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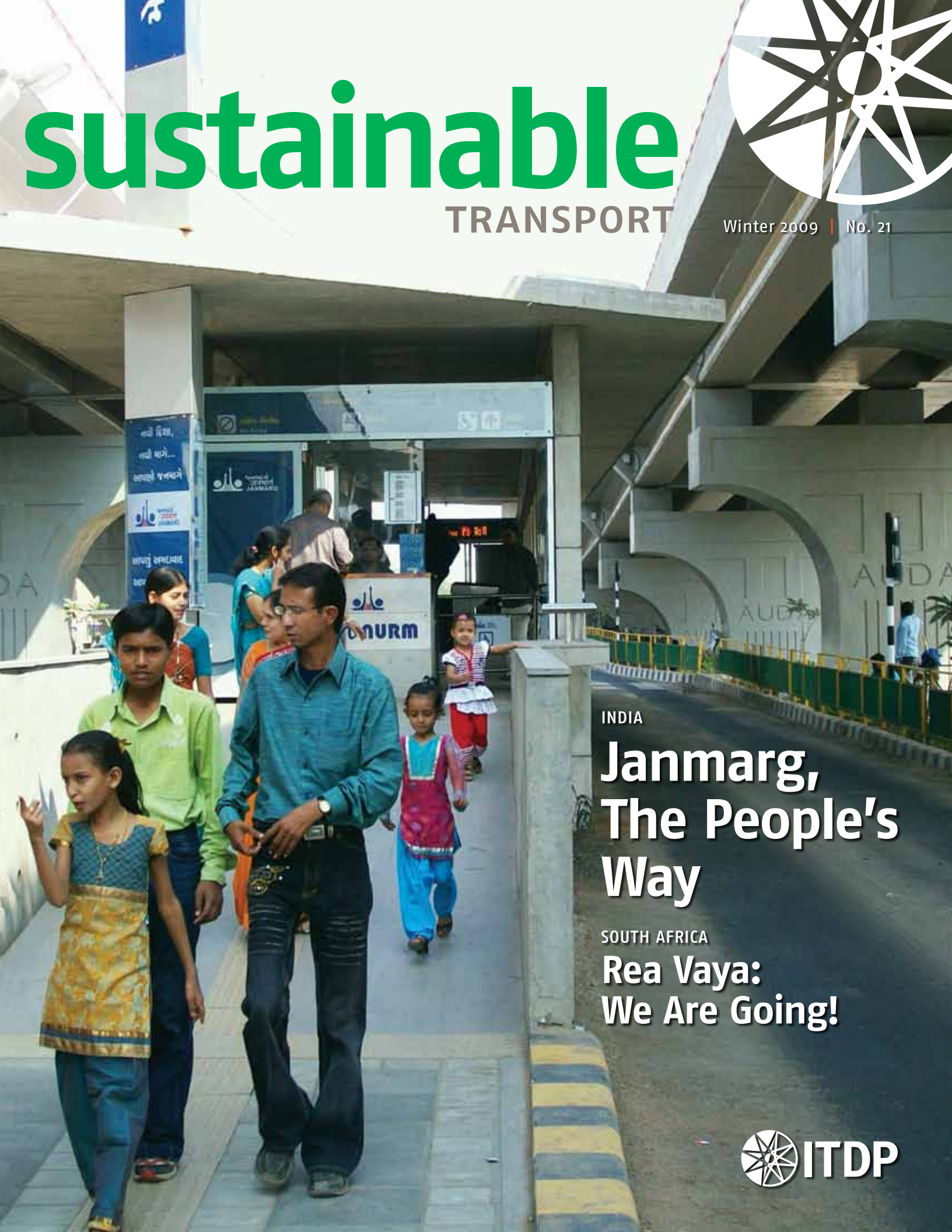

INDIA

Janmarg, The People's Way

SOUTH AFRICA

Rea Vaya: We Are Going!

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ITDP is non-profit advocacy, research and project implementing agency whose mission is to promote sustainable and equitable transportation practice and policy in developing countries. ITDP is registered in the United States as a charitable organization that is eligible for tax-deductible contributions under the Internal Revenue Service code. ITDP members include bicycle activists, transportation planners, economic development specialists, small business owners, environmentalists, and other professionals from the U.S. and around the world.

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Our Cities, Ourselves

By Walter Hook

Our Cities, Ourselves **aims to capture the imagination, to show the possible, and to awaken the desire for meaningful change. We are asking our friends—the brightest and best architects and transport planners we know—to help us imagine future urban places that will give our cities more character and be more appealing to our children than the places in their video games.**

In 2010, ITDP turns 25. In honor of the occasion, we are launching the *Our Cities, Ourselves* campaign. Rather than just looking back at our history, the campaign looks to the future. What will ten major cities look like twenty years from now if we at ITDP achieve our goals? While celebrating work we've done over the past 25 years, *Our Cities, Ourselves* raises exciting possibilities for the next 20.

Back in the 1970s, a book called "Our Bodies, Ourselves" was published by the Boston Women's Health Coalition. The book helped women become better informed about their reproductive health options, giving women greater control over their lives. As one of the writers explained, "We weren't encouraged to ask questions, but to depend on so-called experts."

Today, we worry about our growing waistlines. Our children suffer from Type II diabetes and depression, frequently from getting too little exercise. On the way to work, we sit in traffic congestion, breathing in polluted air. The only human faces we see are behind the windshields of passing cars. The so-called experts tell us that they are taking care of things, that ever increasing traffic is as inevitable as the ebb and flow of ocean tides, and that the only solution is to build more roads.

Our Cities, Ourselves is ITDP's effort to move the project of human emancipation out of the household and onto the street. Literally. For 25 years, ITDP has brought together leading transportation thinkers to challenge the experts and reclaim the right to self-determine the cities in which we live. ITDP challenges non-governmental organizations, citizens, and elected governments to think differently about urban space and to raise questions about the sort of cities we want to live in. There is nothing natural about our children living in fear of every passing car. Unsafe, car-clogged streets are not facts of nature; they are reified acts of political repression that can be transformed through political organization and enlightened leadership.

Our Cities, Ourselves aims to capture the imagination, to show the possible, and to awaken the desire for meaningful change. We are asking our friends—the brightest and best architects and transport planners we know—to help us imagine future urban places that will give our cities more character and be more appealing to our children than the places depicted in their video games.

But ITDP is not just about talking and imagining. In the last year, ITDP has been directly responsible for some of the most important urban transport projects in the world. ITDP played a key role in initiating and designing three new bus rapid transit (BRT) systems that have just opened: the Janmarg system in Ahmedabad, India; the Rea Vaya system in Johannesburg, South Africa; and the Guangzhou system in China. We helped create new pedestrian zones and bike friendly road designs in Mexico City and Guadalajara, Mexico, including almost 1,000 new bike

parking spaces, and new bike-sharing programs in Mexico City and Guangzhou. We were involved with new BRT projects underway in Buenos Aires, Cape Town, and other cities. These projects are not creating hardship by taking away people's cars; they are giving new options to people currently trapped in lousy transport systems with few options.

ITDP is now part of the Best Practice Network of the ClimateWorks Foundation, a coalition of some of the smartest and most strategic experts, advocates and funders trying to stop climate change. By joining ClimateWorks, ITDP has become part of an international team that can marshal financial and political resources on the scale of a multinational corporation but that uses these resources to beat climate change through effective, sector-specific work. Together, while we are working on better transport choices and BRT systems, we can also help bring in cleaner vehicles, and greener buildings around transit stations, and greener appliances in buildings.

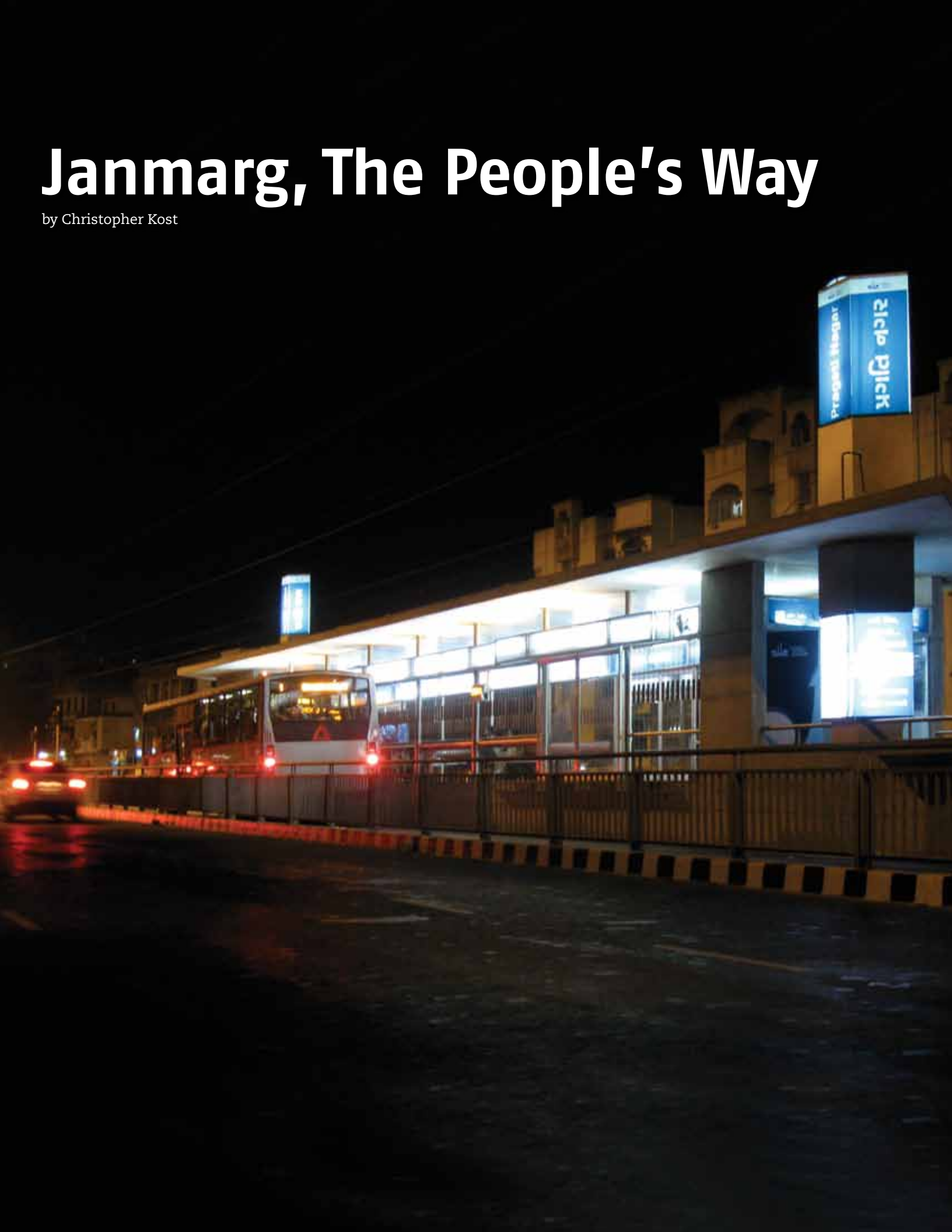
ITDP is somewhat unique in this group. Much of the sector-level work is focused on national regulations that will push progressive technological change. ITDP's approach is more viral. We don't want to just change what type of lightbulb people use, or what type of car they drive. We work with a few enlightened cities willing to turn their dominant transportation systems on their heads and serve as role models and mentors to other cities.

