

our cities ourselves

Principles for Transport in Urban Life





our cities ourselves
THE FUTURE OF TRANSPORTATION IN URBAN LIFE

A PROJECT OF

ITDP Institute for Transportation & Development Policy
Promoting sustainable and equitable transportation worldwide.

GEHL ARCHITECTS
URBAN QUALITY CONSULTANTS

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Mobility | Accessibility | Sustainability

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What is this book about?

Addressing the global issue of sustainability. . .

. . .by emphasizing the local issue of livability. . .

. . .with mobility as a link between the local and the global.

Foreword

Livable today, sustainable for the future
The principles outlined here will help cities significantly reduce greenhouse gas emissions while improving the quality of life.

Citizens of the world do not want to sit in bumper-to-bumper traffic. They do not want to walk in mud, not feel threatened on a simple bike ride to work. They want to be in cities that provide for creative interaction, affordable living and healthy environment. The successful city of the 21st century will be replete with choices, including non-motorized, post-fossil fuel travel options.

Cities that meet the challenge of sustainability will leap ahead of others by attracting people who demand a healthy and culturally-rich lifestyle.

Sustainability does not have to hurt. Reducing CO_2 emissions, conserving land, and making transport more efficient go hand in hand with improving quality of life. We aspire to lay the foundation for achieving global sustainability not through uniform technological solutions but through a global celebration of local difference and innovation based on a common set of principles.

The *Our Cities Ourselves* program invites design teams from ten cities around the world to apply these principles to ten unique locations. This book illustrates the principles that lay behind the designs. Our hope is that national and local leaders worldwide will look to it for inspiration.

On behalf of ITDP

Walter Hook

Brighton, UK

Shift the focus

from:

What we have

to:

What we want

Traffic dominates society

Choice dominates congestion

Economy primarily based on consumption

Economy based on quality of life

Designing objects

Making places

Disagreement on global sustainability

Local livability translates into global sustainability

The consequence:
Sustainability not seen on the streets

The consequence:
Streets become the locus for sustainability

Remaking our cities for livability

Moving towards sustainable and healthy lifestyles

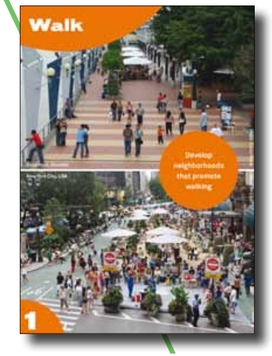
Road space is a scarce public good intended to provide access to important locations by the rich and poor alike. As countries get richer, roads get taken over by motorists. Pedestrians and cyclists, whether they are rich or poor, are driven off the roads in fear for their lives. To return our streets to their basic function of equitable access, they need to be redesigned to give priority to those means of travel that use road space more efficiently, cost less, and generate less pollution and noise.

A growing number of cities around the world are finding that cultural amenities, great public spaces, and a high quality of life are more important than highways and parking lots to attracting educated young workers who will form the backbone of the competitive 21st century economy.

Too often, buildings are designed as symbols of cultural and political power. In the future, city residents will vote with their feet, choosing to live and settle in cities where the greatest architectural minds have focused on creating great places to meet and congregate, rather than on creating great monuments.

Achieving global sustainability isn't about accepting blame or responsibility for global warming; it is about making our cities more livable and our economies more prosperous while reducing carbon emissions.

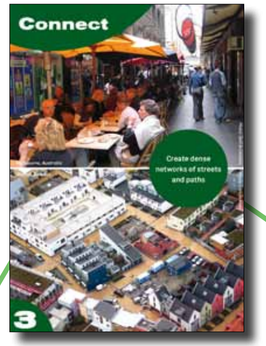
Principles overview



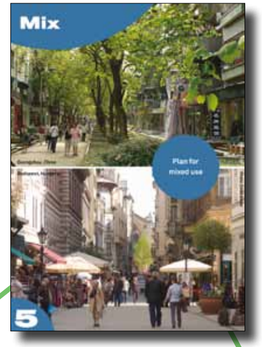
Great cities start with great pedestrian environments. Walking is the most universal form of transport.

Bicycles allow for the convenience of door-to-door travel, but use less space and fewer resources. They are the healthier and more sustainable alternative to cars and taxis for short trips.

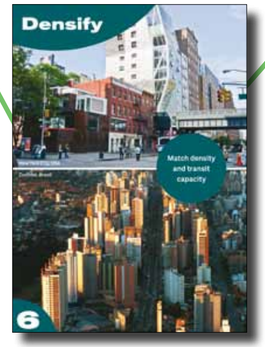
The more connected the blocks, the shorter the distance between destinations, making walking and biking more appealing.



Mass transit can move millions of people quickly and comfortably using a fraction of the fuel and street space required by automobiles.

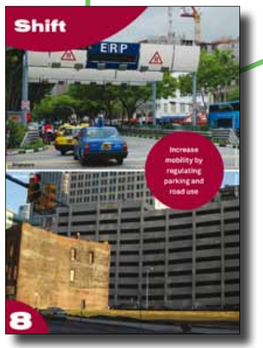


Sustainable transit needs to connect people to attractive places that encourage them to stay. Making a street “great” includes having a diversity of places and activities along it.



High density communities shorten trip distances, save travel time, and preserve millions of square kilometers of arable land. They use resources more efficiently, reducing the carton footprints of its residents.

