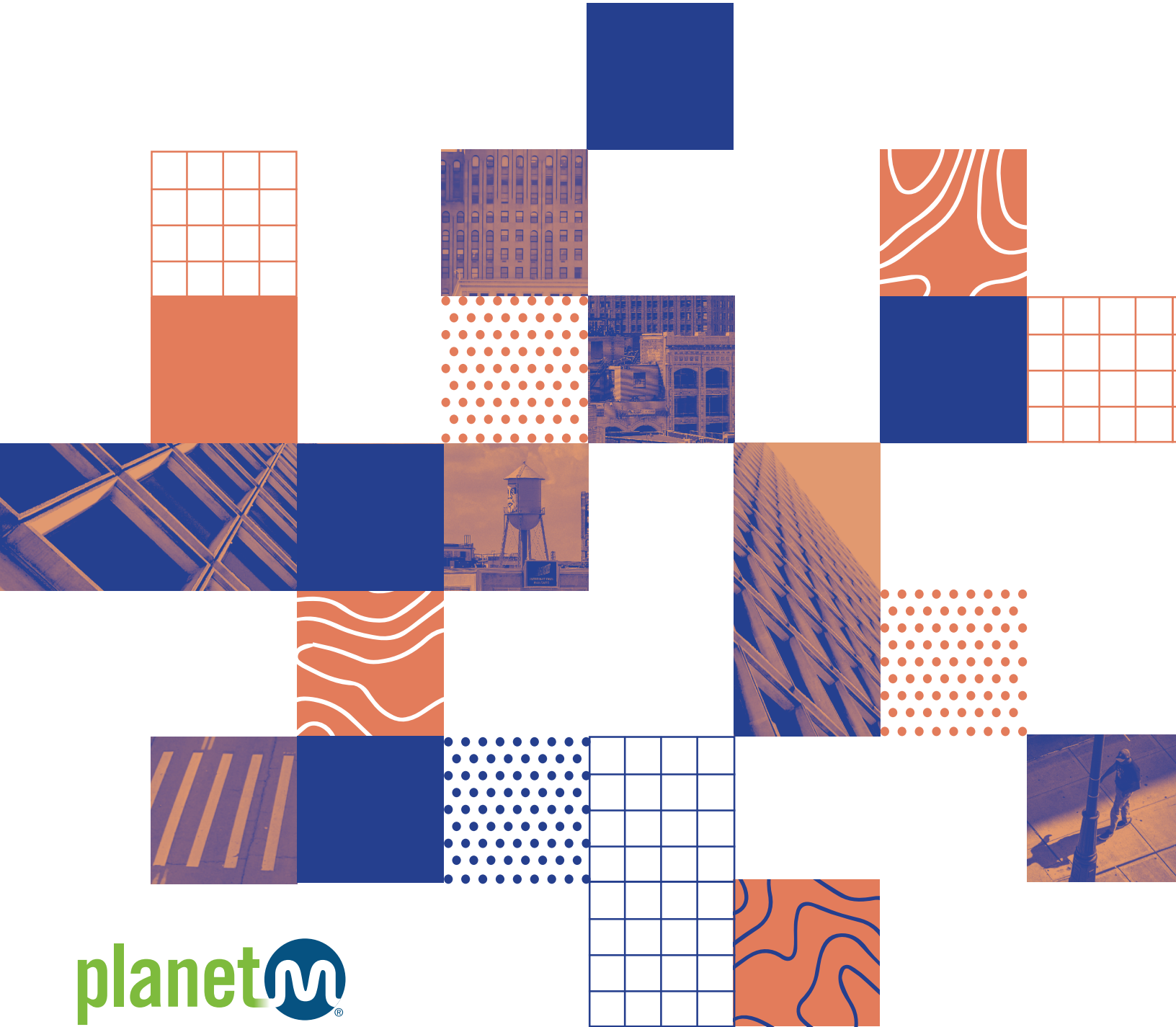# Building Connected Communities:

What's needed for a city to become a 'Smart City'?

planet**m**®

MICHIGAN ECONOMIC
DEVELOPMENT CORPORATION

Building Connected Communities:

What's needed for a city to become a 'Smart City'?

From Ann Arbor to Amsterdam, San Diego to Singapore, cities around the world are striving to become smarter. But what does it really mean to become a smart city?

Smart cities aren't about a single technology or simply about creating smartphone apps for town services. Smart cities are about using information and technology in more intelligent ways to improve the lives of those living in cities. It means safer and cleaner cities, economic opportunity and sustainability. In short, it means creating connected communities.

