WRI TÜRKİYE | SÜRDÜRÜLEBİLİR ŞEHİRLER

CITIES SAFER BY DESIGN

Real-world guide on designing safer streets and communities

EMBARQ®

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WRI Ross Sürdürülebilir Şehirler Merkezi tarafından hazırlanmıştır

Photo: Benoit Colin

GLOBAL TRENDS

The urban population will increase from **50% in 2007** to **70% in 2030** (UNICEF 2012).

The number of cars will more than double by 2050, from **1 BILLION** today to **2.5 BILLION** in 2050.

NEARLY HALF of the world's traffic fatalities already occur in cities.

WHO IS TRAFFIC SAFETY ABOUT?

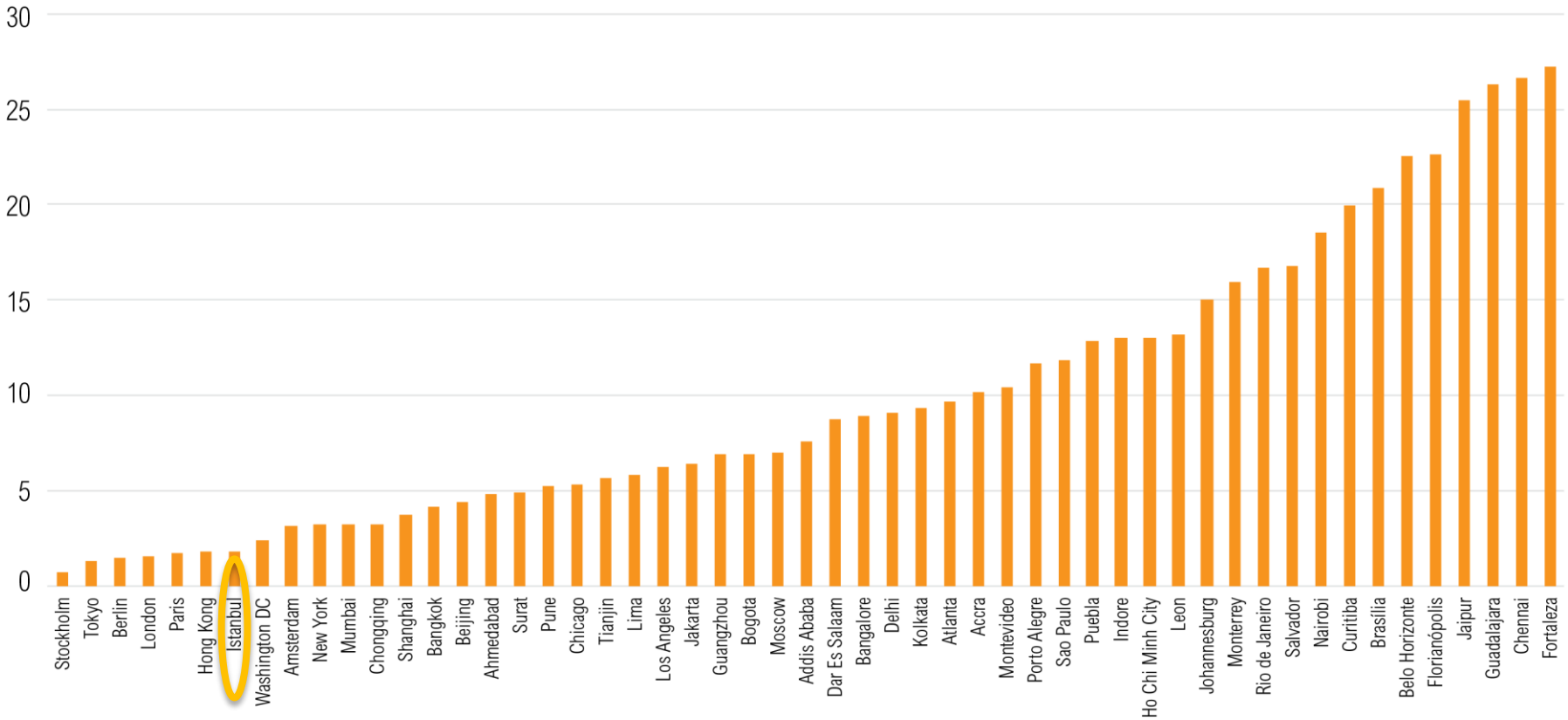
- Road crashes are the leading cause of death among young people **ages 15-29**, and the second leading cause of death worldwide among people **ages 5-14.**[1]

- Older pedestrians and cyclists can account for up to **45 percent** of pedestrian fatalities and up to **70 percent** of cyclist fatalities.[2]

- People from lower socioeconomic backgrounds are more likely to be involved in traffic crashes, and often live in areas with low-quality infrastructure.[3]