New city centers placed far from existing cities are inconvenient and rarely thrive. City planners must locate compact new sub-centers within or adjacent to existing cities.



By managing private car use and expanding car sharing, cities can minimize traffic and congestion problems while creating space for pedestrians, mass and non motorized transit.

Our stories over the next 20 years

Talking about aspects of a better life:

30-year-old career woman:
It would be much more convenient to take my child to day care on the bicycle on the way to work, but I'm just not sure it's safe, so I drive the minivan. It costs a lot and I spend more time looking for parking.

50-year-old politician:
I've thought of bicycling to the office, or at least as far as the express bus stop. It would be good for my cholesterol, and driving in all that traffic can really be a headache. But it seems really dangerous biking in the streets.

3-year-old child:
I want to play in the street, but mom and dad say it's dangerous, and there aren't any other places to play.

38-year-old:
I've decided to start biking to work. I'm not as young as I once was and I have to work harder to stay fit.

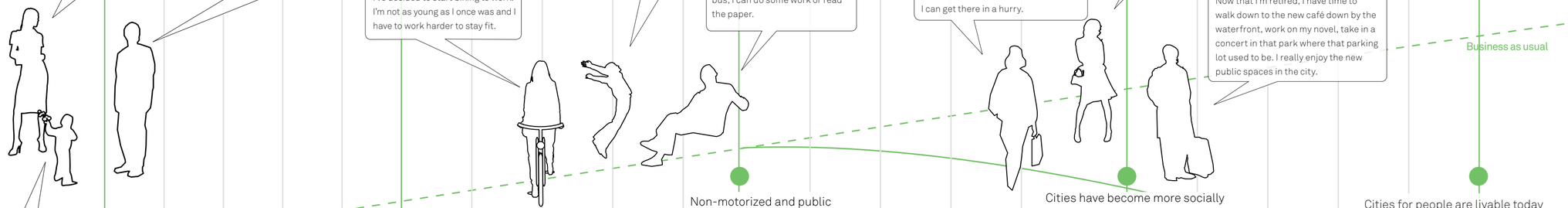
11-year-old:
I'd like to bike to school. With the new bike lanes, my parents are thinking about it, but they're still not sure.

58-year-old:
I've decided to bike to the express bus. I get a little exercise. On the bus, I can do some work or read the paper.

48-year-old:
The new bus rapid transit system is so much faster, I wouldn't dream of driving to work on most days. Still, with the congestion charges, when I do need to drive the zipcar for something, I can get there in a hurry.

21-year-old:
I wouldn't think of going on a date in a car. Cars are so 2010. We'll just pick up a couple of those shared bikes over by the school, bicycle together along the new waterfront promenade, then drop them back near the house.

68-year-old:
Now that I'm retired, I have time to walk down to the new café down by the waterfront, work on my novel, take in a concert in that park where that parking lot used to be. I really enjoy the new public spaces in the city.



Today

2015

2020

Non-motorized and public mobility have improved-private car use is down

2025

Cities have become more socially inclusive for everyone

2030

Cities for people are livable today while ensuring a high quality of life for future generations

Business as usual

paradigm shift regarding transport quality of urban life

Global CO_2 emissions from transport

14 Gigatons

12 Gigatons

10 Gigatons

Reducing greenhouse gas emissions through changes in lifestyles

By 2030, if current trends continue, the world will produce some 49 gigatons of carbon dioxide. We need to reduce 19 gigatons of CO_2 per year to avoid cataclysmic climate change. The transport sector is responsible for about a quarter of this. Based on realistic estimates of what is achievable in other sectors, transport needs to reduce its total CO^2 emissions by at least 3 gigatons. As families and municipal leaders work together to solve their everyday transportation headaches, they are also bringing down the risk of irreversible climate change.

1 Walk

Develop neighborhoods that promote walking

We are all pedestrians. Walking is the most natural, affordable, healthy, and clean way of getting around, but it requires more than just feet and legs. It requires walkable streets–the fundamental building blocks of a sustainable city.

A great walking environment must protect pedestrians from motor vehicles. Vehicle speeds need to be radically slowed or else streets need sidewalks. Sidewalks need to be unobstructed, continuous, shaded, and well-lit. Vehicle speeds at crossings must be slowed with tighter turns, narrower lanes, restrictions on free turns, and speed bumps. Crossings should be made safer with leading pedestrian crossing signals, pedestrian islands and curb extensions that minimize crossing distances. These facilities need to be ramped to ensure accessibility for all–including a person in a wheelchair or a family using a stroller. The pedestrian network should foster the most direct access to all local destinations, like schools, work, and transit stations, and should offer choices of pleasant and interesting routes. Streetscapes should be thoughtfully and artistically designed to draw more people to walk for both utility and pleasure.

The most successful and best-loved cities in the world have vibrant and walkable streets. They put great and constant care into improving them. Great cities start with great pedestrian environments.

Shorten street crossings

Ensure simple, direct street crossings always at grade. Rio de Janeiro, Brazil.

Canopies create critical shade for walkways. Dubai, United Arab Emirates.

Unlike other modes of transport, walking is not simply a means of getting from 'A' to 'B'. Guayaquil, Ecuador.

Emphasize pedestrian safety and convenience

Continuous sidewalks over side streets gives pedestrians priority. Copenhagen, Denmark.