There will always be people who would rather drive down the block to buy every quart of milk and who are happy spending hours a day behind the wheel, but this choice should not be imposed on those of us who want to live car-free, in neighborhoods where our streets are safe enough for our kids to play. We want enough control over our cities to have the choice to leave our cars at home, to use a great BRT if it's cold and raining, and have great safe bike facilities when the weather is great to keep our cholesterol down and our spirits up. We want our cities for ourselves.

Top: Some of ITDP's recent projects include BRT construction in Guangzhou, China. Image: Karl Fjellstrom
Center: Bollards create a new pedestrian refuge in Mexico City. Image: ITDP
Bottom: New bike parking in a pedestrian zone in Mexico, Image: ITDP

Janmarg, The People's Way

by Christopher Kost



Janmarg, or "people's way," improves the image of public transport in Ahmedabad.

India's first full bus rapid transit service was officially launched on October 14, 2009. Janmarg, which means "people's way," is expected to revive not only the image of public transport in Ahmedabad, but also the image of bus rapid transit (BRT) in the country. It is the first BRT system in India to have stations in the median and ticketing conducted off the buses. Passengers buy tickets before entering system stations where they can quickly board the buses. Beyond its physical design, Janmarg is the first system in India to implement institutional and contractual changes that are crucial to the fundamental delivery of BRT.

The service was a success during trial runs in the first half of August when Janmarg provided free rides to passengers. People from all walks of life—students, laborers, families, retired couples—arrived in droves to experience the new system. Since revenue collection began in mid-October, BRT ridership has ranged from 12,000 to 19,000 passengers per day, significantly higher than ridership on the municipal buses that previously traveled on the corridor. A survey by The Times of India indicated that approximately one-third of the passengers used to rely on private motor vehicles or three-wheeled autorickshaws.

Concerned about adverse public reaction, the city of Ahmedabad decided to start the BRT project on a middle ring road that was not very congested and where bus volumes were moderate, but where the city was still growing. In this way, they hoped to get the design right before moving on to more congested and difficult corridors.

Janmarg represents a major advance over the city's public bus system, the Ahmedabad Municipal Transport Service (AMTS). Most consider that service unreliable and simply getting on an AMTS bus can be a challenge. Rather than coming to a full halt at bus stops, AMTS drivers tend to glide through the stops, slowing down just enough for passengers to take a running leap onto the vehicles. Sometimes the buses do not stop at all, and frustrated commuters resort to informal shuttle services provided by auto rickshaws.

In the initial phase, buses run along western Ahmedabad's ring road for 12.5 kilometers (7.8 miles) from the Road Transport Office to Chandranagar. Planning began in 2005 with construction taking two and a half years at a cost of US$ 1.9 million per kilometer. Today, special buses branded specifically for Janmarg run on a dedicated busway and currently stop at enclosed stations. However, with doors on either side, these buses could provide services both on and off the busway (see articles on Cali and Johannesburg). These buses are currently Euro III diesel 12-meter buses manufactured by Tata but assembled locally in Ahmedabad. Later phases are likely to switch to CNG fuel.

The enclosed stations have become some of the finest quality public spaces in the city. They offer protection from sun and rain, as well as comfortable benches and leaning supports. The boarding system is designed at grade—the station and bus floors are both at 900 millimeters (35.4 inches)—and boarding a Janmarg bus is a vast improvement on the narrow, treacherous steps of AMTS buses. The 12-meter-long Janmarg buses have clean interior styling with a city bus seating layout that leaves adequate circulation space.

Accommodating turning movement of both cars and the BRT buses is a challenge. Optimal for both on a BRT corridor is a two phase traffic signal, but a standard two phase signal cannot accommodate the right turns (what would be left turns in the United States) of both cars and buses. Delhi tried to accommodate all turning movements with a central median busway by introducing a six phase traffic signal. This, along with the fact that the stations were located at the junctions, leaving no room for turning vehicles, led to severe traffic congestion which angered the public.

In most cases Janmarg stations are located a short distance away from intersections, close enough that the station can be easily reached from a walkway, but leaving enough space for

Left: Janmarg stations have pre-paid boarding. Image: Chris Kost. **Opposite:** At night, Janmarg stations are well-lighted for passenger safety. Image: Shreya Gadepalli

Janmarg's stations are some of the finest quality public spaces in the city.

Above: As passengers wait for the bus, passive solar technology keeps stations cool. Image: Luc Nadal

mixed traffic at the junction.

Ahmedabad also resolved the turning problem by introducing new 'square-about' intersections, borrowing from some Brazilian examples. A square-about functions like a roundabout but with a two phase traffic signal. The square-about makes it possible to combine straight movements with all turning movements into a single signal phase. Right-turning vehicles enter a queuing space created by the square during the first phase, and then complete the turn during the green phase for the perpendicular direction.

Like many Indian cities, Ahmedabad is building many overpasses. The Janmarg project team managed to convince the city to split the flyovers, allowing the system to continue down the middle of the road while remaining on the surface. In these locations, the stations could be located closer to junctions without adversely affecting the capacity of the junction.

Janmarg introduced some of the first good quality sidewalks in a city where most streets lack them. However, they are still narrow by international standards, as well as sporadic and not fully compliant with guidelines for disabled access. In many stretches of road, pedestrians continue to prefer to walk in the street.

Pedestrians also face challenges in some locations when crossing the street to the median bus stations. Mid-block traffic signals have been installed at the mid-block crossings, but many of them have not yet been activated, and motorists rarely obey those that have. Most of the time the pedestrian only needs to cross two or three mixed traffic lanes, which is generally not too difficult, but the Ahmedabad Municipal Corporation (AMC) has agreed to test raising the entire crossing to the level of the footpath. Motor vehicles will need to slow down to mount what in essence will be a wide, flat-topped speed bump, making it easier for pedestrians.

The city also tried to build cycle tracks parallel to the BRT corridor in some locations, but they are extremely intermittent and have an uneven riding surface. The cycle tracks are located at the lowest elevation in the street, so they quickly fill with rainwater, dirt, and trash. They are not clearly marked and were quickly appropriated as parking lots, hawking zones, and contra-flow lanes for motorcyclists. As a result, most cyclists prefer to continue riding in the mixed traffic lanes. The city of Delhi's cycle tracks were more carefully designed than those in Ahmedabad.

The first phase of Janmarg is part of a planned 90-kilometer network (55.9 miles). Another 4.5-kilometer (2.8 miles) stretch should be open by the end of 2009, and AMC expects to award a construction bid for phase two soon. This phase includes a crucial elevated east-west link through Ahmedabad's historic city center, where existing bus passenger demand is nearly 5,000 passengers per hour per direction. Major stations will require multiple bays and passing lanes to smoothly handle the expected passenger volumes.

A successful BRT is about more than getting the infrastructure right. Earlier busway systems in Delhi and Pune did not pay attention to the full spectrum of management issues, including contracting, operational planning, monitoring, and fare collection. Ahmedabad is the first Indian system to set up a BRT management agency, to introduce competitive tendering of new operational contracts, and to tie the new operators to performance-based contracts.

In Ahmedabad, Janmarg's day-to-day operations are managed by Ahmedabad Janmarg Limited (AJL), a new special purpose vehicle that is a subsidiary of the municipal government. AJL issued a competitive tender for bus operations, fare collection, station management, and for information technology systems like operational control and passenger information. The company that won the bus operating tender is a major player in the trucking industry. AJL officials supervise compliance with these contracts.

The contracts were written to ensure careful monitoring of the system. Operators are paid on a per-kilometer basis, in conjunction with a level of service agreement. Driver performance and the condition of the buses are checked on a daily basis. As in other BRT systems such as Bogotá's TransMilenio, the bus operator faces a fine for each violation of the service standards, including dirty buses or speeding. Ahmedabad is also building a new depot where the bus maintenance will be tightly supervised.

Janmarg is also the first BRT system in India to have a control center that employs global positioning systems (GPS) installed in every bus to help control center staff monitor bus locations and maintain regular spacing by alerting drivers that they need to increase or reduce speeds along their routes. The GPS also provides real time information that allows passengers in the station to see the arrival time of the next bus.

