

# Wendy - The willing-but-wary cyclist.

*"I'd love to ride a bike more, but I'm afraid to ride in traffic."*



## Four Types of Transportation Cyclists

By Proportion of Population



## Get to know Wendy

Meet Wendy. Wendy is afraid to ride in traffic so she seldom gets her bike out of the garage today. Wendy occasionally drives to the Burke-Gilman Trail to ride her bike with her kids and wishes she had safe places to ride closer to home. Wendy longs for the day when her children can ride their bikes to school safely, to soccer practice, to friends' houses and to the library. Until then, Wendy drives her children everywhere. Since Wendy didn't grow up cycling in traffic, she never developed the skills for mixing it up with cars and trucks and probably never will voluntarily "take the lane." Wendy will only ride where she feels safe.

According to Geller's model, Interested but Concerned (Willing but Wary) people are "curious about bicycling," like to ride, but are afraid to do so and therefore very few regularly ride and they "will not venture out onto the arterials." In the Seattle Bicycle Master Plan Update, SDOT has an opportunity to specifically target the Wendy group as the massive untapped market necessary to delight, in order to achieve ambitious mode shift targets. In order to do so, the department needs to prioritize "low-stress" facility types such as physically protected cycle tracks, neighborhood greenways, multi-use trails, bike/ped bridges, pedestrian crossing "HAWK Lights", RRFBs, traffic maintainers, pass-through refuge islands and other low-stress facility types proven to make Wendy feel safer.

According to research conducted by Jennifer Dill, Wendy is very concerned about being hit by a motor vehicle while bicycling. *"For example, 84 percent of the Interested but Concerned group (Wendy) is concerned about being hit, compared with 52% of the Enthused and Confident and 39% of the Strong and Fearless."*

People like Wendy are the future of cycling in the US. She will be the future of cycling in Seattle, too. Wendy represents the "Willing but Wary" population (60% of the general U.S. population). Since Wendy does not belong to bike clubs, she seldom shows up in cyclist counts, surveys, or focus groups.

### You might be a Wendy if:

1. You have said, "I'd love to ride a bike but the idea of riding in traffic scares me so I don't."
2. You won't let your children ride their bikes to school because you feel it isn't safe.
3. You have watched the [Portland Neighborhood Greenway video](#) and said, "I'd ride on greenways like those. They look safe enough even for me."
4. You have ridden a bike only a few times in the past 12 months, if at all. Each time, you've driven your bike to a safe place to ride such as the Burke Gilman Trail or ridden it only within a few blocks of home.
5. You do not like to ride up or down steep hills. You don't have the strength to pull a trailer with two kids up a steep hills.
6. You self-identify your transportation choices as "risk averse" as opposed to "excitement seeking."
7. You don't own cycling specific clothing or shoes.
8. If you own a bike, it probably has the original tires, pedals and seat. You have not added fenders or a rack, but your comfort bike may have come with them.
9. You chose your bike for its comfort and looks, not its components.
10. You don't know how many PSI of air is in your bike tires at this moment.
11. You have never oiled your own chain, changed a flat tire, and you don't feel comfortable adjusting your own shifters and brakes.
12. You prefer being able to reach the ground with your feet as opposed to getting "full leg extension" as your enthusiastic bike friends might say.
13. Your biking words are healthy, clean, fun, empowering, social, practical, stylish, efficient, green, frugal, kids.
14. Your biking words do NOT include chamois buttr, leg extension, cadence, trigger shifter, SPD, clipless, drops, Campy, Ti, wheel suck, gear inches, randonneur, or index.

## Places Wendy would love to go with her bike.

For Wendy, the bicycle is a short distance tool she would like to choose for local errands instead of her car. Wendy wants to use her bike for:

1. Visiting friends who live in the neighborhood.
2. Returning those books to the library at last.
3. Getting to know her neighborhood businesses.
4. Picnicking on the weekends with her family at different neighborhood parks.
5. Getting some exercise in a way that is fun and is free.
6. Short distance commuting.
7. Riding with friends and their kids.

