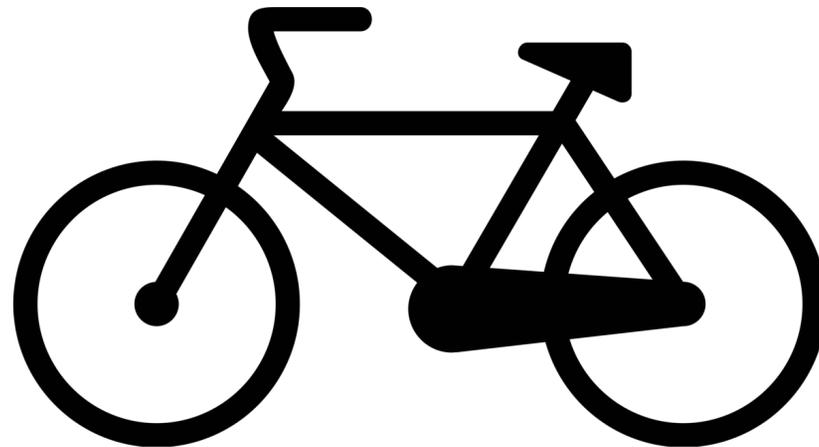


5TH AVENUE HEURISTIC EVALUATION FOR EVERYDAY BIKING



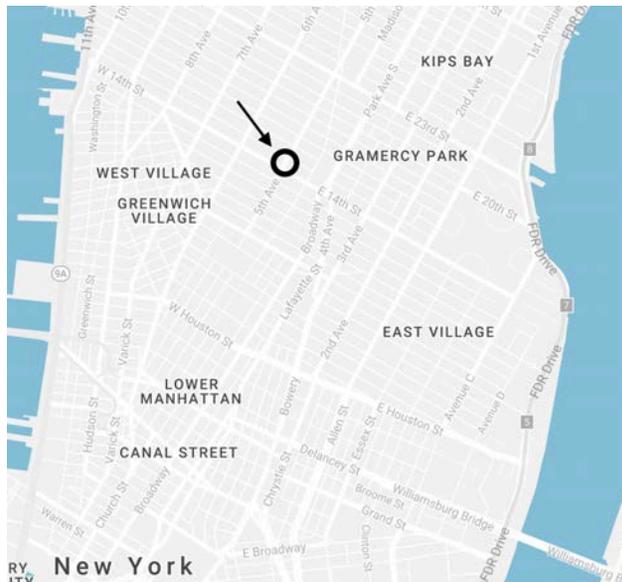
DESIGNING A BICYCLE USER EXPERIENCE

STREET PROFILE

HEURISTIC EVALUATION FOR EVERYDAY BIKING

5th Avenue between 15th Street and 14th Street, Manhattan, New York City

Major southbound thoroughfare; looking at a block at the border of Midtown and Downtown Manhattan



Street Location



[Video of Riding a Bike on the Street](#)



Aerial View

OVERVIEW

5TH AVENUE BETWEEN 15TH STREET AND 14TH STREET, MANHATTAN, NEW YORK CITY HEURISTIC EVALUATION FOR EVERYDAY BIKING

| | Principle | Summary | Rating |
|---|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 1 | Accessibility | The street is only accessible to those ready to adjust their lifestyle and be constantly alert, not the typical everyday person. | 1 2 3 4 5 |
| 2 | Consistency | There is little consistency for people riding bikes on the street. | 1 2 3 4 5 |
| 3 | Cost-Benefit | Most everyday people would never consider biking here, but for a few brave people that ride it is sometimes faster than a car. | 1 2 3 4 5 |
| 4 | Forgiveness | A person cannot afford to make any errors here without risking consequences. | 1 2 3 4 5 |
| 5 | Hierarchy of Needs | The everyday person's basic needs are not fulfilled here, and higher feelings of enjoyment will not come for most people until the basic needs are met. | 1 2 3 4 5 |
| 6 | Signal to Noise Ratio | The user isn't overwhelmed with signs, but the markings are sometimes confusing and there is lots of chaos on the street, which both act as noise. | 1 2 3 4 5 |
| 7 | User Control | People have virtually no control over how their experience is, and are not able to do basic things like relax. | 1 2 3 4 5 |
| 8 | Visibility | While the street grid could make navigation more straightforward at a higher level, there is constant uncertainty about people's experience on a smaller scale, resulting in poor visibility for the overall experience. | 1 2 3 4 5 |

Ratings:

- 1 – Very Poor – Constantly goes against the principle
- 2 – Poor – Almost never fulfills the principle
- 3 – Average – Sometimes fulfills the principle
- 4 – Strong – Often fulfills the principle
- 5 – Very Strong – Always fulfills the principle

DETAILED FINDINGS

5TH AVENUE BETWEEN 15TH STREET AND 14TH STREET, MANHATTAN, NEW YORK CITY HEURISTIC EVALUATION FOR EVERYDAY BIKING

The following pages detail what were found to be the most pressing issues of the street. Issues should be addressed in order of severity when possible (Critical, High, Medium and then Low).

