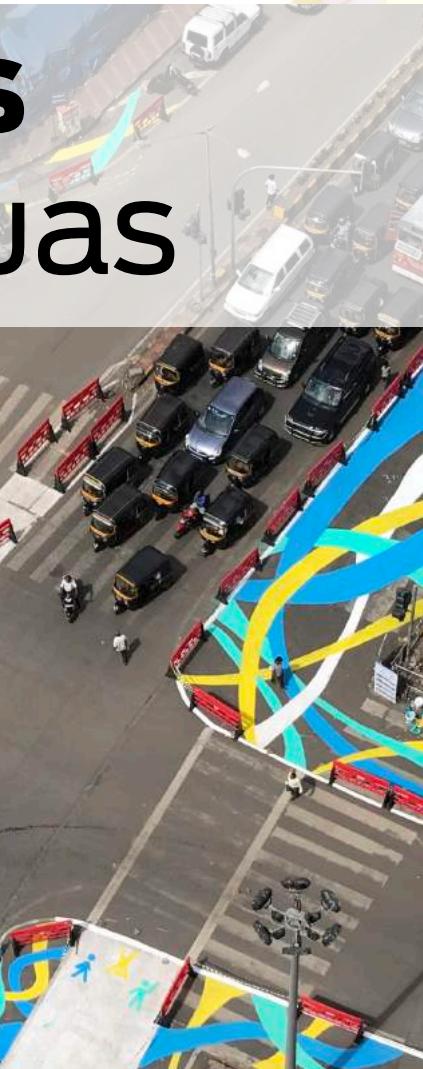


Designing for Safer Streets

Guia Global de Desenho de Ruas



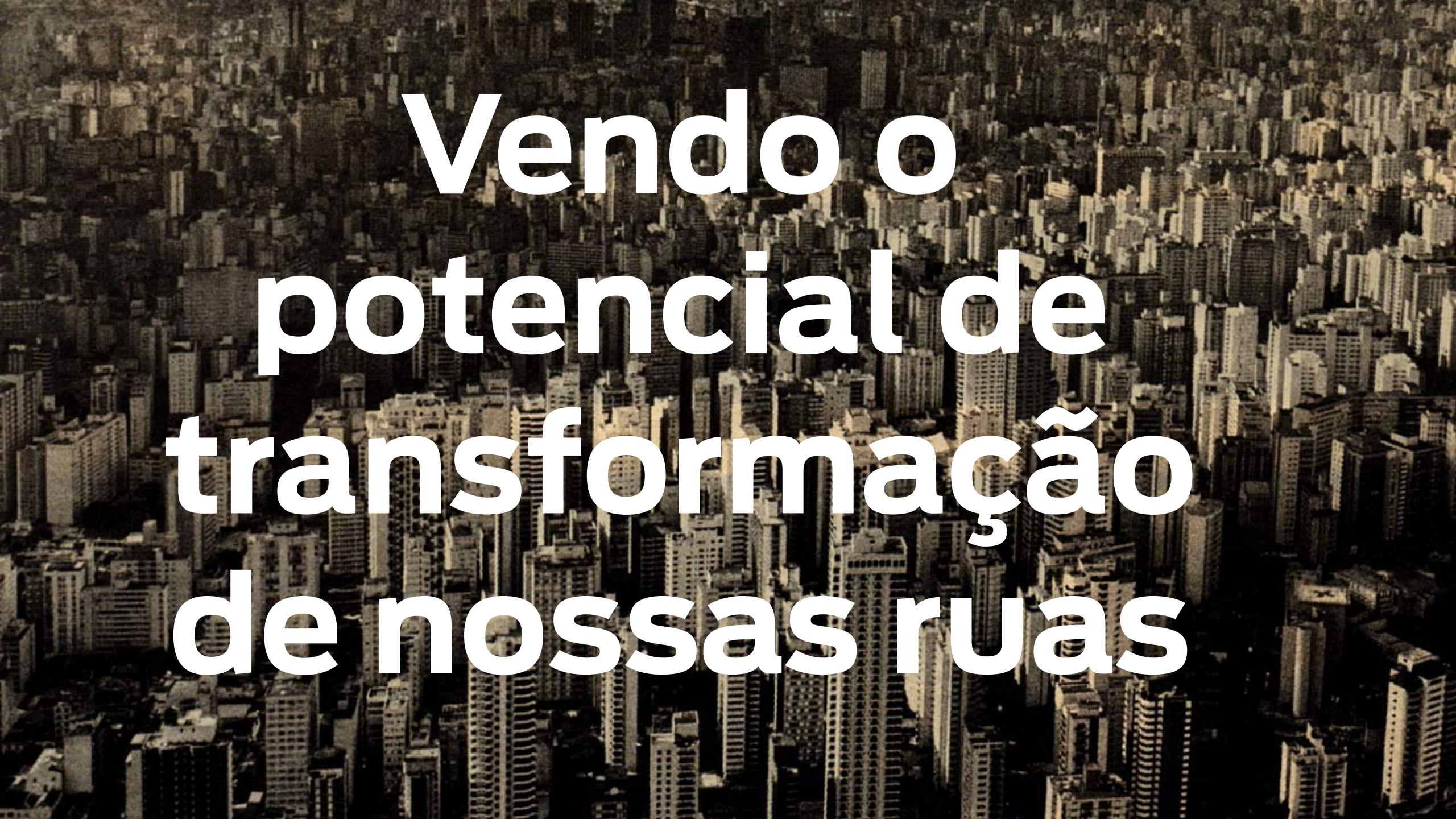
Road Safety Observatory | Fortaleza | August 2018
Skye Duncan

NACTO | National Association of City Transportation Officials
GDCI | Global Designing Cities Initiative

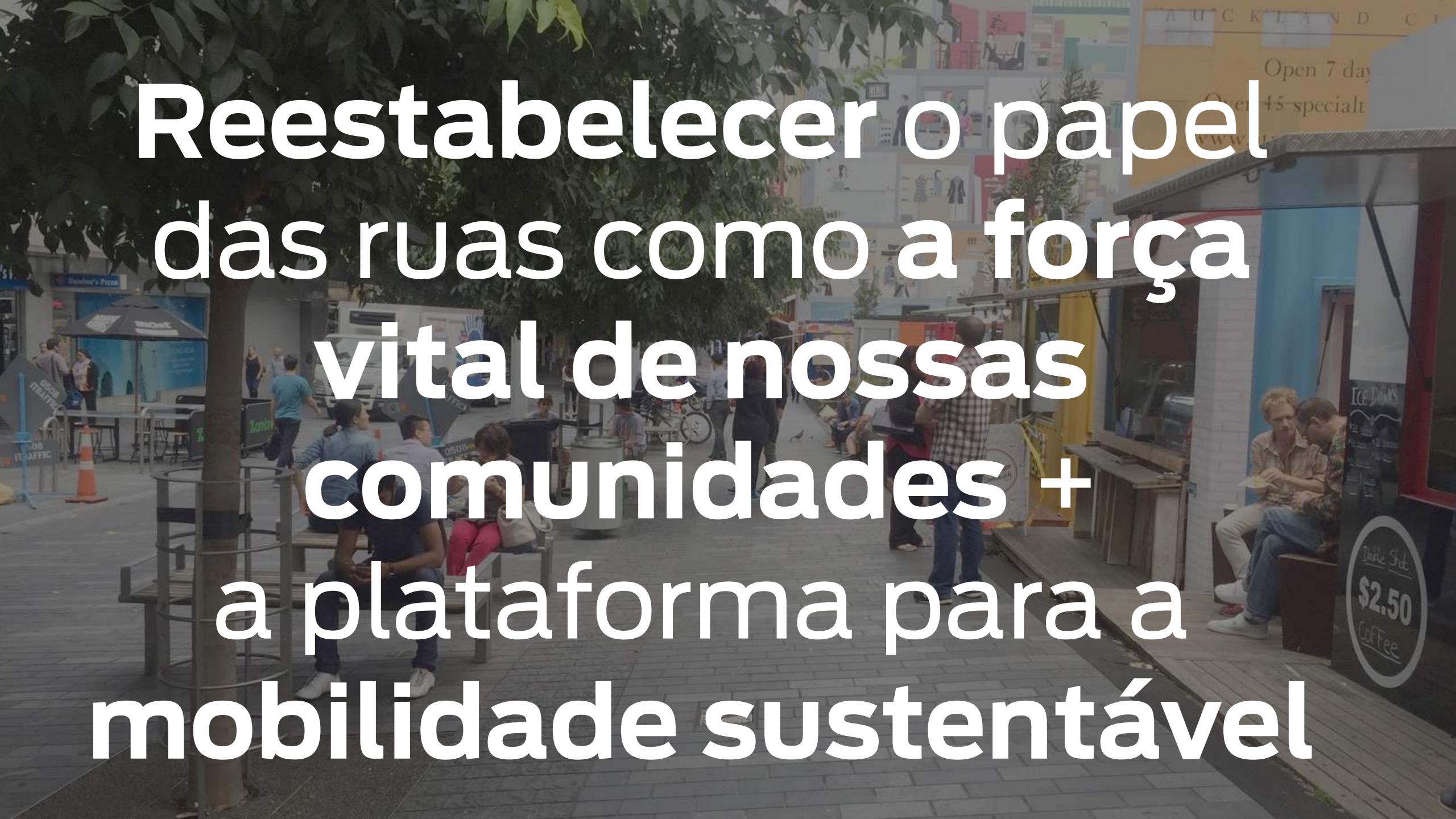
skye@nacto.org
@GlobalStreets



Global
Designing
Cities
Initiative

The background of the image is a high-angle aerial photograph of a city, likely Hong Kong, showing a vast expanse of closely packed buildings, streets, and infrastructure.

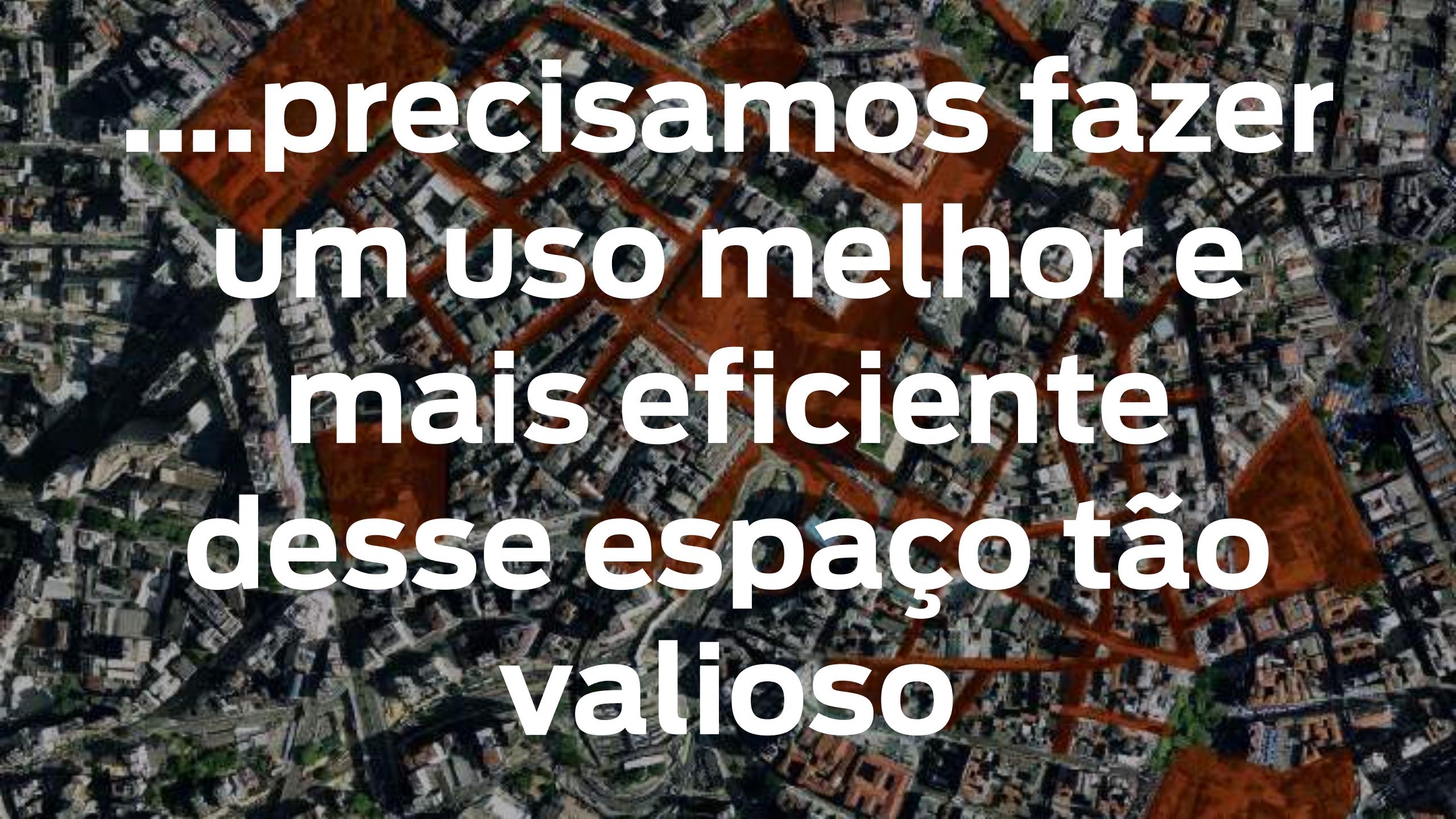
Vendo o
potencial de
transformação
de nossas ruas



Reestabelecer o papel
das ruas como a força
vital de nossas
comunidades +
a plataforma para a
mobilidade sustentável



A maior rede
contínua de
espaços
públicos

An aerial photograph of a city street showing a network of roads. Several roads are painted with a vibrant red color, creating a grid-like pattern across the urban landscape. The surrounding buildings are a mix of different architectural styles and colors, typical of a dense urban environment.

....precisamos fazer
um uso melhor e
mais eficiente
desse espaço tão
valioso

The background image is an aerial photograph of a city street grid. The streets are outlined in red, creating a pattern of red lines against a darker, textured background of buildings and green spaces. The perspective is from above, looking down at the urban landscape.

RUAS

São a plataforma para....

Mover-se



Brincar



Bronx, Nova York

Aprender a Pedalar



Fortaleza

Jan tar



Paris

Celebrar



Fortaleza

Tocar



Sydney

Ganhar dinheiro...



Nova York

...e gastar também ☺



Edimburgo

Passar o tempo com velhos amigos



Madri

....ou conhecer novos



Portland

Curtir a natureza



Delft

Relaxar



Nova Déli

A porta de entrada das nossas casas e lojas!

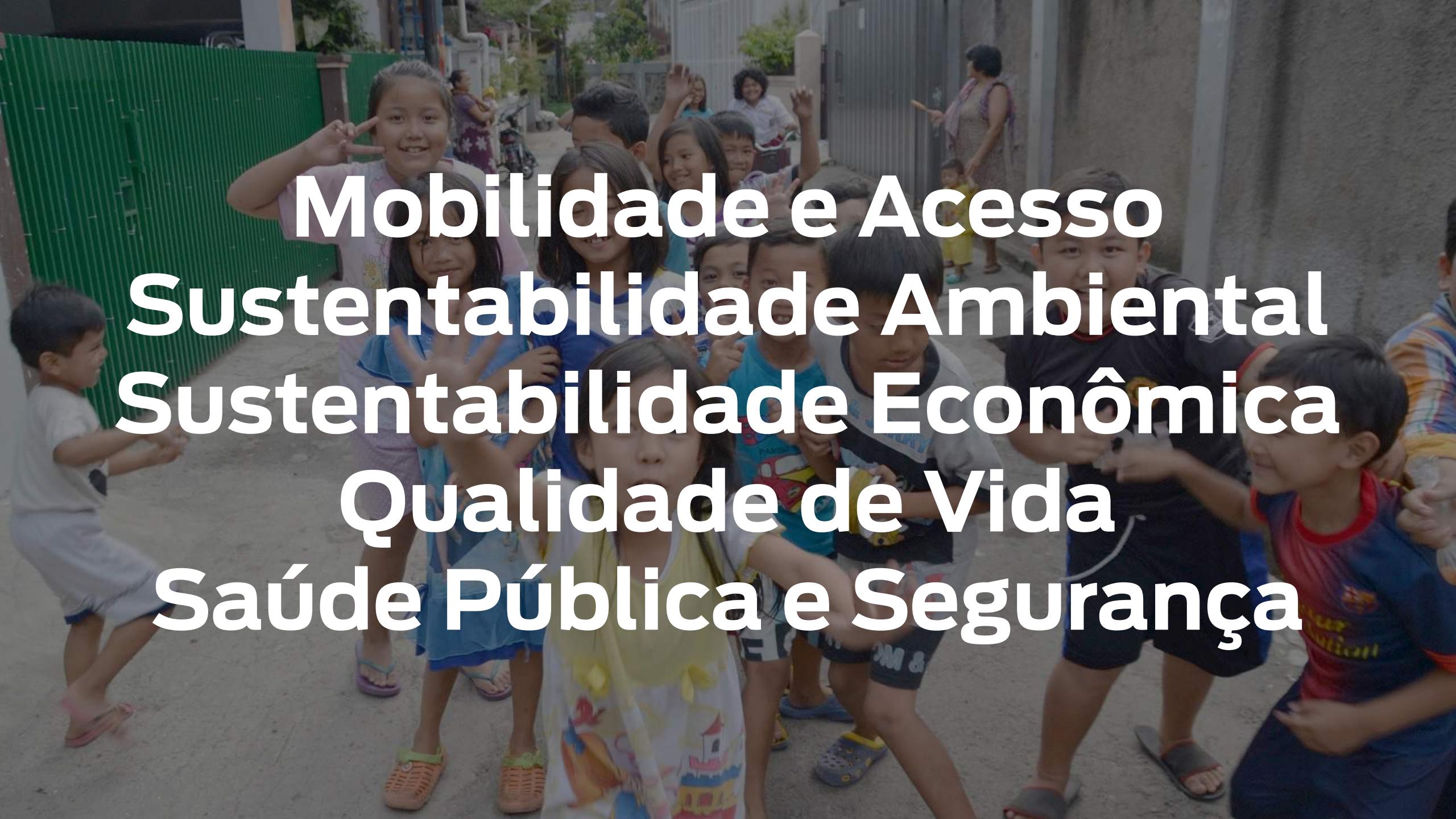


Nova York

An aerial photograph of a city street grid. The streets are primarily paved with a reddish-brown material, while the spaces between them and some smaller roads are covered in grey asphalt. The grid pattern is clearly visible, with major roads intersecting at various points. The surrounding area consists of dense urban development with numerous buildings of varying heights.

RUAS

Cumprem diversas funções...

A black and white photograph showing a group of approximately 15 children of various ages playing together on a paved street. They are wearing casual clothing like t-shirts, shorts, and flip-flops. Some children are in the foreground, while others are in the background near some houses and a green fence. One girl in the upper left is making a peace sign with her hand.

Mobilidade e Acesso
Sustentabilidade Ambiental
Sustentabilidade Econômica
Qualidade de Vida
Saúde Pública e Segurança

Mobilidade e Acesso

An aerial photograph capturing a massive traffic jam on a multi-lane highway. The cars are densely packed, forming a dark, winding path that stretches across the frame. The surrounding landscape includes green fields and some buildings in the distance, providing a stark contrast to the gridlock on the road.

Mobilidade e Acesso



Mobilidade e Acesso



Mobilidade e Acesso

A photograph showing a person from behind, walking away on a paved path. The path is bordered by a yellow curb. The person is wearing a dark jacket and dark pants. The background is slightly blurred, suggesting motion or a shallow depth of field.

Mobilidade e Acesso



Sustentabilidade Ambiental

A photograph capturing a massive environmental disaster at sea. A thick, dark plume of black smoke and oil stretches across the horizon, rising from a ruptured pipe or vessel. The water is dark and reflects the scale of the spill. In the distance, small boats are visible against the bright sky.

Sustentabilidade Ambiental



Sustentabilidade Ambiental



Sustentabilidade Ambiental



Sustentabilidade Ambiental



Sustentabilidade Econômica

A wide-angle photograph of a bustling outdoor shopping area. Large mature trees with dense green foliage provide shade over a paved walkway. In the background, a modern building with large glass windows and a glass-enclosed escalator is visible. Numerous people are walking through the area, some carrying shopping bags, others sitting on benches or at outdoor tables. A sign for "General Pants Co." is prominent on the right side of the frame. The overall atmosphere is lively and suggests a blend of urban commerce and natural elements.



Sustentabilidade Econômica

Sustentabilidade Econômica

An aerial photograph of a complex multi-level highway interchange. The image shows several concrete overpasses and ramps connecting different highway lanes. There are various types of vehicles, including cars, trucks, and vans, moving along the roads. The surrounding area includes some greenery and streetlights. The overall scene depicts a busy urban transportation network.



Sustentabilidade Econômica

A photograph of a woman in a white t-shirt and blue jeans pushing a stroller with a child on a city street. She is looking back over her shoulder. The street is busy with other vehicles, including a yellow school bus and several cars. The background shows trees and buildings.

Qualidade de Vida

Qualidade de Vida



A vibrant, sunlit street scene in a city. In the foreground, a man wearing a green shirt and a white visor pushes a black stroller with a child seated in it. He is looking down at the stroller. To his right, a woman in a red top and grey cardigan walks away from the camera. Further right, another woman in a black top and green skirt walks towards the camera. In the background, a white bus with the number "5113" is stopped at a bus stop. Many other people are walking in various directions, some carrying bags. The scene is filled with bright sunlight and long shadows.

Qualidade de Vida

Saúde Pública e Segurança



Saúde Pública e Segurança



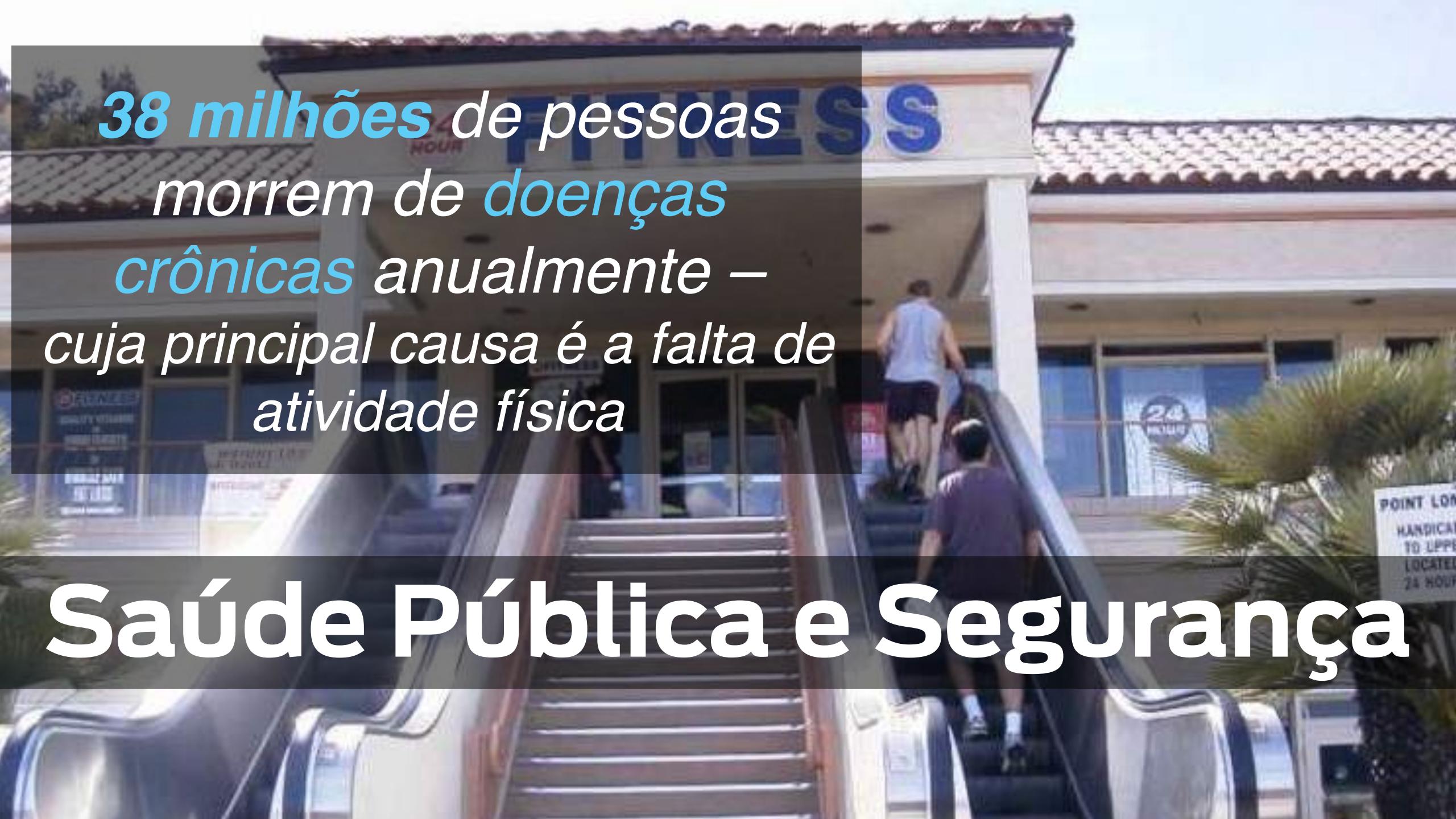
1,34 milhões de pessoas morrem prematuramente devido à poluição atmosférica todos os anos – cuja fonte primária são os veículos motorizados



24
HOUR

FITNESS

Saúde Pública e Segurança



*38 milhões de pessoas
morrem de doenças
crônicas anualmente –
cuja principal causa é a falta de
atividade física*