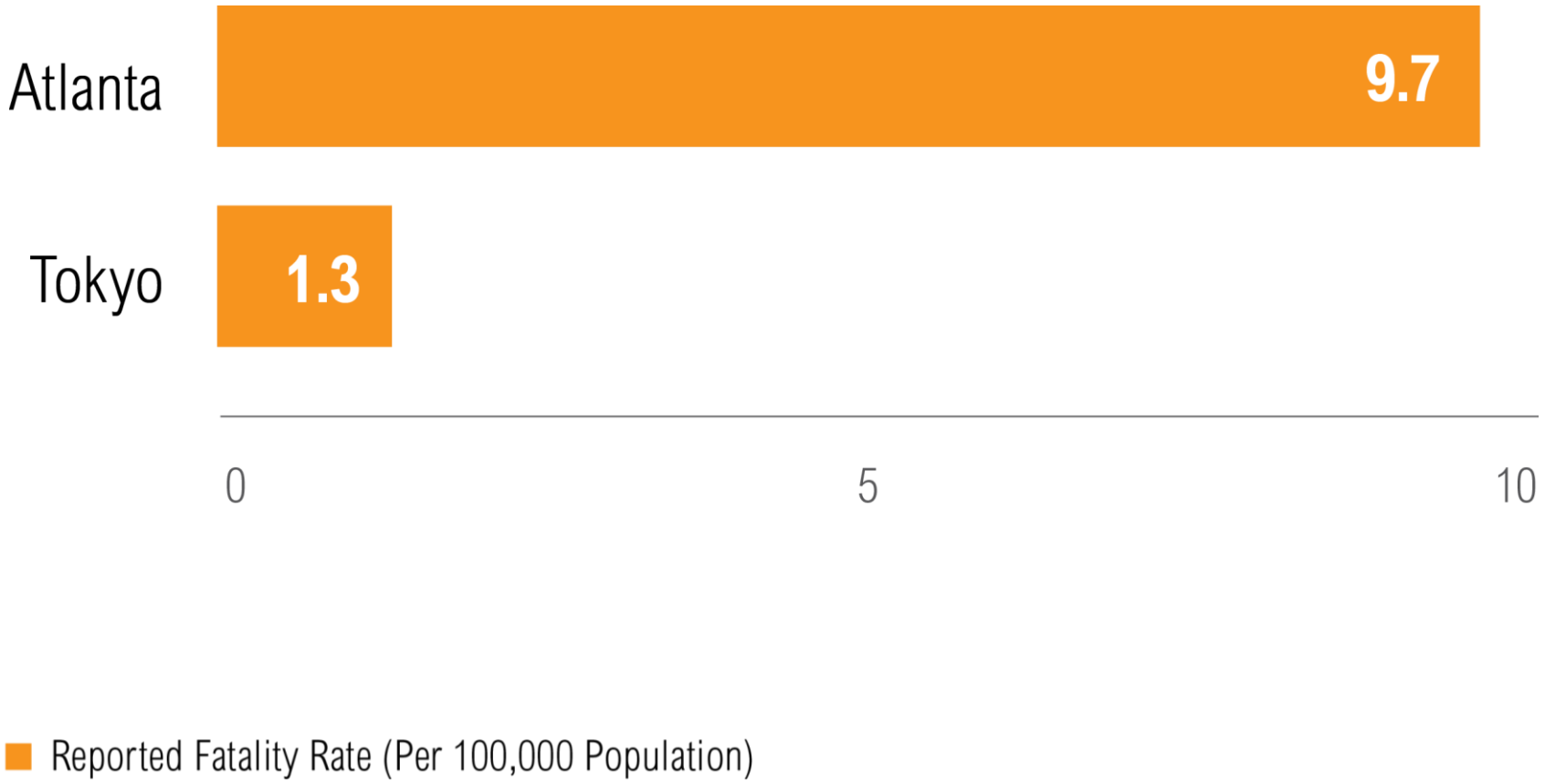
Source: 1) WHO 2003; 2) Oxley et al 2014; 3) WHO 2003)

REPORTED FATALITY RATES IN SELECTED CITIES (PER 100,000 POPULATION)



Source: Welle and Li, 2015, based on data collected by WRI Sustainable Cities

DEVELOPMENT PATH FOR TRAFFIC SAFETY



DESIGN PRINCIPLES

Urban design that reduces the need for vehicle travel and fosters safer vehicle speeds

Traffic calming measures that reduce vehicle speeds or allow safer crossings

Arterial corridors that ensure safer conditions for all road users

A network of connected and specially designed bicycling

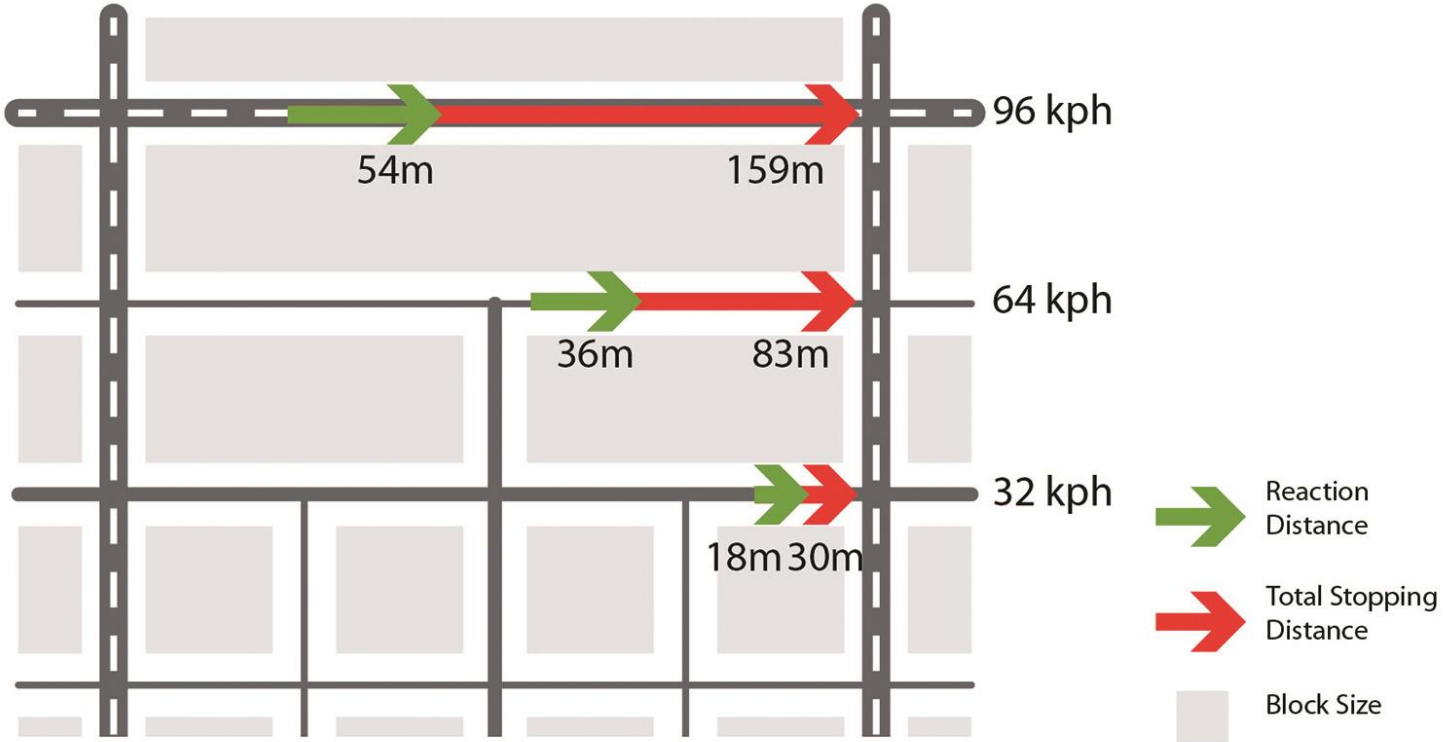
Safe pedestrian facilities and access to public spaces

Safe access to mass transport corridors, stations, and stops

KEY URBAN DESIGN ELEMENTS

- Block size
- Street connectivity
- Street widths
- Access to destinations
- Population density

