

**CHAPTER 6 FINANCING TRANSPORTATION**

Regional transportation plans must include a financial element that identifies monetary resources to implement the plan (23 USC 134(h)(2)(B)). This Chapter serves as the Financial Element to fulfill the federal requirement that the 2022 RTP be financially constrained (i.e., budgeted) and provides a cost analysis for implementing the program of projects included in the Strategic Investments (Action Element). It describes the financial situation that will exist between FY 2022 and FY 2046, the implementation period for this 2022 RTP.

**FINANCIAL ANALYSIS PROCESS**

The Kern Council of Governments (Kern COG) has estimated revenues that are reasonably expected to be available from known federal, state, local, and private sources of transportation funding to implement the proposed projects. Each year, Kern COG is responsible for selecting and prioritizing transportation projects for the allocation of millions of dollars in funding. These responsibilities involve programming federal, state, and local transportation funds, each of which may have different requirements, limitations, and schedules.

Projecting revenues and expenditures over this length of a planning period is difficult at best. The analysis relies partly on historical funding patterns from state and federal sources, though effort has been made to account for new methods of allocating state transportation funds since the passage of Senate Bill 45 (Government Code Chapter 622), effective January 1, 1998. In addition, the year of expenditure must be considered when estimates for capital projects are developed; this is required by the federal surface transportation act.

Even for existing funding sources, understanding and implementing the complex array of local, state, and federal programs is not easy. Some of the programs rely on allocations, others on apportionments, and others are matching programs. Different combinations of apportioned, allocated, or matched dollars from local, state, and federal sources can be applied to one project. Many of the projections included in the 2022 RTP rely on simplified financial assumptions upon which programming assumptions are then based.

The comparison of revenues and expenditures are not an exact budget, but rather a forecast of future financial conditions for the FY 2022-2046 planning period covered by this RTP.

For additional information please refer to Chapter 1.

**REVENUE PROJECTION ASSUMPTIONS**

The 2022 RTP financial plan identifies forecasted revenues and expenditures approaching \$11.5 billion for capital and operations and maintenance, for all modes. Approximately \$6.7 billion is identified to support the region's capital transportation investments. About \$4.8 billion is designated for operations and maintenance of the current and future system. The plan includes a constrained revenue forecast of local, state, and federal sources that are considered reasonably available over the life-span of the 2022 RTP. Financially constrained projects reflected in Table 5-1 are matched with expected revenue summarized in Table 6-1 and based on revenue streams considered by the region to be reasonably available. Approximately 88% of these revenue streams are based on traditional and past revenue streams, while about 12% are considered reasonably available anticipating future changes to local and regional policies and revisions to state and federal transportation legislation.

Approximately \$1.3 billion of the \$11.5 billion revenue estimate is based on revenue streams considered reasonably available to regions in the future as a result of: (1) adjustments to state and federal gas tax rates based on historical trends and recommendations from two national commissions (National Surface Transportation Policy and Revenue Study Commission and National Surface Transportation Infrastructure Financing Commission); (2) leveraging of local sales tax measures; (3) potential national freight

program/freight fees; (4) future state bonding programs; (5) mileage-based user fees; and/or (6) other potential new revenue sources such as federal earmarks. A similar conservative assumption was made in prior RTPs with the approval of federal review agencies.

For the Kern region, each of these funding concepts has a varied weight of opportunity; they are all options that have been under discussion by state and federal legislators for many years and are currently considered reasonably available by larger regional agencies in California. While no one item should be considered a silver bullet for a smaller region such as Kern, collectively, and based on a very conservative estimate, Kern considers several to be reasonably available revenue streams during the life of the plan.

The conservative estimate of \$1.3 billion is based on a combination of newer financing opportunities coming into play during the life of this plan. As such, these revenue streams are collectively listed in Table 6-1 and included as "Other Revenue" in the Revenue Summary for the financially constrained element of this plan. No one item is selected, since Kern's transportation history is mostly dependent on transportation impact fees, other local bonding, and local, state, and federally legislated transportation bills including earmarks and appropriations. In the past several years, state and federal discretionary transportation funding opportunities have turned to performance-based outcomes for the project selection process. In 2012, the Kern region implemented a project selection policy that supports revenue leveraging and performance-based selection criteria to support livable communities and complete streets concepts. Presented below is justification for Kern's "Other" revenue assumptions.

