Principais Modos, Sistemas e Tecnologias no Transporte Coletivo Urbano de Passageiros

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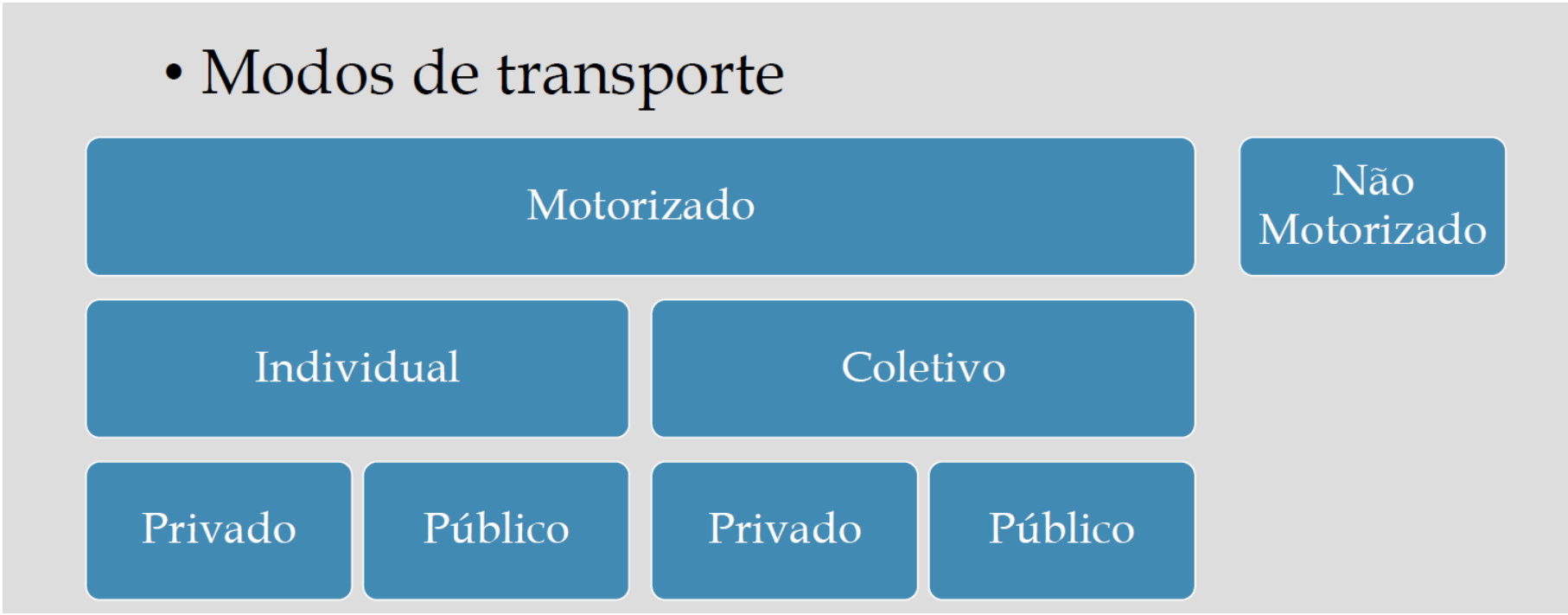
Modos no Transporte de Passageiros

- **A pé**
- **Bicicleta**
- **Ônibus**
  - Convencional, faixa exclusiva, corredor, BRT, fura-fila
- **Trilhos**
  - Metrô, Trem Metropolitano, Trem de Longa Distância, VLT, Monotrilho
- **Aéreo**

Outra visão



Ônibus

Bus Type	Typical Applications	Capacity/Quality of Service Factors
(a) Standard low-floor 	• Typical local bus service	• Faster boarding times, particularly for mobility devices • Fewer seats than comparable high-floor bus • Prefer streets developed with curbs for ramp deployment
(b) Standard high-floor 	• Local bus service on streets without curbs or sidewalks • Routes requiring a little more capacity than what a low-floor bus offers	• Wheelchair lift works better than ramps in areas without curbs and sidewalks • Typically provides 3–5 more seats than a comparable low-floor bus • Longer boarding times (stairs)
(c) Community bus 	• Bus service on lower-volume routes • Bus service that operates on neighborhood streets with tight turning radii	• Can allow bus service to be provided in areas difficult to serve with a standard-size bus • Most or all passengers will be seated
(d) Articulated bus 	• Routes where added capacity is desired without adding more buses • Routes where reduced number of buses, but same capacity, is desired	• 50% more seats and standing capacity than standard bus • High or low floor • Reducing frequency may increase passenger service times and overall travel times
(e) Motor (over-the-road) coach 	• Commuter bus service • Intercity passenger service • Heavier-duty bus for high-speed running • Can carry luggage or bicycles in compartments underneath bus	• Larger, more comfortable seats • May offer internet service, tray tables, overhead storage, and other amenities • Typically no standees allowed • High floor

Fonte: TRB Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition:

Faixa exclusiva de ônibus

Faixa exclusiva de ônibus

Corredor de ônibus

- **Avenida Rebouças**

Corredor de ônibus

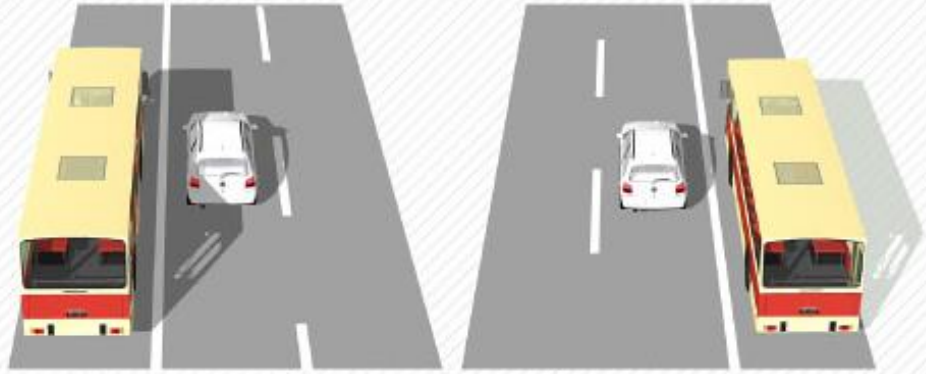
- **Corredor ABD da EMTU**

Comparativo

CORREDORES
Ônibus circulam em faixa do lado **esquerdo** da pista

Quando podem utilizar os corredores
Veículos de passeio
Nos dias úteis, das 23h às 4h e nos fins de semana, das 15h do sábado às 4h da segunda
Táxis
Em qualquer dia e horário, desde que não tenham película escura nos vidros e estejam transportando passageiros

Multa: R$ 127,69 e cinco pontos na carteira



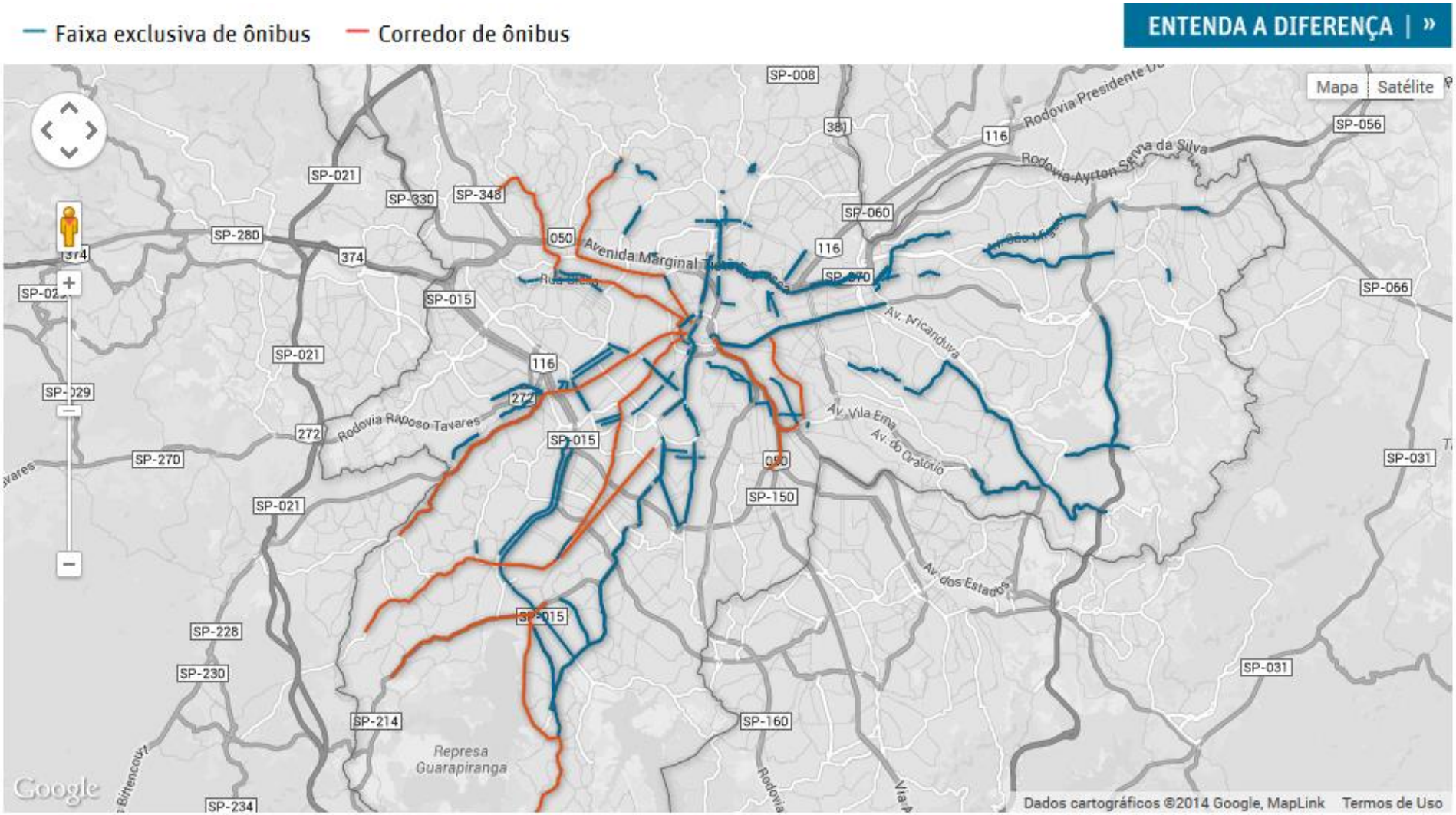
FAIXAS
Ônibus circulam em faixa do lado **direito** da pista

Quando podem utilizar os corredores
Veículos de passeio
Proibidos nos horário de funcionamento das faixas. Fora esses horários, o trânsito é liberado. As faixas tem horários diferentes
Táxis
Devem seguir as mesmas regras que os veículos de passeio

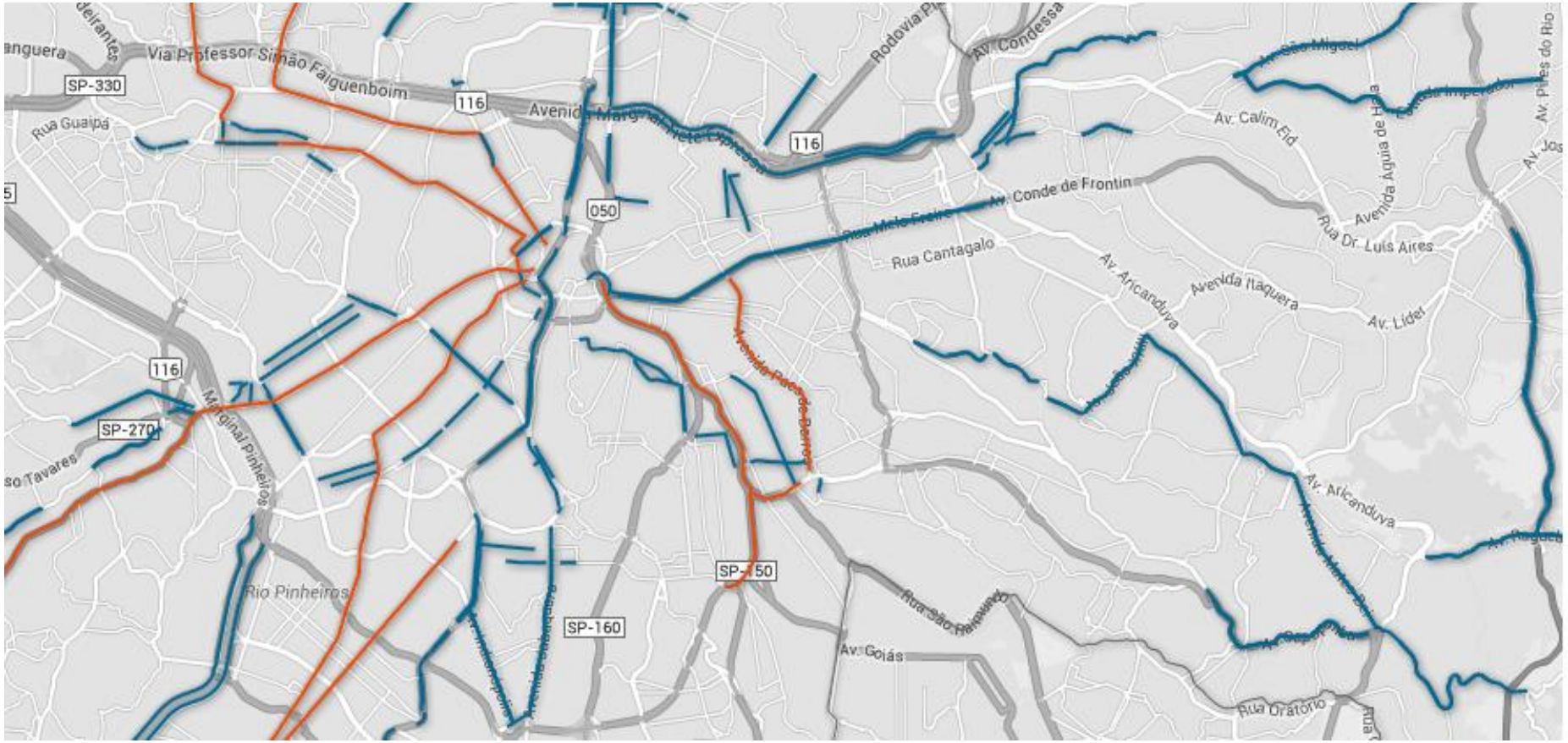
Multa: R$ 53,20 e três pontos na carteira