Wendy would love to teach her kids to ride bicycles like her dad did with her when she was little. She remembers learning to balance and pedaling down the street for the first time with her dad running behind, holding on to the back of her bike and then just letting go. She felt so free!

Wendy has been finding it difficult getting her children interested in any kind of regular exercise. Wendy thinks biking to the park to play might be the first step to instill healthy lifestyle habits. She wants to teach her kids family values such as self sufficiency and autonomy.

### Demographics

- Gender: Female
- Trip Length: Short
- Pace: Social
- Age: The largest segment of Wendies are between 35 and 54 years of age (Dill).
- Level of Traffic Stress Tolerance: Low = LTS-1, minimal LTS-2
- Purchase Priorities: Comfortable, affordable, attractive.
- Wendy represents the easiest and cheapest source of new cyclists for Seattle. Adding low-stress, all ages and abilities bicycle facilities to Seattle neighborhoods for Wendy will hopefully result in a bike/car mode share shift and enable the BMP update to quickly meet its goal of increasing the number of people cycling. Designing for Wendy will satisfy the needs of both genders, resulting in improved gender equity metrics. Cities with safe, healthy streets have a 50/50 gender split in bicycle usage.
- *“Women are responsible for the majority of household trips each day, including 77% of passenger-carrying trips. When children can ride independently to school and elders can get around without a car, caretakers (who are statistically twice as likely to be women) are freed up to participate in income earning work. For true household economic security, grocery stores, schools, and workplaces must be clustered in neighborhoods and must be safely and comfortably accessible by bicycle and on foot by someone who is carrying a child and/or heavy groceries.”* - Elly Blue paraphrasing from [Grist](#)

### Market Influence

- Today, Wendy shops where it makes financial sense, often driving to big box stores which have plenty of free parking. However, when on her bike, Wendy shops close to home. When shopping locally by bike, Wendy visits businesses more often even though she purchases less on each visit. Wendy feels empowered and energized by her decision to shop local by bike and she loves the lifestyle that it affords.
- It would be naive to believe that many Wendy's will naturally turn into Eddies (the Confident and Enthused persona) over time. Most Wendys will never become comfortable using high-stress bicycle facilities. Therefore, it is essential that the low-stress bicycle facility network is complete and perceived as safe by Wendy before she will use it or take her children on it. Wendy can tell you when the facility is done if she is invited to sign off on it before it's considered finished.

## Wendy and Level of Traffic Stress (LTS)

Wendy is a smart, educated parent who listens to her intuition when it comes to making good transportation choices for herself and her family. Safety is her primary concern, but not her only value when it comes to transportation. She knows integrating exercise into the daily routine is an important ingredient of healthy children and adults. While she wants active transportation options for her family, she won't put any of her family members in harm's way. Because of this, she chooses low-stress routes to get places.

According to research published in 2012 by the [Mineta Institute](#), Levels of Traffic Stress (LTS) is a useful criteria to evaluate routes acceptable for all ages and abilities. Wendy only feels comfortable using LTS-1 facility types. Wendy may let her children bike or walk to school only if there is a continuous series of LTS-1 segments between home and school. In the LTS model, Safe Routes to School are comprised only of LTS-1 rated infrastructure components.

“For a bicycling network to attract the widest possible segment of the population, its most fundamental attribute should be low-stress connectivity, that is, providing routes between people's origins and destinations that do not require cyclists to use links that exceed their tolerance for traffic stress, and that do not involve an undue level of detour. The objective of this study is to develop measures of low-stress connectivity that can be used to evaluate and guide bicycle network planning. We propose a set of criteria by which road segments can be classified into four levels of traffic stress (LTS). LTS 1 is suitable for children; LTS 2, based on Dutch bikeway design criteria, represents the traffic stress that most adults will tolerate; LTS 3 and 4 represent greater levels of stress.”

## Levels of Traffic Stress (LTS) from the Mineta Report.

- LTS-1. Presenting little traffic stress and demanding little attention from cyclists, LTS-1 is attractive enough for a relaxing bike ride. LTS-1 is suitable for almost all cyclists, including children trained to safely cross intersections. Cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
- LTS-2. Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. Cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults but may be cognitively and physically difficult for children.
- LTS-3. Presenting more traffic stress than LTS-2, yet markedly less than the stress of integrating with multi-lane traffic, LTS-3 is therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multi-lane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS-2, but are still considered acceptably safe to most adult pedestrians.
- LTS-4. A level of stress beyond LTS-3.