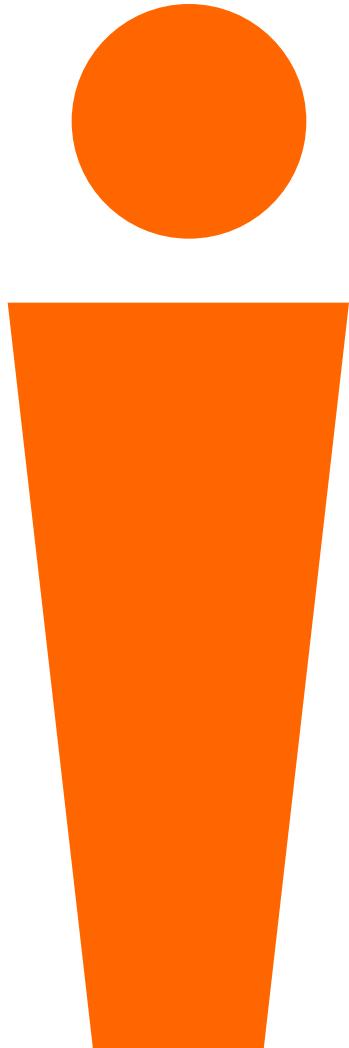
Saúde Pública e Segurança

Saúde Pública e Segurança





1,4 milhões
de mortes no
trânsito ao ano



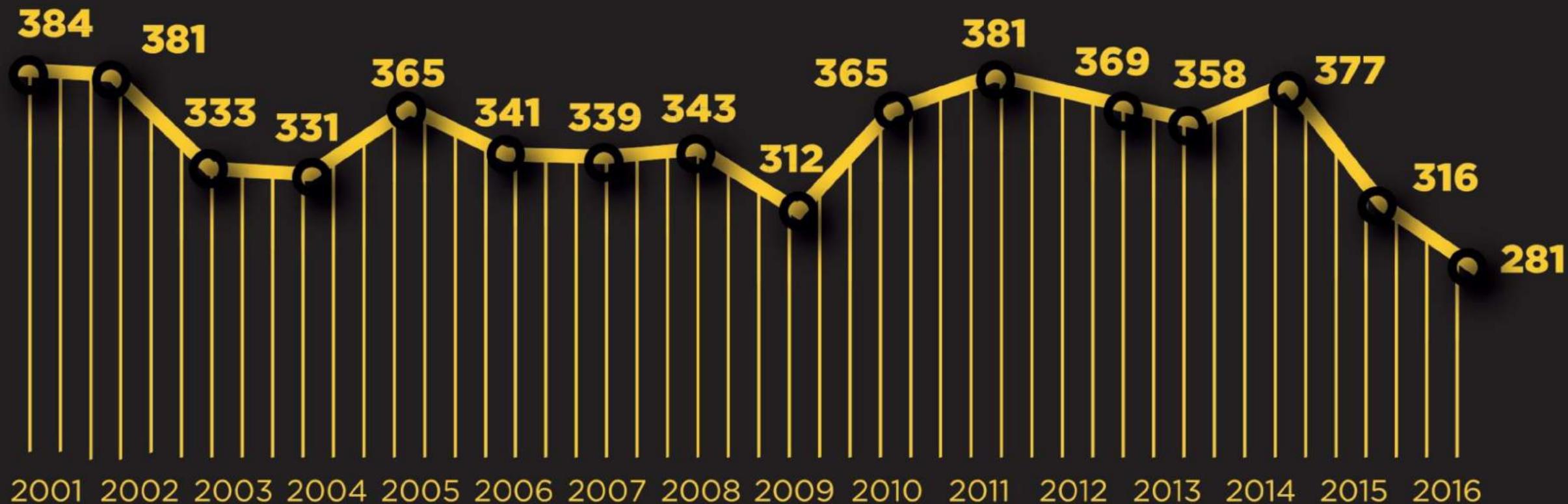
**1 pessoa a
cada
23 segundos**



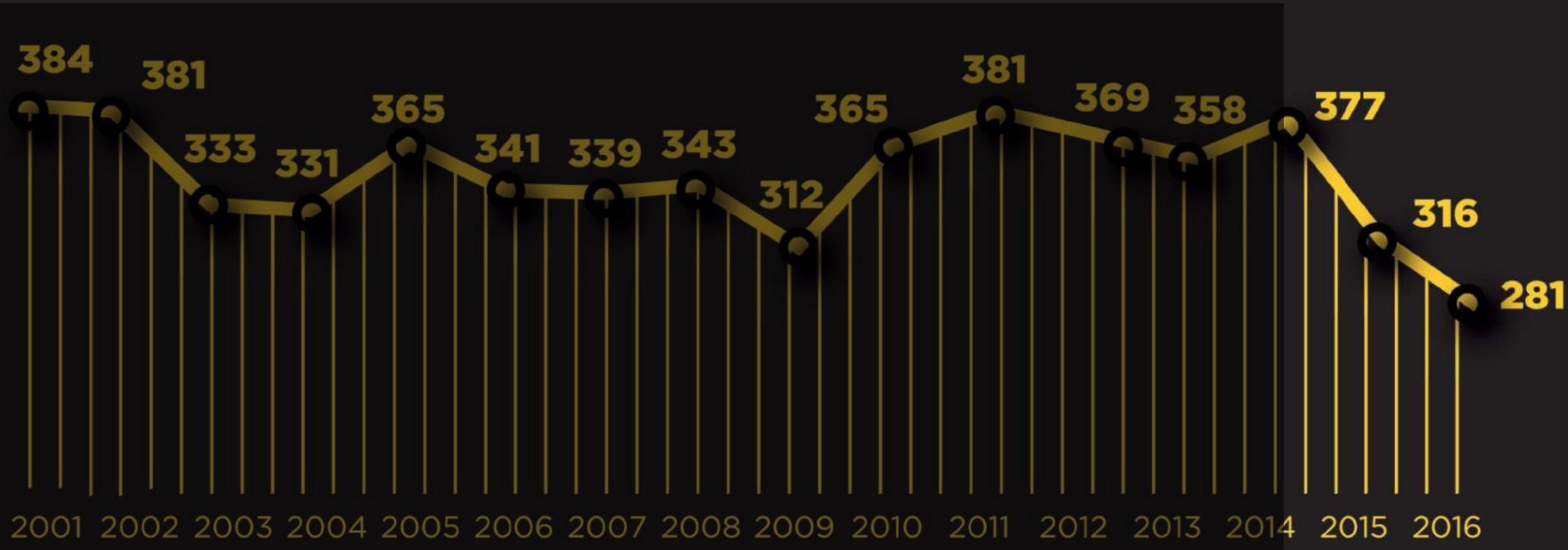
3840

APENAS HOJE

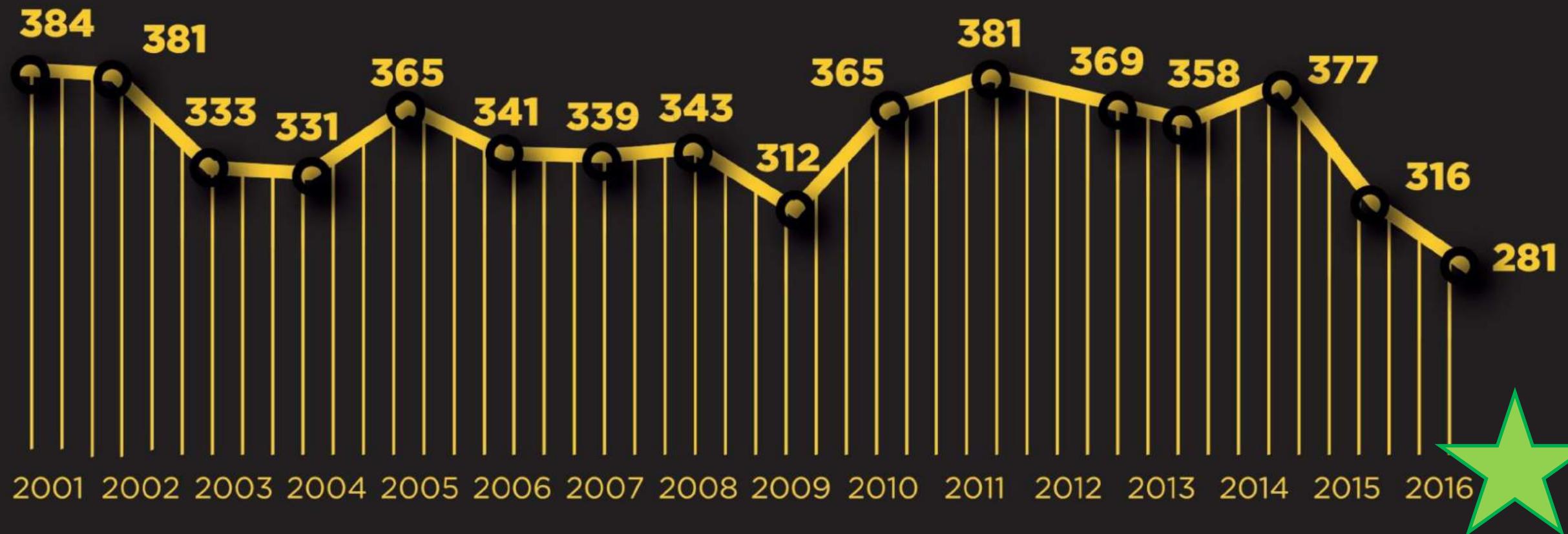
Fortaleza's numbers are improving....



Fortaleza's numbers are improving....



Fortaleza's numbers are improving....



But we still have a long way to go to reach
ZERO....



281

vítimas
fatais no
trânsito
em 2018

**Essas mortes são
evitáveis!**

**Essas mortes são
evitáveis!**

Sabemos como fazer ☺

Speed Kills!

Velocidade mata

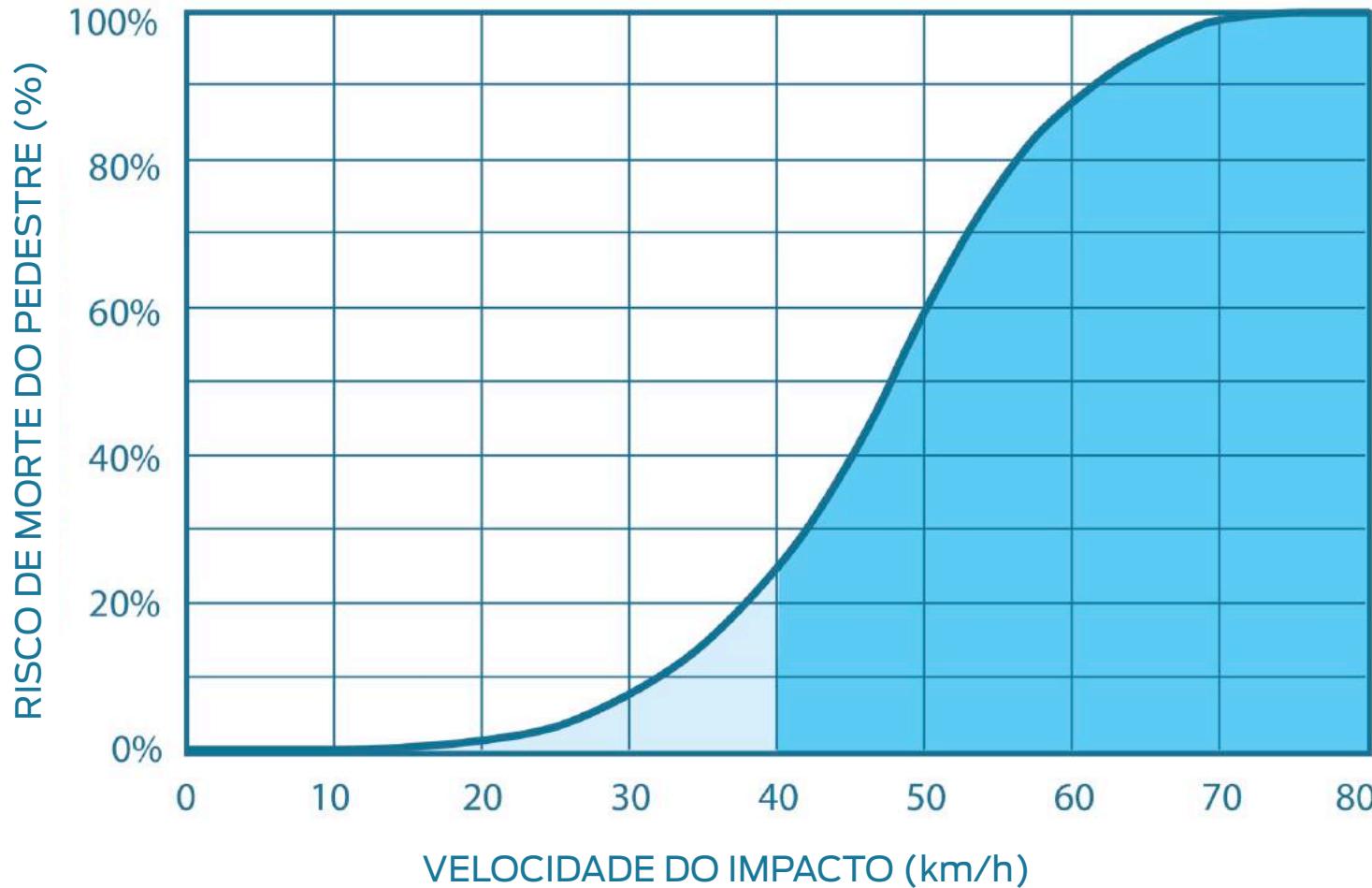


1.

Reducir velocidades

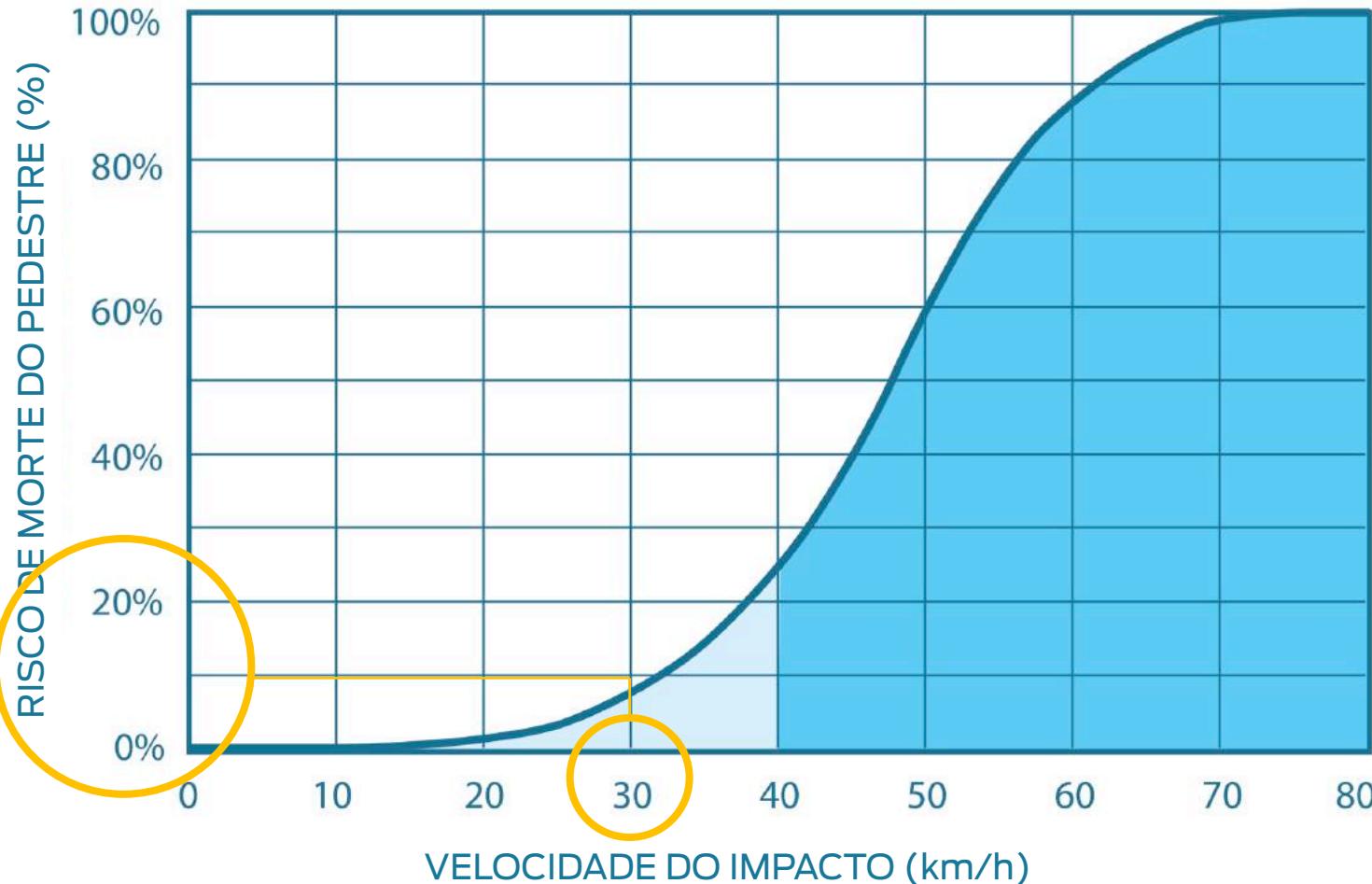


Risco de Morte de Pedestres e Velocidade de Impacto



Note: The above figure shows the relationship between pedestrian fatalities and vehicle impact speed published by the OECD (2006). Some recent studies show a similar relationship, but account for sample bias to find slightly lower risks in the 40 to 50 km/hr range. (Rosen & Sander 2009, Tefft 2011, Richards 2010, Hannawald and Kauer 2004) There are not, however, studies from low- and middle-income countries where things like vehicle type, emergency response time and other characteristics may influence this relationship. In any case, there is clear evidence to support policies and practices that lower vehicle speeds to 30 km/hr where pedestrians are commonly present, and no more than 50 km/hr on non-grade separated streets.

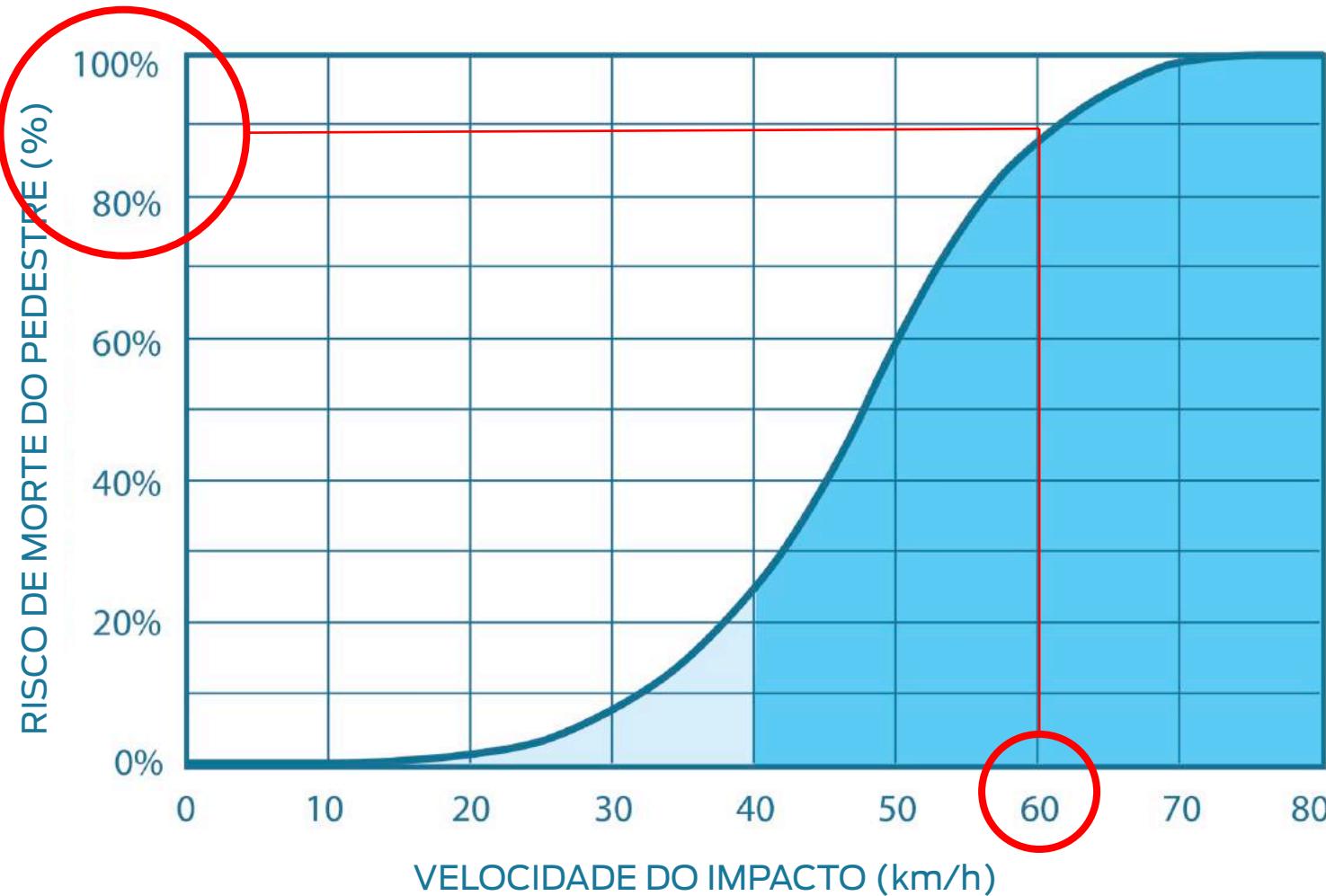
Risco de Morte de Pedestres e Velocidade de Impacto



30km/h =
90%
chance de
SOBREVIVER

Note: The above figure shows the relationship between pedestrian fatalities and vehicle impact speed published by the OECD (2006). Some recent studies show a similar relationship, but account for sample bias to find slightly lower risks in the 40 to 50 km/hr range. (Rosen & Sander 2009, Tefft 2011, Richards 2010, Hannawald and Kauer 2004) There are not, however, studies from low- and middle-income countries where things like vehicle type, emergency response time and other characteristics may influence this relationship. In any case, there is clear evidence to support policies and practices that lower vehicle speeds to 30 km/hr where pedestrians are commonly present, and no more than 50 km/hr on non-grade separated streets.

Risco de Morte de Pedestres e Velocidade de Impacto



60km/h =
90%
chance de
MORRER

Note: The above figure shows the relationship between pedestrian fatalities and vehicle impact speed published by the OECD (2006). Some recent studies show a similar relationship, but account for sample bias to find slightly lower risks in the 40 to 50 km/hr range. (Rosen & Sander 2009, Tefft 2011, Richards 2010, Hannawald and Kauer 2004) There are not, however, studies from low- and middle-income countries where things like vehicle type, emergency response time and other characteristics may influence this relationship. In any case, there is clear evidence to support policies and practices that lower vehicle speeds to 30 km/hr where pedestrians are commonly present, and no more than 50 km/hr on non-grade separated streets.



O corpo humano resiste a uma quantidade de força limitada em um impacto.

Força = Massa x Aceleração
= Tamanho / Peso do Veículo x Velocidade

Vulnerabilidade do Pedestre

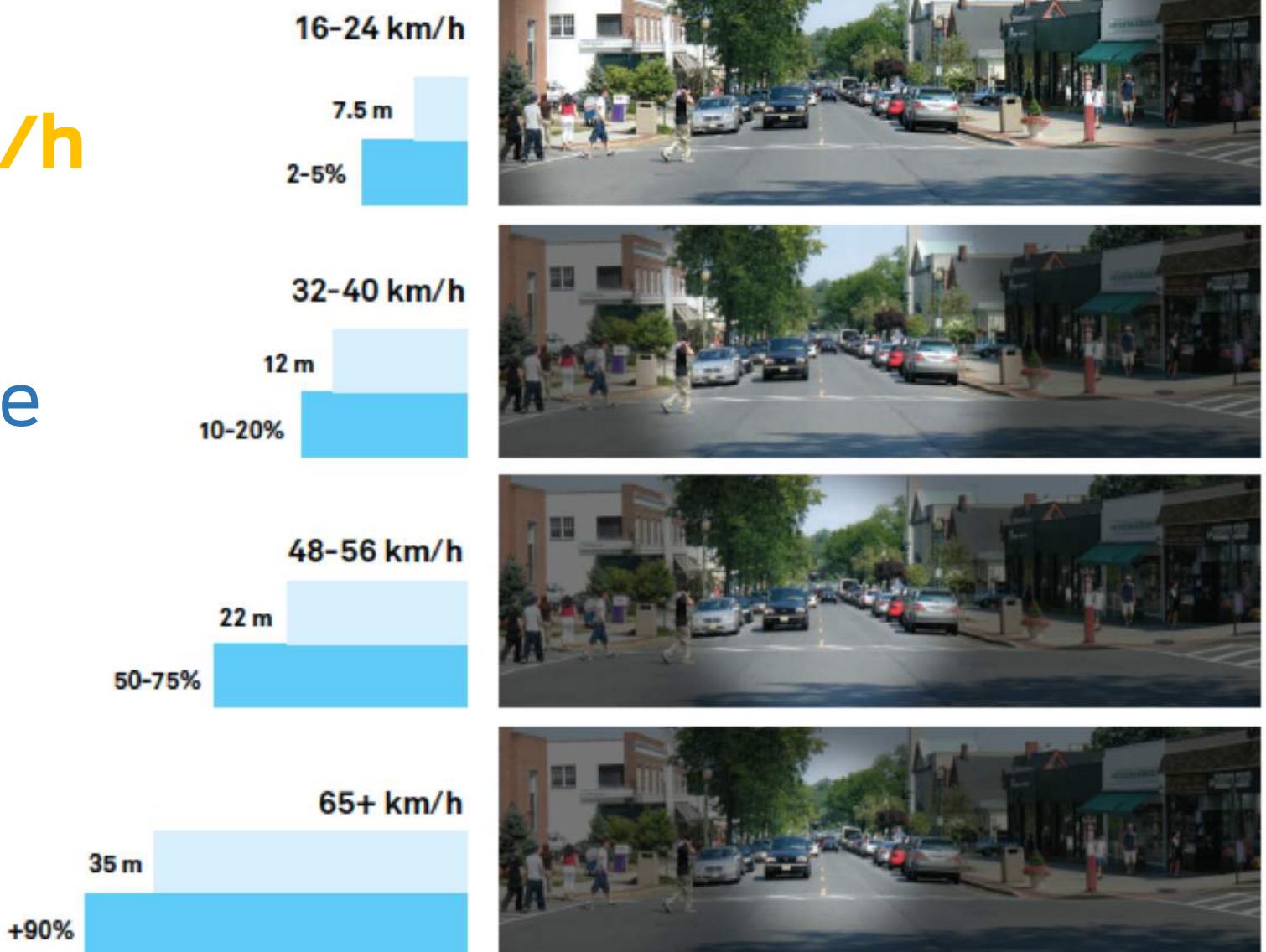


....e nós não andamos
com uma **armadura**
externa de proteção!

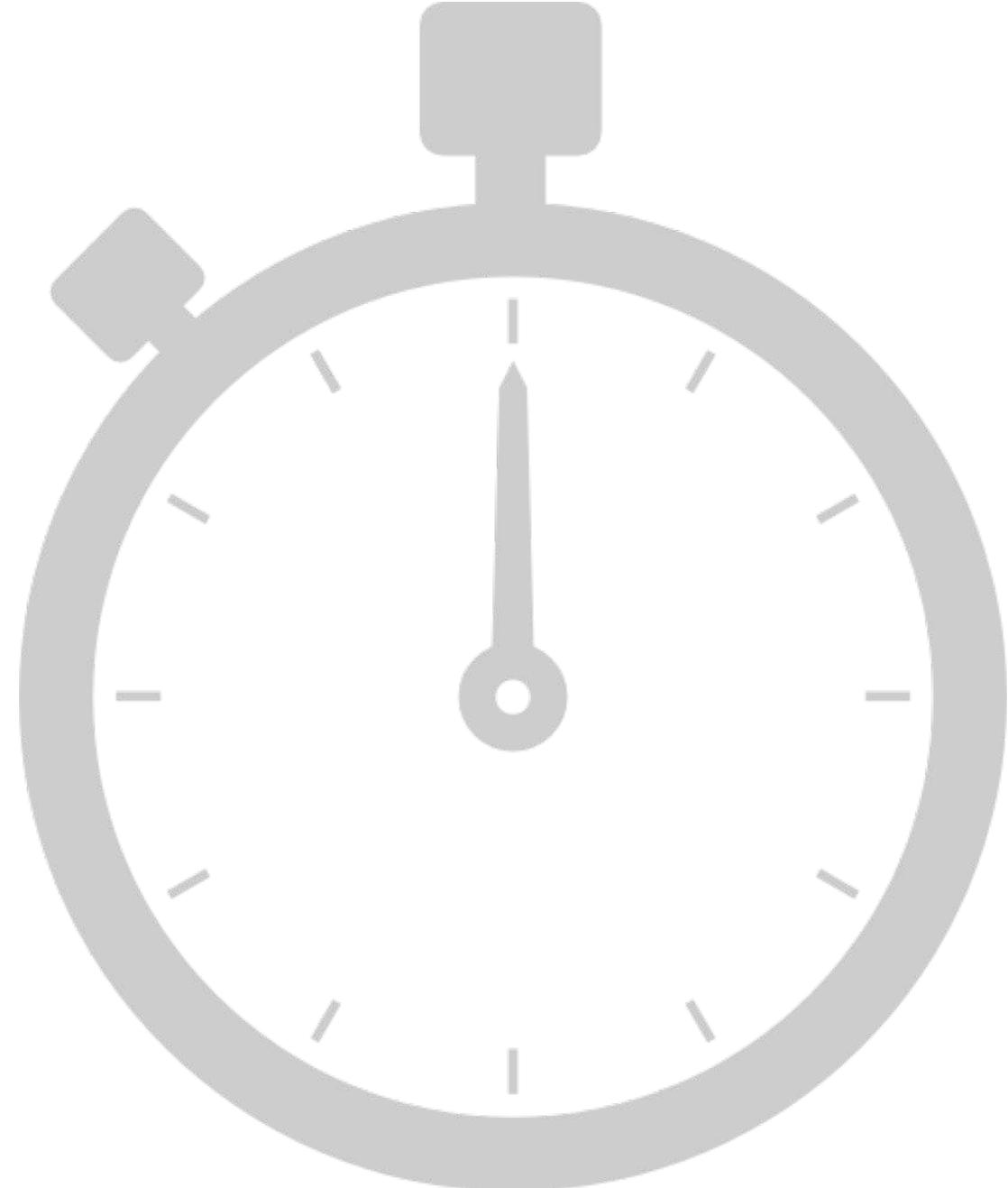
Vulnerabilidade e Velocidade

Um aumento de **1 km/h** na velocidade média **eleva o risco** de acidentes em **3%** e de **mortes** em **4-5%**

(FONTE: OMS)



**Por quantos
minutos a
menos de
viagem
trocaríamos
uma vida?**





Regional Platform on
Access and Innovation
for Health Technologies **PRAIS**



Organización
Panamericana
de la Salud



Organización
Mundial de la Salud
OFICINA REGIONAL PARA LAS Américas

Home > twitter > Great news for #Chile: New speed limits of 50 km/hr in urban areas, which will reduce traffic injuries and deaths....

Great news for #Chile: New speed limits of 50 km/hr in urban areas, which will reduce traffic injuries and deaths....

ADMIN - 15:18, 9 DE JULIO DE 2018 9

| | | | 0

Great news for [#Chile](#): New speed limits of 50 km/hr in urban areas, which will reduce traffic injuries and deaths....
twitter.com/i/web/status/1...

