# HOW TO GROW A SMART CITY BIKE SHARE SCHEME

PRODUCED BY STAGE INTELLIGENCE IN PARTNERSHIP WITH EUROPEAN CYCLISTS' FEDERATION (ECF)

AUGUST 2017

**Data is changing how we experience cities and enabling us to live healthier, happier and more productive lives. As cities become smarter, data is being used to reimagine transportation and how we get from A to B.**

Every city is producing vast amounts of data every hour and every day. Increasingly this data is being captured and put to work creating new solutions, processes and experiences that improve how a city functions and is enjoyed by citizens.

Data can be used to improve, urban planning, health care, sustainability, transportation and just about every aspect of a city. The "smart" in Smart Cities is about taking this data and rapidly turning it into actionable insights.

According to IBM, a Smart City "makes optimal use of all the interconnected information available today to better understand and control its operations and optimise the use of limited resources". It makes cities better places to live and enables the best use of what a city's budgets, space, people and technologies.

By 2021, open and shared data has the potential to add $2.83 billion (10.4 Billion AED) to Dubai's economy every year, according to a report produced by KPMG. That is a lasting and long-term impact on the city of Dubai and results from using data in a Smart City environment.

While Smart City deployments continue to grow, transportation is an area where we are already seeing the direct impact of data on how citizens live day-to-day. In modern cities, Bike Share Schemes have emerged as a healthy and efficient means of commuting and navigating a city.

In some of the best Bike Share Schemes, immense amounts of citywide data are being captured, processed and used to ensure an optimal rider experience. Increasingly, schemes around the world are using city data to not only optimise its redistribution but to also show complete visibility to its users as to where the bikes are on its system map.

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These schemes are taking the Smart City concept and applying it to local challenges and succeeding in growing ridership and providing more citizens with healthy and efficient transportation.

It's this citywide data that is at the heart of the three pillars of smarter public bike sharing system as set out in the Policy Framework for Smart Public-Use Bike Share by the Platform for European Bicycle Sharing & Systems (PEBSS). Data influences how rider priorities are met and how cities offer suitable conditions with sustainable technologies and innovation. Smart Cities support Bike Share Schemes by considering the people, infrastructure and technology elements.

## Positive Rider Experiences Drive Growth

Smart Cities can make vast amounts of data available but it is how Bike Share Schemes make use of the data that drives value for operators, riders and cities. Bike Share Scheme operators are often familiar with rider statistics and patterns but the challenge is to use this data to accelerate growth within a scheme.

Tracking growth and stimulating growth are often two very different things. At the heart of new growth is rider experience. Bike Share Schemes are challenged to offer a consistent rider experience across a city while ensuring that using a Bike Share Scheme is easy, convenient and enjoyable for the rider. A positive and consistent Bike Share Scheme begins and ends with two questions:

A.    **"Can I get a bike where I want one?"**

B.    **"Can I dock my bike at the end of my journey?"**

If a Bike Share Scheme can guarantee these two things, it is likely that a rider will have a positive riding experience. When a rider can borrow a bike and dock it, they are more likely to use the scheme again and make it part of their routine.

That's good for the Bike Share Scheme as it will help to grow overall ridership and new people will experience the city using shared bikes. A Bike Share Scheme with an active and growing ridership is able to invest and expand its schemes.

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## A Balancing Act

The data available in a city can be used to ensure that riders can access bikes and docks where and when they want them. Different days of the week, weather, events, seasons, local conditions and scenarios, and a whole range of criteria can shape how a Bike Share Scheme is used.

On a rare rainy day in Los Angeles, people may not cycle at all. In Amsterdam, there may only be a slight variance in usage patterns. At the same time, different events can be connected like a sunny day in a city matched with a train drivers strike and major sporting event being held in one area of the city. All of these factors can influence how a scheme is functioning and where more or less bikes are needed.

If you combine millions of different criteria across a large urban area, the sheer number of possibilities can be overwhelming. Every element matters and can influence where bikes are dropped and congestion occurs. In the worst-case scenarios, a rider borrows a bike but can't find a dock and must travel away from their destination to drop it off and when they return there are no bikes remaining.

This is where Artificial Intelligence (AI) can be an excellent tool for simplifying Bike Share Scheme operations while using the power of data to drive decision making. AI is able to process a variety of data both historically and in real-time to deliver actionable insights for Bike Share Scheme operators. Operators gain visibility into all of the criteria shaping a cityscape and benefit from useful insights to optimise bike distribution to match changing conditions.