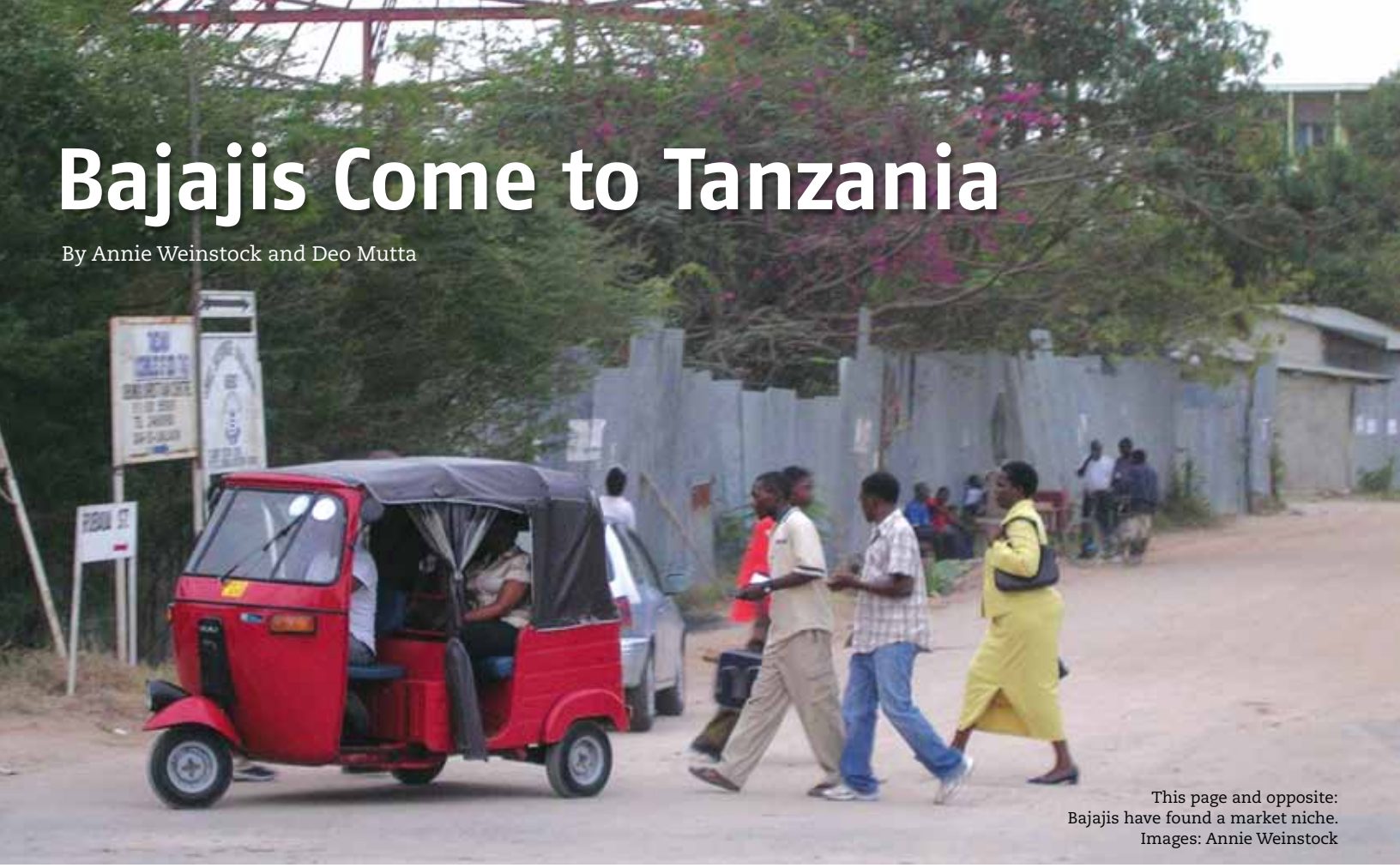
Ahmedabad's BRT system is set to become a high quality transit backbone for the city's five million residents. Janmarg, the "people's way," is the only way that Ahmedabad's five million residents can avoid the traffic gridlock, choking exhaust, and unpleasant quality of life in public space that typify so many Indian cities.

Above: Passengers board Janmarg at-grade, a vast improvement on the narrow, treacherous steps of AMTS buses. **Below:** The city built split overpasses to allow the BRT system to remain on the street level. Images: Shreya Gadepalli

Left: The city of Ahmedabad decided to start the BRT project on a middle ring road where the city was still growing. Image: Chris Kost

Bajajis Come to Tanzania

By Annie Weinstock and Deo Mutta



This page and opposite:
Bajajis have found a market niche.
Images: Annie Weinstock

The auto rickshaw, ubiquitous in India, has crossed the Indian Ocean and is ever more prevalent on the streets of Dar es Salaam.

For years, experts have wondered why Asian cities have such a diversity of vehicle options, while African cities are dominated by four-wheeled vehicles like cars, trucks, minivans, and land rovers. Motorcycles started appearing in Burkina Faso a decade ago in large numbers and later spread to Kenya and Uganda. Now the auto rickshaw, found all over India, has crossed the Indian Ocean and arrived on the streets of Dar es Salaam, Tanzania.

Transport in Dar es Salaam, the commercial capital and Tanzania's most populous city, has long been dominated by minibuses known as daladalas. Slightly better regulated in Dar es Salaam than in other African cities, daladalas are still frequently poorly maintained, aging vehicles that travel at break-neck speeds, loaded far beyond passenger capacity. Each trip costs about 20 cents, but most residents need to make two or three connections to reach their final destinations, paying an additional fare at each connection. Meanwhile, private taxis are nearly as expensive as those in the United States because of high fuel costs and a wealthy user base of Tanzanians, expatriates, and tourists.

In this situation, the auto rickshaw found a market niche. In the 1990s, the Tanzanian Red Cross began providing three-wheeled gasoline-powered rickshaws to some disabled Tanzanians. One such recipient, Mr. Jumbe, was a fruit-seller in the Mwenge area of Dar es Salaam.

Mwenge is a major terminal for daladalas, but the area's many large employment centers, such as Coca-Cola, cannot be accessed quickly from the terminal by foot or by transferring to another daladala. The cost of making this trip by taxi is approximately 4,000 TZS, or about $3, a high price for a small transfer. Mr. Jumbe began charging a flat rate of 500 TZS (approximately 40 cents) to shuttle passengers on his auto rickshaw between the Mwenge bus terminal and the various nearby employment centers.

The idea quickly caught on. Soon, Tanzanians were importing auto rickshaws for the sole purpose of marketing them as cheaper taxis. They were originally purchased from the Indian Bajaj Auto Company. While many auto rickshaws are now imported from China, the Indian name caught on and Dar es Salaam residents were all talking about their new bajajis.

In the last several years, the price for a bajaji ride has escalated, though not nearly to the level of a taxi ride. This is due partly to the lower cost of the vehicle and partly to the reduction in safety that the vehicle offers. One bajaji trip can fetch anywhere from 1,000 – 5,000 TZS (80 cents to four dollars), depending on distance, proving a profitable market for owners and drivers.

The Tanzanian bajaji industry quickly established an effective supply chain. Bajajis are imported and assembled by six companies in Dar es Salaam. The first one was set up as a subsidiary of a Sri Lankan company in 2000. They are sold for between 3.2 and 3.5 million TZS ($2,400 - $2,700).

Owners are rarely drivers of the bajajis; many owners are civil servants angling for additional income. Owners charge their hired drivers about 15,000 TZS ($11) per day to rent a bajaji. Drivers are responsible for fuel costs of approximately 10,000 TZS/day ($7.50), and the driver keeps the remaining profit. Driver profits range from 25,000 to 40,000 TZS ($19 - $30) per day.

Despite, or perhaps because of, the success of the bajaji industry, the Tanzanian government banned bajajis as for-hire transport in 2008. An outcry from municipal political powers quickly resulted in a reversal of the ban in all areas but the central business district (CBD). Traffic congestion within the CBD is extremely heavy, and this provision was ostensibly a way to help control traffic. However, as in many cities, it was more likely a concession to more powerful lobbies.

The success of the bajaji industry has caused some degree of consternation from daladala and taxi owners alike. Capturing the market between the two highly stratified price points, bajajis generally draw riders from both markets. There are even rumors that some "accidents" involving bajajis have been purposefully caused by disgruntled daladala and taxi drivers.

Though generally believed to be unsafe, official statistics are vague and accident records are not well-kept. Many bajaji drivers do not hold the proper licenses, but this is not only true of bajaji drivers. Bajajis are quite convenient at working their way down narrow streets. Despite the risks, the bajaji industry in Dar es Salaam continues to grow steadily. Imports into Tanzania are between 200 and 250 per month with approximately 70 to 80 of these imports remaining within the metropolitan area. The rest of the vehicles are distributed across Tanzania.

The Tanzanian government certainly needs to mandate and enforce reasonable emission standards for bajajis, which are extremely polluting, but tightening emission standards is required across the board. For example, many Indian cities have mandated the use of CNG fuels in bajajis. This conversion generally pays for itself because of lower fuel costs, and Tanzania has supplies of natural gas that could be a useful hedge in case of another oil shock.

As Dar es Salaam introduces its new bus rapid transit system, scheduled to open in 2012, bajajis might be a very helpful, low-cost mode to access the system, if the city can successfully address the pollution problem.

Streets for People
New York's Bold New Pedestrian Spaces

Photos and text by Luc Nadal

Below right: Planters and pavement markings create an urban oasis in the heart of New York City. **Below left:** Times Square before it was closed to vehicular traffic.

Broadway, New York City's oldest and most famous street, was once a rocky path tread by moose, deer and Algonquin hunters. By the 1980s, Times Square was notorious for pickpockets, pawnshops, and pornography. Thanks to a successful urban renewal campaign in the 1990s, Times Square became so overrun with visitors that pedestrians spilled off the sidewalks into Broadway's continuous stream of speeding, honking, and fuming traffic.

Last summer, to the astonishment of citizens and visitors alike, New York City closed sections of Broadway at Times Square and at Herald Square to motor vehicles. Between Times Square and Madison Square, two lanes of Broadway were converted from mixed traffic lanes to bike lanes and walkways. Even in a city known to the world as the triumphal capital of no-nonsense business, treating streets as mere conduits for private vehicles was a losing proposition.

Closing Broadway, a road that diagonally cuts across New York's street grid, actually improved traffic flow in most places because traffic signals could be simplified to two phases in critical locations. There were a few complaints from cab drivers, but the public reaction was almost uniformly positive.

