

## ECONOMIC IMPACT ANALYSIS



# CONSTRUCTION IMPACT OF METRO'S MEASURE R TRANSPORTATION PROJECTS

*2015 Update*



INSTITUTE FOR APPLIED ECONOMICS  
Los Angeles County Economic Development Corporation

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INSTITUTE FOR APPLIED ECONOMICS  
Los Angeles County Economic Development Corporation  
444 S. Flower Street, 37<sup>th</sup> Floor ♦ Los Angeles, CA 90071  
(888) 4-LAEDC-1 ♦ [www.LAEDC.org](http://www.LAEDC.org)



Christine Cooper, Ph.D.  
Somjita Mitra, Ph.D.

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This report was commissioned by the Los Angeles County Metropolitan Transportation Authority.

The LAEDC Institute for Applied Economics offers objective economic and policy research for public agencies and private firms. The group focuses on economic impact studies, regional industry analyses, economic forecasts and issue studies, particularly in water, transportation, infrastructure and environmental policy.

Every reasonable effort has been made to ensure that the data contained herein reflect the most accurate and timely information possible and they are believed to be reliable.

The report is provided solely for informational purposes and is not to be construed as providing advice, recommendations, endorsements, representations or warranties of any kind whatsoever.

## Executive Summary

The Los Angeles County Metropolitan Transportation Authority (Metro) is engaged in the construction of a series of transportation improvement projects in Los Angeles County to be funded through tax revenues generated from the voter-approved Measure R increase in sales taxes.

The Institute for Applied Economics of the Los Angeles Economic Development Corporation (LAEDC) has estimated the economic impact of these construction projects. The total economic impacts consist of the one-time increases in total output, employment and labor income in Southern California associated with construction activities over the next 30 years. All of the projects and most of the employment and economic activity will be in Los Angeles County; however, impacts are estimated at the regional level defined by the counties of Los Angeles, Orange, Riverside, San Bernardino and Ventura.

The exhibit below summarizes our findings.

Economic and Fiscal Impact of Metro Construction Projects			
	Highway	Transit	Total *
Total Project Spending (\$ millions) **	\$ 31,410	\$ 19,724	\$ 51,134
Less Right of Way **	1,742	1,771	3,513
Less Vehicle Purchases **	-	978	978
Net budgeted spending (\$ millions) **	29,668	16,975	46,643
Inflation-adjusted spending (\$ millions)	\$ 24,612	\$ 14,555	\$ 39,167
Total Economic Impact			
Output (\$ millions)	\$ 51,410	\$ 29,290	\$ 80,700
Employment (jobs)	253,100	173,880	426,980
Direct	105,610	82,470	188,080
Indirect	72,750	41,570	114,320
Induced	74,700	49,790	124,490
Compensation (\$ millions)	\$ 16,250	\$ 10,830	\$ 27,080
Total Fiscal Impact (\$ millions)			
Federal taxes	\$ 3,529	\$ 2,311	\$ 5,840
State and local taxes	2,071	1,349	3,420
Total Fiscal Impact	\$ 5,599	\$ 3,660	\$ 9,259

\* May not sum due to rounding

\*\* Nominal dollars; all other values expressed in 2015 dollars

Sources: Metro; LAEDC

Total spending, budgeted to exceed \$51.1 billion over the thirty year period, will generate \$80.7 billion (inflation-adjusted to current dollars) in economic output in the five-county Southern California region, adding 426,980 jobs with labor income of \$27.1 billion over the thirty year period.

Total tax revenues collected will exceed \$9.2 billion on activity occurring in Southern California, including \$5.8 billion in federal taxes and \$3.4 billion in state and local taxes.

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## Budgeted Spending

The Los Angeles County Metropolitan Transportation Authority (Metro) is engaged in the construction of a series of transportation improvement projects in Los Angeles County to be funded through tax revenues generated from the voter-approved Measure R increase in sales taxes. These projects are broadly categorized into two groups: highway and freeway projects, which also include grade separations and sound wall construction; and transit corridor construction. The overall budget for the projects included here is \$51.1 billion over thirty years.

The amounts by budget category are shown in the exhibit below.

Exhibit 1 Metro Transportation Improvement Construction Projects Program Budget by Category		
	\$ millions	% of total
Highway and freeway improvements, including grade separation and sound wall construction	\$ 31,410	61.4%
<i>Of which: Right-of-way acquisition</i>	1,742	
Transit corridor construction	19,724	38.6%
<i>Of which: Right-of-way acquisition</i>	1,771	
<i>Vehicle purchases</i>	978	
<b>Total Budget</b>	<b>\$ 51,134</b>	<b>100.0%</b>

Source: Metro

Approximately 61 percent of the total budget consists of highway and freeway improvements, and 39 percent for transit corridor extensions and improvements.