In this whitepaper we'll address current questions facing smart cities—from growing traffic and congestion problems to the injection of suddenly disruptive solutions like e-scooters. We'll look at what it takes to transform a community into a smart city, the critical nature of mobility solutions, the scope of smart communities, and the importance of infrastructure. We'll also look at examples of smart city projects and two case studies of cities in Michigan and their efforts to become smarter communities.
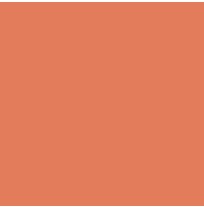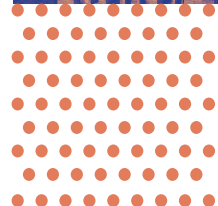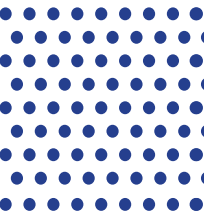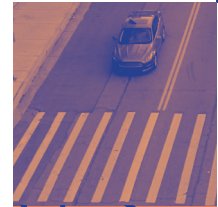
Mobility and Smart Cities:

Across the globe, people are gravitating to cities. Today, roughly 55 percent of the world's population lives in urban environments, but by 2050 the UN predicts that over 68 percent of the world will live in cities. That growth is putting pressure on urban communities to become smarter, faster in order to improve the quality of life for their inhabitants, while simultaneously welcoming growth and providing new opportunities. At the heart of much of this transformation is transportation, changing the way people get around and improving mobility and access to services in the process.

Are smart cities a reality?

In many ways, we're already on to smart cities version 2.0. The initial infatuation with technology for technology's sake has worn off and reality has set in. Many cities have made the easy moves, switching to smart LED lighting and adding cameras to monitor traffic. But now they face more important questions, like what to do with the information they've collected and deliver more efficient mobility solutions?

What are cities doing right now to become smart?

Getting smarter today means cities are learning how to better coordinate services. That entails using existing services like public transportation in more intelligent ways—and laying the groundwork for the autonomous vehicles of the future. It also means working with creative startups on solutions to everything from micromobility to how to reduce pedestrian accidents.

Who is leading the charge in smart city transformation?

While efforts are underway all over the world, some of the most successful smart city work involves having startups working in conjunction local governments and established business leaders. Successful initiatives require the support of public private partnerships to get new companies and smart city solutions off the ground. Statewide initiatives are critical, which is why in Michigan--the epicenter for the transformation of cities and of mobility--the Michigan Economic Development Corporation has focused considerable effort on PlanetM. PlanetM brings together

mobility players in the public, private and research sectors to deploy new technologies driving the future. It's all about connecting people with new ideas and new companies with communities looking for new solutions.

How Are They Paving the Way for Progress?

Perhaps no other initiative requires more of a working symbotic relationship between public and private entrepreneurs than smart city plans. There were nearly two dozen venture capital funds investing in mobility startups last year in Michigan, for example. But to get new technology on the streets of its cities the state itself put another $20 million into next generation mobility companies, while PlanetM's startup grants helped launch nearly a dozen pilot projects for small companies working with cities and towns.

What type of infrastructure is needed for a city to be smart?

Building a smart city infrastructure is not only about building bridges and tunnels. Infrastructure today means communications networks to connect not only businesses to customers but also street lights to city services, cameras to road repair crews, bus locations to commuters' smartphones. The infrastructure of tomorrow's smart cities is also wireless, with advances like 5G that will be necessary to not just support cities' growth and economic development but also safety and sustainability.

Can any city be transformed into a smart city?

From small towns to major metropolises, any community can take advantage of the efficiencies offered by new technologies and become smarter. It also isn't limited by geographical boundaries. Highways, rural communities, and even services that reach across hundreds of miles can become smarter and more effective. Smart cities transcend geographical space.
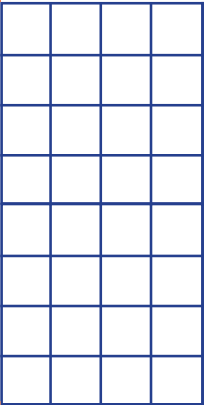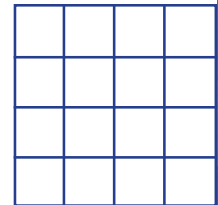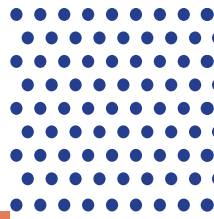
How long does it take to become a smart community?