Accessibility

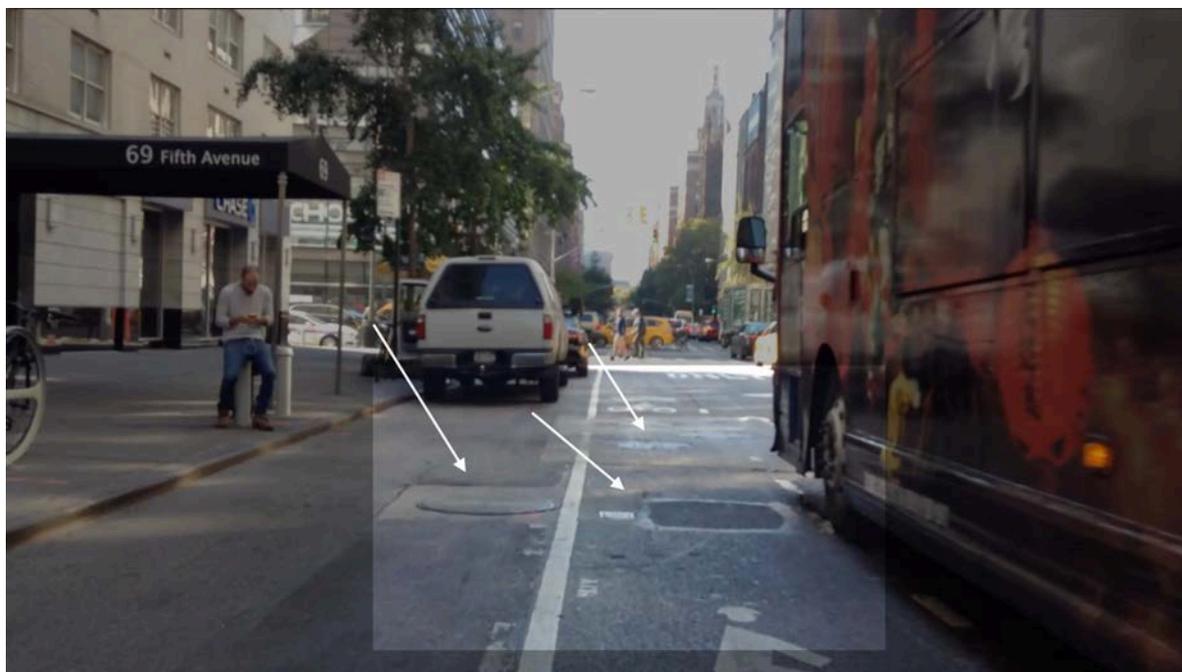
| Issue | Recommendation | Severity |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| The street is not comfortable or easy to ride on for people of all backgrounds, just by people that will tolerate high stress levels. | Make it more easy and comfortable: Separate the bikeway entirely from motor traffic to reduce stress. Provide sufficient space for people of different riding styles to use bikeway comfortably together. | <u>Critical</u> |
| People of diverse abilities are not able to use the street without dramatically adjusting their lifestyle. This is stopping many people from riding a bike on the street. | Make it usable by people of all lifestyles. Same as above. | <u>Critical</u> |



Accessibility: The main type of bike riding on this street is of daredevils weaving in and out of traffic (as in shown with arrow in picture on left). People without this ability and a tolerance for stress cannot ride a bike on this street, severely limiting accessibility to the everyday person.