Leste Oeste



Limites de Velocidade + Áreas de Velocidade Reduzida



Paris



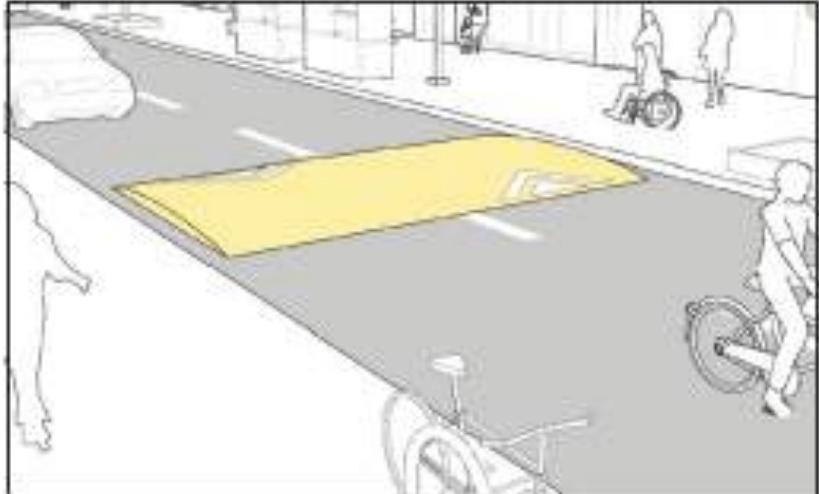
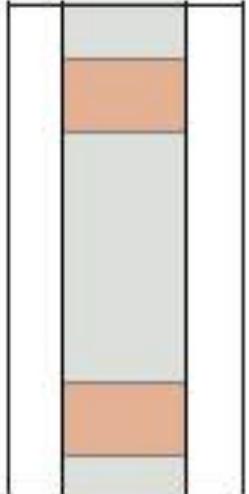
Reino Unido (m/h)



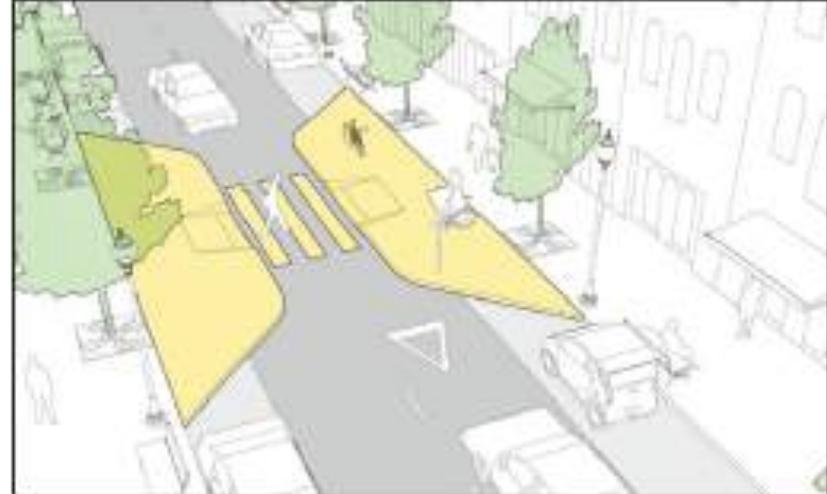
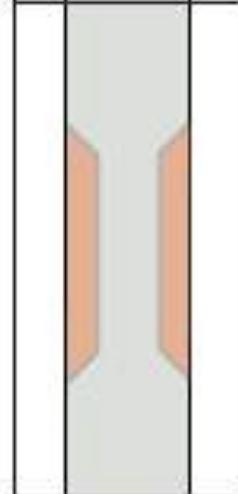
Christchurch, Nova Zelândia

Desenho Geométrico

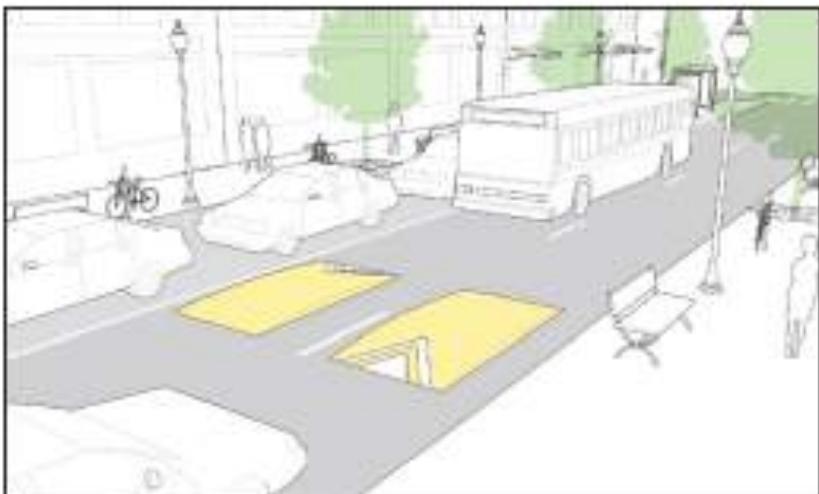
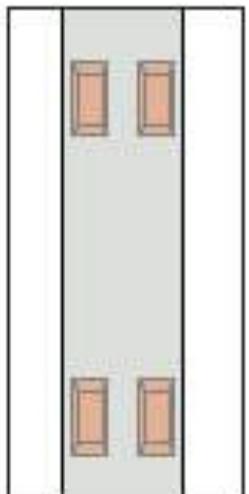
(Deflexões Verticais e Horizontais, Cruzamentos Compactos, Faixas Estreitas etc.)



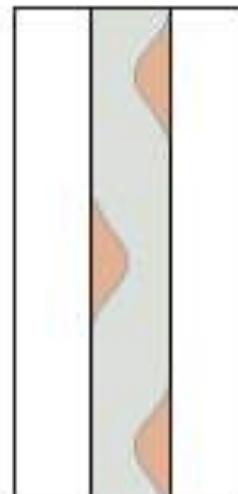
Lombadas



Pontos de Estreitamento e Travessia



Almofadas



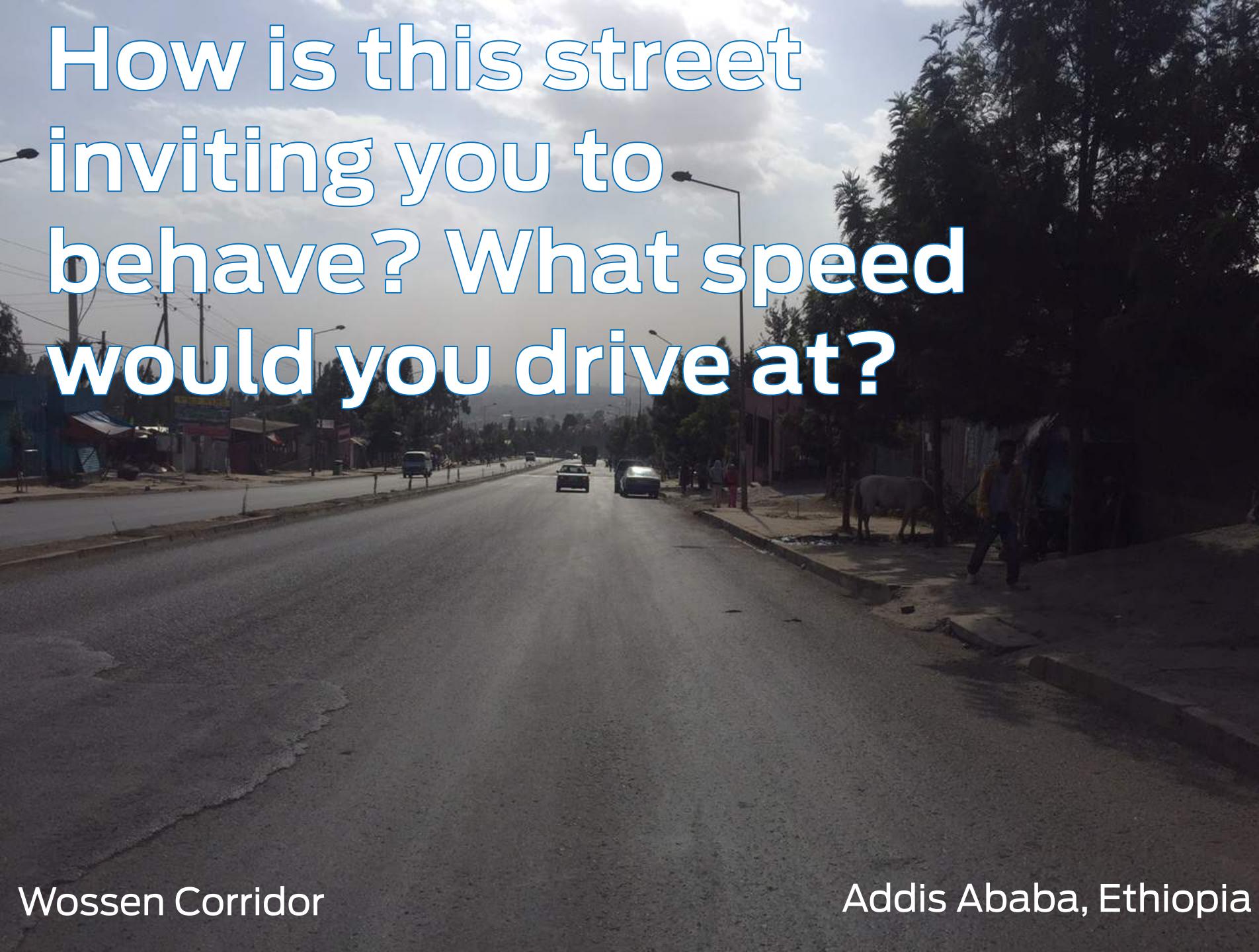
Chicanas e Faixas Alternadas



Wossen Corridor

Addis Ababa, Ethiopia

**How is this street
inviting you to
behave? What speed
would you drive at?**



Wossen Corridor

Addis Ababa, Ethiopia



Add a
speed
limit
sign

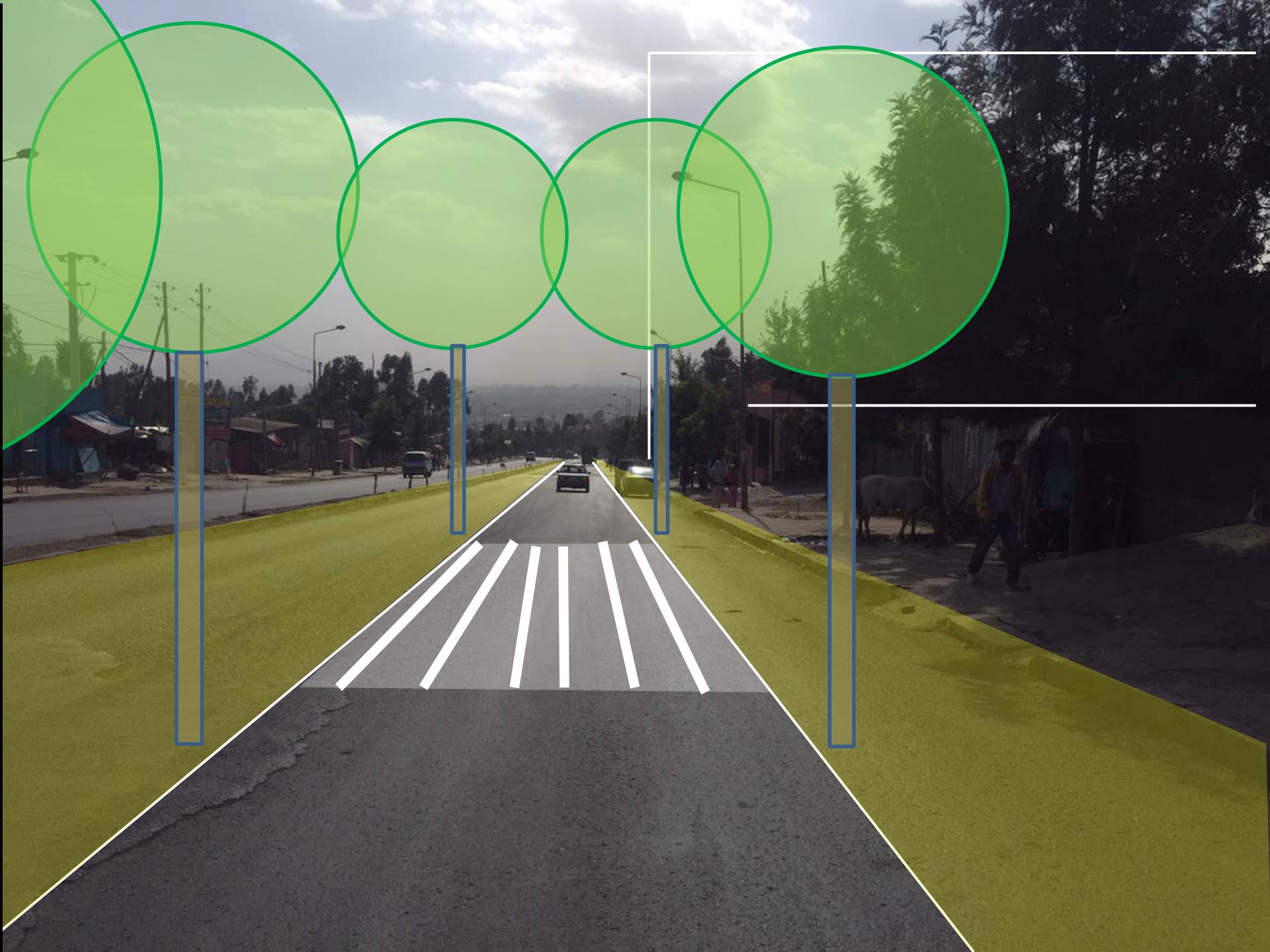
**Police
check
point**

**Add a
speed
limit
sign**



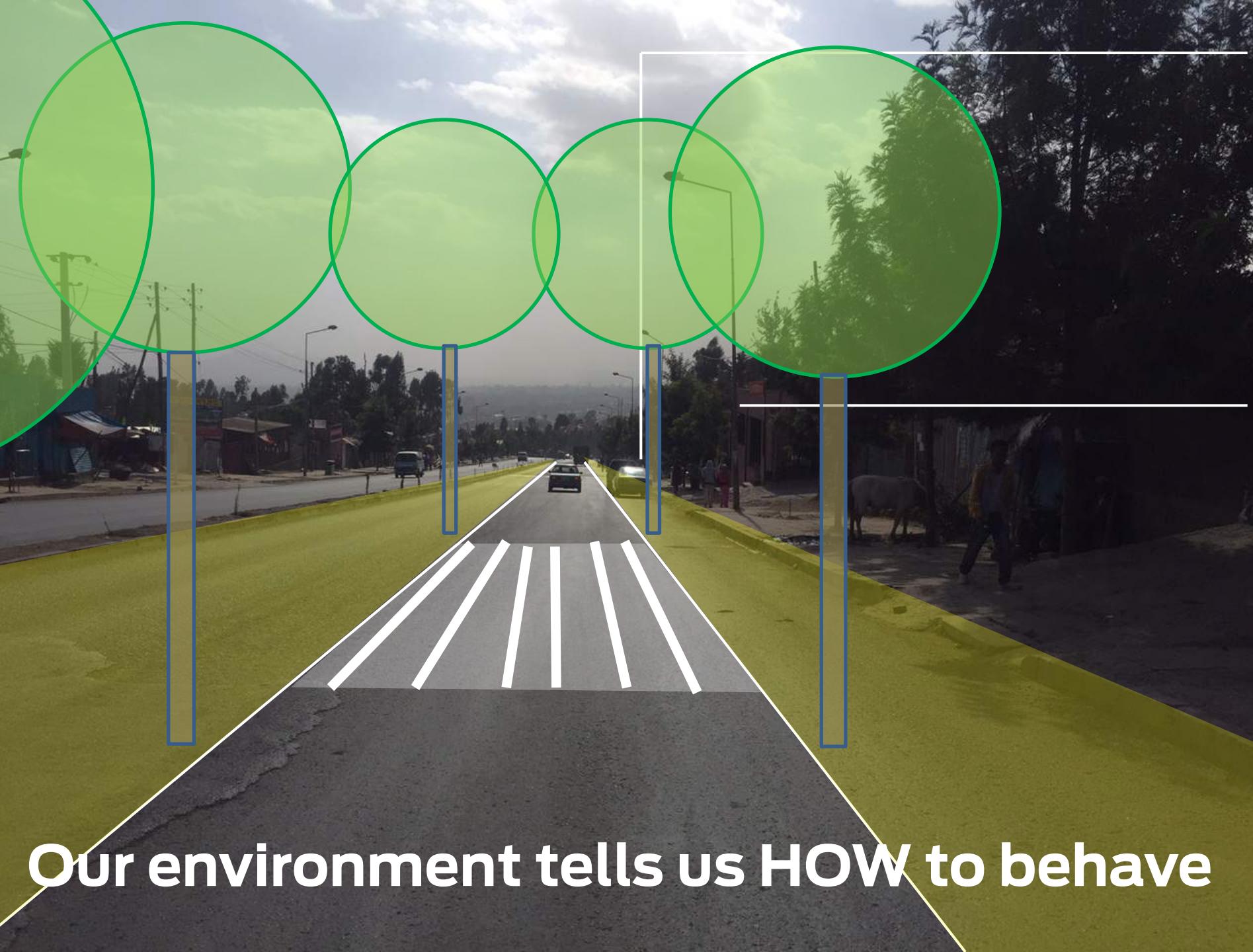
**Police
check
point**

**Add a
speed
limit
sign**



Police
check
point

Add a
speed
limit
sign



Our environment tells us HOW to behave

Station
police
person



Bad ‘Design’
can self-enforce
unsafe behaviors

&

Add a
speed
limit
sign



Good ‘Design’
can self-enforce
safe behaviors

Without redesigning this street, it will be hard to send a different message for default behavior!

2.

Priorizar escolhas de
mobilidade sustentável



**Parar de
priorizar e
subsidiar
veículos
motorizados
individuais**



**Tornar as
opções de
transporte
sustentável
seguras,
convenientes,
baratas e
confortáveis**



**Parar de
priorizar e
subsidiar
veículos
motorizados
individuais**



**Tornar
fácil não
dirigir**



Demanda induzida, ou...



Trânsito

Mais faixas,
mais largas

Mais Carros

Mais
Trânsito

...a profecia autorrealizável do Trânsito

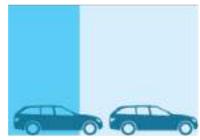


“Acrescentar mais faixas para lidar com o trânsito é o mesmo que afrouxar o cinto para curar obesidade.”

(Lewis Mumford, 1955)

“Adding highway lanes to deal with traffic congestion is like loosening your belt to cure obesity.” (Lewis Mumford, 1955)

Ruas multimodais são mais eficientes



Private Motor Vehicles

600–1,600/hour



Mixed Traffic With Frequent Buses

1,000–2,800/hour



Two-way Protected Bikeway

6,500–7,500/hour



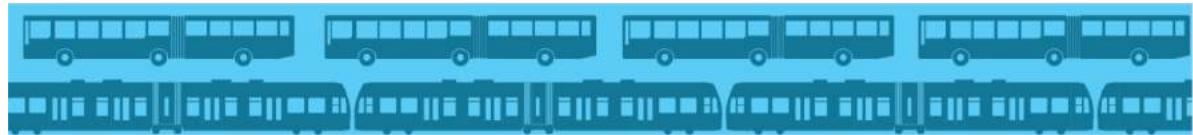
Dedicated Transit Lanes

4,000–8,000/hour



Sidewalk

8,000–9,000/hour

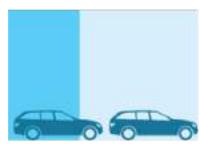


On-street Transitway, Bus Or Rail

10,000–25,000/hour

**transporte
sustentável
se move
muito mais
pessoas**

Ruas multimodais são mais eficientes



Private Motor Vehicles
600–1,600/hour



Mixed Traffic With Frequent Buses
1,000–2,800/hour



Two-way Protected Bikeway
6,500–7,500/hour



Dedicated Transit Lanes
4,000–8,000/hour



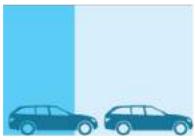
Sidewalk
8,000–9,000/hour



On-street Transitway, Bus Or Rail
10,000–25,000/hour

transporte
sustentável
se move
muito mais
pessoas

Ruas multimodais são mais eficientes



Private Motor Vehicles

600–1,600/hour



Mixed Traffic With Frequent Buses

1,000–2,800/hour



Two-way Protected Bikeway

6,500–7,500/hour



Dedicated Transit Lanes

4,000–8,000/hour



Sidewalk

8,000–9,000/hour

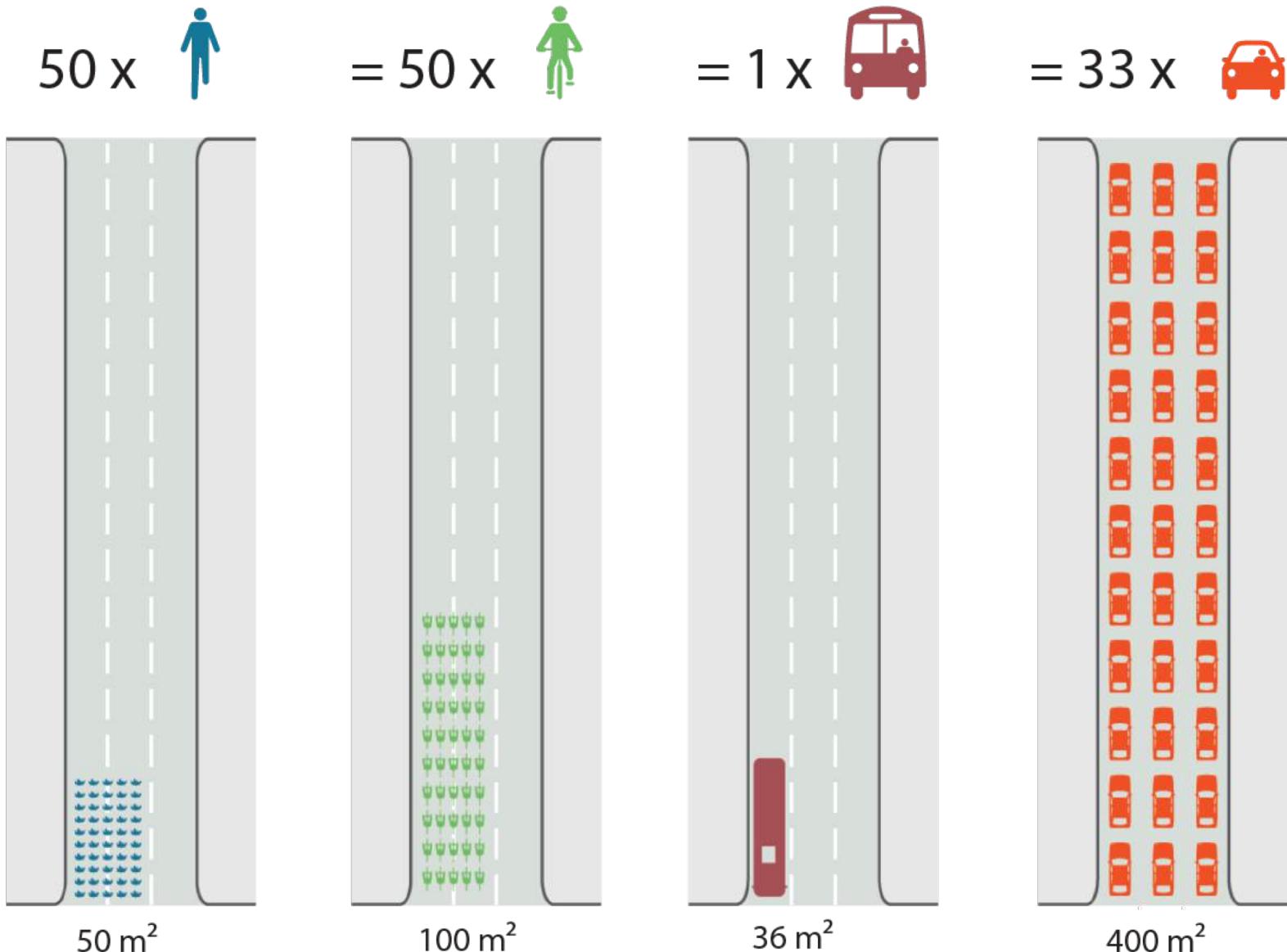


On-street Transitway, Bus Or Rail

10,000–25,000/hour

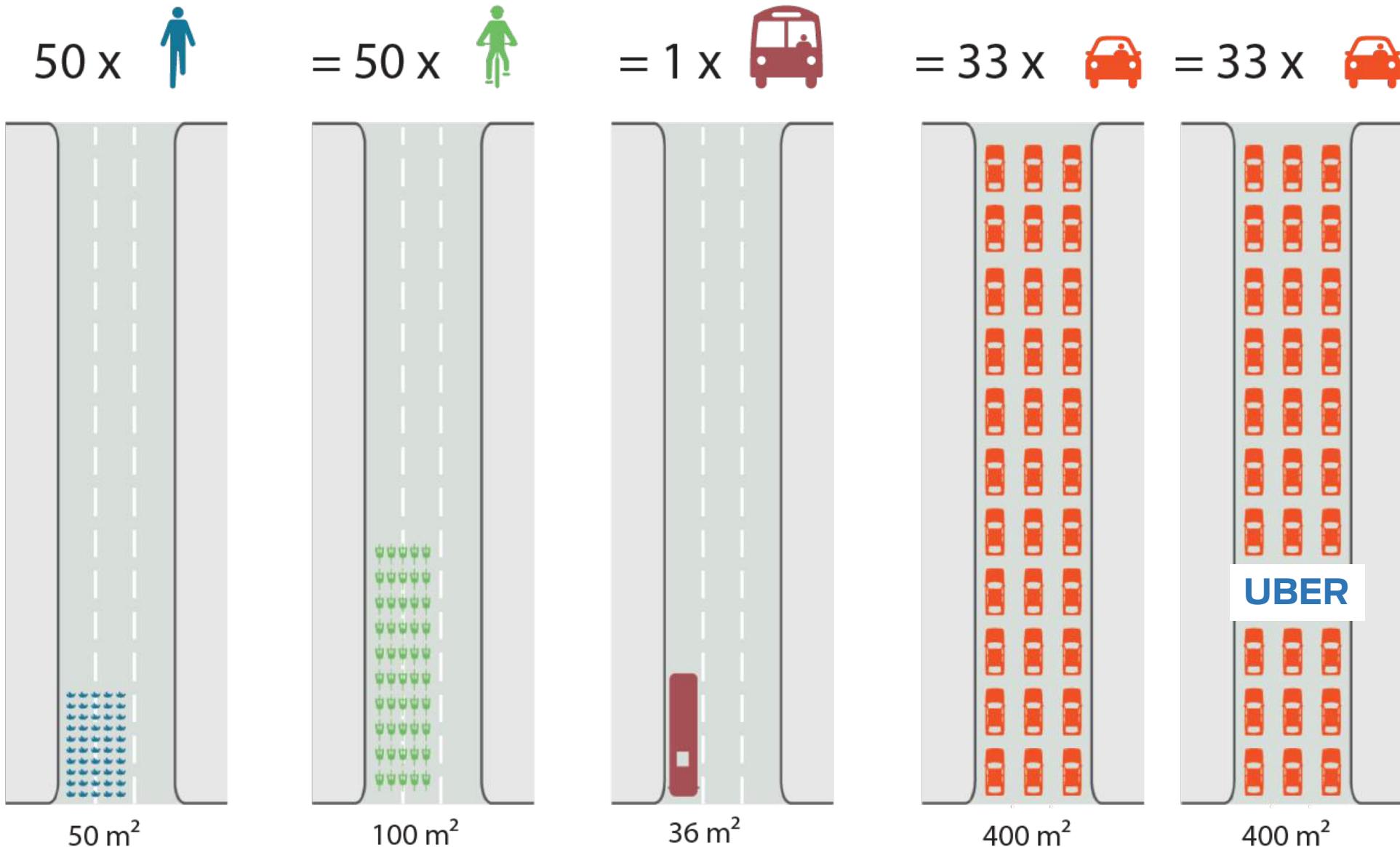
transporte
sustentável
se move
muito mais
pessoas