Right-of-way acquisition is excluded from economic impact analysis since this is an exchange of assets and does not generate economic activity. Similarly, since the purchase of vehicles is expected to occur outside of the five-county Southern California region, this spending is also excluded. Our methodology is fully described below.

## Southern California Impacts

The exhibit below summarizes the economic impact in the five-county Southern California region due to the construction activity.

Exhibit 2 Metro Transportation Improvement Construction Projects Economic and Fiscal Impact of Metro Construction Projects			
	Highway	Transit	Total *
<b>Project Spending</b>			
Total Project Spending (\$ millions) **	\$ 31,410	\$ 19,724	\$ 51,134
<i>Less Right of Way **</i>	1,742	1,771	3,513
<i>Less Vehicle Purchases **</i>	-	978	978
Net budgeted spending (\$ millions) **	29,668	16,975	46,643
Inflation-adjusted spending (\$ millions)	\$ 24,612	\$ 14,555	\$ 39,167
<b>Total Economic Impact in Southern California</b>			
Output (\$ millions)	\$ 51,410	\$ 29,290	\$ 80,700
Employment (jobs)	253,100	173,880	426,980
<i>Direct</i>	105,610	82,470	188,080
<i>Indirect</i>	72,750	41,570	114,320
<i>Induced</i>	74,700	49,790	124,490
Compensation (\$ millions)	\$ 16,250	\$ 10,830	\$ 27,080

\* May not sum due to rounding

\*\* Nominal dollars; all other values expressed in 2015 dollars

Sources: Metro; LAEDC

During the 30-year construction period, the net budgeted spending related to the completion of Metro's proposed transportation projects, after deducting spending on right-of-way acquisition and vehicle purchases, is \$46.6 billion. Together, this spending will generate economic output of \$80.7 billion in the five-county region of Southern California (in 2015 dollars). The projects will create 426,980 part-time and full-time jobs with total labor income of \$27.1 billion.

The total (direct, indirect and induced) economic output associated with highway and freeway projects is estimated to be \$51.4 billion. These projects include building new freeways or highways, expanding capacity on freeways and interchanges, and the construction of grade separations along major goods movement corridors and sound wall barriers. Over the 30-year period, the total number of jobs related to these projects will be 253,100 with \$16.3 billion in compensation.

Transit projects, including the construction of light and heavy rail lines, subway extensions, and the construction of bus rapid transit lines, will generate \$29.3 billion in total (direct, indirect and induced) output for the Southern California regional economy over the course of 30 years. Work on these projects will create 173,880 total jobs with over \$10.8 billion in compensation.

## Industry Breakdown

Total output, employment and compensation impacts are disaggregated by industry sector in the exhibit below. This allows an estimation and industry identification of “follow-on” jobs and business revenues. The values in the exhibit should be interpreted as illustrative of the industry effects rather than precise given model and data limitations.

Exhibit 3 Metro Transportation Improvement Construction Projects Economic Impact in Southern California by Industry			
Industry	Employment	Labor Income (\$ millions)	Output (\$ millions)
Agriculture	470	\$ 23	\$ 44
Mining	2,180	248	735
Utilities	470	63	307
Construction	190,200	13,843	39,570
Manufacturing	17,410	1,260	9,127
Wholesale trade	15,750	1,239	3,750
Retail trade	39,650	1,418	3,603
Transportation and warehousing	14,240	935	2,360
Information	3,510	415	1,898
Finance and insurance	14,750	1,040	2,758
Real estate	14,330	582	5,185
Professional, scientific and technical services	19,200	1,580	2,933
Management of companies	2,720	306	632
Administrative and waste management	18,050	681	1,243
Education services	5,050	229	379
Health care and social assistance	24,800	1,392	2,363
Arts, entertainment and recreation	4,840	175	382
Accommodations and food services	19,800	568	1,324
Other services	16,880	814	1,429
Government and non-NAICS	2,660	272	675
<b>Total *</b>	<b>426,980</b>	<b>\$ 27,080</b>	<b>\$ 80,700</b>

\* May not sum due to rounding  
All values expressed in 2015 dollars  
Source: Estimates by LAEDC

Much of the impact will occur in the construction industry, with almost half of the total (direct, indirect and induced) output earned by firms in the industry and about 45 percent of the jobs generated. However, other industries are also significantly impacted, including: retail trade, health care and social assistance, professional and scientific services and accommodations and food services. Each of these industries will see an increase in business revenues and in the number of jobs as the effects of the increase in construction activity due to the Metro's projects ripple through the regional economy.