- Kern COG has updated its project selection policy and guidance document to direct its priorities toward projects that support livable communities and complete streets goals.
- Improvements to the gas tax structure, odometer-based taxes, federal freight-related programs, and other identified programs will collectively serve to develop consistent and sustainable funding streams not currently enjoyed by most regions or states. Reforms in these areas would benefit not only the Kern region but all regions in the state and nation.
- Kern projects constrained by the addition of \$1.3 billion focus on the areas of operations and maintenance and expanded services to transit, maintenance of streets and roads, and the further implementation of projects that support livable community concepts and complete streets.
- Regional highway capacity projects in Kern include a serious need for safety improvements to many lane miles of two-lane "conventional" highways that could be much safer with four lanes and shoulders/pedestrian improvements.
- Currently waning funding levels for projects of regional significance would be bolstered by state and federal excise tax reform and afford the opportunity for Kern to deliver identified projects that improve safety and increase mode choices.
- The plan does not recommend the use of future revenue streams to add capacity projects, but Kern COG understands that these projects will require a sustainable revenue stream brought on by state and federal reforms to the gas tax to sustain core assumptions to deliver these projects.
- Kern COG has taken steps to move toward integrating safety priorities of capacity needs with cost-effective operational improvements that cost less but provide safety benefits.
- Ongoing outreach to Kern residents indicates a resounding priority to maintain our streets and roads, improve non-motorized opportunities, improve transit, and keep our highways safe.

The assumptions below represent revenue streams considered reasonably available over the last several transportation acts.

- **National Highway System (NHS) and Surface Transportation Program (STP) dollars** are combined with State Highway Account (SHA) dollars to fund the State Transportation Improvement Program (STIP). Total funding available for STIP is apportioned as county shares. The STIP is then divided into two funding groups: (1) the Regional Improvement Program (RIP), which programs 75% of STIP funding; and (2) the Interregional Improvement Program (IIP), which programs the remaining 25%. Of the IIP funding, only 10% can be used in urban areas; the rest is for rural highway projects and other programs, such as rail.
- **County-share estimates to fund state highway projects** and other projects of regional significance are based on California Department of Transportation (Caltrans) projections of Kern County's share and are projected over a 20-year period. Inflation rates were not applied for revenue projections. The first five years of revenue estimates assumed current Federal Transportation Improvement Program (FTIP) project funding plus an additional \$30 million. The second five years assumed a RIP rate of \$30 million per year for five years and \$10 million per year from the discretionary IIP source. The final 10 years assumed \$30 million for RIP and \$10 million for IIP per year.
- **Year-of-expenditure project estimates** shown in Tables 5-1 and 5-2 are constrained by reasonably available revenue estimates outlined herein. Year-of-expenditure is defined as the anticipated fiscal year that construction would begin. A statewide annual average of 3% for expected inflation was applied to these estimates.
- The assumption for the **State Highway Operations and Protection Program (SHOPP) funding** projection was to calculate the last five years of SHOPP projects based on the FTIP.
- Safety Program dollars were allocated in four distinct programs: **Highway Bridge Program (HBP), Highway Safety Improvement Program (HSIP), Safe Routes to School (SRS), and Local (Section 130) At-Grade Crossing**. These were averaged over the last five years and extrapolated based on FTIP analysis. No inflation factors were applied.
- For the **Regional Surface Transportation Program**, annual apportionments were averaged and projected over 20 years. Inflation factors were not applied.
- For the **Congestion Mitigation and Air Quality Improvement (CMAQ) Program**, annual apportionments were averaged and projected over 20 years. Inflation factors were not applied.
- The **Bakersfield and Rosamond Transportation Impact Fee programs** are based on residential, commercial, and industrial development but are difficult to predict. For the Rosamond Impact Fee, an average was determined to have been collected over the last several years, while the Bakersfield impact fee was calculated based on the latest fee schedule. Amounts were then projected linearly with growth and inflation factors applied.
- **FTA Funding Section 5307 (Urbanized Area Formula Apportionments for Transit)** was projected using annual inflation and growth factors and past FTIP programming.
- **FTA Funding Section 5309 (New Starts/Major Investments for Transit)** was projected using annual inflation and growth factors and past FTIP programming.
- **FTA Funding Section 5310 (Elderly and Disabled Persons Transit)** was projected using annual inflation and growth factors and past FTIP programming.
- **FTA Funding Section 5311 (Non-Urbanized/Rural Transit Assistance)** was projected using annual inflation and growth factors and past FTIP programming.