Fonte: http://www1.folha.uol.com.br/infograficos/2013/08/24144-faixas-exclusivas-e-corredores-de-onibus-em-sao-paulo.shtml

Faixas Exclusivas e Corredores de Ônibus em São Paulo



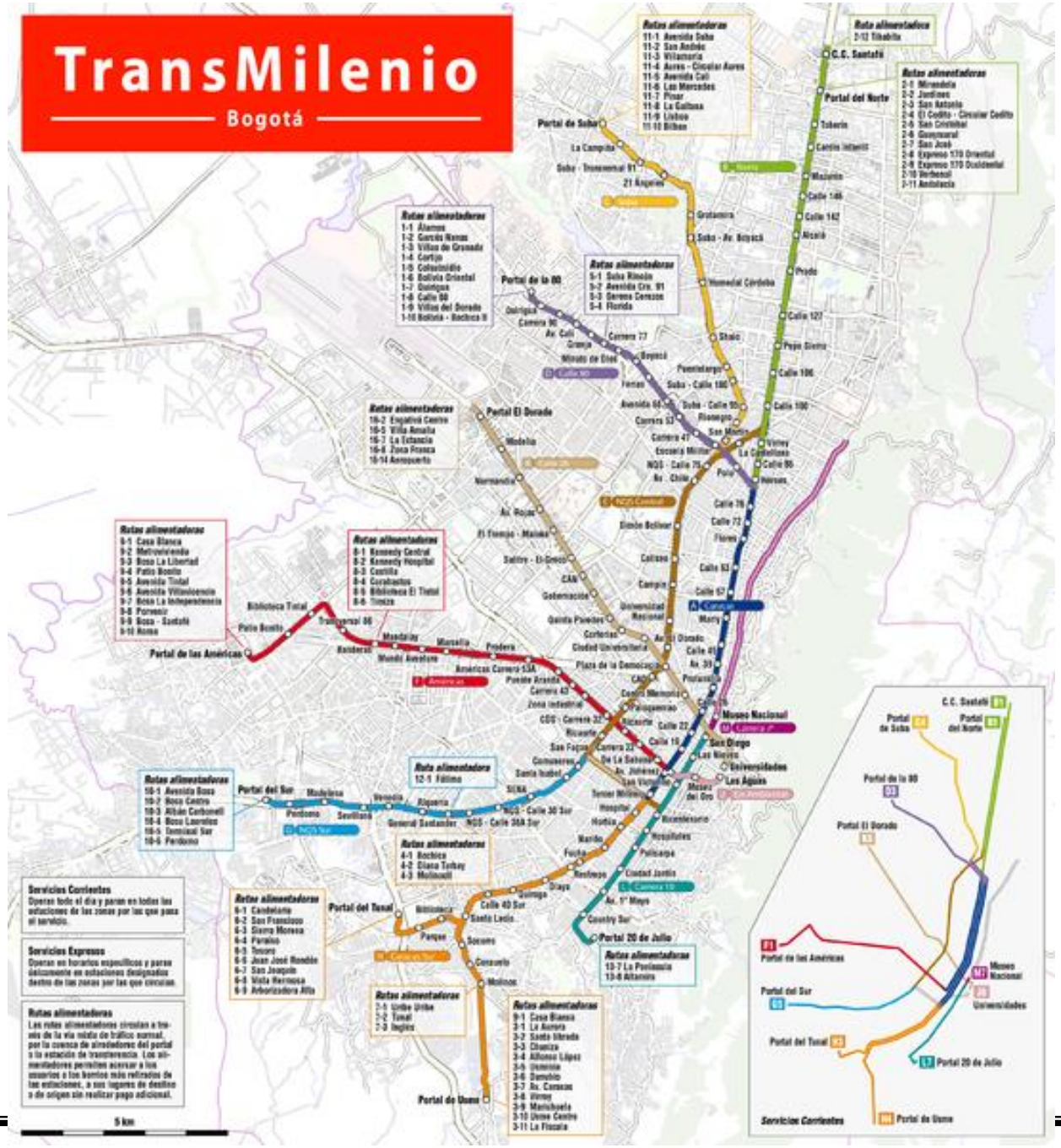
Faixas Exclusivas e Corredores de Ônibus em São Paulo



BRT

- ***Bus Rapid Transit***

BRT Transmilenio - Bogotá, Colombia



Fura Fila

Fura Fila

Ônibus

(a) Electric trolleybus (Vancouver)

(b) Commuter bus (San Francisco Bay Area)

(c) Bus rapid transit (Brisbane)

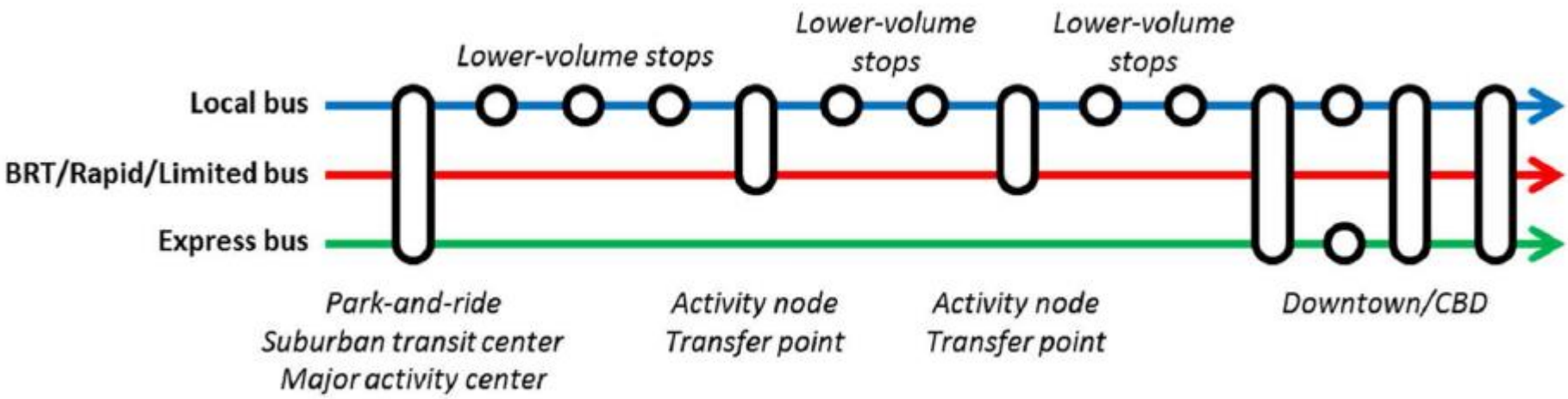
(d) Bus (Washington, D.C.)

Fonte: TRB Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition:

O que caracteriza os diferentes sistemas de ônibus?

- **Segregação**
- **Cobrança (no veículo ou no embarque)**
- **Pontos de parada (com ou sem ultrapassagem)**
- **Estruturação dos serviços**
  - Terminais de integração
  - Veículos de maior capacidade
  - Diversos serviços: parador, expresso, semi-expresso,....
- **Capacidade (pax/h)**

Estruturação de serviços de ônibus



Metrô

(a) Chicago

(b) Toronto

(c) Cleveland

(d) San Francisco Bay Area

Fonte: TRB Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition:

Trem metropolitano

Commuter Rail

(a) Bi-level car (Toronto)

(b) Bi-level gallery car (Chicago)

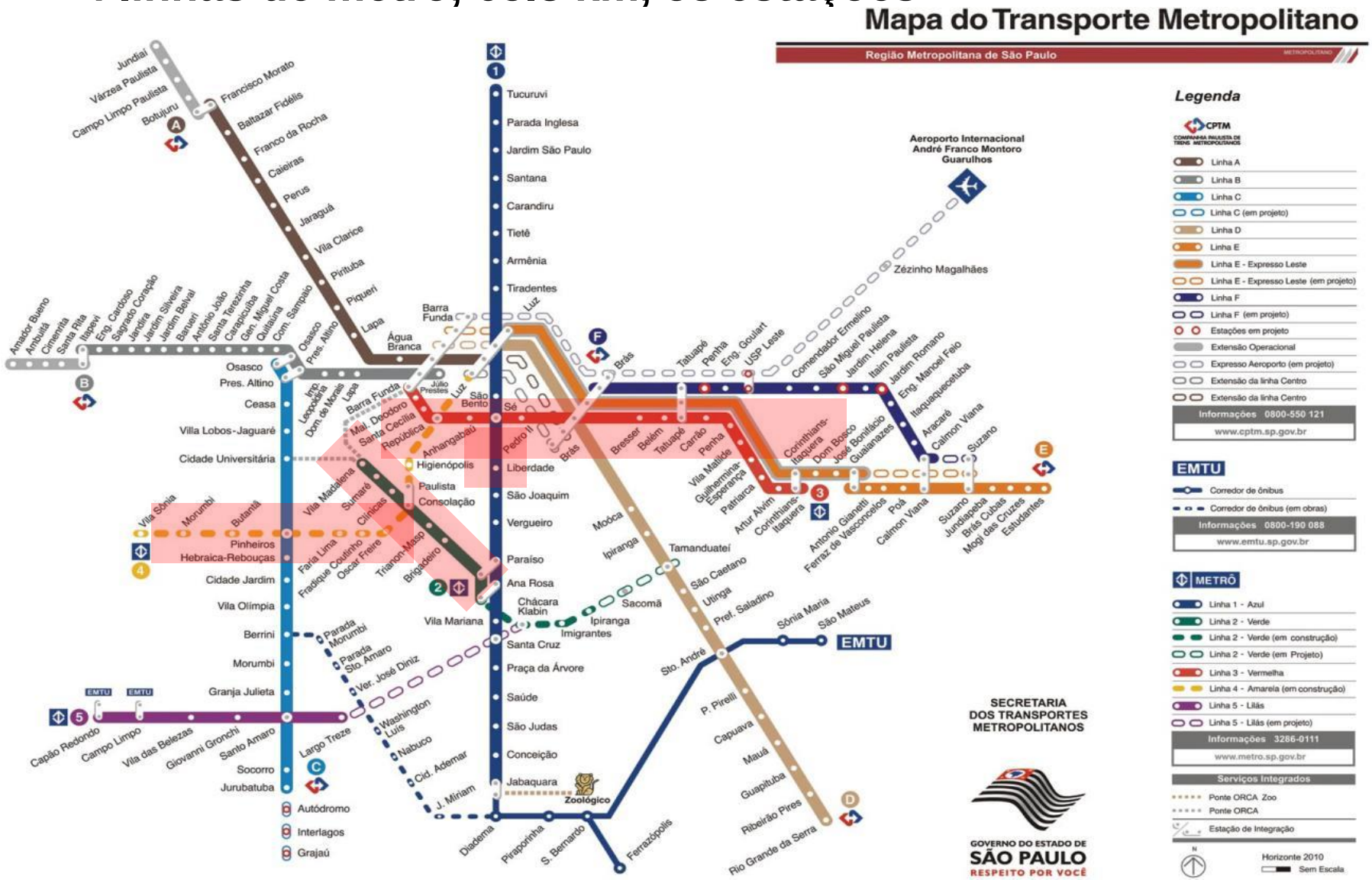
(c) Bi-level car (San Francisco Bay Area)

