

**Vision Three ZEROs:
Zero Congestion, Zero Pollution, and Zero Fatalities –
Towards Next Generation Transport Systems**

**By Michael Replogle
Managing Director for Policy and Founder
Institute for Transportation and Development Policy
To Seventh Asia Environmentally Sustainable Transport Forum
April 22, 2013**

I want to thank and recognize our hosts, the Governor of Bali; Indonesia's Environment and Transport Ministers; the United Nations Centre on Regional Development; the Japanese Ministry of Environment, and the Under Secretary General of UN DESA, for their support for this conference. It is valuable to bring together so many of the world's leaders who are helping to advance sustainable transport across Asia and the globe and to carry forward the Bangkok Declaration and Rio+20 agreements.

We stand today at an important threshold, facing fundamental choices about transportation and the urban development and consumption it shapes. It is a time to organize around an ambitious vision to transform our transportation and to forge more effective means of implementing this vision. I've been asked to talk about such a vision under the banner, "Vision Three ZEROs: Zero Congestion, Zero Pollution, and Zero Accidents – Towards Next Generation Transport Systems"

Since 2008, for the first time in history, a majority of the world's population lives in cities. Urbanization is accelerating and our cities will gain more than a billion people in just the next few years. The pattern of transport system and urban development in the coming decade will decide our common well-being.

Today more than one billion people still live in extreme poverty and urban poverty is growing rapidly. Well-managed urbanization and sustainable transport is a key pathway to shared prosperity and environmentally sustainable development. But today in many countries unmanaged motorization and urban development are increasing both economic inequality and the prospect of catastrophic global environmental degradation.

When cars fill up streets, many see only prosperity. Mobility is a peculiar problem because, absent strategies to manage motorization, it will grow worse as societies get richer. Economists forecast there will be more than one billion new middle class consumers by 2025, mostly living in emerging market cities. How their aspirations for improved mobility are addressed will have a huge influence on whether the poor will be lifted out of poverty or instead face increasing social and economic isolation; whether traffic in cities will move efficiently or be mired in gridlock; whether the air will be healthy to breathe or not; and whether we will succeed in slowing the pace of human-induced climate change.

How mobility is addressed will have important effects on economic growth. Already traffic congestion results in losses of more than 2% of GDP in many rapidly motorizing cities. The costs associated with logistics in developing countries can be as high as 15-20% of GDP, twice as much as in Europe or the US. Traffic exposes billions of people to unhealthful levels of transportation-related air pollution and noise, injures 15 million, and kills 1.24 million people per year. Fossil fuel subsidies of over \$400 billion a year spur traffic and pollution and disproportionately benefit upper income consumers at the expense of the poor. Transportation contributes one quarter of energy-related global CO2 emissions, and these emissions are growing fast.

Today, fewer than 1 out of 7 billion people own a car. Even by 2050, the majority of the world's population will not likely own a car. They will walk, bike, and squeeze themselves into jam-packed buses, trains, and other forms of public transport. Unless these inclusive modes are given priority in street space and transport investment, the vast majority of mankind faces ever-diminishing access to opportunities and services and inclusive sustainable growth will be impossible. Without adequate public transport cities will lock-in land use patterns dependent on high-cost motorized personal mobility.

So what is our vision?

Here in Bali, by the sea, we can see the mountaintop far away, a land of promise, towards which we are walking, advancing a new vision of sustainable transportation. Vision Three Zeros: Zero Congestion, Zero Pollution, and Zero Traffic Fatalities, a vision for safe, clean, affordable transport for all. We may not achieve this vision in our lifetimes, but our children might. This is a dream for our children's future.

I want to tell you today that these dreams can become reality.

Vision Zero started as a 1997 road traffic safety initiative in Sweden, aspiring to achieve a highway system with no traffic fatalities or serious injuries in road traffic. It is built on an ethic that protection of human life and health is paramount over other mobility system goals. It focuses on shared responsibilities between providers and regulators of the road traffic system and users. It recognizes human fallibility and the need to focus on mechanisms for change to guarantee the safety of all citizens. Vision Zero has been widely adopted by a large and growing number of government authorities worldwide and has helped bring about major reductions in traffic fatalities.