## Fiscal Impacts

The economic activity in Southern California generated by the transportation projects over the 30-year construction period will generate significant state, local and federal tax revenues. Income taxes will be collected on the earnings of workers, both direct and indirect, as are unemployment insurance and disability insurance taxes. Sales taxes will be generated on the purchases of materials by the construction contractors and of goods and services by all the workers whose earnings are sustained by the transportation projects.

The estimated tax revenues by level of government are detailed in the exhibit below.

Exhibit 4 Fiscal Impact of Transportation Improvement Projects			
	Highway	Transit	Total *
State and Local Taxes (\$ millions)			
Income taxes	\$ 563	\$ 373	\$ 936
Sales taxes	659	425	1,084
Property tax	562	363	925
Social insurance	52	33	85
Fees and fines	130	86	216
Other taxes	105	68	173
<b>Total state and local taxes</b>	<b>\$ 2,071</b>	<b>\$ 1,349</b>	<b>\$ 3,420</b>
Federal Taxes (\$ millions)			
Incomes taxes	\$ 1,304	\$ 873	\$ 2,177
Social insurance	1,744	1,135	2,879
Corporate income taxes	297	184	481
Other taxes	183	118	301
<b>Total federal taxes</b>	<b>\$ 3,529</b>	<b>\$ 2,311</b>	<b>\$ 5,840</b>
<b>Total *</b>	<b>\$ 5,599</b>	<b>\$ 3,660</b>	<b>\$ 9,259</b>

\* May not sum due to rounding  
All values expressed in 2015 dollars  
Sources: Metro; Estimates by LAEDC

It is estimated that direct, indirect and induced workers will pay \$2.2 billion in federal income taxes, \$936 million in state income taxes and \$1.1 billion in sales taxes in California.

All together, almost \$9.3 billion in tax revenues will be collected in relation to the transportation construction projects. Approximately 63 percent this will be earned at the federal level and 37 percent at the state and local level.



## Impacts by Project

The total economic impacts for each project are detailed in the exhibit below.

Exhibit 5 Economic Impact in Southern California by Project					
Industry	Net Spending (\$ millions)	Output (\$ millions)	Jobs	Labor Income (\$ millions)	Tax Revenue (\$ millions)
<b>Highway Projects</b>					
Alameda Corridor East (ACE) Phase II	\$ 951	\$ 1,986	9,800	\$ 628	\$ 216
Arroyo Verdugo Operational Improvements	208	434	2,100	137	47
BNSF Grade Separations	228	477	2,350	151	52
High Desert Corridor	2,675	5,587	27,500	1,766	608
I-5 Carmenita Road Interchange	275	574	2,830	181	63
I-5 HOV from SR-134 to SR-170	552	1,153	5,680	364	126
I-5 North Capacity Enhancements (Future)	3,905	8,157	40,160	2,579	888
I-5 Widening and HOV Lanes	847	1,770	8,710	560	193
I-10 HOV from Puente Avenue to SR 57	387	807	3,970	255	88
I-605 Corridor "Hot Spot" Interchanges	2,444	5,106	25,140	1,614	556
I-710 Early Action Projects	142	296	1,460	94	32
I-710 South	4,058	8,476	41,730	2,680	923
Las Virgenes-Malibu Oper. Improvements	218	455	2,200	144	50
Soundwalls	1,811	3,783	18,620	1,196	412
South Bay Ramp & Interchange Improvements	1,065	2,225	11,000	703	242
SR-138 Capacity Enhancements	443	926	4,560	293	101
SR -710 North	4,403	9,197	45,280	2,908	1,002
<b>Total Highway *</b>	<b>\$ 24,612</b>	<b>\$51,410</b>	<b>253,100</b>	<b>\$ 16,250</b>	<b>\$ 5,599</b>
<b>Transit Projects</b>					
Airport Metro Connector	\$ 139	\$ 280	1,660	\$ 103	\$ 35
Crenshaw/LAX Transit Corridor	1,797	3,617	21,470	1,337	452
East San Fernando Valley North-South	156	315	1,900	116	39
Eastside Transit Corridor Phase II	1,401	2,819	16,700	1,042	352
Exposition Line Phase II	1,044	2,102	12,480	777	263
Gold Line Foothill Extension	763	1,535	9,110	567	192
Regional Connector Transit Corridor	1,318	2,653	15,740	981	331
Sepulveda Pass Transit Corridor	1,614	3,249	19,300	1,201	406
South Bay Green Line Extension	376	756	4,500	280	94
West Santa Ana Transit Corridor	461	929	5,500	343	116
Westside Purple Line Extension Sect 1	2,311	4,651	27,600	1,719	581
Westside Purple Line Extension Sect 2	1,719	3,459	20,500	1,279	432
Westside Purple Line Extension Sect 3	1,455	2,928	17,380	1,082	366
<b>Total Transit*</b>	<b>\$ 14,555</b>	<b>\$ 29,290</b>	<b>173,880</b>	<b>\$ 10,830</b>	<b>\$ 3,660</b>
<b>Total *</b>	<b>\$ 39,167</b>	<b>\$ 80,700</b>	<b>426,980</b>	<b>\$ 27,080</b>	<b>\$ 9,259</b>