(d) Single-level car (Baltimore)

Fonte: TRB Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition:

Sistema de Transporte Metro-ferroviário

- **4 linhas de metrô, 65.3 km, 58 estações**



Metrô de São Paulo

- **Muito congestionado (8-9 passgeiros por m^2)**

VLT – Veículo Leve sobre Trilhos

VLT – Veículo Leve sobre Trilhos

VLT Rio de Janeiro

(a) High-floor light rail (Denver)

(b) Low-floor light rail (Portland)

(c) High-floor streetcar (Philadelphia)

(d) Modern low-floor streetcar (Seattle)

(e) Vintage trolley (Memphis)

(f) Diesel light rail (San Diego County)

Fonte: TRB Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition:

Monotrilho

Monotrilho

(a) Airport shuttle (Newark)

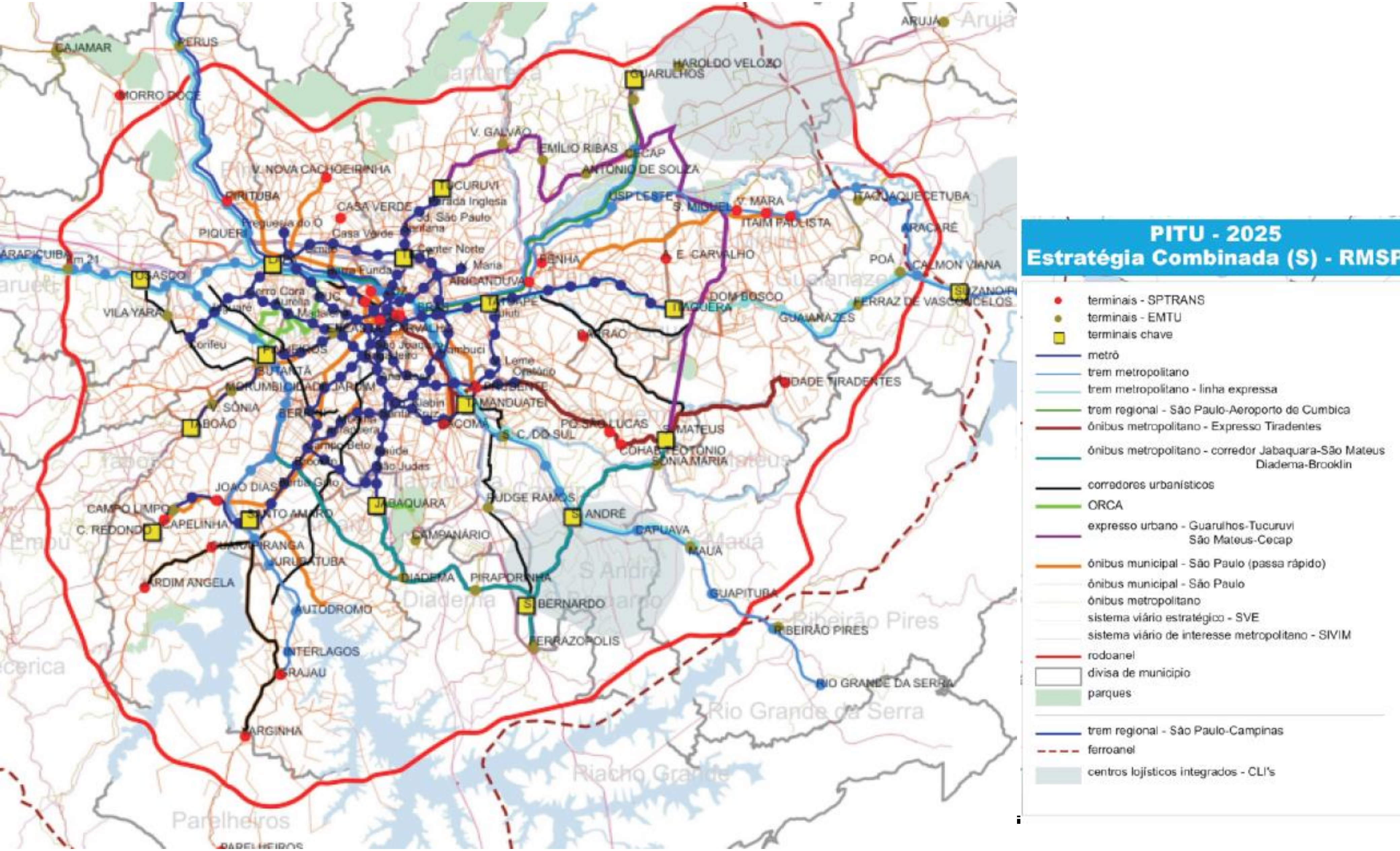
(b) Downtown people mover (Miami)

(c) Institutional (Honolulu)

(d) Leisure (Memphis)

Fonte: TRB Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition:

PITU 2025


PITU - 2025
Estratégia Combinada (S) - RMSP
terminais - SPTRANS
terminais - EMTU
terminais chave
metrô
trem metropolitano
trem metropolitano - linha expressa
trem regional - São Paulo-Aeroporto de Cumbica
ônibus metropolitano - Expresso Tiradentes
ônibus metropolitano - corredor Jabaquara-São Mateus
Diadema-Brooklin
corredores urbanísticos
ORCA
expresso urbano - Guarulhos-Tucuruvi
São Mateus-Cecap
ônibus municipal - São Paulo (passa rápido)
ônibus municipal - São Paulo
ônibus metropolitano
sistema viário estratégico - SVE
sistema viário de interesse metropolitano - SIVIM
rodoanel
divisa de município
parques
trem regional - São Paulo-Campinas
ferroanel
centros lojísticos integrados - CLI's
CAJAMAR
PERUS
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ARUJÁ
HAROLDO VELOZO
GUARULHOS
V. GALVÃO
EMÍLIO RIBAS
CECAP
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V. NOVA CACHOEIRINHA
TUCURUVI
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CASA VERDE
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ITAIM PAULISTA
ITAQUAQUECETUBA
ARACARÉ
PIQUERI
E. CARVALHO
POÁ
CALMON VIANA
ARICANDUVA
PENHA
DOM BOSCO
GUAIANAZES
FERRAZ DE VASCONCELOS
VILA YARA
CIDADE TIRADENTES
S. MATEUS
PQ. SÃO LUCAS
COHAB TEOTONIO
SONIA MARIA
TABOÃO
S. C. DO SUL
JOÃO DIAS
JABAQUARA
RUDGE RAMOS
S. ANDRÉ
CAMPO LIMPO
C. REDONDO
CAPELINHA
SANTO AMARO
CAMPANÁRIO
CAPUAVA
MAUÁ
JARDIM ANGELA
DIADEMA
PIRAPORINHA
S. BERNARDO
AUTODROMO
GUAPITUBA
RIBEIRÃO PIRES
FERRAZOPOLIS
INTERLAGOS
GRAJAU
RIO GRANDE DA SERRA
VARGINHA
PARELHEIROS

Há outras alternativas de transporte coletivo

Há outras alternativas de transporte coletivo urbano

(a) Passenger incline (Pittsburgh)

(b) Vehicle incline (Johnstown, PA)

(c) Passenger incline (Mürren, Switzerland)

(d) Inclined elevator (Ketchikan, Alaska)

Fonte: TRB Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition:

Comparação de Sistemas de Transporte

- **Como medir e comparar sistemas de transporte?**
- **Quem realiza mais transporte?**
- **Exemplo:**
  - Trem entre dois pontos distantes 1000 km, 2x por semana, com 20 vagões de 45 toneladas de carga útil
  - Transferência rodoviária entre fábrica e porto, distantes 800 km, 10 viagens por dia, 7x por semana, carretas bitrens com 35 toneladas de carga util

Produção de Transporte

- **Mede o “esforço” para realizar um serviço de transporte**
- **Procura levar em conta a distância e a quantidade sendo transportada**
- **Pode ser calculada como o produto entre a quantidade total transportada e a distância.**
  - Produção = quantidade total x distância
- **Serve tanto para cargas quanto para passageiros**

Comparando os modais

- **Modal Ferroviário**
  - Distância = 1000 km
  - Quantidade semanal transportada = 2 trens por semana x 20 vagões x 45 t por vagão = 2 x 20 x 45 = 1800 t/sem
  - Produção = 1000 x 1800 = 1 800 000 TKU / semana

- **Modal Rodoviário**
  - Distância = 800 km
  - Quantidade semanal transportada = 10 viag/dia x 7 dias/sem x 35 t / viag = 2450 t / sem
  - Produção = 800 x 2450 = 1 960 000 TKU / semana

Car pooling...

MIT study says 3,000 ride-sharing cars could replace every cab in New York City

http://hubcab.org/#13.00/40.7250/-73.9484

DRT
A evolução do transporte

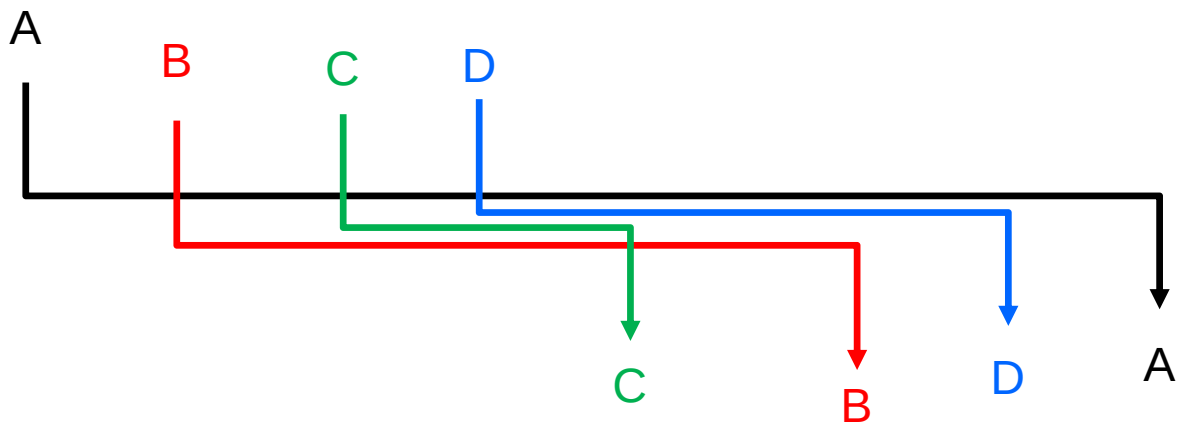
DRT

- Demand Responsive Transportation
  - Anteriormente conhecido com ‘dial-a-ride’
- Soluções flexíveis e personalizadas de transporte
  - Rotas e programação (horários)
  - Em geral, porta-a-porta
  - Transporte público
  - Reserva

    → *Mais de uma pessoa sendo transportada no mesmo veículo*
- Que complementam ou até substituem o sistema de transporte coletivo urbano tradicional
  - Formado por linhas de ônibus e micro-ônibus, BRT’s, metrô, trem, monotrilho, VLT, VLP ....

Como é um serviço DRT?

