184	40,838,029	179
Total	**$121,155,753**	**1,488**	**$128,648,626**	**536**	**$151,172,073**	**529**
California						
Direct effects	$95,626,635	1,114	$54,308,033	209	**	**
Indirect effects	91,065,244	1,525	51,717,540	286	**	**
Induced effects	74,531,399	1,803	42,327,681	338	**	**
Total	**$261,223,278**	**4,442**	**$148,353,254**	**833**	**	**
United States						
Direct effects	***	***	$89,016,354	354	**	**
Indirect effects	***	***	59,533,547	461	**	**
Induced effects	***	***	57,712,942	529	**	**
Total	***	***	**$206,262,843**	**1,344**	**	**

* Represents gross full-time-equivalent jobs

** The CAF USA proposal supplied to EPI lacked sufficient vendor information to produce state and national employment effect estimates.

*** The Siemens proposal supplied to EPI lacked sufficient vendor information to produce national employment effect estimates.

Notes: All estimates are based upon direct-effect multipliers for earnings and jobs.

Source: Author's analysis of data from U.S. employment plans and price forms, P3010 railcar bid, Los Angeles County Metropolitan Transportation Authority, supplied by Los Angeles Alliance for a New Economy, April 4, 2012

the "best-case scenario" job creation effects predicted in the previous section.

LA Metro's decision to award the railcar contract to Kinkisharyo despite the firm's lower potential for job creation warrants careful scrutiny. While the Siemens proposal was more costly than the Kinkisharyo bid (at $941 million versus $891 million),[17] the job creation potential of the Siemens bid was disproportionately greater than the additional cost. Siemens's bid was 5.5 percent larger than Kinkisharyo's, yet our estimates predict the former would

have created almost three times as many regional jobs as will the latter. In addition, we estimate Siemens's plan would have created more than five times as many jobs in California as will Kinkisharyo's. Other factors—such as past firm performance, reliability, etc.—must certainly play a role in the contract-award process. Yet the difference in projected job creation between the Siemens and Kinkisharyo plans is so stark that LA Metro's decision to award the contract to Kinkisharyo stands as a missed opportunity for additional regional and state job creation.

Conclusion

The long-term economic benefits of improved transit infrastructure can hardly be overstated. Los Angeles, perhaps more than any other U.S. region, has the potential to reap tremendous economic gains (particularly productivity improvements) and enhance its quality of life through expanding public transit. The potential immediate labor market benefits of these types of investments are also compelling. Public transit projects—such as the railcar plan analyzed in this paper and other components of the 30/10 Initiative—could provide jobs for thousands of area workers left unemployed by the Great Recession and provide relief to regional sectors that have suffered disproportionately in the downturn.

Yet as policymakers at all levels of government address budget shortfalls, public investment is threatened by myopic calls to reduce public spending, even as the need for such spending only grows larger. Nationwide, public transit ridership has increased 30 percent over the past 15 years, with 13 U.S. cities adding new transit lines and rail systems in that period (Treasury 2012). As environmental concerns and volatile fuel prices encourage more Americans to look for alternatives to private automobile usage, demand for public transit will only grow.

This represents an opportunity for forward-thinking regional planners in Los Angeles and elsewhere. Los Angeles already has a strong manufacturing presence; if the remaining 30/10 Initiative projects also include bid requirements such as the railcar order's insistence on local assembly facilities and the hiring of local workers, this could induce greater regional agglomeration in transit-related manufacturing. The region would then not only reap rewards from the improvements to its own transportation system, but would also benefit from the rise of a nascent industry with strong growth prospects. Indeed, Los Angeles's manufacturing base may give it an advantage in nurturing such development.