- **Local Transportation Fund (LTF)** was projected using annual inflation and growth factors and past FTIP programming.
- **Active Transportation Program (ATP)** The Active Transportation Program is a state program which combines state and federal funding. The federal program is called Transportation Alternatives (TA). While there is an MPO pass-through (formula distribution) for the ATP, a significant amount of the program is discretionary. The projection for this revenue source uses the FTIP average of awarded projects over the last several cycles.
- **Community Development Block Grants (CDBG)** – A small percentage (5%) of improvements from these grants were directed toward normal non-motorized improvements, including bicycle lanes and sidewalks.
- **Tax Credit Incentives** – Also a community development revenue stream, a similar assumption was made as with the CDBG grants, assuming that any new or reconstruction has and would require improvements to roadways and sidewalks contiguous to upgraded or new property construction.
- **SB 1** – Senate Bill 1, the Road Repair and Accountability Act of 2017, was signed into law on April 28, 2017. The newly adopted state gas tax is expected to introduce approximately \$500 million or more of new revenue to the Kern region for use on streets and roads maintenance. There are several discretionary components to the newly formed funding program and Kern projects could be advanced as a result of those programs perhaps exceeding the \$500 million estimate. SB 1 is a 20-year program.

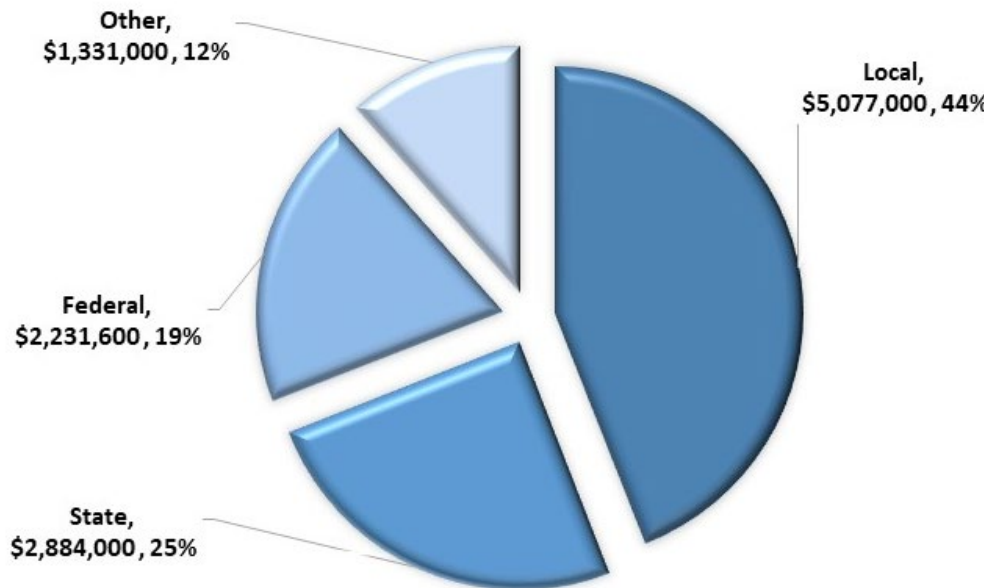
The assumptions below represent newer goals and policies that the Kern region will rely on to deliver an additional 12% of the program.

- **State and Federal Gas Excise Tax Adjustment to Maintain Historical Purchasing Power** – Additional \$0.15 per gallon gasoline tax imposed at the state and federal levels starting in 2017 and continuing to 2024 to maintain purchasing power.
- **Mileage-Based User Fee (or equivalent fuel tax adjustment)** – Mileage-based user fees would be implemented to replace gas taxes—estimated at about \$0.05 (in 2011 dollars) per mile starting in 2025 and indexed to maintain purchasing power.
- **Private Equity Participation** – Private equity share as may be applicable for key initiatives (e.g., toll facilities). Freight rail package assumes railroads' share of costs for mainline capacity and intermodal facilities.
- **Freight Fee/National Freight Program** – A national freight program was approved as part of the FAST Act. Federal formula for funding the national freight network was developed for discretionary programs throughout the nation.
- **Bond Proceeds from Local Sales Tax Measures** – Issuance of debt against existing sales tax revenues in Kern County.
- **E-Commerce Tax** – Although these are existing revenue sources, they generally have not been collected. Potentially, e-commerce tax revenue could be used for transportation purposes, given the relationship between e-commerce and the delivery of goods to California purchasers.
- **State Bond Proceeds, Federal Grants, and Other Financing for California High-Speed Rail Program** – State general obligation bonds authorized under the Bond Act approved by California voters as Proposition 1A in 2008; federal grants authorized under the American Recovery and Reinvestment Act and High-Speed Intercity Passenger Rail Program; potential use of qualified tax credit bonds; and private sources.

REVENUE SOURCES

Revenues identified in the 2022 RTP financial forecast are those that have been provided for the construction, operation, and maintenance of the current roadway, transit, and airport systems in the Kern region. Baseline revenues include existing local, state, and federal transportation funding sources. As **Figure 6-1** and **Table 6-1** summarize, revenue forecasts for the Kern region are estimated to be approximately \$11 billion for the RTP period. Revenue levels identified in Table 6-1 reflect reasonably available funding and include estimates for funding programs used over the last several years.

