

Roundabout

A new way to discover urban bikes



What we want to cover today

1. Background – Team and Approach

2. Use Case

3. Market Size and Trends

4. Fit with LTE-D

5. Business and Revenue Model



1. Background – Team and Approach

The Team



Arezu Aghaseyedjavadi

- 2015 I School MIMS
- Expertise: User Experience Research and Design for Mobile Applications
- Entrepreneurial Experience in early stage start-up in Tallinn, Estonia
- Finalist in Hackathons sponsored by Facebook, Visa, PeaceCorps, and Google/Yetizen
- Current work: Connected Car Services with Nissan Research Center
- [LinkedIn](#)



Emily Hahn

- 2014 Haas MBA
- 4 years of software and management consulting
- Winner of 2013 Bosch Robotics Challenge
- Internship in venture capital (Javelin, Illuminate, First Round Capital), investments in mobile money space
- President of Design and Innovation Strategy Club
- [LinkedIn](#)



Venkat Venkatasubramanian

- 2015 Haas EWMBA
- Currently at Apple – Managing a team of wireless systems engineers
- Tech Expertise - 3gpp protocols, modeling, system simulation and radio Propagation
- BSEE, MSEE @ Virginia Tech
- Previous 3gpp RAN1 standards delegate
- [LinkedIn](#)

Our Approach

Conducted Research

- Interviewed users of bike sharing services
- Outlined main insights
- Researched bike sharing industry and trends
- Researched market size and growth
- Examined macro trends

Performed Analysis

- Analyzed value of LTE-D for each technology and business pain point
- Used frameworks to evaluate business
- Evaluated revenue models based on fit with various actors in the model
- Conducted SWOT analysis
- Compared LTE-D to alternatives

Generated recommendations

- Created a business model canvas to outline the general players
- Identified mobile carrier role in value chain
- Examined cost savings scenarios
- Outlined revenue model based on key actors

2. Use Case



Interview Insights

We interviewed a number of current bike sharing customers to identify their pain points.

Insight

Having to wait for a space to open up or find another parking station is frustrating

If I can't find a bike available, I'd like to know what my other transportation options are

Bike sharing locations need to be more accessible

LTE-D Fit Hypotheses

› Let riders know of available spots within 500m. Or add technology to bikes themselves.

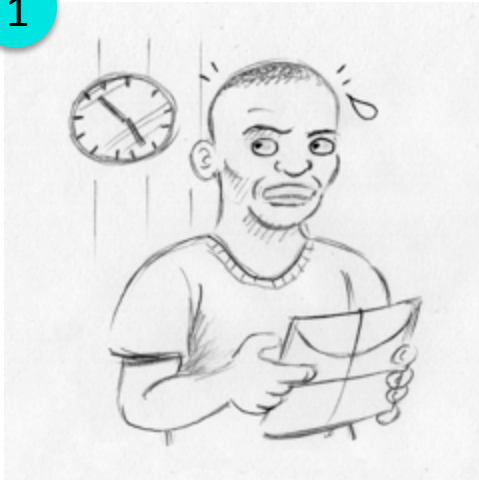
› Incorporate other transportation apps to let the user know the available modes of transport within 500m.

› LTE-D technology could make discovery of available bikes easier

Use Case

1

Ken needs to run to the post office before it closes to mail a small package



2

Ken sends an expression to see if there are bikes nearby



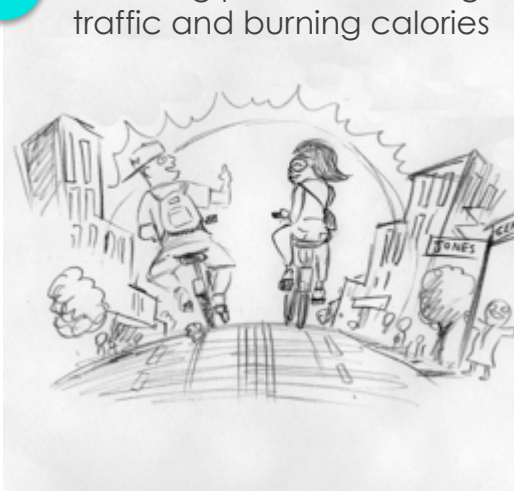
3

The app notifies Ken that there is a bike within range that he then reserves



5

Ken and Tina ride off together, reducing pollution, cutting car traffic and burning calories



4

Ken's friend, Tina, was notified that Ken had rented a bike nearby so she met up with him



Bike Sharing Issues

We researched current issues with bike sharing programs that LTE-D could address.

Issues

Technology

1. Batteries run out of power quickly, disabling entire system¹
2. Issues with locking/unlocking mechanism²
3. Buggy implementation of software (card reader, screen, etc.)³

Battery-efficient

Private

Upgrading to LTE-D and LTE technology to discover, reserve and unlock bikes, without a docking station would solve a number of these issues.

