Bicycle and Pedestrian Planning? There's an App for That!

Webinar Questions and Answers

November 10, 2011

Dero ZAP! (Andrew Rankin)

- How much time and resources went into developing the ZAP proposal?

  The ZAP proposal took approximately .25 FTE for 4 months. Additional staff time has been spent vetting the proposal to potential funders. What we are hoping is that once we establish a model for how to use RFID to track , reward and educate cyclists that it can be exported to other regions with minimal development time.

- Is there an iPhone/Android app for accessing the reporting system?

  Currently there is not an app for accessing the reporting system. The ZAP website (www.derozap.com) has several options for exporting data. In the future there is a potential to develop an app that interacts with the website and your tracking data.

- Many cyclists are no longer using reflectors due to the rotating weight on the wheel. How heavy are these devices and is this concern being addressed? Is there any other place on the bike where this device can be installed?

  The device itself weighs about 25 grams. There is an option to mount the device to a helmet instead of a bicycle wheel. When we look at the project goals it is really to get new people biking. Anyone with concerns about the weight of a reflector is probably already biking regularly.

- Unless you get close to 100% participation with ZAP what conclusions can you draw from the data?

  By conducting pre-registration surveys we can make certain claims about the population of participants. This is no different that if a census survey only surveyed 10% of the population. They are able to make conclusions about the population as a whole by running standard statistics tests to determine if the data can be applied to the population as a whole.

- What's the unit cost on the RFID tags? Follow up: any consideration of reading Bluetooth MAC addresses from cell phones as well?

  The tags themselves cost $4.00. We have not evaluated Bluetooth MAC addresses as we see that we may not capture all rides by subscribed participants if it requires them to open an app on their cell phone to utilize the system. Great suggestion!

- How much does the dero ZAP program cost and are there any similar technologies? Did you research alternatives?

  The installation of a ZAP system is comparable to developing an app. When looking at apps we determined that too many people lose interest and stop tracking. This of course compromise the data as we don't get the full picture. With the ZAP system tracking is automatic and consistent.

- What is the range of the ZAP RFID detection system (how far can a bike be from the pole mounted system and still be detected)?

  Depending on the size of the attached antenna you can be up to 50 feet away from the reader.

- I'm curious who develops the branded website for employers? Will your organization have to manage or maintain the sites once they are in place?

  Dero will manage the custom website and maintain the system as a whole for us. We are able to give admin access for the website to a local company administrator if they would like to change the look and feel or if they would like to download global data.

- Are these sensors active (battery powered) RFID based?

  The RFID tag itself is a passive RFID tag. The ZAP units themselves are active getting power via a solar array.

- What is the cost of RFID tags, readers?

  The reader itself costs $6,500. The tags cost $4. When installing a system the other cost associated with the operation of the unit is a cellular data charge as each poll reports back to a central database on who has ZAP'ed in.

- As bicycle traffic increases at Zap! building receptors placement, land value increases, right? Also, how many miles do you have to register to receive health insurance benefits discounts? Finally,How many bicycles are registered on Zap! and what percentage year over year growth have you seen in registered bicycles? Average miles traveled/year?

  Because we are working in an urban core many things contribute to land value. We already have a very well established bike lane/trail system in the city. As these new lanes/trails are built we have seen property values around them rise. We want to run a test pilot with an insurance company for a reduction in health care costs. Currently most insurance agencies will give you a $20 reduction on you insurance if you visit a health club x times a month. We still need to do research on what insurance companies would like to see in regards to how many times a person bikes to get a rebate. We are currently in planning for the project with a projected launch date of June 2012. In our first year our goal is to get 250 people into the program and double that the second year. Year three-four-five goals are an additional 100 registrations per year. In regards to miles we will have to wait and see when the project is up and running.

Pedestrian Planning Indicators (Gizachew Andargeh)

- Are you using the standard (old) Walkscore, or the newly enhanced Walkscore "Streetsmart"?

   When we started our 14th St Plan the Streetsmart version wasn't available, so the baseline numbers we have are from the original Walkscore.