AI accelerates how decisions are made by operators while taking the guess work out of bike distribution. The AI technology can predict peak times up to 12 hours in advance, enabling operators manage supply and meet requirements in those areas. This ultimately leads to bikes and docks being available and riders getting a better Bike Share experience.

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With an AI-based management platform, a variety of data sources can be used to automate the redistribution process for operators. It can give insights as to where bikes are required and instantly inform distribution trucks about where bikes need to be picked up and dropped off. When information is being processed instantly and communicated to drivers, there is no lag between new demand emerging and that demand being served.

The value of AI is its ability to process vasts amount of data across a Smart City and make it useful for operators. Riders get the bikes and docks they need and that supports the long-term sustainable growth of a Bike Share Scheme.

AI platforms simplify the management of Bike Share Schemes and deliver unique benefits to operators:

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- **User Satisfaction**
  Increased user satisfaction by ensuring bikes and docking points are available when and where required

- **Cost Reductions**
  Improved operational efficiency and reduced requirement of operational resources

- **Remove Unneccessary Processes**
  Move away from traditional schedule or dispatch-based approaches and eliminate wasted journeys

- **New Visibility**
  Real-time truck locations, colour coded station status and station clustering as well as access to advanced analytics and actionable reports via a single dashboard

- **Increased Autonomy**
  Drivers receive direct communications often via a mobile app, allowing them to work independently of each other and the back office with less wasted time

- **Greater Control**
  Autonomous operation of a Bike Share Scheme that reflects real time conditions, offers consistent delivery instruction and a detailed overview of the scheme

- **Scenario Simulation**
  The simulation engine in such management platforms offers the ability to see responses to "what if" scenarios, allowing improved and more efficient resource planning

- **Scale Up**
  Increase the size of a Bike Share Scheme without the need to simultaneously increase available resource to maintain operation levels

# Data-Driven Growth in Bike Share Schemes

While Bike Share Scheme operators may be focused on ridership data and growth, cities offer an entire ecosystem of valuable and relevant data. Citywide data can be used to identify trends and provide actionable insights that can drive the growth of Bike Share Schemes.

These four questions about data hold key information that Bike Share Scheme operators can use to reshape their approach:

## Who are they?

Bike Share Scheme operators need to know not only who their riders are but also the potential of the market. Citywide census and records collect data on population and demographics as well as human behaviour that can be used to predict the future of such schemes for operators. Trends in demographics can be identifiers for areas of growth in specific markets.

## What is happening in the city?

Cities offer the potential to track a range of real-time data from traffic to weather and major events. Understanding how areas are being used at different times of day, by different types of people, and in response to different events through real-time data, can be highly beneficial to operators. A dynamic scheme is the first step in providing mobility options that work for all.

## Where are they going?

How people move in urban cities is just as important as identifying who they are. Fortunately, cities have a way of capturing this data too. Mobile phones, parking sensors, congestion zones all yield data about how and when people are moving around the city. Transport for London (TFL), a body responsible for the cities transport system, can track passenger movements through the Oyster card. For Bike Share Scheme operators, this data allows them to provide resources that are better attuned to the rider's needs.

