



Into the zone

Congestion pricing for major cities all over the world is getting closer and closer. BOB McQUEEN, TOM BIGGS and CHRIS BAUSER discover just how close...

Some ideas never go out of style. The concept of living and working in urban centers is over 5,000 years old, yet cities grow more and more popular every day. The United Nations has projected that the world's population will reach nearly 5 billion by 2030 with 60 per cent of the world's people living in cities.

Such a significant rate of growth brings myriad concerns, not the least of which is traffic congestion. Transportation professionals are working to find creative strategies to decrease congestion and improve livability in the world's urban centers. These needs must be balanced, however, with the high value placed on personal mobility and accessibility as well as the economic importance of efficient, reliable transportation to employment and trade.

Many intelligent traffic solutions, such as providing real time traffic information and optimizing traffic flow, are being studied and implemented. One solution, congestion pricing, offers major benefits to urban centers in particular.

Costs of congestion

A 2005 Urban Mobility Study by the Texas Transportation Institute estimated that congestion costs the United States alone over \$70 billion in delay and wasted fuel. According to the World Health Organization, over one million people—drivers and pedestrians—die worldwide from traffic injuries.

At the same time, auto ownership is growing in Asia and Latin America. In Europe and the United States, vehicle miles traveled has outpaced vehicle registra-

tion. In other words, people are making more trips and driving more miles. Yet, new roadway construction is decreasing except where toll revenues will fund capital projects. The long-term result is that the demand for highways has exceeded, or will soon exceed, the levels for which they were designed.

Introducing congestion pricing

Congestion pricing works by running traffic, or the desire to be within a certain urban zone, like an enterprise. Drivers choose if they want to pay a fee to drive their own vehicle into an urban zone or use public transit instead.

The application of congestion pricing is the same as electronic toll collection. Using dedicated short-range wireless communication technologies with wireline telecommunications and data management/information processing and imaging technologies, a vehicle is identified at an entry/exit point, and a fee is deducted from a pre-established account.

For drivers, a key component of congestion pricing systems is the ability to easily obtain and update the transponder or other payment tool. In cities where congestion pricing has been applied, drivers manage their payment accounts by mail, telephone and online. Tags can also be procured at selected shops and gasoline stations. A comprehensive marketing effort and strong support by local leaders are required to make congestion pricing systems successful. The public must understand how the system works, how they can participate, and the positive benefits to them and their communities

of congestion pricing. To alleviate public concerns about safety and the fairness of the pricing system, a program may choose to exempt some vehicles from the congestion charge such as emergency response vehicles, school buses, those with disability permits, military vehicles, alternative fuel vehicles, motorcycles and taxis.

In addition to reducing traffic and increasing public transit ridership, congestion pricing provides an income stream that may be used to further enhance transportation options. The approach has been used successfully in major world cities, and is proposed for many others.

Success in London

London's congestion pricing scheme, introduced in 2003, created a breakthrough in metropolitan transport management. With over one million workers traveling to Central London on weekdays, congestion had reached a monumental scale. Cars spent most of their time idling, and average traffic speeds topped out at 15 km/h.

The city instituted a flat daily charge weekdays, 7 a.m. - 6:30 p.m., for driving or parking a vehicle within the identified congestion pricing zone, with some vehicle exceptions, as described above. Closed circuit television cameras at entry and exit boundaries record charges using automated license plate recognition technology. Mobile patrol units and monitoring camera sites throughout the zone cover any gaps in recording cars at entry/exit.

The congestion pricing scheme has reduced private vehicle traffic by 33 per cent, representing between 40,000 to 45,000 car owners transferring to another transportation mode, such as bus, underground, rail, taxi or bicycle. Congestion pricing plus improvements to bus systems and route management yielded a nearly 40 percent increase in passengers arriving in the zone by bus alone. London will extend the boundaries of its congestion pricing scheme in February 2007.

Stockholm trials promising

Starting in January 2006, Stockholm Sweden carried out congestion pricing on a trial basis for 16 per cent of the city's total area, the largest version of a charging scheme in Europe to date. Access to the zone is offered through 18 entry points and 39 charging stations. Drivers are not charged a flat rate as in London. Instead, to encourage use of public transport at peak hours, they pay based on day and time of entry/exit.

To provide alternatives to automobile drivers, new buses and routes were added in addition to park-and-ride spaces. During the six-month trial, congestion decreased 25 percent, the equivalent of removing 100,000 private vehicles from the urban zone each weekday. Initially, city residents opposed the charge. But, by March 2006, several months into the trial, the majority of the public supported the congestion pricing scheme. In September 2006, the people of Stockholm voted 'yes' in a congestion pricing referendum.



