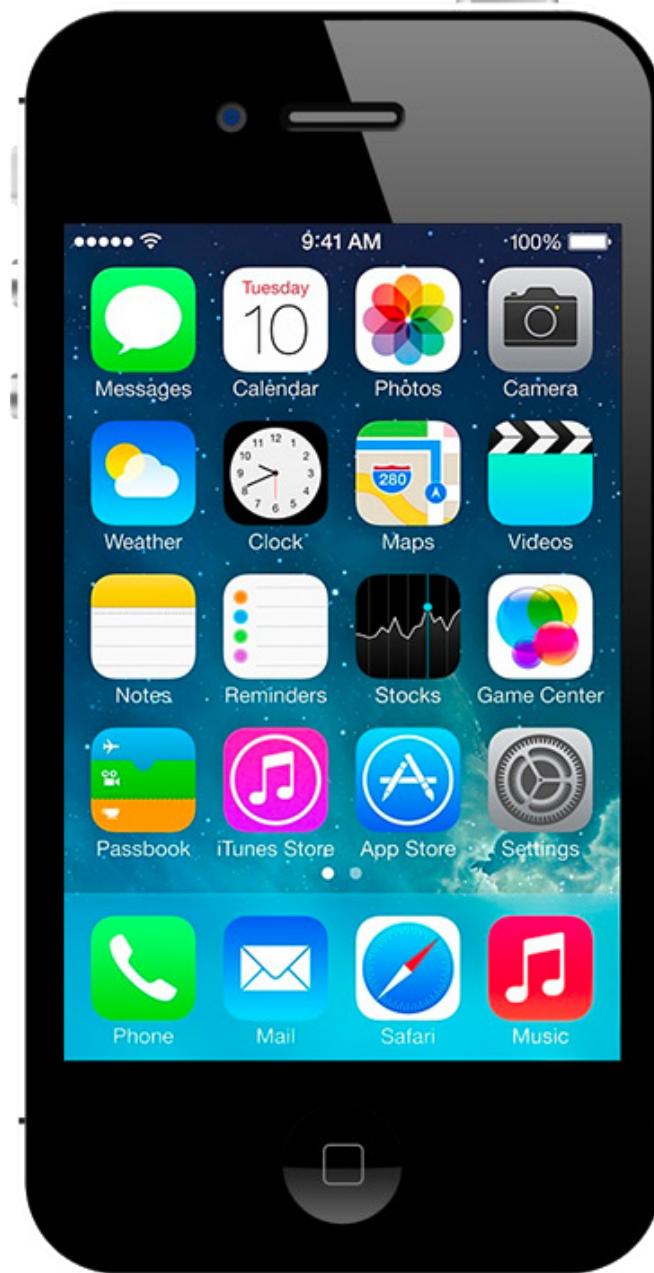


Cartographic Design for Mobile Devices: A Case Study Using the UW-Madison Interactive Campus Map