Ruas multimodais são mais eficientes



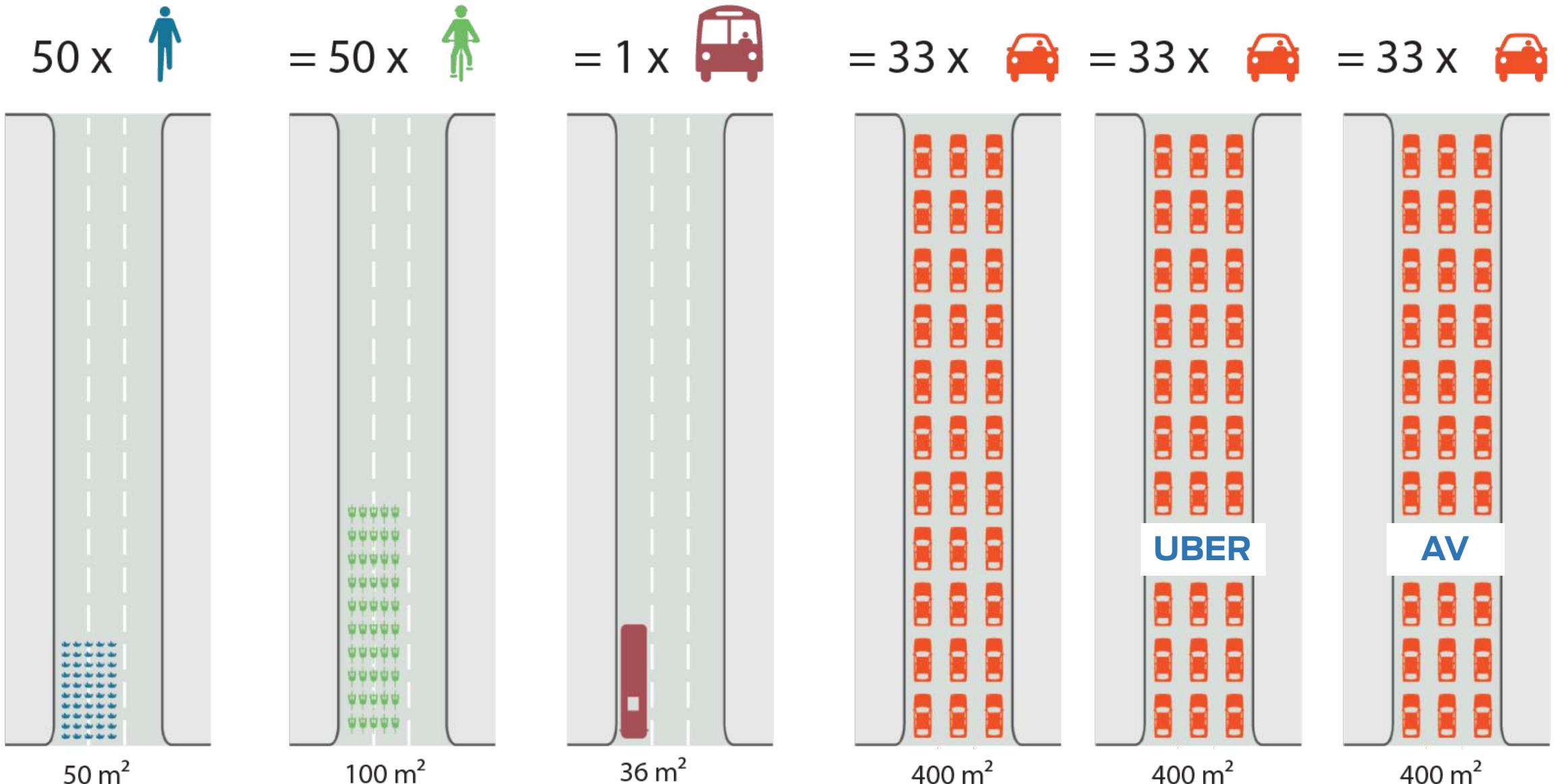
Space needed to move 50 people

Ruas multimodais são mais eficientes



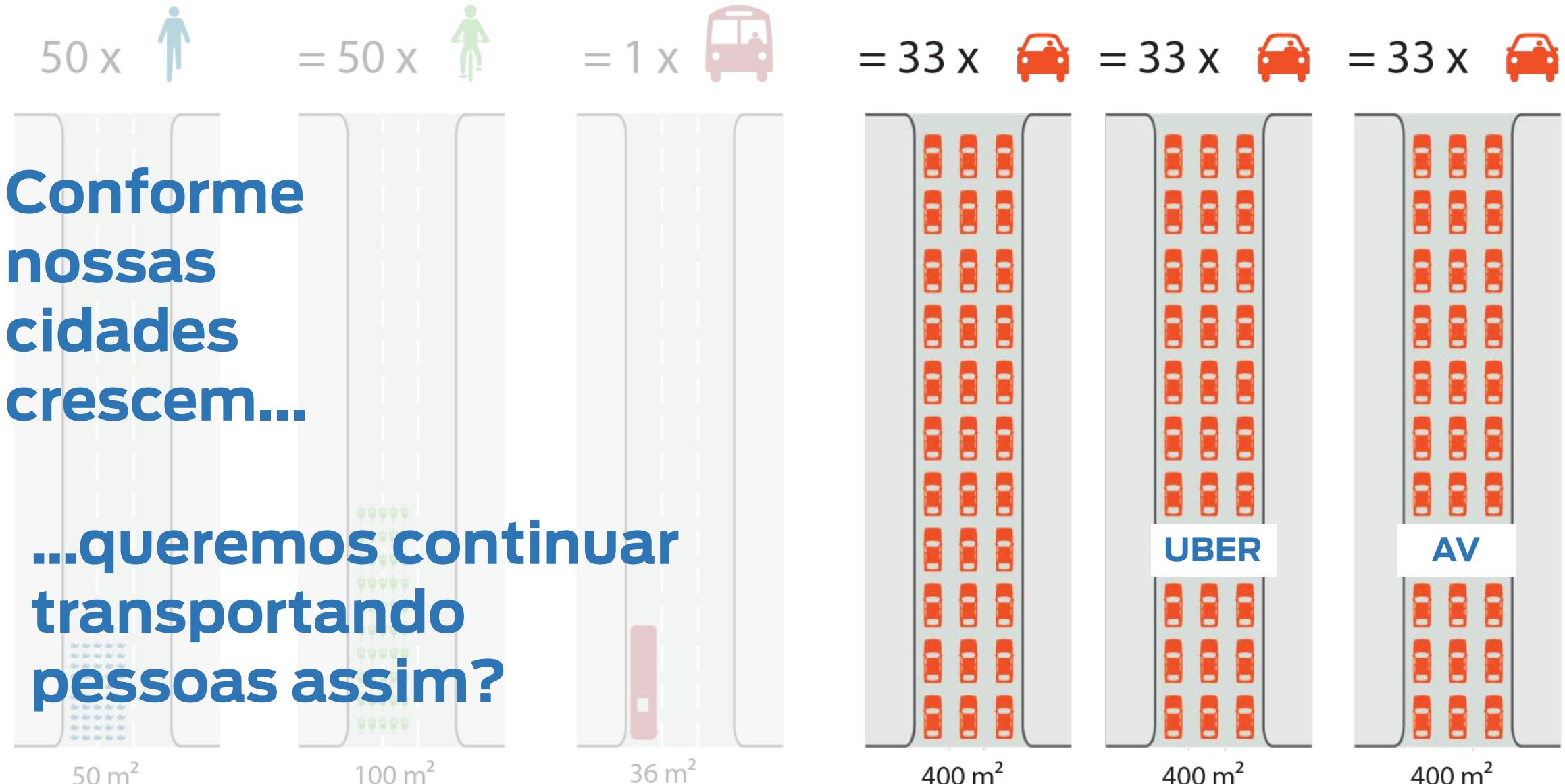
Space needed to move 50 people

Ruas multimodais são mais eficientes



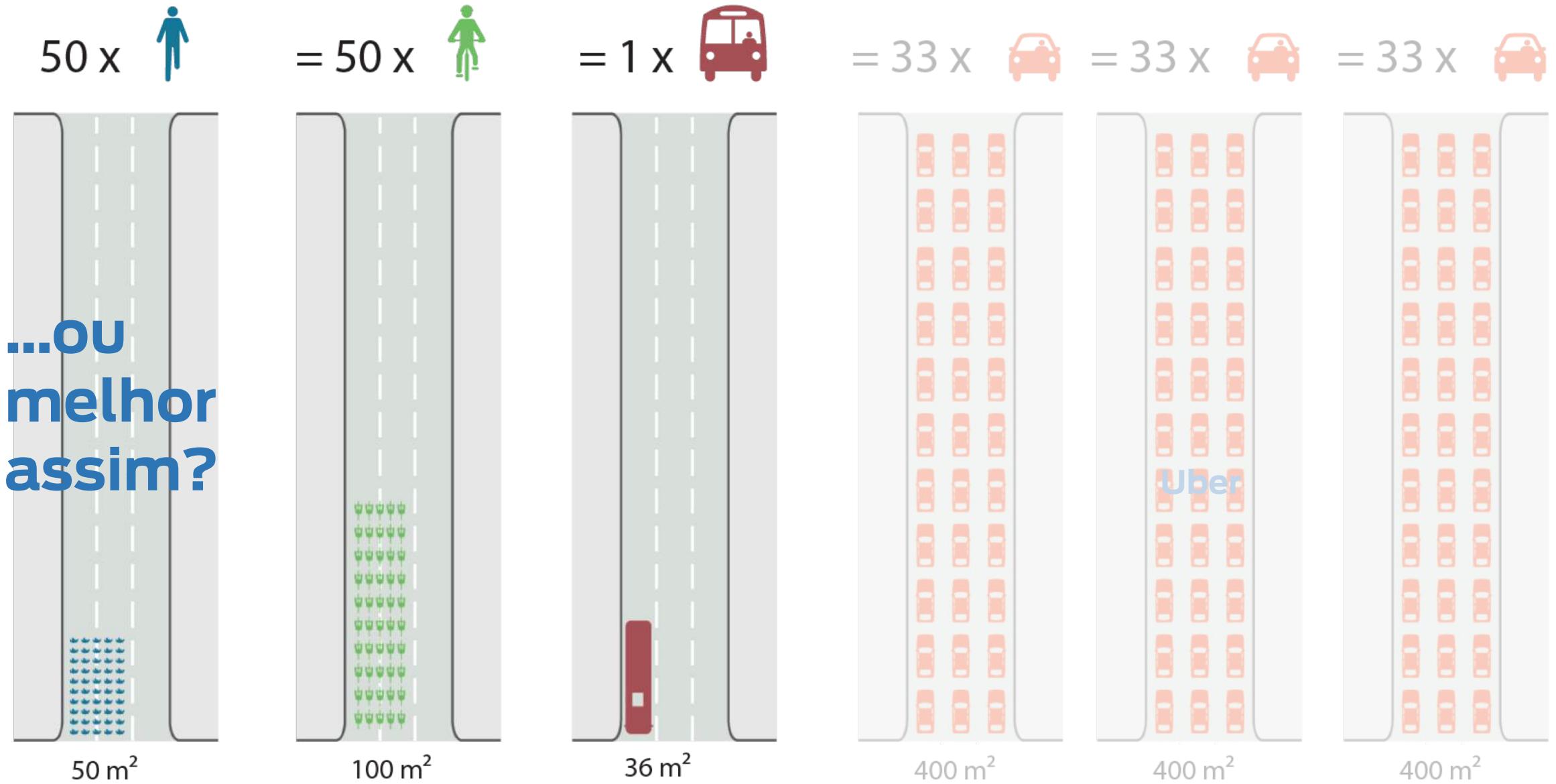
Space needed to move 50 people

Ruas multimodais são mais eficientes



Space needed to move 50 people

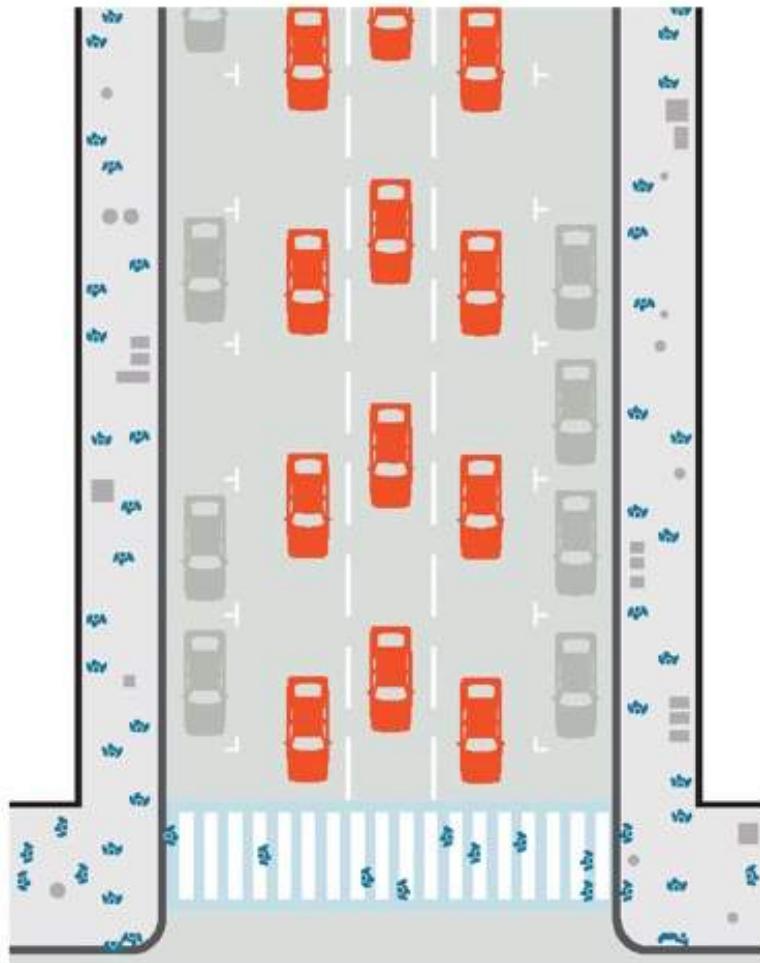
Ruas multimodais são mais eficientes



Space needed to move 50 people

Ruas multimodais são mais eficientes

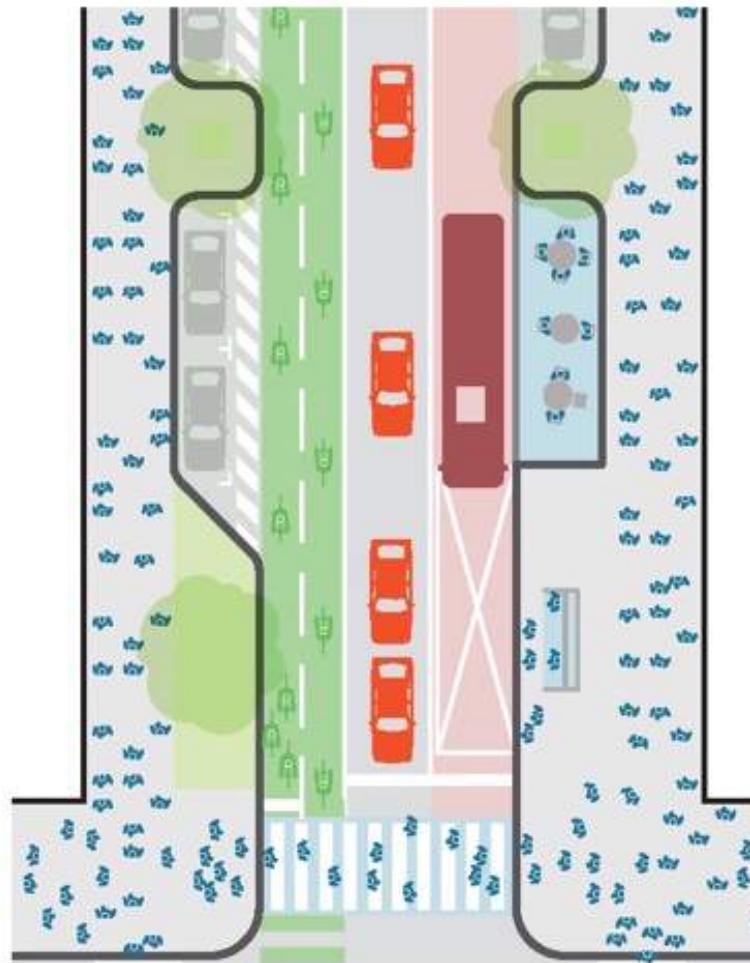
Car-Oriented Street



12.300
Pessoas / h

Capacidade Total:

Multimodal Street



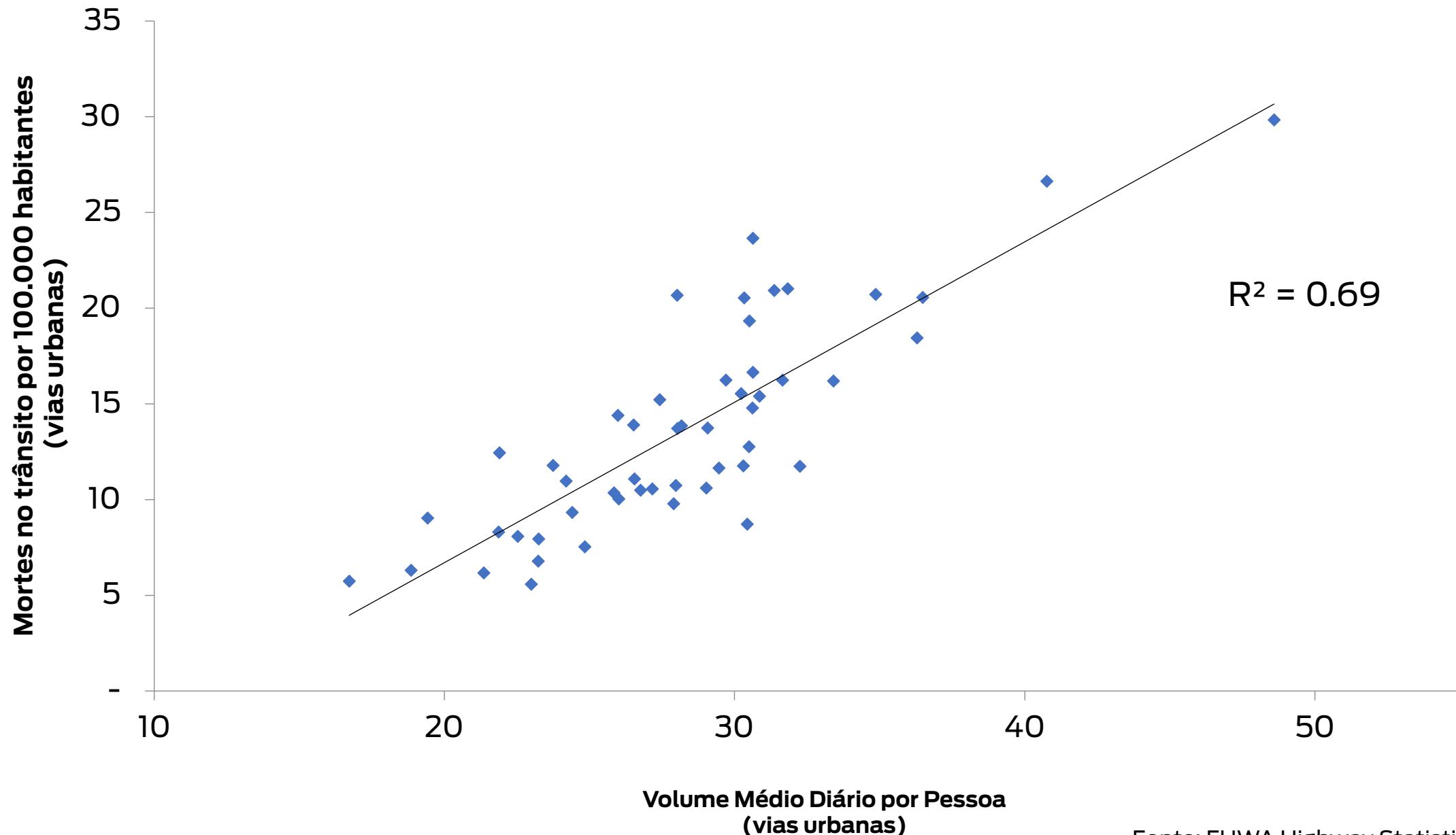
30,100
Pessoas / h

Capacidade Total:

x 2.4
pessoas

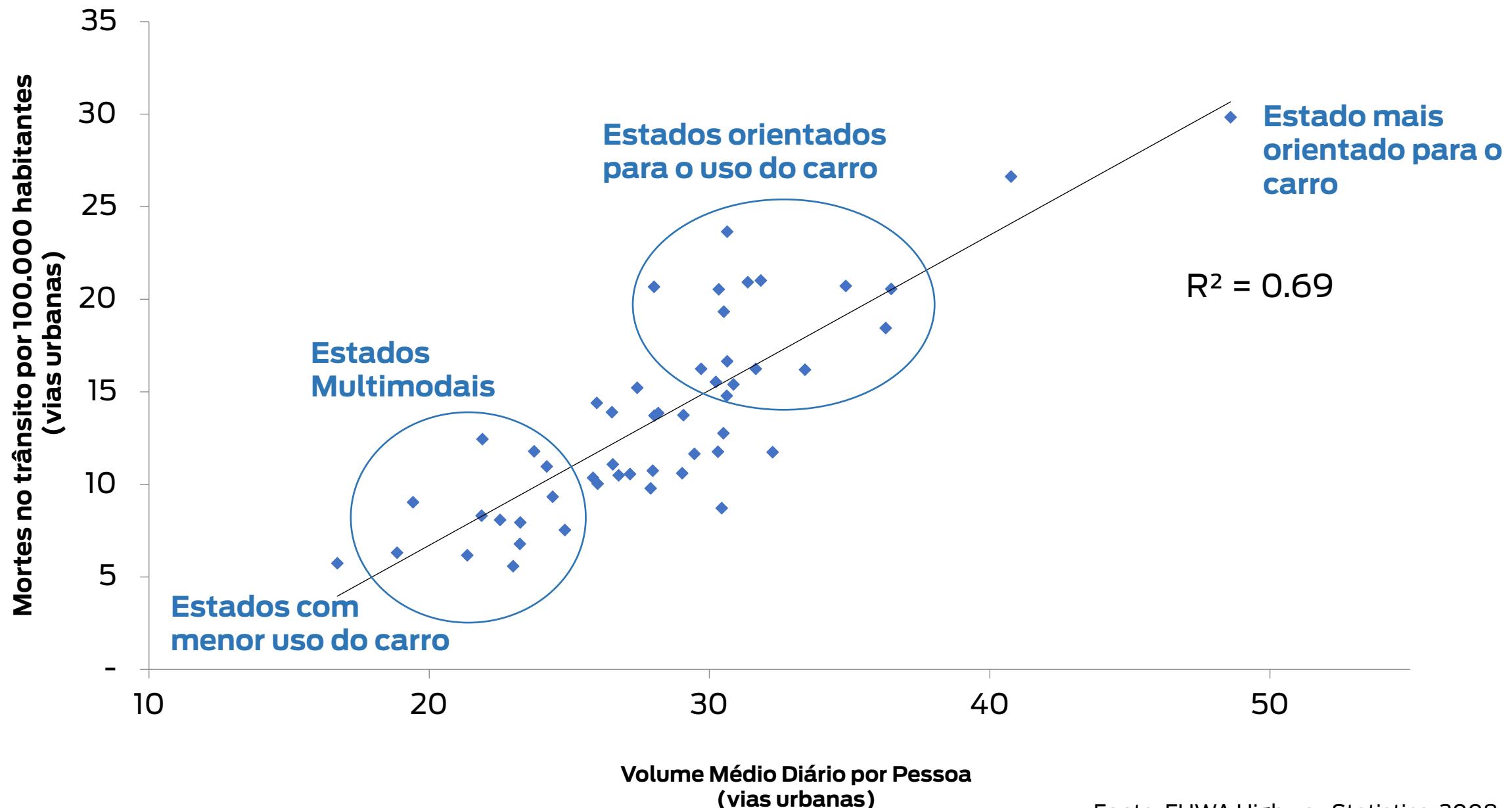
**Transporte
sustentável é mais
seguro**

Maior Uso de Carros está Associado a Maior Número de Mortes

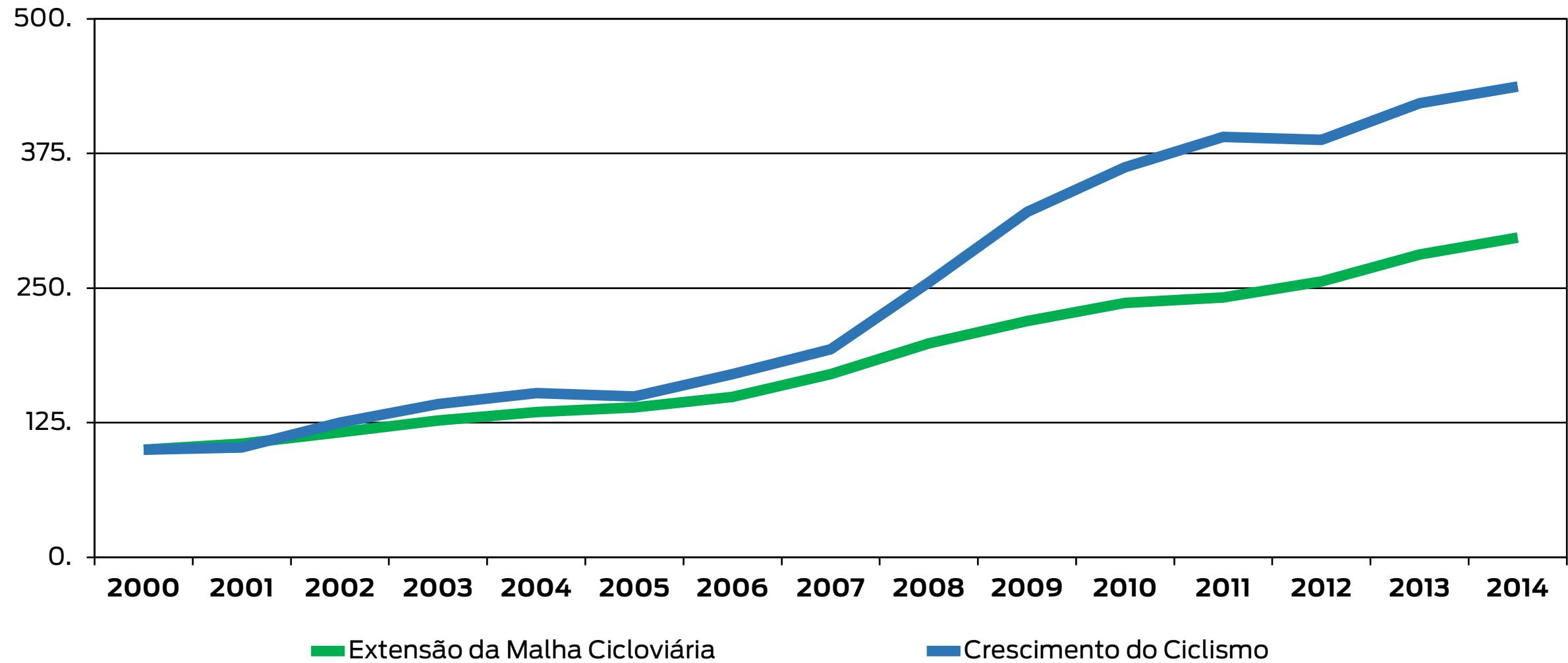


Fonte: FHWA Highway Statistics, 2008

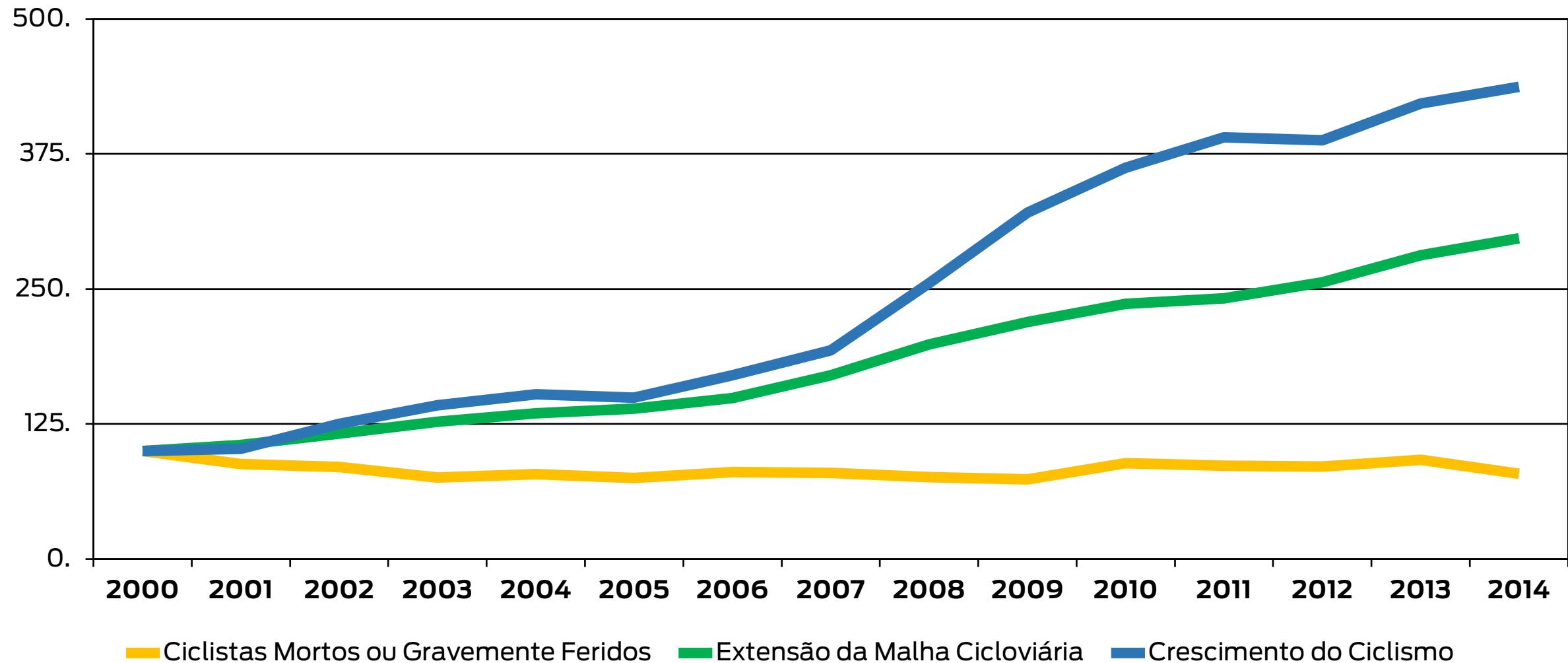
Maior Uso de Carros está Associado a Maior Número de Mortes