Space for activities and spontaneity invites people to spend time, which in turn promotes safety, economic activity and diverse street life. Paris, France.

Encourage ground-level activity and create places to stay

A high quality network of pedestrian and bike-only streets called 'alamedas' leaves cars in the dirt. Bogotá, Colombia.

Establish main pedestrian boulevards and a subsequent hierarchy of streets. Melbourne, Australia.

What does it mean *for the planet:*

Residents living in walkable urban communities use half as much energy per capita as their suburban counterparts.

Farr, Douglas, *Sustainable Urbanism*, 2008

I am likely to have a longer and more healthy life because walking is an enjoyable part of my everday routine.

for you:

If I walk an average of 2 km a day while growing up, I am 10% less likely to be obese.

Frank/Andresen/Schmid, *American Journal of Preventive Medicine*, 2/2004

Case Study

New York streets

From world famous to world class!

Pedestrianizing Broadway

By 2008, the sidewalks in Times Square were so overcrowded that pedestrians were spilling into the streets. In May 2009, New York City implemented the Broadway Boulevard project, which included new pedestrian zones in Times Square, Herald and Greenly Squares, and at Madison Square Park. Despite reclaiming nearly 500,000 ft2 (45,000 m2) of public space from traffic, congestion actually decreased on most surrounding avenues. Traffic injuries fell by 63% and pedestrian injuries fell by 35%.

Today, Broadway is thriving like never before. People from all over the world converge on this famous site to enjoy its cafés, concerts, art exhibitions, yoga classes, spontaneous snowball fights, or just to people watch.

Part of a comprehensive strategy for the public realm of NYC.

Herald Square-from a space for cars. . .

. . .to a space for people!

A safer street.

A more spontaneous place.

A more lively street.

Case Study

Mexico City for Pedestrians

Mexico City has been pedestrianizing streets in the historic city center to create a walking network of more than six streets and 4 plazas, providing more than 4.1km of pedestrian streets around the Zocalo, the main public square in the heart of downtown.

In addition, Paseo de la Reforma keeps its reputation as one of the world's most beautiful avenues, connecting Chapultepec's Castle with the Zocalo where a 2 km dedicated cycle lane is being constructed. Part of this avenue has a shaded median lined with sculptures and, further down, art becomes furniture that people can lounge on and relax. Every Sunday this emblematic avenue is closed to cars in order to become a public space shared by more than 10,000 cyclists, pedestrians, skaters, children and families.

Outdoor cafés, street performances and other activities create a vibrant, people-oriented environment.

Crossings have been improved with wide crosswalks, bike boxes and narrower lanes for cars.

Pedestrianized streets break up the large scale street grid and offer a pleasant walking experience.

Urban furniture is organized to allow places to stop while ensuring clear access for pedestrians.

2 Cycle

Prioritize cycle networks

Bicycles allow the convenience of door-to-door travel while using less space and fewer resources. They are the healthier and more sustainable alternative to cars and taxis for short trips. Many people will choose cycling if streets are made safe and comfortable. Bike sharing makes cycling possible for people who don't have their own bikes with them. Making cycling possible has allowed some families to save up to a third of their income normally spent on vehicles or transit fares.

The more bicycles on the streets, the safer the streets become. Segregated bike lanes are needed on higher speed roads, while on local streets traffic calming and shared street designs are better, allowing traffic to mix at slow speeds. In hot countries in particular, shade is very important. A great bicycling environment is one where a child can cycle without danger. A great bicycling network is one where a cyclist can safely and quickly travel to any destination.

Design streets that emphasize cycle safety and convenience

Simple interventions, like adding a ramp to stairs for people using cycles, make crossing more convenient. Changzhou, China.

Create bike lanes separated from motorized traffic. Beijing, China.

Striping the bike lane through the intersection is a clear indicator that bike traffic is expected and drivers should watch out especially when turning. Barcelona, Spain.

Provide secure parking for public and private cycles

The bike sharing program, Vélib, captured the imagination of Parisians and visitors alike. Paris, France.

Hangzhou's 2,050 bike-share stations has made the system popular and convenient. Hangzhou, China.

Convenient bike parking can facilitate easy transfers between different modes. Amsterdam, The Netherlands.

The availability of safe and convenient parking is critical to encouraging cycling. Hamburg, Germany.

What does it mean *for the planet:*

Biking is the most efficient form of transportation yet invented. Using the same amount of energy you get 3 times as far as walking (and 60 times as far as driving a car).

Gehl, Cities for people, 2010

for you:

If I bike to work instead of taking the car for the next 20 years, I will save $100,000 more for my retirement, live 7 years longer, and cut 94 tons of CO_2.

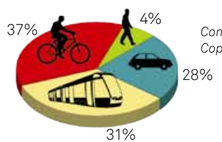
Case Study

City for Cyclists

Copenhagen, Denmark

37% of all residents in Copenhagen commute by bike to work or school every day. They travel a total of 1.2 million kilometres daily. It is also safer to cycle in Copenhagen than in most other cities. This is due both to good infrastructure—dedicated bike lanes (350 kilometres of cycle tracks and 40 kilometres of green cycle routes), and bicycle-friendly intersections, but also because so many cycle. Convenience is why a majority of cyclists chose to bike (61%), but some bike for health (16%), to save money (6%) or to protect the environment (1%).

For every 10% of the population that bicycles to work and school every day, the city reaps a healthcare saving of USD 10 million annually while avoiding 57,000 sick days and adding 61,000 extra years of life (Municipality, 2007).