Business

1. Rider operations – more commuters than tourists lead to neglected and overused stations⁴
2. Maintenance operations are costly and inefficient⁵

Scalable

Expressions

1. <http://www.nydailynews.com/new-york/nyc-citi-bike-bike-share-program-successful-article-1.1374368>

2. <http://blogs.reuters.com/felix-salmon/2013/06/05/the-one-big-problem-with-nycs-bikeshare/>

3. <http://www.gothamgazette.com/index.php/transportation/1435-why-the-bike-share-software-doesnt-work>

4. http://www.nytimes.com/2014/03/27/nyregion/as-citi-bike-approaches-anniversary-worries-abound.html?_r=1

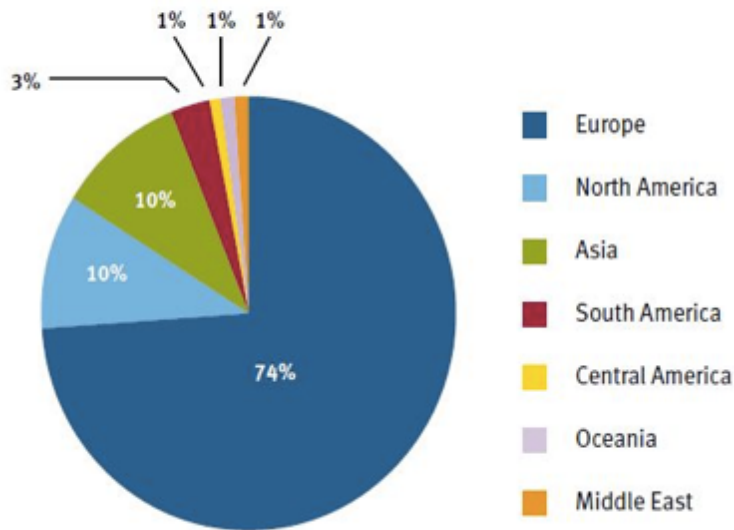
5. <http://www.nydailynews.com/new-york/exclusive-citi-bike-operators-neglecting-bikes-stations-article-1.1731484>



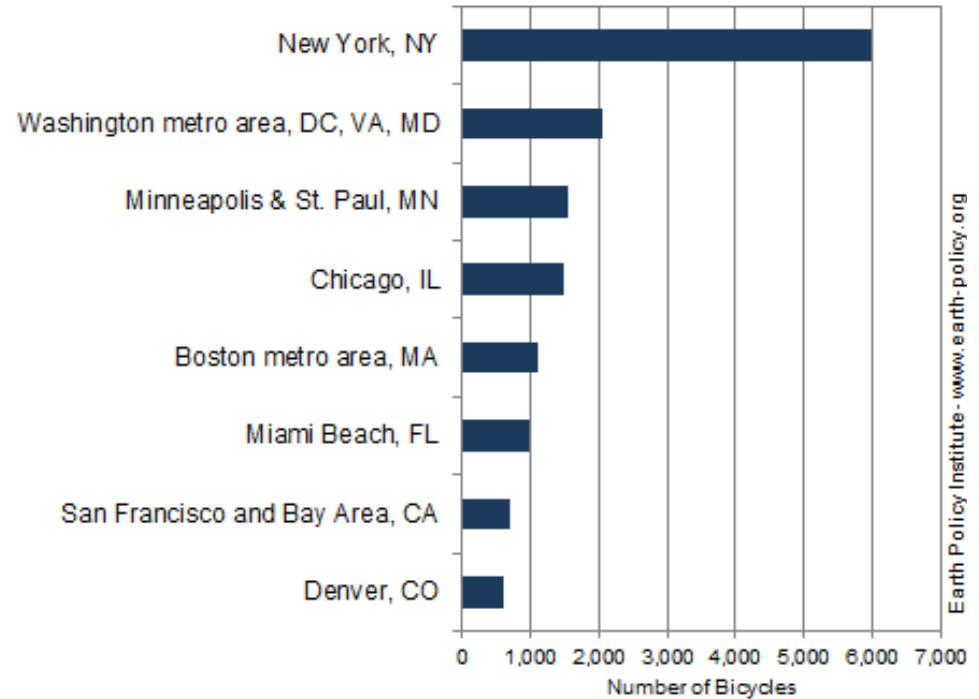
Market Size and Trends

Bikesharing Market Trends:

