

## The Role of Sustainable Transport in Traffic Safety

### Background

In a context of growing traffic fatalities and injuries worldwide (1.3 million killed and over 50 million injured annually)<sup>1</sup> the United Nations have declared 2011 – 2020 the Decade of Action on Road Safety.<sup>2</sup> The World Health Organization (WHO) has warned that traffic accidents are on a path to becoming the fifth leading cause of premature mortality worldwide by 2030, due in large part to increases in motorization, primarily in emerging economies. 92% of road fatalities occur in low- and middle- income countries, which only have 53% of total registered vehicles in the world. In these countries, pedestrians and cyclists account for over a third of road traffic deaths; the majority of these countries do not have policies in place to protect these road users.<sup>3</sup> Young adults aged 15 through 44 account for nearly 60% of all traffic fatalities, across the different regions of the world.<sup>4</sup> This has important implications for economic development, since a fatal crash or even a severe injury crash for a young adult can result in significant economic loss for their families over a long period of time.

Traditionally, road safety policies aim to reduce the likelihood of a crash by improving road infrastructure, by educating road users, and to reduce the severity of a crash by improving vehicle technology and enforcing seatbelt and helmet laws. Equally important should be a focus on the promotion of safer modes, such as public transit, and by reducing exposure. Cities and regions with less vehicle travel have lower rates of crashes and fatalities.<sup>5</sup> Cities with high transit mode shares tend to have lower citywide traffic fatality rates.<sup>6</sup> Sustainable urban form (e.g. higher density, better street connectivity that allow for lower speed) can also improve road safety.<sup>7</sup>

Copenhagen and New York, which have built extensive cycling networks, have seen an increase in cycling fatality rate for cyclists have gone down. Bogota, which has implemented an integrated set of sustainable transport projects, including Bus Rapid Transit (BRT), cycling paths, and pedestrian improvements, has seen a significant decline in traffic fatalities since the mid-1990s.<sup>8</sup>

### Safety as part of sustainable transport

The Avoid – Shift – Improve framework helps to understand how safety fits into sustainable transport. It is possible to avoid increases in vehicle use and traffic volumes by designing more compact and mixed-use cities while shifting travel to safer, more sustainable modes, such as transit, walking and biking. Equally important is to improve the design of the system, including the infrastructure and driver training to better incorporate safety considerations, as well as improving data collection.

The Avoid and Shift components are illustrated by the example of Ahmedabad, India, which is projected to grow from 5.5 million inhabitants today, to 13.2 million by 2040. If the city's development continues on a path of lowering density, rapid expansion and increased auto use, this can increase annual traffic fatalities from 240 to almost 7300, or a 3000% increase. If the city would chooses a more sustainable

<sup>1</sup> Source: World Health Organization

<sup>2</sup> <http://www.un.org/en/roadsafety/>

<sup>3</sup> WHO. 2013. Global Status Report on Road Safety. Supporting a Decade of Action.

<sup>4</sup> Ibid.

<sup>5</sup> Kenworthy et al. 1997. Indicators of transport efficiency in 37 global cities: a report of the World Bank. Perth, W.A.: Institute for Science and Technology Policy, Murdoch University.

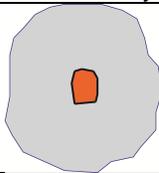
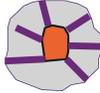
<sup>6</sup> Bhalla et al. 2007. A Risk-Based Method for Modeling Traffic Fatalities. Risk Analysis, vol. 27, no.1.

<sup>7</sup> Dumbaugh and Rae. 2009 Safe Urban Form. Journal of the American Planning Association, 75: 3, 309-329.

<sup>8</sup> Source: Colombian Ministry of Transport, 2011

path, by expanding along high density transit corridors and promoting high quality public transit, thus curbing the growth in vehicle travel, we estimate it can reduce fatalities in 2040 by over 5500 compared to the business-as-usual scenario.<sup>9</sup> It would also reduce CO<sub>2</sub> emissions by over 10 million tons per year. Cities do have the choice of a more sustainable path, and that can have significant impacts on the environment, traffic safety, as well as overall quality of life.

Table 1: Ahmedabad growth scenarios

	Today	2041	
		Automobility	Sustainable mobility
			
Population (millions)	5.5	13.2	13.2
Area (km <sup>2</sup> )	344	1650	825
Density (persons/ha)	160	80	160
Traffic fatalities per year	240	7285	1706
CO <sub>2</sub> emissions (million tons/year)	0.33	12.32	1.97

Research on BRT which provides high quality and high capacity mass transport at relatively low costs compared to rail-based system and traffic safety has shown that high-quality BRT systems, such as TransMilenio in Bogota or Macrobus in Guadalajara, can reduce both crashes and fatalities on the corridors by 50 to 60%, due to infrastructure improvements and reductions in vehicle travel.<sup>10</sup> As in the case of Ahmedabad, India these safety improvements are in addition to other co-benefits, such as reduced travel times and GhG emissions, and improved local air quality. However, if BRTs are not properly designed safety improvements are smaller or non-existent.

## Conclusion

The examples from Asia and Latin America show great potential to use major infrastructure investments in public transport corridors to simultaneously improve safety in cities. The key to achieving this is for national and local governments, development banks and practitioners to consider pedestrian and traffic safety as an integral part of transportation planning. Integrating safety concepts early on in the planning and design stages of new transport and urban development projects is the most cost effective way of improving safety.

It is important that cities promote compact, mixed use land development that is well integrated with the transit system. National governments should provide the policy and economic framework to support this. Non-governmental organizations and development banks should include these considerations when providing technical or financial support to governments.

The UN has declared 2011 to 2020 as the Decade of Action for Road Safety, setting an ambitious goal of reducing fatalities by 50% compared with 2010 numbers. To achieve this target, road safety and sustainable transport should be reflected in the post 2015 development framework and future sustainable development goals.

<sup>9</sup> EMBARQ analysis, based on Rayle, L. and Pai, M. (2010) Scenarios for Future Urbanization: Carbon Dioxide Emissions from Passenger Travel in Three Indian Cities, Transportation Research Record: 2193, pp. 124-131

<sup>10</sup> Duduta et al. 2012. Understanding the Road Safety Impact of High Performance BRT and Busway Design Features. Forthcoming, Transportation Research Record.