Brian Davidson
University of Wisconsin-Madison

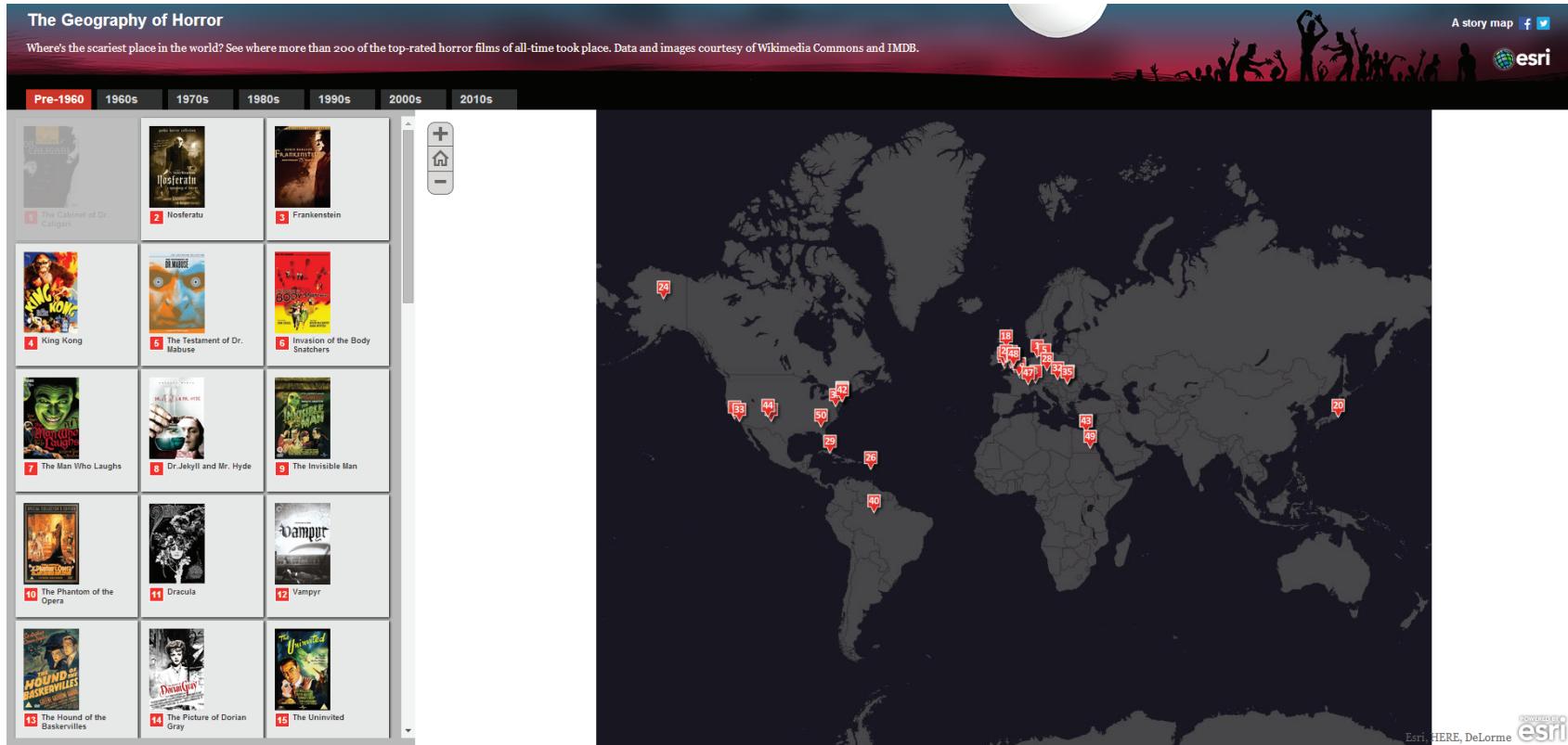


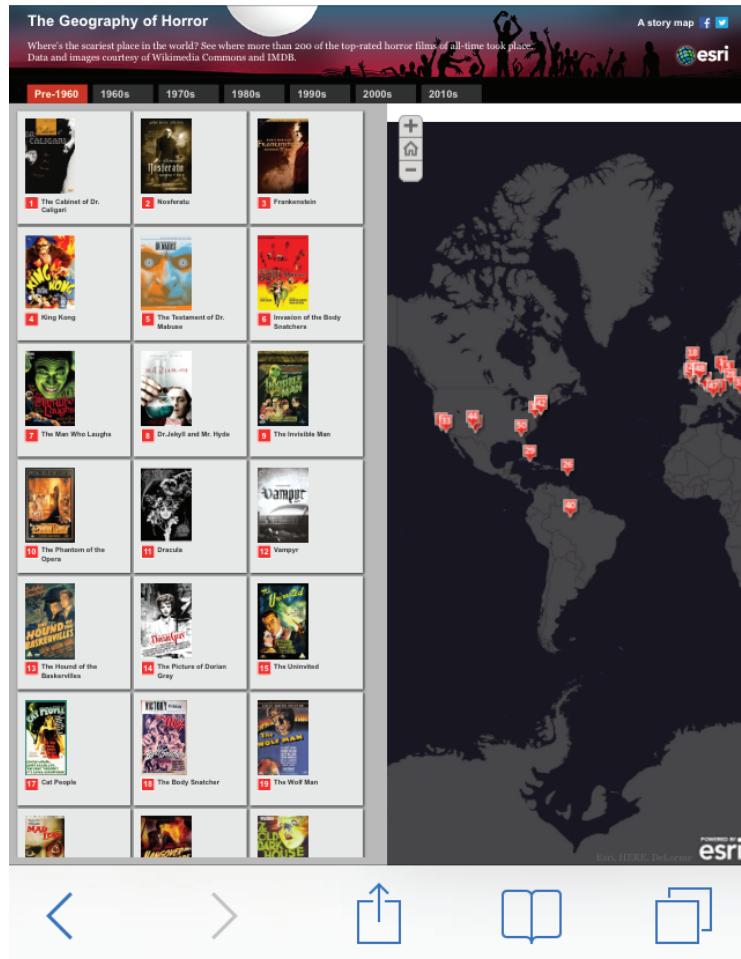


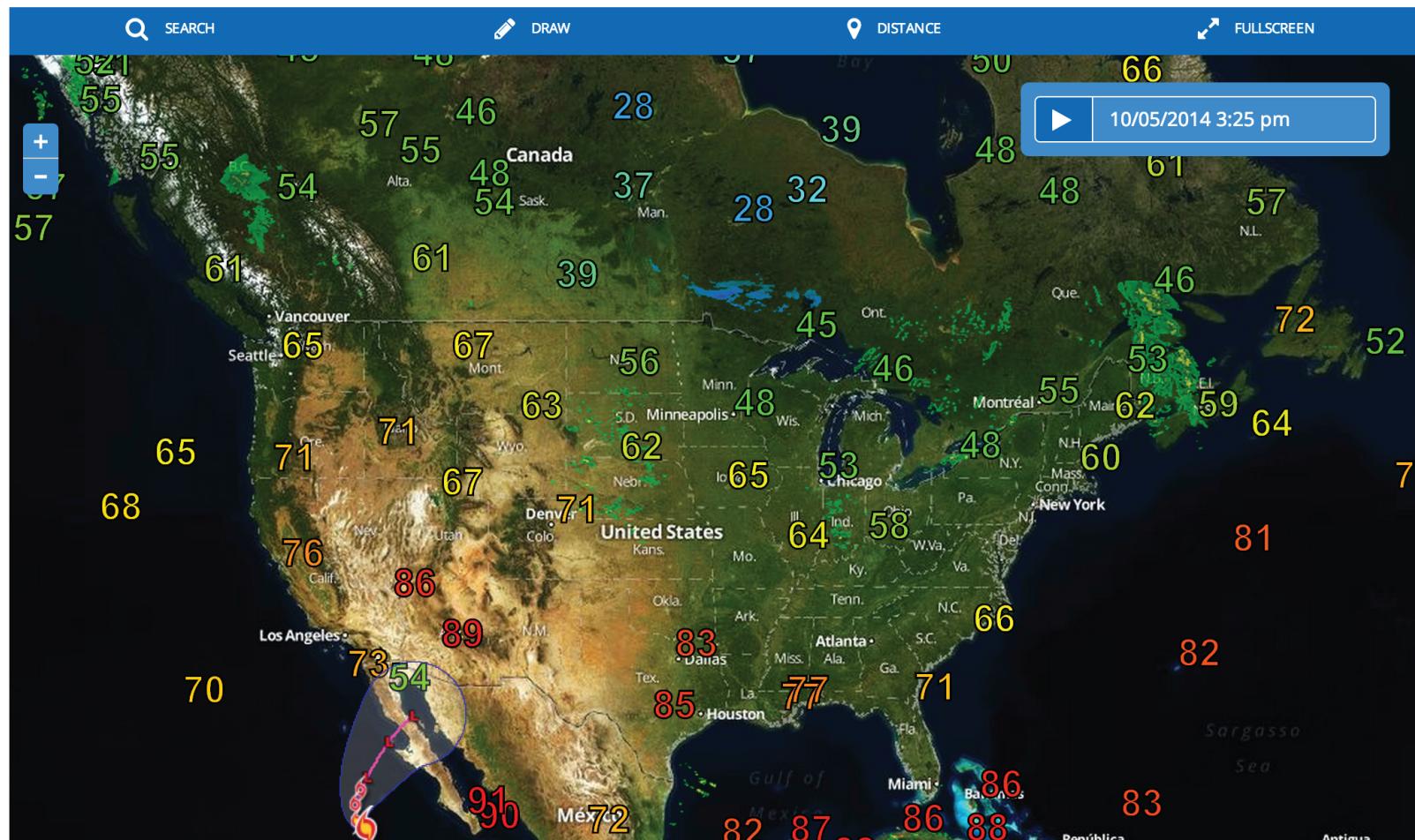
**Web Maps on
a small screen?**

Web Maps on
a small screen?

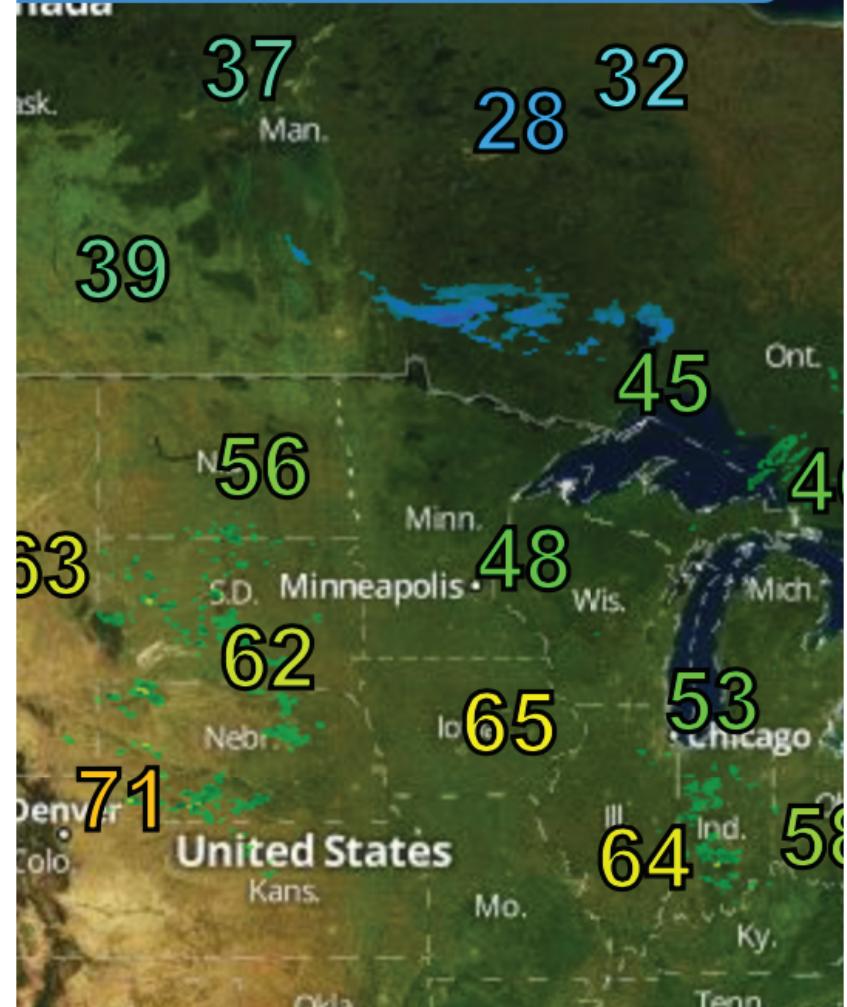
BLASPHEMY!







10/05/2014 3:25 pm



Research Questions

1. **Should the default map scale of a web map differ between mobile device screen sizes?**
- 2.
- 3.

Research Questions

1. Should the default map scale of a web map differ between mobile device screen sizes?
2. **Should the level of detail of a web map differ between mobile device screen sizes?**
- 3.

Research Questions

1. Should the default map scale of a web map differ between mobile device screen sizes?
2. Should the level of detail of a web map differ between mobile device screen sizes?
3. **Are there differences in emotional experiences between mobile device screen sizes?**

Lake Mendota

What I did, who participated and how I did it

(Materials and Methods)



Participants

1. 36 Participants total
2. Introductory survey
3. Two requirements that **needed** to be met

Two requirements

1.

2.