Asian applications

Densely populated Seoul, Korea, after significantly renovating its transit system, enjoys a remarkable 75 per cent ridership rate. The city has implemented congestion pricing at two tunnels, a plan that has improved average traffic speeds from 22-40 km/h) and has reduced traffic volumes by nearly 12 per cent. Seoul

plans to implement a passenger car reduction policy, which may include an expansion of congestion pricing zones, to support its transit reform.

Beijing, set to host the 2008 Olympic Games, enjoys one of China's best bus systems. The city invested heavily in improved highways and transit options in the 1990s. However, as the

population expands into suburban areas, cars have become more popular. The city already provides integrated travel data with real time travel information, and congestion pricing is being studied in conjunction with other infrastructure improvements to improve transportation overall.

Changes in China

In Shanghai, one of the five largest cities in the world, vehicle ownership has increased with growing incomes and an expanding population. Congestion is exacerbated by a poorly designed and managed transport system and a street system designed for pedestrians

“London's congestion charge has reduced private vehicle traffic by a third”

Congestion Pricing

and bicycles.

Shanghai attempts to manage vehicles through costly registrations and adding tolls on main roads and highways. The city government has launched programs to integrate management of vehicles, roadways and parking to achieve complete road traffic condition monitoring and to support traveler information systems. A recent study completed by the coalition of the Shanghai Urban Construction Commission, with the participation of several local urban development, transportation and technology groups, assessed a potential congestion pricing zone and the needed technological and infrastructure upgrades to bring about the plan.

Nanjing, an industrial, scientific and educational hub in eastern China, has seen increased congestion as wealthier households attain private vehicles. The rapid increase in car ownership, however, has outpaced the existing infrastructure and parking options. Public transit remains a popular transportation mode, but the city plans to expand both highways and transit networks to serve growing residential areas outside the city.

The "White Paper for Nanjing Traffic Development" has proposed congestion pricing on the city center's main roads during peak hours. Most residents oppose the charge, a typical response to congestion pricing proposals. Testing and deployment of the schemes, however, are expected to yield an increase in public approval.

Expanding to the US

San Diego, California's highly developed network of freeways makes travel by private automobile the most popular and convenient transportation mode. Continuing growth of the metropolitan area has contributed to significant congestion. There are some transit options, but they have seen a steady decrease in ridership.

RideLink, a transportation demand management pro-



gram offering programs and subsidies to assist commuters, is working to improve transit, vanpool and bicycle use.

MOBILITY 2030, San Diego's comprehensive transportation plan, outlines enhancements and projects that will contribute to the smart growth of the transportation system. Among these improvements are systems to manage demand, such as HOV lanes, plus improved systems management and smart growth. Congestion pricing, in the form of real-time variable tolling, is also being implemented by this progressive region.

A strong economy and slow public transit speeds combine to keep many cars on San Francisco's streets. Parking management is the current means of limiting auto usage in the city. In October 2006, however, the San Francisco County Transportation Authority will kick off an 18-month congestion pricing feasibility study to evaluate pricing design and technology options, mobility enhancements and operational alternatives, such as varying fees based on times of day and days of the week.





An International forum

Recognizing the new possibilities that congestion pricing presents to transportation practitioners around the world, 10 major international cities have come together for the purposes of information exchange. The Metropolitan Transport Optimization (MeTrO) group, an informal union established in November 2005, involves London, San Francisco (above), Seoul, San Diego, Stockholm, Singapore, Shanghai (below, left), Nanjing, Beijing and Santiago. Representatives from each city are participating in a mutual knowledge exchange program including a major workshop to be held October 7, 2006 in London.

With so many successes in congestion pricing and

other technologies, there has never been a better time to renew the focus on solving metropolitan transportation problems by applying advanced technologies. For the first time ever, we are being equipped with a full range of technologies and management solutions that can make a significant difference. The activities of the MeTrO group are designed to help turn this opportunity into real progress.

Reaching synergy

A trend towards metropolitan transportation optimization has emerged. Congestion pricing is just one of a host of intelligent transportation technologies. The reductions in congestion can be significant when integrated with other programs, such as advanced traffic management to minimize delays and maximize flows; parking and transit management; and real-time travel information to help drivers make the best routing choices.

At the same time, drivers can experience greater mobility and accessibility. Businesses can thrive when workers and consumers can reach their locations easily. In time, living and working in large urban centers may be as pleasant as it is necessary. ■

Bob McQueen and Tom Biggs are senior advisors in transportation planning and operations with PBS&J. Along with Chris Bausher, they support and facilitate the MeTrO network activities in mutual knowledge exchange. They

may be reached at bobmcqueen@pbsj.com, tbiggs@pbs&j.com and chrisbausher@pbsj.com

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