Consistency

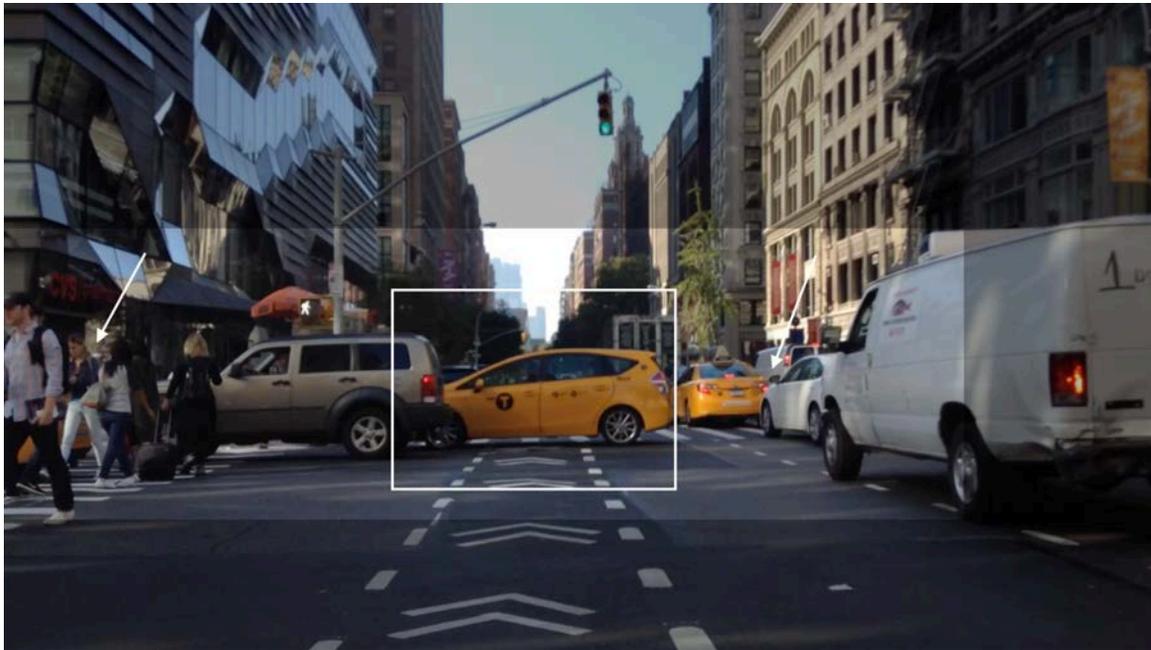
| Issue | Recommendation | Severity |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------|
| Physical interface is not consistent | Better maintain the street pavement and take care to make sure the bikeway is clear of obstacles and vehicles. | Medium |
| Visual interface is not consistent | Use less traffic markings and instead use visual cues, colors, and physical elements to create a clear place for people to ride a bike. | Medium |



Consistency: The many potholes and bumps (indicated with arrows in picture on left), along with the transition to a “shared lane” with motor vehicles turning left makes the physical interface very inconsistent. The numerous yet sometimes confusing markings and unpredictable traffic also make the visual interface inconsistent. However, these issues are not as critical to address as some of the others.

Cost-Benefit

| Issue | Recommendation | Severity |
|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| The benefits do not at all outweigh the costs to riding a bike on this street for the everyday person. | Make basic infrastructure design changes as listed in other recommendations to minimize the real and perceived “costs”/turn-offs of riding a bike here. | Medium |
| The cost-benefit ratio compared to other modes on the street is not positive. | Same infrastructure changes as above, and make sure to prioritize people riding bikes over those driving cars spatially and temporally in the design. | Low |



Cost-benefit: There are too many hassles and risks (such as cars blocking paths unexpectedly like in the picture at left) of riding a bike for the everyday person here, and thus most people choose to walk, take public transport or drive.

Forgiveness

| Issue | Recommendation | Severity |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| The street does not provide any leeway for even the smallest mistake by a rider | Protect people from hazards pointed out in the picture: buffer from these vehicles and move the lane to the other side of parked cars to eliminate the possibility of being run over by vehicles from the traffic lane. | <u>Critical</u> |
| Children, the elderly and other less intense riders cannot be themselves normally on this street | Create more space for biking and make it protected from motor vehicles so that a child can swerve the bike a bit and a person can zone out for a few seconds without risking their lives. | High |



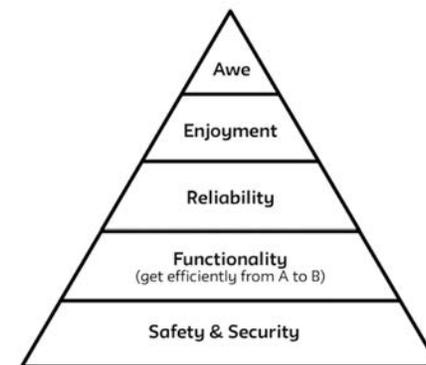
Forgiveness: If a person swerves a bit or is not completely aware of what is around him/her for just a second, he/she may get run over by a moving vehicle or have a door be opened onto him/her.