COMPACT & CONNECTED URBAN DESIGN

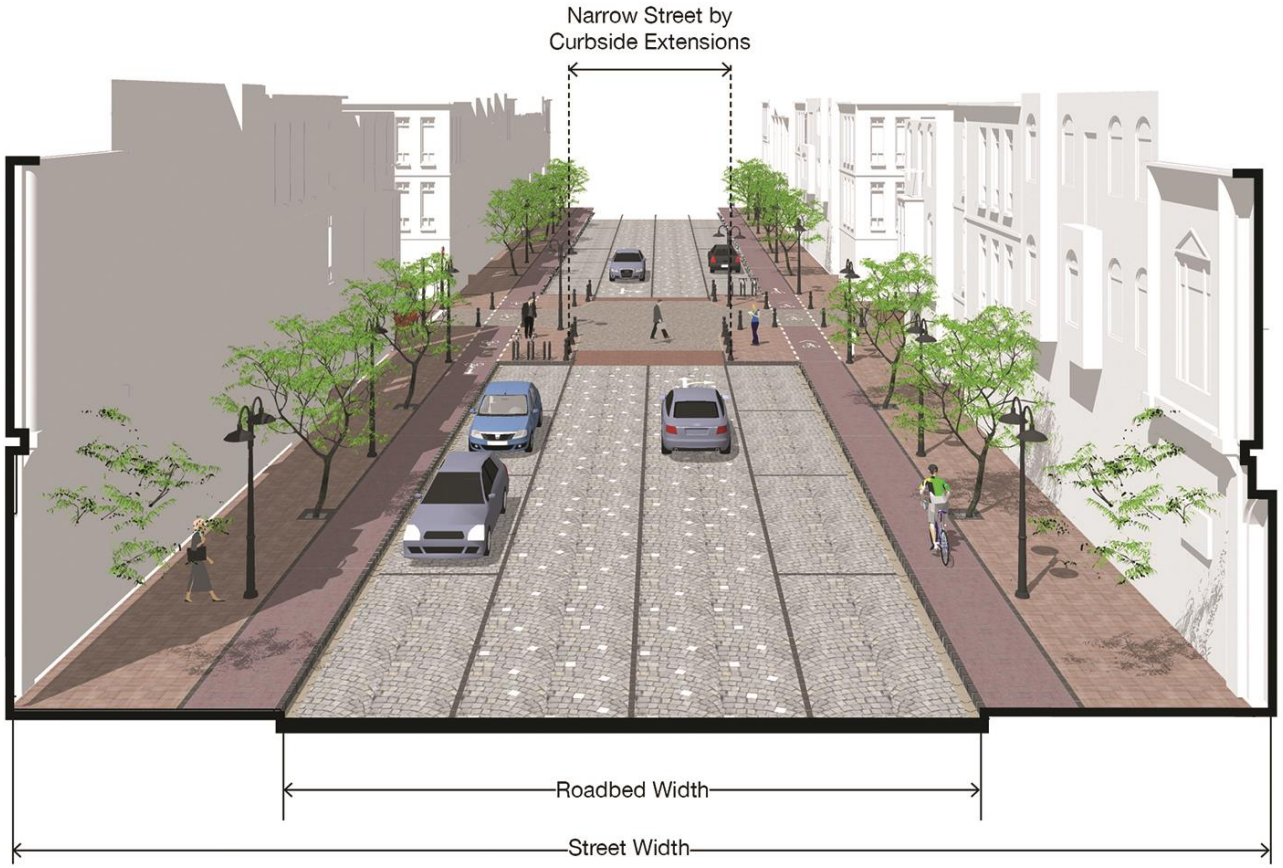


Assumes 2 seconds reaction time and vehicle deceleration rate of 3.4 m/s²

- Smaller block sizes and distance between signalized intersections can reduce speeds and improve safety.[1] Complement with fewer 4-armed junctions.

