### Procedure Details

<table>
<thead>
<tr>
<th>Situation - creating ideas to understand the interaction between the individual, object, and environment</th>
<th>Evaluation (frameworks) — what are users Doing, Saying, and Making within the situation.</th>
<th>Representation - Represent synthesis of ideas</th>
</tr>
</thead>
</table>
| Location  
> 9th Street between Mass and New Hampshire  
Users  
> Walkers passing by (6 testers)  
Object  
> Map Stand facing East  
> Map Orientation Used: SOUTH  
Interface  
> The Interaction between the display of the map and the control of the marker  
Tasks  
> To locate their actual position on the map  
> To position the arrow to the direction their facing in the environment | Lynch Wayfinding Model  
Check list  
> Paths  
> Nodes  
> Landmarks  
> Districts  
> Edges  
All Subjects were timed to locate their position |  |

Rebecca and I set up the map stand between Massachusetts and New Hampshire street on 9th Street. Specifically, we were on the west end of Z’s Coffee shop on the North side of 9th street. The map stand was placed facing East. The map stand remained facing this direction throughout the entire test. This test began using the South orientated map. **We asked testers to 1) find their location on the map, and 2) position the arrow on the magnet to face the direction in which they were facing.** Each test was timed. The timer began when the tester faced the map, and stopped when they correctly placed the magnet on the map, or when they gave up. The testers were randomly selected off the streets. Those that participated received a coupon for $1.50 off at Z’s Coffee Shop. The time was approximately 5:00 pm. We tested until 6 pm. The day was Friday. We tested 6 people with the South orientated map. The entire procedure was photographed - shots were timed at 2 second intervals.

**Subject 15.** The first tester was an African American male aged between 25-30 years old. He locates New Hampshire Street on the map. Next he puts the marker on that street. He realizes its position is not correct and places the marker on Vermont Street. He pauses and then removes the marker. Next he locates 9th street. He places the marker on 9th between Mass and New Hampshire. He faces the arrow to the Right (West) incorrectly. I prompt him to reconsider. He thinks and turns marker to face East correctly. He worked the process out by using Mass Street as a starting point. Also, girlfriend had to prompt him to find 9th street. It took him 2 attempts. His total time was 50 seconds.

**Subject 16.** Next, a white male aged between 25-30 years is tested. He approaches the stand and he immediately places marker facing up (South) incorrectly on intersection of 9th and Mass. Street on map. I prompt him to reconsider. During his second attempt, he turns the arrow to the Right (west) incorrectly. I prompt him again. He turns the arrow to face left (east) correctly. I prompt him again to reconsider location. He moves the marker between Mass and New Hampshire streets correctly. He originally thought the map was north orientated. He used 9th and Mass as a reference point to begin. It took him 4 attempts. His total time was 39 seconds.

**Subject 17.** Next tester was a mother with newborn aged between 25-30 years old. She approaches the map, but then looks behind her in the environment to identify Mass. Street. She looks back at the map and places the marker on the intersection of 9th and Mass. Street with the arrow facing down (North) incorrectly. She tries again but gets confused and frustrated. I prompt her to reconsider and I use guided instruction to help her think of what streets she’s between. She places the marker on 9th between Mass and New Hampshire but faces arrow right (west) incorrectly. I prompt again with guided help. She turns the arrow to face left (east) correctly. Afterwards she explains that she’s terrible at directions. She would have liked a picture of where Z’s coffee is on the map to help her. It took her 4 attempts. Her total time was 74 seconds.
Subject 18. Next tester is a male student. He is white, aged between 25-30 years. He looks at the map to find 9th and Mass as a reference point. Next he tilts his head to the left so he’s looking at the map in East Orientation. He puts the marker facing right (West) incorrectly but on 9th between Mass and New Hampshire. He walks off never fixing it because he thought it was correct. His 1 attempt was incorrect. His total time 23 seconds. It would have been longer had he fixed the position.

Subject 18. Continued

Subject 19. Next tester was a white female aged 40-45. She locates the area around 9th and Mass and New Hampshire on the map. She points to 9th Street. Then she tilts her head to the left (East) to identify the position she is facing on the map. She correctly positions marker on map. It took her 1 attempt. Her total time was 35 seconds.