Today I propose we apply Vision Zero also to pollution and congestion. The Three Zeros. Some may say this is a wild dream. I say it is not.

I look back to the mid-1960s when as a child in Pennsylvania I woke up some mornings to air so thick with smog I could only see a few houses away. It made my nose run, my eyes sore, and it made me cough, just as the air does today in Beijing or Delhi. As a child

I and millions of others had a dream of blue skies. Though the job is not over, in my lifetime, through popular pressure, we enacted clean air laws that have brought much more healthful air quality to America's cities, reducing tailpipe pollution by more than 98% and requiring transportation plans to conform to clean air attainment plans.

My childhood dream has now nearly become reality. The same can happen across Asia, Latin America, and Africa with a Vision of Zero Pollution.

In the mid-1980s when I founded the Institute for Transportation and Development Policy, as a bicycle activist, environmentalist, and civil engineer, I had a dream of curbing America's over-dependence on cars and promoting sustainable transport best practices from Asia and Europe across the globe. A few friends and I organized others to recycle bicycles to aid health and education workers and capitalize bike industry development in Central America, Africa, and the Caribbean, ultimately sending tens of thousands of bikes. In 1988 I organized a campaign to get the World Bank to focus more attention on non-motorized and sustainable transportation. With persistence and global collaboration, we succeeded.

These dreams too became a reality.

In the late 1989, a small band of environmental and transit advocates started a campaign to reform US transportation laws in favor of public and non-motorized transportation. With a huge long struggle, we changed the laws and defended them against repeated efforts to turn them back, contributing to trends we see today. Now, for 8 years in a row, the average American is driving fewer kilometers each year. Younger people would rather surf the web than drive cars. Suburban sprawl has stalled out and America's cities are growing healthy again, after years of decline, even as America's politics have sunk into gridlock.

Our dream, with hard work, is slowly becoming a reality.

In 2009, ITDP partnered with several dozen other groups, including several multilateral development banks, to found the Partnership on Sustainable Low Carbon Transport, to take to scale the successfully demonstrated new transportation paradigm of "Avoid-Shift-Improve." These efforts helped lead the 8 largest development banks to adopt a Rio+20 voluntary commitment to spend \$175 billion over the next decade on more sustainable transport and to focus their 500 transport experts towards that end.

Our dream is becoming a reality. With such resources, Vision Three Zeros might not be such a wild a dream after all.

In the early 2000s the board and staff of ITDP and Embarq along with some key transport leaders worldwide, dreamed that high quality Bus Rapid Transit, first launched in 1975 in Curitiba, Brazil, and then amplified in Bogota, Colombia, could spread to

hundreds of cities worldwide. Today, thanks to support from many institutions and growing application of the [2013 BRT Standard](#), we are seeing BRT system quality raised in many cities, with new gold standard corridors in cities including Guangzhou, Lima, Rio de Janeiro, and Guadalajara, and high standard BRT efforts underway in Chicago and other US cities. A half a dozen years ago, a growing world-wide community of transport visionaries had a dream of taking to global scale urban sustainable transport best practices. Today, national urban transport policy reform and financing initiatives have spread to India, Brazil, Mexico, China, Indonesia, and elsewhere. Efforts to promote sustainable transport are coming into the mainstream.

City by city and nation by nation, our dreams are starting to become a reality.

While many global transportation trends continue in the wrong direction, the forces for transformation are gathering and mobilizing. Today we need to focus our vision and harness the means of implementation to make our Vision Three Zeros a reality.

What might success of Vision Three Zeros look like? And what will it take to get there? To be grounded, we need to focus on the means of implementation.

We will see a shift to cleaner vehicles, fuels, and modes of travel. From road to rail, from half loaded mono-body trucks to fully loaded tractor-trailers linked with efficient logistics and supply chains.

