

# Alternative technologies: *Enabling the Future of Mobility*

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South Asia



# THE FUTURE OF MOBILITY IS NOW

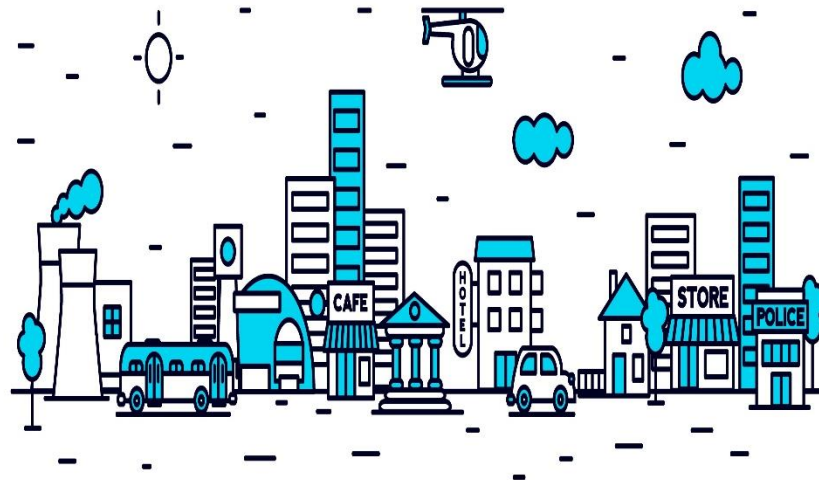
Autonomous

Electric

Ridesharing

Machine Learning and Artificial Intelligence

On demand



Interconnected

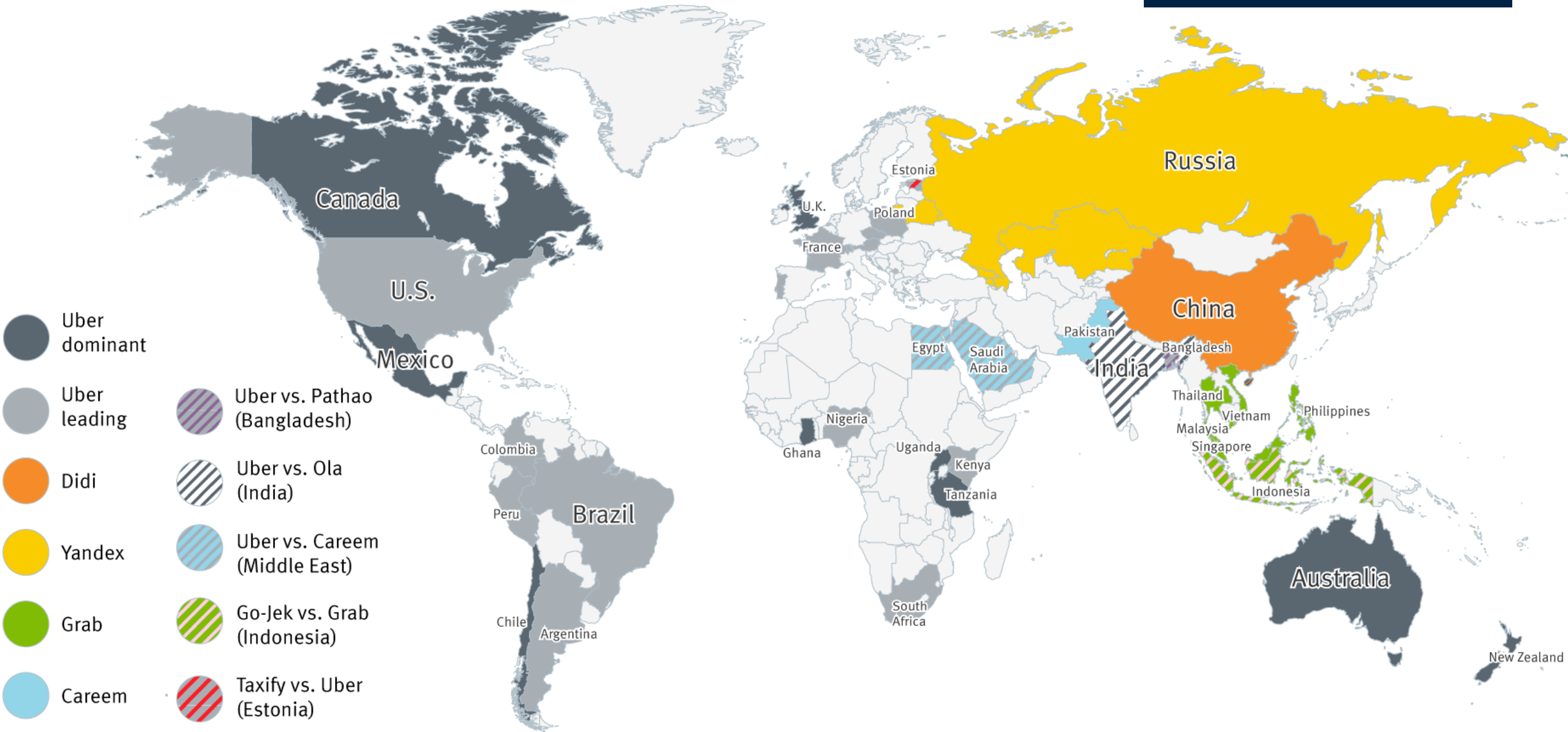
# Autonomous



Electric



# Ridesharing



# Artificial Intelligence, Machine Learning, IoT



WAG  
Outsmarting Traffic



On demand

# THESE DRONES **DELIVER VACCINES**

**Zipline launches the  
world's fastest  
commercial delivery  
drone**

## The rise of mobility as a service

Reshaping how urbanites get around



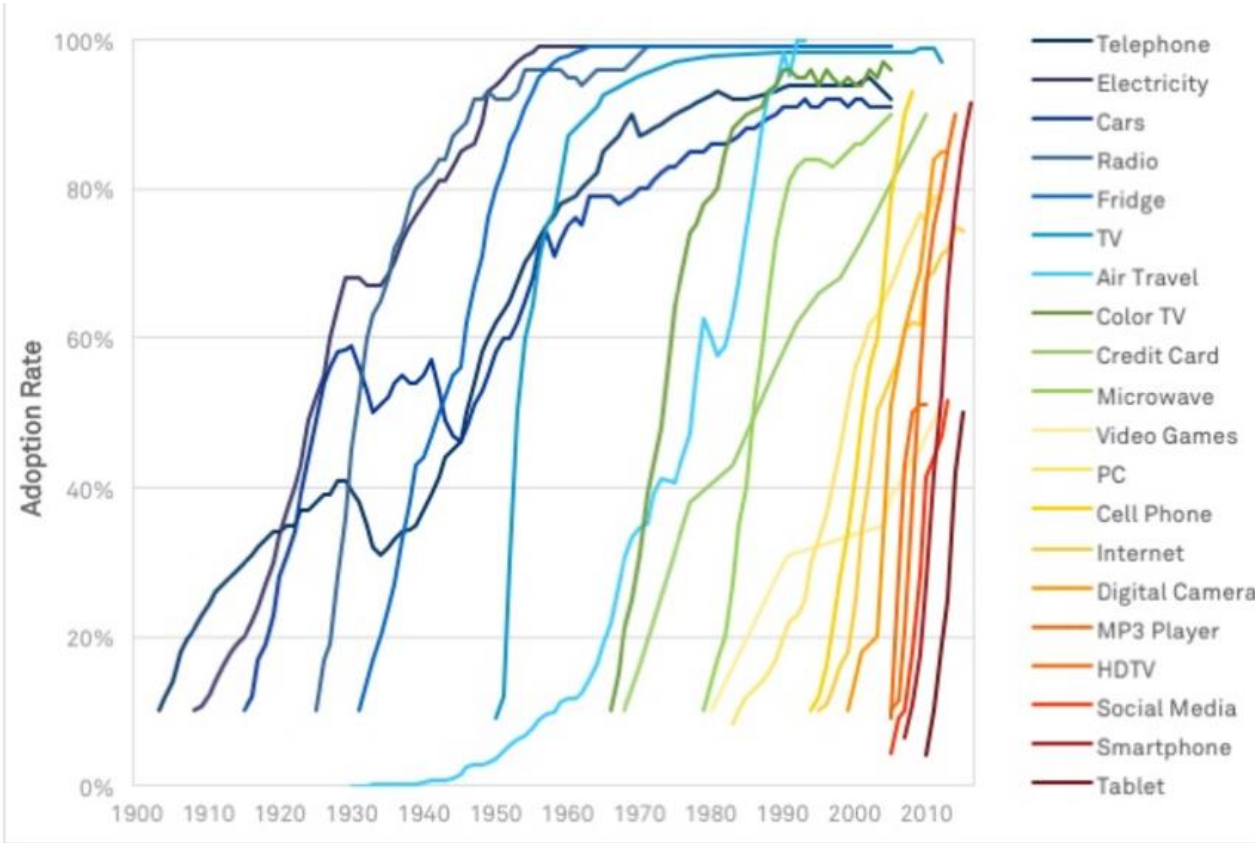
FROM  
MASS TRANSIT  
TO  
MAAS TRANSIT



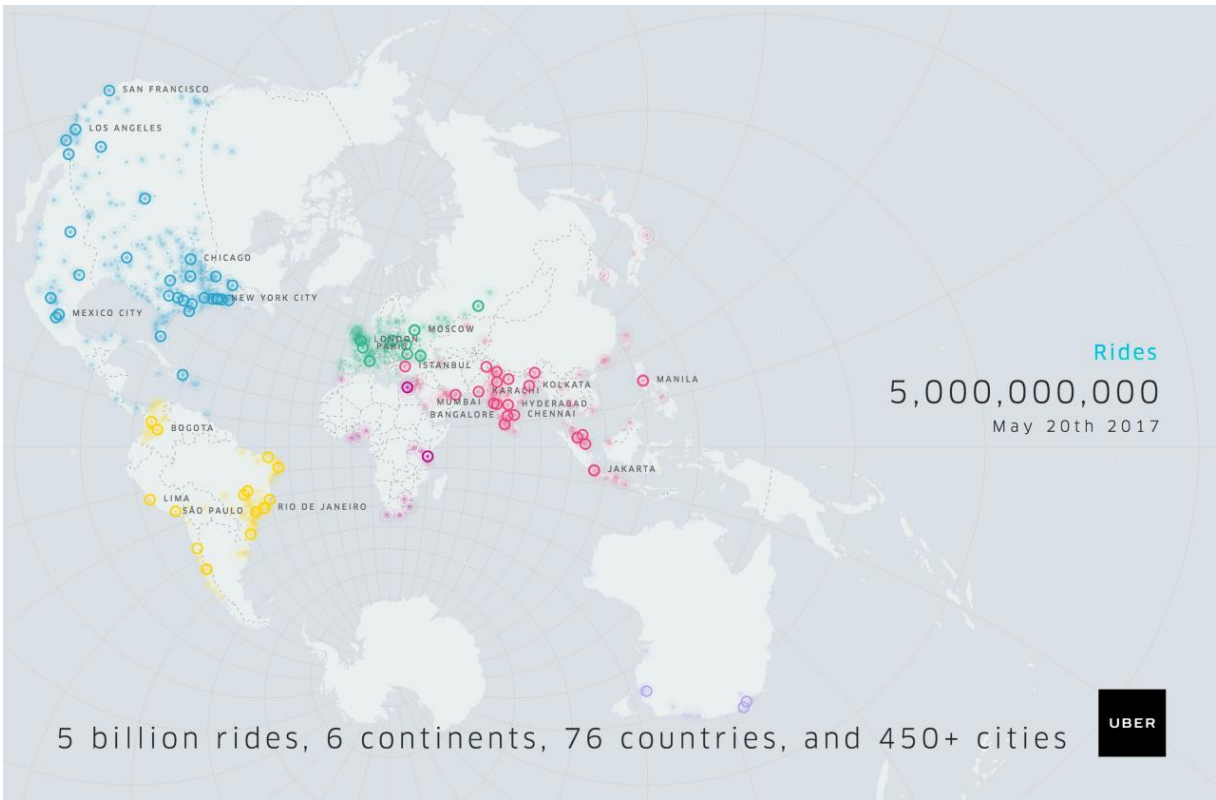
# THE FUTURE OF TRANSPORTATION STACK

<p><b>SERVICES</b></p> <p><b>ROUTE PLANNING</b></p> <p>SPATIAL CITIVIZ waze CommuteMaster X moovit Citymapper</p>	<p><b>PARKING</b></p> <p>Waypals Cloud Parc Paware Waterpark SplitHero PEARL seevoder Parko FenSens Luce onby</p>	<p><b>CAR HAILING + POOLING</b></p> <p>TESLOOP lyft RideCell 360 滴滴</p>	<p><b>OTHER: AFTERMARKET, REPAIR, RENTAL</b></p> <p>CARVUE upshift WRENCH PATROL zipcar Getaround URGENTLY Tantalum bitkar</p>	<p><b>SPECIALTY VEHICLES</b></p> <p><b>2-WHEELERS</b></p> <p>superpedestrian Zagster</p>
