

# Folding Bicycles and Transit

**Bike Sharing Workshop**  
**Coordinating Transit, Bike Share, and Infrastructure**  
**Washington DC**



**Fred Silver**  
**Vice President**  
*3/22/12*



# Mission Statement

CALSTART is a unique national, non-profit, member organization dedicated to the growth of an **clean transportation technologies industry** that will:

- **Create high-quality jobs;**
- **Clean the air;**
- **Reduce dependence on foreign oil; and**
- **Reduce global warming emissions**



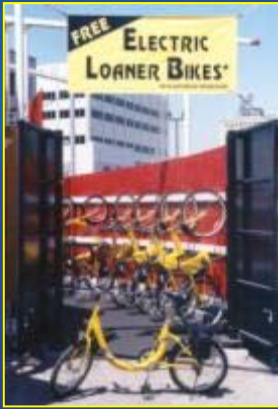
# Today's Discussion

- CALSTART's First Mile Program
- LA Metro's Folding Bicycle Implementation Plan
  - Purpose
  - Benefits
  - Methodology
  - Key Findings
- Next Steps for Folding Bicycles
  - Pasadena FoldnGo 2012 - 2013



# Nation's First Innovative Demo Projects by CALSTART

## Long Beach Electric Bike Sharing Program



## Clean Mobility Center at Bikestation Long Beach



## Clean Mobility Center at Bikestation Seattle

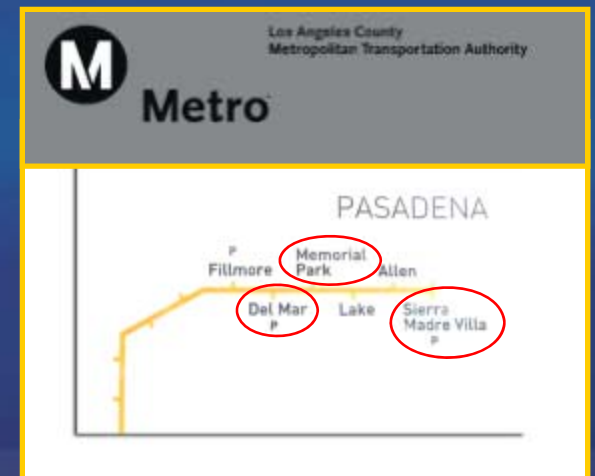




# MyGo-Pasadena 2006 Electric Bike Subsidy Program



- MyGo-Pasadena provided **significant rebates and cash rewards** to transit commuters to purchase/use a two-wheel electric bicycle/scooter to connect to their neighborhood transit stations.
- Sought current & future Gold Line riders to drive a 2-wheel EV (vs. a single occupancy vehicle) to one of three stations. Sierra Madre Villa, Memorial Park or Del Mar will be the “origin” stations, while Union Station in downtown LA will be the most common “destination” station for participant commuters.





# The MyGo-Getters!





# LACMTA / CALSTART Folding Bike Implementation Plan

- Published in April 2011
- Funded in part by Caltrans grant
- Goal: to motivate commuters to switch their transit connection vehicle from the car to a folding bicycle via a menu of incentive choices.





# Why are Folding Bikes needed?

- Many people won't walk more than  $\frac{1}{4}$  mile to a transit stop
- Most convenient and flexible option is to own a car and drive to transit
- Owning a car can make transit less attractive and encourage Single Occupancy Vehicle driver to bypass transit



**Folding bikes can provide flexible door-to-door mobility without dependence on the private automobile**





# Benefits of Transit-Linked Folding Bikes

- Reduces demand for parking spaces at park-and-ride lots
  - 48 Folding Bikes = 1 Parking Space
- Allows for higher density TOD
- Can reduce user transportation costs and encourage cleaner & more sustainable transportation
- Provides flexibility for both first mile and last mile connections
- Eliminate Storage systems often provided and managed by TA's
- Facilitates VMT – a major objective by forward thinking communities





# Target Groups

1. Existing transit riders who use full-size, conventional bicycles to connect to transit
  - who may be “bumped” off transit during peak hours and forced to return to SOV
2. Existing SOV drivers who drive a full car commute door to door
3. Existing transit Park-and-Riders who may give up their parking space in favor of a folding bike.