\* May not sum due to rounding  
All values expressed in 2015 dollars  
Sources: Metro; Estimates by LAEDC

## Annual Impacts – Highway Projects

Project expenditures will occur over a number of years and may not be smoothly distributed across the construction period. Consequently, the economic impacts of the annual expenditures will likewise vary from year to year. The total economic impacts by fiscal year are detailed in the exhibit below.

Exhibit 6 Impact of Highway Projects by Year of Expenditure				
Fiscal Year	Net Expenditures (\$ millions)	Employment	Labor Income (\$ millions)	Output (\$ millions)
2010	\$ 116	1,190	\$ 76	\$ 242
2011	302	3,100	199	630
2012	416	4,280	275	870
2013	367	3,780	243	767
2014	379	3,900	250	792
2015	429	4,410	283	895
2016	708	7,290	468	1,479
2017	1,449	14,900	957	3,026
2018	1,265	13,000	835	2,642
2019	1,195	12,290	789	2,497
2020	1,679	17,270	1109	3,507
2021	1,417	14,570	936	2,960
2022	1,799	18,500	1188	3,757
2023	1,520	15,630	1004	3,175
2024	1,320	13,570	871	2,756
2025	1,189	12,230	785	2,484
2026	1,326	13,640	875	2,769
2027	990	10,180	654	2,067
2028	725	7,450	478	1,513
2029	607	6,240	401	1,267
2030	574	5,910	379	1,200
2031	590	6,070	390	1,232
2032	546	5,610	361	1,140
2033	713	7,330	471	1,489
2034	730	7,500	482	1,524
2035	953	9,800	630	1,991
2036	514	5,290	340	1,075
2037	288	2,960	190	601
2038	209	2,150	138	436
2039	219	2,260	145	458
2040	79	810	52	165
<b>Total *</b>	<b>\$ 24,612</b>	<b>253,100</b>	<b>\$ 16,250</b>	<b>\$ 51,410</b>

\* May not sum due to rounding  
All values expressed in 2015 dollars  
Source: Estimates by LAEDC

## Annual Impacts – Transit Projects

Project expenditures will occur over a number of years and may not be smoothly distributed across the construction period. Consequently, the economic impacts of the annual expenditures will likewise vary from year to year. The total economic impacts by fiscal year are detailed in the exhibit below.

Exhibit 7 Impact of Transit Projects by Year of Expenditure				
Fiscal Year	Net Expenditures (\$ millions)	Employment	Labor Income (\$ millions)	Output (\$ millions)
2010	\$ 69	820	\$ 51	\$ 138
2011	171	2,050	128	345
2012	258	3,080	192	519
2013	378	4,510	281	760
2014	802	9,590	597	1,615
2015	1,133	13,530	843	2,280
2016	1,362	16,270	1,013	2,741
2017	1,282	15,320	954	2,580
2018	917	10,950	682	1,845
2019	752	8,980	559	1,513
2020	686	8,190	510	1,381
2021	577	6,890	429	1,161
2022	496	5,920	369	997
2023	398	4,750	296	801
2024	199	2,370	148	400
2025	132	1,580	98	266
2026	137	1,640	102	277
2027	172	2,060	128	347
2028	235	2,800	175	472
2029	274	3,270	204	551
2030	261	3,110	194	524
2031	419	5,000	311	842
2032	553	6,610	412	1,114
2033	639	7,640	476	1,286
2034	711	8,500	529	1,431
2035	454	5,420	338	913
2036	383	4,580	285	771
2037	304	3,630	226	611
2038	270	3,230	201	544
2039	88	1,060	66	178
2040	44	520	32	88
<b>Total *</b>	<b>\$ 14,555</b>	<b>173,880</b>	<b>\$ 10,830</b>	<b>\$ 29,290</b>

\* May not sum due to rounding  
All values expressed in \$2015  
Source: Estimates by LAEDC

## Annual Employment Impacts by Type

Annual employment impacts are a combination of direct, indirect and induced jobs. The decomposition of employment impacts by type by fiscal year is detailed in the exhibit below.