Must be in their
first two semesters
of college

Two requirements

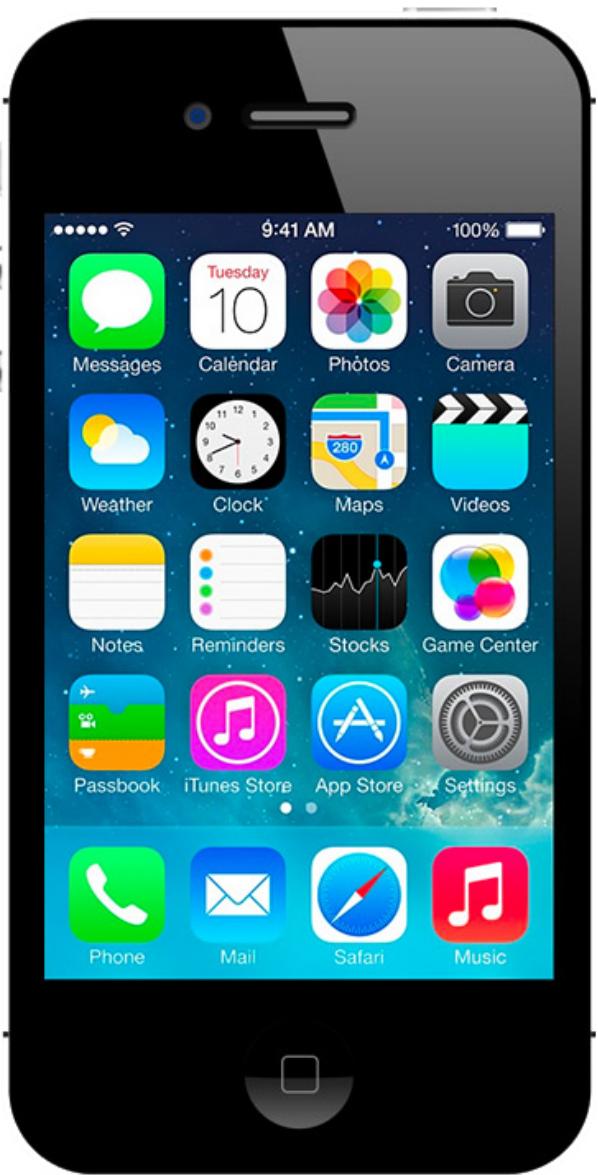
1.

Must be in their
first two semesters
of college

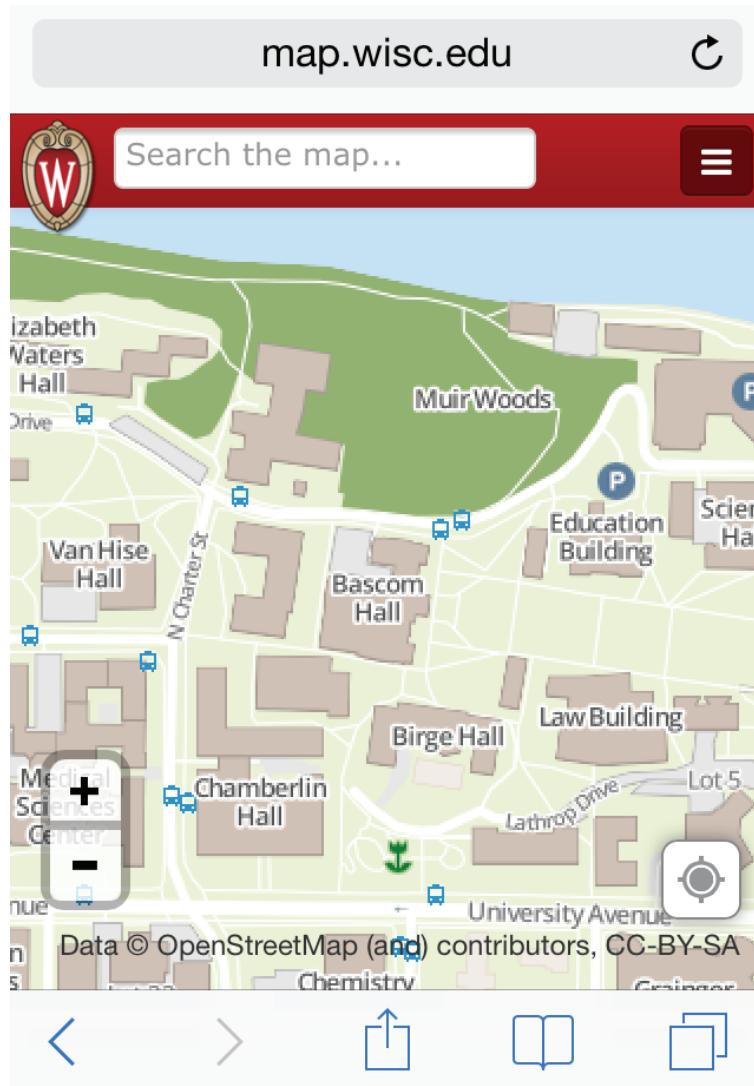
2.

Have little to no
knowledge of the
UW-Madison
campus

Materials - Device



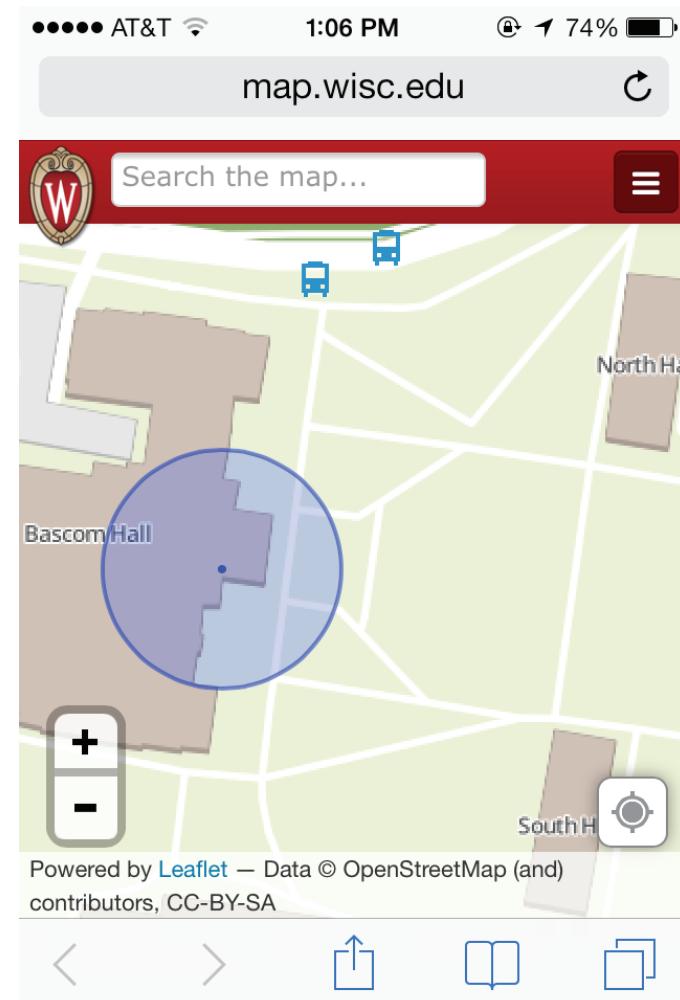
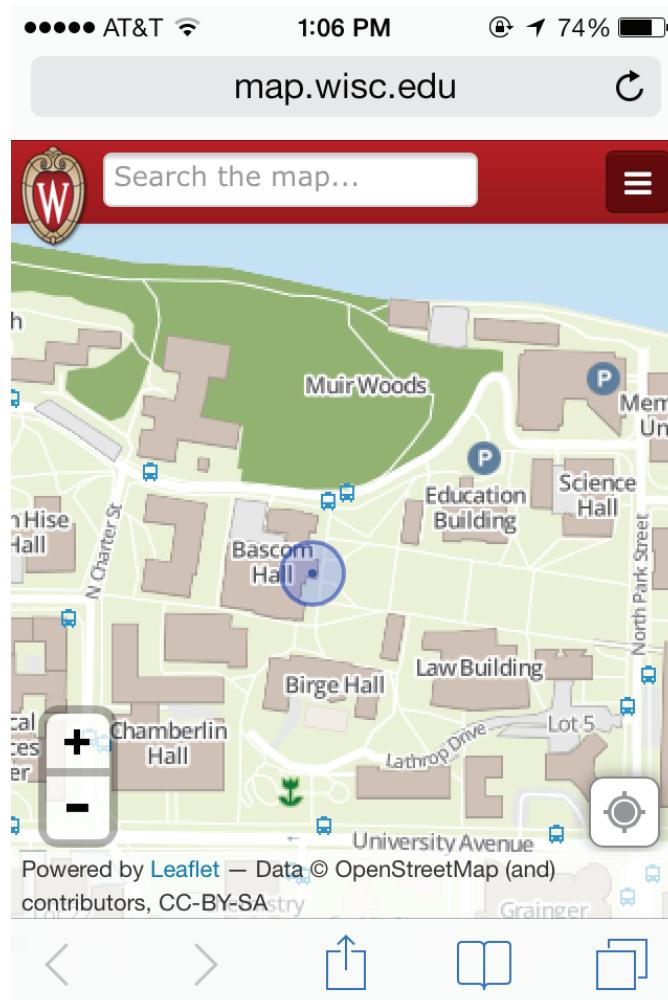
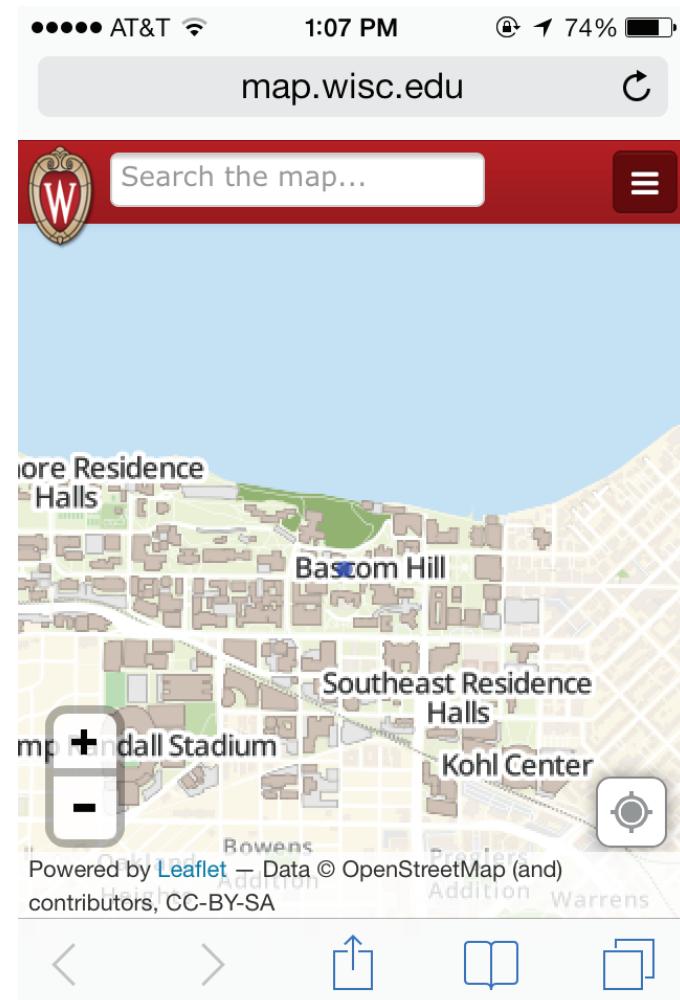
Materials - UW Campus Map