## What are they saying?

In a more connected and social world, it is also much easier to find out what people are thinking. As an example, sentiment analysis can be used to track attitudes and opinions on social media. Operators can use this data to see how people react, what they like and dislike as well identify any opportunities for improvement. Ridership is the key to success for Bike Share Schemes and insights on this data can go a long way in ensuring the satisfaction of riders.
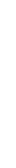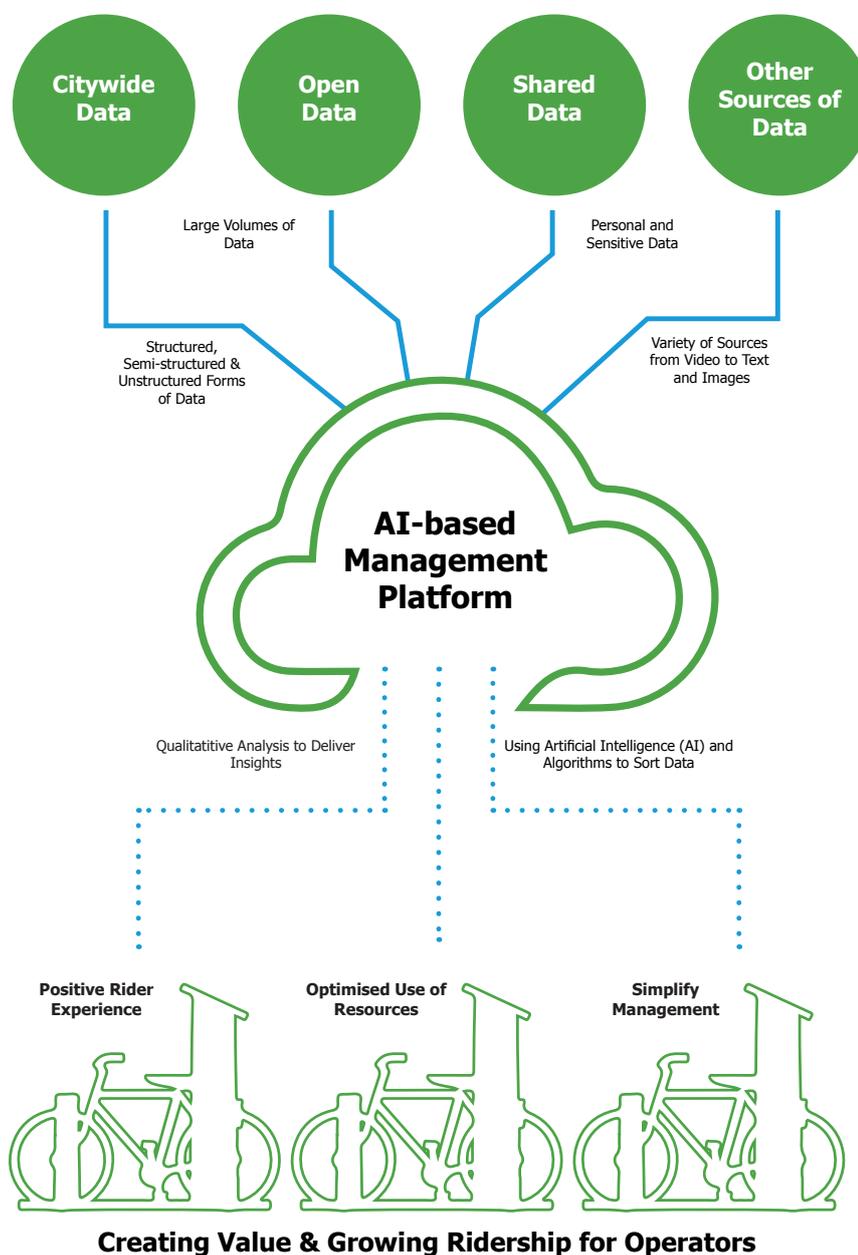
The challenge for operators is in how this data is collected and managed. Smart AI systems will make use of public data feeds and encrypt user information to ensure the security of data.

For Bike Share Schemes and other transportation networks, it is imperative that they comply with existing and soon-to-be implemented regulations on data collection, privacy and usage such as the General Data Protection Regulation (GDPR). The EU GDPR replaces the Data Protection Directive 95/46/EC and was designed to harmonise data privacy laws across Europe, to protect and empower citizens and to reshape the way organisations approach data privacy.

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Citywide Data

Open Data

Shared Data

Other Sources of Data

Large Volumes of Data

Personal and Sensitive Data

Structured, Semi-structured & Unstructured Forms of Data

Variety of Sources from Video to Text and Images

**AI-based Management Platform**

Qualitatitive Analysis to Deliver Insights

Using Artificial Intelligence (AI) and Algorithms to Sort Data

**Positive Rider Experience**

**Optimised Use of Resources**

**Simplify Management**

**Creating Value & Growing Ridership for Operators**

# Bike Share Benefits Smart Cities

Smart Cities that have active and growing Bike Share Schemes create urban environments that are healthier, with less congestion and better placed to manage growing populations.

In 2016, 1.7 billion people or 23% of the world's population lived in a city with at least 1 million inhabitants, according to the United Nations. By 2030, that will grow to 27%. Urbanisation is continuing to grow and that puts strain on transportation networks.

Public Transport in its current state is already stretched and cities are often challenged to fund new projects. With optimised Bike Share Schemes, cities can encourage citizens to cycle and avoid crowded transport systems.