- Serviço de transporte coletivo privado
- Sem itinerário fixo
- Vários passageiros sendo transportados simultaneamente no mesmo veículo
- Com origens e destinos não coincidentes (porém próximos entre si)
- Que embarcam e desembarcam não necessariamente na mesma sequência



DRT não é algo novo

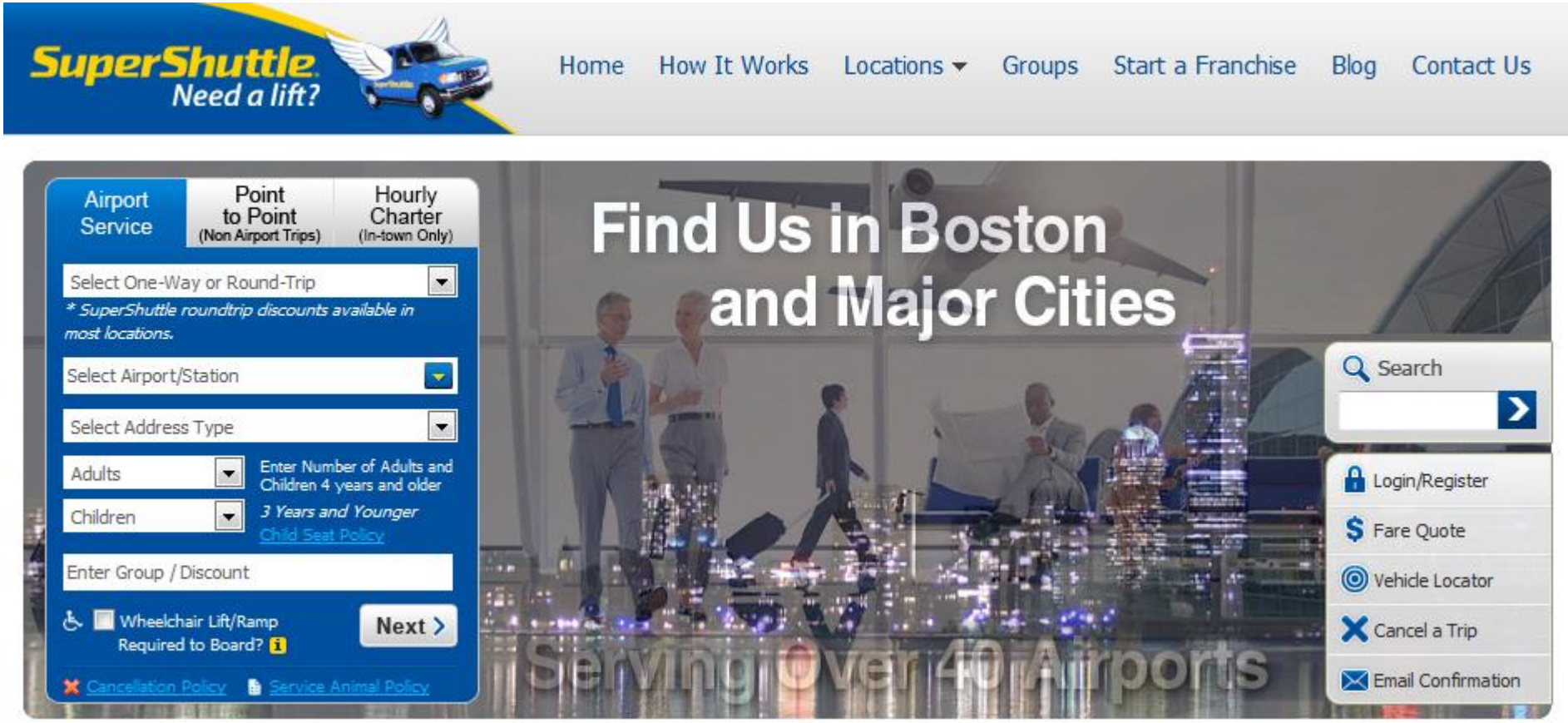
- Transporte de pessoas idosas ou com deficiência
- Atende (PMSP)

ATENDE

O **Serviço de Atendimento Especial**, ou Atende, é uma modalidade de transporte gratuito, porta a porta, destinado às pessoas com deficiência física severa, as quais tenham vínculo à cadeira de rodas.

Horário do serviço: o Atende funciona das 7h às 20h, de segunda-feira a domingo.

Credencial	Dia_Viagem	Hora_Ida	Van_ida	Hora_Volta	Van_volta
2	Quarta	06:20:00	24102	12:30:00	11927
17	Quarta	12:40:00	81950	16:10:00	82043
25	Terça	13:05:00	82026		0
			0	17:00:00	81980
	Quinta		0		0
27	Sexta		0		0
28	Segunda	06:30:00	53815	11:35:00	39319
	Terça	06:15:00	39320		0
	Quarta	06:30:00	39610	11:35:00	48579
	Quinta		0		0
	Sexta		0		0
30	Terça	11:15:00	53811	16:00:00	48560
	Quinta		0		0

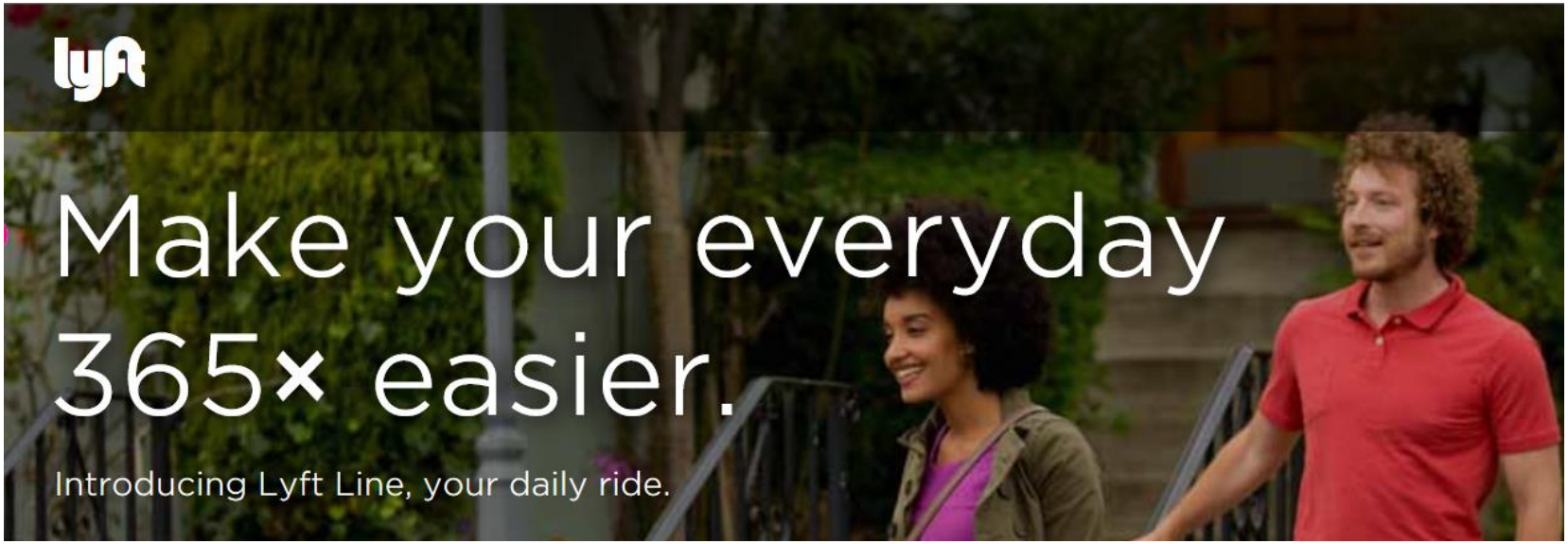

SuperShuttle
Need a lift?
Home
How It Works
Locations
Groups
Start a Franchise
Blog
Contact Us
Airport Service
Point to Point (Non Airport Trips)
Hourly Charter (In-town Only)
Select One-Way or Round-Trip
* SuperShuttle roundtrip discounts available in most locations.
Select Airport/Station
Select Address Type
Adults
Enter Number of Adults and Children 4 years and older
Children
3 Years and Younger
Child Seat Policy
Enter Group / Discount
Wheelchair Lift/Ramp Required to Board?
Next
Cancellation Policy
Service Animal Policy
Find Us in Boston and Major Cities
Serving Over 40 Airports
Search
Login/Register
Fare Quote
Vehicle Locator
Cancel a Trip
Email Confirmation

Novidades recentes

- UberPool
- Lyft Line
- Bridj 

- Via
- Kutsuplus 

- Split 


Make your everyday
365× easier.
Introducing Lyft Line, your daily ride.

Lyft Line

Como funciona

Built for You

Always Less

By riding with others, you save up to 60% compared to an original Lyft ride.

Smartly routed

Ride with fellow passengers headed in the same direction.

People-powered

Meet your community, and see the names and photos of whom you're riding with.

Como funciona

How it works

Request

Open the Lyft app and select 'Line.' Tap the 'Request Line' button. We'll prompt you to enter your destination and then start building your Line.

Chill

Within minutes, we'll match you with a ride. The price of your trip is fixed up-front. Even if we don't find another passenger, your Line will remain the discounted rate.

Go

We'll text you when your Line arrives. All you need to do is walk out the door and hop in.