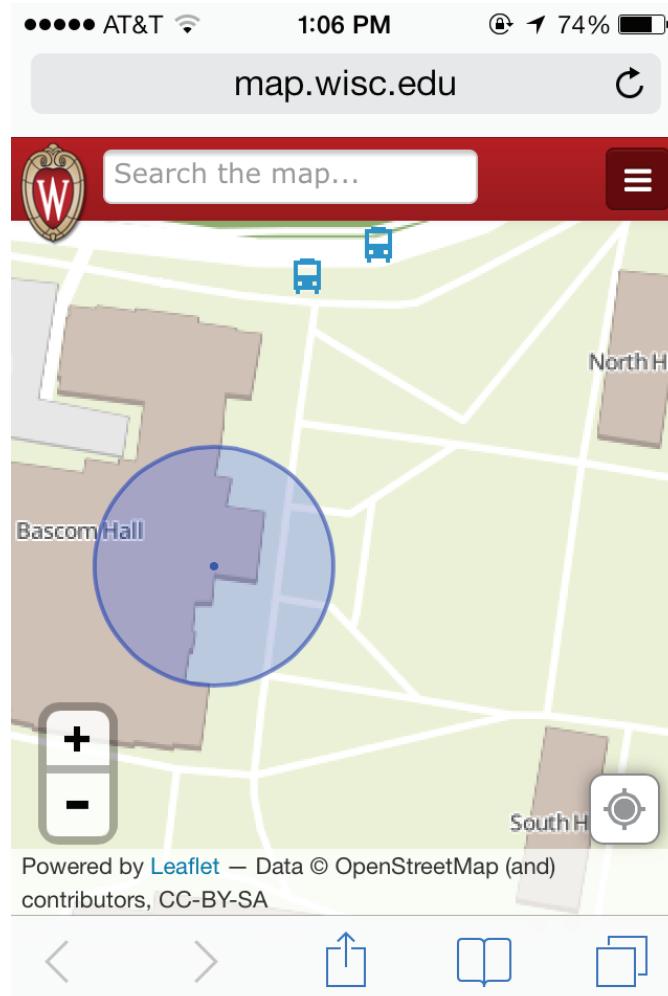
Materials - Functionality



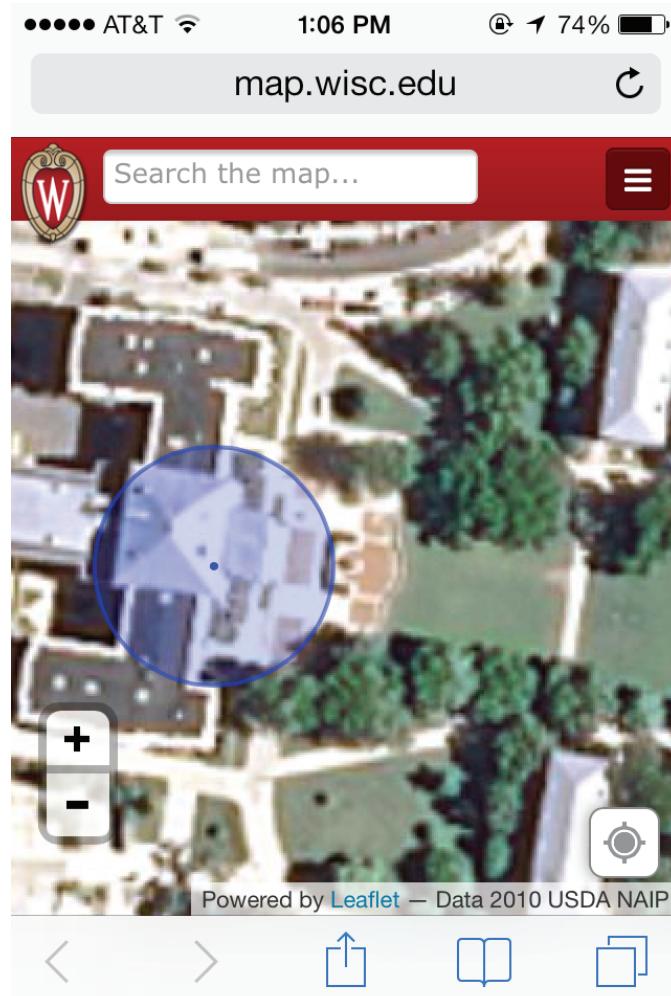
Materials - Scale



Materials - Level of Detail



'Map'



'Satellite'

Materials - Task Type

1.

Wayfinding

Navigating from one building to another

2.