Commuting modes in Copenhagen 2008

Because of a good bicycle network and a developed bike culture, Copenhageners continue bicycling even in winter.

Blue dedicated lanes at intersections increase awareness and safety.

Biking-an everyday activity for all age groups.

Case Study

World's largest bike share

Hangzhou, China

In Hangzhou, some 43% of trips are made by bicycle. In addition to hundreds of kilometers of dedicated bike lanes, and a partial bus rapid transit system, Hangzhou also implemented the first and largest bike sharing system in the world.

Since opening, use of the Hangzhou public bike system has increased from 0.93 daily rides to 3.27 daily rides per bicycle. Hangzhou's bike-sharing program launched in October 2008, and has a total of 50,000 bikes and 1,700 stations (most of which are unmanned). City-owned and operated, the system uses a smart card integrated with the city's bus, bus rapid transit (BRT), and parking systems.

The bike sharing program in Hangzhou has been a success, inspiring other cities to do the same.

Clearly marked bike lanes and special bike stoplights improve safety for bicyclists.

Tents, awnings and shelters protect cyclists from sun and rain at intersections.

Bollards connected by wire help slow cars down as they turn right. Cyclists get a left turn arrow and have their own left turn lane in the protected bikeway.

3 Connect

Create dense networks of streets and paths

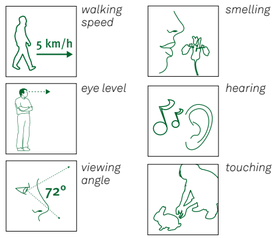
Cities that are pleasant to walk and bicycle through typically have large numbers of narrow short streets and many intersections per unit of area. This makes the traffic slow down while walking becomes more direct, varied, interesting and attractive.

The tighter the street grid, the less detour to a destination. Detours can affect the decision to undertake a trip and by what means. At walking speeds, detours matter much more than at car speeds.

Streets that are short and relatively narrow are well scaled to the perception of people on foot. They afford good opportunities to connect with the surroundings. Each corner offers glimpses of alternate routes or places where to stop, and new possibilities. Buildings, shops, trees and other streetscape elements are closer to the pedestrians and the cyclists as they travel.

Create dense public street and path networks that are highly permeable to pedestrians, bicycles and transit

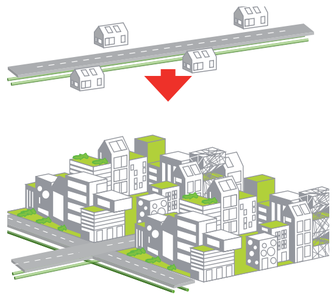
Lanes and small passages increase connectivity, and appeal to the senses. Guangzhou, China.



In an environment well scaled to the physical size of the human body, all senses can engage.

Fine grain area filled with restaurants and small shops. Istanbul, Turkey.

Create auto-free streets, alleys, and greenways to encourage non-motorized travel



In a high density city, the cost of infrastructure will be divided by more people.

Aerial view of Bo01 development. Malmö, Sweden

Almere's short and connected pedestrian priority streets are attractive and animated.

The Donghaochong Greenway cleaned up a heavily polluted urban canal and created new neighborhood parks in addition to the greenway. Guangzhou, China.

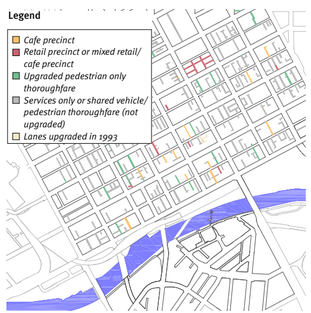
Narrow short streets filled with shops make walking more interesting and attractive. Lyon, France.

Case Study

Opening the laneways Melbourne, Australia

Accessile and active laneways in Melbourne's city centre have increased from 300m (1994) to 3,43 km (2004). Of these, 500 m are completely new lanes or arcades, while the rest are existing, previously unaccessible service laneways that have been opened up with active facades, various functions and art installations. The lanes offer an alternate route through the city centre with a more human scale atmosphere. The opening of the lanes along with other investments in the public realm have contributed to a remarkable increase in public life in the centre of Melbourne, documented in the public space-public life surveys in 1994 and 2004 respectively.

Previously unaccessible laneways. . . *. . .transformed into human scale, active routes through the city centre.*



Revitalisation of lanes.

Nightlife at Hardware Lane.

Lanes used for art installations.

Case Study

Bo01, Malmö, Sweden

The designers of Bo01, a recent community development in Malmö, Sweden, laid out the development on a short and irregular 60 meter by 60 meter grid of well differentiated streets that are highly accessible and user friendly to pedestrians and cyclists. They further enhanced the diversity and variation of the architecture and the public space by breaking down the 60 meter blocks into small plots all allocated to different developers. The blocks were designed to protect the streets and plazas from the strong prevailing winds and open them up to sunlight as much as possible, thereby creating microclimates able to sustain a vital public life even during cold weather. A range of green building systems, including rainwater collection and rigorous building insulation further elevated the environmental sustainability standards set for the development.

Bo01 is testament to the ability of urban planning to create developments that respond to local conditions. Urban developments can be perfectly scaled to the needs to pedestrians, and they can offer a diversity of spaces and architectural details as stimulating and intriguing as those more usually associated with pre-modern city designs.