<p><b>SAFETY &amp; SECURITY</b></p> <p><b>PHYSICAL CAR &amp; DRIVER SAFETY + ACCIDENT DETECTION</b></p> <p>drivebetter splitsecond near GUARDIAN phrame LyfeLens SMART AUTOLABS tourmalinelabs iprocc elsys FORESIGHT</p>	<p><b>EMOTION, FATIGUE &amp; ALCOHOL DETECTION + DISTRACTION AVOIDANCE</b></p> <p>CORTEXLABS evers ALMAcare CARMA saverone SMART Radiomize EASYG CARVI</p>	<p><b>CYBERSECURITY</b></p> <p>CYBORTIVE cognomotiv ARGUS Olympus Sky Karamba Security Ariou</p>	<p><b>INTRUSION, TRACKING &amp; RECOVERY</b></p> <p>tracknstop nonda gmt Connect ROAD EYE caruma</p>	<p><b>PUBLIC TRANSPORT</b></p> <p>navya Varden Labs AURO EASY MILE</p>
<p><b>IN-CAR INTELLIGENCE + ASSISTANCE</b></p> <p><b>VEHICLE DIAGNOSTICS &amp; PREDICTIVE MAINTENANCE + SENSOR-BASED VEHICLE SAFETY</b></p> <p>TrueMotion BRAID IQ metromile LIGHT METRICS</p>	<p><b>PASSENGER-FOCUSED SENSORS (INCLUDING USAGE-BASED INSURANCE)</b></p> <p>Cortics Zobie SONICLUE PREDIC SYSTEMS NEBULA engie</p>	<p><b>INFOTAINMENT + DISPLAY</b></p> <p>link motion HUDIFY CAFFOBOT swedspot OverDrive ROAV FICONIC SOLUTIONS RIGHTWARE PELAGICORE CLOUDCAR</p>	<p><b>PERSONAL / VOICE ASSISTANCE</b></p> <p>novideck AUTOMATIC dash CARIN caria</p>	<p><b>TRUCKS / FREIGHT</b></p> <p>JAYBRIDGE ROBOTICS OTTO PELTON TESLA FLEXPORT TRUELITE TRACE</p>
<p><b>AUTONOMY</b></p> <p><b>AUTOMATION SYSTEM</b></p> <p>AutoX drive.ai POLYSYNC OXBOTICA QIYX ARGO AI ARMOTIVE PILOT CRUISE cognivue nufonomy vector.ai BWV M</p>	<p><b>MAPPING, SIMULATION, &amp; IMAGE RECOGNITION / ANNOTATION</b></p> <p>Mapper.ai CARMERA TomTom IMPROBABLE UDACITY DEEPMAP understand.ai Civil Maps</p>	<p><b>AUTONOMOUS VEHICLE MAKER + TOOLS</b></p> <p>NURO WAYMO FARADAY FUTURE</p>	<p><b>FLIGHT</b></p> <p>WRIGHT ELECTRIC ZUNUM Aero ZEE JOBY Kitty Hawk LILUM AEROPONL</p>	
