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BULLETIN
FACILITATION OF TRADE AND TRANSPORT IN LATIN AMERICA AND THE CARIBBEAN



Issue No. 206, October 2003

TRAFFIC CONGESTION: THE PROBLEM AND HOW TO TACKLE IT

As the culmination of a project financed by the Technical Cooperation Agency of the Federal Republic of Germany (GTZ), ECLAC has just published *Congestión de tránsito - El problema y cómo enfrentarlo*, Cuadernos de la Cepal series, No. 87 (LC/G.2199-P), Santiago, Chile, July 2003, United Nations publication, Sales No. S.03.II.G.88. The English version will soon be published, with the title *Traffic Congestion: The Problem and How To Tackle It*.

The text of 194 pages analyses the negative impacts of congestion and the multidisciplinary efforts that are needed to keep it under control, through the design of appropriate policies and measures. Congestion control is part of the development of a strategic vision of how a city should develop which can make it possible to harmonize the needs of mobility, growth and competitiveness, which are so necessary today and in the future, with the sustainability of cities and the improvement of their quality of life.

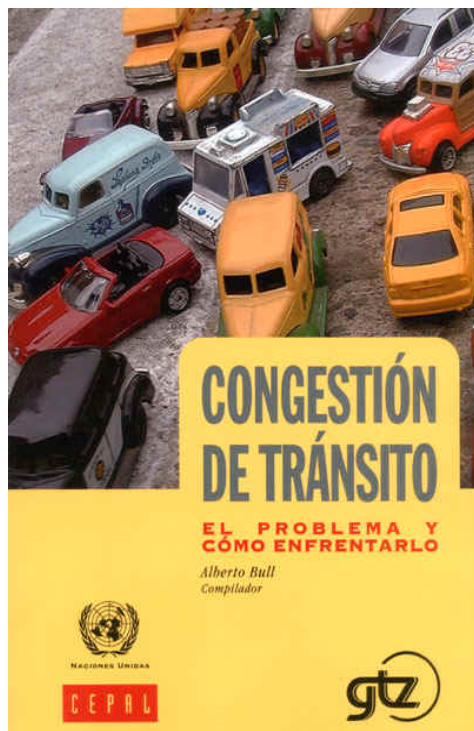
The task is complex and it is not easy to find appropriate solutions. The present publication presents tools for tackling this crucial problem. Everything indicates that it calls for high professional and leadership qualities on the part of the authorities, and that it must have the active support of the citizens.

This edition of the Bulletin presents a summary of the main conclusions of the publication and it is stressed that ECLAC can conduct local workshops to analyze the problem and how to tackle it.

HOW SERIOUS IS CONGESTION AND WHAT IS THE CAUSE?

Traffic congestion has been gaining ground throughout the world, regardless of the degree of development, and everything indicates that it will continue to get worse, representing an undoubted menace to the quality of urban life. Its main expression is longer journey times, greater uncertainty with regard to arrival times, and an increase in fuel consumption, other operating costs and pollution, as compared with an uninterrupted traffic flow.

Congestion is mainly due to the intensive use of cars, whose ownership has spread massively in



Latin America in recent decades. Private cars have advantages in terms of facilitating personal mobility, and they give a sensation of security and even of heightened status, especially in developing countries. In terms of space, however, they are not very efficient for passenger transport, since at rush hours each occupant of a private car causes about 11 times as much congestion as a passenger on a bus.

The situation is further aggravated in the region by problems of road design and maintenance, a style of driving which shows little respect for other road users, faulty information on traffic conditions, and unsuitable management by the responsible authorities, which are often split up among a host of different bodies.

The cost of congestion is extremely high. According to conservative calculations, for example, increasing the average speed of private car journeys by 1 km/hr and that of public transport by 0.5 km/hr would give a reduction in journey times and operating costs worth the equivalent of 0.1% of the gross domestic product.

The harmful effects of congestion are suffered directly by the occupants of the vehicles that are trying to circulate. They are suffered not only by the motorists who cause the congestion however, but also by buses and ultimately their passengers, who are generally persons with lower incomes; they not only take longer to travel from one place to another but also have to pay fares that may be increased by over 15% on account of congestion. All city-dwellers are also adversely affected, owing to the deterioration in their quality of life through such factors as greater air and noise pollution and the negative impact on health. Congestion also threatens competitiveness and endangers the sustainability of urban life. For all of these reasons, it must be kept under control.

