



**RAND RESEARCH AREAS**

- THE ARTS
- CHILD POLICY
- CIVIL JUSTICE
- EDUCATION
- ENERGY AND ENVIRONMENT
- HEALTH AND HEALTH CARE
- INTERNATIONAL AFFAIRS
- NATIONAL SECURITY
- POPULATION AND AGING
- PUBLIC SAFETY
- SCIENCE AND TECHNOLOGY
- SUBSTANCE ABUSE
- TERRORISM AND HOMELAND SECURITY
- TRANSPORTATION AND INFRASTRUCTURE
- WORKFORCE AND WORKPLACE

## Reducing Traffic Congestion in Los Angeles

**L.A.** traffic congestion is the worst in the nation, according to many studies, and it takes its toll on quality of life, economic competitiveness, fuel economy, driving safety, social justice, and air quality. Congestion has recently eased somewhat with rising fuel prices, but long-term trends indicate that it will continue to get worse unless policymakers take steps to intervene. But what steps?

To answer this question, RAND Corporation researchers conducted a study to identify strategies to reduce traffic congestion that could be implemented and produce significant effects within five years. The study, which focused on the denser urban areas within L.A. County, was sponsored by a small consortium of public and private local donors that share an interest in reducing traffic congestion through improved transportation policy. They include James A. Thomas, the L.A. County Metropolitan Transportation Authority, the Music Center of Los Angeles, and the RAND Corporation.

The authors reviewed the research literature related to congestion, examined existing data, and spoke with agency staff and elected officials in L.A. County. The researchers identified several key factors that influence the kinds of solutions most likely to benefit Los Angeles. Here, they provide a set of 13 recommendations that, if implemented together, could reduce congestion substantially.

### Several Factors Shape the Region's Transportation Policy Needs

**Congestion results from an imbalance in the supply of and demand for road space.** Therefore, reducing congestion means either increasing the supply of road space or reducing the demand for peak-hour automotive travel.

**The prospects for building the way out of congestion are limited.** Failure to increase state and federal fuel taxes to keep pace with inflation and improved fuel economy over the past several decades has led to significant shortfalls in available

### Abstract

Traffic congestion in Los Angeles is arguably the worst in the nation. Focusing on the densest areas of L.A. County, RAND researchers analyzed the problem and identified the key factors that determine the area's transportation policy needs. The researchers provide a set of 13 complementary recommendations that, if implemented together, could reduce congestion substantially within the next five years. Given limited prospects for building more roadways, pricing policies must be among them to create lasting traffic reduction.

transportation revenue. Even if more funding were available, however, the road network in Los Angeles is already by far the most extensive in the nation, and there is very little space to add more road capacity in the areas where congestion is most intense. In addition, many local communities oppose the construction of new or expanded roads in their neighborhoods, for social, health, or environmental reasons, and this further limits the possibility of adding new roads.

**Managing the demand for roadways during peak hours offers the greatest prospects for reducing congestion.** Compared to those in other large U.S. metropolitan areas, L.A. residents drive more miles per person—thus demanding more roadway—than would be expected based on the region's overall population density. In other cities, higher population density tends to result in lower per capita demand for roadways, but in Los Angeles, the per capita demand for roadways remains high despite high population density. Therefore, the most realistic way to reduce congestion is to find ways to manage the demand for driving during the peak hours.

**Few congestion-reduction strategies remain effective over time.** When a congestion-

This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of published, peer-reviewed documents.

Headquarters Campus  
1776 Main Street  
P.O. Box 2138  
Santa Monica, California  
90407-2138  
TEL 310.393.0411  
FAX 310.393.4818

© RAND 2008

reduction strategy is implemented and traffic delays are reduced, travelers who had previously altered their travel patterns to avoid congestion will notice the improvement and return to driving along the once-busiest routes during the peak hours. Some will shift from other times of travel, some from other routes of travel, and some from other modes of travel (such as subways or commuter rail). This pattern, often described as *triple convergence*, slowly erodes the initial congestion-reduction benefits offered by most strategies. Triple convergence explains, for example, why traffic flow improves for a short time when new lanes are added to a freeway but then returns to being congested within just a few years.