Identification

Pointing at a building in the real world

Materials - Task Pairing

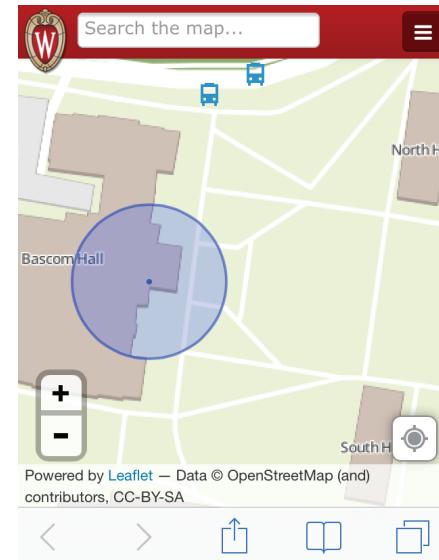
6 = large scale

4 = intermediate scale

2 = small scale

M = Map view

S = Satellite view



	Task Pairing #						
Participant #	1	2	3	4	5	6	
1	6, M	6, S	4, M	4, S	2, M	2, S	
2	2, S	6, M	6, S	4, M	4, S	2, M	
3	2, M	2, S	6, M	6, S	4, M	4, S	
4	4, S	2, M	2, S	6, M	6, S	4, M	
5	4, M	4, S	2, M	2, S	6, M	6, S	
6	6, S	4, M	4, S	2, M	2, S	6, M	
7	6, M	6, S	4, M	4, S	2, M	2, S	

Materials - Task Pairing

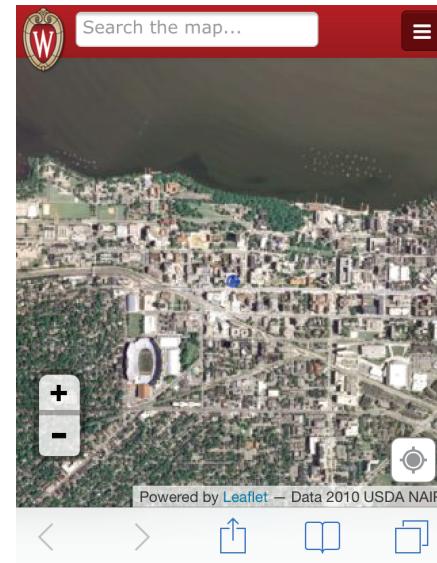
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	Task Pairing #						
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3	2, M	2, S	6, M	6, S	4, M	4, S	
4	4, S	2, M	2, S	6, M	6, S	4, M	
5	4, M	4, S	2, M	2, S	6, M	6, S	
6	6, S	4, M	4, S	2, M	2, S	6, M	
7	6, M	6, S	4, M	4, S	2, M	2, S	

Methods - Experimental Protocol

1. Meet participants at predetermined location

Methods - Experimental Protocol

1. Meet participants at predetermined location
2. Sign consent form and explain study

Methods - Experimental Protocol

1. Meet participants at predetermined location
2. Sign consent form and explain study
3. Begin Testing

Methods - Experimental Protocol

1. Meet participants at predetermined location
2. Sign consent form and explain study
3. Begin Testing
 - A. Wayfinding task, then Identification

Methods - Metrics

1. Accuracy

Methods - Metrics

1. Accuracy

- A. Whether the participant made it to the correct point

Methods - Metrics

1. Accuracy

- A. Whether the participant made it to the correct point

2. Response Time

Methods - Metrics

1. **Accuracy**

- A. Whether the participant made it to the correct point

2. **Response Time**

- A. Length of time it took the participant to navigate or identify

Methods - Metrics

1. **Accuracy**
 - A. Whether the participant made it to the correct point
2. **Response Time**
 - A. Length of time it took the participant to navigate or identify
3. **Emotions**