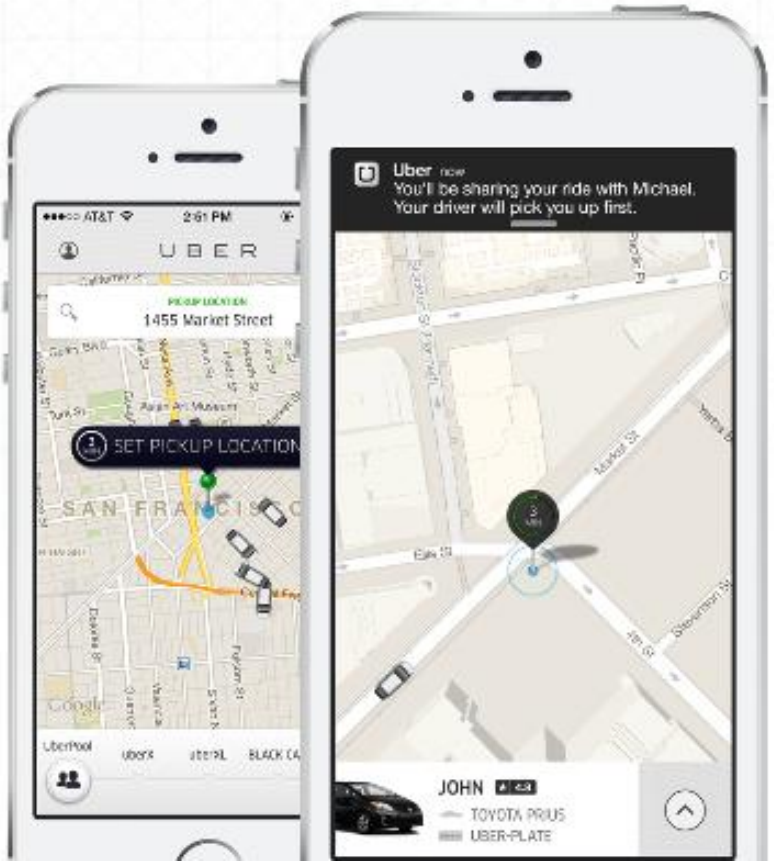
ANNOUNCING UBERPOOL

UberPool

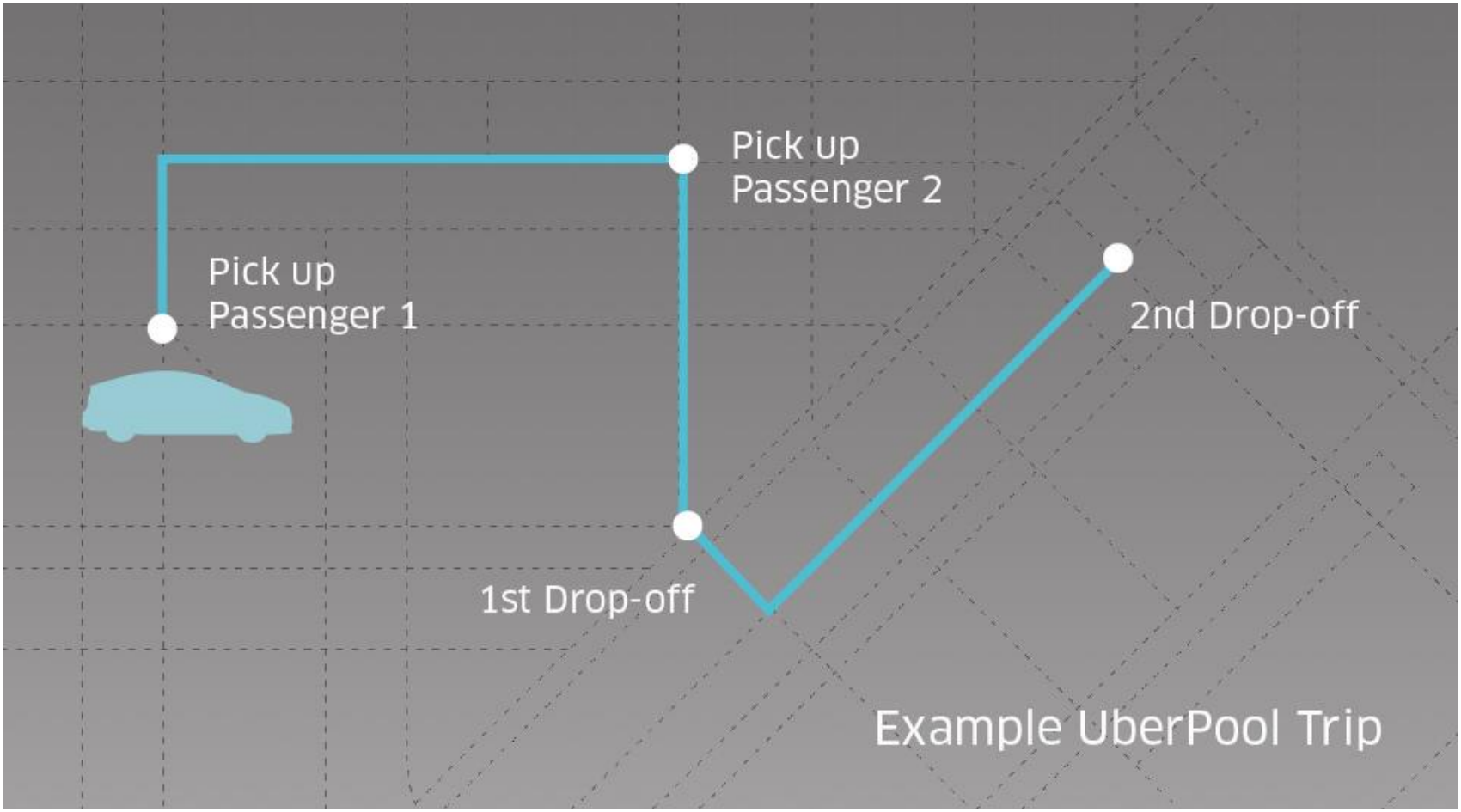
Como funciona

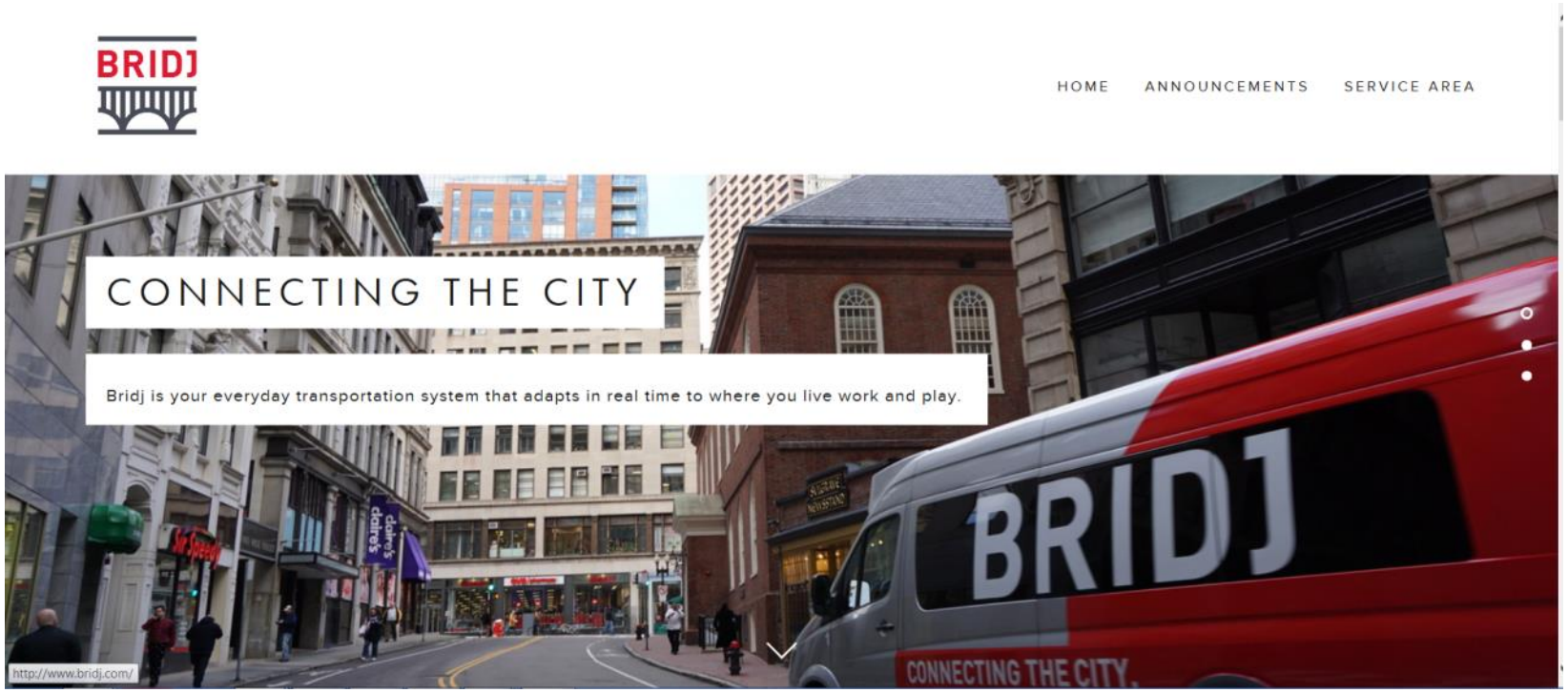
UBERPOOL – THE IDEA

The idea is simple. With UberPool, you share a ride—and split the cost—with another person who just happens to be requesting a ride along a similar route. The beauty, though, is that you still get Uber-style on-demand convenience and reliability: just push the button like before and get a car in five minutes. When we find a match, we notify you of your co-rider's first name.



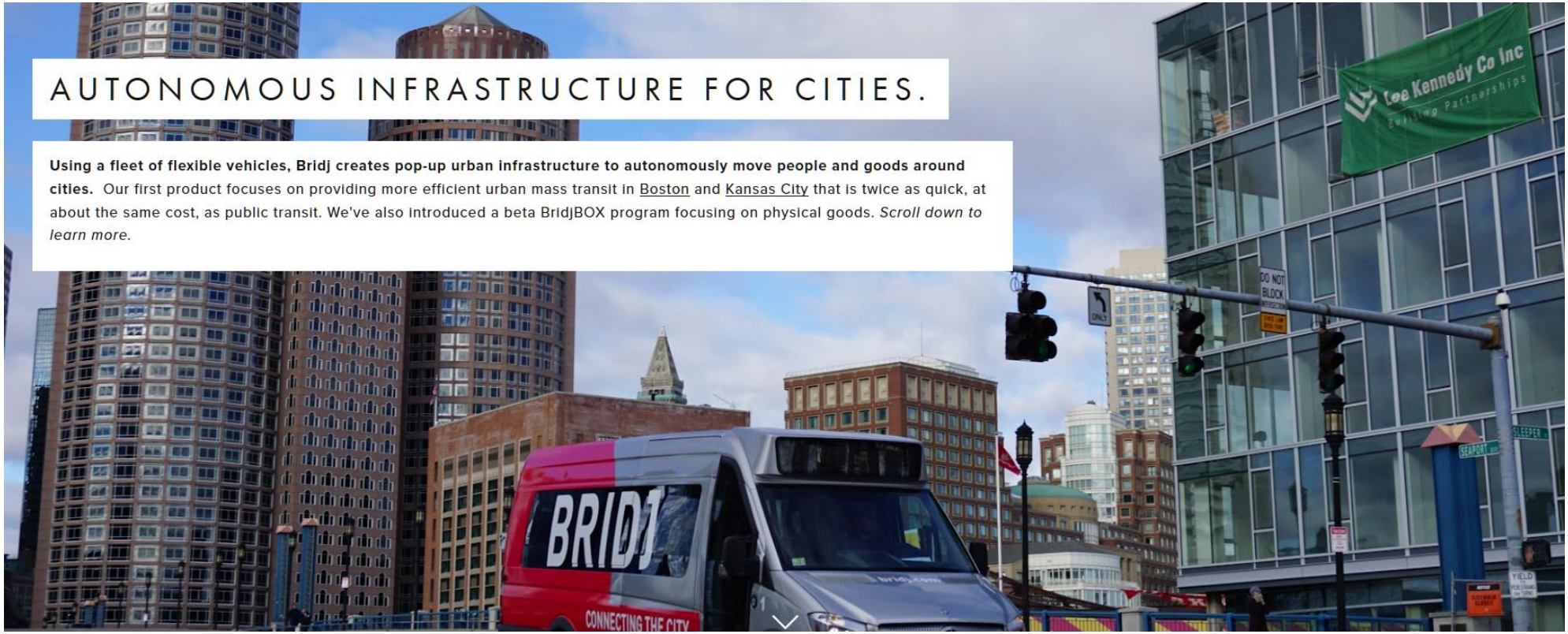
Rota típica do veículo




BRIDJ
HOME
ANNOUNCEMENTS
SERVICE AREA
CONNECTING THE CITY
Bridj is your everyday transportation system that adapts in real time to where you live work and play.
BRIDJ
CONNECTING THE CITY.
http://www.bridj.com/

Bridj


RIP

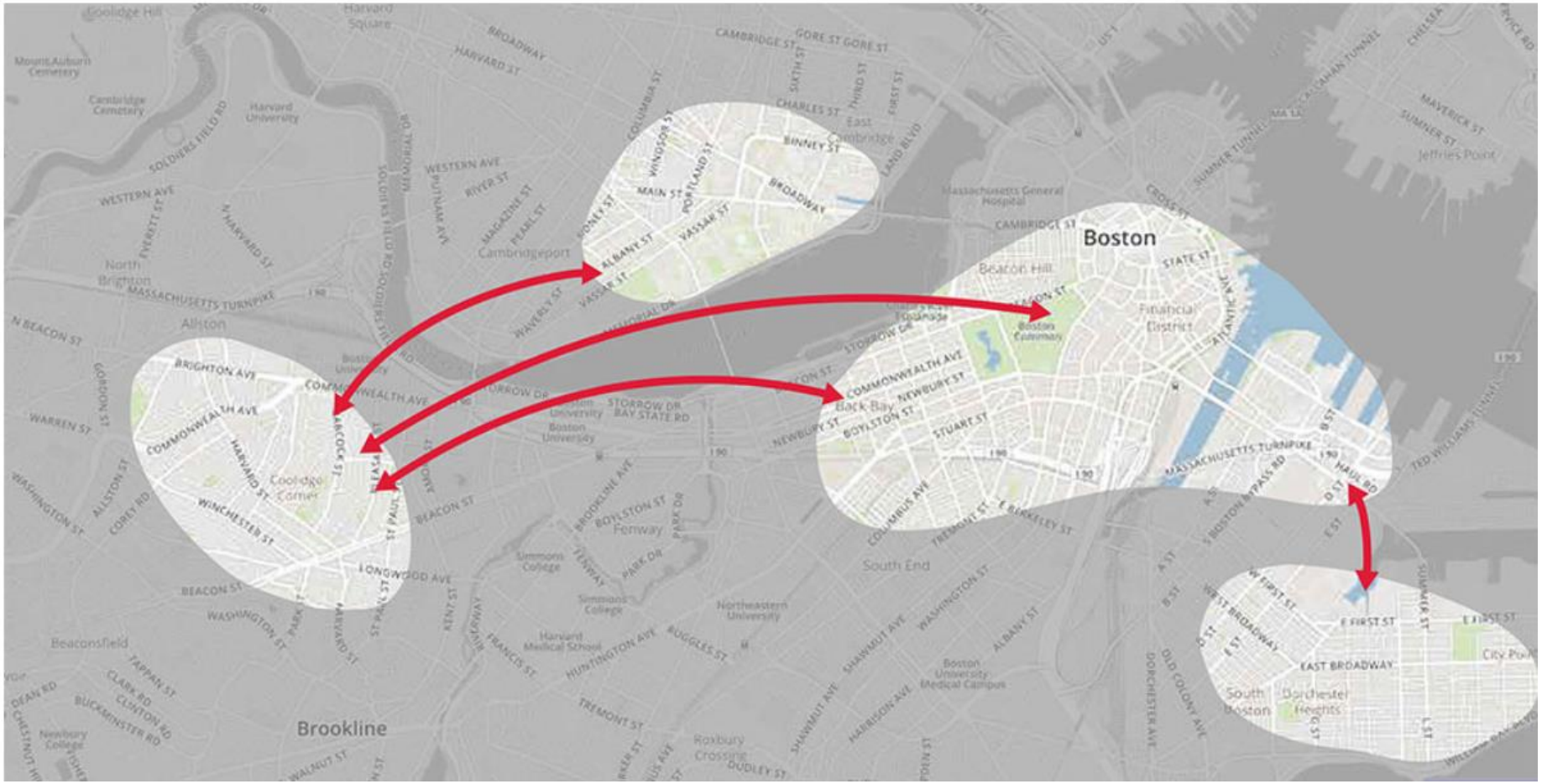


AUTONOMOUS INFRASTRUCTURE FOR CITIES.