**Many strategies provide short-term relief, but only pricing strategies resist triple convergence and manage congestion in the long run.** Often called *congestion pricing*, these strategies involve charging drivers more for their use of roadways when travel demand is highest. They include assigning higher tolls for driving during peak hours or collecting higher fees for parking in the most convenient curb spaces at the busiest times. Triple convergence does not diminish the effect of pricing strategies, because the peak-hour charges encourage some drivers to change their travel patterns and deter others from converging on the freed capacity when prices rise with increased demand.

**Pricing strategies must be complemented by significant alternative transportation improvements.** Certain forms of pricing may introduce concerns about the ability of lower-income drivers to pay. To mitigate such concerns, policymakers must offer faster, more reliable, and more convenient public-transportation options throughout the region.

### **Recommendations Address Four Key Goals**

The researchers determined that Los Angeles needs not just one way to reduce congestion, but rather a set of integrated strategies designed to accomplish four goals: manage peak-hour automotive travel, raise transportation revenue, improve alternative transportation options, and use existing roadway capacity more efficiently. The table summarizes the recommendations and shows the goals to which each one corresponds.

The recommendations promise substantial benefits:

- Paired one-way street conversions can increase travel speed by about 20 percent and reduce travel time by 20 to 30 percent.
- High-occupancy toll (HOT) lanes can maintain free-flowing travel speeds (60 to 65 mph) during peak travel hours while carrying up to twice the volume that congested general-purpose lanes do.
- HOT lanes can also raise sufficient revenue to subsidize express-bus operations.
- Bus rapid transit (BRT) featuring bus-only lanes can result in much faster transit service at relatively low cost.

### **These Strategies Should Be Implemented as an Integrated Package**

The researchers emphasize the importance of implementing the recommendations as a package rather than choosing only certain options (such as the least expensive). Although supply-management strategies—such as traffic signal-timing improvements—are less controversial, their benefits are likely to be only temporary. For Los Angeles to reduce its traffic congestion for the long term, its transportation policies must include pricing strategies. In addition, the recommendations are designed to complement one another in three important ways.

First, with respect to funding, some recommended measures will be costly to implement, while others will raise revenue. Those that will require significant investments include signal timing and control, one-way street conversions, arterial incident management, and BRT expansion. However, other measures, such as cordon tolls, variable curb-parking rates, and local fuel taxes, offer the potential to raise significant county or municipal transportation revenues. HOT lanes and deep-discount transit-fare programs can also provide modest net revenue.

Second, regarding drivers' ability to pay, some recommended measures raise equity issues, while others mitigate them. Cordon tolls—and, to a lesser extent, HOT lanes, variable curb-parking rates, and local fuel taxes—are likely to raise concerns about how lower-income drivers will afford the resulting charges. Therefore, it will be important to improve nonautomotive travel alternatives through such strategies as voluntary, employer-based demand-management programs; deep-discount transit fares; and enhanced BRT service featuring bus-only lanes on surface streets and express bus service in HOT lanes on the freeways.

Third, concerning the competition for road space, some recommended measures reduce road space for cars, while others create more of it. One of the most promising short-term strategies for improving the speed and convenience of public transit in Los Angeles is the creation of bus-only lanes on transit-rich surface streets, such as Wilshire Boulevard. However, individual drivers are likely to object to allocating an existing lane to buses because doing so reduces the road space for cars. To balance this reduction in road space for cars, two measures create additional lane capacity—peak-hour curbside-parking restrictions and one-way street conversions. Combining these strategies to balance one another may make it easier for policymakers to gain the support needed to implement them.

### **Leaders Can Build Consensus to Support the Needed Reforms**

Recognizing that the recommendations require substantial policy changes, the authors also researched how leaders can