Subject 20. The next tester was a white female aged between 40 and 45 years old. She was with her friend and she was visiting. She is not from here. She locates quickly the intersection of 9th and New Hampshire on the map and puts the marker there facing up (South) incorrectly. I prompt her to reconsider. She points to the top of the map thinking North. She gets really confused over multiple attempts. I end up taking over and showing her where she is the environment and where the marker is to be placed correctly. It took her 5 attempts. Her total time was 106 seconds.
| Procedure Details | Task 4  
Testing Orientation: WEST |
<table>
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<tr>
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</table>
| **Location**  
> 9th Street between Mass and New Hampshire  
> Users  
> Walkers passing by (4 testers)  
> Object  
> Map Stand facing East  
> Map Orientation Used: WEST  
> Interface  
> The Interaction between the display of the map and the control of the marker  
> Tasks  
> To locate their actual position on the map  
> To position the arrow to the direction their facing in the environment | **Lynch Wayfinding Model**  
Check list  
> Paths  
> Nodes  
> Landmarks  
> Districts  
> Edges  
All Subjects were timed to locate their position |

Rebecca and I set up the map stand between Massachusetts and New Hampshire street on 9th Street. Specifically, we were on the west end of Z’s Coffee shop on the North side of 9th street. The map stand was placed facing East. The map stand remained facing this direction throughout the entire test. This test began using the West orientated map. We asked testers to 1) find their location on the map, and 2) position the arrow on the magnet to face the direction in which they were facing. Each test was timed. The timer began when the tester faced the map, and stopped when they correctly placed the magnet on the map, or when they gave up. The testers were randomly selected off the streets. Those that participated received a coupon for $1.50 off at Z’s Coffee Shop. The time was approximately 3pm. We tested until 4pm. The day was Saturday. We tested 4 people with the West orientated map. The entire procedure was photographed - shots were timed at 2 second intervals.

**Subject 21.** The first tester was a White female aged between 25-30 years old. She looked for 9th and New Hampshire on the map. She realized the map was backwards. She quickly put the marker on 9th Street between Mass and New Hampshire correctly. But she had the arrow facing up (West). I prompted her. She couldn’t believe she made that simple mistake and quickly fixed the arrow to point down (East). It took her 2 attempts. Her total time was 35 seconds.

**Subject 22.** Next, a white male aged between 25-30 years is tested. He quickly locates the area of 9th and Mass on the map. Next he puts the marker on 9th street between Mass and Vermont facing up (West) incorrectly. I Prompt him to reconsider. He adjusts the arrow to face down (east) correctly, but the marker location is still incorrect. I Prompt him again. He moves the marker one block down (east) correctly. He assumed map was East Orientated from the beginning. It took him 3 attempts. His total time was 30 seconds.

**Subject 23.** Next tester was a female student aged between 20-25 years old. She quickly locates the area of 9th and Mass on the map. She puts the marker on 9th street between Mass and Vermont facing up (West) incorrectly. I prompt her to reconsider. She looks to see what street is in front (east) of her in the environment. Realizes she is facing New Hampshire, she turns the arrow facing down (East), but the marker is still one block to far up (West). She moves the marker down one block correctly. It took her 3 times. Her total time was 29 seconds.

**Subject 24.** Next tester is a White female aged between 40-45 years old. She approaches the map and locates New Hampshire and 9th Street. She places the marker incorrectly on 9th Street just below (East) New Hampshire St (one block too far east). She assumes the map is East Orientated which would justify this action. I prompt her to reconsider. She steps back from the map and while facing the map, points behind her to identify Mass Street. She points to Mass Street on the map. She points to 9th street in the environment and then correctly places the marker. She assumed map was East Orientated. It took her 3 attempts. Her total time was 63 seconds.
### Procedure Details

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#### Location
- 9th Street between Mass and New Hampshire

#### Users
- Walkers passing by (9 testers)

#### Object
- Map Stand facing East
- Map Orientation Used: EAST with LANDMARK

#### Interface
- The Interaction between the display of the map and the control of the marker

#### Tasks
- To locate their actual position on the map
- To position the arrow to the direction their facing in the environment

---

Rebecca and I set up the map stand between Massachusetts and New Hampshire street on 9th Street. Specifically, we were on the west end of Z’s Coffee shop on the North side of 9th street. The map stand was placed facing East. The map stand remained facing this direction throughout the entire test. This test began using the East with Landmark orientated map. We asked testers to 1) find their location on the map, and 2) position the arrow to face the direction in which they were facing. Each test was timed. The timer began when the tester faced the map, and stopped when they correctly placed the magnet on the map, or when they gave up. The testers were randomly selected off the streets. Those that participated received a coupon for $1.50 off at Z’s Coffee Shop. The time was approximately 5pm. We tested until 5:45pm. The day was Friday. We tested 9 people. The entire procedure was photographed - shots were timed at 2 second intervals.