<p><b>INFRASTRUCTURE + CONNECTED CAR</b></p> <p><b>SENSOR NETWORKING INFRASTRUCTURE (V2V, V2X) - LPWA, CELLULAR, WIFI</b></p> <p>DIGIMONDO U SAVARI ZIFISense EVVOS Activity</p>	<p><b>CONNECTED CAR - DATA, PLATFORM, SOFTWARE</b></p> <p>ACTIVE SCALER INRIX SPARC mobiliuz convoyent vinli otonomo bright box mojo</p>	<p><b>FLEET + TRAFFIC MANAGEMENT</b></p> <p>BESTMILE Travel Automile Zendrive GLYDEL Brisk Signleges locoNav Immense Simulations MOTORWAY BUDDY mentis FR</p>	<p><b>OTA CAR SOFTWARE UPDATE + SMART PHONE ENABLED TELEMATICS</b></p> <p>FIXD DRIVEBOT VOYOMOTIVE ZENE anypp</p>	
<p><b>INTELLIGENT MANUFACTURING</b></p> <p><b>NEW / ADVANCED MATERIALS</b></p> <p>AQUARIUS NAWA TECHNOLOGIES SIRRUS NANO STEEL</p>	<p><b>RAPID PROTOTYPING - 3D PRINTING, MODULARIZATION, OPEN SOURCE</b></p> <p>Carbon nanocore DIVERGENT OSVehicle stratasys VADER</p>	<p><b>ADVANCED / AUTOMATED ASSEMBLY LINE</b></p> <p>Grabit SYMBIO CLEARPATH ROBOMOTIVE rethink robotics.</p>	<p><b>MATERIAL CHARACTERIZATION &amp; TESTING</b></p> <p>SynTouch VIDI SASTRA OPTOFIDELITY</p>	
<p><b>ONBOARD SENSORS</b></p> <p><b>LOCATION - GIS, PRECISION POSITIONING, PATH PLANNING</b></p> <p>swif radio sense EXD</p>	<p><b>VISION / CAMERA</b></p> <p>DEEP VISION Carnegie Robotics machines with vision ROADSENSE DEEPCSCALE ironocom VAYAVISION</p>	<p><b>LIDAR</b></p> <p>face INOVIZ PHANTOM INTELLIGENCE VOTAGE QUANERGY AEYE TRILLIMINA LeddarTech Velodyne LIDAR STROBE</p>	<p><b>RADAR</b></p> <p>OCULII RFISEE 6TH SENSE SOS</p>	<p><b>OTHER: HYPERLOOP, PERSONAL MOBILITY</b></p> <p>hyperloop   one ninebot WHILL</p>