The new area has become a meeting place for all inhabitants, a place where anything can happen.

Blocks were developed to open streets and plazas to sunlight.

Narrow, short, zig-zag streets and small squares create a varied streetscape suitable for walking.

4 Transit

Support high quality transit

Some trips are too long to make walking or cycling a viable option. As growing traffic from private cars and trucks slows down buses, cities need to intervene to improve their public transit systems. Mass transit can move millions of people quickly and comfortably using a fraction of the fuel and street space required by automobiles.

Because of their comparatively low costs and fast implementation time, bus rapid transit (BRT) systems are proving able to keep pace with rapid motorization and metropolitan growth while providing a service comparable to metros. Like a metro, BRT combines high quality stations, including level boarding and real time information systems, with exclusive bus lanes and clean and comfortable high capacity buses. Passengers pay before they board, reducing the time it takes for passengers to get on the bus.

The best transit systems are designed around the specific needs of their passengers, much as a good tailor builds a suit to fit a specific person. Investing in mass transit means investing in people.

Ensure frequent, fast and direct transit service

Weather protected stations with seating and real time information systems make the experience much more comfortable for the passenger. Ahmedabad, India.

Real time information displays ensure that passengers are updated. Guangzhou, China.

Establish a high capacity, high speed transit corridor with dedicated transit lines within walking distance

Passing lanes allow buses to bypass certain stations to provide express service, connecting popular destinations for a faster trip. Bogotá, Colombia.

Since opening in 2004, TransJakarta BRT system has expanded to 118 kilometers, or 73 miles. Jakarta, Indonesia.

Locate transit stations, homes, jobs and services within walking distance of each other

Cali's BRT was the first full-featured BRT to build on the inherent flexibility of buses by allowing buses to operate both on and off the busway. This provides a more direct trip and eliminates transfers. Cali, Colombia.

In Bogotá, the BRT has helped revitalize the city center by creating a transit mall where only buses, pedestrians and cyclists can go. Bogotá, Colombia.

Guangzhou's full-featured BRT system allows buses to travel quickly along the corridor and then to leave the corridor to drop passengers closer to their destination. Guangzhou, China.

Guayaquil's BRT station integrates well with the dense downtown. Guayaquil, Ecuador.

What does it mean *for the planet:*

A bus can typically carry over 8 times as many people as a car and proportionately use a fraction of the amount of energy per passenger. This benefits both global climate and street environment in cities.

for you:

If you choose the bus in Jakarta instead of taking the car, you save 0.2 kg CO_2 per kilometer, or 2 tons per year going to and from work.

Case Study

Rea Vaya BRT

Johannesburg, South Africa

Rea Vaya, the first full BRT system on the African continent, opened in Johannesburg, South Africa in August 2009, giving new meaning to the city's motto: "A world class African city."

Rea Vaya replaced 575 rickety and polluting 15-seater minibus taxis with about 140 high capacity Euro IV modern Scania buses. Rea Vaya has 25 state-of-the-art BRT stations which offer pre-paid boarding and platforms level with the bus floor. Each iconic and spacious station is decorated by local artists with a local theme.

The system runs in exclusive busways for nearly the entire 25.5 kilometer length. It has trunk services, feeder services, and also innovative "complementary" services that operate both on normal streets and inside the busway. Many stations include passing lanes to allow express buses to pass local services, and have multiple stopping bays to allow several buses to load simultaneously.

The Rea Vaya bus operators will be new companies made up of former minibus taxi owners. Because the drivers are paid to operate on schedule rather than by how many passengers they pick up, and the companies are penalized for speeding or not maintaining their buses, Rea Vaya is ending the dangerous practice of minibuses jumping in front of each other to capture passengers.

By the 2010 World Cup in June, daily ridership reached 35,000. Rea Vaya, a world-class BRT system, is quickly becoming a model transit system for the African continent as well as for the world beyond.

The BRT system brings passengers directly into the city center.

Level boarding make buses accessible for all user groups.

Stations are well-maintained, lively and well-lit, making them safe and attractive.

Rea Vaya BRT station downtown Johannesburg, South Africa

5 Mix

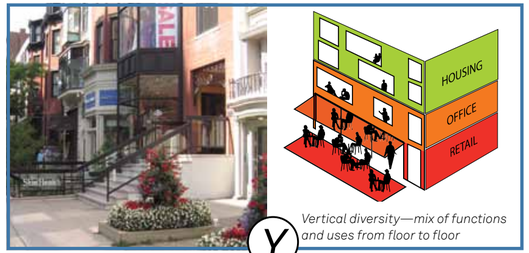
Plan for mixed use

Integrating residential, work, retail and entertainment activities into one area makes for better cities and better places. When the destinations that people need to access everyday are mixed together, as opposed to concentrated in separate spaces, many trips become short and walkable. Time spent commuting or running errands can be reduced, as it becomes easier to combine trips. Socially diverse, mixed income neighborhoods also shorten trip distances, are safer and more interesting.

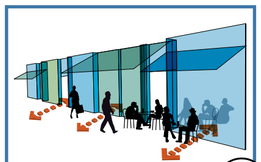
Streetscapes become more varied, rich and interesting. Overlapping activities animate the streets at all hours. Liveliness attracts life, people attract people, local business thrives and diversifies, and safety improves.