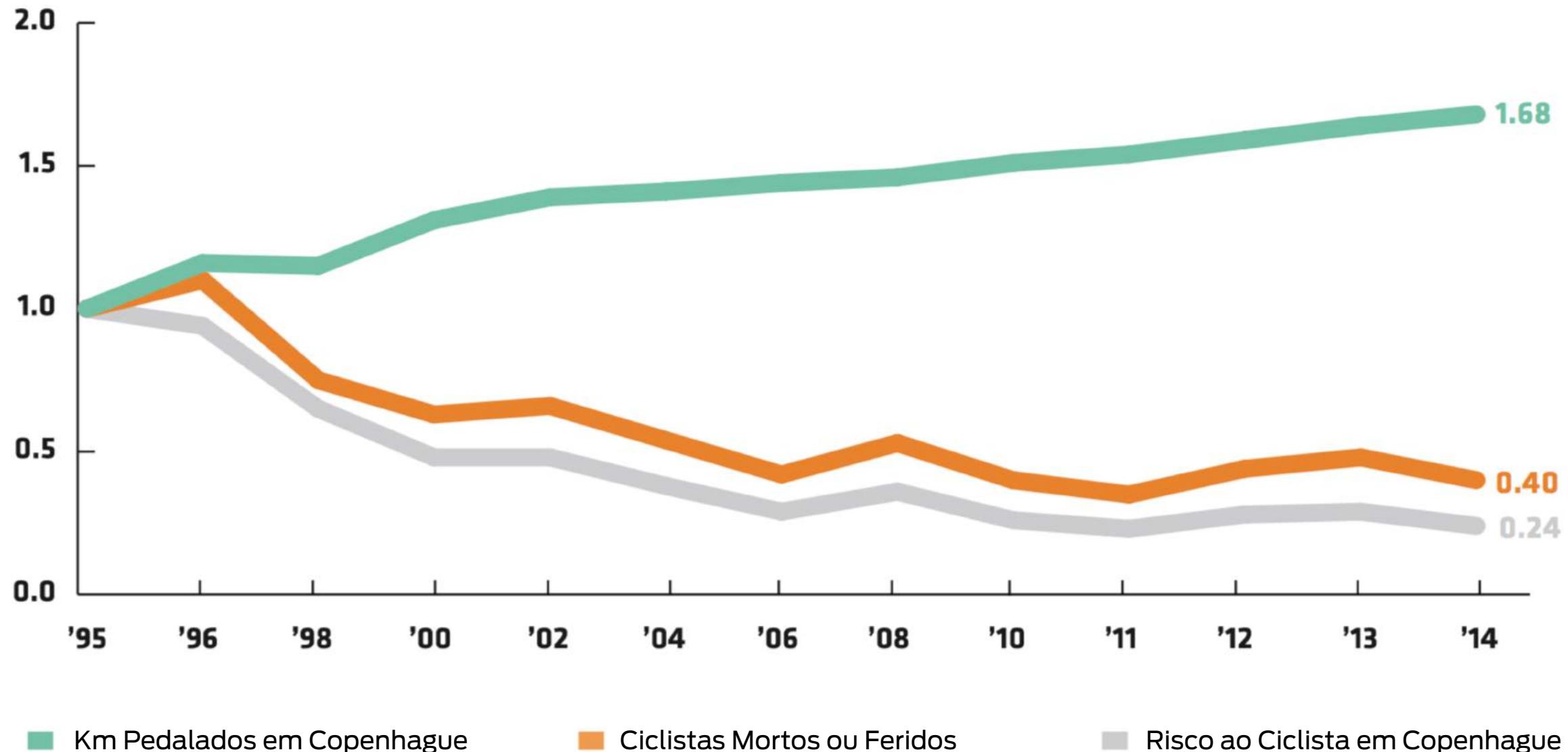
Mais ciclovias = Mais ciclistas



Mais ciclovias = Mais ciclistas = Menor Risco (Para todos)



Mais km Pedalados = Menos Traumas = Menor Risco

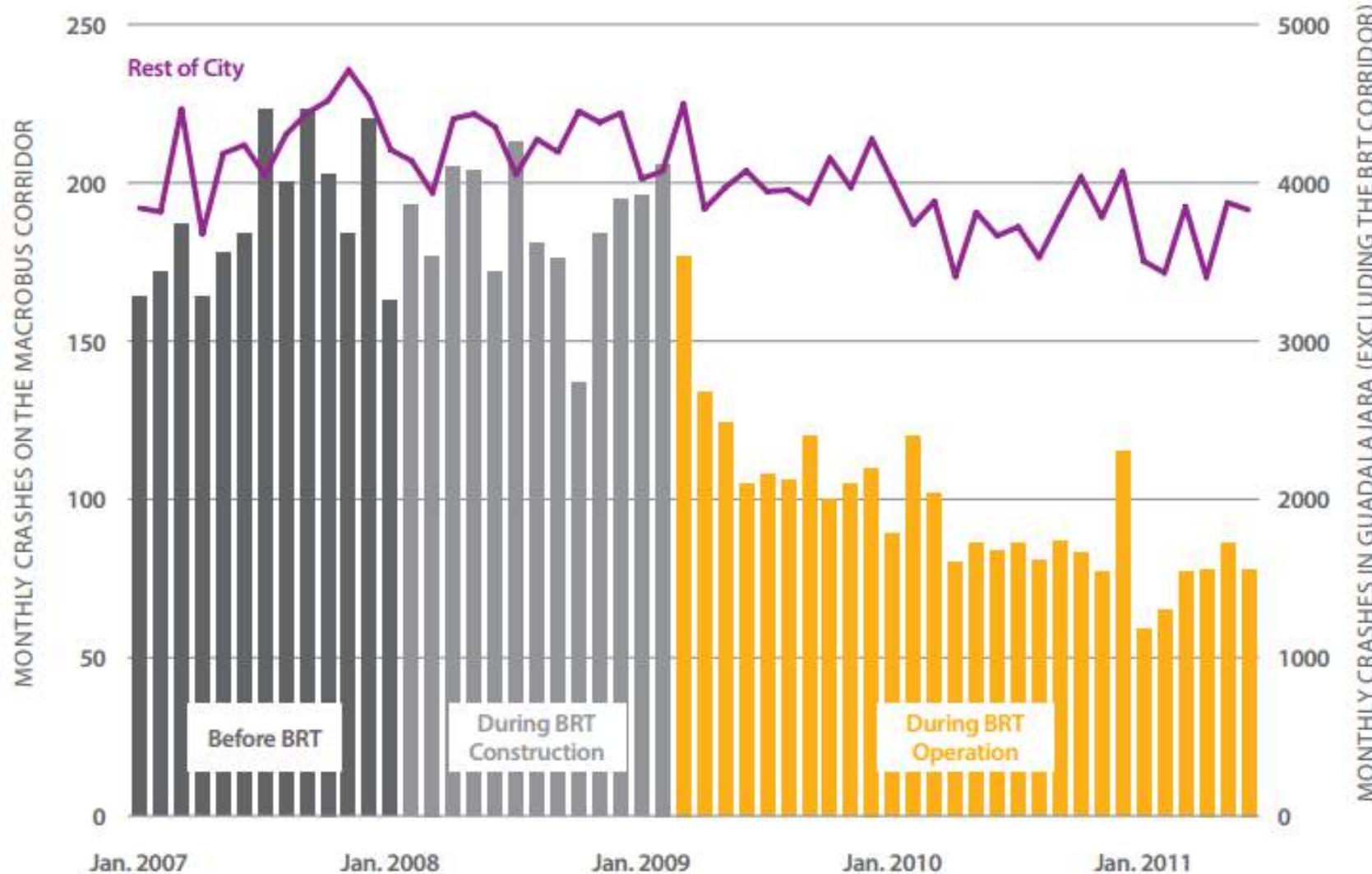


2ª Avenida, Nova York, EUA



- **58%** menos feridos em geral
- **67%** menos atropelamentos
- **29%** menos veículos em alta velocidade
- + **49%** aumento nas vendas do comércio local

Incidentes antes e depois da implantação da linha de BRT Macrobús em Guadalajara



3.

Design streets that put people first









तोर गुड़िका
वजाम कर डप्पा

CNG

UP 16 BT 7001

DL1Y D 8107

DL3CCB1002

MSN





Bandung



RAY-154

ALLE 110
CIDENTE



Fortaleza



New York



Melbourne, Australia



Istanbul, Turkey



Sao Paulo

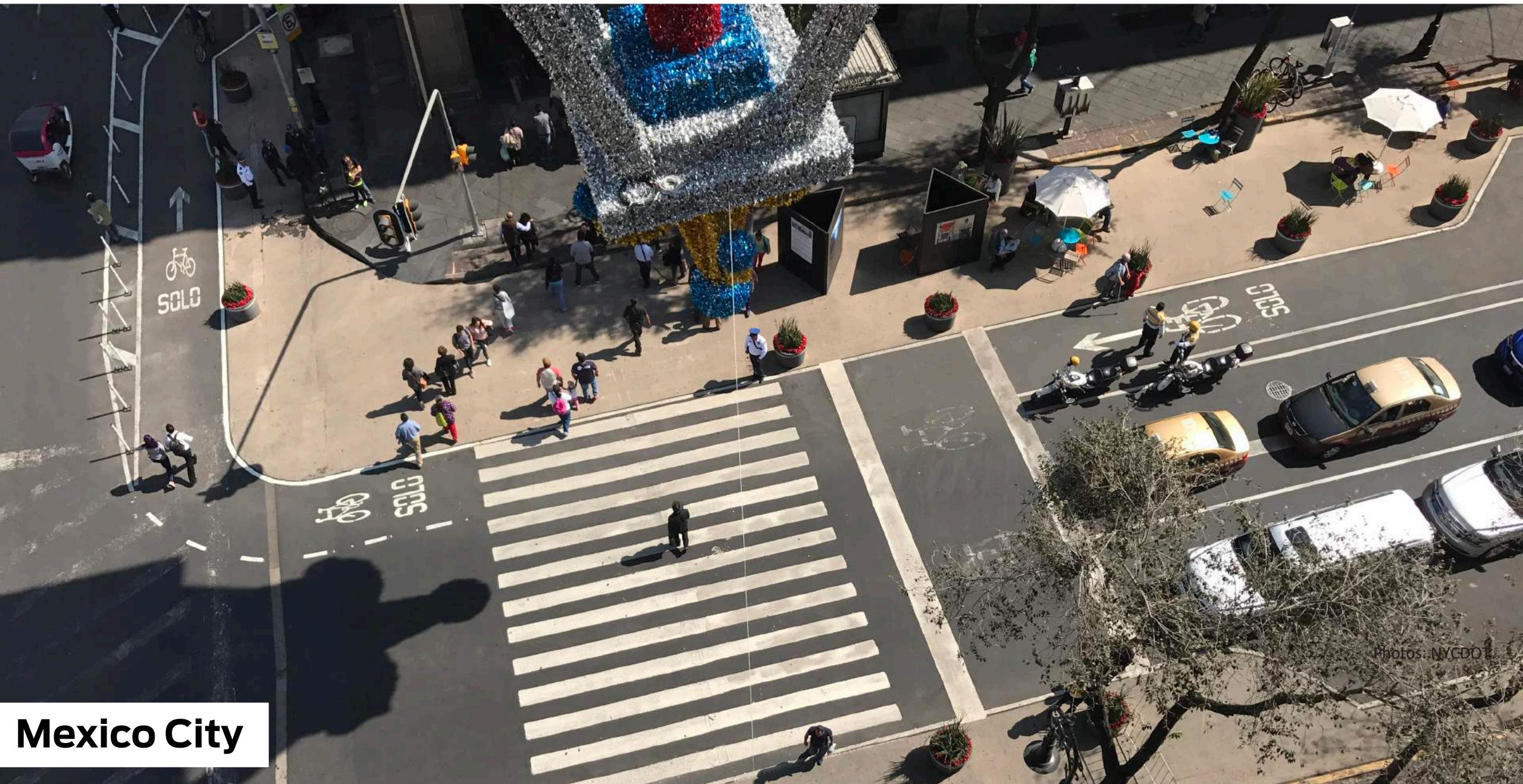


New York, USA



King Street, Toronto, Canada

Traffic Calming Strategies



Mexico City

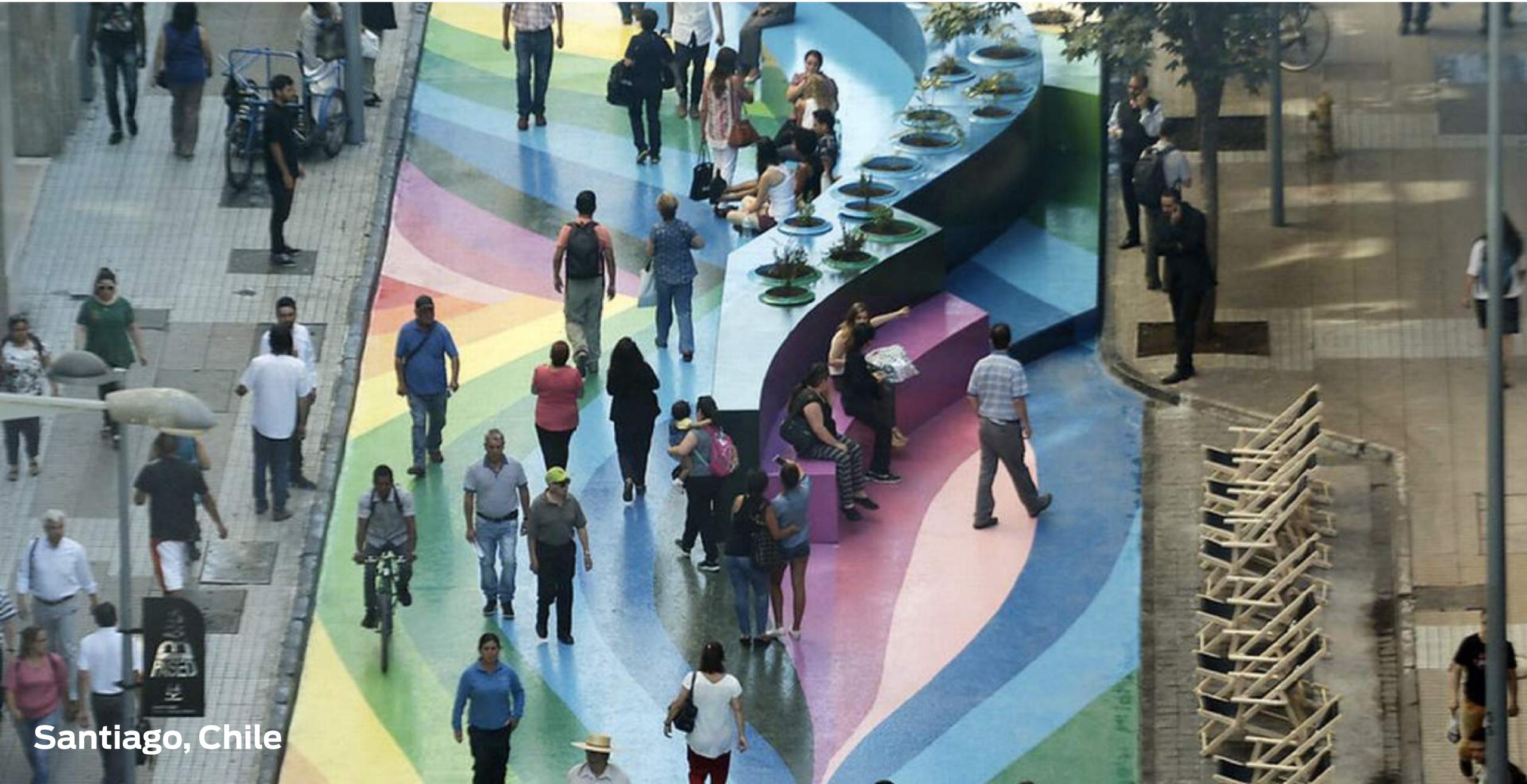
Photos: NYCDOT

Rethinking Existing Infrastructure



Paris

Pedestrian Only Streets



Santiago, Chile



Auckland, New Zealand

Plazas



MOSCOW

Image: Artur+Shakhsbazyan



Fortaleza



London, United Kingdom



Lima, Peru



Bogota



Fortaleza



e: City of Fortaleza)

Fortaleza

2016











Carbon
Neutral
by 2025

Copenhagen



Credit: Gehl Architects

Copenhagen



Credit: Gehl Architects

Copenhagen



beeldbank.amsterdam.nl

Amsterdam



Amsterdam

Van Beuningenstraat and Van Boetzelaerstraat in 1962 and 2015



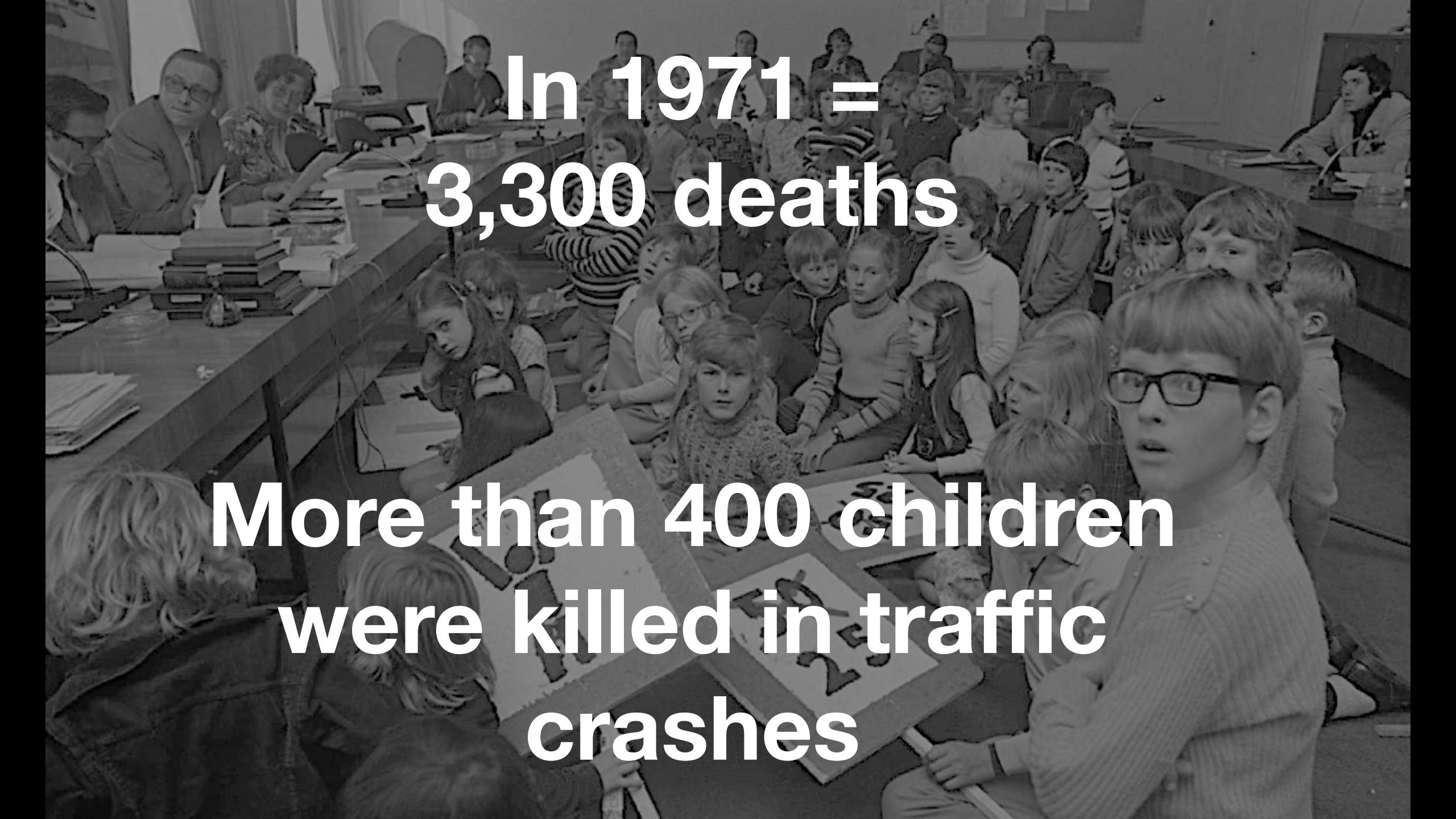
beeldbank.amsterdam.nl

Amsterdam

Van Beuningenstraat and Van Boetzelaerstraat in 1962 and 2015



Amsterdam

A black and white photograph of a classroom full of children sitting at their desks, looking towards the front of the room where a teacher is standing.

In 1971 =
3,300 deaths

More than 400 children
were killed in traffic
crashes



“STOP THE CHILD MURDER”



10

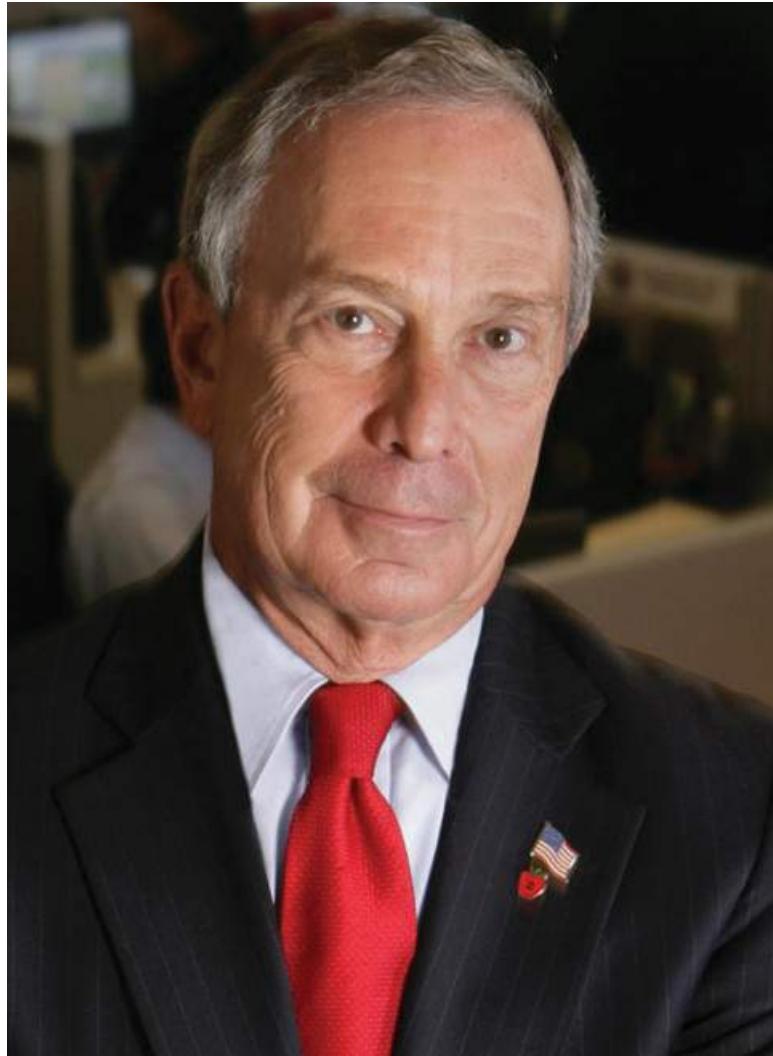
2059



Essas transformações não
ocorreram **por acaso.....**

As pessoas **tomaram decisões** e
desenharam suas cidades de
outra forma, investindo em
alternativas de transporte
multimodal

Para chegar lá, precisamos da
sua visão,
seu conhecimento técnico,
seu advocacy e de
sua ação local!



Bloomberg
Philanthropies

INITIATIVE FOR GLOBAL ROAD SAFETY

Bloomberg Initiative for Global Road Safety

September 2014 announced:

2015-2019

\$125 Million

Michael Bloomberg



Janette Sadik-Khan



**National
Association of City
Transportation
Officials**

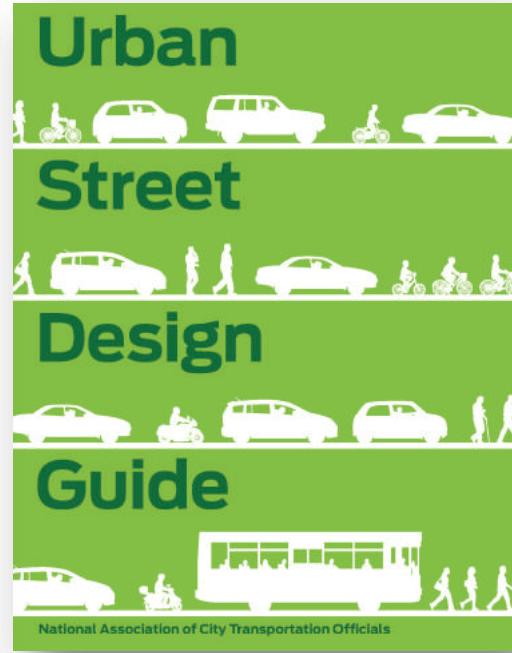
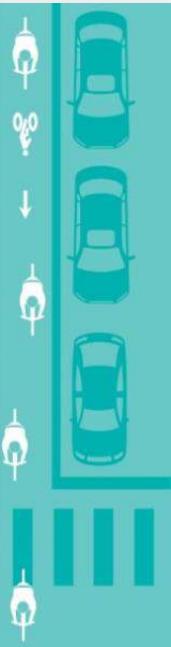


**Global
Designing
Cities
Initiative**

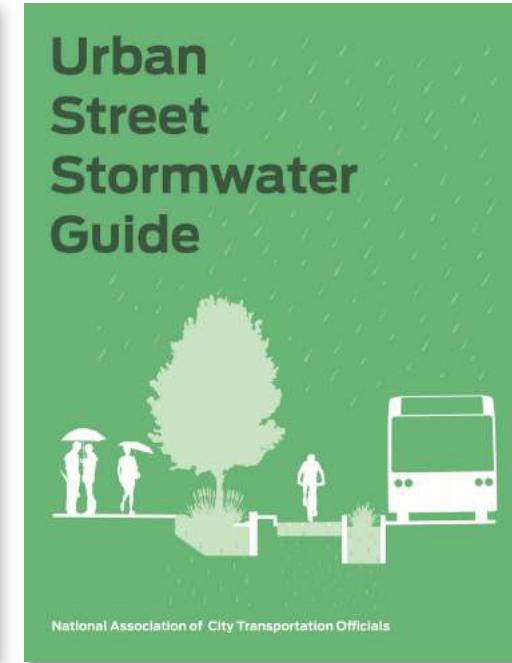
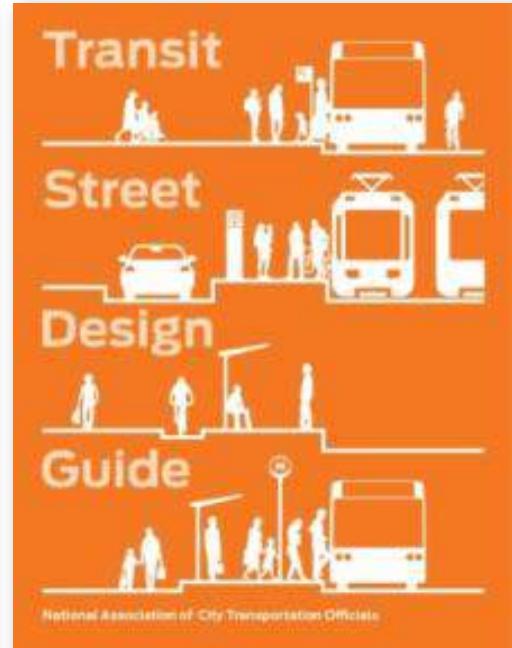
Urban Bikeway Design Guide

National Association of
City Transportation Officials

Second Edition



NACTO Bike Share
Station Siting Guide

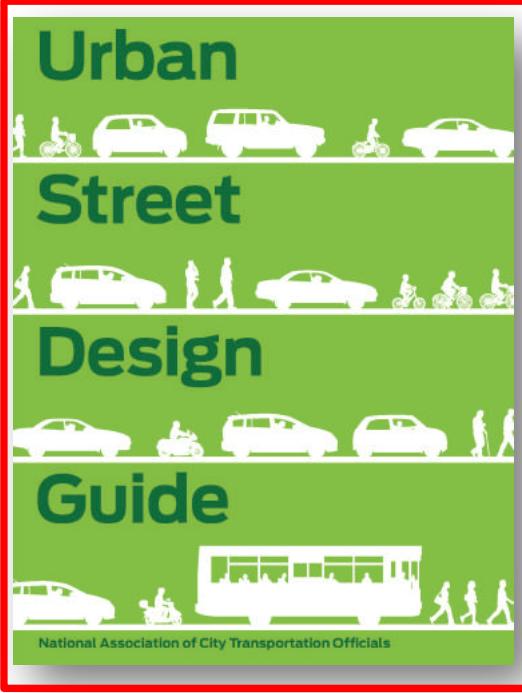
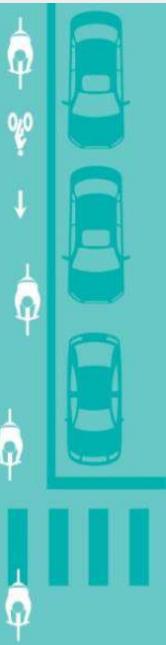