Smart cities are never finished. Cities have to be able to adapt to changing—and aging—populations. Some towns are experiencing sudden growth and mayors are struggling to maintain a quality of life in the face of rising real estate prices and increasing stress on services ranging from garbage collection to healthcare. Other towns are experiencing shifting transportation needs as older residents require better access to health and social services. Being a smart city means being both nimble and farsighted enough to consider the long term future.

Can a smart city be scalable and sustainable?

Adjusting to the changing needs of citizens means that long-term plans need to be scalable and adaptable. Some communities, for example, are already rethinking and redesigning current construction plans like multi-level parking facilities. That's because parking needs may change in the future as ridesharing grows and private vehicle ownership declines. The garages being built today may have to become the apartments of tomorrow.

Indeed, cities looking to more sustainable solutions are trying new ways to incentivize more sustainable transportation solutions, like micromobility electric bikes, while addressing new challenges like how these will interact with pedestrians and walkways.

$34.35 billion

will be spent on smart city initiatives in 2020

Source: Statista (US dollars)

The New Face of Mobility:

Mobility today is about more than planes, trains, and automobiles. Mobility today is about choices, from ridesharing to bike sharing. It's all about transportation services and multimodal solutions. It means offering traditional transit options, like buses, in conjunction with new forms of so-called micromobility transportation solutions like e-scooters and e-bikes to cover the last mile.

This new face of mobility means communities face new challenges in delivering the right options for their towns and cities. Whether it's a bike, e-bike, rideshare or bus, logistics and real-time traffic and transportation demands have to be integrated to deliver the right solution at the right time to get people where they need to go safely.
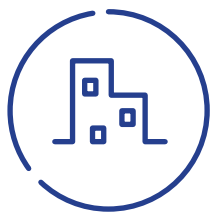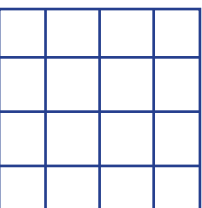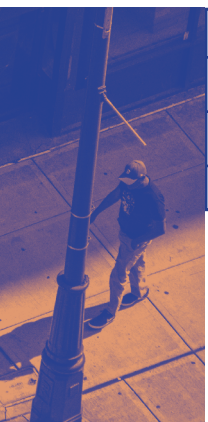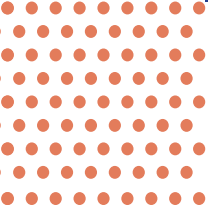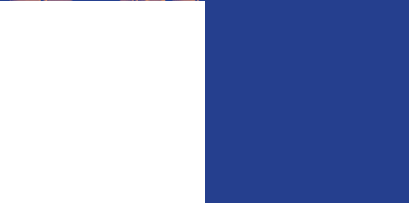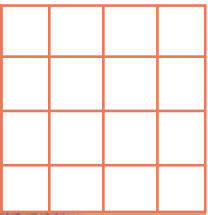
66% of cities

in the U.S. are currently investing in smart city technology

**Source: National League of Cities**

The Top 5 Best Practices for Becoming a Smart City

What exactly does it take to ensure the success of a smart city initiative? A survey of 22 smart cities by Gartner led to the creation of the The Smart City Playbook. Here are the top 5 objectives to ensure a winning game plan.

1. Make the rules for sharing collected data transparent:
The oil that makes any smart city project work smoothly is information, but who can use it and how should be made clear from the start.
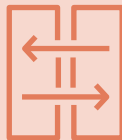
2. Eliminate government silos:
A hallmark of smart city projects is integration and coordination. A DOT has to share information with the local utilities, which have to share information with sanitation departments, etc.
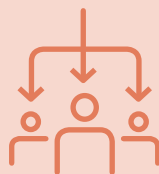
3. Make information accessible to the public:
To increase acceptance and encourage the use of smart city projects, as much information as possible should be made available to users and citizens.

4. Focus on security:
With the increased use of big data and the digitization of information comes the increased potential for harm. So ensure that all players— government departments and private tech partners— adhere to strict security and compliance rules.

5. Sandbox and then scale:
Pilot projects should be carefully contained so that their success or failure can be easily assessed. But before starting, make sure the idea can be cost-effectively scaled in case you find a winning solution.

A Tale of Two Cities:

More than any other place, Michigan is the face of the transformation of transportation. Not only is it home to legendary automotive companies it also has one of the country's largest departments of transportation, overseeing nearly 10,000 miles of highways, more than 4,000 bridgesand wielding an annual budget of almost $5 billion. Michigan also features two prime examples of different communities dealing with different smart city issues.