**Subject 25.** The first tester was a White female aged between 18-21 years old. She quickly identifies 9th street on the map. She positions the marker along 9th street and slides it up (East) to the correct position between Mass and New Hampshire Streets. She lives on Rhode Island so she was familiar with the area. She didn’t even notice the bus stop landmark on the map. It took her 1 attempt. Her total time was 10 seconds.

**Subject 26.** Next, a white female aged between 18-21 years is tested. She quickly finds the streets New Hampshire and Mass on the maps. She looked at 9th street and used the landmark on the map to orient herself. She placed the marker on the map correctly. It took 1 attempt. Her total time was 10 seconds.

**Subject 27.** Next tester was a female student aged between 20-25 years old. She quickly finds and points to New Hampshire while she also looks at Mass. Street. Next, she places the marker on 9th street between New Hampshire and Mass. The marker is placed correctly. She works on Mass and used that street as a reference. She didn’t use the bus stop landmark for orientation. It took her 1 attempt. Her total time was 12 seconds.

**Subject 28.** Next tester is a White male aged between 25-30 years old. He looks to find Mass and New Hampshire as a reference on the map. He places the marker correctly on 9th street between Mass and New Hampshire. He works in this area. He did not use the landmark as a reference. It took him 1 attempt. His total time was 13 seconds.

**Subject 29.** Next tester is a White female aged between 25-30 years old. She immediately places the marker correctly on the map. She’s a frequent patron at the B. Pig. She saw the landmark first because it was the biggest and darkest image. She used that as a reference. It took her 1 attempt. Her total time was 3 seconds.
Subject 30. Next tester is a White male aged between 18-21 years old. He rushes to place the marker on map. He was in a hurry to be somewhere else. He placed the marker quickly on the intersection of 9th and Mass with the marker facing left (west) incorrectly. I prompted him to reconsider. He moves the marker one block up (east) correctly between Mass and New Hampshire, but the marker is still facing west. I prompt him again. He moves the marker to face East correctly. He did not look at Bus Stop Landmark. It took him 3 attempts. His total time was 13 seconds.

Subject 30. Cont. He was in a hurry to be somewhere else. He placed the marker quickly on the intersection of 9th and Mass with the marker facing left (west) incorrectly. I prompted him to reconsider. He moves the marker one block up (east) correctly between Mass and New Hampshire, but the marker is still facing west. I prompt him again. He moves the marker to face East correctly. He did not look at Bus Stop Landmark. It took him 3 attempts. His total time was 13 seconds.

Subject 31. Next tester is a White female aged between 20-25 years old. She approaches the map and immediately finds New Hampshire and 9th Street on the map and places the marker at the intersection. I prompt her to reconsider the exact location. She removes the marker and moves it slightly down on 9th street still between Mass and New Hampshire. I was being picky, but it made her think a bit more. She works at Z's Coffee Shop. She didn't look at the Bus Stop landmark to reference herself. It took her 2 attempts. Her total time was 17 seconds.

Subject 32. Next tester is a White female aged between 20-25 years old. She quickly identifies New Hampshire and 9th street on the map. She places the marker correctly between Mass and New Hampshire. But the marker is facing left (west). I prompt her to reconsider. She correctly adjusts the marker to face East. She doesn't look at the Bus Shelter Landmark. She was sitting with her friend who works at Z's outside at Z's at the time of the test. It took her 2 attempts. Her total time was 10 seconds.