NACTO
Guías de
Desenho
Urbano

Urban Bikeway Design Guide

National Association of
City Transportation Officials

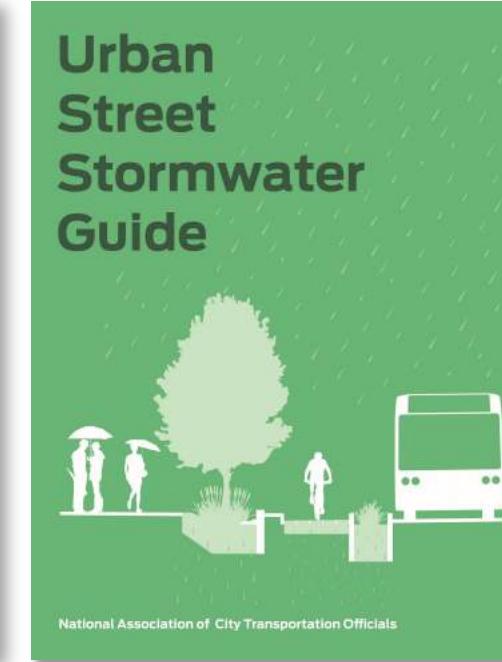
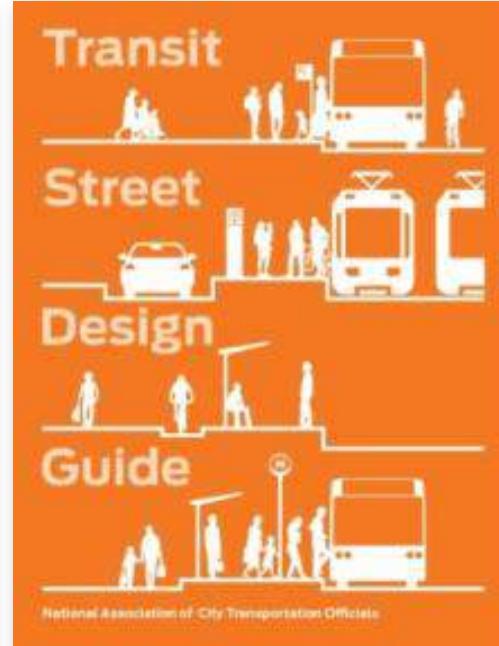
Second Edition



Endorsement from
48 cities,
9 states, and USDOT
= Permission Slip



 Bike Share
Station Siting Guide




**Guías de
Desenho
Urbano**



National
Association of City
Transportation
Officials

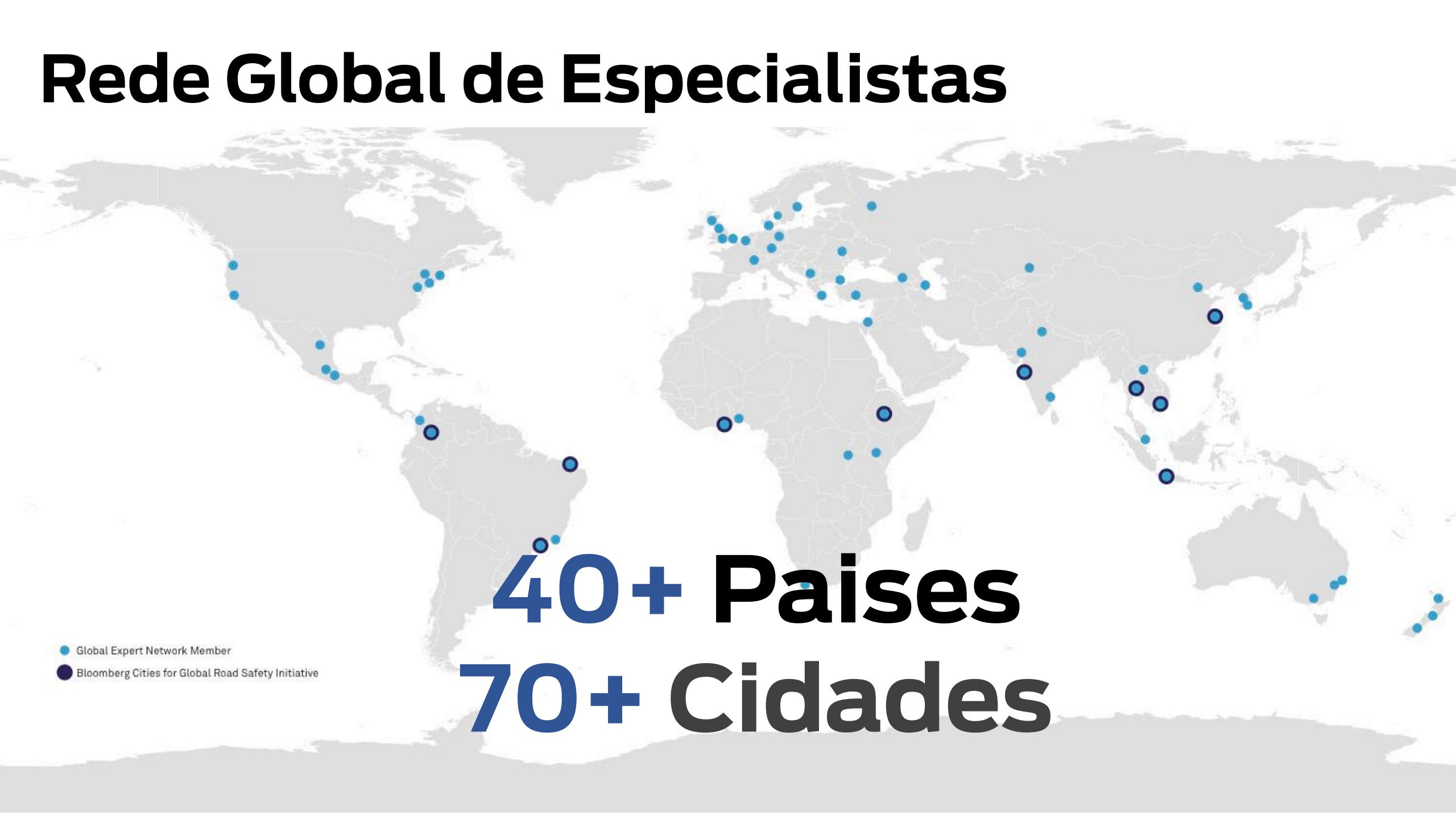


Global
Designing
Cities
Initiative



Bloomberg
Philanthropies
INITIATIVE FOR GLOBAL ROAD SAFETY

Rede Global de Especialistas



40+ Paises
70+ Cidades

● Global Expert Network Member

● Bloomberg Cities for Global Road Safety Initiative

Da Agenda Global à Ação Local



**Inspirar
Líderes**



**Informar
Profissionais**



**Empoderar
Comunidades**

O quê é possível?



Invite Street Activity

Change Street Geometry

Create Cycle Facilities

Add Seating

Add or Improve Pedestrian Crossings

Add Energy-Efficient Lighting

Improve Signals

Enhance Enforcement

Organize Transit

Integrate Public Artwork

Connect Walking Networks

Upgrade Materials

Reduce Speed Limits

Add Green Infrastructure

Provide Street Furniture

Include Wayfinding

Activate Ground Floors

Provide Climate Protection

Desde Maio de 2017:

Download Grátis

www.globaldesigningcities.org

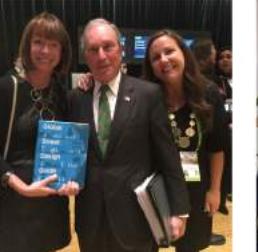


Global
Designing
Cities
Initiative



Endossado por:

35+ Cidades e 20+ Organizações

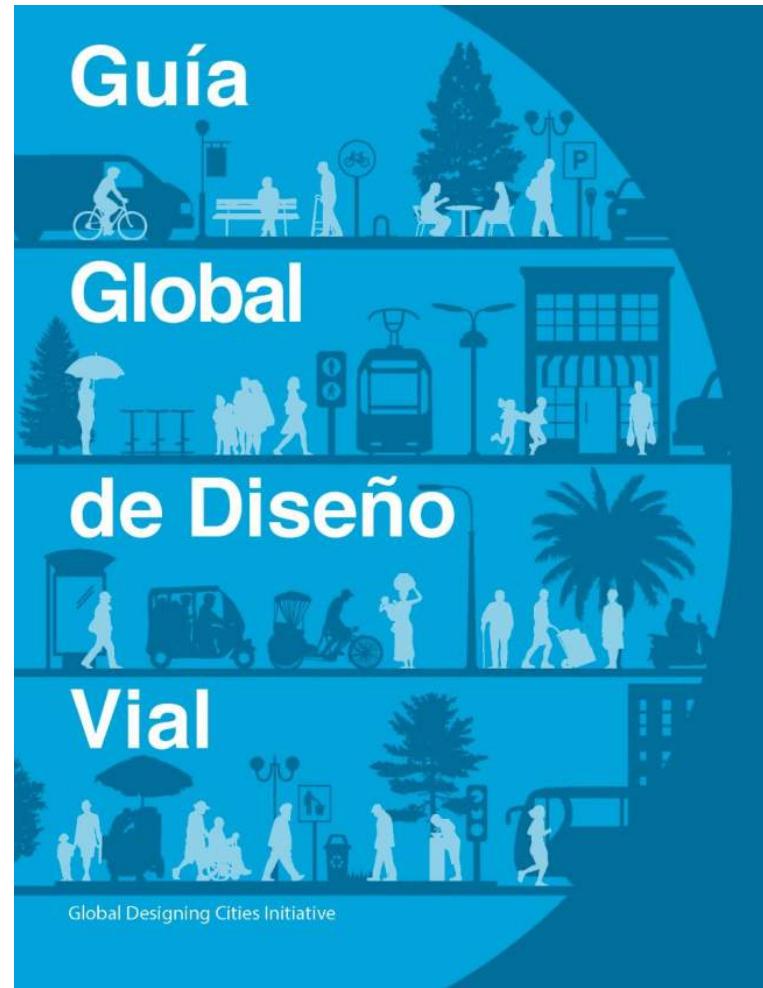
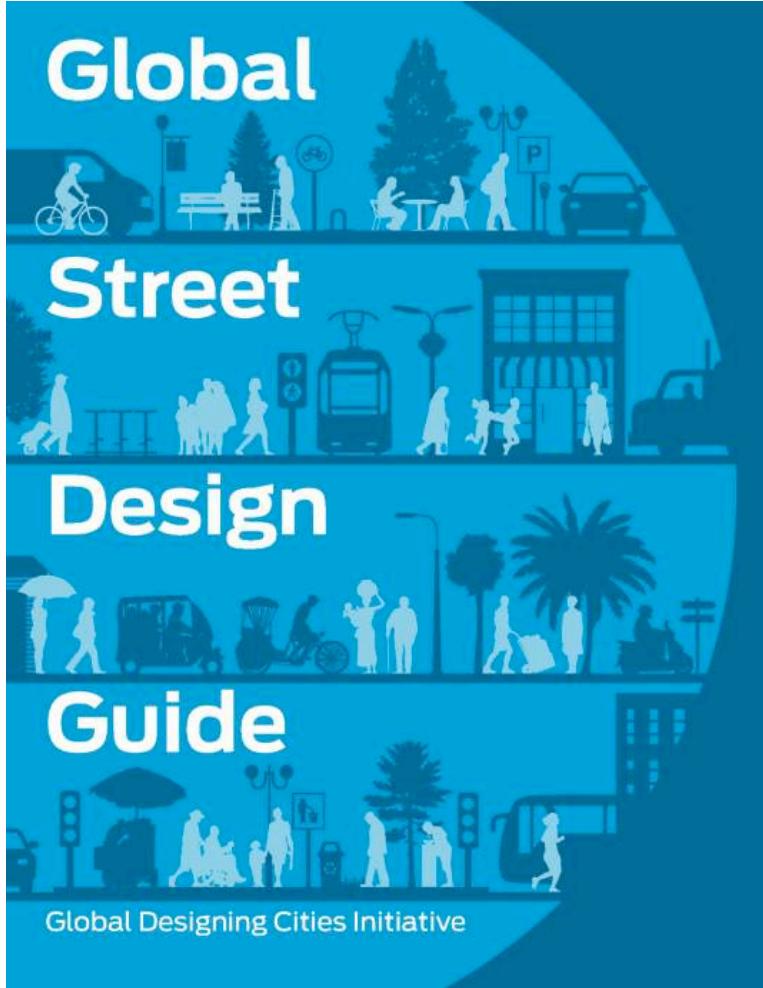


Endossado por:

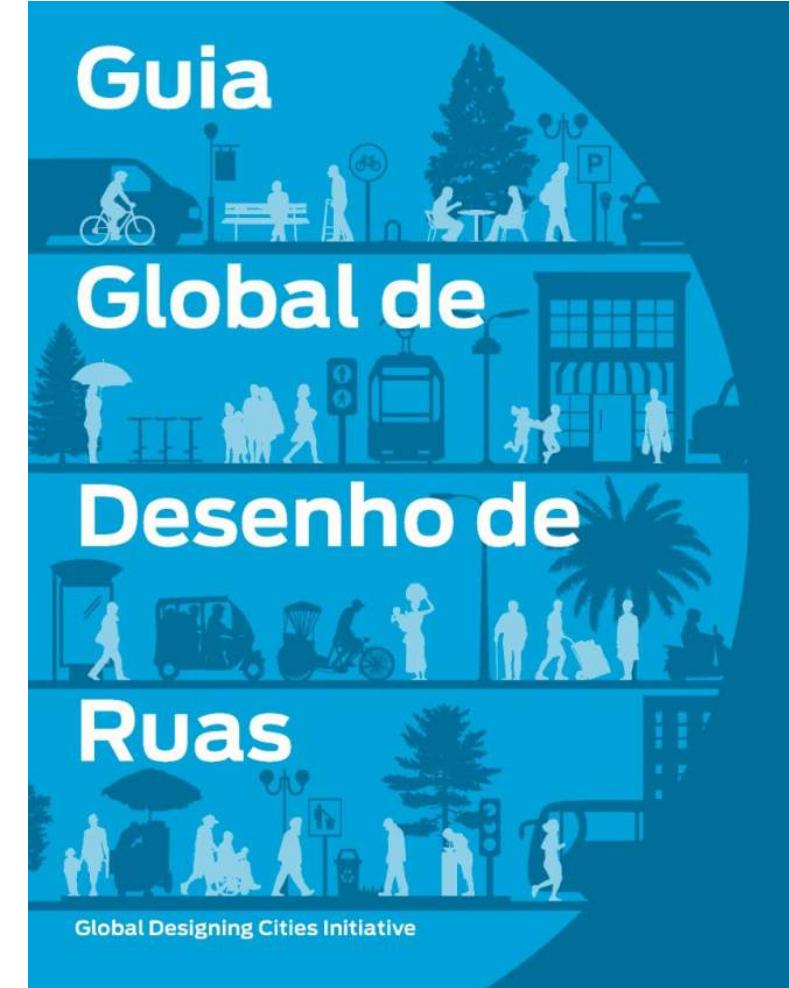
35+ Cidades e 20+ Organizações



Traduções do GSDG



Espanhol

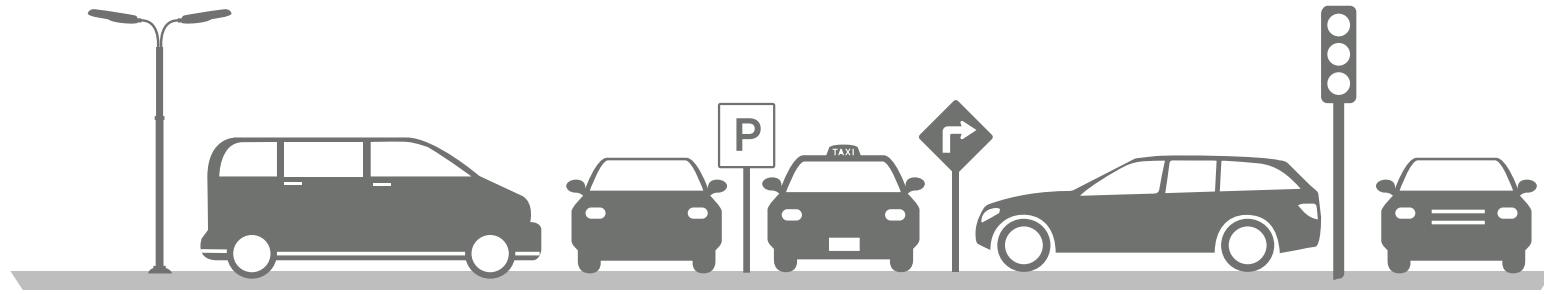


Português

Streets for Kids

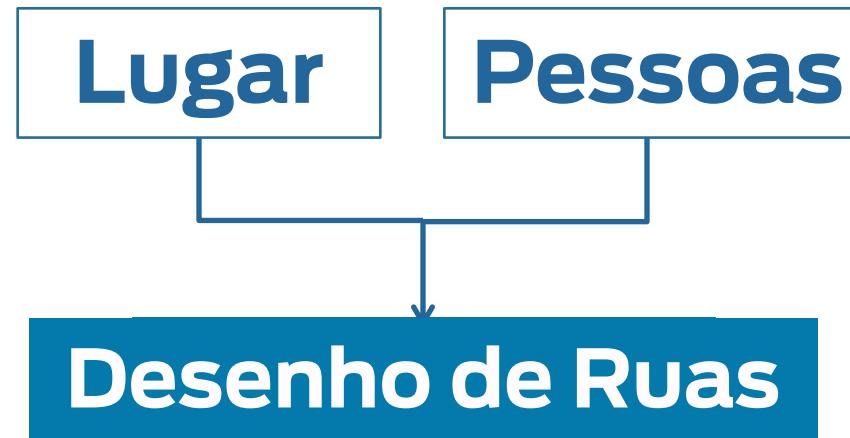
2018







Uma Nova Abordagem para o Desenho de Ruas



Resultados Esperados

- Saúde e Segurança
- Qualidade de Vida
- Mobilidade Multimodal
- Sustentabilidade Ambiental
- Sustentabilidade Econômica
- Igualdade



Desenhando Lugares

Desenhando Lugares



Ambiente Construído



Ambiente Natural

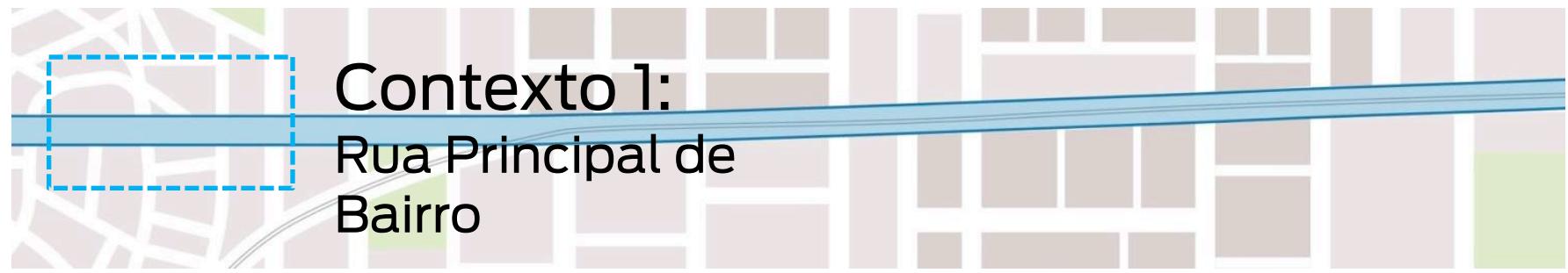


Ambiente Social e
Cultural

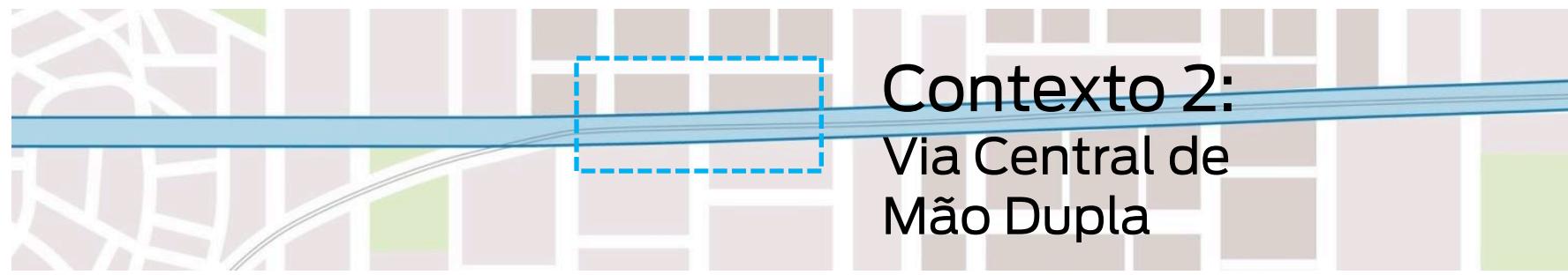


Ambiente
Econômico

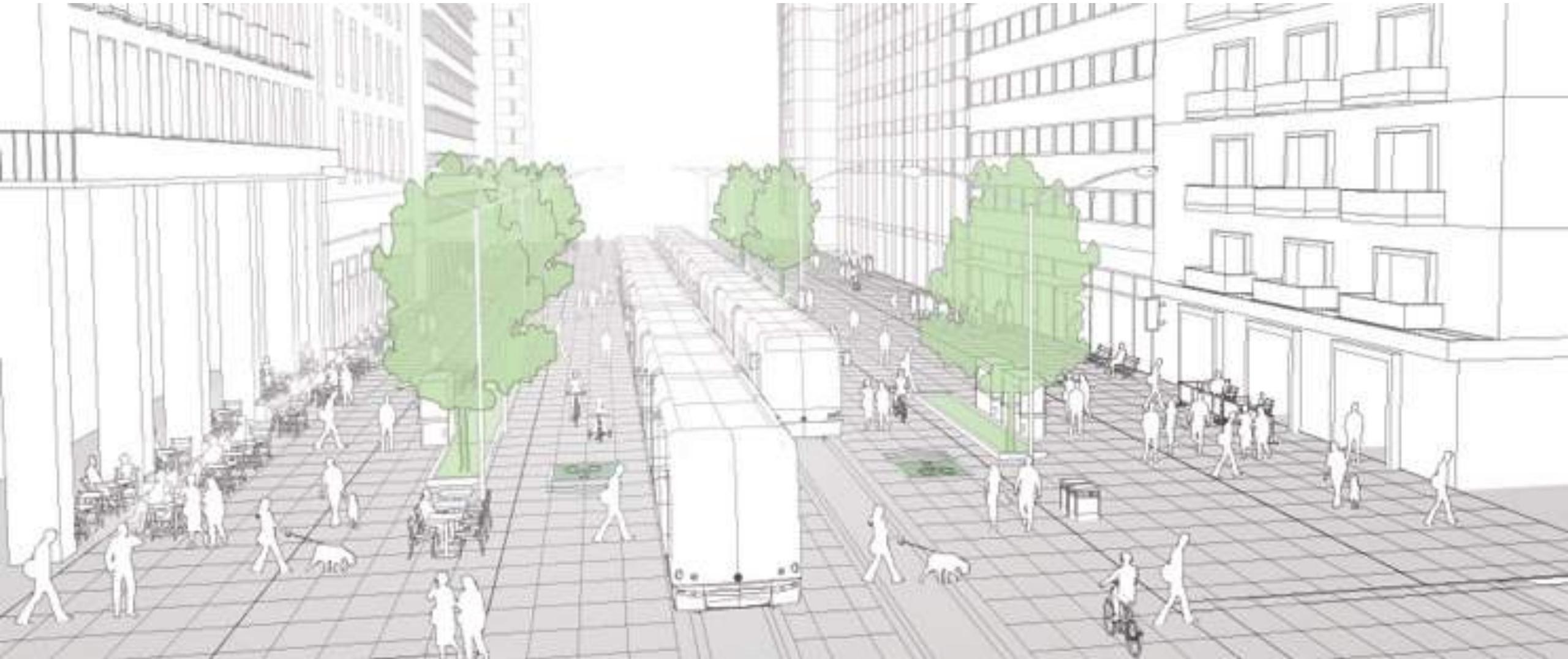
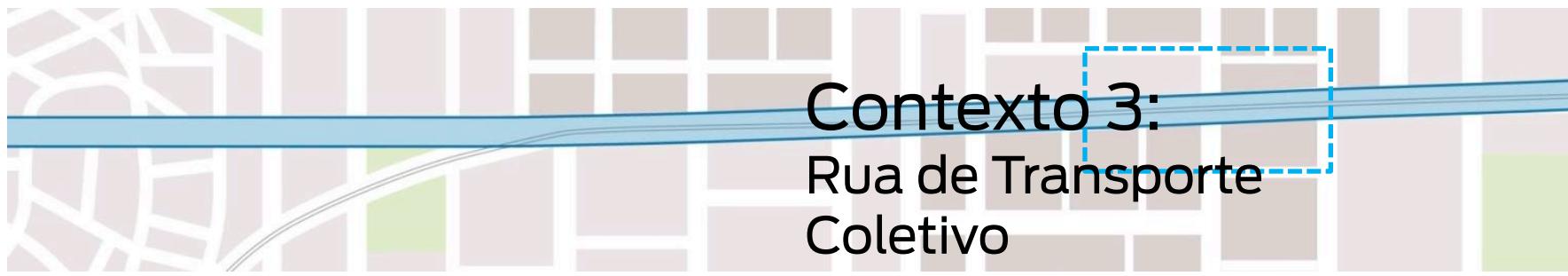
Contextos Variam!



Contextos Variam!