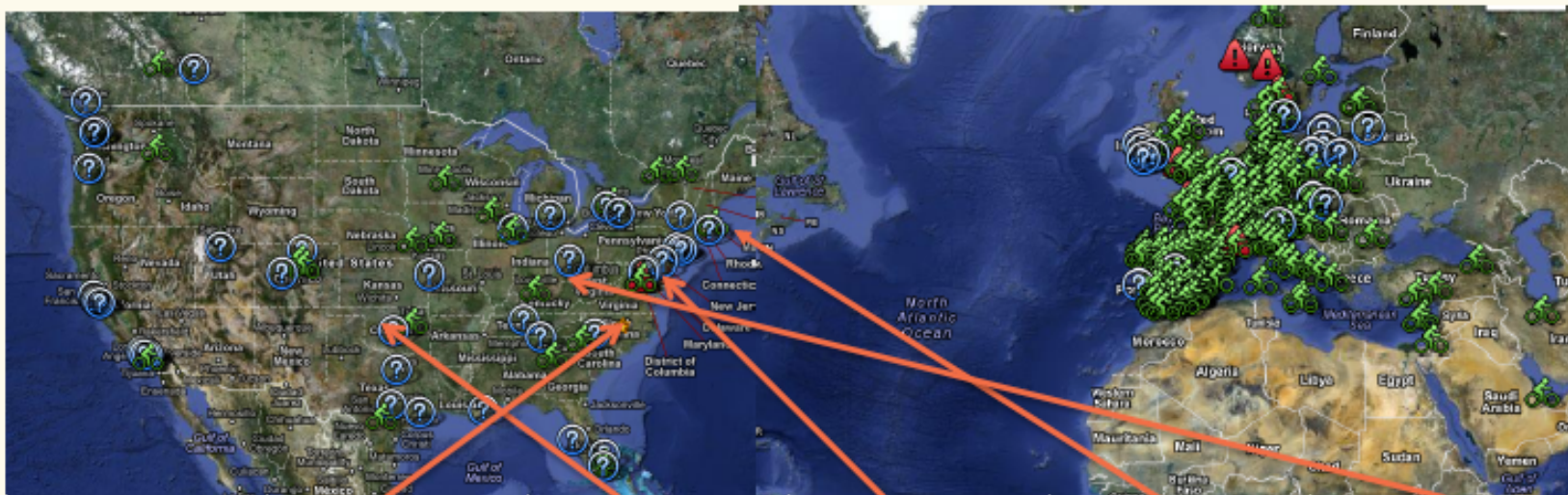
WORLDWIDE DISTRIBUTION OF CITIES WITH A BIKE SHARING PROGRAM



U.S. Bike-Sharing Fleet, Largest Programs, as of August 2013

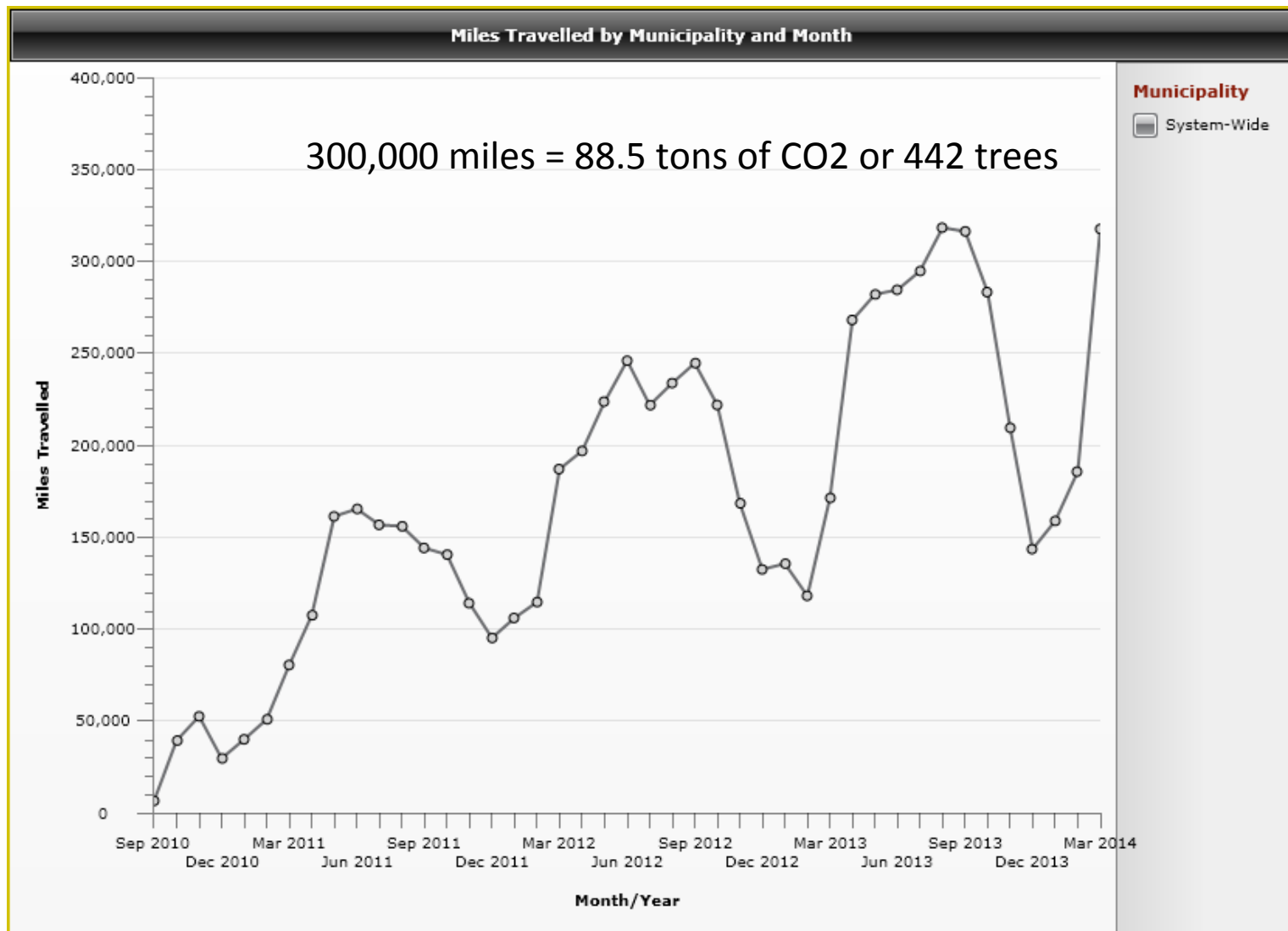


More cities signing up for Bike share programs



CITY	D.C. / Arlington	Denver B- Cycle	Boston Hubway	NY City	Chicago
Year installed	2008	2009	2010	2012	2012
Size	150/1,300	60/600	60/600	600/10,000	300/3000
Operator	Alta Bicycle Share	Denver Bike Share	Alta Bicycle Share	Alta Bicycle Share	Alta Bicycle Share/ B- cycle

DC bikeshare statistics – Miles travelled



Macro Trends



Urbanization

By 2025
Europe, North
America and
Latin America
will have over
75% of their
populations
living in urban
areas



Energy Savings

Americans will
use half as
much
gasoline by
2040



Health

Regular
cycling, even
over 1-2 miles
can greatly
improve
health



Sharing Economy

Sharing
economy is
estimated to
have a value
of \$26B

http://esa.un.org/unup/Analytical-Figures/Fig_1.htm

<http://www.uspirg.org/news/usp/new-report-reduction-driving-likely-continue>

<http://www.nrdc.org/thisgreenlife/1306.asp>

<http://www.fastcoexist.com/1682080/why-the-sharing-economy-is-growing>

SWOT Analysis

Strengths

- Good fit with LTE-D technology
- Fit with pre-existing bike sharing innovation
- Fit with Orange Smart Cities initiative
- Can work across different apps, breaking down silos, providing user with more flexibility

Weaknesses

- Does LTE-D add enough extra value?
- Are bike-sharing companies open to sharing sponsorship/advertising revenue?
- Depends on growth of bike sharing which faces many challenges

Opportunities

- Leverage partnerships with car manufacturers to further connected car initiative
- Macro trends all indicate future growth into developing urban regions
- Grow social component that allow users to express interests
- Establish relationship with local businesses for ads and sponsorship

Threats

- Other infrastructure companies/mobile carriers may also enter market
- Regulatory and safety concern may pose challenges