## Wendy feels more comfortable on lower-stress facility types

The image below is from research by Jennifer Dill from PSU presented at VeloCity 2012. (2) The dark purple indicates cyclist types who are very comfortable on different facility types. Wendy is

not very comfortable riding on streets with no bike facilities or with traditional bike lanes. The pattern of data shows that Wendy feels more comfortable on lower stress facility types.

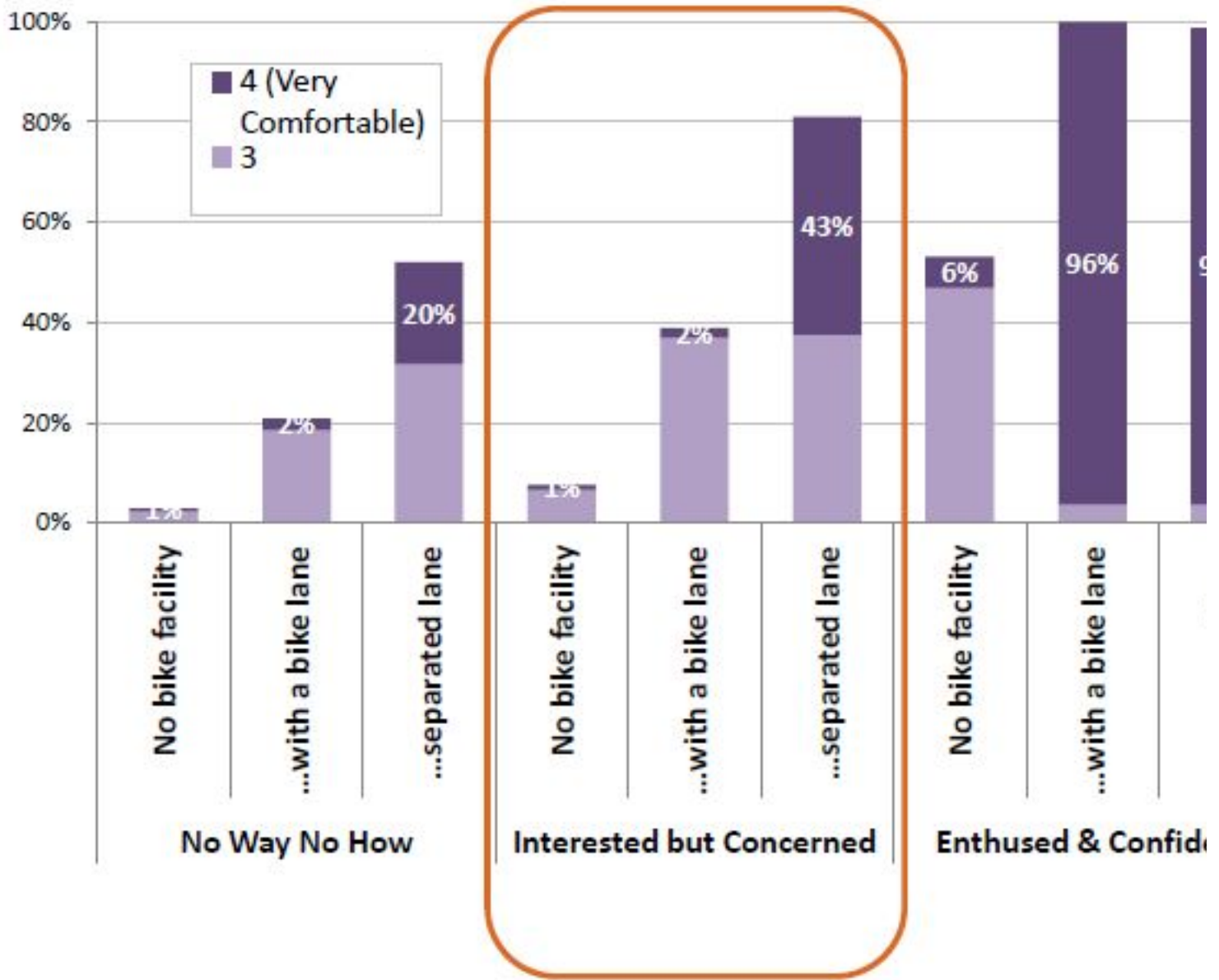


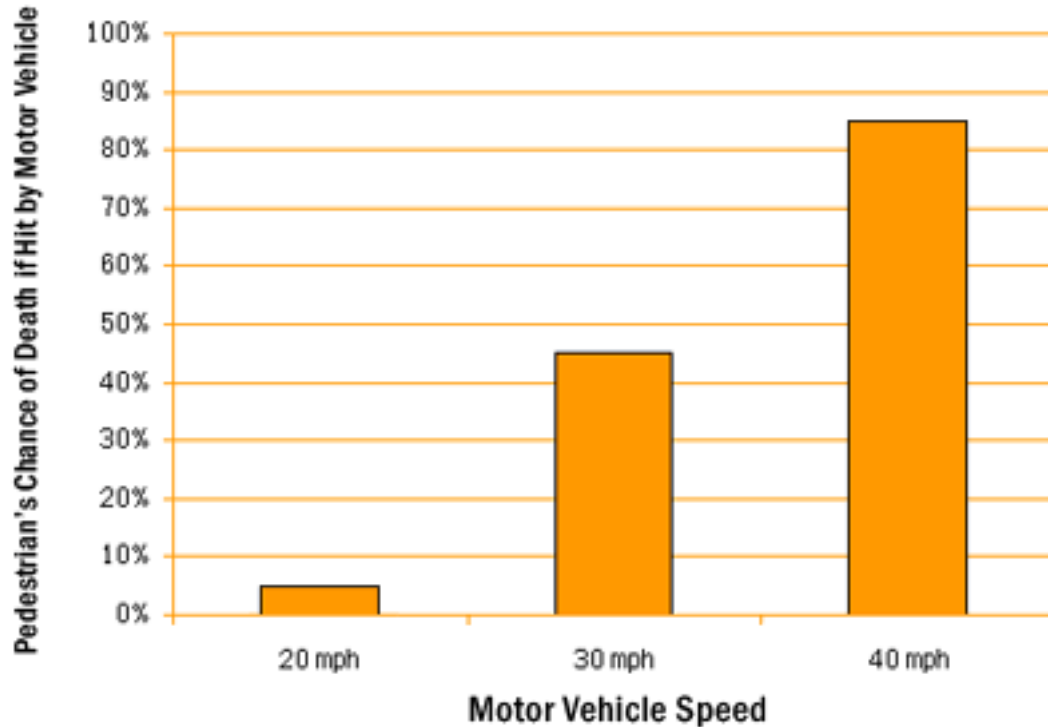
Image: Jennifer Dill VeloCity 2012

Safety is a real concern for Wendy. Research conducted by Jennifer Dill found that 84% of Wendies are concerned about being hit by a motor vehicle. Any bicycle facility that will be used by Wendy will first need to effectively address this concern, or it simply will not be used by her.

Image: from Jennifer Dill's presentation at VeloCity 2012

Speed Kills. Plenty of research from municipalities around the world have found the same pattern in historical crash data. Wendy instinctively knows this to be true and is right to be concerned for herself and her children.

## Pedestrian Fatalities Based on Speed of Vehicle



### What Level of Traffic Stress (LTS) Facilities would Wendy use?

- Wendy feels comfortable using LTS-1 facilities. Because she has trained her children to cross streets safely, Wendy is comfortable teaching her kids to walk and bike to school on continuous LTS-1 routes.
- Since the definition of LTS-2 excludes use by children due to the fact that it requires adult levels of attention and experience, LTS-2 facilities are not considered appropriate for inclusion in Safe Routes to School programs. Since Wendy is uncomfortable riding in traffic, she is also unlikely to feel comfortable on higher stress facility types.
- LTS-3 and LTS-4 are not appropriate for Wendy or her children.