Hierarchy of Needs

| Issue | Recommendation | Severity |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Basic needs of safety, reliability and functionality are not met on this street for the everyday person | Make the lane protected and also bring protection into the intersection. Keep the lane clear of obstructions as is usually done for motor vehicles. | <u>Critical</u> |
| Enjoyment is not probable for someone riding a bike on the street | Once the bottom half of the pyramid is fulfilled, work on integrating the bikeway into the rest of the built environment. Focus on what can elicit enjoyment and awe in this specific context. | Low |



Hierarchy of needs: Cars constantly blocking people's paths (as in photo on left) and other unexpected occurrences make the bikeway extremely unreliable and usually not safe, secure or functional. The top parts of the pyramid (awe and enjoyment) are not close to being reached.



**ADAPTED HIERARCHY OF NEEDS FOR
EVERYDAY PEOPLE GETTING AROUND**

Translated from Maslow's Hierarchy of Needs

Signal to Noise Ratio

| Issue | Recommendation | Severity |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| There is too much extraneous information (“noise”) on the street | Having lots happening is common in New York City and is not necessarily a bad thing. However, less markings and signs that require reading and interpretation where possible would make the street more usable for an everyday person riding a bike. | Medium |
| There is no clear signal to what the everyday person is supposed to do on many parts of this street | Protect the bikeway through the intersection instead of using markings and a “mixing zone” with heavy motor traffic. Limit where people biking have to yield to motorized traffic, and if absolutely necessary make it more clear and not too troublesome that it becomes a frustration. | High |



Signal to noise ratio: There is tons happening on the street visually, but none of it helps the everyday person ride a bike on it. Numerous signs related to car parking and other uses such as advertisements take a lot of brainpower to process. Pavement markings are either confusing or dangerous. The bicycle “sharrow” painted in the picture above recommends people to bike in a dangerous spot and can create a false sense of security.

User Control

| Issue | Recommendation | Severity |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| People are not able to choose their own riding style and control how they use the street | Provide more leeway for different riding styles and flexibility to stop when necessary by separating the bikeway and providing sufficient space for a variety of people to do it safely. | High |
| People are not able to meet their personal needs on the street | Same as above, so that people can take a phone call if needed, finish eating some food, or ride next their child or friend. | High |



User control: The bikeway is narrow, and it's difficult to ride socially next to a friend. You cannot move at a leisurely pace without being honked or yelled at and because you have to put so much energy into constantly scanning your surroundings to not get injured or die, it's extremely difficult to take care of personal needs such as having time to destress after work, finishing a meal, or calling a parent, etc.

Visibility

| Issue | Recommendation | Severity |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Everyday people cannot predict the status of individual elements of their street experience | Make the experience clear and predictable: Better maintain and separate bikeway from motor vehicle traffic to minimize unexpected potholes and prevent cars from blocking the bikeway. Modify the traffic lights to give people riding bikes a countdown until the green so they can gauge how fast they should pedal. Change signal timing to meet biking speed or redesign intersections so traffic lights are not needed and people riding bikes can see everything moving through it. | Medium |



Visibility: The status of whether people can keep riding a bike at normal speed is unclear- people cannot gauge when traffic lights allow them through intersection, have no idea when there will be potholes or other impediments in the road, and physically have their line of sight blocked.

SUMMARY

5TH AVENUE BETWEEN 15TH STREET AND 14TH STREET, MANHATTAN, NEW YORK CITY HEURISTIC EVALUATION FOR EVERYDAY BIKING

STRENGTHS

There has been allocated some space for biking on the street and there seems to be some excitement in the populace along with some political will. These are good and important to maintain going forward. However, there needs to be more focus on the user (everyday person) and how this facility/product fits into their everyday lives.

MAIN ISSUES

Issues related to accessibility, forgiveness and hierarchy of needs are the most critical to resolve to make the street bike-able for everyday people. When people's basic needs are not met and they cannot be themselves and do normal things such as swerve or look down for a bit, it is not a tolerable experience. That is while although biking can be faster than driving a car on this street, the huge majority of people do not choose to ride a bike on it.

RECOMMENDATIONS

A major redesign of this street is needed for it to be usable for everyday people riding a bike. The good thing is that it is probably not too costly to do so, if done smartly. The street design should be behaviorally driven and done with prototypes and inexpensive user testing, such as on an open streets event with temporary materials and or as a pilot project. Constant user feedback is important so that their basic needs are met and they can have a good experience.

Many problems have been identified. Now the major challenge is developing community driven and user-centered solutions. Learning about and engaging with everyday people in the community can be done through other user-centered methods, eventually leading to a design that works comfortably and practically for the everyday person.