**Figure 6-1: Transportation revenues 2022-2046 (\$ x 1,000)**



Approximately \$4.8 billion of the \$11.5 billion in expected revenue is for the operation and maintenance of the countywide transportation system. The remaining \$6.7 billion is dedicated to capital improvements for all modes over the 24-year period of this plan.

**Local Revenue**

Funding from local sources contributes nearly one-half of the revenues to this RTP. Major contributions to local revenue include Local Transportation Funds (10%), bus transit fare box (1.5%), and other local funding such as developer fees and general funds (27%).

One potential source of local funding for Kern County is a transportation impact fee (TIF). Outside Metropolitan Bakersfield, most developments currently do not pay a fair-share impact fee to offset the costs of constructing regional street or highway improvements. The impact fee is designed to collect the difference between the cost of the new roads attributable to new development and the amount of gas tax revenues that the new development will produce for the County or cities to use in road construction. Kern COG has undertaken a series of studies to assess the potential for future TIF programs within unincorporated county areas and small cities. Several small cities have implemented new TIFs, including

**Table 6-1: Revenue Forecast 2022-2046 (\$ X 1,000)**

Table 6-1 Revenue Forecast 2022-2046 (\$ X 1,000)								
Funding Source	Total Revenue	Overall Percent	Transit, HOV, Aviation & Other		Roads & Highways		Pedestrian & Bicycle	
			Capital	O & M	Capital	O & M	Capital	O & M
<b>Local Sources</b>								
Cal Vans - Private Funds	\$ 192,000	1.67%	\$ 48,000	\$ 144,000				
Local - General Funds - streets and roads maintenance	\$ 400,000	3.47%			\$ 320,000		\$ 80,000	
Local Transportation Funds	\$ 1,205,000	10.46%	\$ 301,000	\$ 904,000				
Bus Farebox	\$ 171,000	1.48%		\$ 171,000				
Local Agency Funds/Developer Fees/Regional Fees/Other	\$ 3,109,000	26.98%	\$ 37,000		\$ 2,937,275		\$ 134,725	
<b>Subtotal</b>	<b>\$ 5,077,000</b>	<b>44.06%</b>						
<b>State Sources</b>								
SB 1	\$ 546,000	4.74%		\$ 80,000		\$ 438,000	\$ 28,000	
STIP (Regional and Interregional)	\$ 1,125,000	9.76%	\$ 140,000		\$ 985,000			
State Transit Assistance (STA)	\$ 460,000	3.99%	\$ 100,000	\$ 360,000				
State Highway Operation and Protection Program (SHOPP)	\$ 750,000	6.51%				\$ 700,000	\$ 50,000	
State Aid to Airports	\$ 3,000	0.03%	\$ 3,000					
<b>Subtotal</b>	<b>\$ 2,884,000</b>	<b>25.03%</b>						
<b>Federal Sources</b>								
Regional Surface Transportation Program	\$ 210,000	1.82%				\$ 190,000	\$ 20,000	
Transportation Alternatives Program / Active Transportation Program / Safe Routes to School	\$ 37,500	0.33%					\$ 37,500	
Congestion Mitigation and Air Quality Program	\$ 197,500	1.71%	\$ 60,000		\$ -	\$ 68,750	\$ 68,750	
Local Assistance (HES, HBRR, Sec.130, Emergency Relief)	\$ 82,000	0.71%				\$ 82,000	\$ 6	
Federal Aid to Airports	\$ 45,000	0.39%	\$ 22,500	\$ 22,500				
FTA Section 5307 (Transit – metro)	\$ 97,500	0.85%	\$ 24,375	\$ 73,125				
FTA Section 5310 and 5311 (Transit – senior/disabled/rural)	\$ 22,500	0.20%	\$ 5,625	\$ 16,875				
Recovery Act - High Speed Rail	\$ 1,500,000	13.02%	\$ 1,500,000					
State/Federal Demonstration / Other	\$ 39,600	0.34%	\$ 9,600		\$ -		\$ 30,000	
<b>Subtotal</b>	<b>\$ 2,231,600</b>	<b>19.37%</b>	<b>\$ 2,251,100</b>	<b>\$ 1,771,500</b>	<b>\$ 3,922,275</b>	<b>\$ 1,798,750</b>	<b>\$ 348,981</b>	<b>\$ 100,000</b>
<b>Other Sources - Revenue Streams during life of RTP</b>								
May be derived from the following:	\$ 1,331,000	11.55%	\$ 95,000	\$ 156,000	\$ -	\$ 700,000	\$ 150,000	\$ 230,000
Cap and Trade Revenue								
E-Commerce								
Freight Fee / National Freight Program								
Future State Bond Proceeds								
Odometer-based user fee								
Self-help sales tax								
State Federal Excise Tax on Fuel								
Mass Transportation - expansion of transit system	\$ 120,000	1.04%	\$ 60,000	\$ 60,000				
Mass Transportation - Commuter Rail	\$ 211,000	1.83%	\$ 115,000	\$ 96,000				
Highway Safety, Streets and Roads and Maintenance	\$ 850,000	7.38%				\$ 700,000	\$ 150,000	
Non-motorized system Countywide Capital & Maintenance	\$ 150,000	1.30%					\$ 31,000	\$ 80,000
<b>Subtotal</b>	<b>\$ 1,331,000</b>	<b>11.55%</b>						
<b>Total</b>	<b>\$11,523,600</b>	<b>100.00%</b>	<b>\$ 2,346,100</b>	<b>\$ 1,927,500</b>	<b>\$ 3,922,275</b>	<b>\$ 2,498,750</b>	<b>\$ 498,981</b>	<b>\$ 330,000</b>
<b>Total of Capital Revenue</b>	<b>\$ 6,767,356</b>	<b>100%</b>	<b>20.4%</b>	<b>16.7%</b>	<b>34.0%</b>	<b>21.7%</b>	<b>4.3%</b>	<b>2.9%</b>
<b>Total of O &amp; M (Operations and Maintenance)</b>	<b>\$ 4,756,250</b>			<b>37.1%</b>		<b>55.7%</b>		<b>7.2%</b>