# The Pace of Technology Adoption is Speeding Up



Source: Asymco





How can governments, planning and regulatory authorities **ENABLE** the opportunities for **LEAPFROGGING** that these technologies present, while ensuring the spread of new technologies is **EQUITABLE** and **SUSTAINABLE**?



# WHAT'S NEXT?

Think Creatively  
about Reform



Partner with  
Private Sector

Start building the foundation for an interconnected on-demand world



Leverage  
Available  
Technology and  
Innovation



# THINK CREATIVELY ABOUT REFORM



“Formal” reform approach - creation of companies, contract services, public sector planning & regulation – is not the only way



# THINK CREATIVELY ABOUT REFORM



Mixed results: several successful BRTs, but challenging when targeting all of the city's informal services

Desconcierto por el lento arranque del sistema integrado de transporte

REDACCIÓN BOGOTÁ | 10:41 p.m. | 23 de Diciembre del 2012



Foto: Diego Santacruz / EL TIEMPO

Los problemas que rondan al SITP

BOGOTÁ La chatarrización, el retaso de operadores son factores que podrían retrasar la meta.

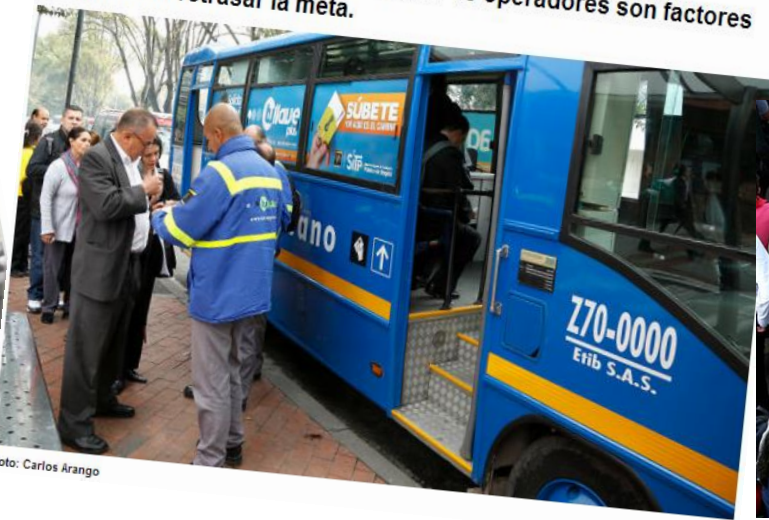
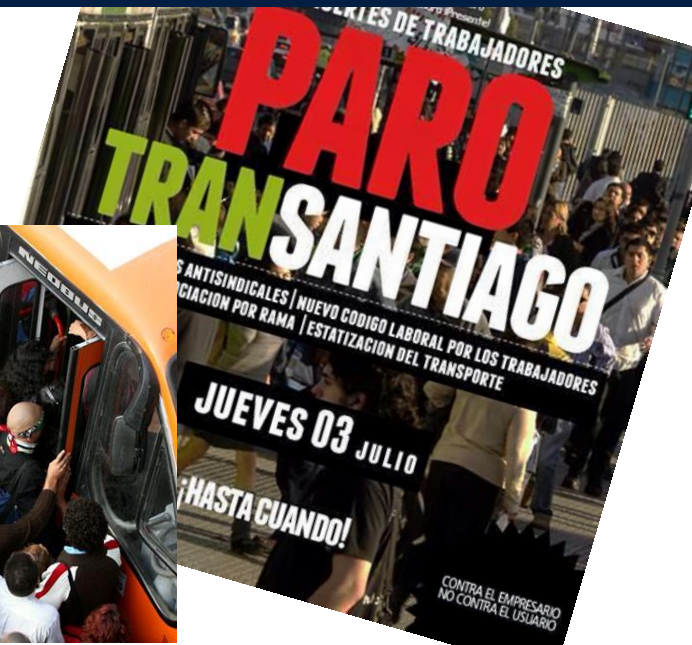