As more Smart City initiatives are deployed, cities become data-rich environments that can benefit Bike Share Schemes. The emergence of the Internet of Things (IoT) and a growing number of connected devices deployed across a city will only expand the potential of AI in Bike Share Schemes and transportation overall.

Expanding data sets managed with AI can deliver results that directly benefit riders and influence how a city functions and grows.

All cities can benefit from an AI-driven Bike Share Scheme but as smart technologies are rolled out widely, the depth of data will grow. Operators benefit from new and increasingly precise insights while riders will see Bike Share Schemes optimised in new ways.

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Effectively managed Bike Share Schemes offer cities unique benefits that go beyond other modes of transport:

### A Cleaner Transport Option
For cities to help tackle climate change and deliver a better environment for citizens to live in

### Healthier and Happier Riders
Through daily exercise

### Effective First & Last Mile Solution
Since it can be significantly cheaper and faster than other public transport options for short distances

### Reduced Strain on Infrastructure
As less people are using public transport that requires continuous upkeep and maintenance

### More Investment in Cities
With less need for maintenance and new projects, Smart Cities can use funding on other much needed transport infrastructure such as cycling lanes and incentives
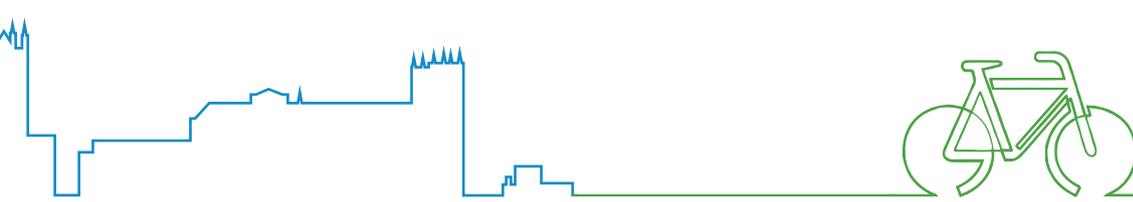
### Manage Rising Transport Demand
With increasing urban-dwellers, cities can offer more transport options with a Bike Share Scheme to accommodate this rise

### City's Brand Image
Can be shaped by a cycling culture, supporting tourism and other thriving economic industries

# Next Steps

Bike Share Schemes have been deployed and developed across six continents and there is an opportunity for operators to accelerate growth within their schemes. Both schemes that are in the planning stages and ones that have already been deployed can benefit from leveraging data and AI.

Going forward, data needs to be more accessible to operators. Open data allows Bike Share Scheme operators to deliver a transport solution that works for all. Data ensures bikes are available when and where it's needed to support the growth of Bike Share Scheme deployments around the world.

Regulations such as the GDPR will still be paramount in the push for the openness of data. Cities, operators and all others involved have a duty to follow secure practices and take necessary steps in protecting user information.

Data and AI are ready to help operators to adapt and grow their schemes while refining and simplifying how they manage distribution. For operators, getting started is simple:

**1** Evaluate **long and short-term goals** and growth objectives

**2** Explore what **AI-based management platforms** are available

**3** Look at what **open data, shared data and Smart City initiative** have been launched or are being developed locally

**4** Collaborate with **AI experts** and begin the journey towards smarter and more efficient Bike Share Schemes

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## About Us

### European Cyclists' Federation (ECF)

With over 80 members across more than 40 countries, the European Cyclists' Federation (ECF) unites cyclists' associations from across the globe, giving them a voice on the international level. Our aim is to get more people cycling more often by influencing policy in favour of cycling.

www.ecf.com   @EuCyclistsFed

### Stage Intelligence

Stage Intelligence specialises in developing Artificial Intelligence solutions for the transport and logistics industry. Its flagship solution, the BICO recommendation engine, delivers real-time intelligence for the management of bikeshare schemes. BICO enables precise and optimal decision making and has been purpose-built to remove the complexity from managing resources within a bikeshare scheme.

Customers choose Stage Intelligence because our solutions increase their agility, adaptability and enable them to move beyond traditional manual processes. We collaborate with customers to solve complex problems and deliver solutions that have a lasting impact on their operations.

www.stageintelligence.co.uk

Stage Intelligence is a proud member of PEBSS, the Platform for European Bicycle Sharing & Systems, created by the ECF. We believe in supporting advocacy to grow a healthier market for all.

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