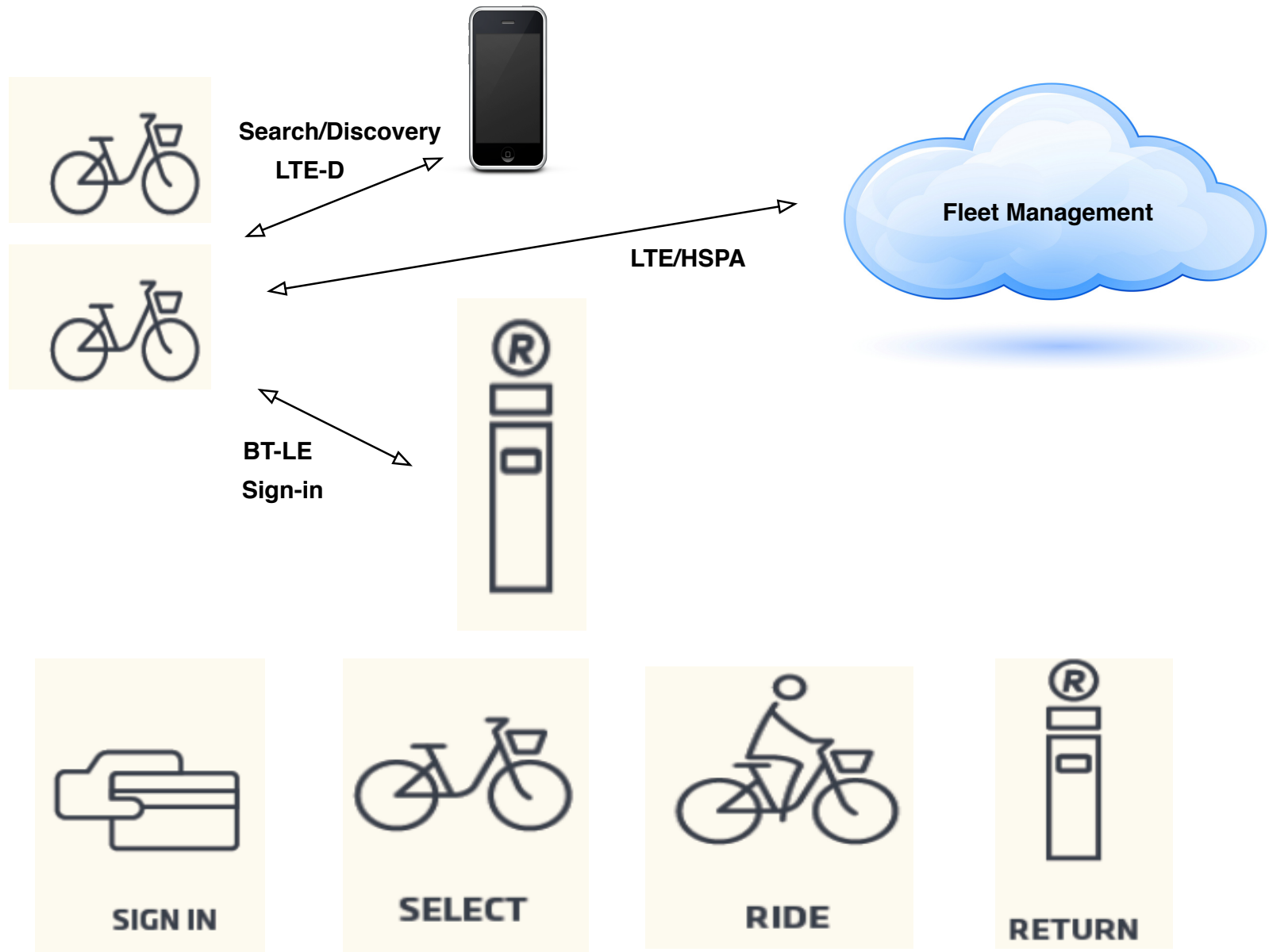
4. Fit with LTE-D



Comparison of various technology options

	GPS + HSPA/ LTE	BT-LE	LTE D2D	Smart Phone with LTE-D
Coverage	Spotty inside parking lots.	Limited coverage. Max 10-20 m.	500m. Ideal for ad-hoc parking situations	Wide coverage
Search/ Discovery	Yes. Needs frequent LOC updates to cloud	Not ideal	Yes. Can search better if parked inside buildings	Not possible if bike is idle. What if you need to ride at 12 AM?
Battery Drain	Worst	Minimal	Minimal	Minimal
Public/Private Expressions	Not Possible	Not Possible	Yes. Use across application platforms	Not possible
Scalability	Yes, scalable	No	Yes, scalable	Yes, scalable