Foto: Carlos Arango



# LEVERAGE AVAILABLE TECHNOLOGY AND INNOVATION



Can Magic Bus double incomes of slum dwellers?

by Parija Kavilanz @CNNTech



© Bus won \$1 million as the 2016 Hult Prize winner.

Mexico City is attempting to map its more than 1,000 unwieldy bus routes with a crowdsourcing app

OPEN TRANSIT

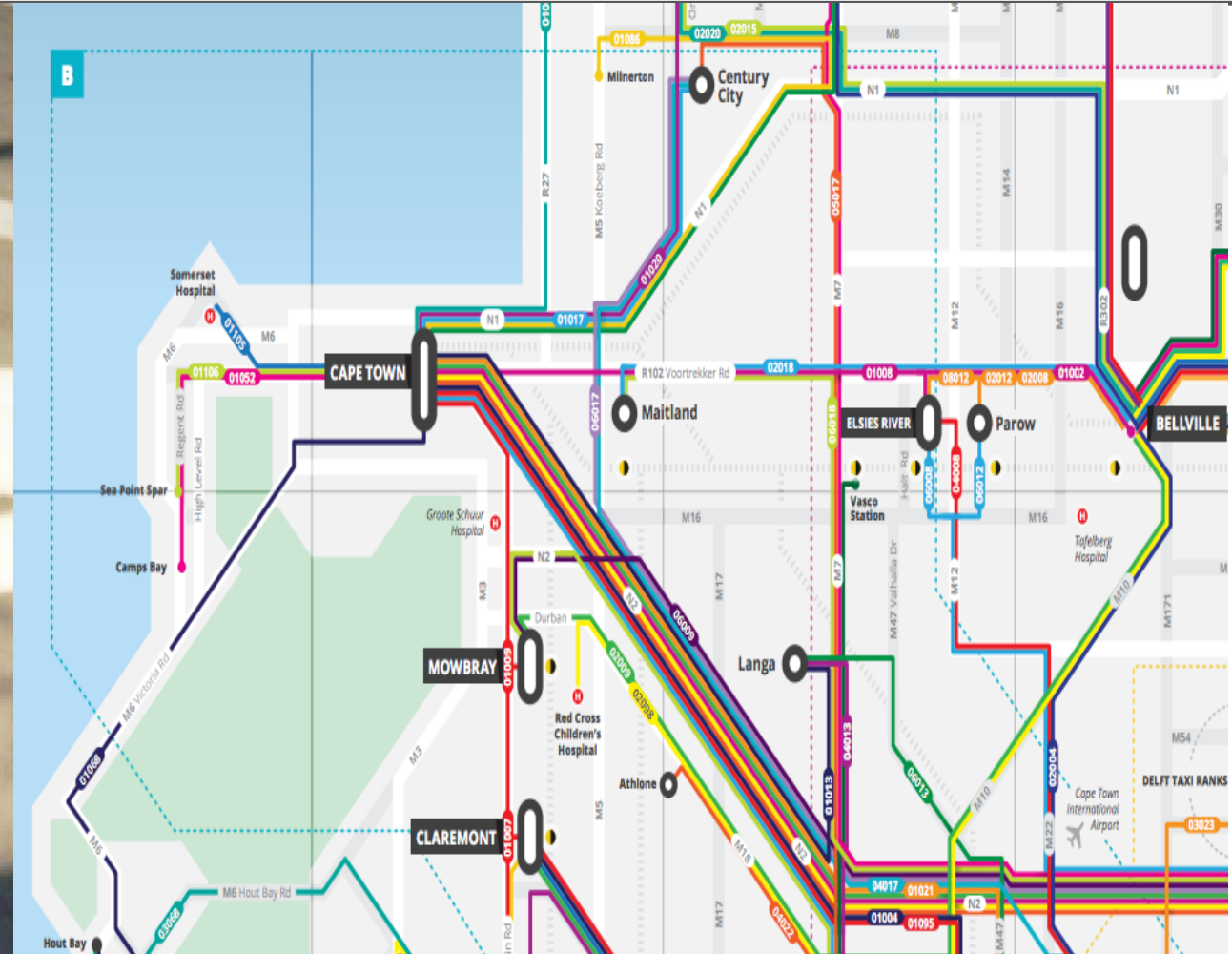
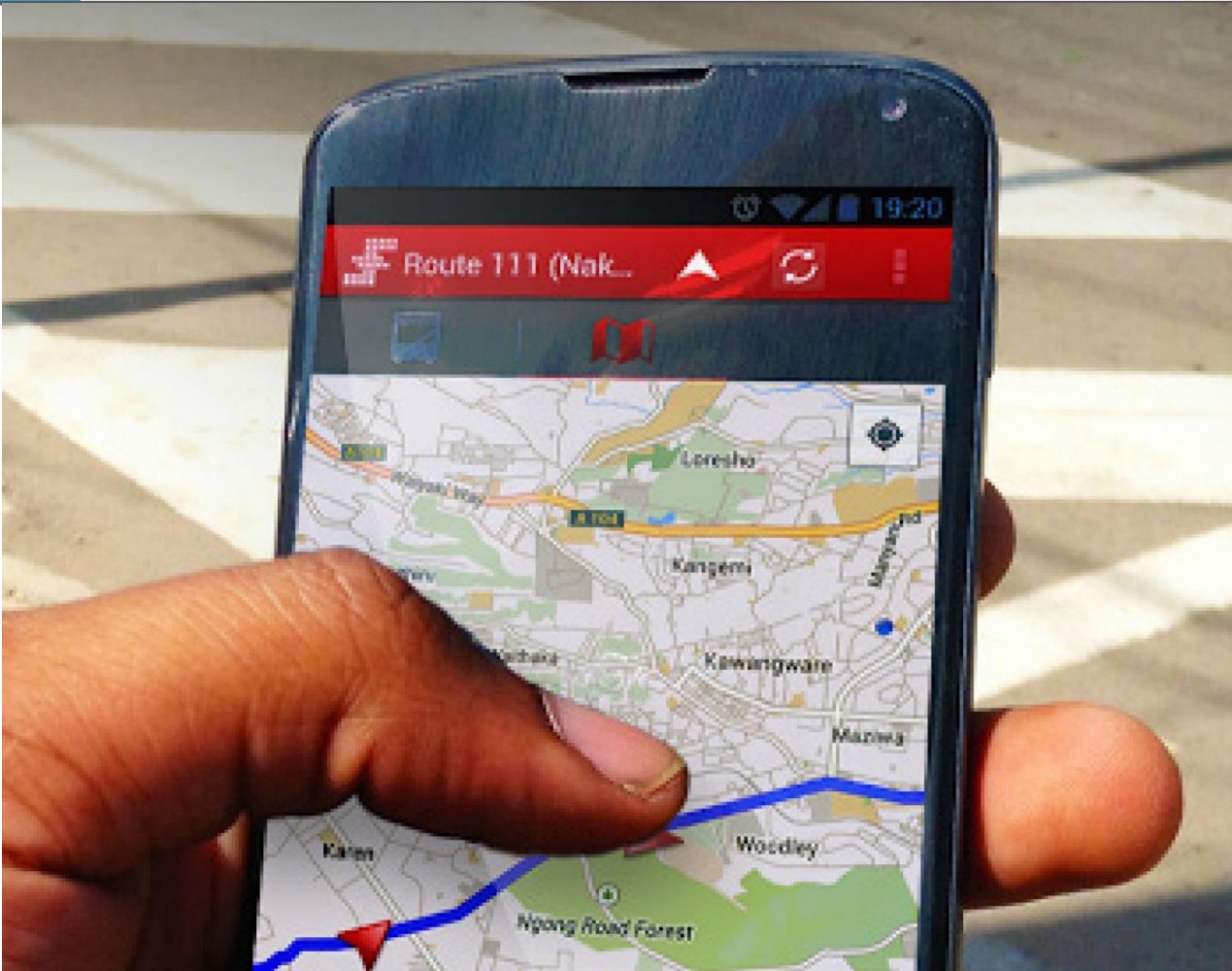


The chaos of South Africa's taxi system is being tackled with open data



Cheap sensors & mobile technology are disrupting the world of informal buses and can support a gradual reform approach

# LEVERAGE AVAILABLE TECHNOLOGY AND INNOVATION



Integrating the informal: Collaborative mapping of informal buses



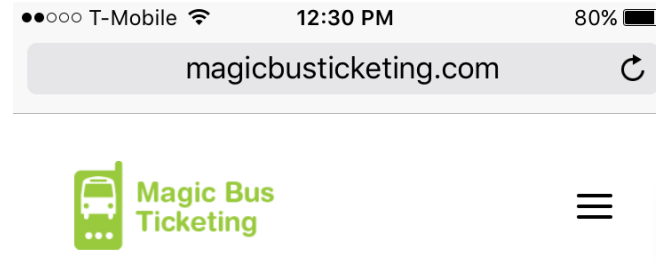
# LEVERAGE AVAILABLE TECHNOLOGY AND INNOVATION



**¡ATENCIÓN AFILIADO AL SISBÉN ENTRE 0 Y 40 PUNTOS!**

**Ahórrate \$680**  
en cada viaje del SITP

Para mayor información llama gratis a la línea **01 8000 115 510**, a la línea **195** o acércate a los CADE y SUPERCADÉS seleccionados