Tehachapi, McFarland, Delano, Shafter, and Wasco. The County of Kern has adopted a new TIF for the greater Tehachapi area, and the County will continue to review growing unincorporated areas and develop identical programs when appropriate.

**State Revenue**

State funding sources constitute about 25% of the total 24-year transportation budget. Most of these monies come from the State Transportation Improvement Program (10%) and the State Highway Operation and Protection Program (7%). State Transit Assistance funds make up 4% while the newly introduced SB 1 funding adds an additional 5%.

In April 2017, Senate Bill 1 the Road Repair and Accountability Act was signed into law. The administration estimates this legislation will increase state revenues for California's transportation system by an average of \$5.2 billion annually over the next decade. Kern County is estimated to receive over \$546 million over the life of this RTP, a 4% increase in total transportation funding. Two thirds of the funding is slated for road repairs while the rest is focused on transit, freight, bike and pedestrian improvements. The program is primarily funded by a 12-cent per gallon gas tax increase as well as other tax and fee increases; the funding mechanism will bring in less revenue over time. As the state goals to increase low and zero emission vehicles are implemented, the amount of annual revenue from gas tax is anticipated to decrease significantly after the first 20 years. A portion of the SB 1 includes a fee on electric vehicles but only accounts for about 3% of the total revenue from the act. Still, in the near and mid-term of this plan the act provides a much needed source of transportation funding.

## Federal Revenue

Approximately 19% of the transportation funds for the 2022 RTP program of projects come from federal funding sources. For purposes of discussion in this document, the STIP and SHOPP programs were considered as state revenue programs; however, their funding is approximately 80% federal highway funds or 40% of the estimated state revenues discussed above. Federal Transit Administration dollars constitute approximately 1% of all RTP funds. These funds are generally used to support transit capital and operating needs. Federal sources also include flexible funding programs such as the Surface Transportation Program (STP), Congestion Mitigation and Air Quality Improvement (CMAQ) Program, and Transportation Alternatives (TA). In the 2022 RTP, STP, CMAQ, and TA programs total approximately 4% of anticipated funds. The remaining programs are for safety projects and aviation funding.

Federal revenue estimates in **Table 6-1** are consistent with federal fund estimates resulting from the passage of the Fast Act. Project programming of regionally significant projects and revenue estimate information is consistent with the latest four-year STIP fund estimate adopted by the California Transportation Commission (CTC) for use in the development of the 2022 STIP.

Since its enactment, Caltrans has distributed information with regard to annual estimates for use in the programming of new transportation projects. Also included in the table are SAFETEA-LU federal earmarks from Sections 1301, Projects of National and Regional Significance; Section 1302 – National Corridor Infrastructure Improvement Program; and Section 1701 – High Priority Projects Programming, totaling \$720 million. These earmarks are considered a one-time revenue opportunity and are not extended throughout the 24-year life of this document.

