Reducing Demand for Vehicle Trips in Cities

Many cities have realized they cannot build themselves out of traffic jams by adding new roads and parking lots. An alternative is managing the demand for urban trips (called travel demand management). An interesting subset of demand management is to require companies to devise flexible ways to change how their employees commute.

In this Unit You Will Learn:

- Why to reduce the demand for trips rather than increase the number and size of roads to accommodate more cars
- Which strategies can make cars less attractive and/or more expensive to use them
- How one type of demand management—a Trip Reduction Ordinance—works by influencing the way employees commute

Course Content

Introduction

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In this Learning Guide, you will learn:

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Urban Transportation Has Supply and Demand

The conventional way we try to solve urban mobility problems is by building more infrastructure. Photo by Mariana Gil / WRI Brasil.

The **supply** is the built infrastructure (e.g., streets, overpasses, highways, and parking lots) to accommodate an increasing number of person-trips or person-miles traveled (**demand**).

To meet the growing demands of commuters, most cities first try to expand the infrastructure, but many are now:

- Running out of space
- Suffering from health problems related to air pollution due to auto exhaust
- Finding their city centers and neighborhoods disrupted by cars and roads and no longer walkable or livable
- Increasing housing costs due to off-street parking requirements
- Fostering car trips due to free on-street parking
- Paying exorbitant costs for transport-related issues. In some cases, more than 10 percent of a country's GDP is lost due to wasted time, traffic fatalities, and other things…(Dalkman, H. & Sakamoto, K., 2012)
- And yet they are still unable to provide high-quality transportation.

Managing Demand for Urban Trips

Another idea is to manage the demand – the number of trips generated daily.

Transport Demand Management (TDM) is a way to reduce the number of trips, alter the time that a trip occurs, or eliminate the necessity for the trip. It also aims to optimize single-occupancy vehicle trips and foster more sustainable choices, thus increasing transport system equity and affordability.

- Vehicles with one driver are discouraged and vehicles with multiple occupants encouraged.
- Using public transportation is encouraged.
- Active methods of transportation like cycling and walking are encouraged.
- Patterns of easing traffic congestion and keeping polluting vehicles away from certain areas are encouraged.

Such policies are gaining momentum, since they spread peak hour trips, relieving public transport occupancy-agglomeration.

TDM strategies are less expensive and quick to implement — and can have measurable impacts in the short term.

TDM strategies can help improve urban mobility in a fast and cheap way. Photo by Joana Oliveira / WRI Brasil.

Transportation Demand Management Strategies Either Push or Pull

Push strategies (“sticks”) seek to deter people from using individual cars and motorcycles by making it less attractive and/or more expensive to use them. Common push strategies are:

- Increase taxes (e.g., vehicle ownership, fuel).
- Manage parking (e.g., on-street fees and time-limits).
- Charge during congested periods.
- Reduce or ban them in low-emission zones.
- Implement Trip Reduction Ordinances.

Pull strategies (“carrots”) aim to attract people to more sustainable modes of transport. These strategies focus on enhancing:

- Walking
- Cycling
- Public transport
- Vanpooling
- Carpooling

While push strategies reduce the use of cars, pull strategies bring forward more sustainable options.

Both strategies focus on transportation issues, but cities can also manage the demand through better urban planning policies.

While push strategies reduce the use of cars, pull strategies bring forward new options. Photo by Mariana Gil / WRI Brasil.

Common Push TDM Strategies

Parking management –

- Reduce the demand for parking, mainly by charging more for on-street parking spaces or applying dynamic pricing.
- Rotate the number of cars using parking spots by imposing a time limit on parking.
- Reforming parking policies (e.g., changing minimum to maximum requirements in zoning codes or unbundling parking costs from rents).

Congestion charging – Tax vehicles that enter a delimited urban area, usually the city center, to encourage drivers to avoid these areas or switch to alternate forms of transportation.

License plate restrictions – Restrict some vehicles from transiting through certain areas of the city on specific days and/or times based on the number of their license plates (e.g., ending in an odd or even number).

Low-emission zones – Prohibit or limit vehicles with a certain level of emissions from designated areas. Usually the policy starts by focusing on the most polluting vehicles and gradually becoming more restrictive.

Trip Reduction Ordinances – Require organizations in the city to develop and implement strategies to change commuting habits.

Parking management. Photo by Mariana Gil / WRI Brasil.

Congestion charging in London, United Kingdom. Photo by Nevilley / Wikimedia Commons.

License plate restriction in São Paulo, Brazil. Photo by Mariordo / Wikimedia Commons.

Low emission zone. Photo by EURIST e.V. / Flickr.

Example of a Low-Emission Zone – Beijing

In **Beijing**, the transport sector is the leading source of pollution. More than 50 percent of vehicle emissions come from heavy freight vehicles, which represent less than 10 percent of total vehicles on the road in that city.

With support from WRI, Beijing in 2017 created a **low-emission zone** that prohibited heavy freight vehicles. The zone was later extended to the whole city and stricter emission standards were introduced in 2019.

In the first two years, Beijing's low-emission zone is expected to reduce emissions by 11 metric tons of nitrogen oxides and particulate matter each day. With stricter regulations, it could eliminate up to 95 metric tons of the total air pollutants daily and potentially abate 2.5 million metric tons of carbon dioxide

annually by 2020.