The liveliest cities are those who stack lower-floor retail with residential and office functions above. Combined with dynamic public spaces and plazas, mixing it up creates vibrancy in and above the streets.

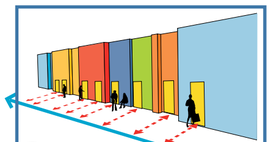
Plan for an optimal balance of housing, commerce, incomes and services



Y *Vertical diversity—mix of functions and uses from floor to floor*



Z *Inside-outside connections -permeable frontages*



X *Horizontal diversity - small units, many entrances*

Provide a variety of accessible parks and open spaces

Pedestrian flows help retail businesses and services, which in turn activate the streetscape. Avoid blank walls and long building set-backs. Santiago, Chile.

Encourage a diversity of activities on sidewalks and public space. Beijing, China.

Auto free streets with lower-floor retail shops encourages people to shop and linger. Mexico City, Mexico.

Create a place where a diverse mix of people can meet or retreat. New York City, USA.

What does it mean *for the planet:*

Mixed use development can reduce average vehicular miles travelled per person per day by 30%

Farr Douglas, *Sustainable Urbanism*, 2008

for you:

The daily activity most injurious to happiness is commuting (by car). With a shorter commute, you'll be happier!

Stutzer/Frey, The Commuting Paradox, 2004

Case Study

London Southbank

Re-imagining the public realm-inside and outside

The regeneration of London's South Bank provides a model of mixing users and functions day and night. Dynamic and flexible spaces are open to the public and welcome a range of events, from local school plays to international fashion shows. Indoor and outdoor public spaces, free wi-fi networks, electronic outlets, and good places to sit encourage people to linger, mix, and mingle. Students and professionals with laptop computers flock to the South Bank which functions as informal office space.

The addition of two pedestrian bridges (Charing Cross and Millenium) acted as a catalyst for the revitalization of the Southbank. With improved accessibility, a vast mix of institutions and destinations have located along the waterfront, attracting diverse activities and events as well as people from all walks of life-locals and tourists alike.

Always a draw for special events and activities, the South Bank is in many ways Londoners urban living room.

The space has been reinvented to act as a public living room, mall and promenade, with invitations for residents and tourists.

Indoor public spaces at the National Theatre provide for meeting, eating as well as a collective work and study places.

Case Study

Guangzhou-Tianhe Nan

Vibrant mixed-use district emerges out of single-use housing complex

Tianhe Nan, in Guangzhou, China, is a housing complex composed of dozens of walk-up apartment buildings constructed in the early 1990s, up to 9 storey high. The community was initially fenced off, access-controlled, and single-use. Starting in the early 2000s, some ground floor owners began converting apartments into coffee shops and small retail stores. The area soon became a vibrant cluster of trendy independent designers. The streets were gradually opened to the public and closed to cars; their design and material improved. The transformation process rapidly spread to adjoining communities.

Streets have filled with people as shops have opened up.

The careful integration of trees and planting improve the comfort and quality of the street.

The former single-use, residential complex has turned into a vibrant neighbourhood.

Ground floors are being retrofitted to create opportunities for shops and businesses.

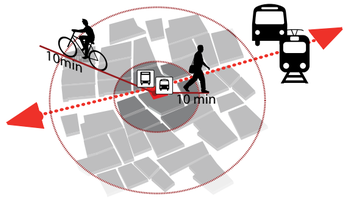
6 Densify

Match density and transit capacity

By 2030, cities are projected to absorb two billion more people. High density is crucial to low-carbon cities. Density needs to be related to the capacity of all modes of transportation. If roads are designed to be bike and pedestrian-friendly with transit-priority lanes on major arterials, new residents will concentrate in transit convenient locations.

This will maintain the viability of transit in the ling run, shorten trip distances, save travel time and preserve millions of square kilometers of arable land. These dense communities use resources more efficiently, reducing the carbon footprints of its residents.

Match density to the capacity of a transit system



Densify around transport nodes according to pedestrian and cycling 10-minute catchment areas; 800 meters for pedestrians and 3 km for cyclists.

Existing low-density areas. . .

. . .should be densified horizontally along a wide area, becoming denser towards the transit nodes

Land use planning encouraged densification around the BRT transit corridor in Curitiba, Brazil.

Bus Rapid Transit. Curitiba, Brazil.

Maximize transit system capacity

Major job centers should be located where high-volume transit is available. Guangzhou, China.

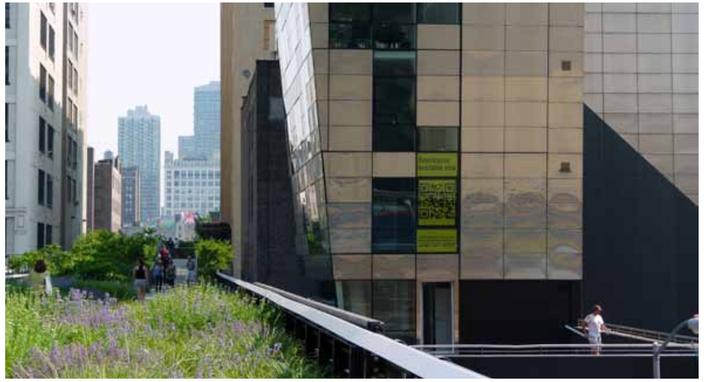
In Guangzhou, density is focused around the BRT corridor. The system's capacity matches commute-hour transit demand. Guangzhou, China.