## BASELINE EXPENDITURES

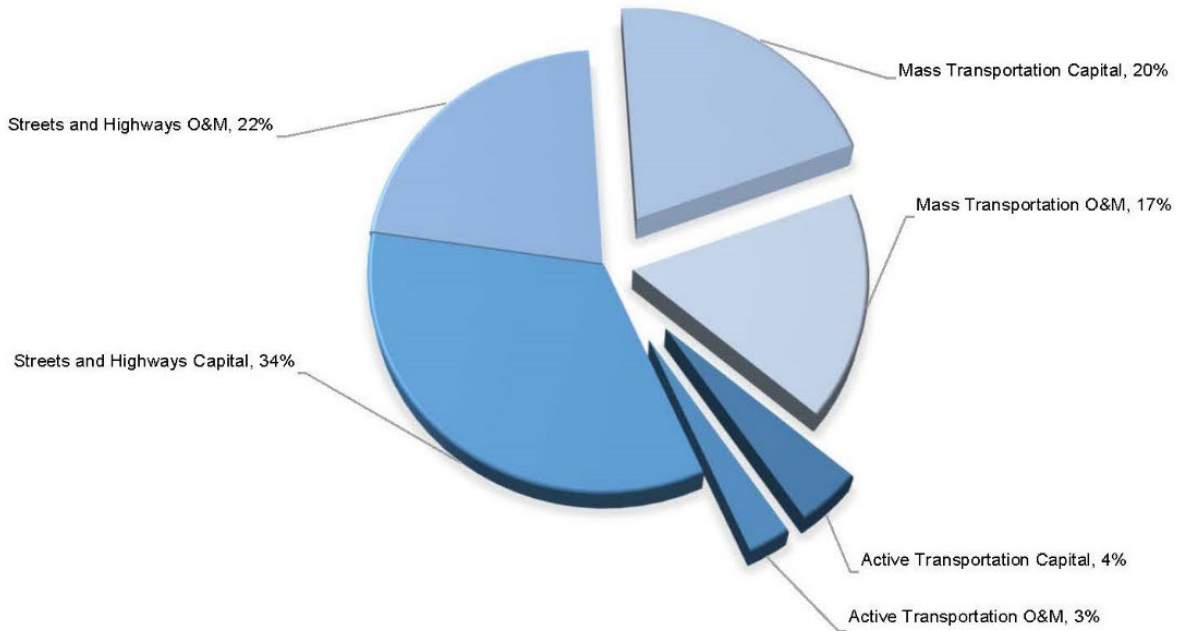
Given the 2022 RTP's baseline cost estimate of \$11.5 billion, **Figure 6-2** illustrates the mode split for the region. The data show that about 56% of the region's baseline costs are dedicated to street and highway improvements and maintenance. Thirty seven percent (37%) of expenditures are for transit, HOV and rail capital needs, operations and maintenance. The remaining 7% of RTP expenditures are for transportation improvements including active transportation projects, complete streets, aviation capital improvements and maintenance.

## Financial Constraint Demonstration

Kern COG has assembled a comprehensive inventory of the transportation revenue programs currently in use by all governmental entities (federal, state, and local) and has projected these revenues primarily based on historical averages over the life of the RTP. Financial revenue projections are based on the best available data from existing sources (i.e., Federal Highway Administration, Caltrans, Kern COG historical

programming data, member agency information). **Table 5-1** reflects capital projects that are constrained to revenue estimates in **Table 6-1**.

**Figure 6-2: Investments by Mode 2022-2046 (\$ x 1,000)  
2/3rds for Maintenance, Transit & Active Transportation**



**Funding Shortfall of \$36.8 Billion**

To further assess the region’s financial outlook, baseline revenues were matched against a program of projects that have been divided into two groups: constrained and unconstrained. The Unconstrained Program of Projects (**Table 5-2**) lists projects considered necessary for development of Kern County’s transportation infrastructure but for which funding cannot be reasonably expected within the time frame of this RTP. This comparison clearly indicated that the Kern region will experience funding deficits to operate, maintain, and rehabilitate its existing transportation system over the 2022 RTP time frame. While the shortfall is shown in **Figure 6-3** as approximately \$36.8 billion, it is actually much greater because some projects do not as yet have actual cost estimates. Such projects as high-speed rail improvements and grade-separation projects (over- and under-crossings) do not have identified funding. Some grade separations have been included as components of street widening projects, while others are stand-alone projects. Costs will vary based on right-of-way purchase in addition to construction costs. A baseline cost estimate on the order of an additional \$8 million per project for grade separation projects could be added to the \$6.8 billion identified shortfall.

The extensive list of unconstrained projects, including regionally significant highway improvements, interchanges, regional roadway improvements, rail and bus service, railroad grade crossings, transportation control measures, and deferred roadway maintenance, paints a vivid picture of Kern County’s need for additional revenue. Funds to support operations and maintenance—whether it be street and highway, bus and rail, or transportation demand management programs—are the most difficult to find. Historically, the Kern region has relied heavily on local monies for these operating funds.