Detroit: The Motor City Delivering Options

With a population of over 673,000 people, Detroit is Michigan's largest city. As such, it's been focused on smart city initiatives for nearly a decade.

Today, the city is working on more sophisticated projects, such as Central Traffic Intelligence, a big data management proposal that would use collected information to develop future mobility projects. With an eye toward generating more opportunities for startups, data from connected cars, smartphones, networked sensors and cameras will be used to do everything from help identify damaged roadways to pinpointing areas where people tend to drive too quickly and create dangerous conditions for pedestrians.

Several public private partnerships have already formed to work toward Detroit's traffic intelligence goal. Thanks to the PlanetM initiative—a partnership between the Michigan Economic Development Corporation, local governments, and private transportation and mobility companies— many of these projects are already underway. PlanetM works with the Detroit Office of Mobility Innovation and corporate members like General Motors, Lear Corporation, DTE Energy, Quicken Loans, and Bedrock to spur on innovation with over $1 million in grants.

Thanks to a PlanetM grant, HAAS Alert, for example, is working on a first-responder alert system for motorists. The Chicago-based company essentially supplements police and EMS sirens and lights with alerts sent to connected cars, warning them of the presence of emergency vehicles nearby long before they can be seen or heard.

3 million

people move into cities every week

Source: International Organization for Migration
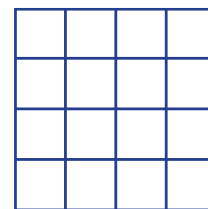
In the public transportation space, Humanising Autonomy is testing a bus driver alert system that keeps an eye out for cyclists and pedestrians and tries to anticipate their behavior. To improve the condition of the roads themselves, RoadBotics is using AI to interpret dash cam video of road surfaces that can then be used to allocate government resources.

Meanwhile, DERQ is using a grant from PlanetM to study how to use AI in vehicle-to-infrastructure (V2X) communications to improve the timing of traffic signals, speed up traffic flow, and anticipate and prevent car accidents.

Detroit is also working on the autonomous future.

Ann Arbor-based startup Bedestrian will use a $100,000 grant to study the use of self-driving delivery vehicles to get drugs from a hospital's pharmacy to its cancer center. Bedestrian's robotic B1 goes 15 mph, can interact with people and has hot and cold compartments.

Self-driving shuttles from EasyMile are using a $103,600 grant and assistance from Oakland University and the city of Auburn Hills to operate a program run by OU students. Meanwhile, Navya is piloting an autonomous shuttle service at the Detroit Medical Center, working with Bestmile, Flagstar Bank, and IXR Mobility.

Planet M also recently awarded a grant to Naventik. The company will test a software-based GPS receiver for safety critical autonomous vehicles.

Smart cities can't afford to rule out any new form of mobility—even drones. So the Michigan Unmanned Aerial Systems Consortium is looking up and working to provide airspace for drone testing including unmanned aircraft for first responders and delivery services.
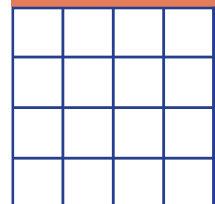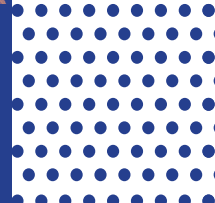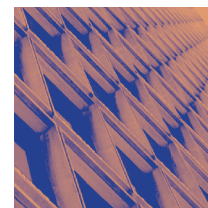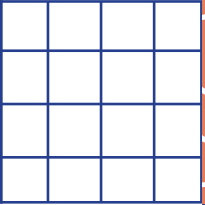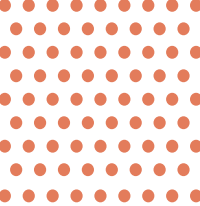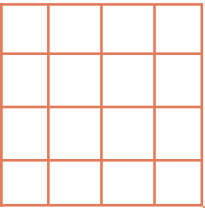
Grand Rapids: Vital Streets

With roughly 200,000 people, Grand Rapids is about a third of the size of Detroit—but its smart aspirations are just as big.

For example, the municipality launched its own City of Tomorrow Challenge program a year ago. Out of that initiative came Kaizen Health. The startup's proposal is to improve transportation options for the underserved with the ultimate goal being to increase access to proper medical care.