**Contextos
Variam!**



Desenhando para as Pessoas



PESSOAS: Desenhe para todos os usuários da via



Desenhe para todos os usuários da via

PEDESTRES



Pedestres

Desenhe para todos os usuários da via

CICLISTAS



Pedestres



Ciclistas

Desenhe para todos os usuários da via

PASSAGEIROS DO TRANSPORTE PÚBLICO



Pedestres



Ciclistas



Usuários do
Transporte
Público

Desenhe para todos os usuários da via

MOTORISTAS E MOTOCICLISTAS



Pedestres



Ciclistas



Usuários do
Transporte
Público



Motoristas

Desenhe para todos os usuários da via

ENTREGADORES E PRESTADORES DE SERVIÇO



Pedestres



Ciclistas



Usuários do
Transporte
Público



Motoristas



Entregadores e
Prestadores de
serviço

Desenhe para todos os usuários da via

PESSOAS FAZENDO COMÉRCIO



Pedestres



Ciclistas



Usuários do
Transporte
Público



Motoristas



Entregadores e
Prestadores de
Serviço



Pessoas
Fazendo
Comércio

Considerações sobre a Rede



Pedestrians



Cyclists



Transit Riders



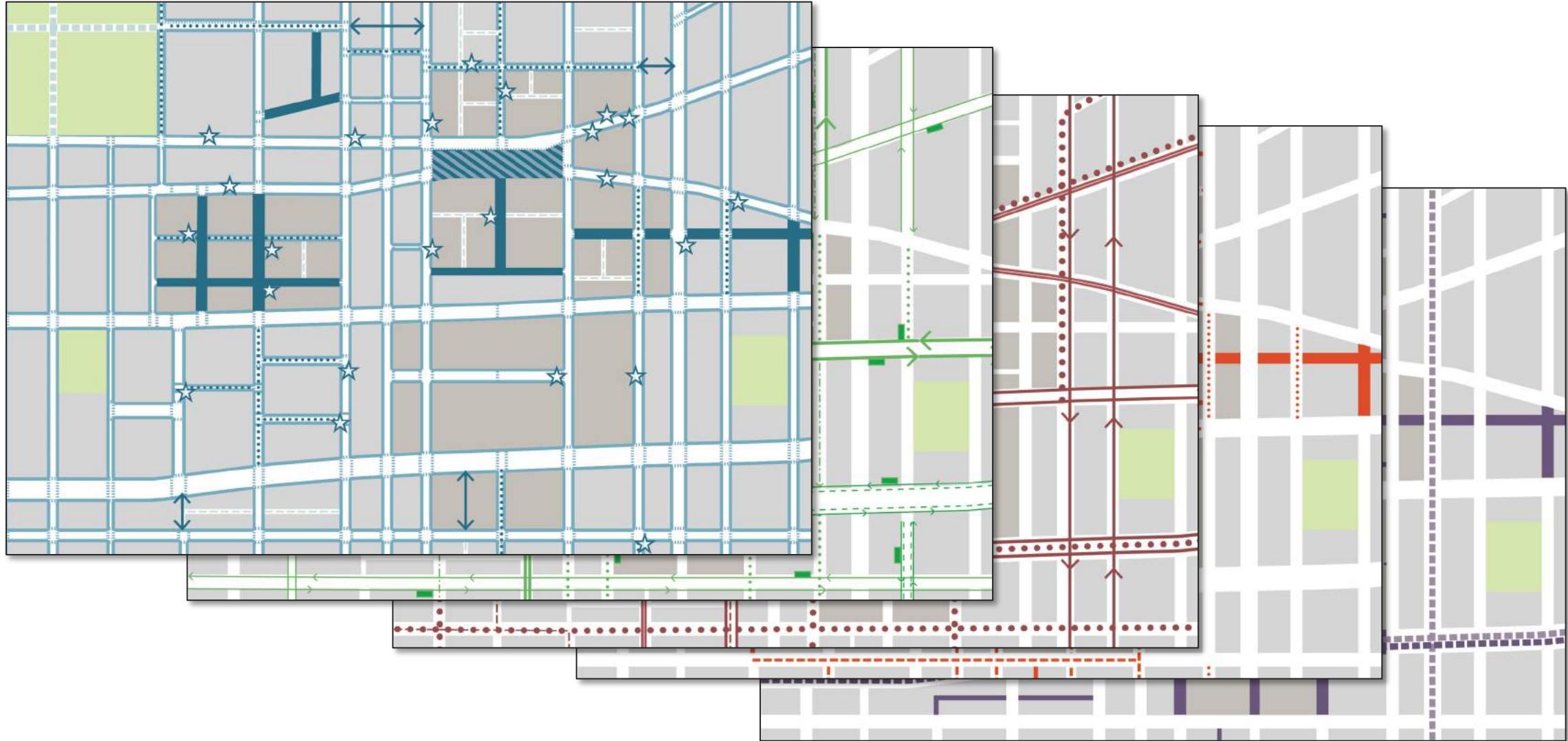
Motorists



Freight Operators
and Service
Providers



People Doing
Business



Geometria



Pedestrians



Cyclists



Transit Riders



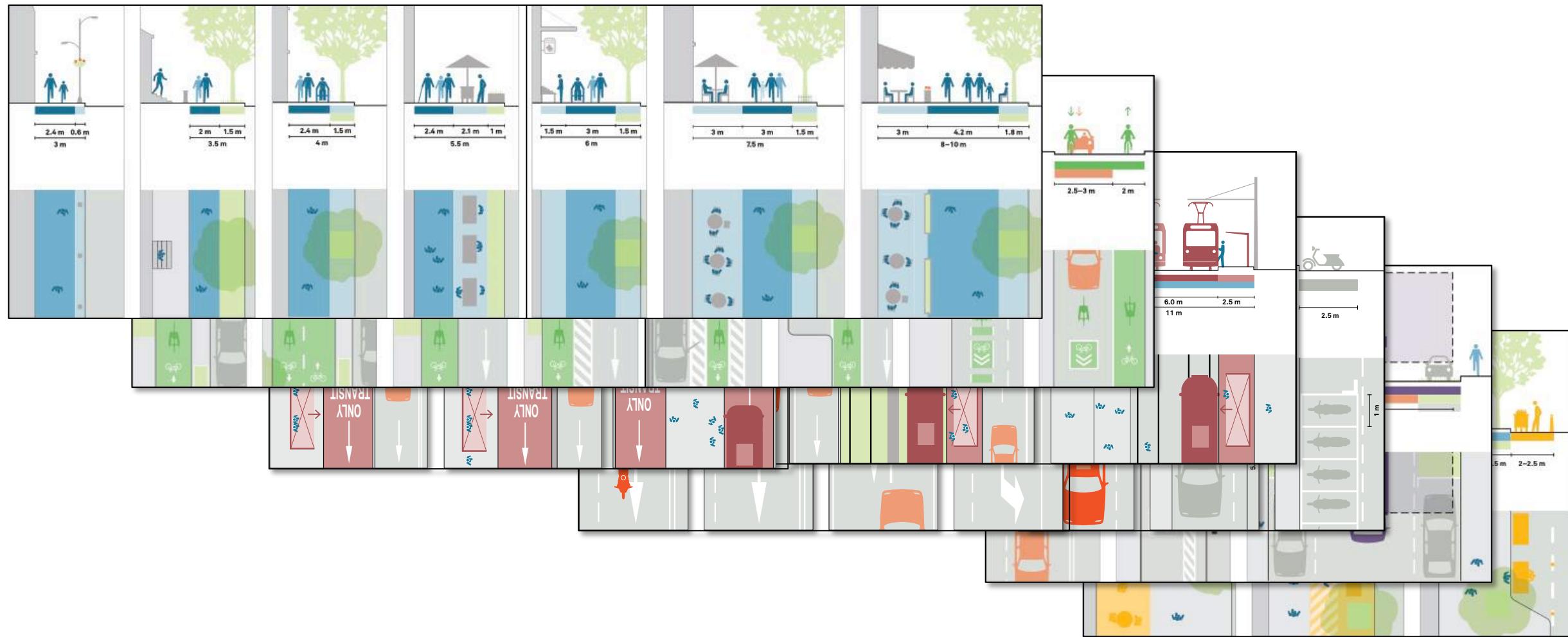
Motorists



Freight Operators and Service Providers



People Doing Business



Elementos



Pedestrians



Cyclists



Transit Riders



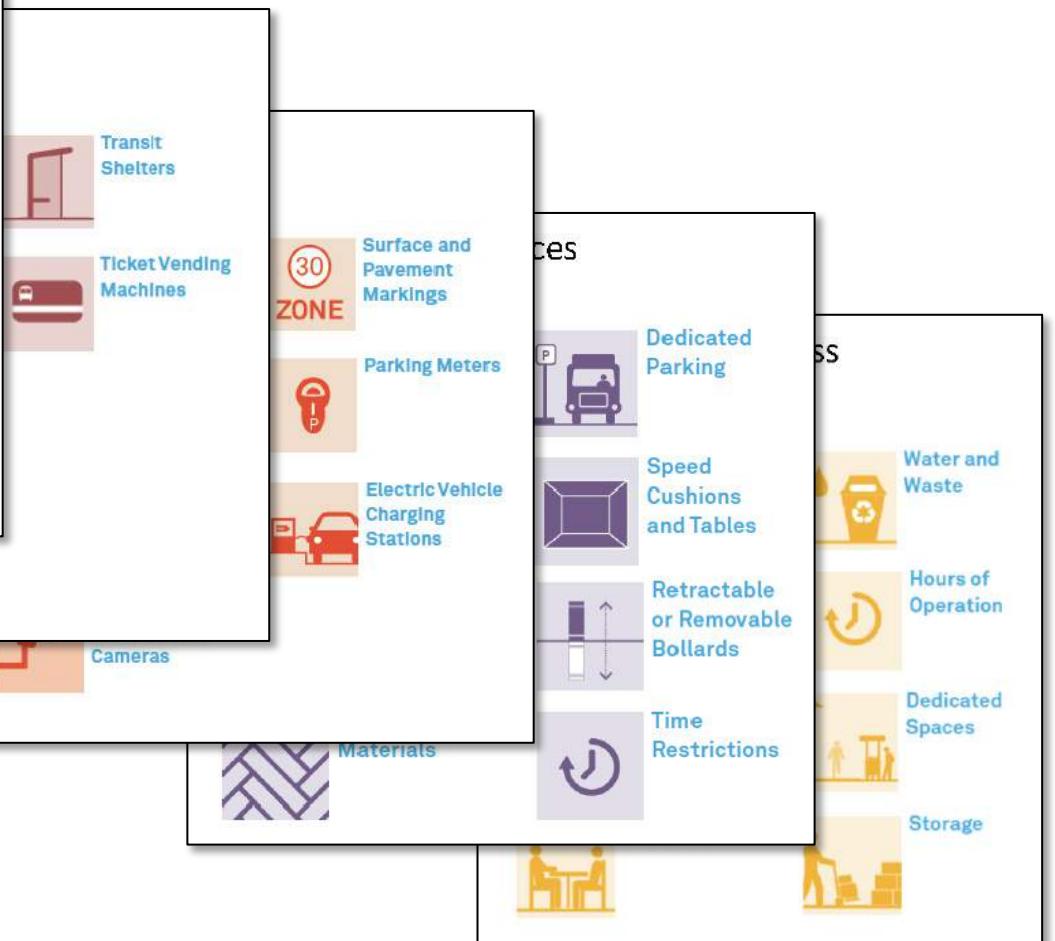
Motorists



Freight Operators
and Service
Providers



People Doing
Business



Transformações de Ruas

A vibrant street scene in Istanbul. On the left, a modern yellow tram is stopped at a station. In the foreground, a person on a black motorcycle with a sidecar is waiting. To the right, a group of people are walking along a sidewalk. There are several small outdoor cafe tables with chairs. In the background, there are white buildings with arched windows and a domed structure. A street lamp is visible on the left. The overall atmosphere is lively and sunny.

Tipologias de Ruas



**Ruas Exclusivas
de Pedestres**

**Ruas
Compartilhadas**

Ruas Residenciais

Ruas Grandes

**Condições
Especiais**

Ruas Principais de Bairro



Ruas Principais de Bairro

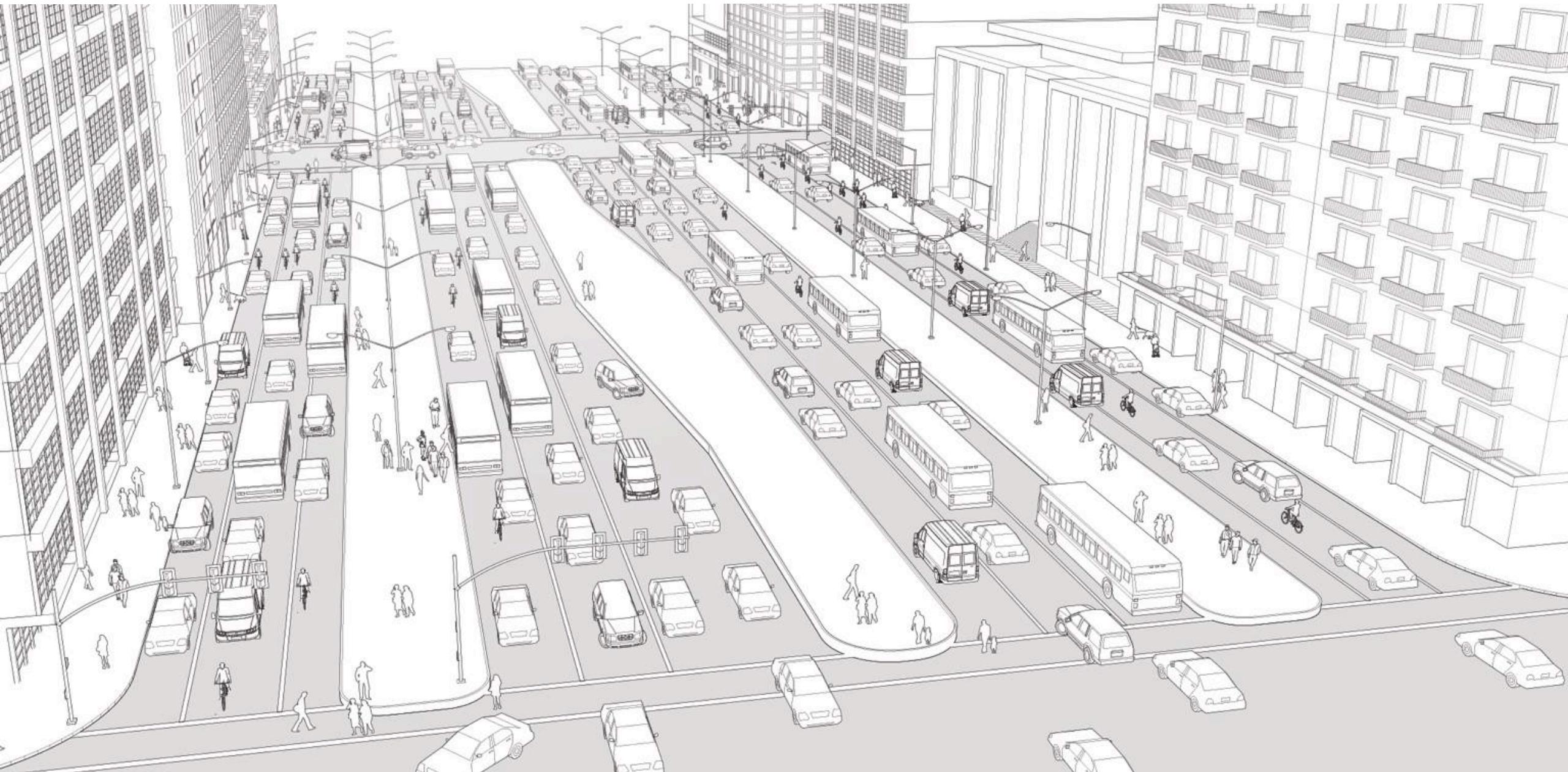


Nova York, EUA

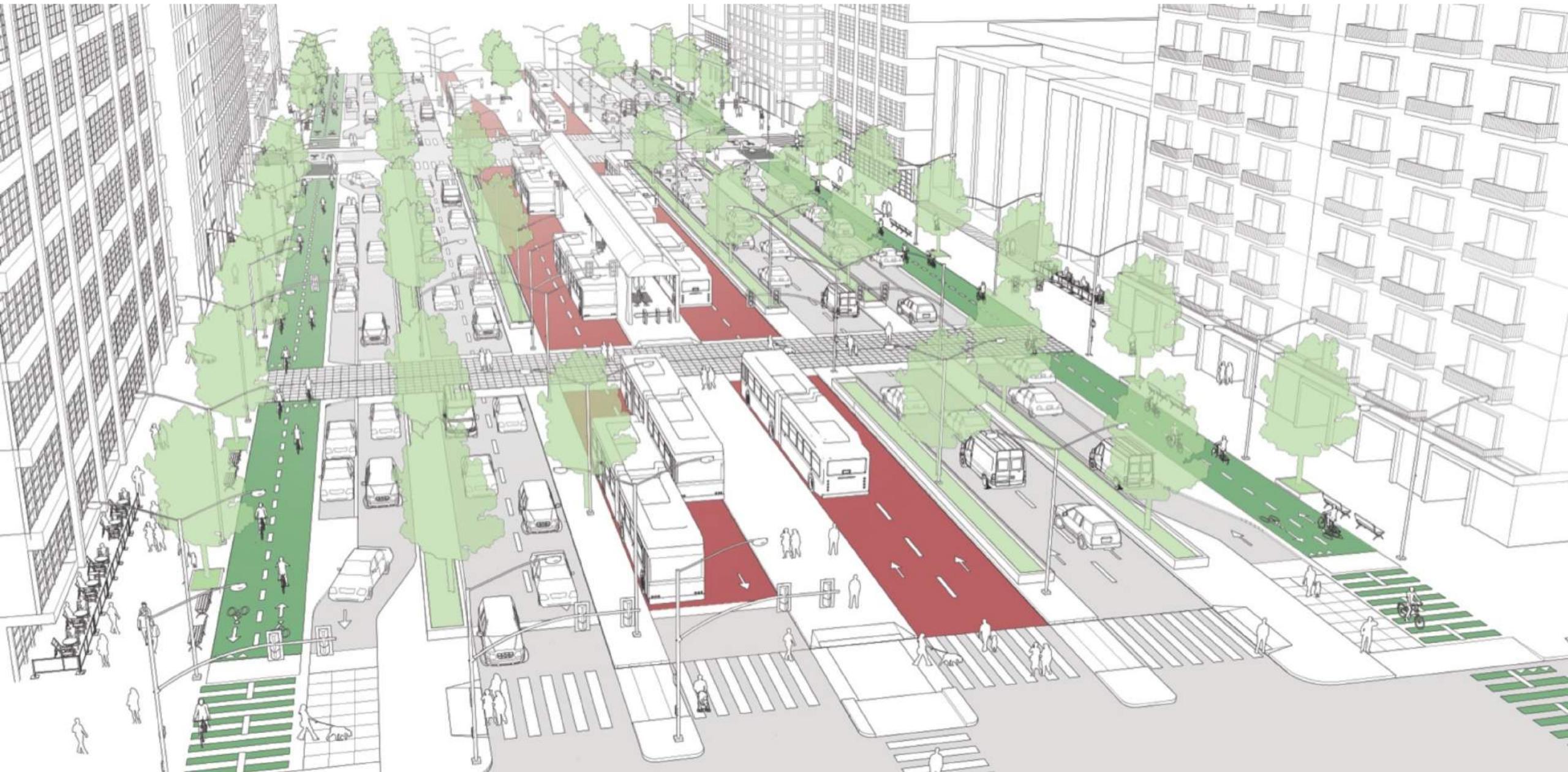


- 58% menos feridos em geral
- 67% menos atropelamentos
- 29% menos veículos em alta velocidade
- + 49% aumento nas vendas do comércio local

Grandes Avenidas



Grandes Avenidas



Buenos Aires, Argentina



98% redução em acidentes

63% redução no tempo de viagens de ônibus

5619 Toneladas redução de emissão de CO₂

Credit: City of Buenos Aires

Ruas Exclusivas de Pedestres



Ruas Exclusivas de Pedestres



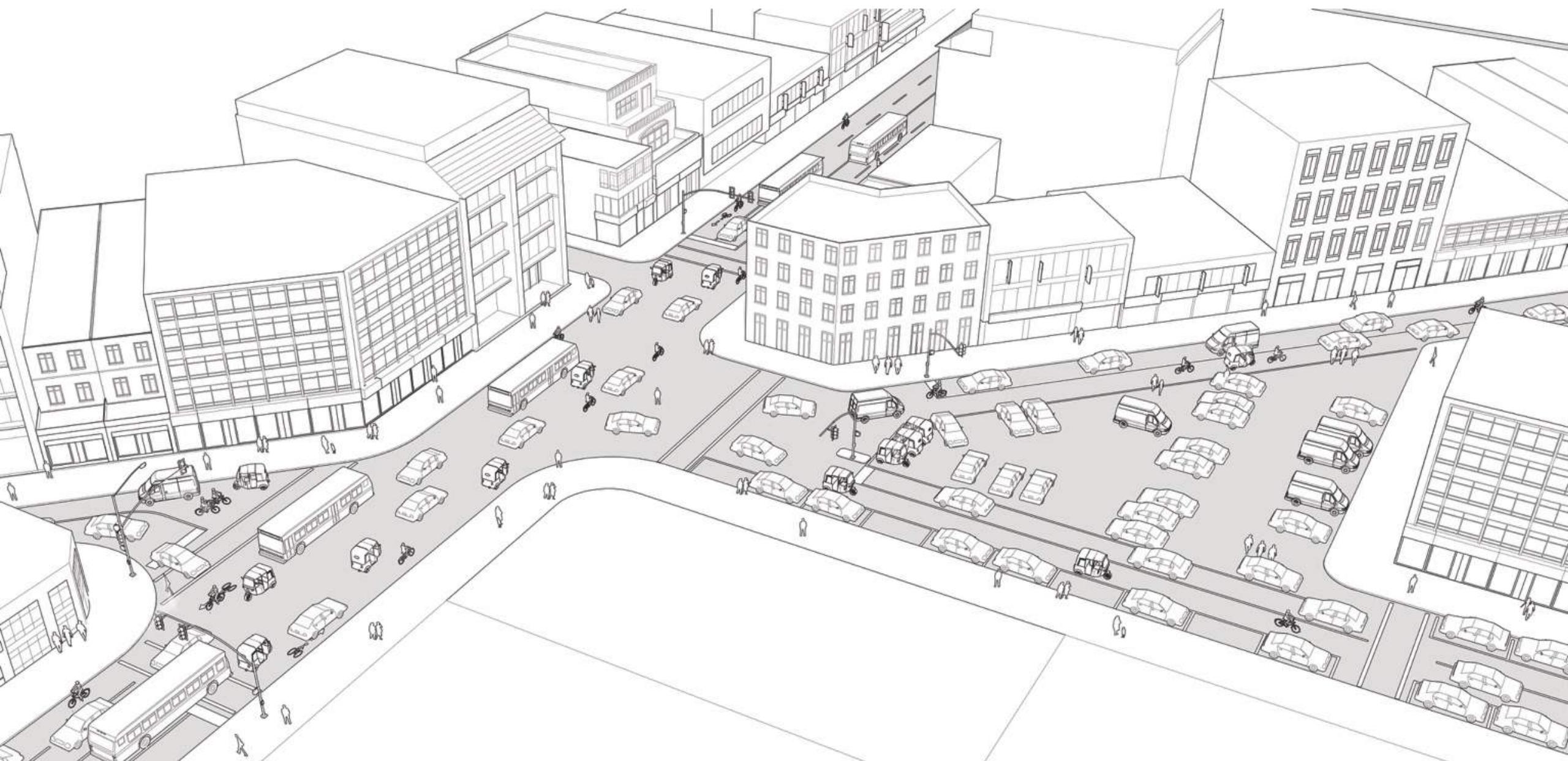
Copenhague, Dinamarca



Credit: Gehl Architects

- + 600% mais espaço para pedestres
- + 35% mais pedestres no primeiro ano
- + 81% mais pessoas sentadas ao ar livre em cafés
- + 400% mais pessoas permanecendo no espaço público

Criando Praças



Criando Praças



Nova York, EUA



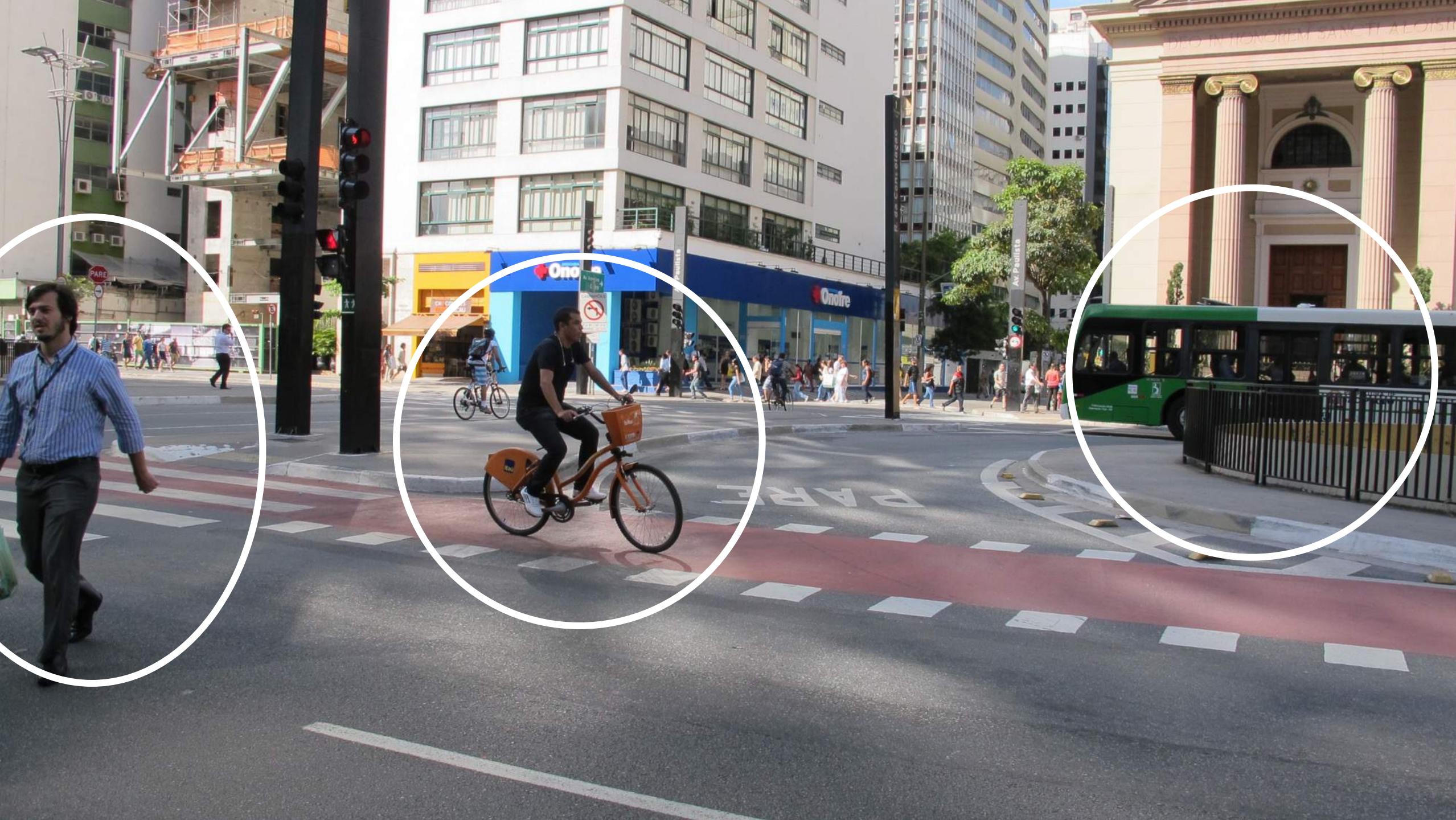
Fotos: NYCDOT

- + 11% mais pedestres
- + 1.5% mais usuários de ônibus
- + 74% preferência dos usuários

- 63% menos incidentes
- 40% redução de material particulado

Mensurar as Mudanças





PARE

Oncore

Av. Paulista

DEO IN HONOREM SANCTI ALBONIS

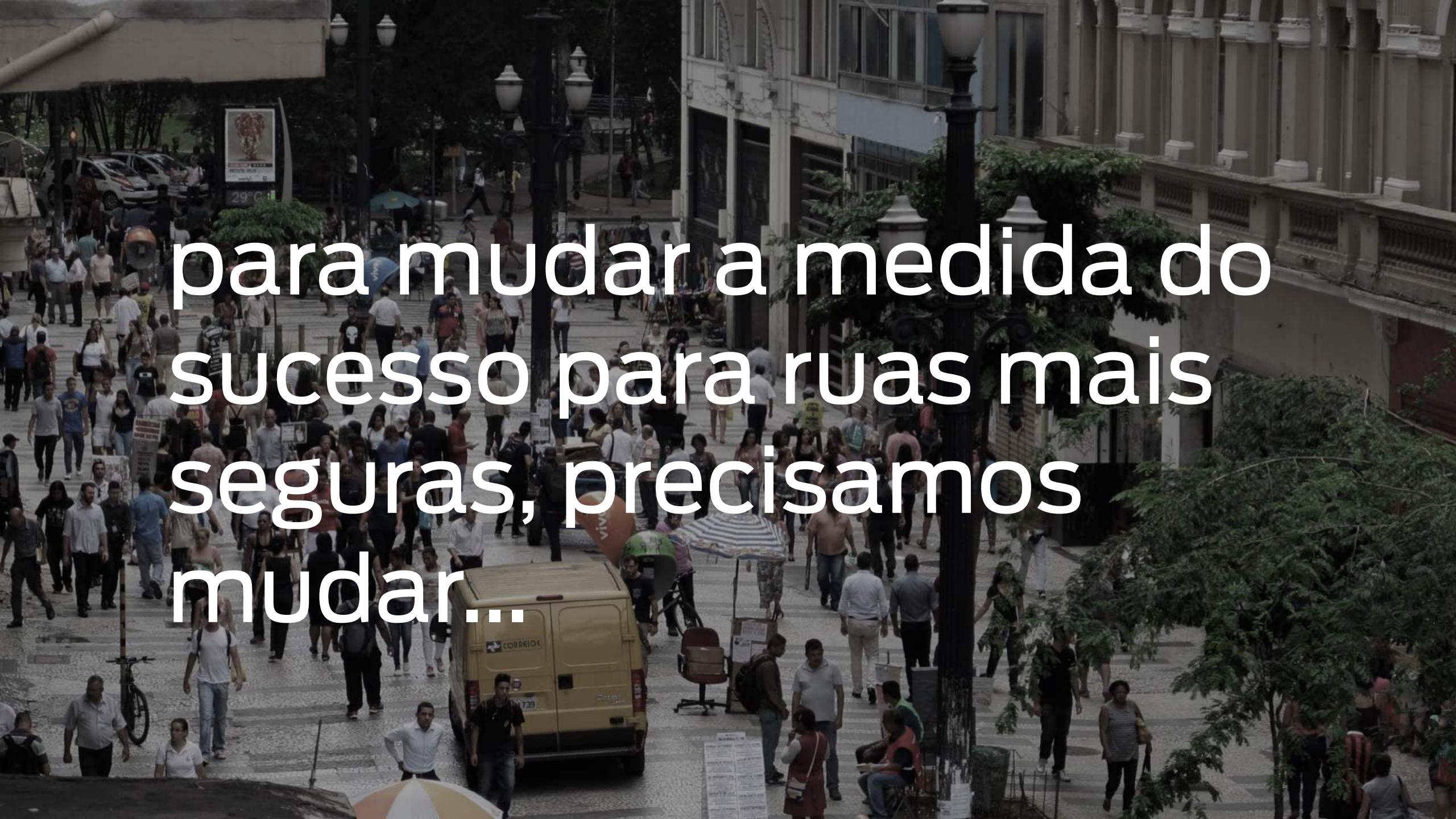
Measuring the Street – From Measuring one user



Measuring the Street – Measure All Users



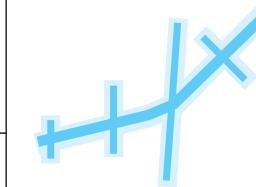
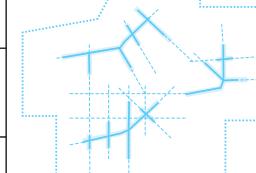
Inclusive . Quantitative . Qualitative . Contextual

A wide-angle photograph of a bustling city street, likely in Brazil given the Portuguese text. The street is filled with people walking in both directions. A yellow delivery van from 'CORREIOS' is parked on the left side. In the background, there are large, ornate buildings with classical architectural details. A digital sign on one of the buildings displays the number '29°C'. The overall atmosphere is one of a vibrant urban environment.

para mudar a medida do
sucesso para ruas mais
seguras, precisamos
mudar...