Figure 6-3: Investment Shortfalls



Operating funds for streets and road maintenance have been available traditionally through gas taxes, Transportation Development Act (TDA) funds, and flexible federal transportation funds; however, TDA funds in support of street and road maintenance projects are not expected to continue. With increasingly fuel-efficient vehicles and the rising cost of gasoline, revenues from gas taxes are not expected to increase at more than a nominal rate.

For transit, some relief is available in the form of operating subsidies, which the FAST Act has increased moderately. No alternative funding source has been identified to augment these funds. Thus, the Kern region’s shortfall could easily double over the amount of constrained funding.

**Future Revenue Shortfalls for Transportation Maintenance and Expansion**

**Problem: Federal Energy/Environmental Policies Impact Transportation Funding for Maintenance and Expansion** – The recent increase of supplemental gas tax funding sources, such as toll roads in Southern California, sales tax measures, and transportation impact fees on new development, may be symptomatic of a much larger issue. Federal transportation, energy, and environmental policies are linked by the use of federal tax law involving motor fuels to advance national objectives. However, these tax policies are often debated and decided on separately, resulting in policies that sometimes contradict goals and objectives in other policy areas.

In 1956, the federal Highway Trust Fund was established to ensure that America would have a “pay-as-you-go” system for funding needed highway and bridge improvements. The principle was: The more you drive or use the roads, the more you pay to build and maintain them. Congress, in its 2004 transportation-funding bill, reaffirmed this principle. However, current public investment in road, bridge, and mass transit improvements financed by highway user fees is not sufficient to maintain the system’s physical condition and has left local governments scrambling to find alternative funding sources to fund their transportation infrastructure. Two specific issues exacerbate this funding situation: less tax revenue generated as a result of improved fuel economy and gas tax revenues allocated to promotion of alternative fuels.

**Cause: Improved Fuel Economy Reduces Highway Trust Fund Revenue** – Since the 1970s, vehicle manufacturers have struggled to meet federal requirements for fuel economy. While improvements to fuel economy allow more travel on the overall transportation system, lower tax revenues generated per mile of travel result in increased wear and tear on the system. From 1970 to 2000, the average vehicle fuel economy (for all cars and trucks) has improved 42% (from 12 miles per gallon (mpg) to 17 mpg). If today's vehicle fleet had remained at 12 mpg, gas tax revenues would be \$46 billion higher than the recent rate of \$110 billion per year (federal, state, and local). If this trend continues over the next 30 years, the potential loss in gas tax revenue per vehicle mile traveled could drop by a third, furthering problems in maintaining the system. The vehicle manufacturers' commitment toward providing more fuel-efficient gasoline-electric hybrids, the promise of hydrogen fuel cell technology, and increased fuel costs that motivate consumers to purchase these vehicles will likely accelerate this trend. A more fuel-efficient national vehicle fleet is a worthy national policy to reduce dependence on foreign oil, but a mechanism is needed to preserve the nation's transportation infrastructure investment.

**Cause: Use of Gas Tax Revenue to Promote Alternative Fuels/Modes** – In addition to highway maintenance and expansion, small portions of the gas tax are used for programs like deficit reduction and improved air quality. The Congestion Mitigation and Air Quality Improvement (CMAQ) Program uses 3% of federal gas tax funds to reduce transportation-related emissions in areas that do not attain federal clean air standards. Projects using CMAQ funds are required to demonstrate a reduction in emissions, usually by reducing gasoline/diesel fuel consumption through the use of alternative fuels. Many of the projects result in a reduction in gas sales and subsequent loss of tax revenue. CMAQ is an effective program that provides funds to help clean the air in nonattainment areas and has only a relatively minor impact on gas tax revenue; however, it is one of many instances of federal energy and environmental policies affecting the “pay-as-you-go” policy of the transportation systems.

### **Possible Solution: Toll-based System and Congestion Pricing**

Many revenue mechanisms are being considered to augment the gas tax. They include gas tax increases, sales tax measures, transportation impact fees on new development, and tolls. One system to consider for augmenting or replacing the current flat rate gas tax system has been implemented for trucking in Europe. The Swiss version of the system uses satellite global positioning systems (GPS) technology and tachometer data that is uploaded to the Internet to create a travel log for calculating a toll fee based on where the vehicle has traveled. Alternative transportation funding mechanisms would provide incentives to carry out national policies for cleaning the air and conserving fuel while reducing deterioration of the existing transportation infrastructure and providing increased capacity where needed. A variable toll rate based on weight per tire is an example of an incentive that would promote the reduction of wear and tear on the highway system. With such a variable rate, trucking companies might consider adding more axles to reduce per tire weight (and subsequent road wear) to reduce their toll fees.