Technology improvements will support, but cannot be sufficient to help us attain Vision Three Zeros. The interpenetration of information and communication technologies into surface transportation management and operations will be a key enabler of system transformation. But using that technology effectively will first and foremost require better transport system management, governance, and accountability.

Governments will need to focus on setting goals and measuring performance, on managing performance-based contracts and funding programs, on coordinating integrated transport, land use, resource management, and economic development. Governments will need to focus on cost-effectiveness. How can we serve the most people with high quality alternatives to driving at an affordable cost? Scarce resources expended on a high status metro service a single corridor may do far less to cut pollution and traffic than if those same resources are used to create a high quality BRT network 10 times larger, serving many more people and trips.

Today, most people think about traffic the way they think about the weather. Some days are just bad and you have to put up with it. It's unreliable. So if you can afford it, buy a comfortable car with a good radio. If you're dependent on public transport, plug in your earbuds and tune it out as best you can. Either way, allow extra time in your schedule for unpredictable delays.

In many countries electricity is a relatively reliable public utility; though weather may cause problems brownouts and blackouts, these are few and far between. Technologists manage and balance supply and demand, adding more costly peak supply and shedding loads as needed to keep the network from failure.

Imagine if transportation networks were operated the same way as electric utilities, using all the tools in the kit of modern traffic engineering, including integrated real time demand and supply management. If combined with much cleaner motor vehicle technologies and fuels, and smarter land use and urban design, the result might not be Zero Congestion and Zero Pollution, but something clearly moving in that direction.

How might this be possible? In the mid-1970s, fewer than a third of Singapore trips were made on public transport and congestion was a terrible problem. Some in Singapore dreamed a more modern mobility system. Today time-of-day tolls are adjusted every few minutes at more than 70 charging locations on the arterial and motorway network to keep traffic free flowing at least 85% of the time. A Vehicle Quota System limits the number of new motor vehicle registrations, with a price determined by monthly auctions. Parking is managed. While the city has developed a world-class Mass Rapid Transit network, buses that don't get stuck in congestion carry the majority of public transport trips. Real time passenger information systems let you know when the next bus or train will arrive. And almost all housing is within walking distance of public transport, with safe and secure pedestrian conditions, with shade and rain covers offering some protection from equatorial weather. Today public transport carries 60% of all travel, incomes are 10 times higher, and car ownership has tripled compared to 1975. Singapore is among the countries with the lowest road traffic deaths per capita.

Singapore's dream has become a reality.

Other nations have adapted Singapore's best practices. Vehicle quota systems have been adopted in four major cities in China—Shanghai, Guiyang, Guangzhou, and Beijing. Congestion pricing has been a success in a dozen cities across Europe and has been adapted to a growing number of roadways in North America. Research by the US Federal Highway Administration shows that real-time highway congestion pricing can prevent the loss of as much as half of the effective road capacity during times of peak demand by preventing inefficient stop-and-go turbulent traffic flow. Pricing and managing two existing lanes can boost capacity the same amount as adding one new unmanaged lane.

Singapore also teaches us that managing transportation is not an easy or one-time thing. As incomes rise, many people will pay more and more to get cars. Once having paid for them, they will want to use them more, unless there is more comprehensive system management. Indeed, Singapore's dream of getting 70% of all peak period trips on public transport by 2020 has been slowed by heavy investment in new motorways and the provision of added parking as growth occurs in central areas.

Vision Three Zeros is a dream that one day we will see comprehensive real-time management of metropolitan transportation networks that is as reliable as electricity. Achieving this will demand confidence building and incremental demonstration of new approaches that can gain public support. In most cities, such as Stockholm, the public distrusts transport authorities' competence to use tolls to manage traffic for better performance. People want to see they are being given improved travel alternatives to avoid driving. Once they see these results, public opinion turns around rapidly.