- Do you know of a tool to evaluate scores for neighborhoods or schools related to walking to school (similar to walkscore) is available or being developed?

   Safe Routes to School may have an online tool for this idea or would be willing to consider it in their research and practical application.

CycleTracks App (Elizabeth Sall)

- Is there a plan to offer CycleTracks for Blackberry?

   There are no plans to do this, but blackberry's market share is in decline. We would welcome somebody else to use the CycleTracks code that we released as a starting point to develop a blackberry version if they thought it would be useful.

- How much was the development cost of the app? What about opperating costs of tracking the data? What are the development and operating costs associated with CycleTracks?

   The original app cost around $10,000 to develop, but it could have been done for less. The operating cost is the cost of having an Amazon EC2 server up to take the data. This ranges from $100-250 for us per month, but could be done for less.

- Can this app be used outside of San Francisco?

   This app works anywhere you can get a GPS signal on the smartphone. So yes!

- What is the spatial resolution of CycleTracks? Can it tell you what lane and what part of the lane a cyclist used?

   The spatial resolution is dependent on the precision of the GPS signal that the smartphone gets and this can be highly variable. From what we have seen so far, I don't think it would be appropriate to try and ascertain what part of a lane that a cyclist was in. However, GPS technology in phones is always improving so that may be feasible in the future.

- What is the motivation for people to use the app?

   There were a few reasons why we think people used the app: (1) they knew it was something that they could do to help bike planning in their community, and having planners understand what they valued could have a foreseeable benefit for them (i.e. anticipation that we would build more bike infrastructure on their commute route); (2) it is a free, bare-bones way to collect information about your biking habits and speeds with no need to sign up for anything; and (3) they were entered to win one of several $50 iTunes giftcards.

- What about those commuters who took their bikes with them on the bus or BART?

  Trips with any GPS segment that didn't "look like a bike trip" were eliminated from the estimation dataset. If the CycleTracks app was turned off before getting on a non-bike mode, then that trip was likely retained.   The purpose of our modeling exercise, however, was to evaluate the route choice trade offs for just the biking portion of a trip.

- It sounds like the data involving BART, ferry boats, and other multi-modal trips was removed from the sample... Was there any thought to using this data to prioritize multi-modal improvements?

  We already have data collected about transit routes via the on-board survey. The purpose of the bike route choice model using CycleTracks was to fill that gap for the cycling mode. One possible way of expanding this is to do a similar analysis for pedestrians.

- Could you clarify how the dollar benefit was arrived at for Cycle Tracks ?

  We used the marginal rate of substitution for the coefficient for the distance spent on a bike lane compared to distance. This is equivalent to the distance that people are willing to bike out of their way to use a bike lane. We translated that distance into a time using an average cycling speed, then translated the time to a monetary value using an average "value of time".

- Does Cycletrak meet statistical validity tests? Elective participation usually is not acceptable to statisticians.

  "Statistical validity" is a question you could apply to a lot of sub-parts of the bike route choice model project. For the bike route choice model estimation itself, the parameters were all statistically significant and had reasonable values for everything including the path size variable, which is important for being able to say that our 'choice set' was good.

  Getting to the part that I think you are referring to, the CycleTracks dataset is a far cry from any organized, statistically-based sampling strategy and we don't claim that it is. In order to even know if it came close to being a good sample would mean that we would have to know something 'real' about the cycling public, and I don't really believe that such data exists. The comparison in the N for CycleTracks and our Bay Area Travel Survey points out the problem with being able to get a good handle on the cycling public. We've done two main things that allow us to sleep at night with respect to our sample bias: (1) we tried to minimize and control for the the biases that we have introduced by introducing them as variables (i.e. the cycling frequency, gender, etc); and (2) we don't believe a lot of the biases have a specific effect on the route choice portion of people's decision-making. For example, we don't think that people with smartphones dislike biking up hills any more or less than people without smartphones. It is also very important to remind everybody that while this assumption may be a reasonable one to make in the context of a bike route choice model, it probably doesn't translate to too many other situations.