Given the country's enormous infrastructure needs, Los Angeles in the coming years can serve as a prime example of how greater public investment can bring back lost jobs in the short term—and build a sounder economic foundation for the long term. Yet policymakers in Los Angeles and elsewhere must also be mindful of the trade-offs they face when awarding infrastructure contracts. The decision to grant the railcar contract to Kinkisharyo, despite the firm's lower potential jobs impact, was likely driven by immediate cost concerns, as Kinkisharyo's bid was less costly than Siemens's. While ensuring fiscal responsibility is always essential, we question whether the short-term savings achieved by selecting a marginally cheaper manufacturer with a less significant U.S. presence is better for Los Angeles and California residents than the long-term value of creating more good-paying jobs in the region. While this question may now be moot for the railcar purchase, it should be paramount for future components of the 30/10 Initiative.

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Appendix: Methodology

National estimates

The national employment effects estimates were produced using the Bureau of Labor Statistics' 2008 employment requirements input-output tables, which report the employment change of all U.S. industries for a given change in demand within a particular industry.

Regional estimates based upon final-demand change

The regional estimates were produced using the Regional Input-Output Modeling System (RIMS II) from the Bureau of Economic Analysis. The RIMS II model uses regional and national business spending patterns to estimate levels of regional interconnectedness. The model also takes into account regional variation in prices and wage levels to allow for regional differences in household spending among workers in the same industries.

There are some limitations of the model. The first is that the final-demand multipliers are priced in producer prices, not final-demand or user prices. (See U.S. Department of Commerce 1997.) Thus, without further detail on pricing that would allow the user to disaggregate the wholesale, transportation, and retail costs of a particular set of goods, the model's estimate using the final-demand multipliers will overestimate the regional effects. The RIMS system recommends using bill-of-sale detail to separate out specific changes in demand at the detailed industry level to attain more robust results. Such detailed information was not available for this analysis. This is likely why the estimates using final-demand multipliers are larger than the final employment estimates provided by each of the bidding firms.

Because all three firms indicated they would not manufacture the railcars in the Los Angeles region—they would only assemble the final components there—we adjusted the RIMS estimate to reflect this lack of a railcar manufacturing presence. As noted in the body of this issue brief, the BLS national input-output employment requirements data estimate that 56.3 percent of the domestic employment requirements of railcar production are in the railcar manufacturing industry. Furthermore, an analysis of the relative component costs of railcar production from the Siemens proposal[18] showed that the firm's proprietary component costs—i.e., those components that would be produced within the company and hence within the railcar industry category—is roughly 56 percent of total component costs. Therefore, the manufacturing impacts initially predicted by the RIMS model were reduced by 56 percent, and the model's direct-effect multipliers were then used to reduce the overall change in employment, earnings, and output effects in all other regional industries.

Estimates based upon each firm's proposal

The total employment and earnings estimates were made using direct-effect multipliers for employment and earnings from the RIMS II model. The initial direct-effect components for the regional model are simply the percentage of the employment and earnings totals reported by each firm for the Los Angeles region.

Because Siemens indicated that it would have manufactured the railcars at its production plant in Sacramento, we were able to apply RIMS state-level multipliers to the state-level employment and earnings figures included in the Siemens proposal. The Kinkisharyo proposal included some direct employment and earnings estimates from other U.S.-based parts suppliers that we attempted to use to generate state- and national-level estimates. However, without a domestic manufacturing facility and direct-effect figures for such a facility, it is difficult to benchmark our estimates against the national overall employment response estimate produced by the BLS employment requirements matrix. The CAF USA proposal did not include sufficient vendor information to attempt any state- or national-level estimation.

Endnotes

1. See the section "Estimated jobs and earnings effects based upon bidding companies' proposals" and the appendix for an explanation of why the job creation estimates based upon the submitted bids differ significantly from the regional estimate presented in the previous bullet.

2. Throughout this issue brief, the terms "Los Angeles" and "Los Angeles region" are used interchangeably to refer to the Los Angeles Metropolitan Statistical Area. The regional modeling later in the paper applies specifically to Los Angeles and Orange counties.

3. Los Angeles's annual vehicle operating cost was estimated in 2010 at $746. Los Angeles is second only to San Jose, at $756 annually (TRIP 2010).