1. Dumbaugh and Rae, 2009

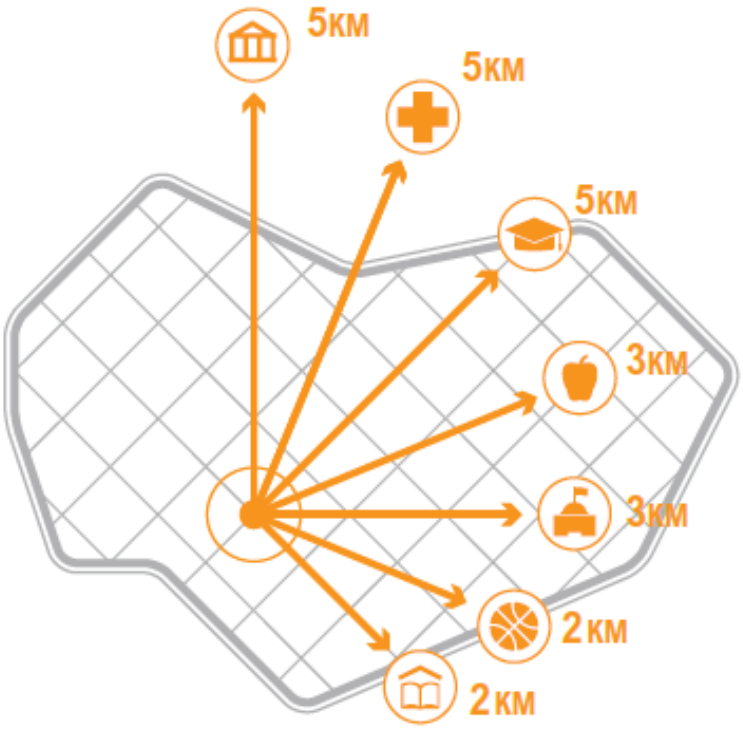
COMPACT & CONNECTED URBAN DESIGN

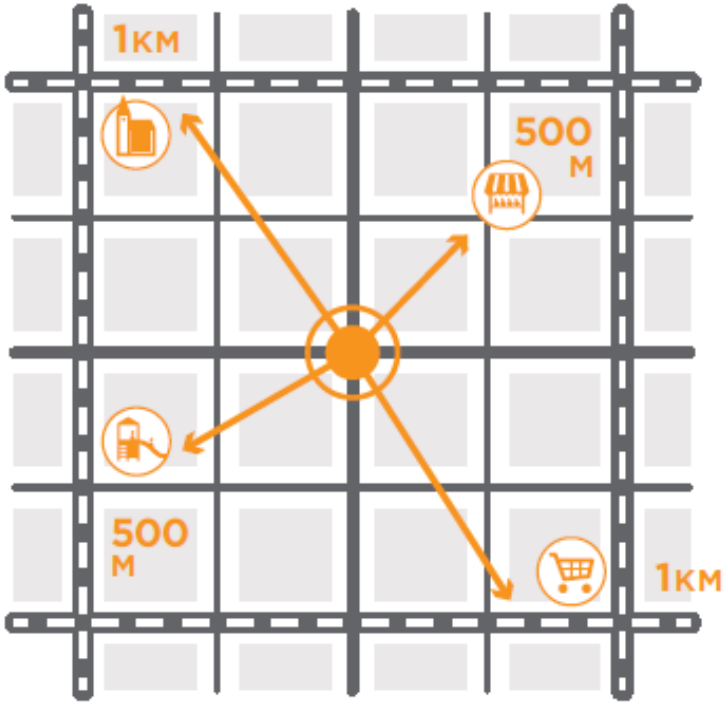


- Evidence from Mexico City shows that as the maximum pedestrian crossing distance at an intersection increases by 1 meter, pedestrian fatality risk increases 6%. [1]

Source: Duduta et al 2015

COMPACT & CONNECTED URBAN DESIGN





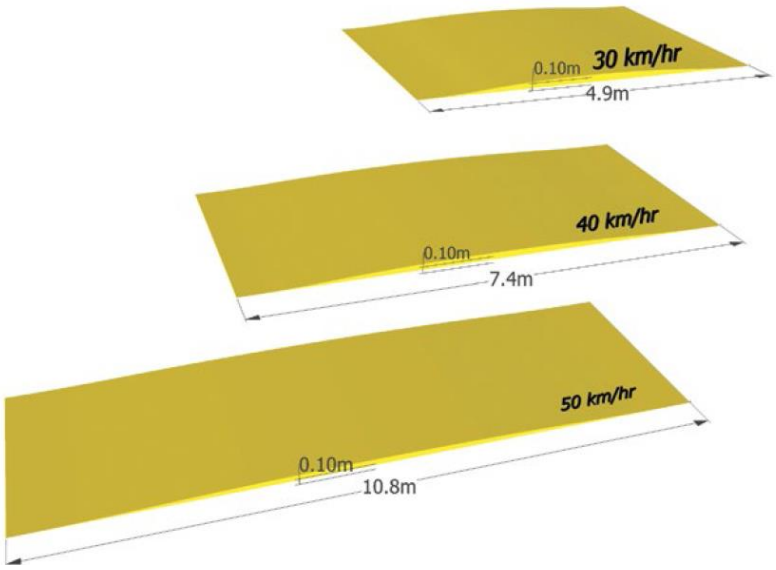
- Vehicle travel in cities is most strongly related to accessibility to destinations, meaning that efforts to increase access to jobs, retail and public space can decrease vehicle travel and improve overall safety.[1]

Source: Ewing and Cervero 2010

TRAFFIC CALMING MEASURES

- Speed humps
- Speed cushions
- Chicanes
- Chokers
- Curb extensions
- Raised pedestrian crossings
- Traffic circles
- Roundabouts

SPEED HUMPS



- Speed humps are simple but effective ways to lower speeds. Newly installed humps have shown to reduce mean vehicle speeds from 36.4 to a designed speed of 24.4 km/hr. [1]

Source: Elvik, Hoye and Vaa 2009

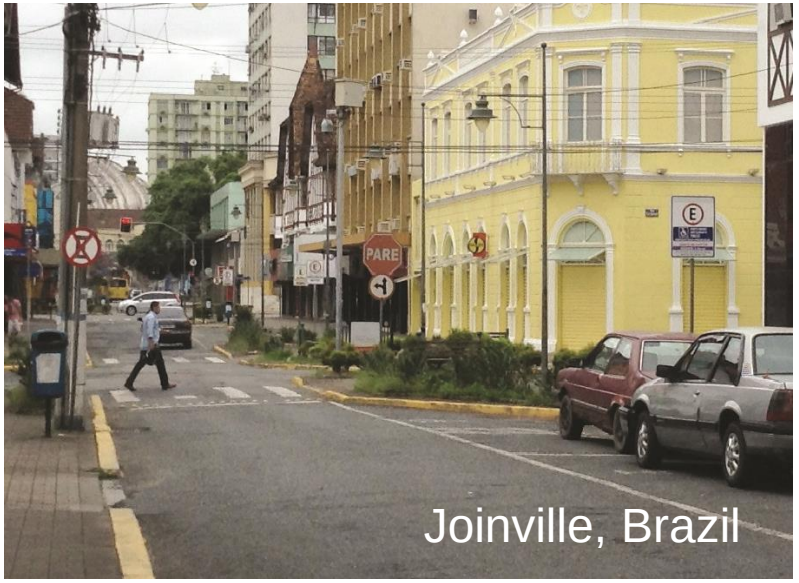
RAISED CROSSINGS

Bogota, Colombia

- **10 percent** reduction in speeds, slows vehicles turning and passing through intersections, and prioritizes pedestrian passing on even pavement.[1]