Below: Pedestrianized Broadway at Times Square is now a major draw for both tourists and locals alike.

Below: High-quality road designs accomodate pedestrians, cyclists, and pedicab drivers

New York recently put some of its streets on a "road diet" and used traffic calming measures on others. In the newly fashionable Meatpacking District in Chelsea, a once dilapidated roadway was turned into something close to a *woonerf*– a space in which pedestrians have priority but which all modes can access at slow speeds. With simple changes in traffic direction and large stone blocks and planters set on the roadbed, vibrant street life immediately flourished in the zone.

The city also developed some of the highest quality parking-protected bike lanes anywhere on segments of Eighth and Ninth Avenues between 14th and 34th Streets and also along Grand Street. Hundreds of parking spaces were removed to create parking-free bikeways on Prince Street and Bleecker Streets.

The hallmarks of the two-year tenure of New York's Transport Commissioner Janette Sadik-Khan are swiftness and economy of implementation. Surface treatments require no involvement of other government agencies and minimal environmental review, so simple paint markers on asphalt have been used to test radical roadway redesigns quickly and at low cost.

Below: A *woonerf* in Chelsea's Meatpacking District provides a place for strolling tourists and residents to gather

Left: High quality, protected bike lane on Eighth Avenue; Right: Cyclist on Broadway in the Flatiron District

Later, when new streets designs are popularly accepted, the more cumbersome permanent reconstruction can be worked through municipal bureaucracy. Far from resting on its laurels as the winner of the 2009 Sustainable Transport Award, New York plans to roll out a major bike-sharing program and a world-class BRT system within the next few years.

Rea Vaya: We Are Going!

By Annie Weinstock

Above: Passengers board Rea Vaya on opening day. The system ranks among the top BRT systems in the world. Image: Aimee Gauthier

For the last three years, the threats rolled in and the bullets flew. At times, many feared that the Johannesburg bus rapid transit (BRT) system would be halted before the first bus ever got the chance to enter one of its bus lanes. But the leadership in Johannesburg, South Africa was strong and determined. On August 30, 2009, Rea Vaya, the first full BRT system in Africa, began its starter service. Women, men, and children gathered along the corridor to clap and cheer as the buses passed. In actualization of the system's Sotho name, the people were finally going.

Opened just three years after the city of Johannesburg approved the concept, Rea Vaya gives new meaning to the city's motto: "a world-class African city." Fast-tracked to be ready in time for the 2010 World Cup, Rea Vaya is the first major urban public transit deliverable of the African National Congress (ANC) government.

The starter system runs in exclusive busways for most of the 25.5 kilometer route, and includes 25 full BRT stations. It ranks among the top BRT systems in the world, incorporating most of the "standard" features of

BRT —center-aligned, barrier-separated busways; pre-paid boarding; raised platforms for level boarding; and secure, weather-protected stations. Most stations include a passing lane to accommodate both express and local services, as well as multiple stopping bays to allow several buses to load simultaneously.

Rea Vaya is central to the city's plans to revitalize the city center and reestablish an integrated civil society with safe public spaces. While the city has made significant improvements in increasing safety in the downtown area, warnings still abound—don't carry your cellphone, take off your earrings, don't walk around. Most people with money drive their cars even to travel a few short blocks mainly for fear of crime. Three ITDP staff members were mugged at knifepoint while viewing downtown stations before the system opened. But the system has opened and Rea Vaya is helping continue the Johannesburg's downtown revitalization.

Rea Vaya seeks to transform the minibus taxi industry, perceived as another source of violence in the city. Since the relaxation of apartheid's restrictions on informal sector transit in the mid-1980s, minibus taxis have been the main mode of travel for most of the 63 percent of city residents who do not own a car.

The minibus industry emerged in the 1970s when the city government opened the public transport market to private operators, drastically scaling back public service. This was one of the only spaces where black entrepreneurship was permitted during apartheid and the industry became a source of pride. This legacy remains.

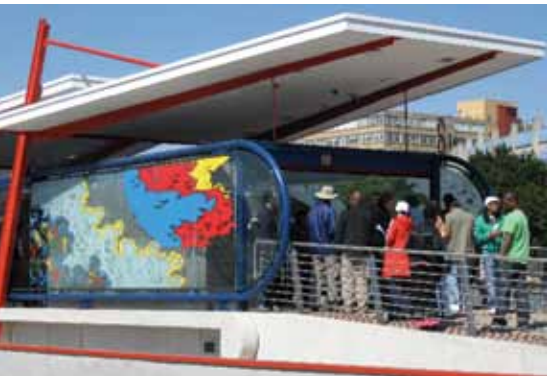
Shortly after the taxi industry's emergence, driver associations were formed to protect individual routes. Violence, and a mafia mentality, took hold. Taxi organizations declared war on one another, resulting driver and passenger deaths.

While the minibus taxi industry was one of the few places where middle class blacks could invest their savings during apartheid, much of the excitement about Rea Vaya, from South Africans of all backgrounds, is based on anger and frustration towards the minibus taxi industry. City residents see Rea Vaya as a test of the government's ability to reestablish control over Johannesburg's rampant crime and lawlessness.

The 15-seat minibuses operate without schedules waiting at taxi ranks until they are full to depart, so passengers never know how long a trip will take. Hailing the right minibus taxi requires knowledge of a complex array of hand signals. Most minibus taxis terminate in Johannesburg's central business district (CBD), so passengers who need to travel beyond the CBD must transfer and pay a second fare. The taxis also travel at breakneck speeds, trying to capture passengers as quickly as possible. Many drivers are unlicensed, vehicles are poorly maintained, drivers are sometimes rude, and accidents are frequent.

From the outset, the city made a political commitment to incorporate the minibus taxi industry into Rea Vaya by allowing operators to form companies responsible for system operations. Some labor and community groups questioned why the new system would be turned over to the very people responsible for the current problems. The Institute for Transportation and Development Policy (ITDP) explained in radio and newspaper interviews that minibus taxi drivers are not bad people, they are just trapped in a system that encourages gang formation and rewards lawlessness. Rea Vaya is about changing the rules of the game.

Above: Rea Vaya uses Euro IV buses, the first in the country. Image: Chris Kost
Below: Schoolchildren on board a system bus. Rea Vaya is part of the city's plan to create safe public spaces. Image: Annie Weinstock



Above: Instead of crawling into a minibus taxi, passengers enjoy the at-level boarding and alighting.
Below: Rea Vaya stations accommodate high daily passenger volumes.
Images: Chris Kost

Opened just three years after the concept was approved, Rea Vaya has already given new meaning to the city's motto: "A world-class African city."

The protectionism rife in the taxi industry was not limited to competition between associations. When BRT was proposed, the taxi industry protested and carried out strikes, seeing BRT as a threat. Those in opposition formed themselves into an anti-BRT association called the United Taxi Association Forum (UTAF). UTAF, together with one of the two national taxi associations, SANTACO, threatened to strike.

As the system opened, everyone was terrified of the potential for violence. Just before the system opened, many of the new drivers, the government officials and politicians working on the project, and the supportive minibus taxi industry representatives received threatening messages warning them that hit men had been hired from the nearby KwaZulu Natal Province to kill them. Preparations for the opening included protection for these people.

The Department of Transportation made security a top priority. Even one passenger fatality would have been a disaster. On opening day, a full police escort accompanied every bus. Officers rode on the buses, and during the first week, an officer and a bus driver were shot (not fatally) as the bus was moving. In response, the South African Police Service raided community housing along the BRT corridor and arrested a dozen armed gangsters.

Since then, members of the taxi association who support BRT have been targeted by the anti-BRT taxi industry. In November, one pro-BRT taxi boss was attacked outside his girlfriend's home, who was killed. He was later killed in December 2009. Another taxi boss was shot at while driving, although he was not injured. The city announced that 40 more police officers will be patrolling the system, on board buses, in stations, and along the busway to help control fare evasion, enforce the dedicated busway, and protect passengers.

The minibus taxi industry was not able to form a company to provide operations in time to meet the scheduled opening date of August 30, 2009. As an interim measure, the city hired the public bus company, Metrobus, to operate the service until the minibus taxi company was ready to assume control. Out of respect for the taxi industry negotiating process, the starter service is limited, using only 40 of the 143 Phase IA buses. One week after opening, ridership had reached 17,000 trips per day, and the buses and downtown stations accommodate high daily passenger volumes.

The taxi industry is not yet fully integrated into the Rea Vaya system but the system is, at last, operational. Building and opening a starter system was the biggest hurdle. The minibus taxi industry will now inherit a system that has solved many of its initial problems.

Rea Vaya puts Johannesburg at the forefront of urban African transportation reform. The challenge between now and June 2010 is to transfer the ownership to the system's intended beneficiaries, the minibus taxi industry, as well as provide world-class service to several hundred thousand anticipated World Cup visitors. The world will be watching.

China's Cities at a Crossroads

By Luc Nadal

A continuous flow of men and women streams in and out of the symbolic gate that marks the entrance to Tangxia, one of the many villages swallowed by the sprawling city of Guangzhou, China, in the last 30 years.

Tangxia does not fit the traditional image of a village. Old houses have been razed and replaced with nine-story structures. These new buildings are made of concrete, covered with muted pastel tiles with windows secured with steel bars. Rooms are dark and sanitation is often primitive. The buildings lean over narrow alleys, backlit by the neon glow cast from hundreds of vibrant small shops and eateries below. Occasionally, an old ancestral shrine preserved from demolition for ritual reasons, a mature tree at a crossroads, or a historic neighborhood gate present brief moments of antiquated charm.

Most people walking down the old alleys of Tangxia belong to the millions of people in the transient rural migrant community of China. These migrants come to cities seeking meager salaries from work in factories, construction and the service industry. Mindful of spending one or two Yuan ($0.15-0.30) on bus fare, many walk or cycle long distances to work.