# Implementation Strategies

- Direct Incentive Program
- Employee Program
- Subscription program
- Retail discount program
- Manufacturer discount program
- Needs assistance program
- Bicycle education and outreach program



# Folding Bicycle Attributes Selection Criteria

Attributes	Explanation
<b>Folding Ease</b>	<p><b>Folding the Bicycle should be easy and stress free and take no more than 10 to 20 seconds after one is familiar with it.</b></p> <p><i>Here are some comments made from the testers</i></p> <ul style="list-style-type: none"> <li>-Simple with few adjustments.</li> <li>-Too many adjustments; handlebars, stem, seat post, and etc. add complexity and difficulty when using bike.</li> <li>-Should have a magnet or latch to keep from unfolding. Strap is necessary if secure latch not available.</li> <li>-Folding hinges must be secure and fail proof. Too many hinges, adjustments and steps make folding difficult.</li> <li>-Need to Stand unsupported</li> </ul>
<b>Portability</b>	<p><b>The bicycle must be easily transportable both women and men especially considering the egress and ingress of various transit stations and situations with Metro. The <b>Targeted</b> size of the folded bicycle should be less than 30.0 H by 26.8 L by 12.5 W</b></p> <p><i>Comments to consider</i></p> <ul style="list-style-type: none"> <li>-Must be easily transportable and I didn't have a chance to fold the bike since the train arrived suddenly</li> <li>-Does it roll on wheels when folded? Should at least be easily rolled on one wheel with out interference from other wheel.</li> <li>-Must be easy to carry with light weight or</li> <li>-Must be easy to maneuver or have strolling wheels</li> <li>-Needs to be less intrusive than a conventional bicycle</li> <li>-Needs to be considered no more intrusive than midsized luggage</li> <li>-Vast majority of users should be able to carry bike up several flights of stairs</li> </ul>
<b>Ride, Handling, Durability and Reliability</b>	<p><b>The bicycle should have stable ride performance and a confident feel with the ability to achieve similar speeds and ease as conventional bikes. It should be able to fit a variety of sized people. It should be easy to maintain and be reliable.</b></p> <p><i>Comments to consider</i></p> <ul style="list-style-type: none"> <li>-Ability to fit a variety of sized people</li> <li>-need wide range of gears for various terrains and speeds</li> <li>-Minimum of 3 gears but 5 is more desirable</li> <li>-Components and accessories must be secure and not loosen easily. Hinges and clamps must be secure and fail proof.</li> </ul>
<b>Price, Availability, Service</b>	<p><b>We should offer a two to three price points such as a good, better and best philosophy. The product should sales and service for the bicycle should be very convenient and available to users throughout Los Angeles County using local dealers.</b></p> <p><i>Comments received or heard</i></p> <ul style="list-style-type: none"> <li>-Should have affordable and have reasonable price point. \$900 is too much.</li> <li>-Needs to be affordable for choice and non choice ridership</li> <li>- Products need to be readily available and serviceable to everyone</li> <li>-Additional Accessories to consider are racks, fenders, kickstand, bell, reflectors, lights, carrying bag or case</li> </ul>



# Folding Bicycle Attributes Bus Placement





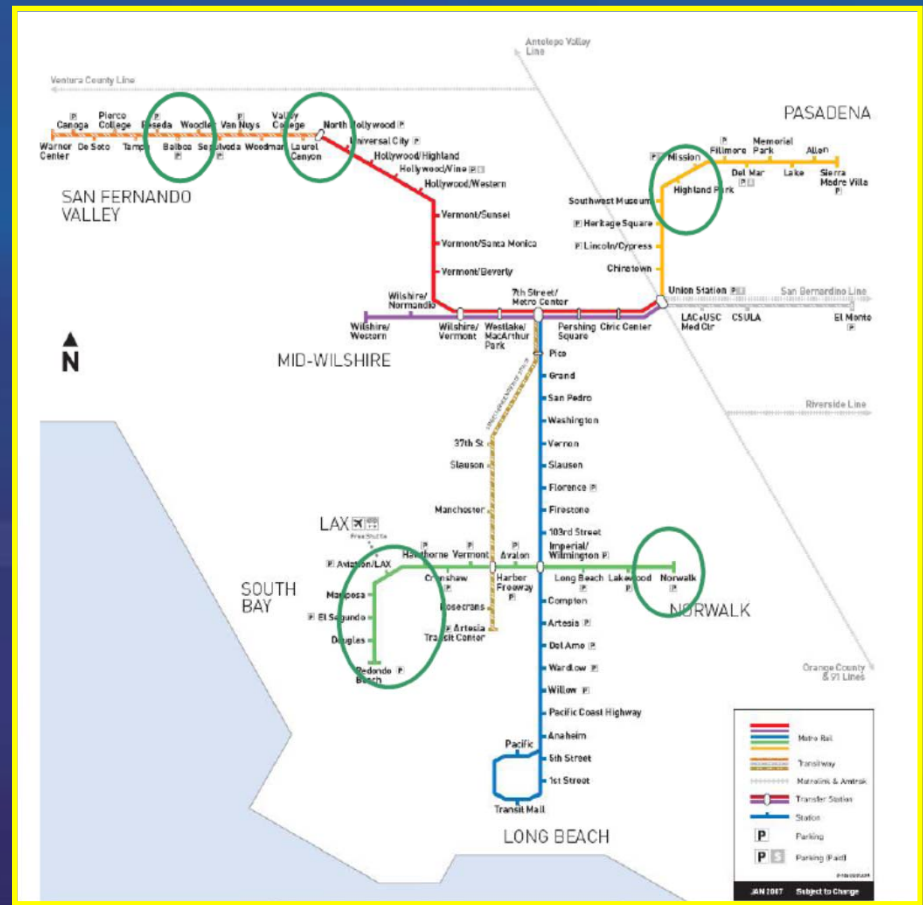
# Transit Rider Location Analysis and Surveys at Five Stations