Source: institute for Transportation Engineers 2013

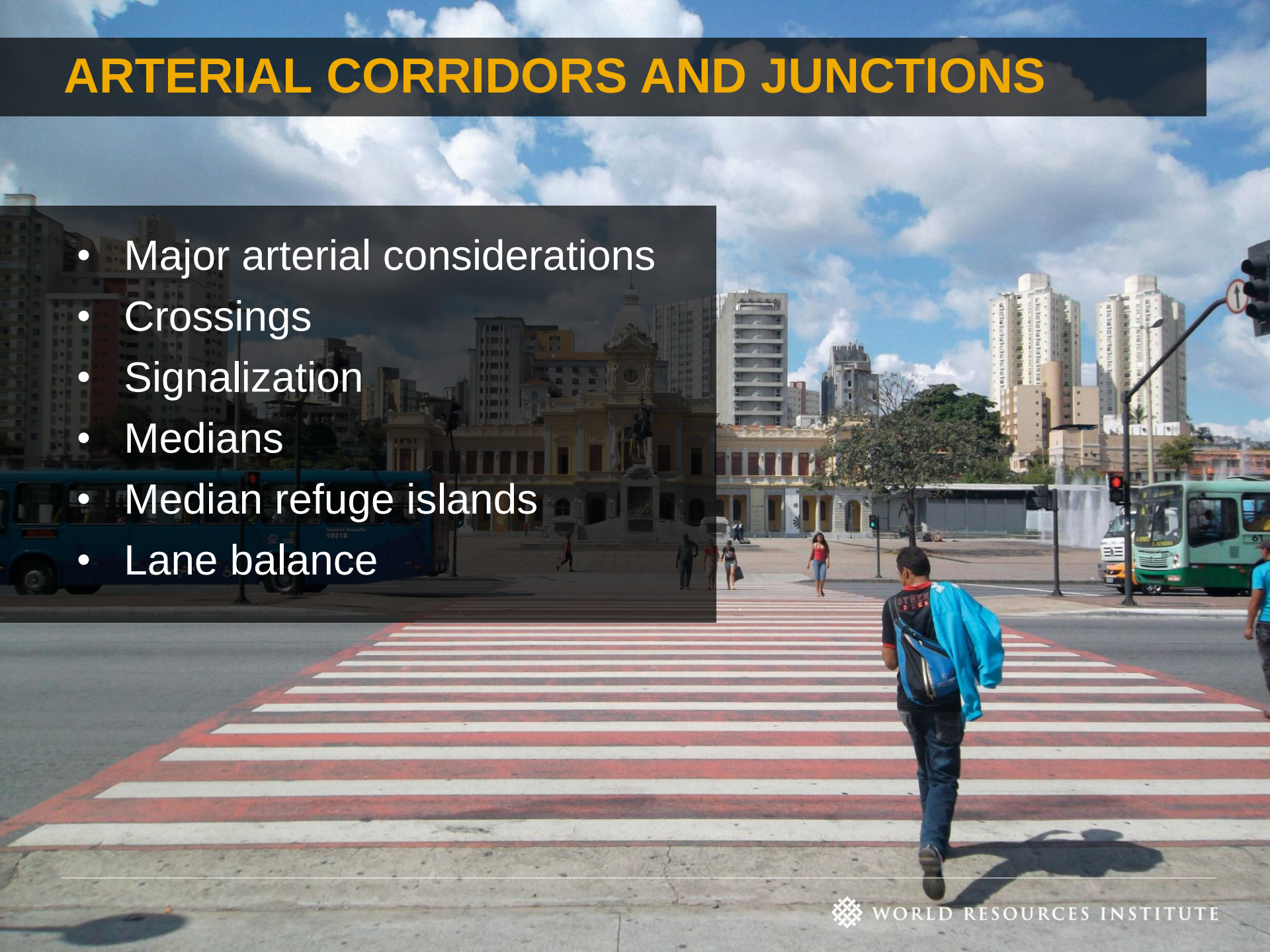
CURB EXTENSIONS



- Evidence from Latin American cities shows that the chance of a vehicle collision and pedestrian crash increases by **6 percent** for every additional 1 meter of pedestrian crossing distance. Curb extensions are simple ways to reduce crossing distance.[1]

Source: Duduta et al 2015

ARTERIAL CORRIDORS AND JUNCTIONS



- Major arterial considerations
- Crossings
- Signalization
- Medians
- Median refuge islands
- Lane balance

CREATING COMPLETE STREETS

A major arterial street in Mexico City was recently transformed into a “Calle Completa,” with a protected cycle lane, dedicated BRT, new sidewalks and access to a central green median.