4. Regional agglomeration refers to the phenomenon wherein businesses in similar or related industries aggregate in the same area to decrease transportation costs in the exchange of intermediary products and components. This aggregation can also lead to higher concentrations of workers with industry-specific knowledge, or "human capital." Researchers have theorized that such concentrations can turn these regions into centers of innovation—the best example being Silicon Valley. For more information on agglomeration effects, see Glaeser 2010.

5. The jobs deficit is calculated using employment data from the Current Employment Statistics and regional population numbers from the Bureau of Labor Statistics' Local Area Unemployment Statistics data. The peak employment level in July 2007 is extrapolated to March 2012 on a monthly basis at a growth rate equal to the region's population growth over that same period.

6. Once individuals exit the labor force—i.e., when they cease to look for work—they are not counted among the unemployed.

7. A complete breakdown of regional peak-to-trough employment changes by industry is presented in **Table A1**.

8. The BLS employment requirements matrix predicts that 84.6 percent of new jobs created by increased U.S. railcar demand would be domestically located. This highlights the railcar production industry's large potential for domestic job creation—in contrast to other industries that house their manufacturing plants overseas and/or source a greater portion of their parts from locations outside the United States.

9. Full-time equivalency takes into account the fact that some workers who are already employed will receive additional hours as a result of the increase in economic activity. It essentially takes the total additional work hours of both new hires and existing workers and divides by 40 to determine the total number of full-time-equivalent jobs. It is also important to note that the number of jobs supported by any increase in demand for railcars is a measure of gross, not net, job creation. That is, if the increase in demand requires rail producers to expand capacity and hire new workers, a portion of those workers may be pulled from existing employment elsewhere in the economy.

10. The previously noted job losses in manufacturing and construction were among businesses within these two major industry classifications. Data and sample size limitations make it more difficult to determine with greater specificity the minor industry groups that suffered losses, and doing so is beyond the scope of this issue brief.

11. The estimates shown are for Los Angeles and Orange counties. Further modeling detail is available in the appendix.

12. As a means of clarifying these three effects, consider only the earnings figures. The bottom-line, total dollar amount includes, for example, the dollars paid directly to a railroad car assembler at the railcar company (direct effects), the dollars paid to a machinist at the glass manufacturer that supplies the railcar company (indirect effects), and the dollars paid to the server at the local restaurant when these two workers go out to lunch (induced effects).

13. The RIMS II model relies upon 2008 data to estimate regional effects, and also uses producer prices, not final consumer prices, in the model's calculations. This is likely to create somewhat conflicting effects upon the resulting estimates. The degree to which regional economic conditions and business patterns in 2008 reflect the current environment in Los Angeles is unclear. As previously noted, there is far greater slack in the labor market today than in 2008. Physical capacity constraints are also unlikely to be an

issue for regional businesses given that the national economy has been operating below potential since that time. These two factors suggest that more jobs would be created than the model predicts. Moreover, many regional households have likely deferred major purchases as a consequence of the downturn, particularly those households with workers who lost their jobs. If the increased household earnings resulting from the railcar purchase allow households to actually make these purchases, the induced consumption effects would be magnified. At the same time, because the RIMS model is based upon producer prices, the $1.1 billion change in demand overstates the true change in railcar demand, as it includes retail markup and transportation costs of component parts. Thus, the resulting figures would overstate the true regional effects. It is also possible that railcar manufacturers have achieved greater efficiencies in their production processes since 2008 that would reduce the employment requirements for manufacturing railcars. Reconciling all of these competing effects is impossible without more recent regional data and a more detailed breakdown of the railcar producers' actual component prices.

14. The bid proposals show the employment and earnings requirements for an initial "base buy" of 78 railcars, with options to produce the remaining 157 cars. To remain consistent with the preceding estimations, only estimates reflecting the full "base buy plus options" for all 235 railcars are presented.