Methods - Metrics

1. **Accuracy**

- A. Whether the participant made it to the correct point

2. **Response Time**

- A. Length of time it took the participant to navigate or identify

3. **Emotions**

- A. What emotions participants were feeling during testing

Methods - Variables

1. Overall Performance
2. Landmark Difficulty
3. Mobile Screen Size
4. Default Map Scale
5. Default Level of Detail

Methods - Metrics Measured

Accuracy

Response Time

Emotions

Overall Performance

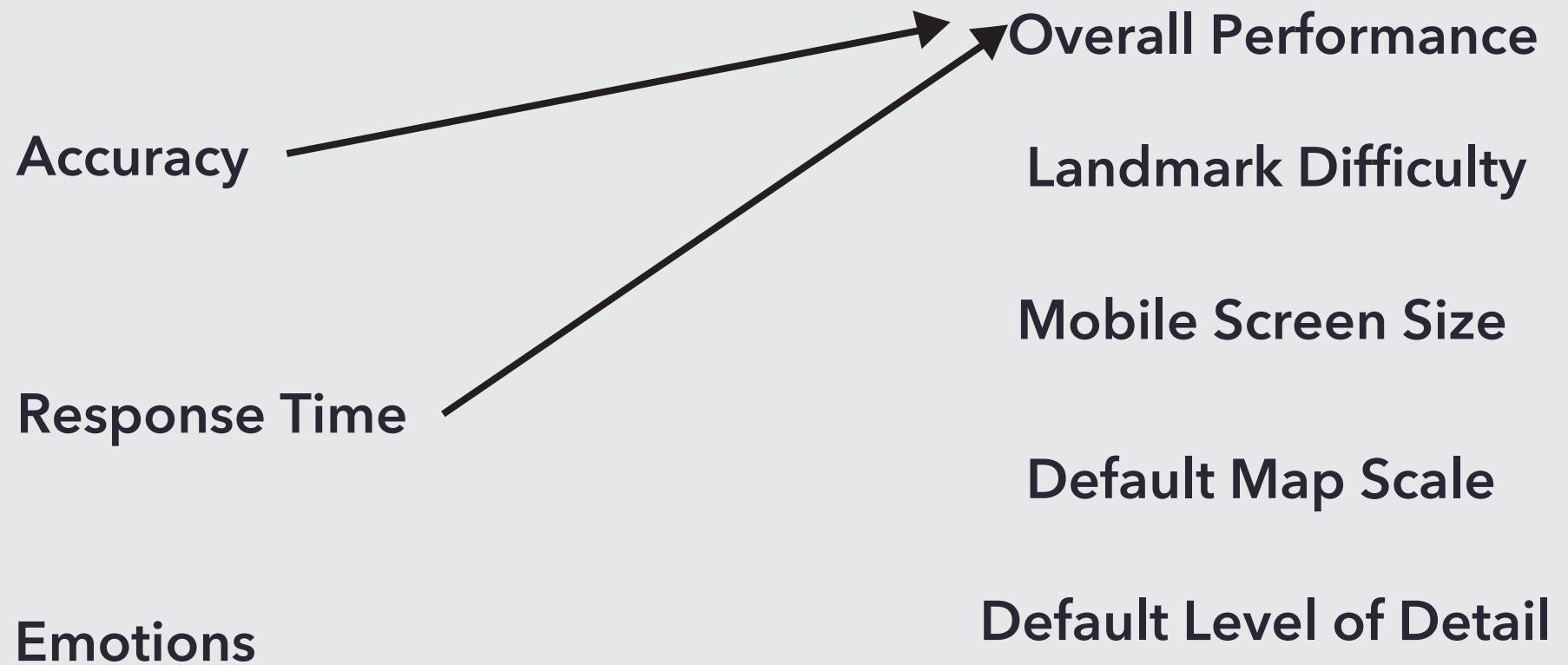
Landmark Difficulty

Mobile Screen Size

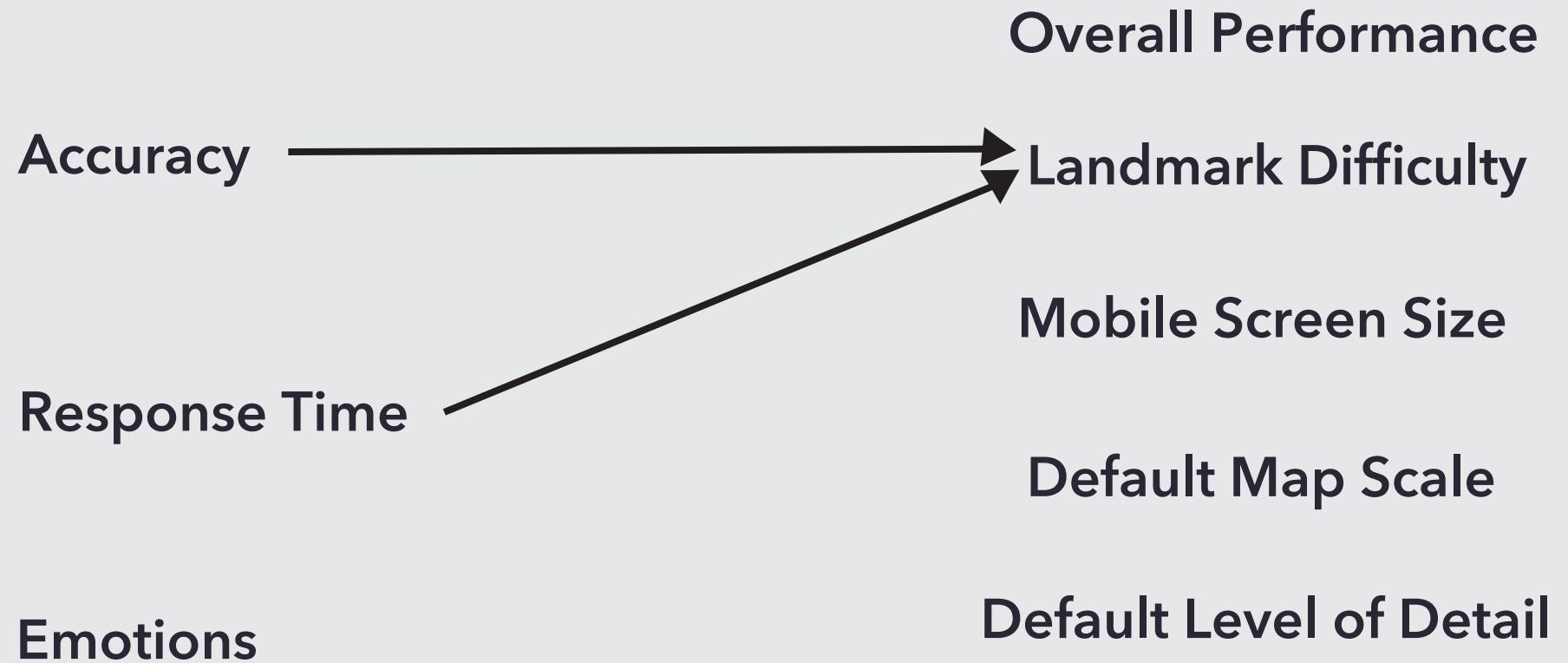
Default Map Scale

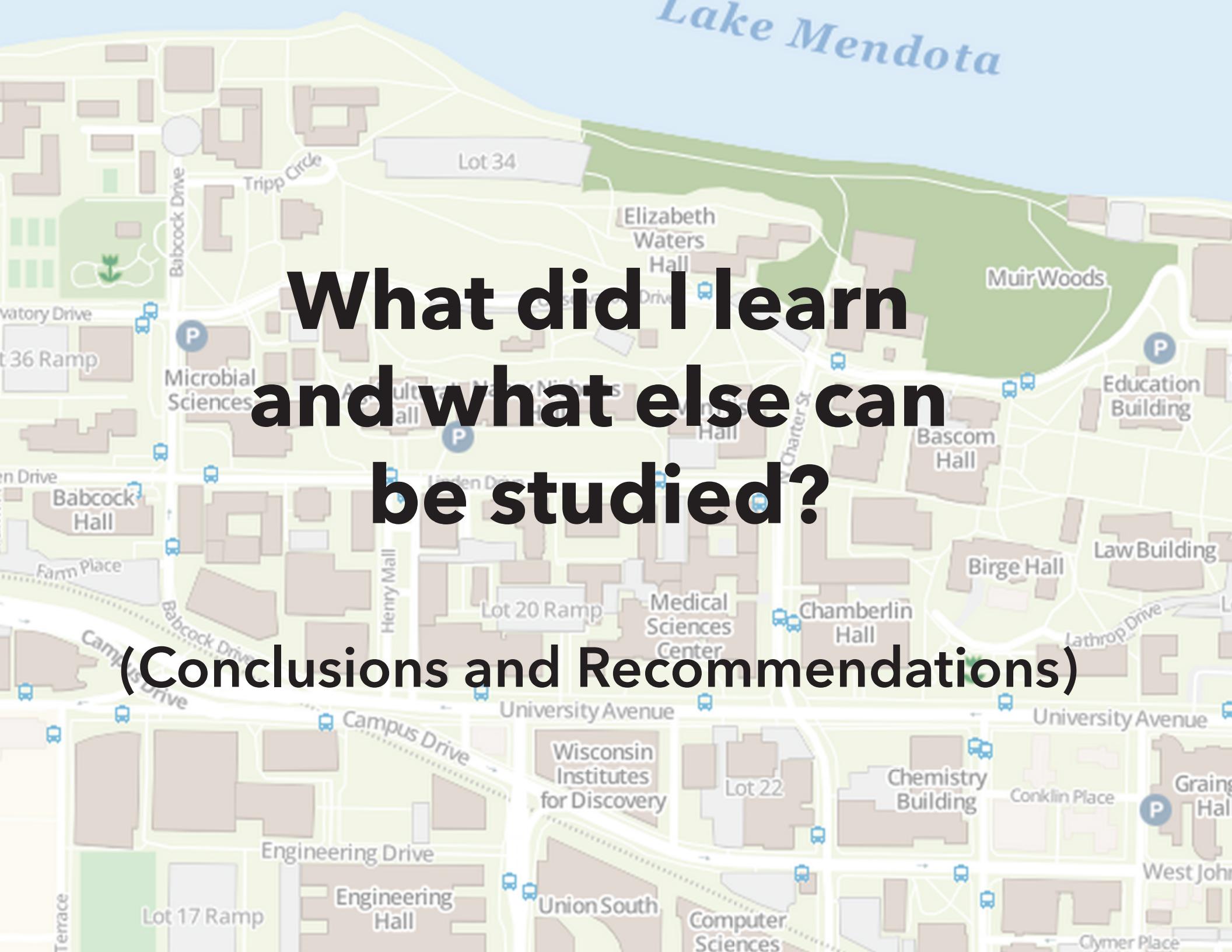
Default Level of Detail

Methods - Metrics Measured



Methods - Metrics Measured





A faint background map of the University of Wisconsin-Madison campus, showing various buildings, streets, and landmarks. The map includes labels such as Babcock Drive, Tripp Circle, Lot 34, Elizabeth Waters Hall, Muir Woods, Education Building, Bascom Hall, Law Building, Birge Hall, Chamberlin Hall, Medical Sciences Center, Lot 20 Ramp, Henry Mall, University Avenue, Wisconsin Institutes for Discovery, Lot 22, Chemistry Building, Conklin Place, Grainger Hall, West Johnson Hall, Clymer Place, Engineering Drive, Engineering Hall, Union South, Computer Sciences, Lot 17 Ramp, and Farm Place.

What did I learn and what else can be studied?

(Conclusions and Recommendations)