Redevelopment of these urban villages is under consideration at city hall. Their locations have become more central as the incessant growth of suburban development spirals outward. The increase in land value now makes it profitable for developers to level the existing structures and pay the mandatory compensation owed to landowners. Wherever redevelopment proceeds, migrants find themselves relegated to distant peripheries. The carpet of high-rise buildings and wide traffic-choked roads finally absorbs the last of these old enclaves of close living quarters and walkable alleyways.

Middle-income and luxury housing development seldom takes the form of Western-style low-rise suburbs in China. The buildings are typically 12 to 30-story high-rise buildings clustered in landscaped compounds. This physical arrangement is encouraging from a sustainable transportation and development perspective. Urban density is a prerequisite for both ease of walking and efficient public transport.

Above: Traditional urban villages being demolished
Image: Luc Nadal

Density alone, however, is insufficient to make China's urban environment both pedestrian and transit friendly. For the most part, the rapid vertical and horizontal expansion of Chinese cities in the 1980s has corresponded to a rapid decline in walking and cycling. The vast bicycle flows of the 1970s and 1980s gave way to raging vehicular traffic in the 1990s. Some cities banned bicycles on many major arterials. China once possessed a world-class network of bike lanes. Today, most of them have been narrowed, relegated to sidewalks, or altogether eliminated.

Roads were expanded at rates that would be impossible in most countries where governments do not own the majority of the land. Huge land tracts were zoned for single-use development and transit infrastructure lagged far behind urban development. Walking became tedious and tiresome. Not surprisingly, the Chinese urban

Left: Some urban villages are being modernized with new bridges and walkways. **Right:** Tangxia urban village is alive with petty commerce. Images: Walter Hook

middle-class took to driving en masse.

If current trends hold, hundreds of millions of Chinese people will follow in the steps of the migrants of Tangxia, moving from rural villages to cities headed for long-term environmental disaster and the commensurate deterioration in quality of life for its citizens. The Asian Development Bank recently predicted that half of the 2030 global increase in human-generated greenhouse gases would come from Asian cities, much of it from transportation.

After a very brief slowdown during the recession, the vast army of real-estate developers, construction companies, financiers, and local officials are once again busy casting China's cities of tomorrow in concrete and asphalt. China has some world-class developers and architects, but most Chinese will be housed and employed in developments designed by companies trying to make a fast return on their investment and devote little attention to the long-term walkability and transit-friendliness of these settlements. Fortunately, there is rising awareness in China that the current form of urban development is an environmental and social dead end.

The best-loved cities of the world share certain characteristics. They are full of people who chose to live car-free even though they can afford to own automobiles. The bulk of development is densely laid out within walking distance of a transit station. The zoning and development pattern balances multiple uses, making it possible to live, work, shop, learn, relax, and have fun. Usually, block sizes are of one hectare (2.5 acres) or less, bounded by relatively narrow, walkable, and interconnected local streets. The streetscapes and public spaces are attractive, lively, and safe.

However, making these characteristics the guiding principles for new development is difficult. Ingrained practices, economies of scale, streamlined production and construction, ready marketability, profit-maximization, and convenient regulatory loopholes all converge to reinforce the domination of the single-use, superblock enclave model in China and large parts of Asia.

Regulatory challenges include Chinese national planning standards that require large arterial roads every 400 to 500 meters and leave the provision of a network of local access streets and the accommodation of non-motorized modes optional. The general practice of local authorities is to release blocks of 16 to 25 hectares [40 to 60 acres] to single developers with the leeway to close them to the public and arrange internal circulation at their will. For comparison, the average block area of the older walking neighborhoods of Guangzhou is about 0.5 hectare (1.2 acre).

Single-use zoning of large blocks is a norm followed closely by local planning authorities. Unrealistic schedules in developing regulatory plans and lack of capacity and skills result in boiler-plate solutions.

Developers' interests are thoroughly intertwined with those of local officials and the cities' budgets. Since the land reform of 1988, city coffers have been largely fed through the transfer of long-term land-use rights to developers. The municipal land and urban planning

Above: A greenfield in Panyu already has a metro stop. Image: Walter Hook

bureaus have clear incentives to be close and lenient to developers. Insider trading is known as common practice in land development.

Until proven otherwise, developers and city planning bureaus will continue to believe that large scale, cookie-cutter projects on clear lots will be easier, cheaper, and more profitable. Until some high-profile success stories break this pattern, changing the regulatory environment in which developers work

is the only solution. Such reform does not seem to be on the table yet.

In the past year, the Institute for Transportation and Development Policy (ITDP) worked actively with the municipalities of Guangzhou and Harbin, as well as together with the China Sustainable Cities Program of the Energy Foundation in Beijing, on land development regulations and policies, and the conceptual design of current projects.

Above: This schematic image shows a mixed use development with a commercial base that creates an active street edge. Image: Gehl Architects

Hanxi Chanlong, Panyu, Guangzhou

This greenfield project is centered on a patch of countryside earmarked for rapid development around an underground Metrorail station which connects to downtown Guangzhou and to the nearby sub-center of Panyu. The regulatory plan drafted by the Urban Planning Bureau of Guangzhou presents a fairly typical large-scale single-use commercial zoning with superblock lots and oversized roads. It disregards the natural and historic resources of the site, and to a large extent its topography.

ITDP partnered with the Guangzhou Urban Planning and Design Survey Research Institute (GZUPI), and the Real-Estate branch of the Metro Company to elaborate an alternative development plan. The plan required zoning variances—road planning and mixed uses—that are the subject of protracted negotiations with the Urban Planning Bureau.

The alternative conceptual plan submitted by ITDP was designed to increase density above and near the transit center. It identifies the site's natural and historic resources and restores them within a network of open public streets and spaces. Resources include the spontaneous footpaths, which follow the path of least resistance, taking into account the steep slopes and hills, streams, canals, ponds, and mature trees. Finally, the plan proposes to develop the land as a dense grid of mixed-use blocks of one hectare (2.5 acres) or less, with active lower-floor commercial spaces along planted boulevards, along with narrow and calm side streets.

Zhongshan Dadao BRT corridor, Guangzhou

The city of Guangzhou recently decided to use its first bus rapid transit (BRT) line as one of the symbols of the city's modernization to be showcased at

Below Left: Existing regulatory plan by the GZUPB – large single-use blocks, layout ignoring the nature of the terrain and the natural and historic resources present on the site.
Below Right: Alternative conceptual plan by ITDP
Images: Left-GZUPB, Right-ITDP

Above left: Zhongshan Dadao BRT corridor, station under construction
Above right: The original BRT corridor landscaping proposal focused on covering all available land with greenery and flowerbeds. The design works well from the aerial perspective, but the gated landscaping was not particularly usable by children, the local community, or passersby.
Images: Left-Karl Fjellstrom, Right-GZUPI

the forthcoming Asian Games in November 2010. This BRT line was planned and designed with critical ITDP technical input, and is currently in its final phase of construction. The city set aside significant resources to improve the appearance of the corridor. ITDP rallied its staff, along with the team of Jan Gehl Architects from Copenhagen, to push beyond the cursory layout of flower beds and minor façade improvement.

Haxi Proposed Railroad Station, Harbin

Harbin's new high-speed rail connection to Dalian and Beijing will terminate at the new Haxi Railway Station. A large development is planned around the station, on what is currently a mix of agricultural land and old industrial land. Over 50,000 passengers a day are expected to use the terminal. The city held a competitive tender to design the development and attracted a lot of big name firms. ITDP helped evaluate the entries.

The winning plan's main feature is the elegantly inflected street grid design of roughly 100 meters (330 ft) square – the quintessential resource-efficient city form capable of supporting both high-intensity development and high pedestrian connectivity. Interspersed neighborhood parks, including a linear park linking the station with two small rivers, complete the system.

Time Square, Harbin

The city of Harbin also launched a competition for a major new symbolic square on the banks of the majestic Songhua River. The brief included a sculpture expressing the aspirations of the city in the 21st century, a concert hall, and a landmark office tower across the main arterial road. The city's urban planning bureau consulted ITDP to identify sustainable urban design strategies. ITDP recommended building a world-class public space, teeming with life, people, and activities. Finally, ITDP recommended it should put forth a statement of the city's commitment to the health of the environment and of its people, and to sustaining the resources of future generations.

Left: Guangzhou could turn its canals and rivers into great public spaces. Image: Gehl Architects

Destruction of Urban Heritage

In moves reminiscent of the now outdated and discredited urban renewal policies of the 1950s-60s in the West, China's cities have in the 1990s and 2000s engaged in large scale demolition and redevelopment of inner city neighborhoods deemed substandard slums. The government condemns, evicts, and clears older areas before selling or leasing the land to private and quasi-private developers.

Above: ITDP recommended extending the ground floors of the proposed new Landmark Tower and Concert Hall to the street line. Image: Luc Nadal, background image by Jingwei Tower competition team No. 6 (all rights reserved)

Demolishing historic urban forms amounts to demolishing the patterns of spatial organization that predated the era of automobile dominance. In this sense, urban preservation is fully part of the struggle for a predominantly pedestrian and transit-oriented city. And in China, this means aiming to preserve and creatively reuse much of the urban forms anterior to the late-1980s.

The urban villages and the old inner-city quarters are home to tens of thousands of people with little capacity to move to more comfortable quarters. Living conditions in the urban villages generally satisfy their residents, however cramped, uncomfortable, and undesirable they may appear to outsiders. People value the relatively central location, the reasonable cost, and the rich social network that demolitions and displacement break irreversibly. For village residents, relocation is an infinitely greater hardship than village life.

Urban preservation is fully part of the struggle for a predominantly pedestrian and transit oriented city.

The old Xiguan area, located just west of the old center of Guangzhou on the east and north bank of the Pearl River, is one of the most historic and attractive parts of Guangzhou. It features impressive examples of the region's architectural and urban heritage. There are old mansions and temples, tree-shaded streets lined with typical Quilu arcaded stores and shops, and a large stock of dense six-story housing quarters served by a maze of narrow residential alleys. Similarly to Tangxia, although to a lesser extent, most old houses have been torn down and rebuilt.

The alleys are often picturesque, reminiscent of the original berms between rice paddies that were not built up in that part of town until the late Ming and the Qing dynasties. These alleys are repositories of a collective memory that is partly subliminal but bound to resurge and emerge into consciousness. These places help constitute the identity and historical continuity of the city.