**SMS bus ticketing made easy.**

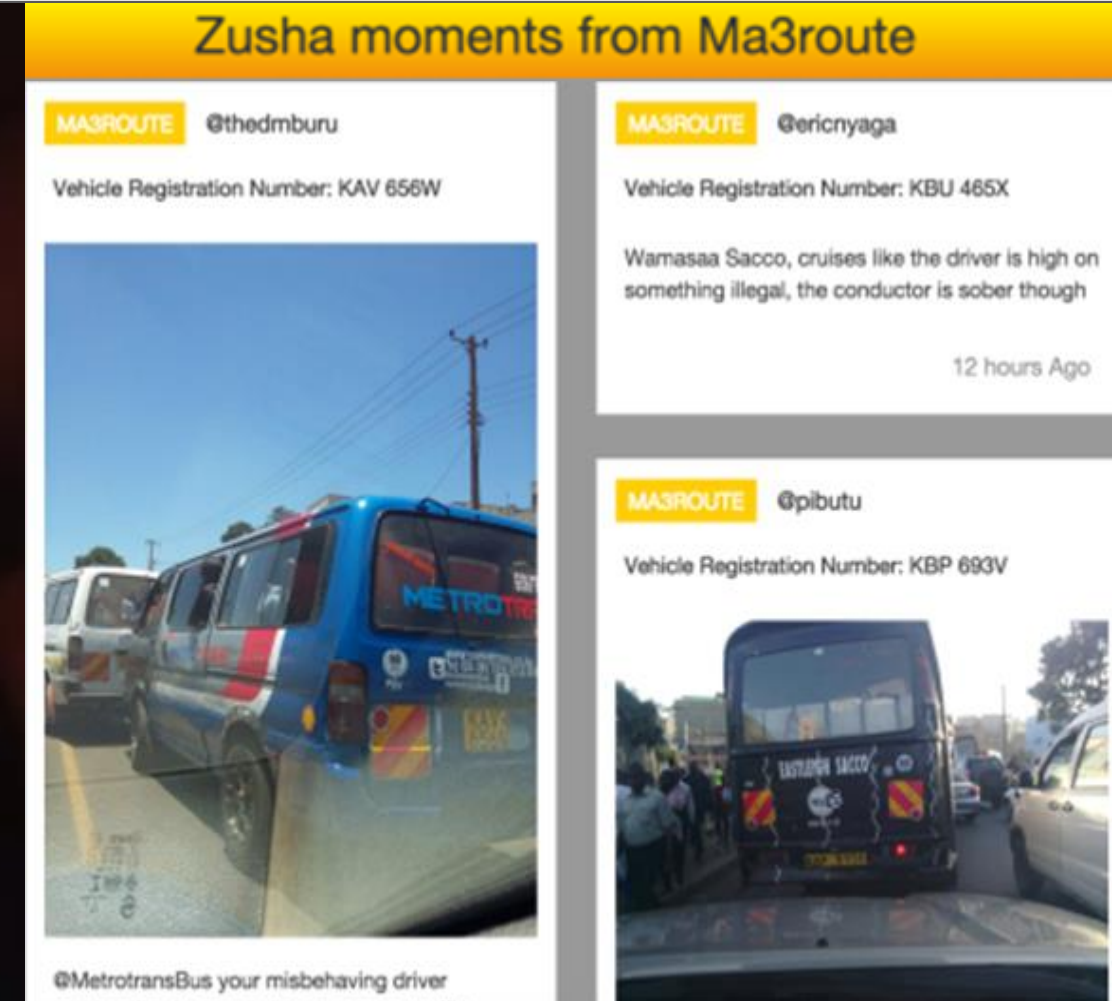
LEARN MORE

ABOUT HULT PRIZE



Get ticketing right by opening protocols within an integrated environment. Think about the smart card and beyond, and use it to integrate fares and target subsidies

# LEVERAGE AVAILABLE TECHNOLOGY AND INNOVATION



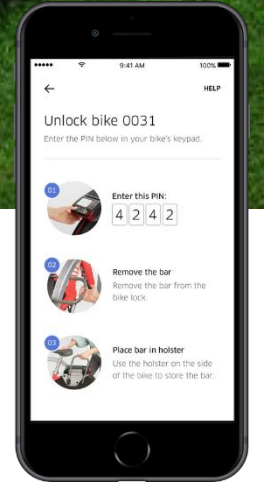
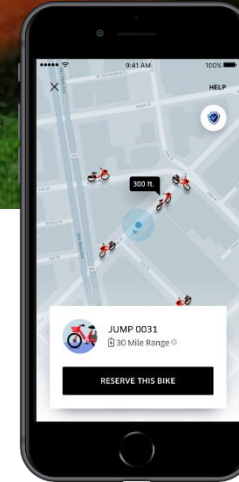
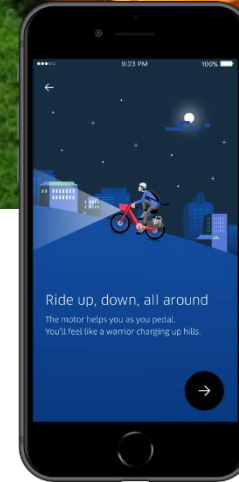
Identify wreck less drivers and vehicles real time, and use machine learning to send preventive messaging to drivers at risk

# PARTNER WITH PRIVATE SECTOR

Didi integrates public transport options allowing users to book a car to meet them at the bus stop