15. Because the Kinkisharyo proposal did not specify a location for the company's intended U.S. railcar facility, we applied a national average of the state-level multipliers to the predicted labor requirements for this facility described in the Kinkisharyo proposal. The predicted California impacts would be higher if the facility were located in the state.

16. See endnote 13.

17. The total price of each firm's bids were: Siemens, $940,636,114; Kinkisharyo, $891,371,272; CAF, $785,632,250. Basing the final-demand modeling on the amount of $1.1 billion is appropriate because this is the value of the railcars sought to be purchased from LA Metro's budget allocation. It serves as a baseline for potential job creation and household earnings effects that can be compared with the firm-specific effects predicted by each individual proposal.

18. We use Siemens's component cost information as a benchmark because, of the three bidding firms, it is the only one that indicated it would manufacture the railcars entirely in the United States. Consequently, the firm's production requirements are likely to be closest to those predicted from the BLS employment requirements data.

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TABLE A1

Changes in Los Angeles regional employment, by industry, 2007–2012

Industry	Peak employment	Lowest employment	Current
Mining and logging	2007Q4	2009Q4	2012Q1
Employment level	5,033	4,433	4,500
Difference from peak	-	-600	-533
Percentage change from peak	-	-11.9%	-10.6%
Construction	2007Q3	2011Q1	2012Q1
Employment level	265,533	168,033	170,967
Difference from peak	-	-97,500	-94,567
Percentage change from peak	-	-36.7%	-35.6%
Manufacturing	2007Q1	2012Q1	2012Q1
Employment level	634,267	514,933	514,933
Difference from peak	-	-119,333	-119,333
Percentage change from peak	-	-18.8%	-18.8%
Wholesale trade	2007Q4	2010Q1	2012Q1
Employment level	315,700	277,500	285,267
Difference from peak	-	-38,200	-30,433
Percentage change from peak	-	-12.1%	-9.6%
Retail trade	2007Q4	2009Q3	2012Q1
Employment level	608,667	519,567	536,767
Difference from peak	-	-89,100	-71,900
Percentage change from peak	-	-14.6%	-11.8%
Transportation and utilities	2007Q4	2010Q1	2012Q1
Employment level	197,000	174,933	176,767
Difference from peak	-	-22,067	-20,233
Percentage change from peak	-	-11.2%	-10.3%
Information	2008Q2	2010Q2	2012Q1
Employment level	246,033	212,367	218,533
Difference from peak	-	-33,667	-27,500

TABLE A1 (CONTINUED)

Industry	Peak employment	Lowest employment	Current
Percentage change from peak	-	-13.7%	-11.2%
Financial activities	2007Q1	2010Q1	2012Q1
Employment level	380,833	311,167	313,600
Difference from peak	-	-69,667	-67,233
Percentage change from peak	-	-18.3%	-17.7%
Professional and business services	2007Q4	2009Q3	2012Q1
Employment level	886,033	755,167	797,900
Difference from peak	-	-130,867	-88,133
Percentage change from peak	-	-14.8%	-9.9%
Education and health care	2011Q4	2007Q3	2012Q1
Employment level	705,733	626,967	704,600
Difference from peak	-	-78,767	-1,133
Percentage change from peak	-	-11.2%	-0.2%
Leisure and hospitality	2008Q3	2010Q1	2012Q1
Employment level	587,100	535,767	564,767
Difference from peak	-	-51,333	-22,333
Percentage change from peak	-	-8.7%	-3.8%
Other services	2007Q4	2010Q1	2012Q1
Employment level	195,833	175,900	176,200
Difference from peak	-	-19,933	-19,633
Percentage change from peak	-	-10.2%	-10.0%
Government	2008Q2	2011Q3	2012Q1
Employment level	778,167	674,400	718,700
Difference from peak	-	-103,767	-59,467
Percentage change from peak	-	-13.3%	-7.6%

Source: Author's analysis of Current Employment Statistics data