Using a fleet of flexible vehicles, Bridj creates pop-up urban infrastructure to autonomously move people and goods around cities. Our first product focuses on providing more efficient urban mass transit in Boston and Kansas City that is twice as quick, at about the same cost, as public transit. We've also introduced a beta BridjBOX program focusing on physical goods. *Scroll down to learn more.*

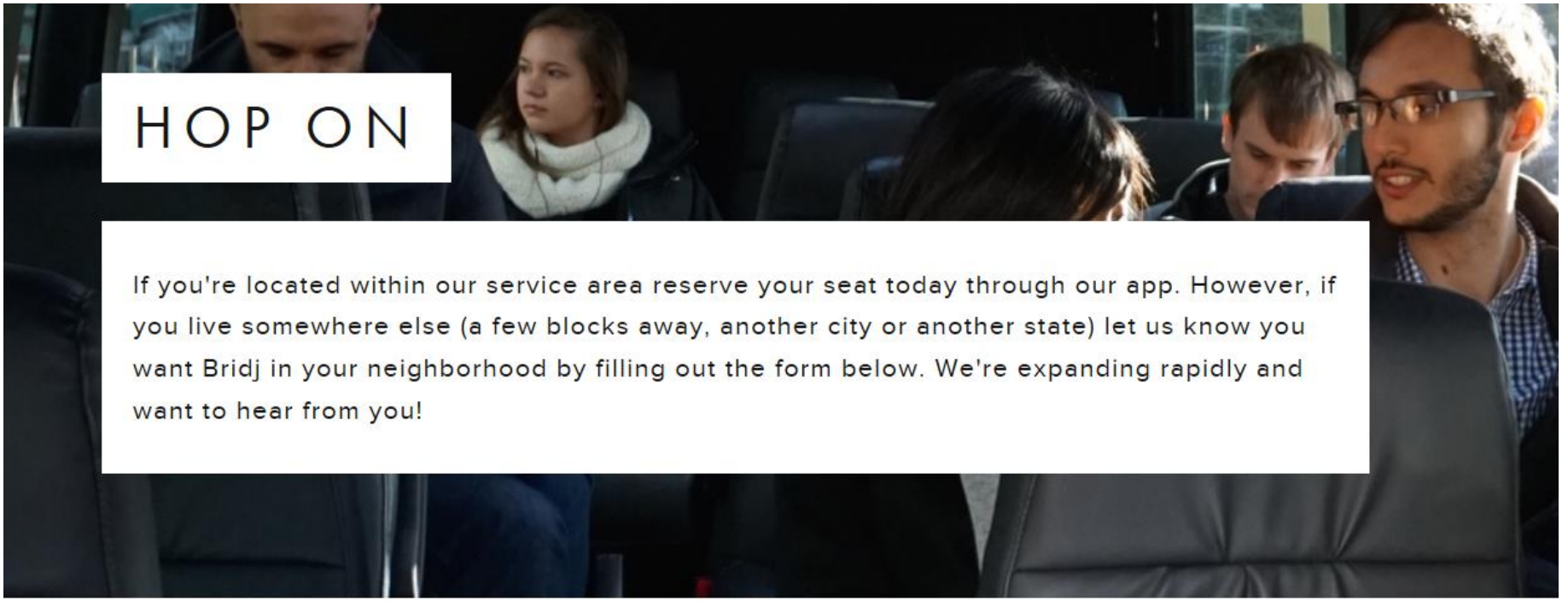
Área de atuação

- Boston (MA), horários de pico



Características do serviço

- Linhas Fixas, horários programados



Serviço ‘dinâmico’

Bridj Releases App, Says It’s a ‘First Step’ Toward Dynamic Routing

Share Tweet Pin Comment Email

Bridj

Bridj, on-demand bus service backed by Ford and others, shuts down

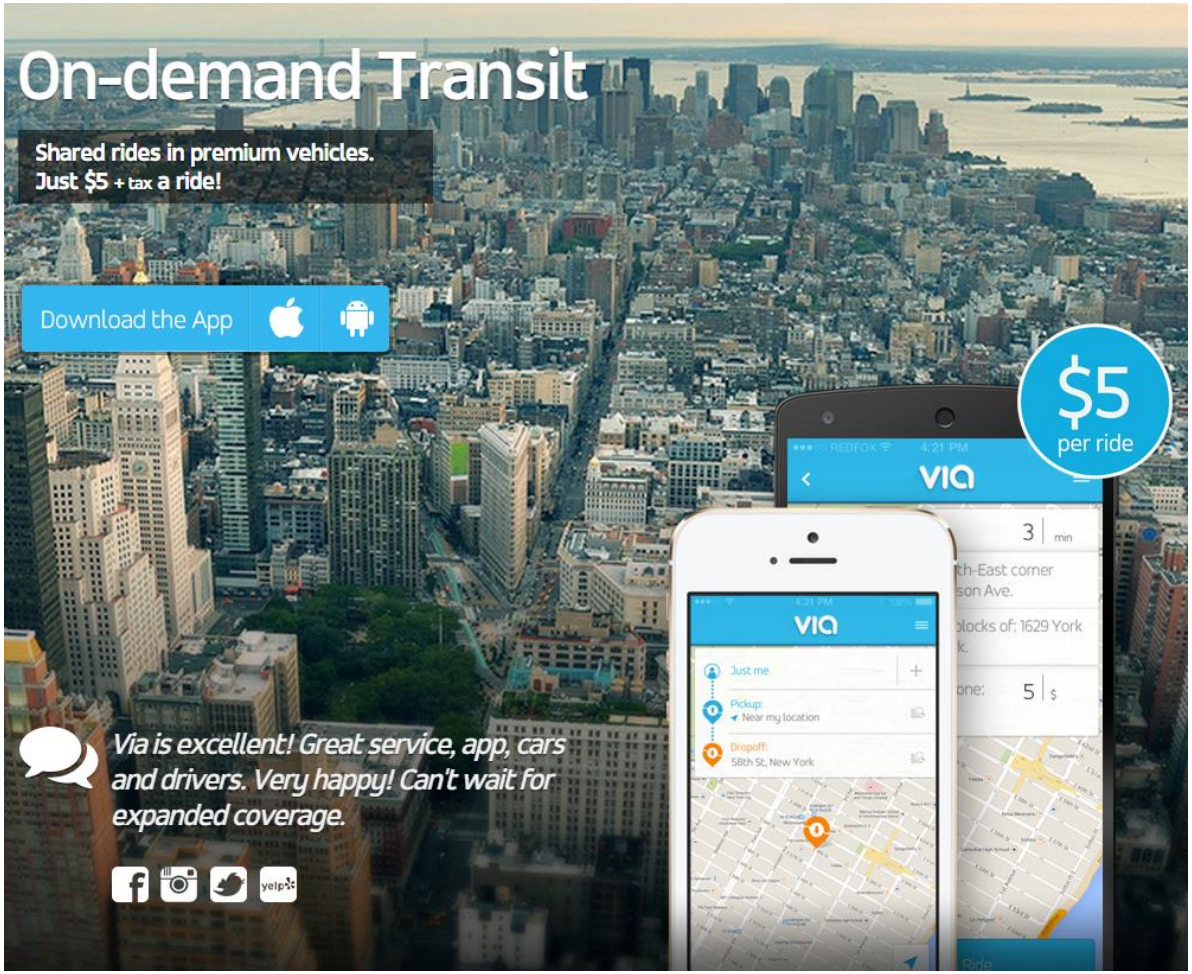
'Major' car deal falls through, leading to startup's demise

by Andrew J. Hawkins | @andyjayhawk | May 1, 2017, 12:27pm EDT

Bridj, the Boston-based on-demand bus service, is closing up shop after failing to close a "major deal" with an unnamed car company, the founder explained in a Medium post yesterday.

“After three years and millions of passenger miles as the largest operation of our kind in the country, Bridj is winding down,” wrote Matt George, the CEO of the pop-up transit service. He went on to describe the details of how his company collapsed:

> We made the strategic choice to pursue a deal with a major car company who promised a close date for a sizable transaction in lieu of a traditional venture capital funding round. The close date timeline extended from weeks to months, as they sought to gain the appropriate internal approvals that we (and they) thought were already in place. Throughout, we remained convinced of the close strategic fit and both sides had every expectation that the transaction would close. Despite assurances, and all parties acting in the best of faith, that didn’t happen.


On-demand Transit
Shared rides in premium vehicles.
Just $5 + tax a ride!
Download the App
$5
per ride
VIA
Via is excellent! Great service, app, cars and drivers. Very happy! Can't wait for expanded coverage.

Via

Como funciona

Via. Smarter than the subway. Better than the bus. Cheaper than a taxi.

Book a ride on your phone

Get picked up on your corner by a professionally chauffeured SUV

Share your ride with others going the same way

Save cash and reduce your carbon footprint

Características

How does Via work?

Book a ride and in under a second our algorithms match you with a vehicle going your way. Via makes sharing with other members seamless and is nearly as fast as a taxi.

How much does Via cost?

Rides are $5 plus tax when you prepay (just buy Ride Credit in the app) or $7 plus tax when you pay per ride. Members with a commuter benefits debit card can use it to pay with pre-tax $.

How long will I wait?

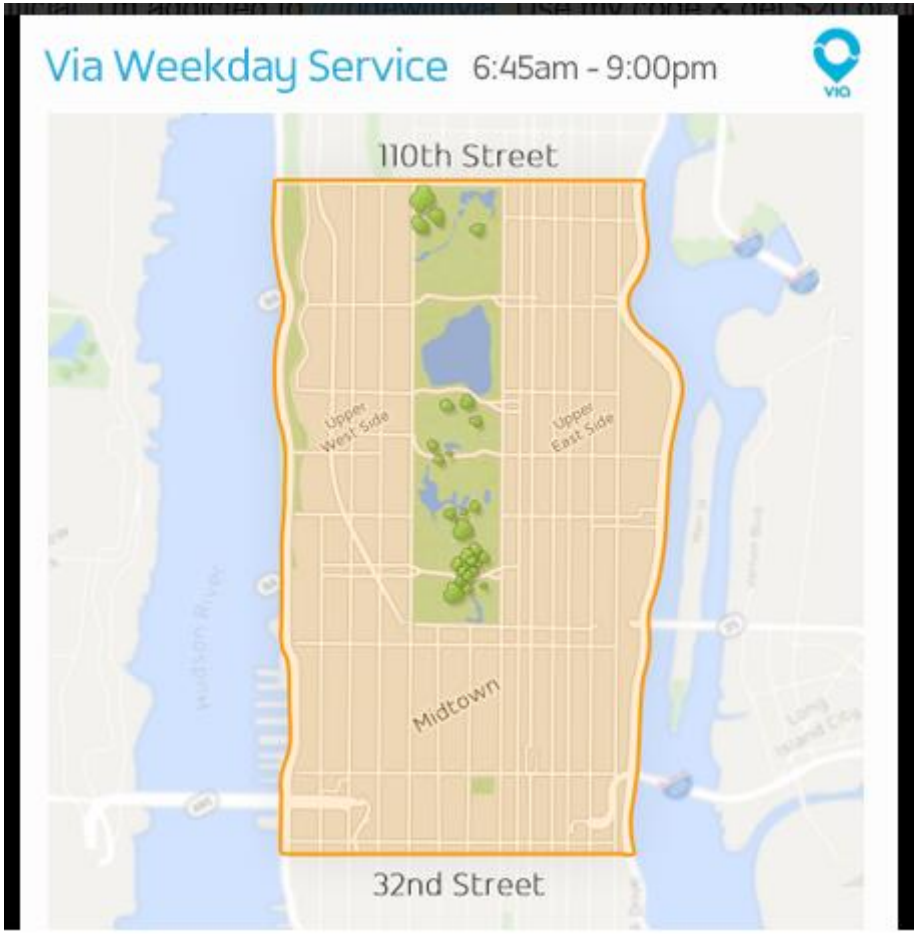
Our average wait time is 5 minutes, and you'll always get an accurate estimate of your pickup before booking. You can also track your vehicle in the app.

Área de abrangência

- Desde 14/10/2014

Ride weekdays, 6:45am - 9pm

Via anywhere within the orange zone.
Stay tuned! We're expanding weekly.



How long will I wait?

Our average wait time is 5 minutes, and you'll always get an accurate estimate of your pickup before booking. You can also track your vehicle in the app.

- **Who's driving my vehicle?**

  You are our most precious cargo, and we take safety very seriously. When you book a ride, we connect you with a vehicle operated by a professional driver who carries proper insurance and is licensed by New York City.

  But proper insurance and licensing are no-brainers. We expect more! We want all Via vehicle drivers to be downright amazing, so don't forget to leave feedback for your driver after each ride – you'll help us make sure only the best drivers get to drive for Via.

- **What if I'm late to the pick-up spot?**

  Because you're such a superstar, we know this won't ever happen. Just in case, though, your driver will wait 30 seconds for you at the pick-up spot before moving on. If you miss the boat, we'll let you know through the app and we'll need to charge you a $3 no-show fee. Please remember Via is uniquely dependent on its members – if everyone skips Via rides like an early dentist appointment, it just won't work.

- **I waited at the pick-up spot, but my vehicle never showed up. What gives?**

  Oh boy, that's not good. We're really sorry! Just to make sure, can you double-check that you were waiting in the right spot? Don't forget that where you ask to get picked up isn't necessarily the same as where the vehicle will pick you up. Whether you were at the right spot or not, please shoot us an email at support@ridewithvia.com and tell us what happened – we'll do our best to make it right.