Leveraging existing services like Lyft, GO!Bus, and others, Kaizen will work with in conjunction with healthcare providers. Professional care coordinators will in turn work directly with patients to determine their mobility needs and the best transportation options for them.
Grand Rapids is also an example of how smart cities and towns may need to reassess the use of streets to accommodate changing populations and needs. Especially when it comes to the latest forms of two-wheeled transportation.

The city has built over 80 miles of bicycle lanes and infrastructure since 2012. To further increase safety, it has also instituted a 5-foot rule requiring 5 feet of clearance (rather than the typical 3) between a passing vehicle and a cyclist. And the city is trying other innovations, such as so-called green boxes at major intersections. The specially marked areas are designated for cyclists only in order to enable safer left-hand turns. It's all intended to make the environment friendlier to new approaches to mobility.

Meanwhile, the city continues to update its rapid transit bus system to make it more appealing and convenient. It now includes mobile ticketing and smartphone app support so that riders can get live schedule information.

The rural areas around smaller cities must also be taken into account. And the reality is that some residents outside of town remain isolated. So one PlanetM grant-funded pilot project from startup Hi-Ho Mobility is aimed at communities outside of Grand Rapids. Working with Aequitas, which provides door-to-door medical transportation in underserved areas, Hi-Ho is working on a pilot program to create secure prescription drug delivery to rural sections of Battle Creek, Michigan.

In total, Grand Rapids is taking a holistic approach to the idea of a smart city, epitomized by the city's Vital Streets plan. It coordinates the infrastructure needs of the community with available technology solutions and quality of life issues. It's a goal that extends back several years to when Grand Rapids expanded Joe Taylor Park. Considered a model of how to create healthier, more sustainable cities at the time, the park literally piggybacked on the construction of a water treatment facility upon which it now sits.

Go Get Smart at PlanetM

From Detroit to Grand Rapids these examples show there's no one-size-fits-all solution for creating a smart city. What is clear is that local governments and individual businesses can't do it all alone. Smart cities require smart partnerships--and organizations that can foster those collaborations. To get started, check out what PlanetM is up to and where you can connect with intelligent partners and startups at the PlanetM Landing Zone.
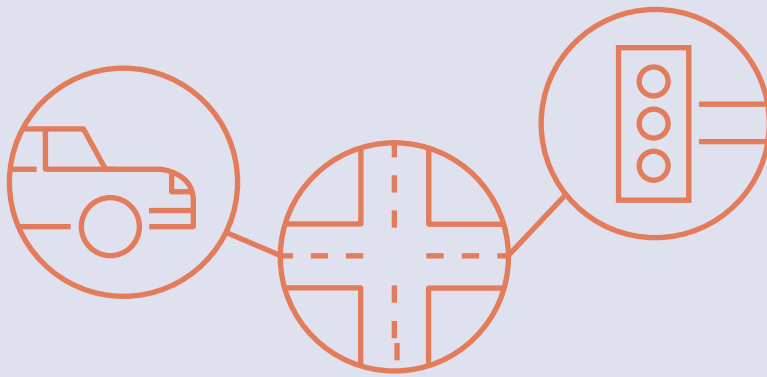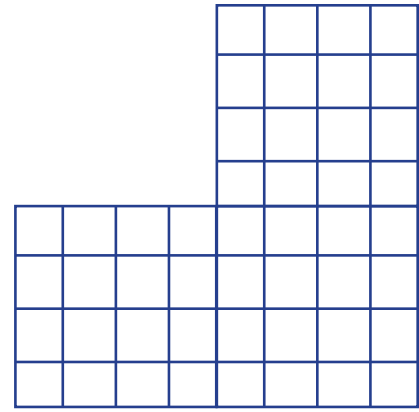
Connecting Everything to Make it Smarter:

From the Internet of Things to connected cars, it's becoming clearer every day that everything is going to be connected. But how does a city leverage such systems? One of the best demonstrations of how to make this work is the so-called "World's Smartest Intersection" in Detroit.

Actually a series 5 traffic lights along Detroit's downtown corridor, the TrafficLink system is made by Miovision. For the smart system, Miovision uses an AI program and a package of sensors, 360-degree video cameras, and intelligent traffic signals with remote monitoring to respond to live situations. It allows the transit corridor, for example, to clear intersections for emergency vehicles like ambulances and fire trucks in real time. TrafficLink can also communicate with drivers to warn them of cyclists or pedestrians jaywalking in the intersection. Moreover, Miovision uses an open architecture so that other smart capabilities and functions can be added in the future.