### What are examples of LTS-1 Facilities?

1. Neighborhood Greenways as implemented in Portland, OR and Vancouver, BC (due to effective traffic calming and low-stress arterial crossing treatments that motor vehicle drivers respect).
2. Multi-Use Trails. The Wendy persona is historically drawn to multi-use trails because of the perceived safety of these facility types. Wendy thinks multi-use trails are safer than other facility types because they lack cars and other motor vehicles. Perceived safety drives Wendy's facility type choices, even if high volume and large speed differentials on some multi-use trails makes this facility type feel uncomfortable at times.
3. Pedestrian/Bicycle bridges. Since these are separate from motor vehicle traffic, Wendy finds them comfortable for herself and her children. The steep and sometimes twisty approach and departure ramps on some some bike/ped bridges can be problematic while pedaling a loaded cargo bike or while pulling a child trailer.
4. Physically protected Cycle Tracks where there are physical barriers such as Jersey barriers, planters, bollards, parked cars, or other physical protections along the length of the track. These barriers protect the space from trucks, taxis and other motor vehicles that inevitably encroach on paint-only buffered cycle tracks. However, Wendy needs high low stress intersection treatments for cycle tracks. Seattle style cycle tracks with "mixing zones" at

intersections ruin the experience for Wendy by turning the facility into a high stress facility at the most dangerous point in the route, at the intersections.

5. Parks and Green Spaces. The lack of motor vehicle traffic makes parks and green spaces a safe place for Wendy and her kids to ride their bikes. Wendy taught her children to ride bikes in local parks due to the safety of the environment.
6. Staircase Runnels. These enable Wendy to safely push her bike up and down staircases without having to carry it. Since there are so many public staircases in Seattle, adding Runnels can enable Wendy to make connections between other LTS-1 facilities that would be difficult otherwise. However, some designs do not accommodate child trailers or loaded cargo bikes.

## **Will Wendy use LTS-2, 3 & 4 Facilities?**

Not if she has better choices. Wendy does not feel safe using higher-stress bicycle or pedestrian facilities. She does not feel that they are safe enough for her children to use on their own.

1. LTS-3. Sidewalks. From a lack of better options, some Wendies bike to school and/or local destinations with their kids using existing sidewalks because sidewalks provide some protection from motor vehicles. The ordinary five foot wide sidewalks typically found in residential areas are often overgrown with vegetation, contain frequent bumps and moss, cross blind driveways and lack curb ramps. In some neighborhoods, parked cars often block sidewalks completely. Pedestrians feel threatened by people riding bicycles on sidewalks. The combination of these elements makes typical sidewalks stressful for regular use by both Wendy and her kids.
2. LTS-3. Bicycle Lanes. Typical urban bicycle lanes do not provide adequate clearance from parked cars. Dooring (people opening their driver door into the path of a person riding a bicycle) causes a very large number of injury bicycle crashes. These crashes often result in severe injuries and fatalities. Women are more risk averse, in general, than men. Crash statistics show that Wendy is right to be concerned for her safety and the safety of her family in traditional American bicycle lanes which direct riders to ride only in the door zone of parallel parked cars. European bike lanes flip the model and use parked cars to protect people on bikes. [According to NACTO](#), *“bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and flows in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge, or parking lane.”*
3. LTS-3. Buffered Bike Lanes. As typically implemented in US cities, the design of Buffered Bike Lanes still directs people on bikes to ride only in the door zone. This design failing prevents them from achieving a lower LTS rating in practice.
4. LTS-4. Climbing Lanes. These have all the benefits and dangers of conventional bike lanes. Climbing Lanes are applied to steep uphill stretches where the bike/car speed differential is highest. The lower speed relative to traffic makes these more dangerous for Wendy and her kids relative to ordinary bike lanes.
5. LTS-4. [Shared Lane Pavement Markings](#). Since these typically involve simply painting stencils of male bicycle riders on busy streets, they yield no safety benefits and Wendy isn't fooled by them.
6. LTS-4 Signed Routes. Signed Routes do little to modify the behavior or volume of motor vehicles because they involve no changes to the roads. The small green signs blend in with background foliage so it is not likely that drivers perceive them at all. Most Wendies are unaware that signed routes exist at all.