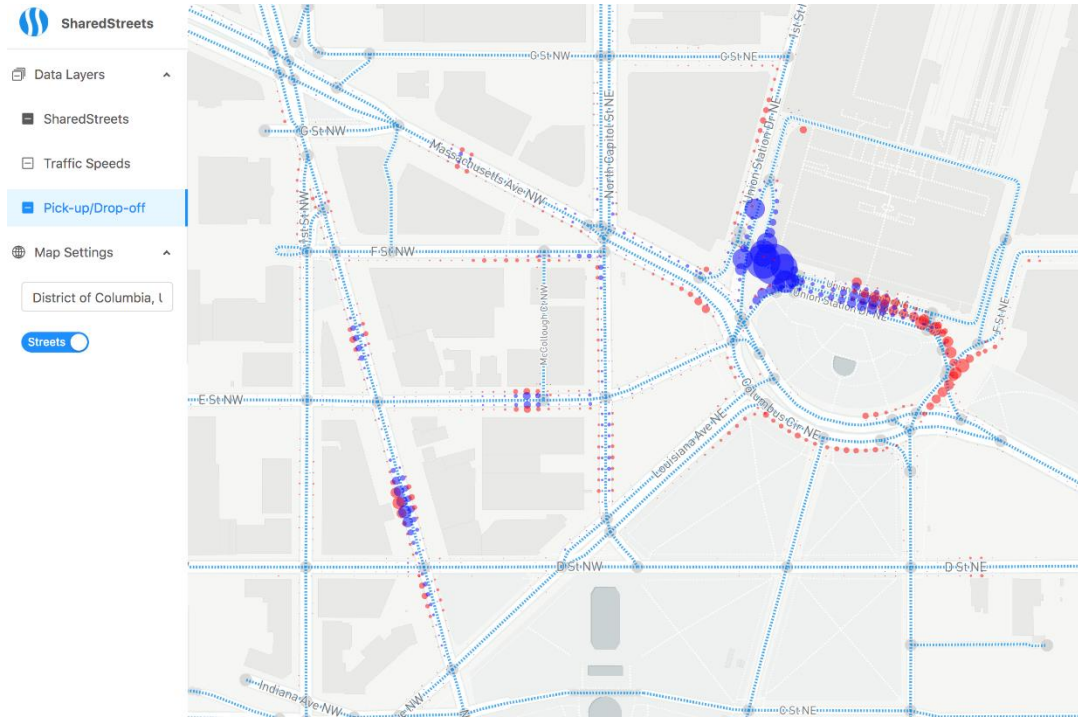
Apr 9, 2018 Frank Hersey

Didi News



Support low-risk experimentation in policy making

## Who Owns Urban Mobility Data?

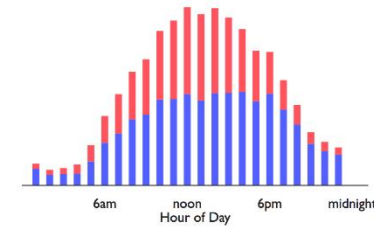


### Analysis

#### Pick-up/Drop-off by Hour of Day

Total by hour for November 2017

■ Pick-up ■ Drop-off



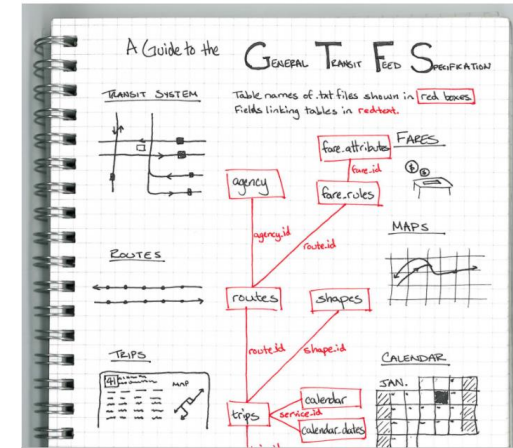
### Filters

#### Days of Week

Mon Tue Wed Thu Fri Sat Sun

#### Hours of Day

12am 6am noon 6pm



Ensure you speak the same language – default to the use of standards that reduce knowledge asymmetry between government, citizens and private sector

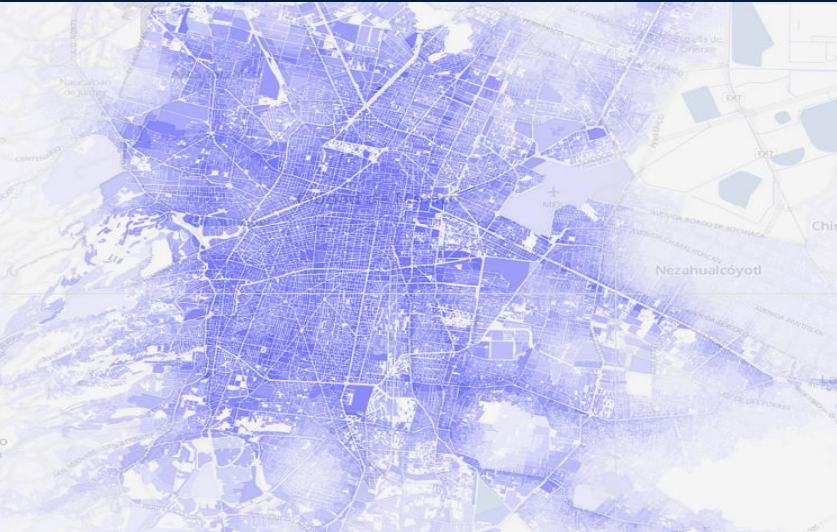
# PARTNER WITH PRIVATE SECTOR

Mobiles



Sensors

Harness the full potential of available standards and technology



Open Data



# THANKS!



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