Subject 33. Next tester is a White male aged between 25-30 years old. He looks at the center of the map and reflects. He quickly puts the marker correctly on 9th street between Mass and New Hampshire facing East. He knew Mass was behind him and New Hampshire was in front. He used the Bus Stop Landmark as a reference to help. It took him 1 attempt. His total time was 11 seconds.
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<table>
<thead>
<tr>
<th>Location</th>
<th>Lynch Wayfinding Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 23rd and Louisiana at Checkers Bus Stop</td>
<td>Check list</td>
</tr>
<tr>
<td>Users</td>
<td>&gt; Paths</td>
</tr>
<tr>
<td>&gt; Ilka - Experience Bus Rider for 8 years</td>
<td>&gt; Nodes</td>
</tr>
<tr>
<td>&gt; Doesn't own a car. Uses the bus to travel.</td>
<td>&gt; Landmarks</td>
</tr>
<tr>
<td>&gt; 32 years old, White female.</td>
<td>&gt; Districts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Object</th>
<th>Subject was timed to locate her position</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Map Stand facing WEST</td>
<td></td>
</tr>
<tr>
<td>&gt; Map Orientation Used: WEST and NORTH</td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td></td>
</tr>
<tr>
<td>&gt; The Interaction between the display of the map and the control of the marker</td>
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| Tasks | Subject 34 Ilka met me at 4:00pm at the Checkers bus stop. She lives off of 14th and Ohio. She had to take the bus to the location. It took her about an hour because of transfers. When she arrived, I explained that she will be asked to find her location on the map. The North map was on the first map to test with. I handed her that magnet and began to time her as soon as she approached the map. Ilka quickly identified 27th street. She then saw where 23rd street was and found the intersection of 23rd and Louisiana. She placed the magnet at the Checkers stop correctly on her first time. Her total time was 6 seconds. She explained that she looked for the street names to help her identify the correct position. I prompted her to examine the map and see if she can plan a route from Checkers to downtown. She explained that she would take the route 7. She showed no confusion. I gave her marker and asked her to draw improvements on the map. She drew a label for route 5 closer to the union, followed by an arrow which indicates route 5’s direction. Next she drew a transfer location at 6th and Kasold. She felt this would be nice considering three routes pass this location. Next, I replaced the North map with the West map. I timed Ilka again. She found the correct location on her first try in 5 seconds. She preferred the West map over the North map. She explained that it was easier because she was actually facing the direction the map was orientated to. Again, she used the streets as reference points to find her location. The final task Ilka performed was to adjust the angle of the map stand to her desirable preference. That information is described in the next task sheet. | |
| Procedure Details | Task 7  
<table>
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<tr>
<td><strong>Situation</strong></td>
<td><strong>Testing Angle: New Route Map</strong></td>
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<td>- creating ideas to understand the interaction between the individual, object, and environment</td>
<td><strong>Evaluation (frameworks)</strong> – what are users Doing, Saying, and Making within the situation.</td>
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<tr>
<td><strong>Tasks</strong></td>
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<tr>
<td>&gt; To adjust the angle of the map to a desired level.</td>
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</table>

Ilka continued the test by adjusting the angle of the map to her preferred level. She adjusted the map to a 45 degree angle to the ground. She explained that this angle is suitable for her to clearly identify the street in front of her without the map causing an obstructed view. The position of the map reminded her of when she goes to the Zoo and looks at the You are Here map. She further explained that this angle would suit well individuals new to the area who need to identify their location based on objects surrounding them. However, she is an experienced user and is very familiar with this area. She prefers to have the map stand at 90 degrees vertical to the ground.
Goal: To Improve the User Experience of the Bus System
Policy B: Improving the Usability of the Route Map

Objective 2B: Route Planning

Policy d:

Involve a user-centered and participatory approach using methods such as observation, interview and task analysis to explore and develop the route planning process and find opportunities for improvement in efficiency and satisfaction.
**Project Goal:** To Improve the User Experience of the Bus System

**Policy B: Improving the Usability of the Route Map**

- **Objective 2B:** ROUTE PLANNING. To create a map that is readable and legible and allows users to easily plan a route trip.
- **Policy d:** Involve a user-centered and participatory approach using methods such as task analysis, observation, and interviews to determine the route planning process and find opportunities for improvement in efficiency and satisfaction.

<table>
<thead>
<tr>
<th>Team</th>
<th>User Types</th>
<th>Situation</th>
<th>Evaluation (frameworks)</th>
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</thead>
<tbody>
<tr>
<td>&gt;Eric</td>
<td>&gt;Riders / Non-riders, and Staff of the Transit System</td>
<td>Creating ideas to understand the interaction between the individual, object, and environment</td>
<td>Lynch’s Wayfinding Characteristics&lt;br&gt;Norman’s Mental Model&lt;br&gt;Kosslyn Memory Model</td>
<td>&gt;Illustrations&lt;br&gt;Maps&lt;br&gt;Time lapse</td>
</tr>
<tr>
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<td>&gt;Color schemes&lt;br&gt;Line attributes&lt;br&gt;Animations</td>
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<td></td>
<td>&gt;Paper&lt;br&gt;Illustration software&lt;br&gt;Map stand&lt;br&gt;Media player</td>
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</table>

**Summary**

**What I want to determine:**
- What steps do users use to route plan with the map?
- What heuristics do experienced users use?
- What is the mental model of Lawrence to various users like?
- What graphical attributes need to be implemented for improved information processing?
What I learned:
> Users read the map based on prior knowledge and experienced riders develop heuristics to lessen the amount of tasks needed to achieve their goals.
Users begin with a goal or destination or reason to be somewhere. Inexperienced riders or users who are unfamiliar with the area, look for identifying markers in the environment that are represented also on the map for a reference point. If they are unable to find a reference point, frustration from disorientation occurs.