Implementation of road user charging requires political courage, skill, institutional capacity, and legal authority. Cities like Paris, Zurich, and Barcelona show how many of the same benefits of urban road user charging can be accomplished with strong parking management and pricing. A Zero Congestion vision, however, will require comprehensive network pricing and management.

How might such management become possible? Imagine being faced with a new set of travel choices in your city of the future. If you spontaneously jump in your car to drive alone downtown to work during peak hours, you will be faced with very high distance-based road user charges and parking fees at your destination. But if you pre-plan your trip, accept riders to fill the empty seats in your car, and accept the route and scheduling window guidance of the network manager, you might find your trip and parking are free or compensated with travel credits. If you take public transport, you will get real-time information on when your bus or train will arrive at your stop so you can walk or bike there and board with little delay, paying a fare subsidized by road user charges. Private or public sector network operators may compete to be compensated under performance contracts that depend on effective load, supply, and demand management. Independent evaluators may audit performance and arbitrate contract disputes. Government officials might focus on setting system performance goals, urban and street design standards, land use policies, and transport operator contracting rules, and ensuring transparency and accountability.

Under Vision Three Zeros there are no fossil fuel subsidies, but strong price incentives and regulations for use of cleaner, lighter, more efficient vehicles for both passengers and freight. Walking and cycling get high priority in urban and suburban networks, along with public transport, and will account for the vast majority of trips. Design codes ensure provision of complete streets and roads that safely accommodate all transportation users, not just motor vehicles. Traffic law enforcement is strongly linked to Three Zero goals and efficient transport system operations. Every city and nation has a freight plan to guide the provision of safe, efficient, and environmentally friendly goods movement.

Under Vision Three Zeros national transport investment funds are gathered from a variety of road user and motor vehicle charges. These are available for investment in sustainable urban transport and modernization and safety improvements to rural

highways and transport services, ports, and integrated transport system development. Metropolitan transport plans are integrated with land use and resource protection plans.

To be successful, Vision Three Zeros must be designed not just for efficiency in meeting congestion, safety, and environmental goals, but also to support inclusive prosperity. Efforts focus on improving access to jobs, education, healthcare, and services for the poor and the disabled, and ensuring that women and children are offered secure and safe door-to-door mobility options that meet their daily needs. These efforts serve sustainable economic development, unlocking value and potential trapped in now underperforming human and infrastructure assets.

Vision Three Zeros could save trillions of dollars for smarter investments in sustainable development. The International Energy Agency recently found that following the avoid-shift-improve transportation strategy to stay within a two-degree climate scenario, which would be consistent with Vision Three Zeros, could save \$50 trillion USD in infrastructure and vehicle operating costs between now and 2050.

If adopted, Vision Three Zeros will lead towards a phase-out of internal combustion motor vehicles and fossil fuels, likely fostering wider use of electric vehicles or ultra low carbon gaseous fuels. But in the coming decade, such vehicles are likely to contribute only modestly to the reduction of CO₂ emissions, with greater near-term gains more likely from improvements in existing technologies and regulatory and pricing incentives to reduce vehicle weight, power, and activity.

Vehicles and infrastructure will get smarter, with adaptive cruise control, dynamic speed limits, and peer-to-peer intelligent vehicle systems contributing to all Three Zeros. But the speed with which these new systems will be introduced will be a function of motor vehicle fleet turnover, which itself will be determined by regulations and incentives.

A post-2015 development agenda that recognizes the enabling role played by sustainable transport will be crucial to timely progress in achieving the Vision Three Zeros. A post-2020 climate agenda must recognize and address the huge role played by transport in contributing to growing CO₂ emissions if timely progress is to be made on that most pressing problem.

In short, adoption of Vision Three Zeros within a sustainable economic and social development agenda could be the key to turning around the current dismal trends in the transport sector.

Join us in the dream. Join us in offering a brighter future to our children. Join us in the hope that we might together look back in years to come, from our path up the mountain, seeing our progress, our sense of attainment as we marched from the sea. With your hard work and determination, our dream can become a reality.