In terms of specific infrastructural recommendations, this Heuristic Evaluation will refrain from prescribing a physical design solution. The focus instead should be on how people feel and interact with the street, and the infrastructure

will follow once this is done well. With that said, there are infrastructural precedents that have created better conditions for everyday biking. Through the user-centered-design process, solutions will likely be reached that include elements of these successful precedents: physically separating the bikeway from car traffic, keeping it free from obstacles, maintaining protection at intersections, and providing ample space for different types of biking styles to coexist would be extremely beneficial in fulfilling all of the heuristics/principles.

One of the main strengths of user-centered methods is the clear value and relatedness they provide for people using the street. Communication, empathy and engagement are key for a successful user-centered project so that people in the community don't perceive bicycle infrastructure popping up out of nowhere.

CHECKLIST

5TH AVENUE BETWEEN 15TH STREET AND 14TH STREET, MANHATTAN, NEW YORK CITY HEURISTIC EVALUATION FOR EVERYDAY BIKING

This checklist was employed to organize the process of evaluating the street.

Accessibility

Compliance

| | Always | Sometimes | Never | Notes |
|--------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------------------------------------------------------------|
| Is the street easy and comfortable to ride a bike on by people of all backgrounds? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | There are people biking there, but not of all backgrounds. Is it easy or comfortable? No. |
| Are people of diverse abilities able to use the street without adjustments to their normal life? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | No. Many adjustments are necessary to ride here. |

Consistency

Compliance

| | Always | Sometimes | Never | Notes |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------|
| Is the visual interface consistent and easy for everyday people to navigate throughout the experience of using the street? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | The street interface is geared towards cars, but it is relatively consistent in the small study area. |
| Is physical interface (e.g. street pavement) consistent and easy for everyday people to use throughout the experience of the street? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sometimes the asphalt is smooth and consistent in the bike lane. |

Cost-Benefit

Compliance

| | Always | Sometimes | Never | Notes |
|----------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Do the benefits to biking on the street outweigh the costs for the everyday person? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Is the cost-benefit ratio for riding a bike better than for that of motorized modes of transportation on the street? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Car travel can be slow and difficult on this street, which is likely spurring some people to ride a bike. |

Forgiveness

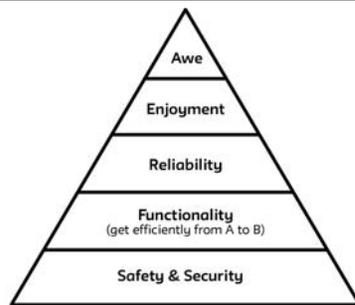
Compliance

| | Always | Sometimes | Never | Notes |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Does the street allow for and forgive human error such as someone riding slow for a while, a kid swerving while learning to ride, or a person using their cell phone? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | If you stop focusing for more than a few seconds, there could be fatal consequences like being hit by a motor vehicle or getting caught in a pothole and then run over. |

Hierarchy of Needs

Compliance

| | Always | Sometimes | Never | Notes |
|-------------------------------------------------------------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Does the street meet people's most essential needs (bottom 3 of the pyramid at right)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Everyday people would not feel safe or secure here. The street is especially unreliable while experiencing it on a bike. |
| Does the street build off those lower level needs and then give people enjoyment and awe? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |



ADAPTED HIERARCHY OF NEEDS FOR EVERYDAY PEOPLE GETTING AROUND
Translated from Maslow's Hierarchy of Needs

Signal to Noise Ratio

Compliance

| | Always | Sometimes | Never | Notes |
|-------------------------------------------------------------------|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------------------------------------|
| Does the street design clearly and concisely communicate its use? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | For cars it is relatively clear, but not for people riding bikes. |
| There is no redundant, ineffective signage or markings. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Markings are sometimes not concise and can be confusing. |

User Control

Compliance

| | Always | Sometimes | Never | Notes |
|--------------------------------------------------------------------------|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Do people have control of their experience on the street? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | No, there is always a motor vehicle blocking you or popping out. |
| Are people able to meet their own personal needs while using the street? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | You're really forced to conform your behavior around what cars do. You get some exercise out of the experience, but other emotional needs aren't met. |

Visibility

Compliance

| | Always | Sometimes | Never | Notes |
|---------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Can the users understand how the street system is working at a higher level? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | The street grid system makes navigation somewhat easier, but beyond that people can't easily understand the larger system. |
| At a smaller scale, is the status of street elements that affect people's experience clear? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | People do not know status of the traffic lights. One can never be sure when he/she will run into a giant pothole. Huge trucks, taxis and other vehicles swerve into people's paths out of nowhere. The status of this street is completely unclear for an everyday person on a bike. |