### Strategy Recommendations and Policy Objectives

Recommended Strategy	Manage Peak-Hour Automotive Travel	Raise Transportation Revenue	Improve Alternative Transportation Options	Use Existing Capacity More Efficiently
<b>Primary recommendations</b>				
1. Prioritize and fund investments to improve signal timing and control where current technology is deficient, coordinate signal timing among jurisdictions, and ensure that new signal technology can give priority to BRT.			○	●
2. Restrict peak-hour curbside parking on congested streets and dedicate the added capacity to bus-only lanes.			○	●
3. Develop a network of paired one-way streets in high-volume travel corridors.			○	●
4. Promote voluntary reductions in driving at businesses and other large organizations. <sup>a</sup>	○		●	
5. Develop a network of HOT lanes on freeways and use net revenue to subsidize express bus service in the HOT lanes.	●	○	●	●
6. Implement variable curb-parking charges in busy commercial and retail districts. Return some of the revenue to local merchants to invest in public amenities, and use the rest to fund municipal transportation investments.	●	●		●
7. Enforce the California parking cash-out law at the municipal level in cities where a significant share of employers lease parking.	●			
8. Develop and market deep-discount transit fares to employers in areas well served by public transit.		○	●	
9. Expand BRT in urban areas with bus-only lanes on the arterial network and express freeway service in HOT lanes.			●	
10. Develop a regionwide bicycle network, with specific focus on dense urban areas where bicycles can serve a large share of trips.			●	
<b>Contingent recommendations</b>				
11. Evaluate costs and benefits of implementing a regional incident-management system to clear accidents and breakdowns quickly on congestion-prone surface streets.				●
12. Evaluate the potential for implementing cordon tolls in major activity centers. <sup>b</sup>	●	●		○
13. Levy county fuel taxes to raise transportation revenues and reduce the demand for driving.	○	●		

NOTE: ○ = an additional goal that a recommendation may help support. ● = a primary goal that a recommendation is intended to accomplish.

<sup>a</sup> Voluntary reductions might entail ride-sharing, telecommuting, and flexible work schedules.

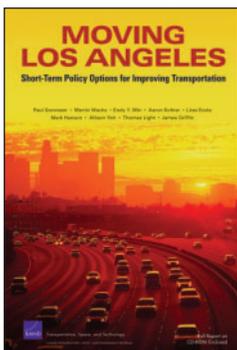
<sup>b</sup> Cordon tolls are charges for vehicles to enter a designated area.

build consensus to support the recommended transportation policy reforms. The following actions will aid in such efforts:

- Form a diverse, inclusive coalition of community representatives to provide political leadership.
- Broadly define the problems associated with congestion to help foster agreement on the need for aggressive action to reduce congestion and improve transportation options.
- Develop a compelling narrative of the benefits of action.
- Generate support for comprehensive programs rather than for individual projects.
- Apply congestion-reduction strategies systematically.

The challenge of consensus building will be compounded by the complexity of the transportation decisionmaking environment in L.A. County, in which cooperation among multiple agencies is required and lack of agreement can delay or stop the process.

The authors' analysis indicates that successful collective action is possible and that the recommendations offered in the book would promote social welfare across multiple dimensions. Reducing congestion should help to improve quality of life, enhance economic competitiveness, reduce greenhouse-gas emissions, improve air quality, and improve mobility for drivers and transit patrons alike. ■



---

This research brief describes work done for RAND Infrastructure, Safety, and Environment documented in *Moving Los Angeles: Short-Term Policy Options for Improving Transportation*, by Paul Sorensen, Martin Wachs, Endy Y. Min, Aaron Kofner, Liisa Ecola, Mark Hanson, Allison Yoh, Thomas Light, and James Griffin, MG-748-JAT/METRO/MCLA (available at <http://www.rand.org/pubs/monographs/MG748/>), 2008, 716 pp., \$35, ISBN: 978-0-8330-4555-3. The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. RAND® is a registered trademark.

#### **RAND Offices**

Santa Monica, CA • Washington, DC • Pittsburgh, PA • New Orleans, LA/Jackson, MS • Doha, QA • Cambridge, UK • Brussels, BE



# Transportation, Space, and Technology

A RAND INFRASTRUCTURE, SAFETY, AND ENVIRONMENT PROGRAM

THE ARTS  
CHILD POLICY  
CIVIL JUSTICE  
EDUCATION  
ENERGY AND ENVIRONMENT  
HEALTH AND HEALTH CARE  
INTERNATIONAL AFFAIRS  
NATIONAL SECURITY  
POPULATION AND AGING  
PUBLIC SAFETY  
SCIENCE AND TECHNOLOGY  
SUBSTANCE ABUSE  
TERRORISM AND  
HOMELAND SECURITY  
TRANSPORTATION AND  
INFRASTRUCTURE  
WORKFORCE AND WORKPLACE

This PDF document was made available from [www.rand.org](http://www.rand.org) as a public service of the RAND Corporation.

This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of individual published, peer-reviewed documents or of a body of published work.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

---

## Support RAND

[Browse Books & Publications](#)

[Make a charitable contribution](#)

## For More Information

Visit RAND at [www.rand.org](http://www.rand.org)

Explore the [RAND Transportation, Space, and  
Technology Program](#)

View [document details](#)

## Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).