## Methodology

### Day / Location

Tuesday, July 20:	Highland Park Gold Line
Wednesday, July 21:	North Hollywood Red Line
Thursday, July 22:	Balboa Orange Line
Tuesday, July 27:	Aviation Green Line
Wednesday, July 28:	Norwalk Green Line

Data collection was conducted at each station over a 5-hour period each day from 2:00 PM to 7:00 PM, with special emphasis on the PM peak from 4:00PM to 6:00PM.



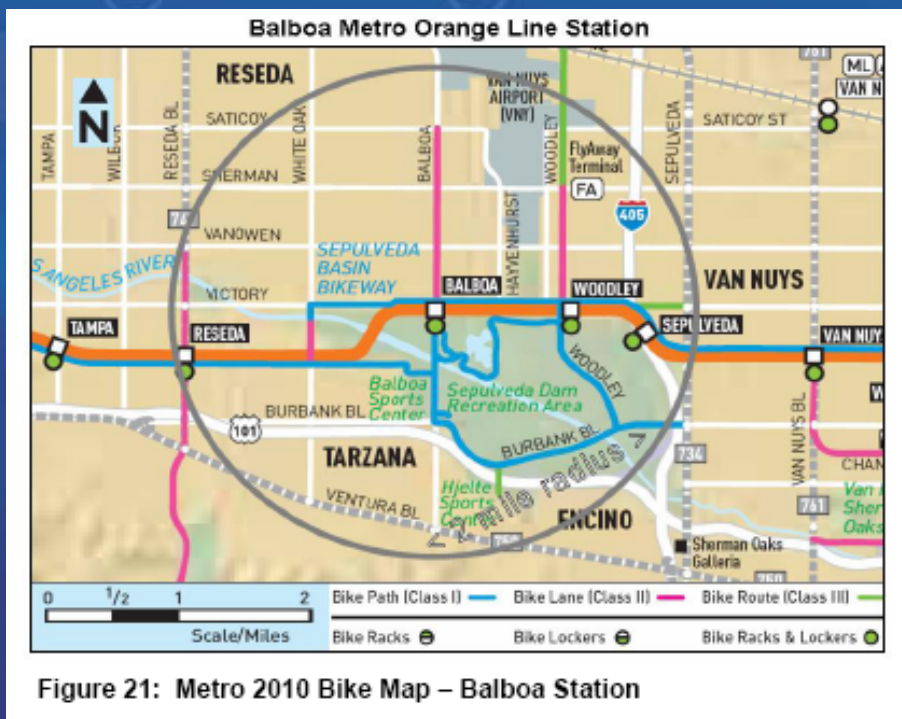


# Location Analysis Assumptions

Indicators	Assumptions
Land Use Density	<ul style="list-style-type: none"> <li>• Neighborhoods that have higher land use density are better target markets for folding bikes (due to the reduced need for a car and the increased number of nearby destinations) than are sprawled areas.</li> <li>• A folding bike is well suited for apartments since multiple residential dwellings have limited storage options than single family dwellings.</li> </ul>
Transit	<ul style="list-style-type: none"> <li>• Neighborhoods that have higher levels of alternative transportation and public transit users are better targets for encouraging folding bikes than are neighborhoods with higher levels of drive alone residents.</li> </ul>
Bike Access	<ul style="list-style-type: none"> <li>• Neighborhoods that have extensive bikeways around transit stations are better target markets than those where bike facilities are limited.</li> <li>• A majority of folding bicycle users could conceivably ride for distances up to 5 miles.</li> </ul>
Parking Availability	<ul style="list-style-type: none"> <li>• Neighborhoods where there is limited or costly parking (for both cars and bicycles) at or around transit stations are better target markets than those where parking is plentiful and free.</li> </ul>
Vehicles Per Household	<ul style="list-style-type: none"> <li>• Low vehicle ownership indicates the need for increased transportation options.</li> </ul>
Age	<ul style="list-style-type: none"> <li>• Neighborhoods that have a higher density of working adults (vs. children) are better targets for folding bike commuting than are neighborhoods with a lower percentage of adults.</li> <li>• Adults over 50 years of age may be less interested in using folding bicycles as commuting tools than adults in their 20's through 40's, which is the predominant age group for bicycling.</li> </ul>
Income	<ul style="list-style-type: none"> <li>• There is generally an inverse relationship between income and transit ridership in Los Angeles.</li> <li>• Neighborhoods with the lowest average incomes have the greatest need for car alternatives.</li> </ul>