Case Study

Re-zoning along the High Line, New York

The High Line, an elevated public pedestrian promenade, situated between Gansevoort St and West 30th Streets in the West Chelsea neighborhood of New York City, was formerly an elevated rail line used to transport goods to the factories and warehouses of the West Side. The project first captured public attention in 2003, when the Friends of the High Line held a competition soliciting proposals for the reuse of the abandoned railway. The competition attracted 720 entries from 36 counties, which were displayed in Grand Central Station. Phase I of the High Line opened in 2009, and a second section opened in 2011, expanding the promenade to a 1.5-mile length.

In anticipation of the development impacts of this new urban amenity, the City of New York adopted the West Chelsea Comprehensive Plan in 2005 to spur development in the surrounding area, while preserving the character of historic Gansevoort Meat Market, the West Chelsea art district and the newly planned Hudson Yards. Before, this new plan was adopted, the area was zoned for industrial uses only, and the maximum allowable floor-area to lot ratio (FAR) was 5. The adopted plan changes the zoning to allow for mixed commercial and residential developments and inceases the allowable FAR to a base of 6.5. Landowners of properties within a designated "High Line Transfer Corridor", beneath or immediately adjacent to the High Line are permitted to use a TDR (transfer of development rights) scheme to sell their developable floor area for land within in the Corridor, to designated "receiving sites" within the larger special district, allowing for FARs as high as 10 or 12 on these sites.

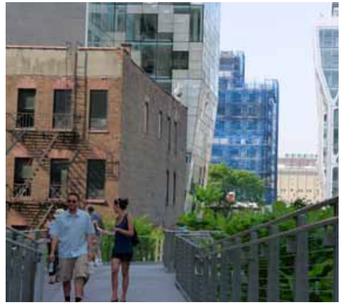


The new zoning district encouraged densification, allowing for mixed-use developments.

Developers willing to include low/moderate-income housing or public access to the High Line in their projects receive additional FAR bonuses.

To date, the new zoning district has catalyzed over 17 residential and commercial developments, including more than 1,000 residential units, protected many historic sites such as Chelsea Market and the Chelsea arts district, and repurposed nine off-street parking lots.

This careful densification and mix of uses, human-scale street grid, excellent transit accessibility and protected bike lanes on 8th and 9th Avenues, and proximity to mid-town Manhattan has made the former industrial area a vital, highly desirable mixed-use urban neighborhood.



Maximum FAR on some lots more than doubled.

A concrete pathway spans the length of the High Line, providing an interesting walking experience, as well as new views of the city.

7 Compact

Create compact regions with short commutes

Community location has a long-term impact on sustainability. New developments placed far from existing cities are inconvenient and rarely thrive. City planners can avoid this by locating compact new sub-centers within or adjacent to existing cities. Most cities have underutilized land no longer needed for its original purpose. Old docklands, rail yards, surface parking, industrial zones or decommissioned military bases can often be re-used and become vital new urban centers.

Cities need to create incentives to develop this land first, before driving development to distant greenfields. In addition to protecting arable land, this strategy significantly decreases the cost of providing transit, utilities, and other services to these new locations, while reducing most residents' daily commute.

Reduce sprawl by focusing development in areas adjacent to and within existing developments

Old factories turned into exhibition halls. Factory 798, Beijing, China.

Reused structures preserve elements of neighborhood history and identity. Vertical extensions accommodate additional people and activities. New York City, USA.

New infill development. Budapest, Hungary.

Co-locate jobs and housing within short commuting distances

Industrial area metamorphosed into a hub of life, work and leisure. New York City, USA.

In Malmö, more than 35% of residents travel less than 5km to get to work. Malmö, Sweden.

In Frieburg, no home is more than 400 m from a transit stop and all trams offer step-free access. Freiburg, Germany.

Selective redevelopment on existing footprints allows densification while preserving the grain of the walkable district. New York City, USA.

What does it mean *for the planet:*

By encouraging infill development, the economic savings to society would equate to over $300 million per 1000 housing units or $110,000,000,000 over the next 50 years for a city with 4-5 million inhabitants.

Adams Rob, Transforming Australia, 2009

for you:

A compact neighborhood for me is a place where my friends and kids can easily live nearby, I can walk to where I need to get to, and everything I need is close at hand.

Case Study

Massena, Paris

From obsolete industrial district to people and transit-oriented, dense and mixed used neighborhood.

Integrating residential, work, retail and entertainment activities into one area makes for better cities and better places. When the destinations that people need to access everyday are mixed together, as opposed to concentrated in separate spaces, many trips become short and walkable. Time spent commuting or running errands can be reduced, as it becomes easier to combine trips. Socially diverse, mixed income neighborhoods also shorten trip distances, are safer and more interesting.
Streetscapes become more varied, rich and interesting. Overlapping activities animate the streets at all hours. Liveliness attracts life, people attract people, local business thrives and diversifies, and safety improves.

The liveliest cities are those who stack lower-floor retail with residential and office functions above. Combined with dynamic public spaces and plazas, mixing it up creates vibrancy in and above the streets.

Aerial view of the Massena district before development

Small plots and many designers create varied architecture.

. . .and during construction.

Narrow streets and active ground floors.