HSL HRT Kutsuplus

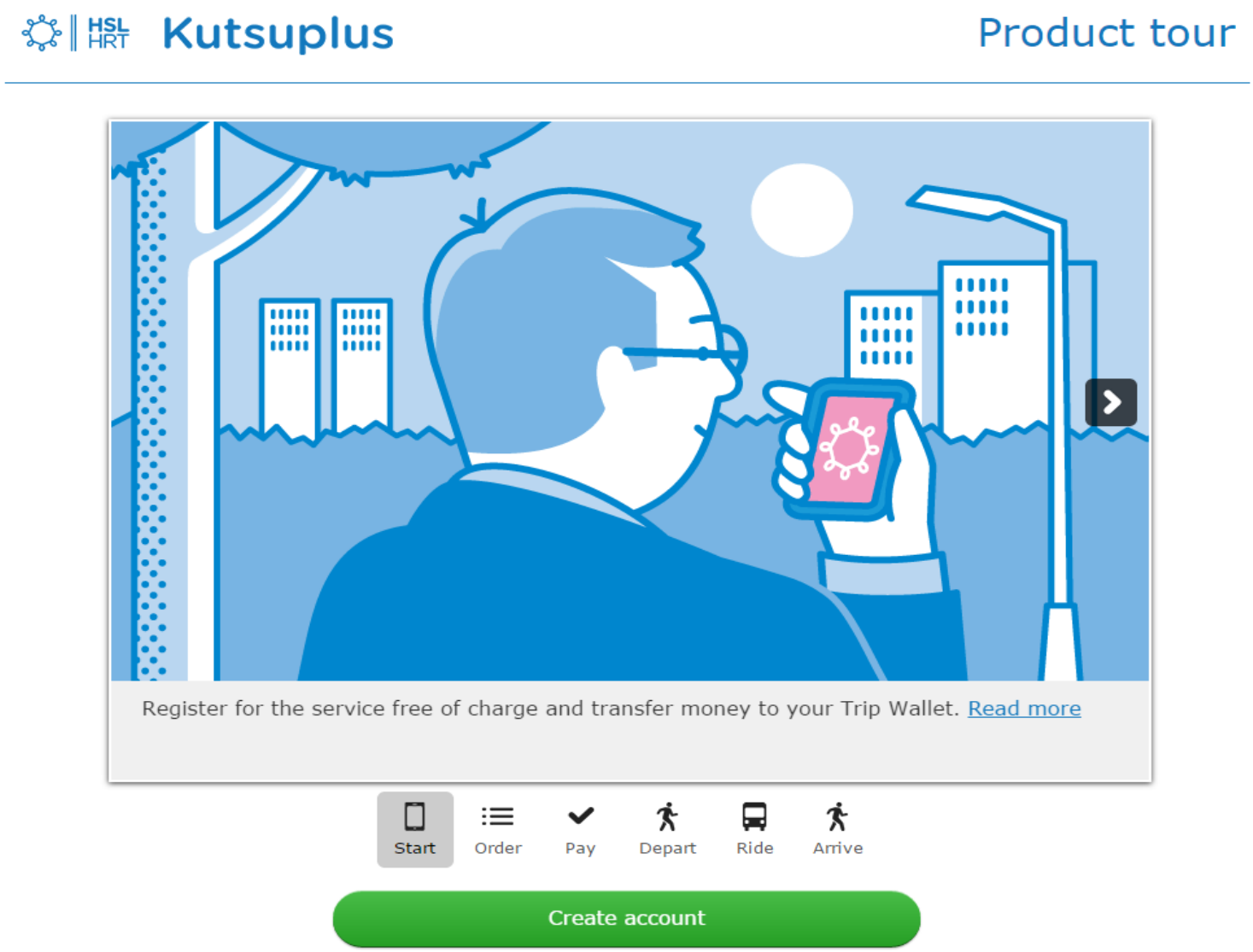
245

Kutsuplus is a new kind of on-demand bus service - tailor-made rides without having to change buses or worry about parking. Learn how it works

Kutsuplus

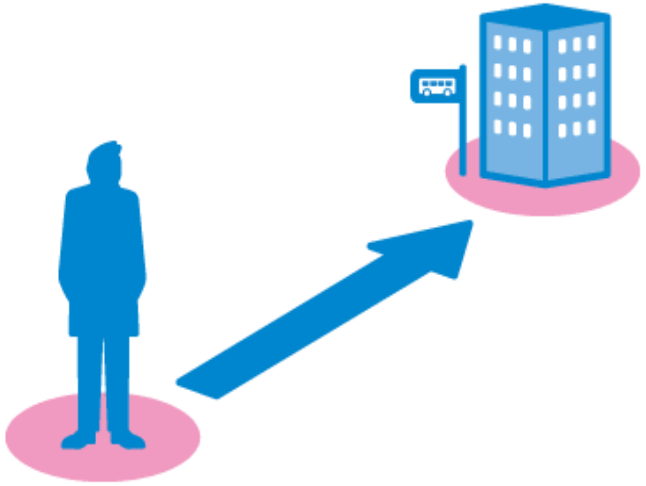
Como funciona

Product tour



Product tour (2)

Rides are paid in advance using the Trip Wallet. You can transfer money to your Trip Wallet from your bank account or credit card. You can also share your wallet, for example, with your family members or company employees.



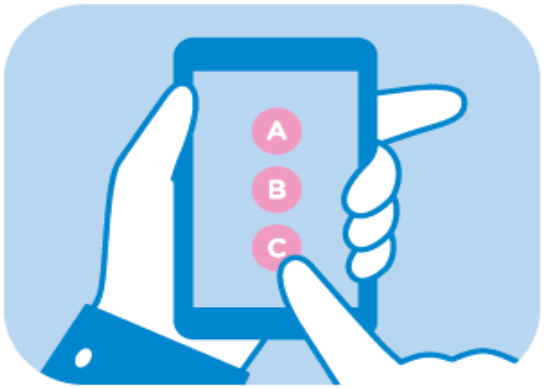
You can define the places of departure and destination on the basis of a street address or a stop number. You can also choose an address or stop on the map. You can choose the departure time from Now, In 5 min, In 10 min or you can enter the desired departure time. At the moment, the departure time can be max. 45 minutes from the order.

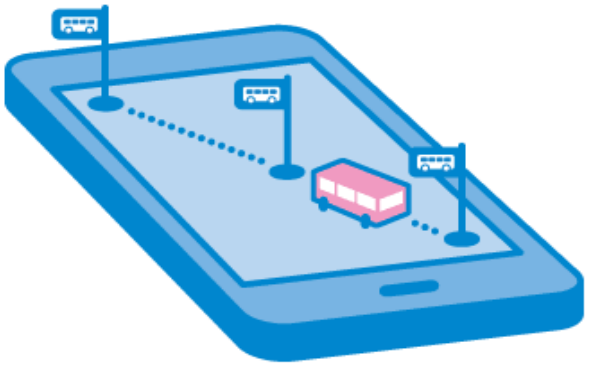
You can also reserve a space for the pram or a walker.

Product tour (3)

The service can offer several trip options at different prices. The normal price of a ride comprises a basic price of EUR 3.50 plus an additional charge of EUR 0.45 per kilometer, according to the direct route. The basic price of an economy ride is EUR 2.80 and charge per kilometer EUR 0.36.

With the order confirmation, you receive a travel code, which serves as your ticket. Please tell the code to the driver when boarding the vehicle. You will also get the time when the minibus will pick you up from the bus stop, the estimated arrival time, and the number of the Kutsuplus bus (for example, K15). After the order is confirmed, the journey cannot be cancelled or changed.





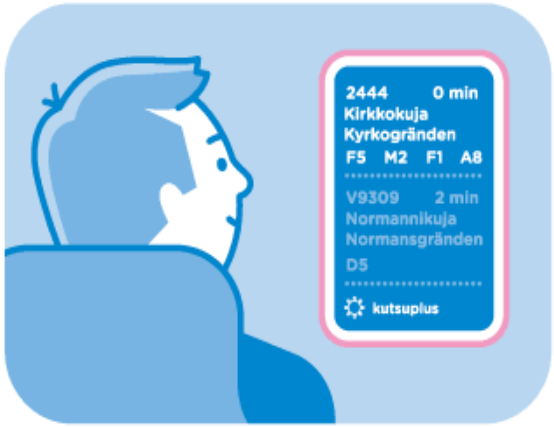
With the order confirmation, you receive a walking route drawn on a map from the departure address to the bus stop. With a smart phone, you can also view your location on a map.

Bus and tram stops have stop numbers (e.g. 0663 or E1119) that can be found on the stop sign. The service includes also virtual stops that are not marked with signs (e.g. X2001). The order confirmation includes a photograph of the virtual stop to show its locations.

Please be on time at the stop – the Kutsuplus bus cannot wait for you.

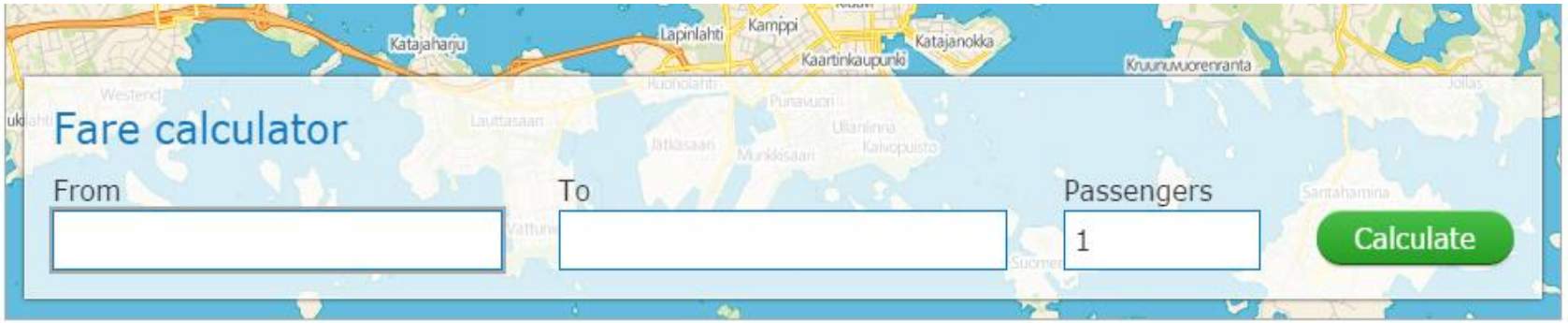
Product tour (4)

Kutsuplus buses have nine passenger seats. The passenger information display shows the estimated travel time to the next stop. The Kutsuplus bus driver will provide you with advice and assistance when needed.



When you get off the bus, you can view the walking route to your destination on a map provided in the trip information in your kutsuplus.fi account.

Tarifa Kutsuplus



Zoom in to see the stops included in the service.

Service class - Normaali

Trip pricing

Base fare	3.50 €
Fare / km	0.45 €

You will pay your trip in advance when ordering it. The price consists of a fixed part and a charge based on the length of the direct route. Direct route means a route calculated by the system that does not involve diversions because of other passengers.

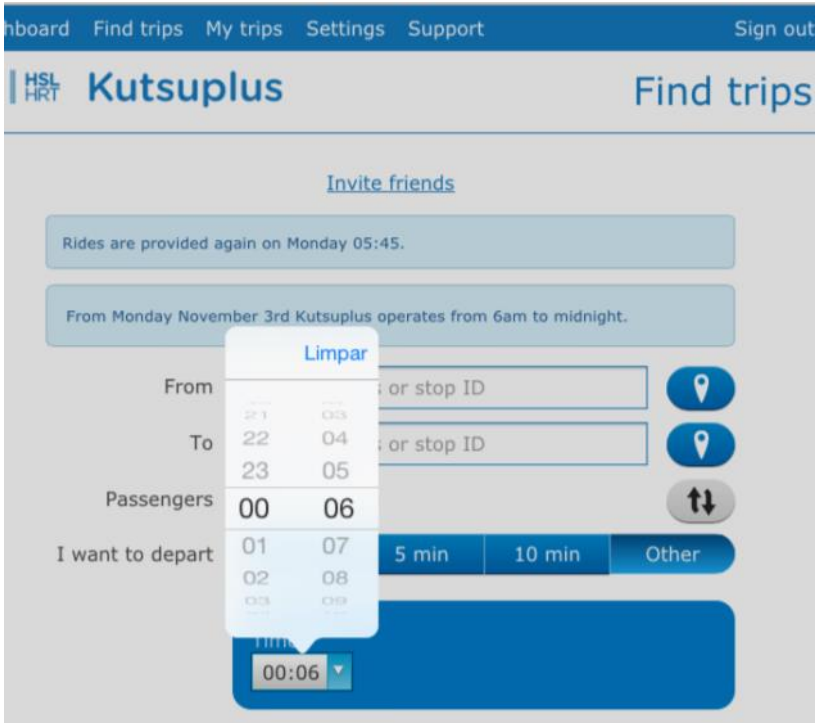
Congestion and/or traffic situation may affect the direct route selected by the system and the fare also when no other passengers are picked up.