With a toll-based system, congestion pricing also becomes an option. Trips in heavily congested areas during peak hours could also be billed a higher toll to fund increased transportation capacity and provide an incentive for drivers to seek alternative modes at these times.

Implementing a toll-based system would have some significant hurdles. The public often views tolls as double taxation; that is, tolls being paid in addition to the gas tax. In addition, toll plazas are not viewed as convenient. However, a toll-based system for trucks could eliminate the passenger vehicle subsidy for maintenance of highways created by truck travel. Eighty percent of the wear and tear on the nation's roads is attributed to heavy trucks while they only account for approximately 20% of the total fuel tax revenue and 8% of the total vehicle miles traveled. Despite this, in Southern California, the trucking industry is advocating incentives such as using the toll funds to build commercial “all-truck” toll facilities. The advantage to the trucking industry is that the lanes could be built to allow heavier loads and longer train sets (triple trailers) that cannot currently operate in California. In the interim, local governments will have to focus more on local funding sources to make up the funding shortfall in the face of ever-increasing vehicle use and congestion.

**Possible Solution: Mileage-Based User Fee (or Equivalent Fuel Tax Adjustment)**

Another possible solution is mileage-based user fees could be implemented to replace existing gas taxes. Analysis assumed \$0.05 (2011 dollars) per mile starting in 2025 and indexed at a rate of 2.5%.

Advancements in technologies enabling greater use of electric or alternative fuel vehicles will continue to impact gas tax revenues. The US Energy Information Agency forecasts that fuel efficiency for all light-duty vehicles will steadily increase, from an average weighted mpg of just over 20 in 2008 to nearly 29 in 2030. The fuel efficiency of freight trucks also is expected to improve, although at a slower rate, from an average weighted mpg of about 6 in 2008 to nearly 7 in 2030. These forecasts assume there is no major paradigm shift in vehicle fuel technology, such as affordable electric cars or hybrid heavy-duty trucks. It also assumes no shift will occur in public policy or public attitudes that encourage people to reduce their long-term travel habits or shift to more efficient vehicles more quickly. Given the growing concern about climate protection and fuel price volatility, however, such changes are likely to compromise the long-term viability of the current fuel tax.

Southern California Association of Governments (SCAG) projections indicate that the total number of vehicle miles traveled in the SCAG region will increase by about 16% by 2035. The National Surface Transportation Infrastructure Financing Commission also predicts an increase in vehicle miles traveled (VMT) nationwide. The Financing Commission evaluated a combination of short- and long-term factors, identifying that short-term motor fuel price volatility combined with a weak economy could have a considerable negative impact. They indicate that despite a recent national decline in VMT, travel growth nationally will resume a trajectory of about 1.5% to 1.8% per year for the foreseeable future due to factors such as population growth, economic growth, and land use patterns. Accordingly, the Financing Commission's findings and recommendations indicate that the most viable approach to efficiently fund investments in transportation in the medium to long run will be a user charge system based more directly on miles driven (and potentially on factors such as time of day, type of road, vehicle weight, and fuel economy) rather than indirectly on fuel consumed. Additionally, the National Surface Transportation Policy and Revenue Study Commission identified consistent findings and recommendations.

Numerous studies in the United States have tested approaches to charging drivers on a use basis - including in Oregon and the Puget Sound region of Washington State. A nationwide survey was conducted by the University of Iowa for the US Department of Transportation that focused on equipment for monitoring travel and methods of billing. The study involved about 2,700 vehicles in 12 locations. Participants were surveyed on their reactions to receiving two types of monthly bills: one providing aggregate data only and the other showing detailed information that included routes of travel. The study included the installation of on-board systems in six regions across the country (San Diego, Baltimore, Austin, Boise, Research Triangle in North Carolina, and eastern Iowa). The aim of the study is to design a prototype road pricing system that is reliable, secure, flexible, user-friendly, and cost-effective and to assess vehicle operators' reactions to the system.

For the SCAG region, revenue from mileage-based fees totals \$148.2 billion from FY 2025 to FY 2035. This analysis assumes that mileage-based fees would replace existing state and federal gas taxes. As such, the incremental increase in revenue resulting from the transition to a more direct mileage-based charge system would generate an additional \$110.3 billion, from FY 2025 to FY 2035.

- Base Year: FY 2025.
- Data Source: SCAG travel demand forecast for 2014 RTP.
- Real Growth Rate: 0.5% annually. Revenue Total: \$110.3 billion (nominal dollars) - estimated incremental revenue only.

*From Appendix B: Details about Revenue Sources, SCAG 2012–2035 RTP/SCS, Adopted April 2012*