8 Shift

Increase mobility by regulating parking and road use

In the last century many cities were retrofitted and designed to accommodate automobile travel. Car travel will remain a preferred choice for some people on certain trips in 2030, especially where cost-effective public transit options are not available. These cars should be as clean, fuel efficient, quiet and safe as possible for both passengers and surrounding people.

Widening or adding roads in built up urban areas tends to damage local communities. More cars lead to greater congestion, pollution, fuel consumption, and greenhouse gas emissions. Cars consume too much road space to be viable for more than a fraction of total travel. If car travel keeps pace with population growth, gains from fuel efficiency and cleaner technologies will be countered by slow speeds—as drivers get stuck in traffic congestion. Car trips can be kept at levels that available roads can handle through parking policies, vehicle restrictions, user charges, and traffic cells that allow more direct access for transit vehicles and bicycles. These strategies can also be tailored to specifically encourage the use of cleaner and quieter vehicles. Better management of travel demand is critical for any city made for people, not cars.

Limit parking to discourage driving during peak traffic periods

Creating protected pedestrian space gives walking and other travel modes legitimacy alongside vehicle access. Bogotá, Colombia.

Traffic cells allow passenger vehicles and lorries to access a street only if it is their destination, giving pedestrians and cyclists priority.

Off-street parking regulations force developers to build more parking than needed, increases housing prices and blight the urban environment. Detroit, USA.

A woonerf with perpendicular parking arranged to calm the street, giving priority to pedestrians and bicyclist. Amsterdam, The Netherlands.

Adjust car use fees by time of day and destination

Drivers have been paying to enter the city's central business district since 1977. A device linked directly to a car owner's bank account is used to deduct a fee at entry checkpoints. Tolls adjusted by the time of day keep traffic free-flowing at least 85% of the time on streets and highways. Singapore.

2-to-1 public opposition to congestion charges turned to 2-to-1 support after voters saw how a 20% drop in traffic led to a 30-50% reduction in traffic delays. Stockholm, Sweden.

Real-time information display boards let drivers know where parking spaces are available nearby, lowering the distance cars travel cruising for parking. Chengdu, China.

On-street parking fees are used to optimize turnover at the curb and fund Bicing, the city's bike sharing scheme with stations in former car parking spaces on certain streets. Barcelona, Spain.

What does it mean *for the planet:*

A 5-kilometer per hour drop in speed results in 15 percent fewer collisions, 10 percent fewer pedestrian fatalities, and 20 percent less severe pedestrian injuries.

for you:

With car sharing, I always have access to a car—in fact, many types of cars.

Case Study

Zurich

Zurich's traffic problems began in the 1960s and 1970s when the city mobility plan sought to accommodate more cars on the road. As road capacity, air quality issues, and noise pollution got worse, Zurich amended their plan to a more restrictive parking policy, raising prices for parking in the residential areas to match the city center, amending on street parking regulations, enacting a parking supply cap and linking the off-street parking regulations to traffic management and air quality goals.

The parking supply cap and off-street parking regulations were established in 1996. According to Zurich local laws, if a space is created off-street in a capped area, like inside the city center, no new parking can be built unless the City agrees to remove an equal number of on-street parking spaces. Access to public transit prompts a reduction in the parking requirement with developments close to a bus or tram stop. The policy has allowed for on-street improvements to be made and the creation of new public plazas.

Zurich developed two types of regulated on-street parking zones: blue and white. Blue zones allow free parking up to 90 minutes using a pre-paid parking permit, but does not guarantee that permit holders will find parking. White zones require paying for visitor parking, which increases every 30 minutes. The P&D scheme in Zurich is hyper-localized with prices and privileges varying by time of day and location across the entire city block-by-block, rather than in geographic clusters. The parking surplus from the fees goes directly to the city treasury.

Former curbside parking was converted to bicycle parking.

Parking Spaces oriented in a way that promotes traffic calming on a residential street.

European blue disc affixed to the windshield of a car.

Two hour limited paid parking in a residential neighborhood.

Street cleared of parking to conform to parking supply cap.

Summary

1. Walk	**Develop neighborhoods that promote walking**	*Shorten street crossings*	*Emphasize pedestrian safety and convenience*	*Encourage ground-level activity and create places to relax*
2. Cycle	**Prioritize cycle networks**	*Design streets that emphasize cycle safety and convenience*	*Provide secure parking for public and private cycles*	
3. Connect	**Create dense networks of streets and paths**	*Create dense public street and path networks that are highly permeable to pedestrians, bicycles and transit*	*Create auto-free streets, alleys, and greenways to encourage non-motorized travel*	
4. Transport	**Support high quality public transport**	*Ensure frequent, fast and direct transit service*	*Establish at least one high capacity, high speed transit corridor with dedicated transit lines within walking distance for 80 per cent of the population*	*Locate transit stations, homes, jobs and services within walking distance of each other*
5. Mix	**Plan for mixed use**	*Plan for an optimal balance of housing, commerce, incomes and services*	*Provide a variety of accessible parks and open space*	
6. Densify	**Match density and transit capacity**	*Match density to the capacity of a transit system*	*Maximize transit systems capacity to planned capacity*	
7. Compact	**Create compact regions with short commutes**	*Reduce sprawl by focusing development in areas adjacent to and within existing developments*	*Co-locate jobs and housing within short commuting distances*	
8. Shift	**Increase mobility by regulating parking and road use**	*Limit parking to discourage driving during peak traffic periods*	*Adjust car use fees by time of day and destination*	





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