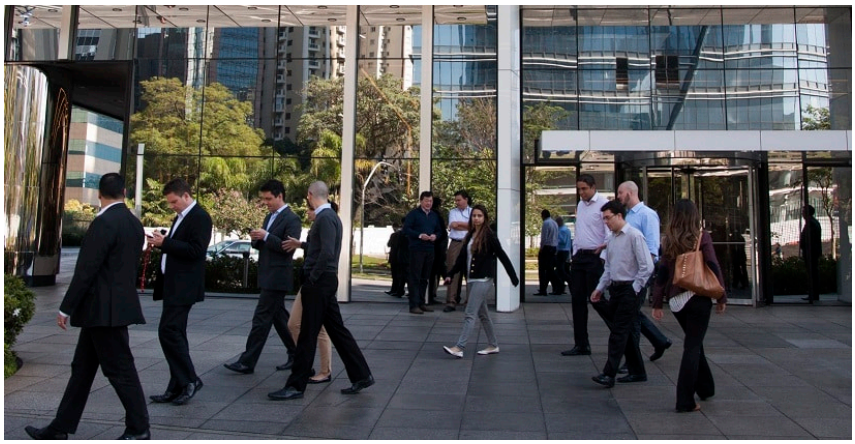
Following Beijing's model, Chinese cities like Tangshan, Linfen and Fuxin also implemented LEZ's.

Video explaining the process of planning and implementation of the low-emission zone. Video by WRI China.

Video explaining the process of planning and implementation of the low-emission zone. Video by WRI China.

Trip Reduction Ordinances Can Reduce Demand

- A Trip Reduction Ordinance (TRO) is a law or decree by a city, state or country that engages organizations in improving urban mobility.
- Organizations develop plans to foster the use of more sustainable modes of transport by their employees.
- The involvement of organizations can be voluntary or mandatory, or only organizations in certain locations or of a certain size may be involved.
- Trip Reduction Ordinances have general elements in common but the required plans are tailored to each organization.



TRO policies can have a big impact on people's daily commute. Photo by Mariana Gil / WRI Brasil.

Common Elements of Trip Reduction Ordinances

A Trip Reduction Ordinance requires organizations to develop Workplace Travel Plans to reduce the number of vehicle trips and single-occupancy vehicles.

Goals: The city or state sets the goals (e.g., to reduce traffic congestion, emissions of greenhouse gases and other air pollutants, and/or reduce energy consumption).

Objectives: The city or state sets a measurable target (by percent or units) to reach in terms of reducing traffic congestion, emissions of greenhouse gases and other air pollutants, and/or energy consumption. Organizations adopt objectives suitable to their size as approved by the city or state.

Define who participates. The city or state decides which "organizations" must participate by size, location, recency of development, or other criteria. An organization is any employer or development complex, public or private, that generates daily commuting trips. For example, an organization could be a

public building, office complex, industry, shopping center, university, school, hospital, or company. Participation can be voluntary or mandatory.

Type of TRO: The government authority determines whether the TRO is “programmed” or “performance based”.

- Programmed (activity-based) – the organization selects mobility measures from a pre-defined list of options given by the city.
- Performance-based – the organization conducts a staff travel survey and develops a plan of action to meet the goals set by the city.

Incentives and penalties: Set by the city or state to spur compliance.

General requirements for participating organizations:

- Define goals and objectives aligned to the city’s policy.
- Develop and implement a Workplace Travel Plan and its communication strategy.
- Designate a person to lead the effort.
- Submit reports on progress toward goals.

Examples of Trip Reduction Ordinances

More than 50 Trip Reduction Ordinances are in force, mostly in U.S. cities and states, as well as in Europe, Oceania, and Latin America.

Examples are given here of Trip Reduction Ordinances in San Francisco, Belo Horizonte, Brazil, and Medellín, Colombia.

San Francisco, USA

San Francisco’s program is applicable only to new developments or those seeking to expand.

Each organization must calculate (**using an online tool**) the number of mitigation points it needs. This number is based on the type of organization (retail, office, residential, or other), the floor space, and the number of parking spaces.

Then the organization chooses from a list of more than 60 mobility measures those they will deploy to achieve their points to meet the goal set by the city. Each measure has a number of points, depending on the difficulty and/or cost of implementation and its ability to reduce single-occupancy vehicle trips. It is important to note that most of the measures are infrastructures deployed inside the development to foster more sustainable means of transport.

San Francisco's TDM program helps reduce single-occupancy vehicle (SOV) trips in the city. Photo by torbakhopper / Flickr.

Belo Horizonte, Brazil

Belo Horizonte was the first city in Latin America to develop a TRO, called the Mobility Management Program Roadmap, in 2016. The program applies to new developments or those seeking licensing to expand that have more than 200 employees and/or students. Its impacts on mobility are still not measured, but as of December 2017 the policy had asked 13 organizations to develop a workplace travel plan, potentially affecting up to 40,000 people.

Belo Horizonte, Brazil. Photo by WRI Brasil.

Medellín, Colombia

Medellín's policy, in force since June 2017, applies to public and private organizations with more than 200 direct or indirect workers.

The policy's core is the mobility inverted pyramid, in which pedestrians (who are the most numerous) come first and single-occupancy vehicles come last.

The policy requires organizations to develop a Workplace Travel Plan with the goal of reducing its commuters' carbon footprint by 10 percent the first year and by 20 percent by 2020.

Medellín, Colombia. Photo by WRI Brasil.

Quiz Yourself

○ Increase the road network by building more overpasses and widening streets to ease congestion

○ Optimize the use of the road network while promoting more reliable and sustainable modes of transport

○ Punish people who drive alone

○ None of the above

Quiz Yourself - 2

○ Encourage more sustainable transport modes in the commute to work and/or study

○ Engage organizations in improving urban mobility

○ Promote change in travel behavior

○ All of the above

Further Reading

For more information, see the unit:

The Role of Companies in Improving Urban Mobility

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