Exhibit 8 Annual Employment Impact of All Projects by Type				
Fiscal Year	Direct	Indirect	Induced	Total *
2010	890	540	590	2,020
2011	2,270	1,380	1,500	5,150
2012	3,250	1,970	2,150	7,370
2013	3,720	2,160	2,410	8,290
2014	6,170	3,420	3,900	13,490
2015	8,260	4,510	5,180	17,950
2016	10,760	5,990	6,810	23,560
2017	13,490	7,950	8,780	30,220
2018	10,620	6,360	6,970	23,950
2019	9,390	5,670	6,210	21,270
2020	11,090	6,920	7,440	25,450
2021	9,350	5,840	6,280	21,470
2022	10,520	6,740	7,150	24,410
2023	8,790	5,640	5,970	20,400
2024	6,790	4,460	4,690	15,940
2025	5,850	3,900	4,060	13,810
2026	6,470	4,310	4,500	15,280
2027	5,230	3,420	3,590	12,240
2028	4,440	2,810	3,010	10,260
2029	4,150	2,580	2,770	9,500
2030	3,940	2,440	2,630	9,010
2031	4,900	2,930	3,220	11,050
2032	5,480	3,190	3,550	12,220
2033	6,680	3,930	4,350	14,960
2034	7,160	4,180	4,640	15,980
2035	6,660	4,110	4,440	15,210
2036	4,380	2,610	2,870	9,860
2037	2,950	1,710	1,910	6,570
2038	2,430	1,390	1,560	5,380
2039	1,440	900	970	3,310
2040	590	360	390	1,340
<b>Total *</b>	<b>188,080</b>	<b>114,320</b>	<b>124,490</b>	<b>426,980</b>

\* May not sum due to rounding  
Source: Estimates by LAEDC

## Methodology

Economic impact analysis is used to estimate the overall economic activity, including spill-over and multiplier impacts, which occurs as a result of a particular business, event or investment. The initial economic activity related to Metro's transportation projects is the purchase of goods and services from local vendors and the wages and benefits paid to local workers.

The total estimated economic impact includes direct, indirect and induced effects. The injection of new funds into the region circulates from Metro to its contractors. This is the *direct effect* of the spending. The contractor in turn purchases goods and services from local establishments that in turn hire workers and buy goods and services to facilitate their business. These are called *indirect effects*. In addition, workers employed on site, as well as employees of all suppliers, spend a portion of their incomes on groceries, rent, vehicle expenses, healthcare, entertainment, and so on. These are called *induced effects*.

The recirculation of the original expenditures multiplies their impact through such indirect and induced effects. The extent to which the initial expenditures multiply is estimated using economic models that depict the economic relationships between industries (such as road construction and its suppliers) and among different economic agents (such as a cement supplier and its employees). The models used in this analysis were developed using software and data from the IMPLAN Group, LLC. The economic region of interest is the five-county Southern California region consisting of Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. This region forms the Los Angeles Combined Statistical Area defined by the Bureau of Labor Statistics.

The metrics used to determine the value of the economic impact include employment, labor income and the value of output. *Employment* includes full-time, part-time, permanent and seasonal employees and the self-employed, and is measured on a job-count basis regardless of the number of hours worked during the year. *Labor income* includes all income received by both payroll employees and the self-employed, including wages and benefits such as health insurance and pension plan contributions. *Output* is the value of the goods and services produced. For most industries, this is simply the revenues generated through sales; for others, in particular retail industries, output is the value of the services supplied.

Expenditures are modeled as nominal expenditures in year of spending, and inflation-adjusted to reflect 2015 dollars. All dollar figures are quoted in 2015 dollars.

Spending in the budget category denoted as right-of-way and land acquisition is excluded from economic impact analysis since this is an exchange of assets and does not generate economic activity on its own. Additionally, spending on vehicle purchases and on finance charges, if any, are excluded because they are not expected to occur within the economic region.

Job creation estimates are measured on a job-count basis for both wage-and-salary workers and proprietors regardless of the number of hours worked.



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