How it works



5. Business model and revenue



Smart utilities /
metering

Smart home &
building

Public
transport

Connected car

City Global
Approach

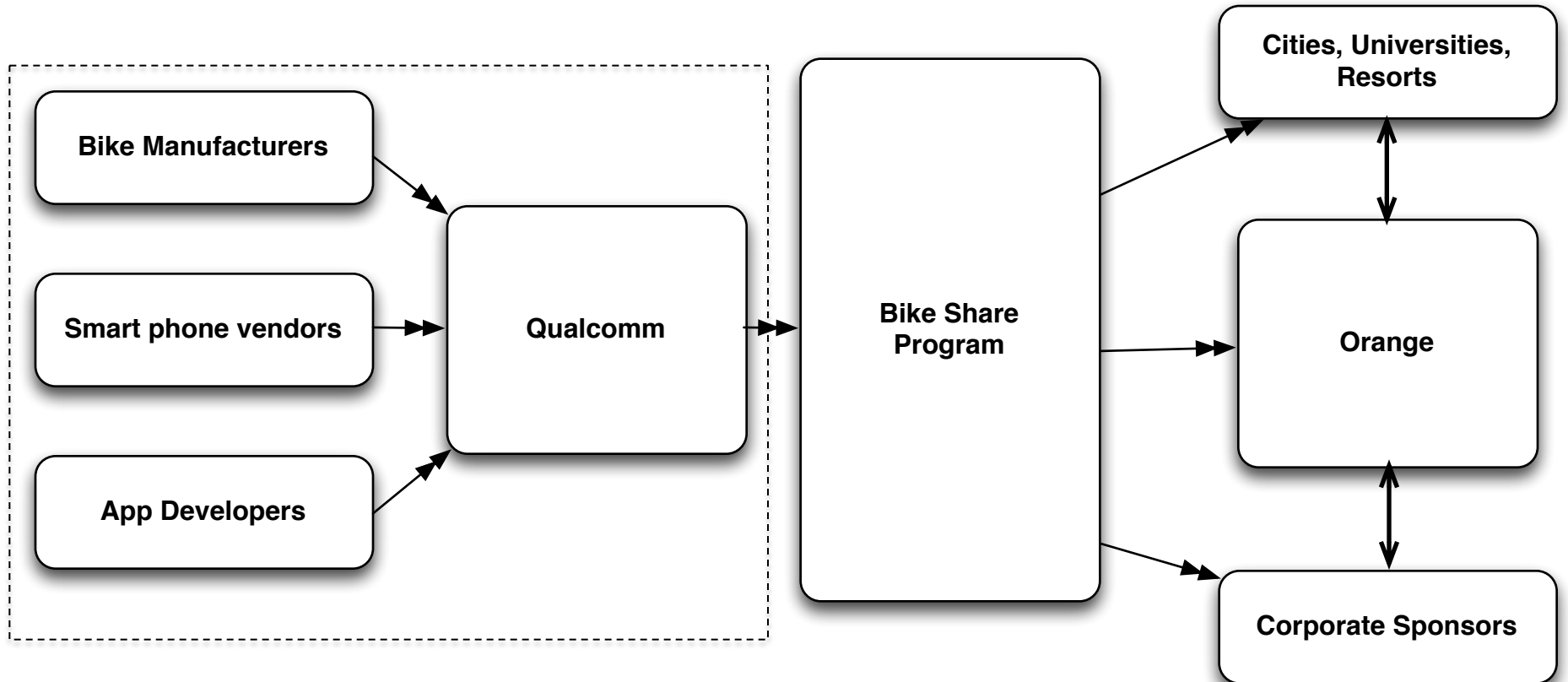
Bike sharing initiative aligns well with
Orange's Smart Cities Initiative

- Bike sharing programs can be subsidized by cities and purchased via public transportation tickets (ie. Clipper Card)
- Connected cars will be easily discovered via LTE-D, and can build upon learnings from bike sharing implementation
- Bike sharing plans are nearly always city-wide and demonstrate a community-based solution

<i>Key Partners</i> Mobile Carrier – tie into smart cities initiative by providing mobile infrastructure, offer service to car and bike sharing services, build relationship with cities and businesses Car/bike sharing services – partner to promote their business and increase it's value proposition, allowing them to focus on the transportation and consumer aspects.	<i>Key Activities</i> 1. Form partnerships with mobile carrier, car/bike sharing providers 2. Create app with developers (focused on LTE-D technology) 3. Test app with consumers 4. Create Go To Market campaign 5. Launch service	<i>Value Propositions</i> Sponsor 1. Increase exposure to relevant groups 2. Associate brand with social and sustainable impact initiative 3. Build community awareness 4. Offer products/ discounts to car/bike riders. Bikers 1. Easier to access bike location and rent in real time 2. Easier way to unlock 3. Communicate with friends about when/ where you are renting 4. Don't get stuck at a full docking station	<i>Customer Relationships</i> Sponsor – easy access to new potential customers focused on social aspects of brand Consumers – Trust, reliability and easy use.	<i>Customer Segments</i> Sponsor Large chain or local business that wants to increase exposure to commuters, residents and tourists Bikers Busy, on the run commuters, residents and tourists, located in urban settings where bike sharing programs are available. Drivers Busy, on the run commuters, residents and tourists, located in an urban setting with a car-sharing program (ie. ZipCar, City Car Share)
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<i>Cost Structure</i> Creation of app Updates to infrastructure Implementation of LTE-D Marketing and advertising efforts	<i>Revenue Streams</i> Corporate Sponsorship payment Subscription/hourly fees from users Advertising at bike/car stations and on bikes/cars
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Different players in value chain



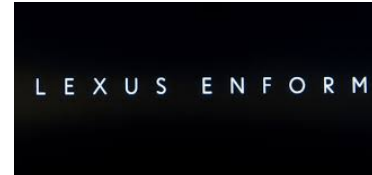
Membership fees in different bike share programs