O QUÊ QUEM PORQUÉ COMO ONDE QUANDO

Medindo e Avaliando as Ruas

	What to Measure	When to Measure	Why It's Important	How to Measure	Where to Measure	Example Metrics
Measuring Physical and Operational Changes	The physical and operational changes resulting from a specific project.	<p>Before: Measure and document existing site conditions.</p> <p>After: Measure immediately after construction completion.</p> 	<ul style="list-style-type: none"> For benchmarking against prior conditions or control areas. To build an inventory and database of the city's infrastructure. To demonstrate and communicate short-term achievements and progress to stakeholders. To measure perceived quality of conditions. 	 Before-and-after photos and videos  Before-and-after plans and sections  Qualitative surveys of infrastructure quality	Project site and immediate surroundings. Maintain consistency with locations measured.	 <ul style="list-style-type: none"> Length and width of new and improved sidewalk. Added length of cycle tracks. Added length of dedicated transit lanes. Improved signal timing for pedestrian crossing length. Number of additional trees planted. Percentage of residents happy with specific facilities or conditions.
Measuring Shifts in Use and Function	<p>The change in behavior and use of the street.</p> <p>Identify how and why the street functions differently, and measure the level of satisfaction with the changes.</p>	<p>Before: Observe and document existing use and function. Note locations on site plans.</p> <p>After: Measure periodically after 1, 3, 6, and 12 months. Measure during different seasons and at varying times of the day and week.</p> 	<ul style="list-style-type: none"> To evaluate success of intended change in behavior and function. To measure user satisfaction and user perception. For benchmarking against prior conditions and other projects. To build an evidence base for sustainable streets To learn lessons and inform future street designs. 	 Before-and-after photos and videos  On-site counts and observations  Quantitative analysis  Qualitative surveys	Project site, connecting networks, and surrounding neighborhood. Maintain consistency with locations measured.	<ul style="list-style-type: none"> Shift in mode share and user counts. New or changed non-mobility activities. Change in average vehicular speeds. User preferences. Volume of water treated or infiltrated. 
Measuring Resulting Impacts	<p>The extent to which the project contributes to larger local and regional goals and principles of:</p> <ul style="list-style-type: none"> Public Health and Safety Quality of Life Environmental Sustainability Economic Sustainability Equity 	<p>Before: Identify existing metrics or collect new data relevant to project goals and priorities.</p> <p>After: Measure matching metrics periodically after multiple months, and after 1, 2, and 3 years.</p> 	<ul style="list-style-type: none"> To evaluate long-term impacts and benefits. To benchmark against larger citywide goals and priorities. To build an evidence base for sustainable streets. To measure return on investment and evaluate cost effectiveness. To communicate and build support for sustainable streets. 	 Quantitative analysis  Qualitative surveys  Comparative analysis of census results  Environmental analysis	Project, neighborhood, network, and citywide scale. Choose scales relevant to specific metrics.	<ul style="list-style-type: none"> Road safety (KSI/ fatalities and injuries by location). Respiratory and chronic disease rates. Air quality. Total CO₂ from transportation. Water volumes diverted from city system. Property values. Percentage of population with access to public transportation. Perceived quality of life. 

São Paulo Brasil



Bogotá Colombia



Addis Ababa Ethiopia



Fortaleza Brasil



Mumbai India



Global
Designing
Cities
Initiative

Policy and Design Guidance



Capacity Building and Community Engagement

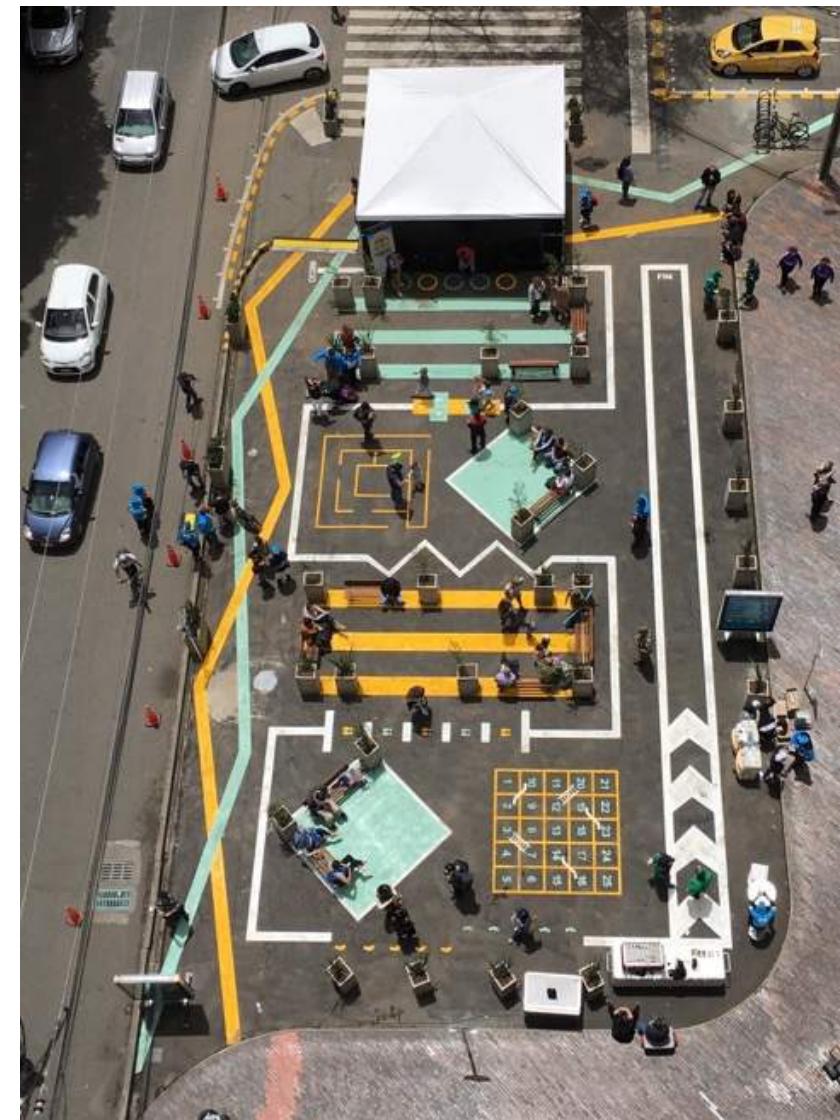
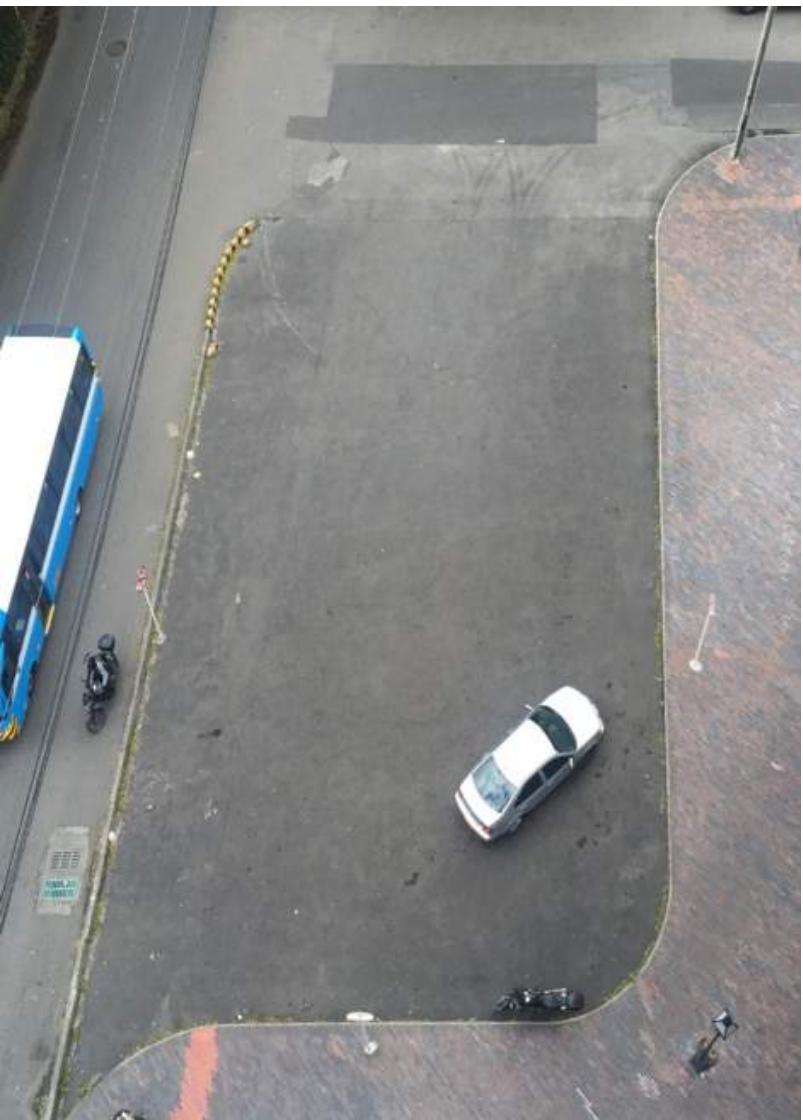


Interventions and Transformations



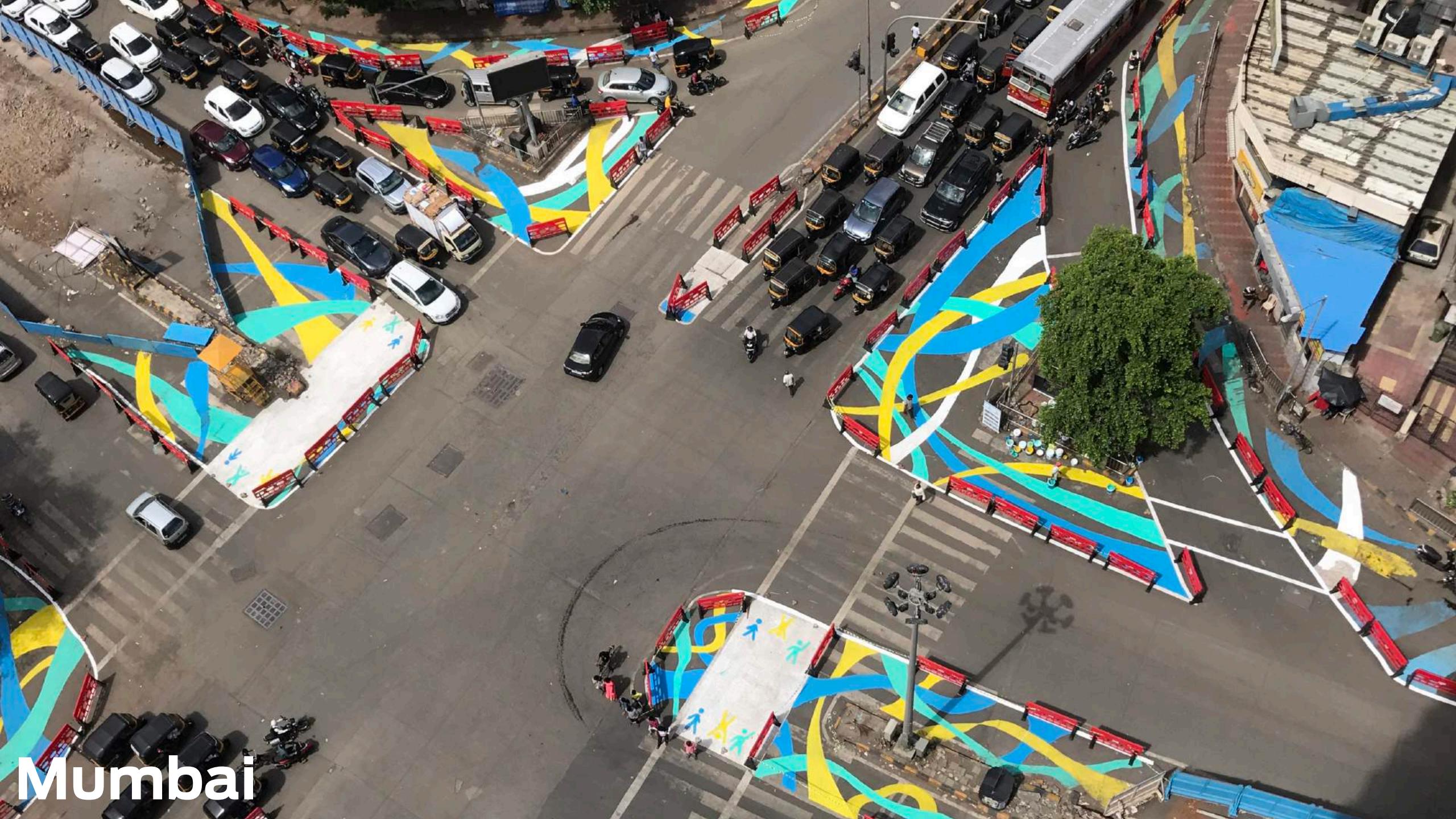
Metric Collection and Evaluation

Short-Term Interim Transformations





Mumbai



Mumbai



Addis Ababa, Ethiopia

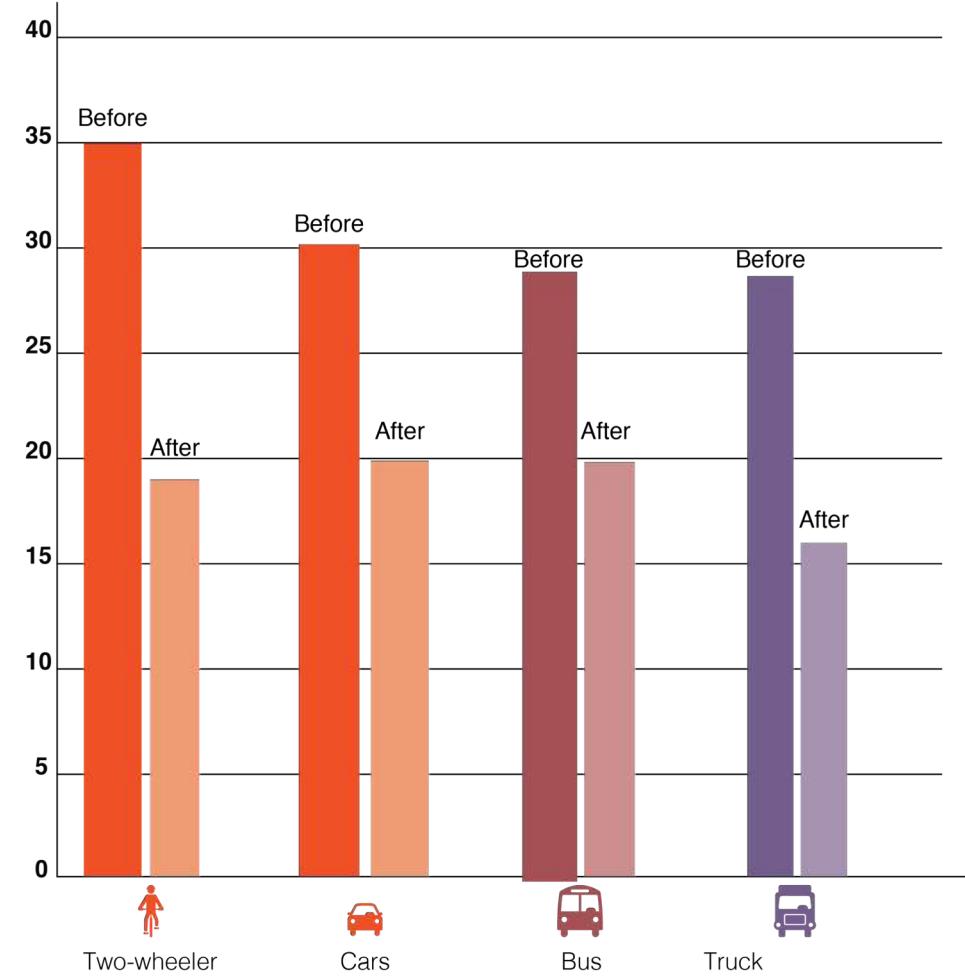


Addis Ababa, Ethiopia

Medir Antes x Depois



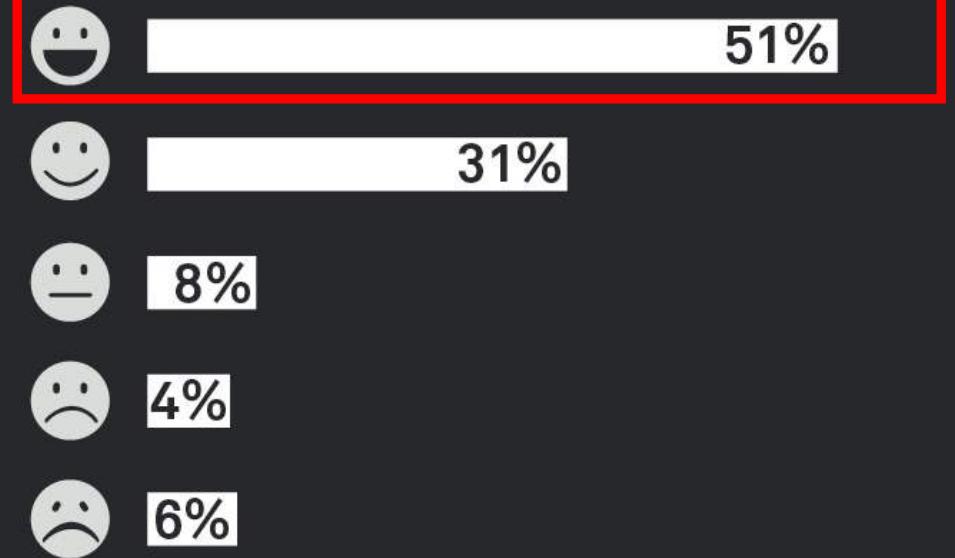
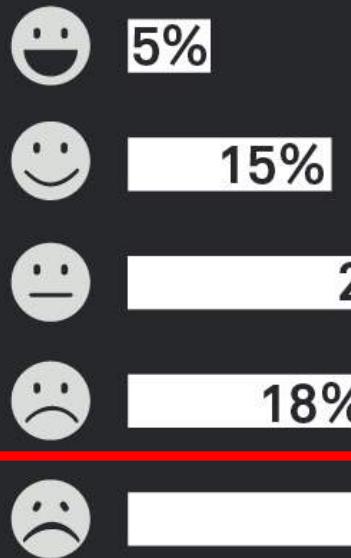
Observed average speed on right turn traffic (Km/hr)
WEEKDAYS (Before/After)





Sao Paulo, Brazil





How safe do you feel on the **sidewalks**?



BEFORE



AFTER



How safe do you feel on the crosswalks?





Average speeds reduced by **30%**





930 Vehicles per hour



33 km/h Average Speed

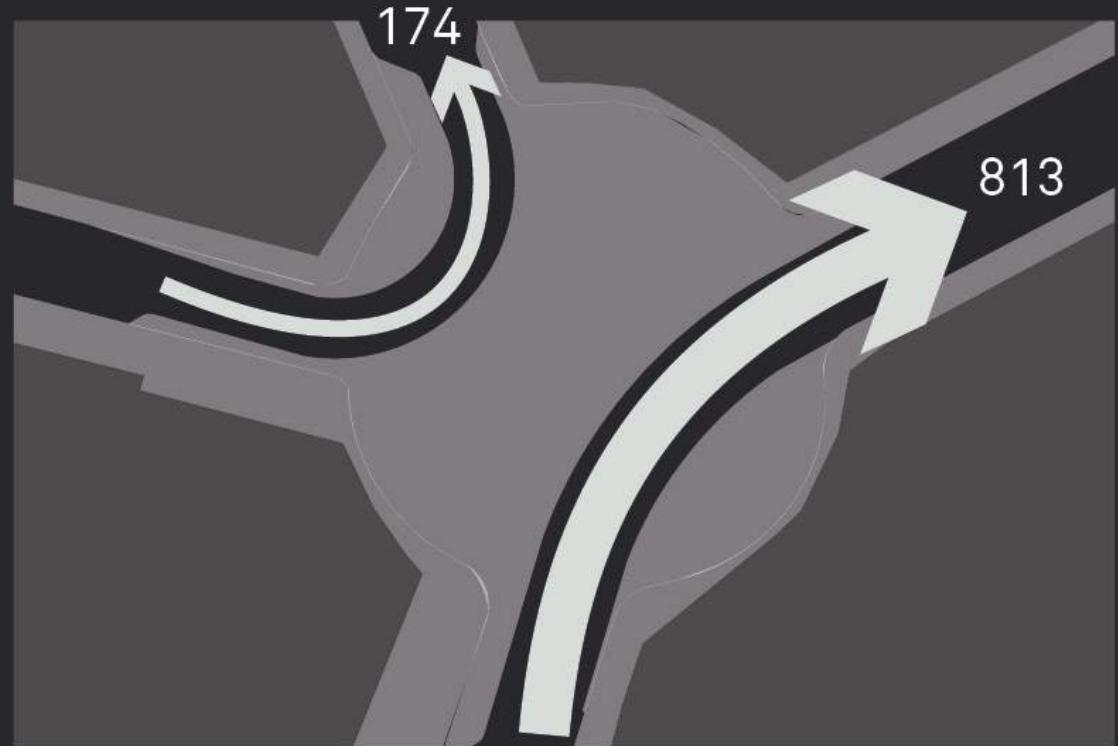


987 Vehicles per hour



21 km/h Average Speed

Throughput was higher, in spite of lower speeds





ANTES
Cidade 2000, Fortaleza



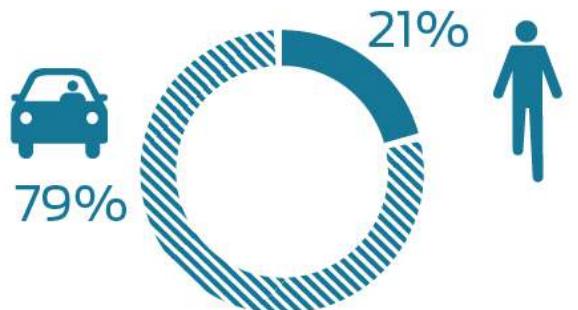
DEPOIS
Cidade 2000, Fortaleza

Fortaleza

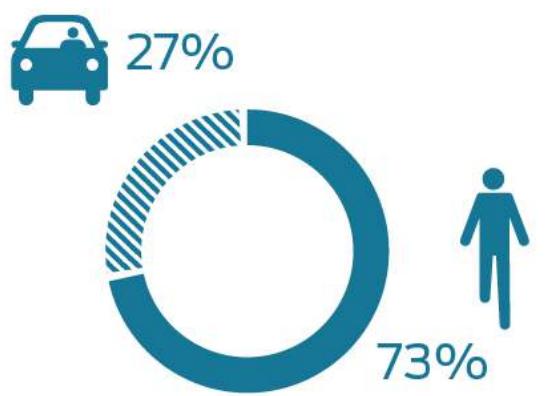
Quantitative survey

Pedestrians Share of the Street

Cidade 2000



BEFORE



AFTER





Cidade 2000, Fortaleza



Cidade 2000, Fortaleza





Prefeitura de
Fortaleza
Autarquia Municipal de
Trânsito, Serviços Públicos
e de Gestão
Central de Atendimento
190
UNIDADE MÓVEL
AMC TRÂNSITO

HYG-5494

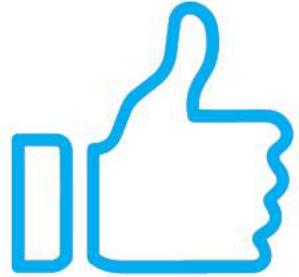


Cidade 2000, Fortaleza

Fortaleza

Quantitative survey

Cidade 2000



94%

Approve of the intervention



97 %

Believe Pedestrians should be prioritized over motorized traffic





Cidade 2000, Fortaleza





Image: City of Fortaleza



CALIFORNIA
BEACH

Dragão do Mar





Antes



Depois



Antes



Depois



Antes



Depa



Antes





Depois

Antes

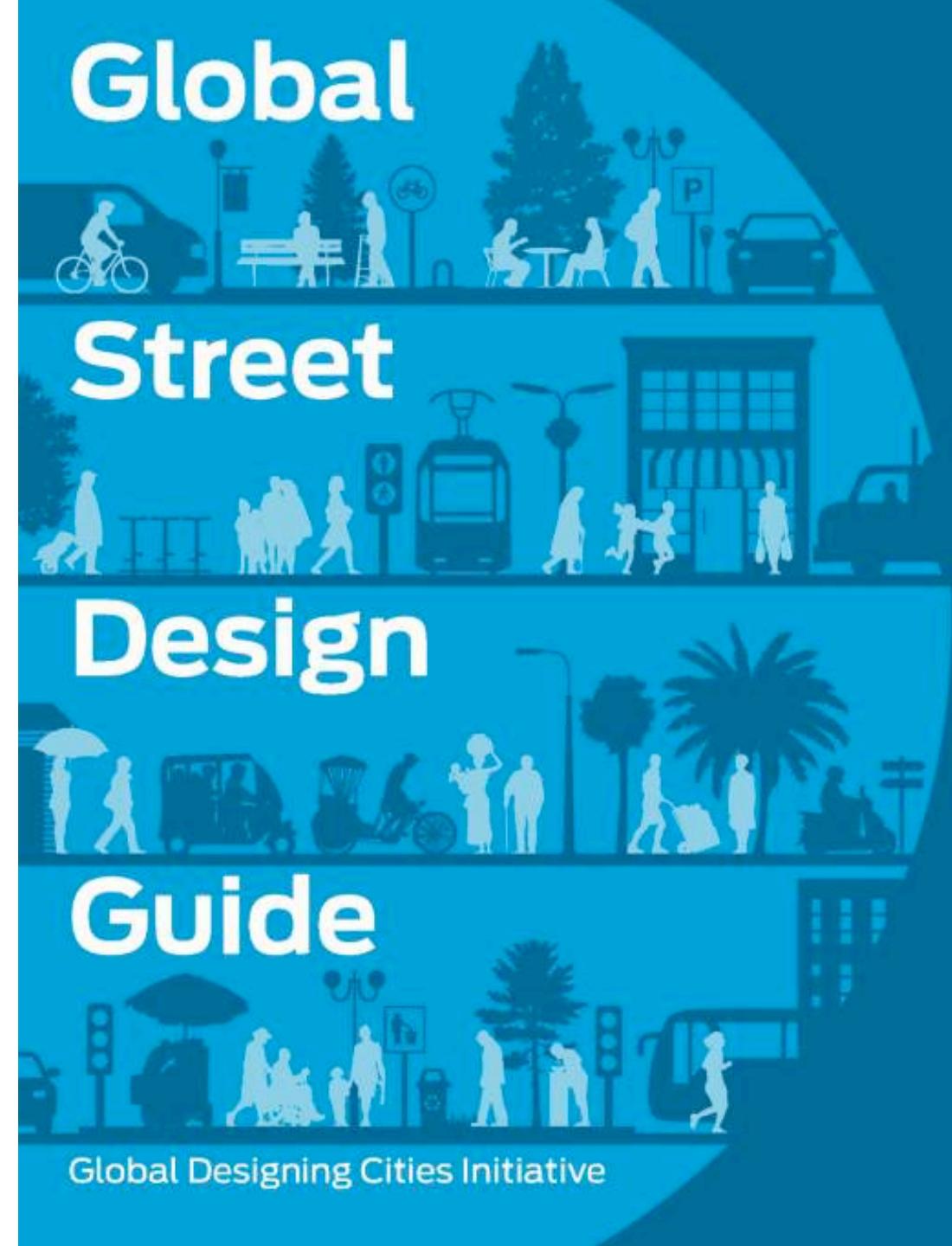


Depois





Provide the tools
to reimagine,
reinvent, and
redesign
safer, more
sustainable
streets for
everyone!



Global Designing Cities Initiative

**ENDORSE IT
ASK FOR IT
DEMAND IT
DESIGN IT
FUND IT
DO IT**

DESENHE AS RUAS PARA AS PESSOAS!



Safe + Sustainable Street Superheroes!!





Change Streets, Change the World
www.globaldesigningcities.org

Obrigada!

Baixe uma cópia grátis em:
www.globaldesigningcities.org



Skye Duncan
skye@nacto.org

 @GlobalStreets
 @skyejduncan
 facebook.com/globalstreets