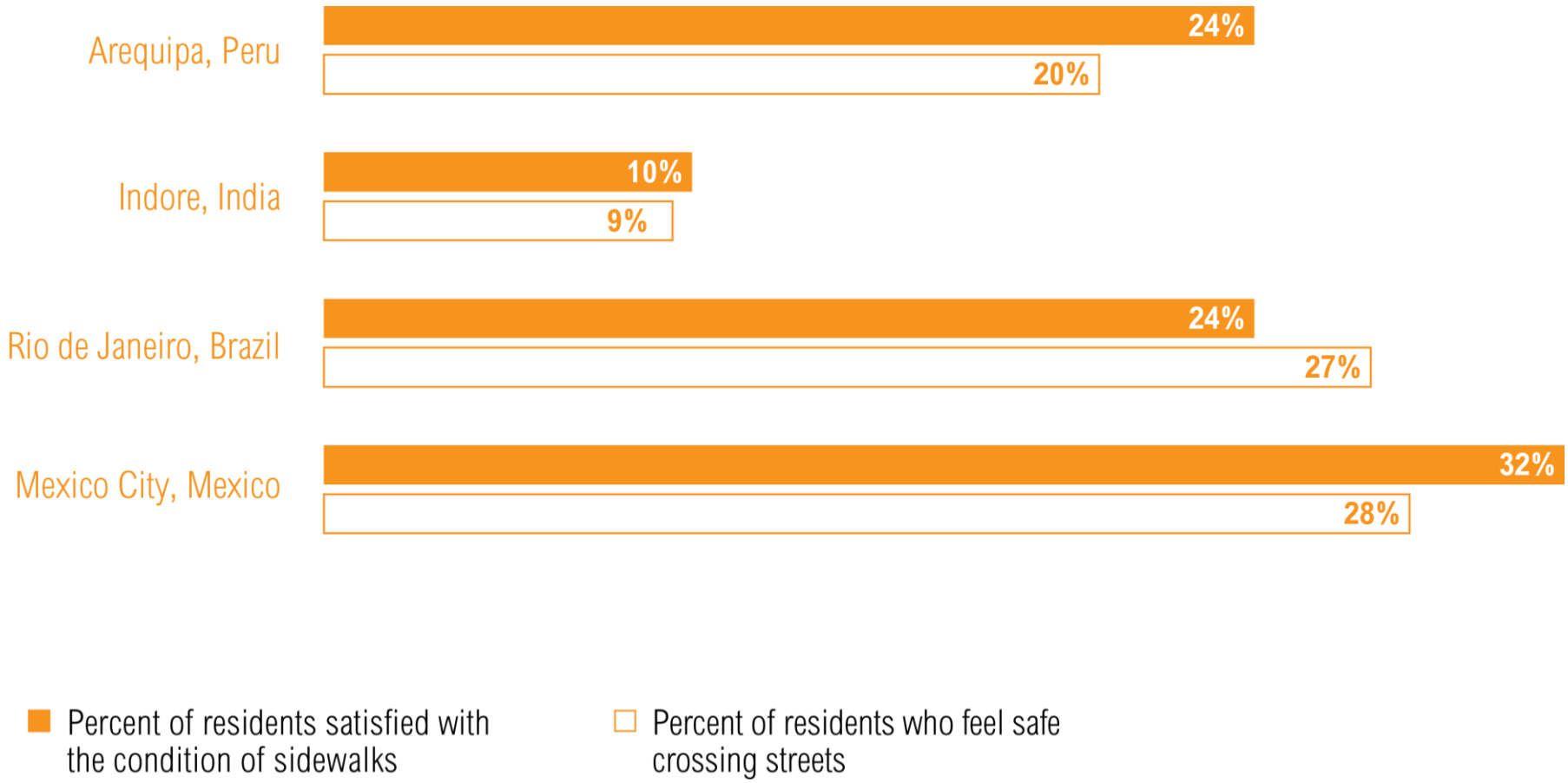
MEDIAN REFUGE ISLANDS

Small changes can help, too. Median refuge islands and medians can make crossing easier and lower speeds of passing traffic by providing protection in the middle of the road and narrowing the view of the road of drivers

PEDESTRIAN SPACES AND ACCESS TO PUBLİC SPACE

- Safer sidewalks
- Shared streets
- Pedestrian streets and zones
- Safe access to places to learn and play
- Open streets, or ciclovias
- Street plazas

SIDEWALK CONDITIONS AND STREET CROSSING SAFETY SATISFACTION IN FOUR CITIES



Source: WRI/EMBARQ household surveys in these cities, 2011 published in Cities Safer by Design

SAFE SIDEWALKS CASE

PEDESTRIANIZING STREETS

Pedestrianization can cut traffic crashes in half in and around these zones, and create great public spaces for people in high-volume areas. Measures should be taken at buffer areas to ensure safe entry.

STREET PLAZAS & PARKLETS

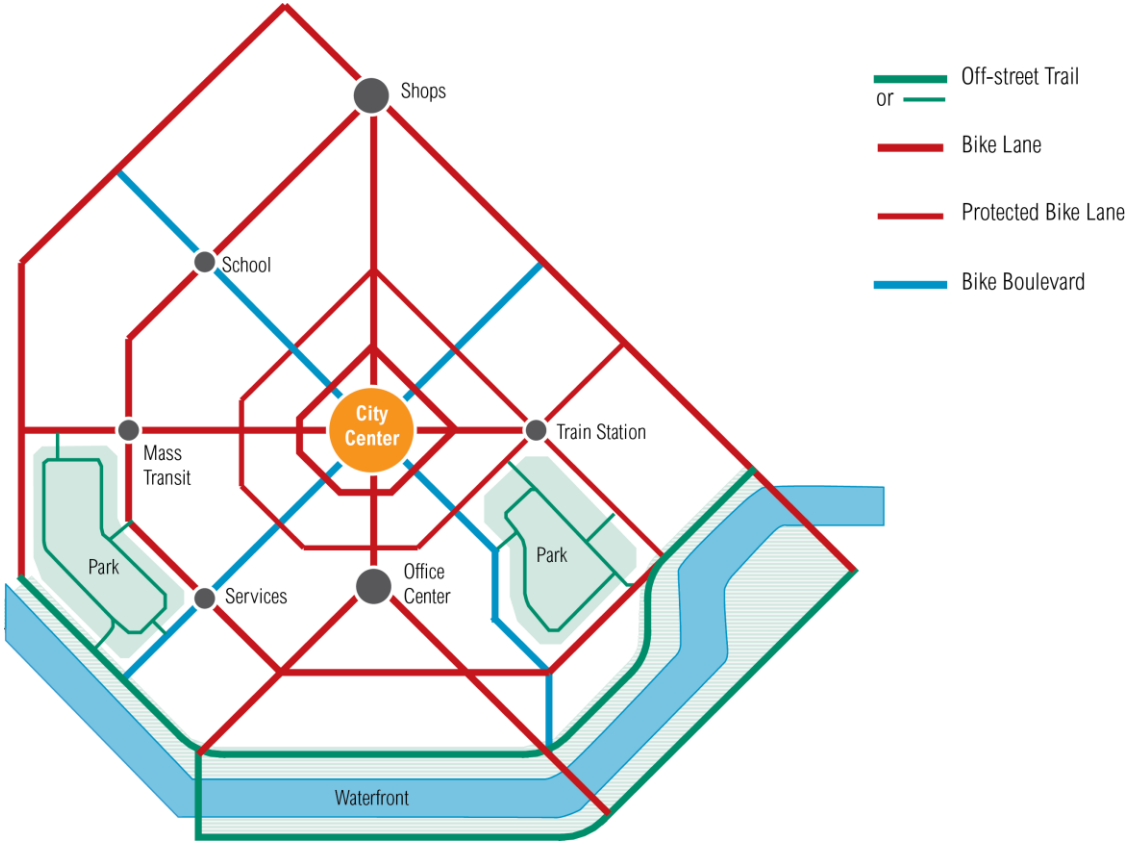
New York has shown a decrease of **16 percent** in speeding and a **26 percent** reduction in injury crashes along streets that contain pedestrian plazas.[1]

Source: NYC DOT 2012

BICYCLE INFRASTRUCTURE

- Bicycle networks
- Bike lanes and cycle tracks
- Off-street trails
- Shared bicycle street
- Bicycle safety at intersections
- Bike safety at bus stops
- Bicycle signals