MEASURES AFFECTING SUPPLY: A PROMISING WAY TO START

The most logical approach is to tackle congestion through measures affecting the supply of transport, i.e., the availability and quality of the transport infrastructure, vehicles and their management, since this represents an increase in the capacity for travel.

There are many shortcomings in Latin American urban road systems which need to be put right: it is necessary to improve the design of intersections, mark roads properly and provide them with suitable signs, and correct the operating cycles of traffic lights, for example. Another possible measure would be to make the traffic flow of the main avenues reversible at rush hours.

These measures can relieve congestion considerably and do not usually cost much. The construction of new roads or the widening of existing ones should not be ruled out, however, when appropriate and feasible within the context of a harmonious form of urban development which provides for adequate spaces for pedestrians and preserves the architectural heritage and open spaces. It should be borne in mind that building more and more roads, under- and overpasses and urban expressways may be counter-productive in the medium and long term and may actually make congestion even worse, as we have unfortunately seen in the cases of some cities which adopted this strategy.

Big savings may be obtained, at least in the short term, through a system of traffic lights run from a central computer. The rather high cost of this system in the view of many municipalities might make it advisable to set about this programme initially in several stages and only in certain sectors of the city, beginning with the progressive replacement of obsolete traffic lights by newer ones suited to the necessary technology. The application of this system in areas of heavy traffic would show off its virtues and obtain

citizen support for its wider use.

Another very real need is to organize a public transport system which provides effective service. Substantial benefits are provided, not only for buses but also for private cars, by segregated lanes for public transport. It may also be necessary to reorganize the bus lines into trunk and feeder lines, to give them certain preferential traffic rights, and to improve the quality of the buses used and the business capacity of their operators. Buses of a higher standard than those generally in service may also have a useful role to play, especially if their operating timetables and frequencies allow them to offer a viable alternative to private car users.

Some transport systems that make use of the elements mentioned in the previous paragraph would be similar to above-ground subway lines: organized on the basis of buses running in their own segregated lanes, with regular journey frequencies, centralized control, boarding and alighting of passengers at designated stations, and a requirement that passengers must purchase their tickets before boarding the bus. Although careful planning is needed, such systems deserve the allocation of public resources for construction of the necessary infrastructure. The excellent results obtained in Curitiba, the Quito trolleybus system and the Transmilenio public transport system in Bogotá fully justify this solution, which costs only a fraction of the construction of an underground subway system.

It is important that public transport should be improved in order to provide a rapid service of decent standard and thus maintain the present proportion of journeys made by this means. In developing countries, over half of all journeys –and as much as 80% in some cities—are made by public transport.

If well designed and executed, measures affecting supply offer an interesting potential for tackling congestion. Even so, it is necessary to incorporate other measures, especially respecting demand, to be able to solve the imbalances in infrastructure use and to help achieve an acceptable balance for the community as a whole.

MEASURES AIMED AT DEMAND ALSO HAVE A ROLE TO PLAY

The purpose of such measures is to persuade a substantial number of private car users travelling at rush hours or in areas of heavy traffic to use higher-density forms of transport, use non-motorized means of transport, or change the times at which they travel.

Some measures may involve the application of regulations and restrictions. Others may provide economic rewards or disincentives in order to encourage forms of conduct that reduce congestion. Both types of measures need to be considered for a better overall result, since economic measures may not be fully effective, while those involving regulations may be vulnerable if the controls are weak.

Substantial results can be achieved through the rationalization of parking spaces, since their availability and cost condition access by private car users. Permanent or daytime prohibition of parking on the main streets, charges for parking on other streets, the regulation of paid parking in private parking lots and free parking offered by institutions and firms to their workers or to the public, economic incentives for not going to work by car, and intermediate parking lots for leaving cars and continuing the journey in public transport are potentially useful measures if applied in the right places and the right way. Some of them may also generate income for the municipalities.

Staggering the starting hours of activities relieves congestion somewhat, as it spreads the morning rush hour over a longer period.

Restrictions on vehicle use can take a part of the total number of vehicles out of circulation. The application of such restrictions only in the most congested sectors or times, as for example in central areas during the morning and evening rush hours, may have more lasting effects than their more general application, since it offers less incentive to buy extra cars to get round the restrictions. Another form of

restriction is to charge differential licence fees depending on whether or not the vehicle can be used at any time of day.