Cultural and historic specificity goes a long way toward reinforcing the prestige and ultimately the economic attractiveness of a place. In the long run, the health and the wealth of cities also depend on the fabric of their historic centers.

Bike-Sharing Goes Viral

For city-level transport interventions to fight a problem as massive in scale as global warming, these interventions have to spread virally to thousands of cities across the world. For a project to be copied, it needs to be done in a city that other cities admire, and the project needs to be world-class, inspiring awe and admiration in visitors, particularly visiting politicians.

The concept of bike-sharing, or public use bikes, has been around since Amsterdam's "White Bikes" experiment in the 1960s. Within one month of that noble, anarchist-inspired experiment with free bikes, all of the bikes had either been stolen or dumped into Amsterdam's famous canals. That experiment led to a few 'first generation' public use bike projects, like Portland's '"yellow bike" program, but these projects also failed to attract much interest.

By the mid-1990s, some simple mechanisms for theft prevention such as locks, coin return, user identification cards, and bikes with specialized spare parts not widely available, led to a 'second generation' of projects in Copenhagen, La Rochelle, and other cities, which were more successful but never went to scale. Finally, in 2005, the city of Lyon, France, introduced a successful 'third generation' bike-sharing program with 4,000 bicycles that relied on smart card electronic payment, bicycle tracking devices, and better user information. The Lyon project was successful enough to convince Paris to try. The Paris system, called Vélib, now has 20,600 bikes. Vélib has inspired so many cities that in just two years the number of bike-sharing programs globally has increased from 60 to 90. Here is a quick look at five new bike-sharing systems inspired by Vélib that have launched in the past year.

Clockwise from above left: The Bixi system in Montreal, Canada; Hangzhou Public Bike in Hangzhou, China; Mexico City Mayor Marcelo Ebrard inaugurates Mejor en Bici; SAMBA in Rio de Janeiro, Brazil. Images: Zvi Leve, Bradley Schroeder, Jonas Hagen

Hangzhou, China

by Bradley Schroeder

Hangzhou, the ancient southern terminus of the Grand Canal, was once described by explorer Marco Polo as "the most splendid heavenly city in the world." Hangzhou was built around West Lake, a tourist attraction since the Song Dynasty. Two great poets restored West Lake to greatness: Bai Juyi, who as governor from 785 to 804 restored the dyke creating the lake, and Su Dong Po, who as governor from 1086 to 1094 dredged the lake and built its first causeway.

Bai once said, "I miss Hangzhou most, in the moonlit temple I traced the scent of sweet osmanthus, undisturbed in the Jun Pavilion."

Su Dong Po, said "whether rippling water on a sunny day, or misty mountains shrouded in rain, West Lake is always alluring."

The beautiful West Lake now has a new distinction: it was the launch location of China's first 'third generation' bike-sharing program, Hangzhou Public Bike. It is now the world's largest bike share system.

Hangzhou's bike-sharing program launched in October 2008. To date, the system has a total of 40,000 bikes and 1,700 stations. Each bicycle is equipped with handlebar baskets and bicycle locks, and some have child seats. The majority of stations have no attendants and the process for renting and returning is similar to Paris's Vélib system, after which some of the infrastructure and operational plan was modeled. City-owned and operated, Hangzhou's system cost an estimated 200 million Chinese yuan (29.3 million USD).

The system uses a smart card integrated with the city's bus, bus rapid transit (BRT), and parking systems. Both permanent and temporary smart cards are used to check out the bicycles from the system and are reasonably easy to acquire. A permanent smart card allows the user to receive a ten percent discount on buses and parking. The first hour is free, with the next two hours costing one renminbi each ($0.15 USD). Each hour after that is three renminbi ($0.45 USD).

Top: Hangzhou is the world's largest bike-share program. **Bottom:** The system uses smart cards to check out bikes at public docking systems like this one. Images: Bradley Schroeder

Stations have docking terminals that lock and release the bicycles when the smart card is placed on them. An automated machine allows users to check card balances and view total trip times. Because of their high-tech docking infrastructure, system stations require additional space per bicycle than other systems.

The service is managed through a 30 percent–70 percent partnership between Hangzhou Public Advertising Company and Hangzhou Property Management Limited. Like Paris, the bike-sharing contract is linked to a contract to manage public advertising. The system generates a small profit from advertising revenue.

Since opening, use of the Hangzhou Public Bike system has increased from 0.93 daily rides to 3.27 daily rides per bicycle. The major complaint about the system is that bicycle stations are occasionally empty or too full of bicycles, which is a problem all bike-sharing programs face. The system operator manages this challenge in the control rooms using available RFID and GPS technology to move the bicycles when and where they are needed. Demonstrating how cities can adapt a flexible system to their needs, Hangzhou's high-tech, low-density system is a successful model of multi-modal integration.

Wuhan, China

by Bradley Schroeder

Wuhan, a city of over nine million at the junction of the Yangtzee and Han Rivers in central China, launched a bike-sharing program in August 2009. Wuhan's system is lower tech, but with higher density than Hangzhou's, with a total 21,000 bikes. These bicycles are free to use within a defined time limit, but users must apply in person for a card to participate in the program. While the number of bicycles and stations continue to increase, the system can hardly keep up with demand.

Wuhan has two independently operating bike-sharing systems. This works because the Yangtze River creates a natural barrier dividing the city into two sections, with one operator on each side. Both companies employ the same card system for checking out bikes.

The larger of the two operators, Xinfeida Environmental Protection & Energy-Saving Science Technology Company operates in eight city districts south of the river. It has more than 10,000 bicycles at more than 450 stations. To use a bike, residents must first apply for an Honesty Card, a credit card that is used to check out a bike. Bikes are free to use for the first four hours, and if returned late, the person receives a strike on their record. After three strikes, you are not allowed to use the system anymore.

The second operator, i-Bike Media, operates in only one district to the north of the river, and has more than 3,000 bicycles and 66 stations. This system also uses the Honesty Card, and the bikes are free to use within a two-hour period. As opposed to Xinfeida's penalty system, i-Bike Media operates on a point system, where points are taken off for bad behavior (like returning bikes late) and added for good behavior. If a person's balance drops below zero, the card becomes invalid.

The system has proven so popular that Xinfeida Group has limited its quota of daily card applications, and long lines can extend down the street at Xinfeida kiosks for people who want to apply for the honesty card.

Attendants at Xinfeida-operated stations swipe honesty cards through a handheld electronic verification device before issuing keys to system bicycle locks. The bicycles are locked inside a covered bicycle shelter rather than automated docking terminals. This more than doubles the number of parked bicycles per square meter as

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Above left: Bicycles are locked inside a covered bicycle shelter rather than automated docking terminals, doubling the number of parked bicycles per square meter as compared to Hangzhou's system; **Above right:** Wuhan's system has proven so popular that Xinfeida Group has limited its quota of daily card applications. Images: Bradley Schroeder

Rio de Janeiro, Brazil

by Jonas Hagen

Rio de Janeiro launched a pilot public bicycle sharing program called SAMBA, or Solução Alternativa Para Mobilidade por Bicicletas de Aluguel, in January 2009. Fittingly, the first eight stations were launched in the iconic Copacabana neighborhood with a total of 80 bikes.

Made entirely from Brazilian technology, including the bicycles, stations, and communications, SAMBA clocked 4,316 trips in its first eight months. Employing a simple online registration process, the system allows users to make and pay for bicycle reservations with their cell phones.

SAMBA has grown with support from the municipal government. At an inauguration of shared-use bike lanes to support the system in May 2009, Mayor Eduardo Paes said, "Bicycles make sense for Rio—they are efficient, non-polluting, and are perfect for the millions of short trips that people make everyday in Rio. My administration will be helping the public bike system grow, in addition to implementing many more kilometers of bikeways."

Angelo Leite, president of Serttel, the company that created and runs SAMBA, said the system's costs are 40 percent lower than those of similar European or Canadian systems.

"Our concept is to keep the system simple, but use advanced technology. There are no monitors or keypads at the stations, and this makes them much less expensive to build and maintain. The SAMBA bikes can only be accessed by cell phone, and besides making the system cheaper, we believe this is in line with a growing trend, where people will pay for many things via cell phone," said Leite.

Leite is confident that the next 16 stations in the neighborhoods of Ipanema, Leblon, and Lagoa will be open in the beginning of 2010, and the remaining 26 stations, whose locations include the business center and working class neighborhood of Tijuca, shortly thereafter.

Leite said he hopes "SAMBA will soon be seen more as a means of transportation." He said that there were already many examples of people that had included the bikes into their daily commutes, and that these kinds of users will grow when new stations are opened.

The city government has pledged to increase safe cycling facilities for bicycles to encourage system growth. The city created a 31-mile (50 km) bike network specifically for SAMBA. With input from The Institute for Transportation and Development Policy, the city completed detailed design work for many of these bicycle lanes. However, realization of the bike lanes has been slow. As of September 2009, less than a mile of lanes were operational. Nevertheless, the 11 blocks of shared use lanes, with reduced speeds of 19 mph for cars (30 km per hour) and pavement markers for cyclists and motorists, are the first such facilities in Brazil.

Rio has the largest bicycle network in Brazil, with 87 miles (140 km) of bike lanes. In Latin America, Rio's network is second only to Bogotá, Colombia. While many of the lanes in Rio have no practical use for cyclists because of obstacles or difficult accessibility, some are truly safe and comfortable. Rio's estimated 217,000 daily bike trips represent two percent of trips made in the city. For the metropolitan region, this proportion is 3.2 percent according to a 2003 survey.

Many other cities throughout Brazil, Latin America, and North America have shown interest in bike-sharing systems. The Brazilian city of Blumenau recently purchased five stations and 50 bicycles, and inaugurated them in September on International Car-Free Day.

"The same municipalities that are interested in public bikes also want to know about smart parking meters and other possibilities for travel demand management and rationalization of car use," said Leite. "These cities are moving toward a more balanced urban transportation that provides good alternatives to the car."