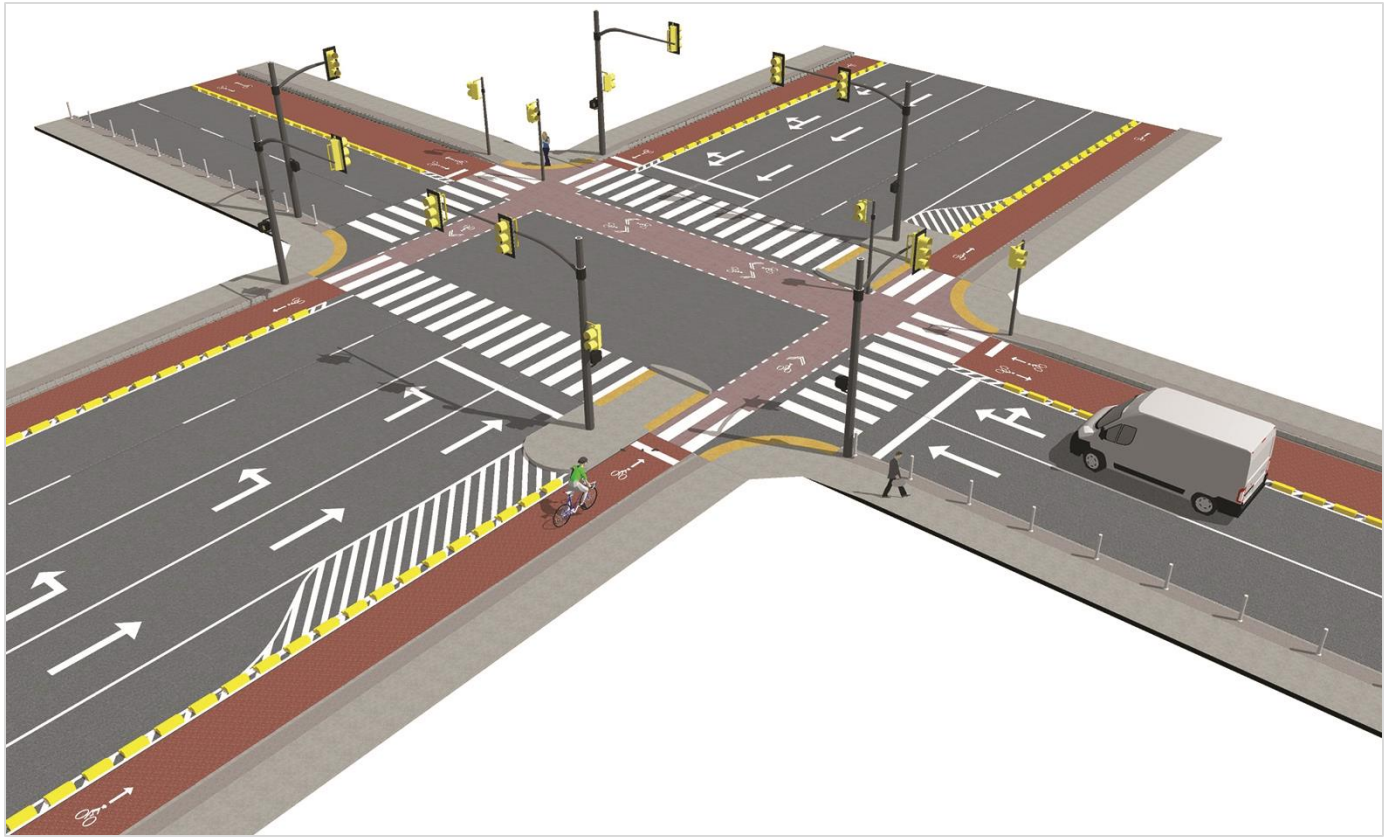
NETWORK FOR SAFETY IN NUMBERS



- Bogota, Colombia found that adding more than 100 km (62 miles) of bikeways helped reduce bicyclist deaths by **47.2 percent** between 2003 and 2013 , and increased bicycle use from just over **3 percent** of all daily trips to over **6 percent**. [1]

Source: Bogota Bicycle Account, (Verma, Lopez & Pardo 2015)

PROTECT CYCLISTS ON BUSIER STREETS



Protected bicycle lanes on busy roads and help ensure cyclists feel safe and are not at great risk from distracted drivers.

PROTECTED CYCLE LANES

- Mexico City now has over 120 km of cycle lanes, including protected lanes, and places like Shanghai also are installing protected bicycle lanes.[1]

Source:

GETTING INTERSECTIONS RIGHT

Speed-reducing countermeasures (e.g. raised bicycle crossings) and design to increase cyclist-driver visibility can improve visual search patterns in favor of the cyclists coming from the right.

GREEN NETWORKS

Off-street bike paths have been found to be one of the safest bicycle routes, but providing bike and pedestrian tracks within them has been shown to provide better safety compared to mixed-user paths

SHARED BICYCLE STREETS – BIKE BLVDS

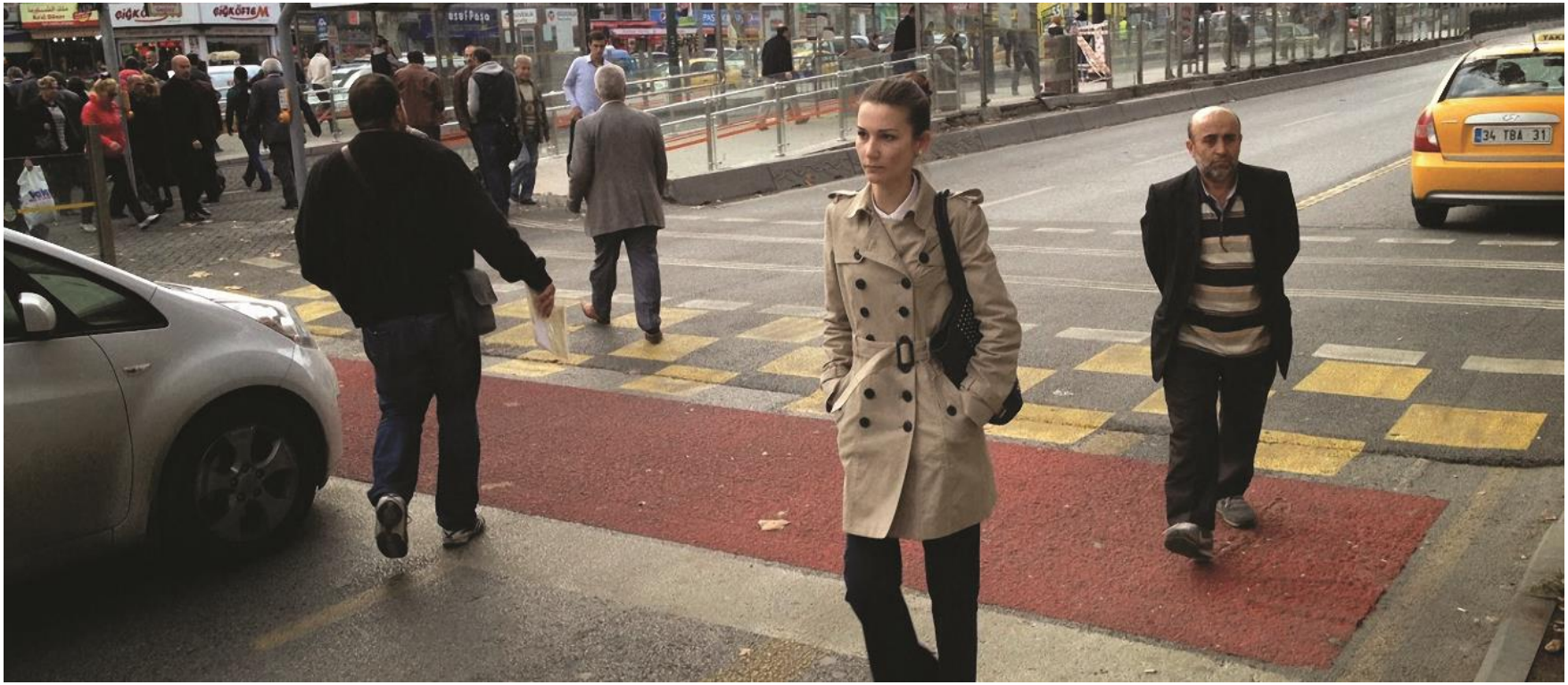
- Collision rates on well-designed bicycle boulevards have been shown to be two to eight times lower than those on parallel, adjacent arterial routes.[1]