	LARGE SCALE SYSTEMS			MEDIUM-SCALE SYSTEMS	
	DC/Arlington	Minneapolis	Miami Beach	Boston	Denver
<i>Annual Membership</i>	\$75.00	\$60.00	N/A	\$85.00	\$65.00
<i>30 Day Membership</i>	\$25.00	\$30.00	\$15 - \$35	N/A	\$30.00
<i>Weekly Membership</i>	N/A	N/A	N/A	N/A	\$20.00
<i>3 Day Membership</i>	\$15.00	N/A	N/A	\$12.00	N/A
<i>Daily Casual</i>	\$7.00	\$5.00	\$24.00	\$5.00	\$6.00
<i>First Half-Hour (member)</i>	\$0.00	\$0.00	N/A	\$0.00	\$0.00
<i>Second Half-Hour (member)</i>	\$1.50	\$1.50	N/A	\$1.50	\$1.00
<i>Third Half-Hour (member)</i>	\$4.50	\$4.50	N/A	\$4.50	\$4.00

Daily Casual usage with close proximity to tourist and recreation attractions are very popular in existing ride share programs

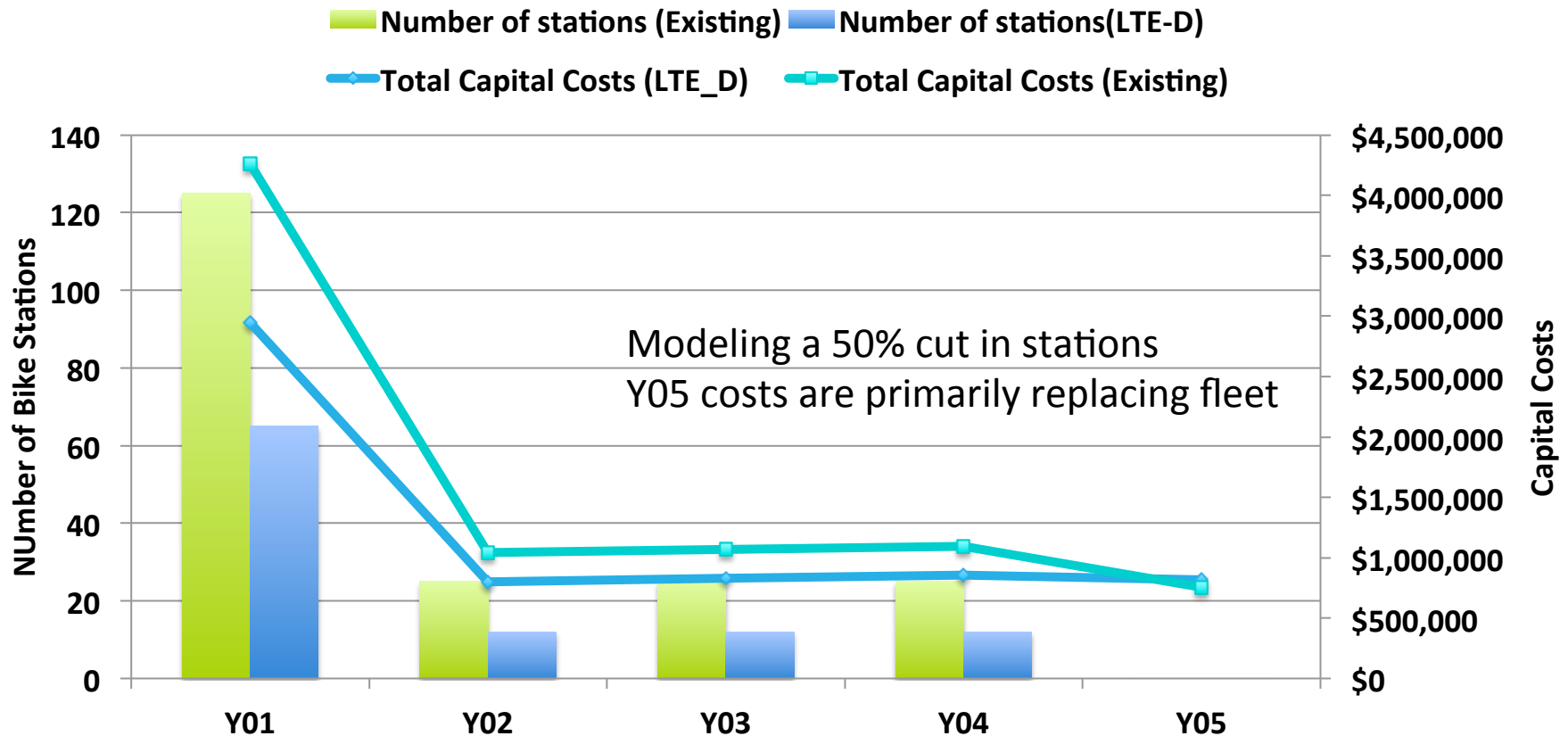
Annual membership fees are subsidized with corporate transit subsidies