Above: Rio has the largest bicycle network in Brazil, with 87 miles (104 km) of bike lanes.
Image: Jonas Hagen

Montréal, Canada

by Zvi Leve

Early last summer, Montréal opened the largest bike-sharing system in North America. Since then, Bixi, a name derived from "bicycle" and "taxi", has been gaining international recognition. Bixi has created a strong sense of community, and Montréal residents and visitors to the Canadian city have quickly embraced the system. Approximately 5,000 bicycles and 400 stations are located throughout Montréal's downtown area.

The strong visual identity of the Bixi system has put it squarely in the public eye. Local attitudes towards cyclists and bicycle infrastructure are changing for the better. Bloggers have praised the Bixi system, even going so far as to write Bixi-themed love stories. The Bixi page on Facebook has been a hub of activity for fans, and creative new ideas are being produced every day. Bixi even provides jobs for local youth, partnering with area high schools to train students to perform daily network maintenance.

Unlike other bicycle sharing systems, Bixi was conceived from the earliest design stages to be completely flexible. The bike parking stations are self-contained modular units that require no dedicated infrastructure and can be moved around as necessary. The units are solar-powered and use WiFi, so no electrical or hard-wired internet connections are needed. The number of docking points at each station can easily be adapted to meet changing demand conditions. In fact, the city has already moved a couple of stations as they evaluate the system and how people use it.

Bixi is city-owned and operated. The parking authority is responsible for managing the system, partly because generating system revenue through outdoor advertising is limited in Montreal. The city paid approximately $13 million USD to implement the system, but expects all operating costs to be funded through user fees.

Left: riders can use Bixi free for the first half hour. **Right:** Self-contained modular stations can be adjusted to meet demand conditions. Images: Zvi Leve

The Bixi bicycles, estimated to cost about $2,000 each, are robust enough to withstand all kinds of road conditions and require relatively little maintenance. For safety, each bicycle has self-powered front and rear lights. The bicycles have aluminum frames, contributed by Rio Tinto Alcan, a major aluminum manufacturer and principal partner of the system.

The system has 10,000 registered annual members to date, and close to 80,000 occasional riders. Over one million trips have already been taken on the system, for a total of over over 3,500,000 kilometers (2,175,000 miles) in bicycle travel.

Designed for rapid turnover, the system's initial half hour of bicycle use is free and the second half hour is $1.50 Canadian dollars (US$ 1.40), with the charges doubling every half hour period to a maximum of $6.00 Canadian dollars (USD $5.60) per half hour. Daily, monthly, and annual subscriptions are available.

Other cities are watching Bixi intently. Canada's capitol region, Ottawa-Carleton, opened a modest pilot version of the system. The city also hopes to recoup costs by selling the system to other cities; patents have already been registered for the system design.

London and Boston have placed orders for similar bike-sharing systems. In London, the system will be branded with a British partner and will open by 2010 with a network of 6,000 bikes and 400 stations. Boston's initial system rollout will feature 2,500 bikes distributed among roughly 300 stations. New York, Seattle, Toronto, and Vancouver are also courting Bixi to see if they can create a bike-sharing love story in their own cities.

Mexico City, Mexico

by Ana Peñalosa

This article has been corrected from the original printed version. Mexico City's bike share program is called Ecobici, not Mejor en Bici, as was printed in the original.

Mexico City recently announced its plan for Latin America's largest public bicycle program. Slated to open by March 2010, Ecobici will have 84 stations and 1,114 bikes. The city anticipates 9,000 daily trips on the system that will be a complementary part of the public transport network, allowing people to close the gap between the metro and Metrobus and their ultimate destinations. Mexico City expects 24,000 subscribers in the program's first year.

Ecobici is one component of the city's master plan for bicycle mobility. This plan represents a real commitment to transform the third largest city in the world. With the opening of the bike share program, there is hope that the city will rise to the challenge of ensuring a safe environment for cyclists including dedicated bike lanes. The city has committed to building 186 miles (300 kilometers) of bicycle lanes by the end of 2012.

Mexico City's mayor, Marcelo Ebrard, insists that the city needs to plan for public transport and public space, not just for automobiles, which are only used by 20 percent of Mexico City's residents. "We must create a new alternative to the automobile that is producing several mobility problems," the mayor said in August.

After a competitive bid, the city awarded the contract to Clear Channel, one of the world's largest outdoor advertisement companies. Clear Channel will be responsible for operations and management of the fully automated system, as well as provide the bikes. The city will provide the stations.

After conducting the first ever count of cyclists in the city, Martha Delgado, Environment Secretary, decided to implement the first phase in a central area that has a large number of cyclists. This area will encompass six middle-income neighborhoods close to the city center, including the fashionable and trendy Zona Rosa and Condesa districts where some bike lanes and traffic calming projects already exist.

As is the case with many other bicycle sharing programs, system maintenance and operations will be funded by the earnings from advertisements within bicycle stations and on other street furniture.

In the initial phase, the city made an investment of 75 million pesos (about $6 million), equivalent to 80 percent of the cost of the entire infrastructure.

Depending on the success and growth of the program, the network will expand to the Zócalo district, Mexico City's historic city center, in a second phase scheduled to begin by 2011. The expansion depends on the success of the system's first year of operations.

Ecobici is part of Mayor Ebrard's goal to increase the number of bicycle trips made in Mexico City from 1.2 percent to 5 percent by the end of his term in 2012. Other initiatives are planned to reach this goal and encourage people to use more sustainable forms of transport like cycling. The city launched "Bike-school" to teach people to safely use bicycles as vehicles in the city.

To ensure cyclist safety, a special cyclist-police command will monitor the system and its users. In response to advice provided by the Institute for Transportation and Development Policy (ITDP), a 30 km/hr speed limit zone will be employed in the area of the program. ITDP is also working on accessibility by improving the infrastructure surrounding the stations, as well as providing proper traffic signage for cyclists.

Ecobici is only the first piece of the ambitious bicycle mobility plan to be implemented. Some major challenges remain to creating an optimal environment for cyclists. Safe traffic design, dedicated cycling lanes, civic education, and proper enforcement are all crucial components that must come together to make Mexico City a better place for cycling.

Left: Mexico City mayor Marcelo Ebrard announces Ecobici at a press conference. Image: ITDP

Going Back to Cali

by Carlos Felipe Pardo

An elderly man sums up the feelings most Cali residents have toward their year-old MIO bus rapid transit (BRT) system, "It is a very perfect service!" In addition to raising the standards for BRT operations globally, Cali's new blue and green buses have also raised the expectations and demands Caleños, as citizens of Cali are called, have for their transit system.

Cali's BRT, that began operations in November 2008, is the most ambitious mass transit system in Colombia and the first in the world to offer a new type of BRT service. Called complementary service, MIO capitalizes on the inherent flexibility of bus mass transit over rail-based transit systems. Cali is also implementing a total reorganization of its public transit system, similar to TransSantiago, without the riots and rock throwing.

Above left: Smaller, green buses provide feeder services to MIO. **Above right:** Designated seats for the elderly are available in all buses. Images: Carlos Felipe Pardo

Cali's two million residents take more than a million trips per day on public transport. Before the MIO system opened, all these trips were taken on a fleet of old, fifty-seat buses. Residents who lived in the hilly outskirts of the city were forced to take unsafe jeeps, called "Jeepetos", precariously adapted for passenger service down the hills to access the city's main bus routes. Before MIO, an oversupplied public transport service of 5,149 vehicles clogged city streets.

To address the problem, Cali officials conducted feasibility studies for light rail and BRT systems. BRT won out because of cost effectiveness and national endorsement and thus funding. MIO carries an average of 110,000 passengers per day. At peak travel hours, 7,000 passengers per hour per direction use the system. Four operators chosen through a competitive bidding process currently provide the service.

Classic BRT systems such as those in Bogotá and Curitiba, offer trunk and feeder services. Jakarta and Mexico City offer only trunk services. Cali is the first service to offer trunk, feeder and complementary services. Trunk bus services run on protected busways and use enclosed stations that passengers must pay to enter. In Cali, trunk services are provided by articulated buses that can each carry up to 150 passengers. Trunk buses can only stop in stations with high platforms located in the middle of the street

Feeder services bring passengers to the BRT system, allowing them to transfer to the system's trunk service. These buses are not allowed to enter the busway. Cali uses small buses and only provides service from the outskirts of the city to the terminal stations. By 2010, a cable car will replace Jeepeto service going into the hilly city outskirts.

The new complementary service acts as both trunk and feeder. In outlying areas of relatively low density and demand, buses pick up passengers curbside. Those buses then enter the dedi-

cated busway and operate as trunk buses, allowing passengers to exit at enclosed stations in the middle lane. Passengers no longer have to transfer, saving them time and hassle. The complementary service is provided by regular buses with doors on both sides that have a capacity of 80 passengers.

All these transit modes operate under an integrated smartcard ticketing system, where 1,500 pesos provides access to all the services in one trip. There is also a free bike parking station with 120 spaces at the Cañaveralejo station with plans for more bicycle parking at additional stations.

The system designers hope to make MIO a fully integrated public transport system, where all services are planned, controlled and provided within MIO and its three services. By the end of phase two, 100 percent of all public transit demand will be met by MIO. The integrated ticketing system will provide passengers with access to the entire city. A fully integrated bikeway network will complement the MIO system and its existing and planned bike parking. Finally, the city will implement a complete urban renewal along the trunk lines of the MIO system.

To help passengers become accustomed to the new system, MIO let riders use the system for free from November 2008 until the actual launch of operations in March 2009. During this time, users were given information on how to use the system, while Metrocali, the managing company of the system, conducted surveys on user satisfaction to improve the quality of service.

Users say that the MIO system is an improvement over the previous system. A young woman said that she loved the service for its faster travel times, but "…above all, it's much cleaner than what we used to have."

As the quality of service improves, users are demanding more from the service. One passenger, commenting on waiting times that were longer than had been announced, "This is not worthy of the MIO. MIO is an improved service, and it should continue providing such a service."