Source: 1)Minikel 2012

SAFE ACCESS TO TRANSIT STATIONS AND STOPS

- Intersections
- Midblock pedestrian crossings
- BRT /Busway Stations
- Terminals and transfer stations
- Midblock bus stops

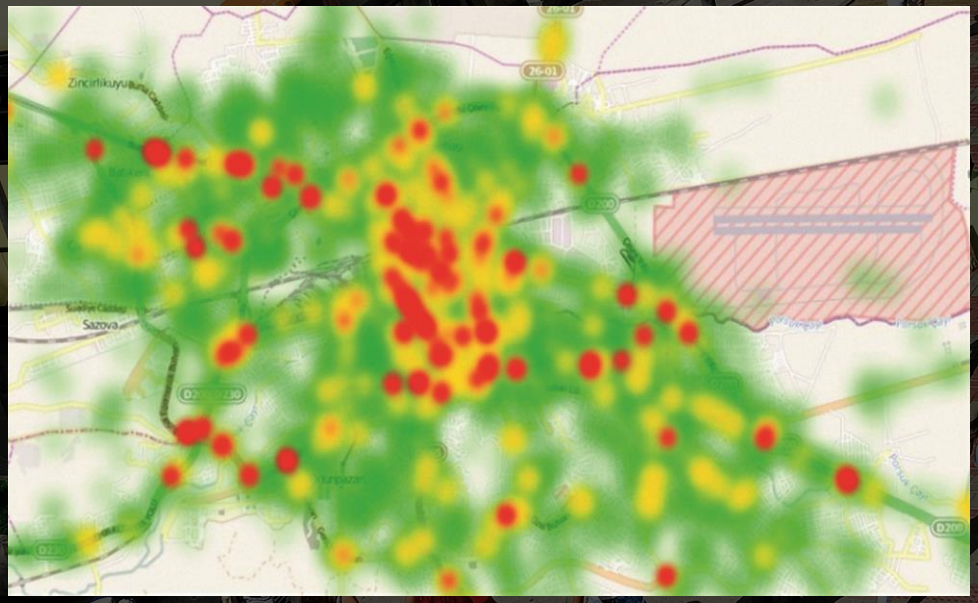
TRANSIT IS SAFE - MAKE ACCESS TO IT SAFE, TOO



Mass transit has a lot of people moving to and from it, so making this a safe connection is key. Often a corridor might be built or run without much consideration of this, so things like providing traffic calming, or raised pedestrian crossings to stations as seen here in Istanbul can help improve safety and access.

IMPROVING DATA AND ANALYSIS

- Data analysis and assessment tools for deploying these design principles



- Heat Map of Traffic Crashes in Eskisehir, Turkey [1]

Source: 1) EMBARQ Turkey. Tolga Mamoglu, PTV Visum Safety

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DOWNLOAD THE REPORT AT:
http://wrisehirler.org/sites/default/files/TasarimlaDahaG%C3%BCvenliKentler_web.pdf

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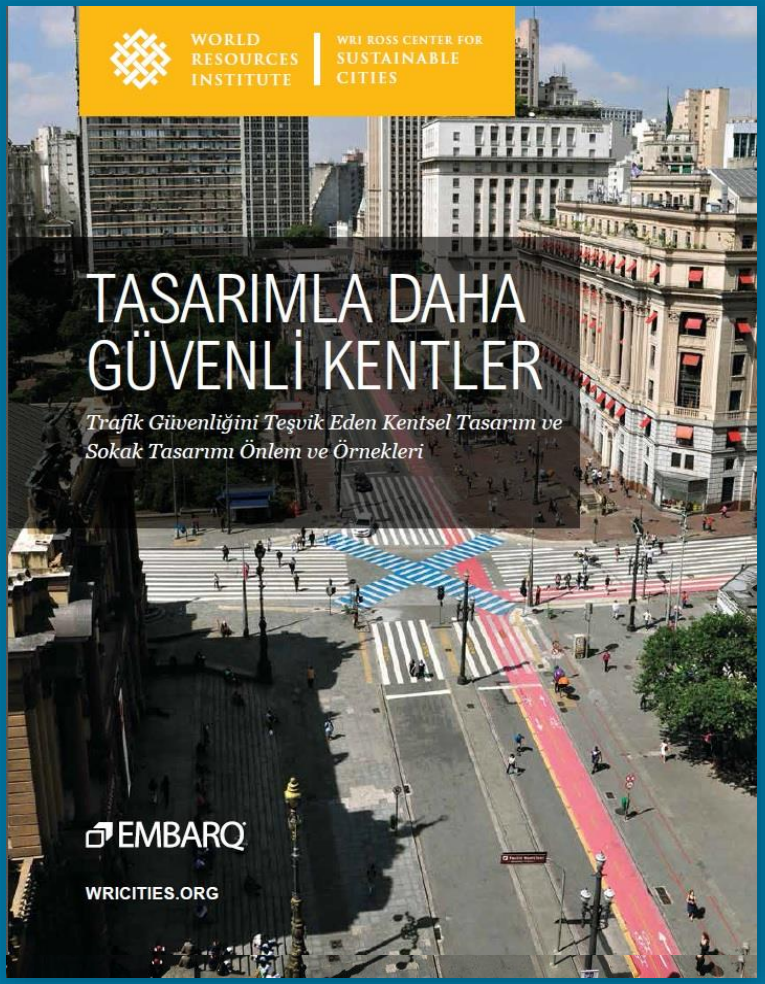

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