## **Metrics**

Money spent on LTS 2-4 facilities is unlikely to yield significant increases in riders who match the Wendy persona.

1. **Gender equity.** If no other metric is used, gender split is the easiest and most reliable metric of a network's perceived comfort.
2. **Connectivity.** Number of contiguous LTS-1 routes. According to the Mineta Institute report conclusions, any route that contains gaps in LTS-1 quality routes should be considered separate routes. The model is: a chain is only as strong as its weakest link.
3. **SR2S.** Percentage of children who walk or bike to school. Engineering, education and encouragement components all need to be in place within a school district in order for a Safe Routes to School program to take hold and increase the percentage of kids walking and biking to school. While each school will likely have its own ideal mode share target, a "buddy program" that matches schools in existing bike/walk friendly cities around the world could be a good exercise for building international community ties.
4. **Mode share.** Looking at raw bicycling count numbers without factoring in the concurrent increase in the population and variations in employment figures could lead to inconsistent interpretations. Mode share percentages are cleaner metrics.

## Variations

The Wendy persona represents a broader set of people who choose to replace some of their car trips with biking and/or walking who have similar physical and psychological needs from their transportation network.

1. 39-year-old single mom Jocelyn pulling a Burley trailer with a two-year-old in it being followed by 8-year-old Sophie who has just learned how to cross intersections by herself. Sophie wants to ride her new bike to school next year. Jocelyn is wary but hopeful.
2. Lois is 75 years old and bikes to the grocery store now that she's successfully concluded the car ownership phase of her life. Lois can bike up to two miles from home, but can only bike up mild grades. Today, she only rides on sidewalks because she is afraid to ride in the road with fast cars in her neighborhood. Lois would like to rely on biking, walking and bussing for all of her shopping, leisure and social endeavors but she needs safer routes and arterial crossings. The bike is special to Lois because she feels young, strong, happy and free on it. It also serves to keep her healthy and independent.
3. 54-year-old Anne who rides less than 10 times per year and will never figure out how to choose the best of the 27 gears available on the bike she bought five years ago. Anne wants to go on short rides with her friends and their school-age children.
4. 52-year-old Gerry who has no cartilage in either knee but still loves to ride. Big on smiles, distance limited by joint pain, it is Gerry's dream is to go on regular local bike rides with his two teenaged daughters before they've flown the nest for college.
5. 12-year-old paraplegic Peter uses a hand cranked bike to get around his neighborhood. Peter also plays competitive wheelchair basketball on weekends. While endowed with superhuman enthusiasm, Peter has limited hill climbing ability and range.

Wendy is the primary design target for our Neighborhood Greenway network. Wendy trusts that we'll take her needs into consideration in the Seattle Bicycle Master Plan update. Since many municipalities lack the resources to assess what is needed to integrate low-stress bicycling and walking with other means of travel, Wendy hopes her needs are taken into consideration in their decision making processes.

## References

1. [Four Types of Transportation Cyclists.](#) Roger Geller, Bicycle Coordinator. Portland Office of Transportation.
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4. [NACTO Cities for Cycling](#). September, 2012
5. [Integration of Bicycling and Walking Facilities into the Infrastructure of Urban Communities](#) Mineta Transportation Institute. Feb, 2012.
6. Cascade Bicycle Club [Sophie](#) May, 2011
7. [Seattle Voter Attitudes Toward Bicycling](#) - FM3 Public Opinion Poll of 400 Seattle voters. December, 2012.

Please send Bob Edmiston additional research findings that can help fill out this persona. Bob Edmiston is a User Experience Research professional and has developed personas for Apple, Google, Microsoft and the University of Washington. Wendy was created from a crowdsourced set of insights from Seattle Neighborhood Greenway volunteers, stakeholder interviews and contemporary transportation research publications.

Tiny URL: <http://tinyurl.com/Wendy-WBW>

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