In the previous public transport system, there was no person or agency to call when demanding better service. Users are now more likely to express specific complaints under MIO because a specific entity now exists that can be held accountable and respond.

"Everyone wants a MIO station next to their house. They even send letters asking us why the MIO doesn't stop right in their front door," said Juan Ricardo Segura, Metrocali's engineer in charge of designing future routes. Users have had to adapt to walking a few blocks to the station. Under the previous system buses would stop to pick up passengers anywhere.

"They have to learn!" said a taxi driver who described the whole system by heart. "They were used to taking the older buses which seemed to be door-to-door but had a very bad quality, so they must now learn to use this improved service which has designated stops." He was convinced that the MIO was the best system Cali has ever had but that it must continue its planned expansion to reach every neighborhood in the city.

The previous bus system did not offer designated special seating.

Above: Passengers board MIO via enclosed stations with prepaid boarding. Images: Carlos Felipe Pardo

Now designated seats for the elderly, disabled or pregnant are available in all MIO buses and riders gladly offer their seats to these passengers.

"It has not been easy, but we've been able to design and plan the system at a very fast pace," said Tito Garzón, the manager of operations.

As with most systems, fare collection proved to be problematic and caused Cali to delay launch by some months because of contractual issues with the fare collector. There are still some issues to be remedied, such as bus signaling and maps, but MetroCali officials say they are working on it.

What was glorious once, is again: the main train station of Cali has been reclaimed by MIO to become the main office for Metrocali, even as Metrocali reclaims public transit for Caleños.

The Future is on the Surface: Curitiba Opens the Green Line

By Jonas Hagen

Known as the birthplace of bus rapid transit (BRT), Curitiba has been a model for integrating its innovative transport system with land-use planning. Over 35 years after the implementation of the city's first bus corridor in 1974, Curitiba once again proves it is ahead of the curve by converting a federal highway into the first new BRT corridor to open in Curitiba since the 1980's. The Green Line, as it is called, began operations in September.

Despite being one of Brazil's wealthiest cities with some of the highest car ownership ratios in the country—1.85 residents for every automobile—45 percent of trips in the city are made using public transport, according to a 2006 survey.

This is in part because, over the past four decades, Curitiba's transport and planning professionals have systematically expanded and upgraded the RIT (Rede Integrada de Transport/ Integrated Transport Network), as Curitiba's bus-based public transport network is known. Today the system includes 390 bus routes, 2,000 vehicles and carries roughly 2.1 million passengers every day.

"We have to constantly optimize the system and innovate in order to improve capacity and performance," said Luiz Filla of Urbanização Curitiba, SA (URBS), the agency that runs the RIT. "We went from conventional buses in mixed traffic to exclusive lanes, then added level boarding and articulated buses, then bi-articulated buses. Now we are adding passing lanes to some of the exclusive lanes to reach metro-like capacity," he said.

Four kilometers (2.5 miles) of the existing Boqueirão BRT line were retrofitted with the city's first passing lanes in 2009, and the city's flagship project, the 18 kilometer Green Line BRT ("Linha Verde") was planned with passing lanes. Passing lanes greatly increase the capacity of BRT systems by permitting express service.

With the first nine kilometers implemented by September 2009, the red buses of the RIT are already operating on the Green Line, carrying some 18,000 daily passengers between spacious stations. The six buses use bio-fuel made from soy, with 'flex' engines that can use normal diesel, as well as biodiesel. The buses emit 19 percent less nitrous oxide, and 30 percent less carbon dioxide, according to www.biodieselbr.com, a website that promotes biodiesel in Brazil.

"The Green Line will be a new area for residents to live, work and play, based around the public transport system," said Luiz Hayakawa of the IPPUC, the city's urban planning institute.

While today it might seem that the Green Line has much more capacity than is needed, the project represents the government's bold efforts to keep the city's growing population within the municipal limits, by promoting density in an underutilized area while preserving green space in the city.

"The Green Line will be a new area for residents to live, work and play, based around the public transport system," said Luiz Hayakawa of the IPPUC, the city's urban planning institute. Formerly a national highway dotted with truck stops and lumberyards, the city created legislation to turn this underutilized area into a mixed-use corridor that, according to Hayakawa, can accommodate up to half a million new residents.

At the same time, legislation was created so that growth in the area would subsidize open space preservation in and around Curitiba. Developers can increase building rights for properties along the corridor by purchas-

Above: Complete with passing lanes, feeder lines, integration stations, sidewalks and a bike lane, the Green Line BRT was built to accomodate new mixed-use growth for up to half a million residents and preserve open space at the same time. Image: IPPUC, Lucilia Guimarães

Above: Traffic calmed streets, tax incentives and business management programs will be implemented in an ongoing effort to spark economic and cultural activity in the city center. Image: IPPUC

ing undeveloped properties in other areas that will be preserved as parks. "The more growth we have along the Green Line, the more preservation we will have in the city," said Hayakawa.

Planning for the next major project is already underway at the IPPUC. A 42-kilometer stretch of freight rail line will be deactivated and converted to a linear park and bicycle path, complete with residences and businesses, complementary roads, and where feasible, the RIT. "Today Curitiba has 1.9 million residents," said Hayakawa. "With the Green Line and the area along the train, we could add three million residents to Curitiba, all with great access to parks, bikeways, and public transport. At the same we can guarantee a high quality of life and preserve open space in the city and the countryside."

Besides creating new dense, mixed-use neighborhoods, projects are underway that will revitalize the city center. Already home to a lively pedestrian corridor, where residents shop, eat ice cream, or watch live music, the IPPUC is working on key streets in the center to widen sidewalks and slow traffic down to 15 kilometers (9 miles) per hour. Additionally, the city is planning to implement additional raised intersections, where pedestrians cross at level and the cars have to slow down to enter what essentially is a large speed hump.

The city offers tax incentives to property owners to preserve historic buildings and attract a new generation of small, creative businesses such as design or architecture firms. "We want to attract young people, recently graduated from the university, to the city center. The idea is that they could have a storefront or office and living space in the same area, thereby stimulating business and cultural activity there," said Mauro Magnabosco of the IPPUC. "We will also help local businesses improve management and profitability with the 'Good Management Program'," he said, referring to a federal program that aids small enterprises.

While Curitiba is currently studying a metro for 22 kilometers of the RIT's most saturated BRT corridor and the current mayor has stated his preference for this project, it remains to be seen whether funding is available for the metro. With a pricetag of $900 million US dollars, 82 percent of the funds were not guaranteed, according to a 16 July 2009 Gazeta do Povo article.

According to Jaime Lerner, three-time mayor of Curitiba and former governor of Paraná State where Curitiba is located, "with improvements to the operation of the RIT, as well as new lines and express service, we can meet the present and future needs of Curitiba with surface transport alone. The future is on the surface."

Above: Pedestrian streets and raised crossings like these will be expanded under the city center revitilization program. Images: Jonas Hagen

Still Stuck in Gridlock:
U.S. Sustainable Transportation Policy

by Michael Replogle

U.S. Department of Transportation Secretary LaHood has pledged to support "...projects that reduce GHG [greenhouse gas] emissions and fuel consumption."

Image: ©iStockphoto.com/Stouffer

When U.S. Department of Transportation Secretary Ray LaHood was first appointed by President Obama, advocates were disappointed that this position was given to a Republican with no transportation experience, fearing it was a nod to bipartisanship. However, LaHood has embraced transit-oriented development, taking the sustainable transportation community by surprise.

LaHood told Congress in October, "compact development, complemented with pricing strategies and support for alternative transportation modes, could reduce carbon dioxide emissions by up to 15 percent by 2050." He went on to say, "promoting mixed-use, connected communities has the potential to reduce vehicle miles traveled, and thereby significantly contribute to U.S. carbon dioxide emissions reductions."

LaHood has pledged to work with Congress on supporting "...robust transportation planning techniques to target investments to projects that reduce GHG [greenhouse gas] emissions and fuel consumption."

LaHood's comments are just one component of the Obama administration's new livability initiative. Obama has appointed many smart growth advocates to key policy positions at the US Department of Housing and Urban Development and the Environmental Protection Agency.

The U.S. House of Representatives also recently passed a climate change bill that would fund and promote such plans as part of a broad measure to cut the United States' GHG emissions by 17 percent by 2020 through a cap-and-trade system. A companion climate bill is now advancing through the Senate. It would cut GHGs by 20 percent by 2020 and provide more funding to transportation plans that reduce GHGs than would the House bill.

Under either bill, federal grants would be awarded competitively, based on criteria that will include impact on GHG emissions reduction, cost-effectiveness, progress toward achieving GHG targets, expected increase in transportation options and mobility, as well as other factors.

The big battle over U.S. surface transportation funding looks like it will be pushed into 2010 or even 2011. The former law, Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which dictates how states can spend national gasoline tax revenues, recently expired. Rep. Jim Oberstar (D-MN), who chairs the key House transportation committee, introduced a new six-year bill in mid-2009, but the Senate and White House oppose a long-term re-authorization and are seeking an 18-month stopgap measure which would basically continue the old law.

Rep. Earl Blumenauer (D-OR) and other leaders have proposed a roadmap for increased accountability for transportation plans and programs to meet GHG reduction goals, accompanied by a temporary increase in gasoline taxes in two years that would be phased out over a decade and replaced with distance-based road user charges, like those planned in the Netherlands and the United Kingdom. Key Republicans have made clear their intent to launch a fierce anti-tax partisan attack should the Democratically-controlled Congress pursue such revenue measures. The result for now is political gridlock.

Bike-Sharing: Wuhan, China

CONTINUED FROM P. 26

compared to Hangzhou's system. While this system decreases capital costs and creates jobs, it increases operating costs, because an attendant always needs to be at the station.

I-Bike Media uses a mixture of automated docking terminals and attendants on site during peak hours. Because of the high volume during peak hours, more bikes come back to stations than there are automated docking terminals and attendants take excess bikes and corral them.

Both operators struggle with balancing the system, having to move bikes from too full stations to empty ones. To meet demands, both companies have combined high density with high technology, in addition to employing station attendants.

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