Orange business model



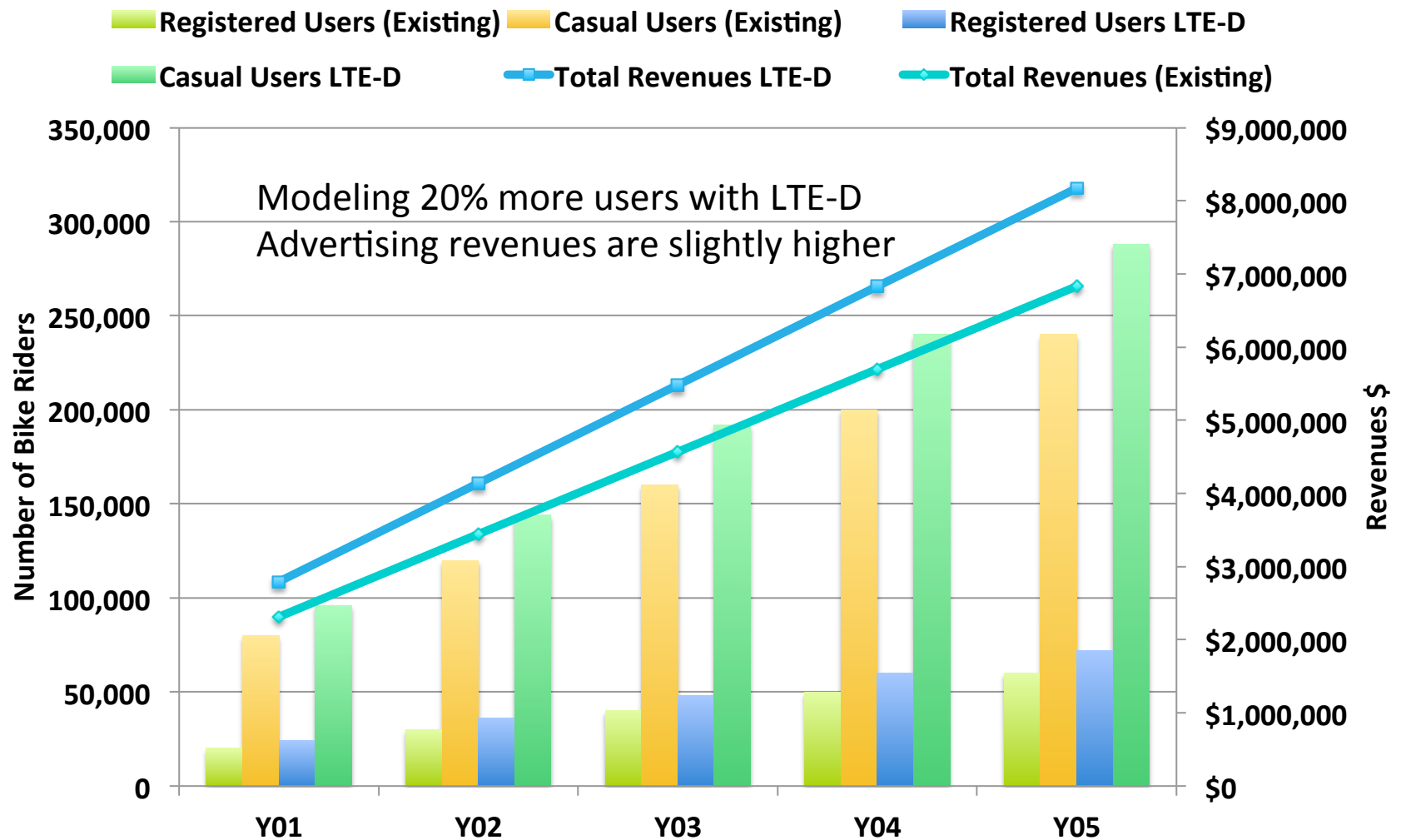
An example deployment costs with LTE-D

Cost Model with LTE-D



- Costs = Stations (\$20k) + Bikes (\$200, \$300) + Maintenance + Replacement (5% per year, full replacement at 5 years)
- Roll out 2000 bikes in 4 years for a POP 1.5M city to get 20% usage in 4 yrs
- Lower costs structure with LTE-D as moving away from Bike Stations

Revenue Model with LTE-D



Next Steps

- System implementation throughout the city
- Expand to carsharing services
- Leverage Renault-Orange Partnership to Japan for Choimobo EV Carsharing Service



The Future for Mobility, Communication and LTE-D

- Orange and Qualcomm will lead the market in developing LTE-D into numerous transportation systems and consumer applications
- As the network grows, scalability and social aspects will become more valuable
- Leading to social discovery, sustainability and economic impact