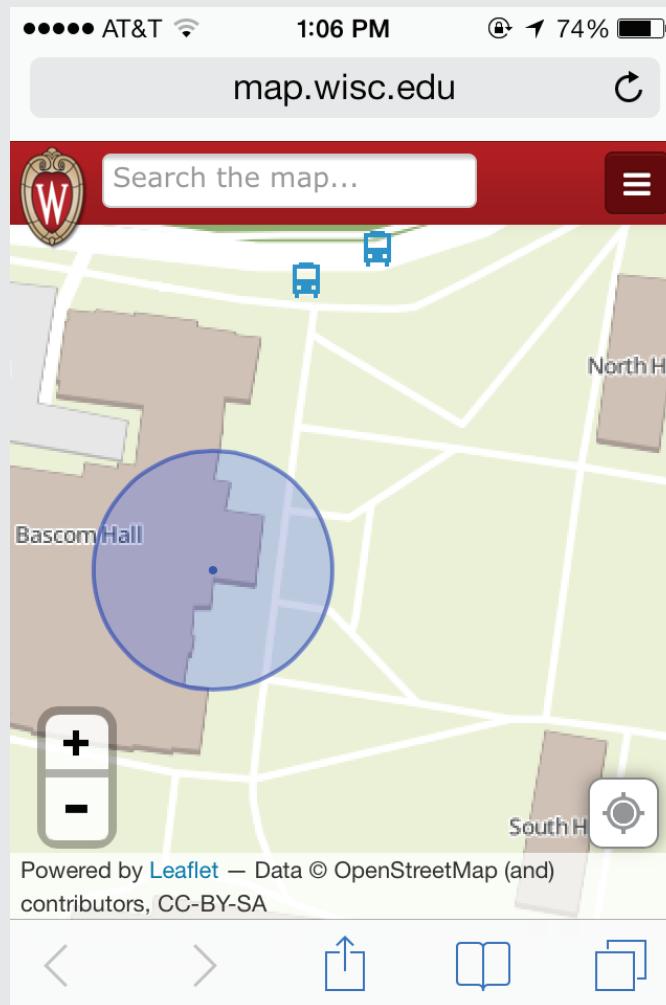
What did we learn? - Overall

Identification

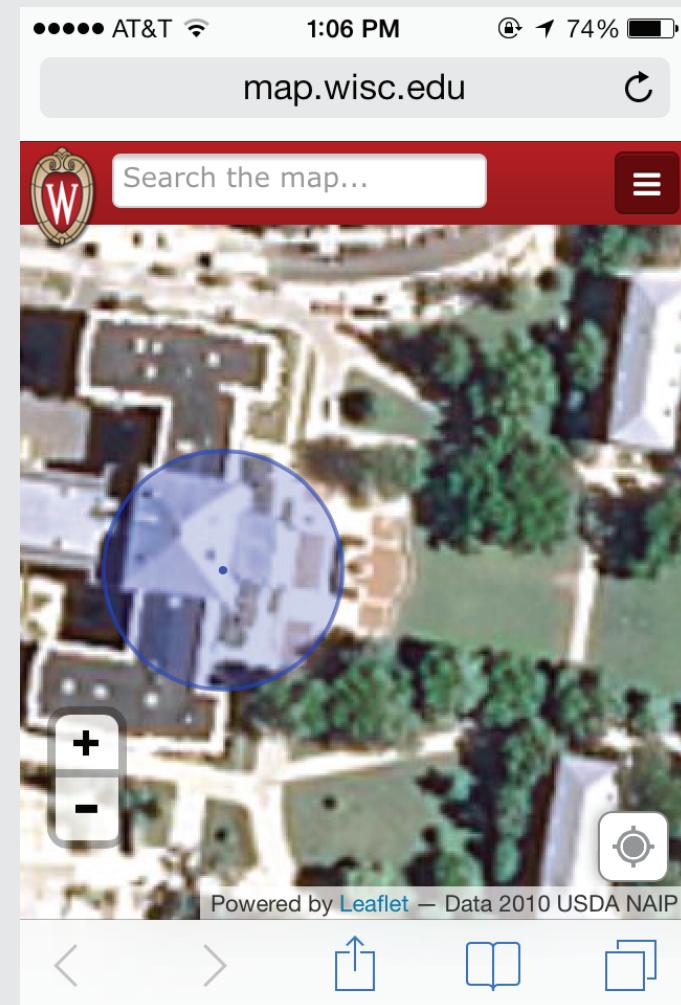
Wayfinding

What did we learn? - Overall

Identification



Wayfinding



What did we learn? - Landmark Difficulty

Identification

Wayfinding

What did we learn? - Landmark Difficulty

Identification

Wayfinding

Easy = Better

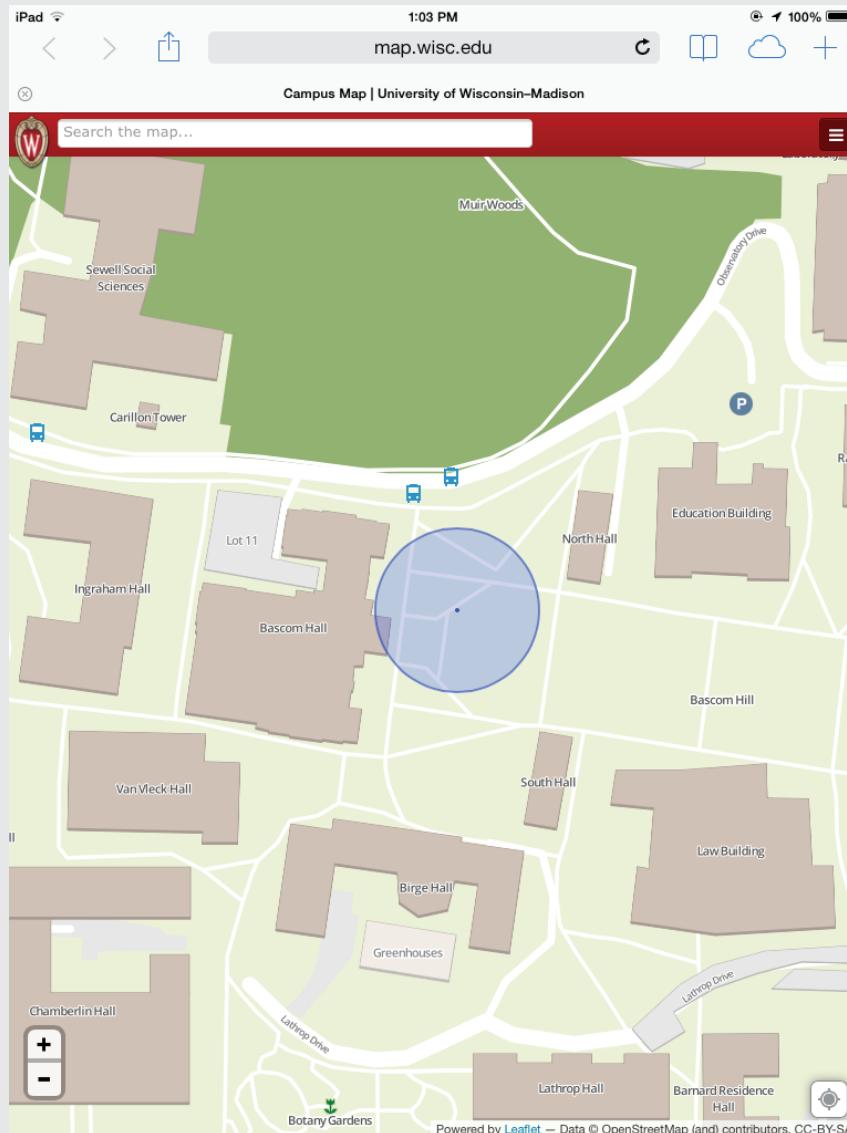
What did we learn? - Mobile Screen Size

Identification

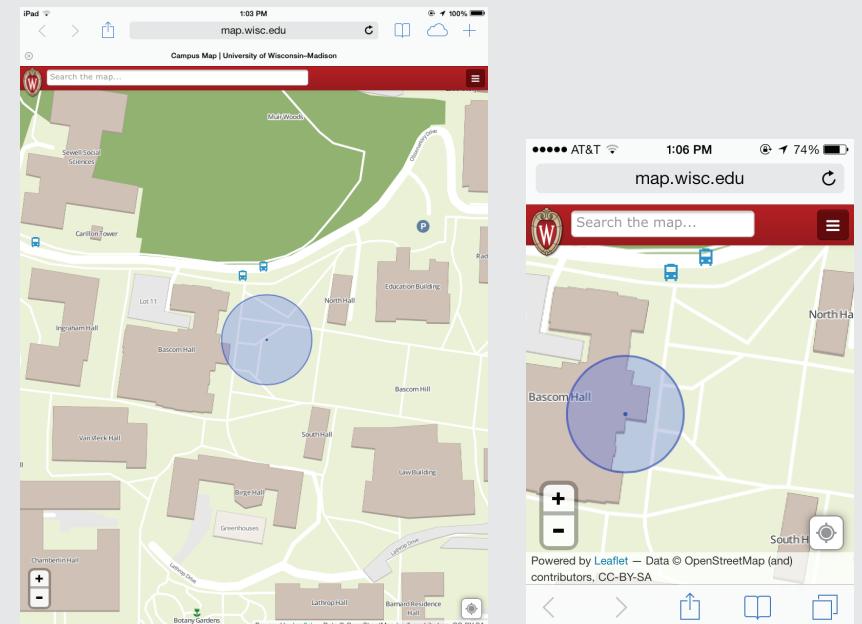
Wayfinding

What did we learn? - Mobile Screen Size

Identification



Wayfinding



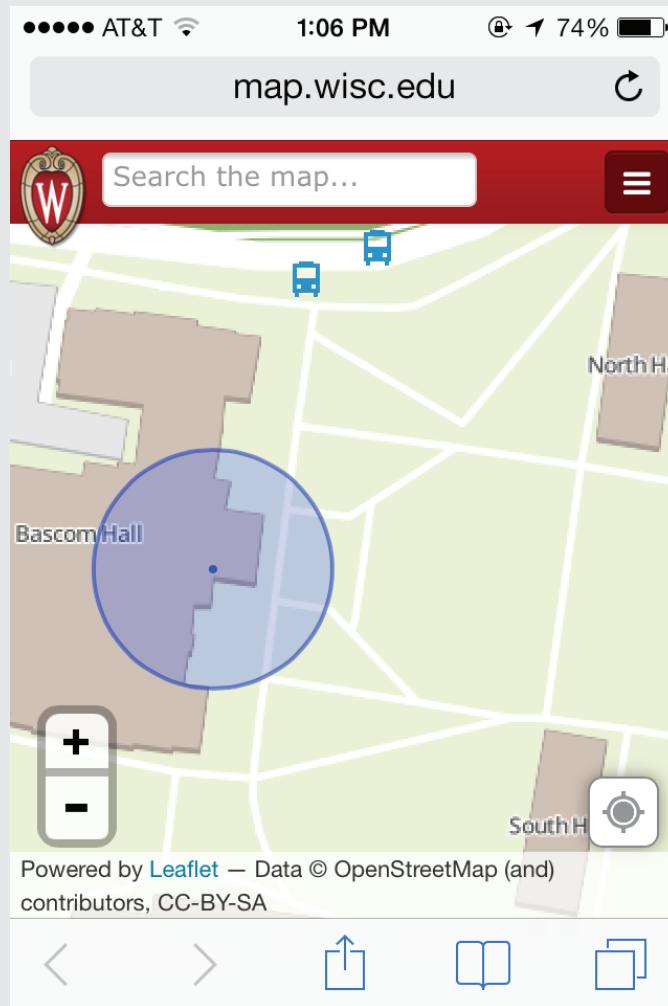
What did we learn? - Default Map Scale

Identification

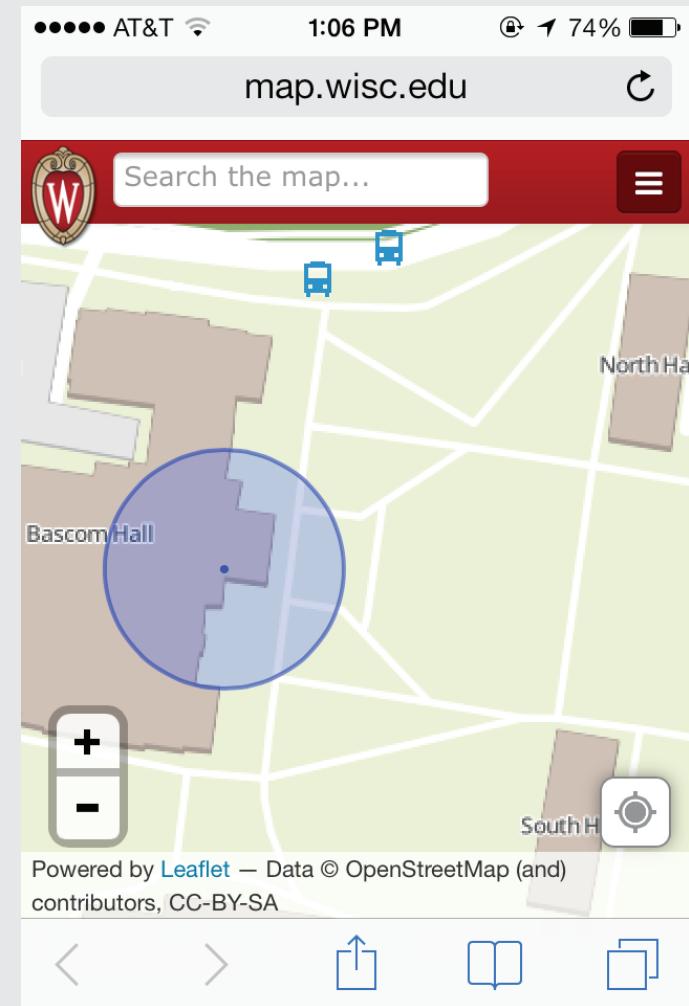
Wayfinding

What did we learn? - Default Map Scale

Identification