# Location Analyses Indicators



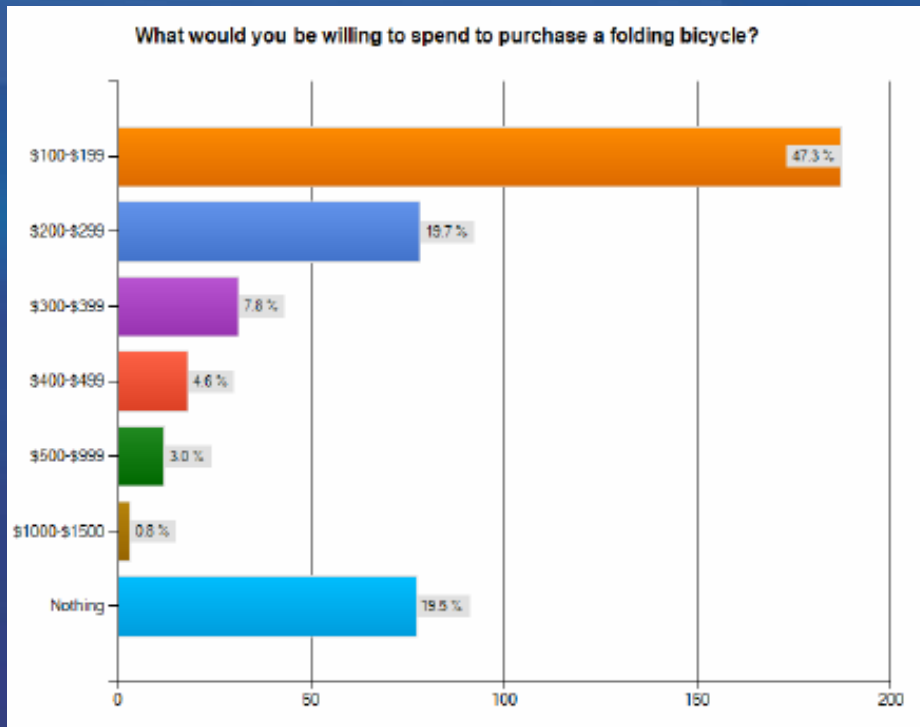
Summary Table Balboa Orange Line Station	
Income	↑
Vehicles per Household	↑
Age	↑
Land Use Density	↓
Parking Availability	↑
Bike Access	↔

Direction of arrows indicated high or low values for each indicator; Color of arrows indicates positive (green), negative (red) or uncertain (yellow) effect on potential folding bike usage for that station.





# Selected Survey Results



Station	# of Respondents	Age	Gender	Travel Mode	Income
Highland Park	44	40-50 (28%) 51-65 (29%)	Male (53%)	Walk	Under \$15,000
North Hollywood	82	29-39 (32%)	Male (56%)	Drive Alone	Under \$15,000
Balboa	37	18-28 (22%) 29-39 (22%)	Male (58%)	Drive Alone	\$15,001 - \$34,999
Aviation	56	51-65 (34%)	Male (54%)	Drive Alone / Metro Bus	Under \$15,000
Norwalk	148	40-50 (28%) 51-65 (29%)	Male (68%)	Drive Alone	Under \$15,000



# Overall Findings of Plan

- Offering a cash buy down on the purchase price of a folding bicycle is likely to be the most effective incentive for end users
- Amount a transit rider would pay for a folding bike is largely independent of the amount of money he or she makes per year
- Portability is the most important attribute of a folding bike when used in conjunction with transit
- Equally important that bikes are available for purchase from local vendors to ensure a high level of service and support.
- Residential density, the level and quality of nearby public transit, and the level of bicycle friendliness are effective indicators for determining levels of bicycle usage in a given community
- Many transit riders are generally aware of folding bicycles but do not fully recognize their value given that few would pay more than \$200 to purchase one ( thus necessitating a small subsidy)
- To effectively stimulate the folding bike market, early cash incentives should bring down the purchase price to users' expectations



# Next Steps for Folding Bicycles

## *Pasadena FoldnGo* 2012 - 2014

**Goal:** to subsidize and motivate commuters to use folding bicycles rather than automobiles as their connections to transit.

**Metrics:** 700 participants over 3 years receive subsidy of approximately \$120 towards the purchase of a folding bicycle.

**Participants:** bus and rail transit riders who live or work in the City of Pasadena.

***Clean Transportation  
Technologies and Solutions<sup>SM</sup>***



**[www.calstart.org](http://www.calstart.org)**