Discounts

Group discount, 2 pax	-20%
Group discount, 3 pax	-30%
Group discount, 4 pax	-40%
Group discount, 5+ pax	-50%

The group discount is specific to each order and is given to a group traveling together from same pickup stop to same drop-off stop.

Tela de solicitação



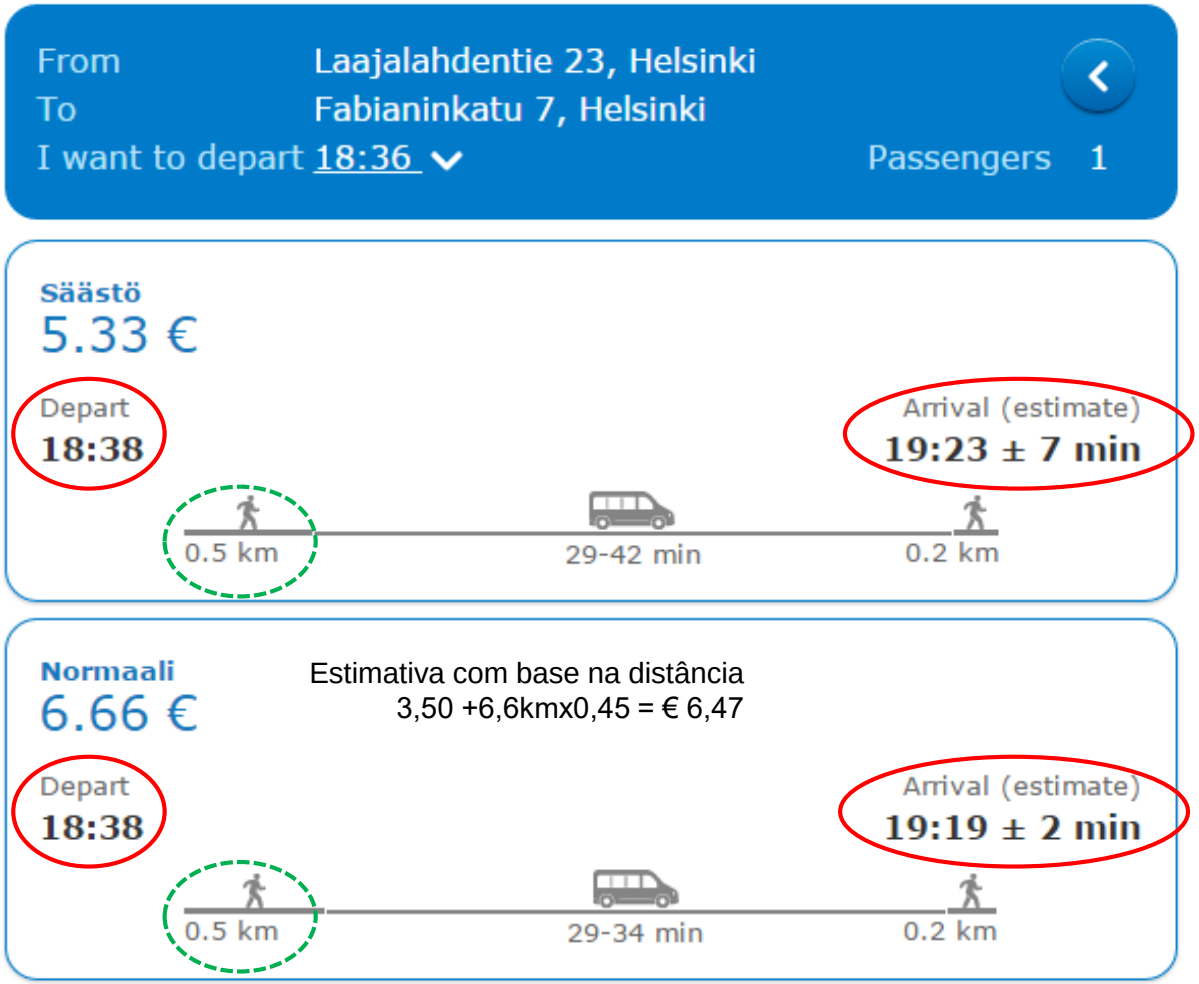
Exemplo de Solicitação

IBM Helsinki -> Hotel Fabian

Laajalahdentie 23 -> Fabianinkatu 7

4/12/2014

Kutsuplus



45 min (38– 52)

41 min (39– 43)

38 min

Desconto de 20% no econômico

Detalhe dos trajetos

Säästö
5.33 €

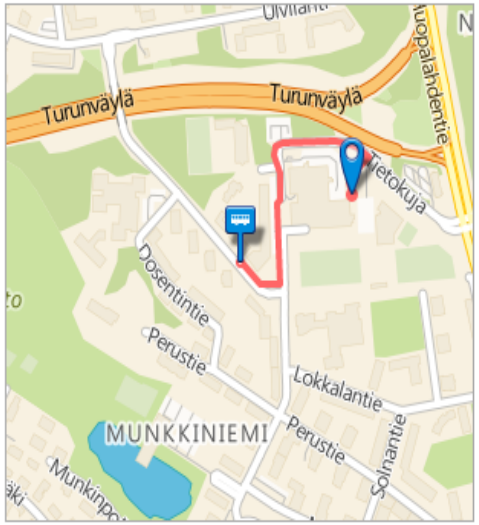
Cancel

Buy

Payment method
cbcunha@gmail.com
Balance 0.00 €

Trip schedule

18:38 Laajalahdentie 23, Helsinki
Walk 0.5 km to stop 1403 (Professorintie).



18:45 Bus stop 1403 (Professorintie)
The vehicle waits for the customer until 18:45. Pickup within few minutes.

Normaali
6.66 €

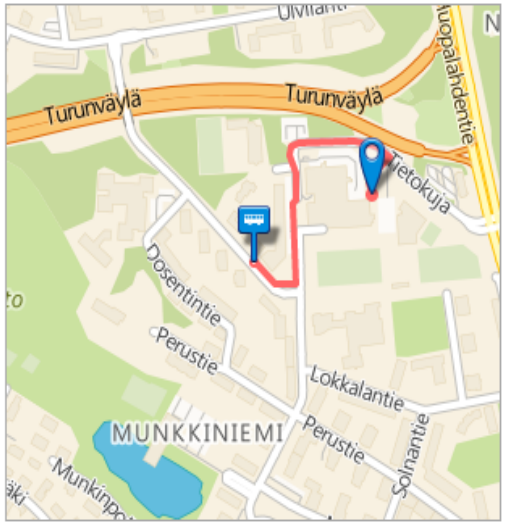
Cancel

Buy

Payment method
cbcunha@gmail.com
Balance 0.00 €

Trip schedule

18:38 Laajalahdentie 23, Helsinki
Walk 0.5 km to stop 1403 (Professorintie).



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Veículos autônomos

- Driverless interiors: could your car become a gym?

- https://www.1843magazine.com/design/inside-job

Minnesota transportation department wants robot buses in the streets next year

Tuesday, February 28, 2017 by Susan Du in News

The Mercedes-Benz Future Bus has a driver, but his job is to just sit back and supervise the computers that do all the work. Mercedes-Benz

Fully autonomous, driverless buses have hit the streets in France, Germany, and Australia. In Switzerland they shuttle college students around campus. In Japan they ferry the elderly. In China they weave expertly through city traffic.

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Posted Feb 6, 2017 by ***Darrell Etherington*** *(@etherington)*

Gridlock

D.C.-based Split will discontinue rideshare service, citing market 'saturation'

By Faiz Siddiqui September 27, 2016

Local ride-hailing service Split expands its offerings to three more neighborhoods. (Photo courtesy of Split).

D.C.-based ridesharing company Split will end its passenger service next week, the company announced in a blog post Tuesday. The crowded marketplace is partly to blame.

The company, whose 100 drivers had shuttled tens of thousands on trips in the District, said it will discontinue service and turn its attention to technology, where it can "refocus our efforts on the next generation of transportation challenges."

Gridlock

D.C.-based Split acquired by Volkswagen-affiliated mobility group

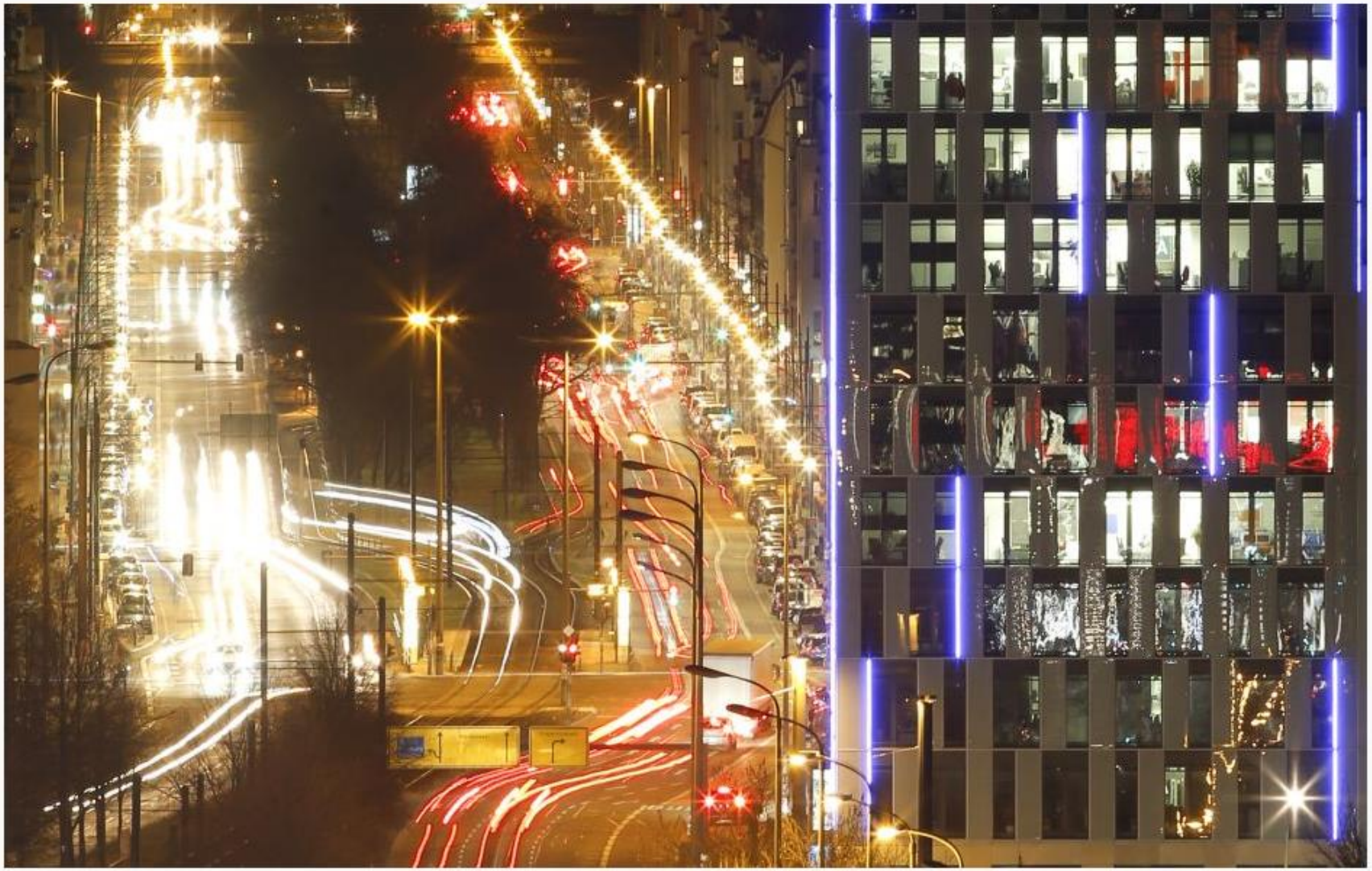
By Faiz Siddiqui June 2

(Split)

Ride-sharing start-up Split has been acquired by a Volkswagen-affiliated mobility company, its co-founder said, the latest disbanded ride-booking app to find new life with an automaker's investment.

FARE GAME

Startups in Germany are racing their Silicon Valley rivals to reinvent the bus



Startups in Germany are racing their Silicon Valley rivals to reinvent the bus

The “shared mobility” industry is a confusing tangle of automakers and tech companies developing services for car-sharing, car-pooling, and ride-hailing at the tap of an app. Passenger cars have been the focus in recent years, but now the humble bus is up for re-imagining as well.

Two startups in Berlin are developing on-demand shuttle buses, equipped with AI that figures out where people are and where they want to go, tracing algorithmically optimized routes around town. One is owned by Volkswagen and will deploy fleets of VW vans, while the other is building an AI-powered platform for urban planners to link roving shuttles into local transport networks.