Wayfinding



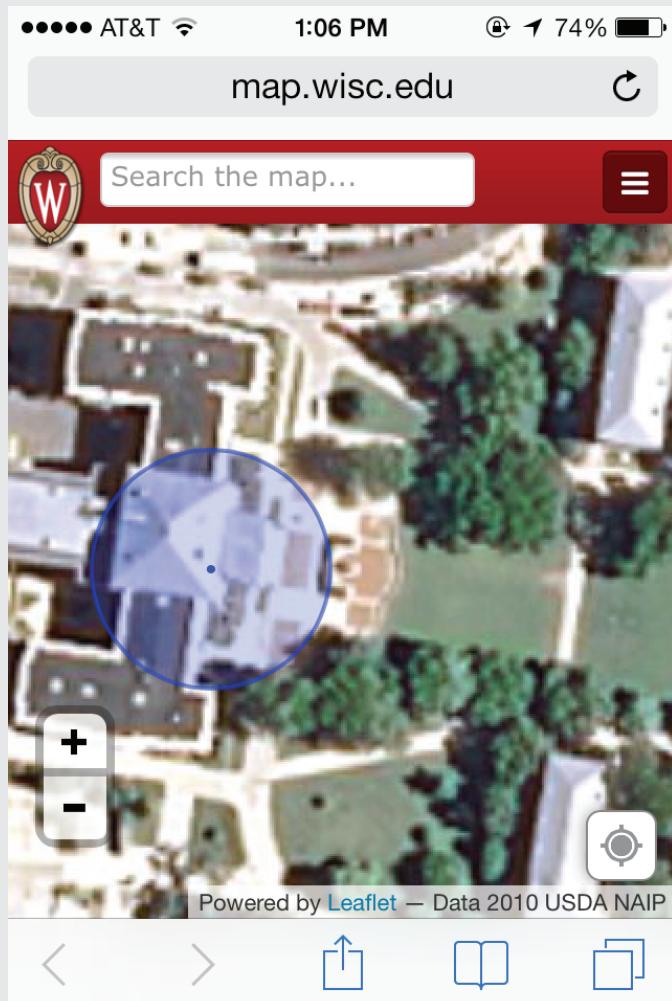
What did we learn? - Default Level of Detail

Identification

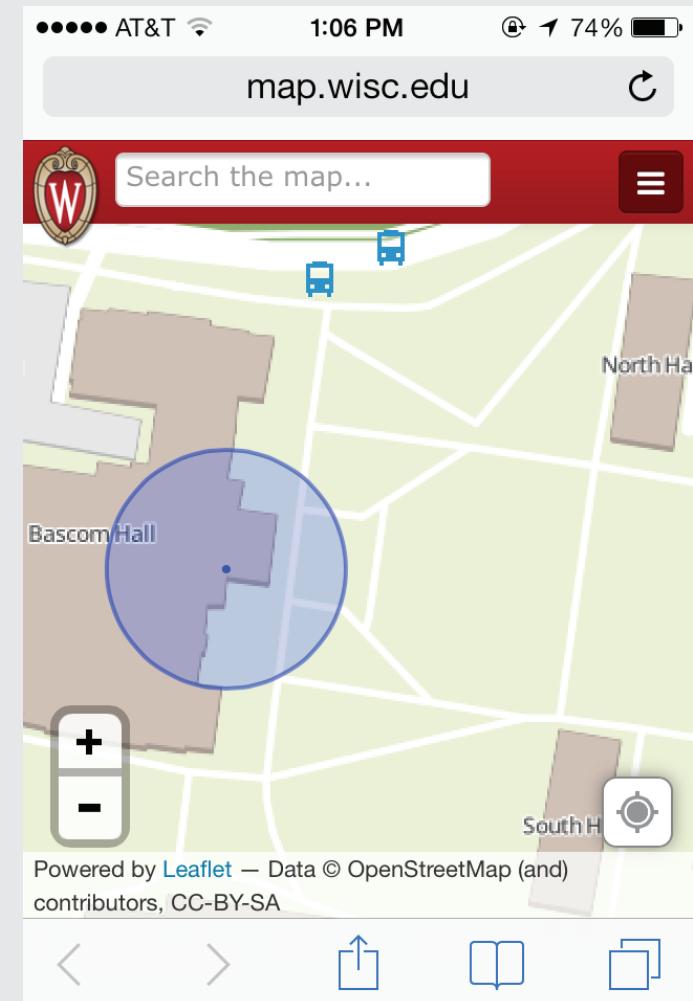
Wayfinding

What did we learn? - Default Level of Detail

Identification



Wayfinding



What did we learn? - Emotions

Small Screen

Large Screen

What did we learn? - Emotions

Small Screen

5.67 Positive

9.44 Negative

Large Screen

7.22 Positive

15 Negative

Limitations

1. Sample size
2. Prior knowledge of campus
3. Time of year

Future Directions

- Design
- Interactions
- Emotions
- Functionality

Special Thanks

- Dr. Robert Roth, Tanya Buckingham, and Dr. Jim Burt
- Family and Friends
- Trewartha Graduate Research Award
- 36 anonymous participants

briandaviddavidson.com
@brianddavidson

Thank you!

Questions?