Tariffs for the use of congested roads, which have been proposed by many academics and urban transport officials because they represent an attractive concept for making drivers pay for the costs they cause to society, are the measures which have met with the strongest resistance. These measures may get results in the short term, but they are questioned from every imaginable angle. The arguments include the following: (i) they are unacceptable for users, since they require them to pay for moving about in conditions of congestion; (ii) there are doubts about how to apply them; (iii) there are objections about their effects on areas immediately adjoining those subject to tariffs; (iv) they are accused of being inequitable with regard to persons with less resources; (v) it is feared that economic activities in the areas subject to tariffs will be adversely affected; (vi) there are doubts about their long-term effects on town planning, because they are an incentive for cities to expand unless there are severe controls on land use; and (vii) it is even claimed that their application would be theoretically inconsistent unless other related prices, such as those of green spaces, are also made subject to the recovery of their marginal cost. It would therefore appear that the likelihood of their application is limited in Latin America, where the conditions are different from cities such as Singapore or London, which have managed to put them into effect successfully. Their time may come, perhaps first of all in developed countries, if the congestion there reaches intolerable levels, no other effective means are seen to exist, and the theoretical and practical questions that still affect them can be successfully resolved.

If carried out continuously from childhood, education in proper road use can help to reduce congestion by teaching the population not to drive or walk in an undisciplined manner or fail to show due respect to other road users, whether pedestrians or other drivers. Likewise, pedestrians must also be made to observe traffic rules and cross the street only at appropriate places and moments.

Measures affecting demand must be carefully analysed in order to avoid unwanted ill-effects. Over-restrictive regulations can alienate firms and residents and depress some areas of cities.

HOW SHOULD THE PROBLEM BE TACKLED?

Congestion must be kept under control, in order to avoid endangering the quality of life and the sustainability of cities. Reducing congestion also has the result of reducing the emission of pollutants that contaminate the air, since in most cities of the world the transport system is one of the main culprits for air pollution. An integrated strategy for combating these two problems can therefore result in more efficient solutions than the application of isolated measures to combat each of them separately.

A set of actions is also needed on various aspects of the urban transport system, designed to affect both supply and demand, in order to rationalize road use in the areas and times subject to congestion.

One main concern must be to relieve the effects of congestion on those who have little or no responsibility for causing it, by:

- facilitating the circulation of those who contribute to congestion only to a lesser degree. This mostly means providing public transport with clear, unimpeded routes and giving it some degree of priority over other road users, including segregated bus lanes when appropriate in order that it should not be held up by congestion
- providing adequate spaces for pedestrians.

Incentives should also be added for reducing car use in places and at times of greater congestion. It must be recognized that a style of personal mobility based essentially on the use of private cars is not sustainable in the long term, although this does not necessarily mean that it should be prohibited. Private

cars have many uses which make urban life easier, such as facilitating social life, shopping or travelling to distant destinations. Using them every day to go to one's place of work or study in areas of heavy traffic is a different matter, however.

It is therefore necessary to design and implement policies and measures of a multi-disciplinary nature. In the case of cities in developing regions, while local conditions must always be taken into account, it would seem advisable to give priority to the following measures:

- rectification of intersections
- improvement of road markings and signs
- rationalization of on-street parking
- staggering of working hours
- synchronization of traffic lights
- reversibility of traffic flow direction in some main avenues
- establishment of segregated bus lanes, together with the restructuring of bus routes and the system of public transport
- Restrictions on parking by non-residents in areas well-served by public transport.

At the same time, it is necessary to establish a long-term strategic vision of how the city should develop which will make it possible to harmonize the needs of mobility, growth and competitiveness, which are so necessary in the world of today, with the sustainability of cities and the improvement of their quality of life. This is a complex task, calling for high professional and leadership qualities on the part of the town planning and transport authorities, and it could be made easier by the concentration of decision-making power in the hands of a single unified traffic and transport authority in metropolitan areas.

Combating congestion entails various amounts of costs. Some must be defrayed by the public bodies that are applying the measures; others affect the population in general, while those related with actions regarding demand affect motorists in particular.

Keeping congestion under control is an ongoing, never-ending task. Tools exist for this purpose, some of them more effective and some of them more readily accepted than others, but a set of measures which has the support of the local population is needed in order not to run the risk of succumbing in the face of the modern scourge of traffic congestion.

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