Once users have located and/or understand where their destination as it relates to their current position, they determine route planning tasks. Some riders are concerned with times while others may be concerned with the number of transfers that will be used to get to their destination. Users seem to want to develop personal heuristics when route planning. If the signage has legible and visible information that is readable, these heuristics are quicker to develop. However, heuristics might develop due to the complexity and confusion of the information displayed. One experienced user refuses to look at the route map because it’s too complicated. Instead he just looks at the route schedules and finds his stop and destination. Then he determines the route, and time of departure. Another experienced user created her own pocket map with just the routes she uses.

Mental Models
Users perceive the city of Lawrence differently. People will understand more of the city based on their frequency of position in the environment. Mental models are not accurate. They are loosely drawn and represented. Important buildings streets, intersections, repeated paths are remembered. Grocery stores, stores, restaurants, and home residences where places which were referenced a lot. Unfamiliar users may just now the main roads that are driven on to get in and out of town. Some aren’t recalling the names of these streets but recall instead the look of them as they are reinforced by landmarks.

Graphics
Norman’s Interface Model and Kosslyn’s Memory Model are referenced. White on Blue Background along with gray shapes provided an effective color scheme to communicate the information. Routes were given their own number and color. These attributes were consistent throughout the signage system.
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<td>&gt;Riders and Drivers of the Bus System</td>
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<tr>
<td>&gt;Activity</td>
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<tr>
<td>Have users draw their mental model of the City of Lawrence</td>
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The user was asked to think out loud and draw their mental model of the City of Lawrence. The information was recorded though time lapse photography and later created into an animated movie file using Illustrator files.
Goal: To Improve the User Experience of the Bus System
Policy B: Improving the Usability of the Route Map

Objective 3B: Accessibility

Policy e:

Research color blindness. Apply color schemes and visual elements that can discriminate information legibly.
Project Goal: To Improve the User Experience of the Bus System

**Policy B: Improving the Usability of the Route Map**

Objective 3B: ACCESSIBILITY. To design a visual map display that is accessible to the color-vision impaired.

Policy 1: Research color blindness. Apply color schemes and visual elements that can discriminate information easily.

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> Literature Reviews  
> Participatory Design  
> Techniques  
> Think alouds  
> Walkthroughs  
> Tools  
> Internet | > Illustrations  
> Maps  
> Color schemes  
> Line attributes | > Paper  
> Illustration software  
> Map stand |

**<Summary>**

**What I want to determine:**
- What is color blindness?
- Who's affected?
- What are distinguishable color schemes that can be used?
- What graphical attributes need to be implemented.

**What I learned:**
- The most common form of color blindness is red-green.
- Color blindness is a genetic trait.
- 8% males and .05% females are colorblind.
- 99% of the color blind males are red-green.
- Attributes to distinguish color should be applied: pattern, shape, labels, line weight, and color.
- Color should not be used as the sole identifier.
User Based Scenarios
Like every Saturday morning, Melinda and Rosaletta cook breakfast together. They like to spend time with each other before the busy week begins. Today, Melinda was cooking her grandmother’s favorite omelet. While she was mixing the eggs, she caught a glimpse of her grandmother chopping the tomatoes. The tremors in Rosaletta’s hands seemed worse and stronger.

“Rosa. Are you feeling OK? Your hands are trembling.”

“Oh sweetie, I’m fine, really. It’s just your grandmother getting old.”

After breakfast while her concern lingered, Melinda found the number for Dr. Hendrick and placed a call. A week has passed since Dr. Hendrick spoke to Melinda over the phone about Rosaletta’s Parkinson’s disease.

Now, Melinda, who just finished her biology exam, leaves HINU. Rather than walking home as she usually does, she heads to the bus stop. She is excited, yet sad and worried, to visit her grandmother in the hospital.

Melinda
Haskell Indian Nations University student
Age 24

Melinda lives in Lawrence, Kansas. Her mother died when she was 14 and now she stays with her grandmother Rosaletta. She doesn’t know where her father is. He left her mom when she was 8. Melinda has been attending HINU for 4 years and is almost done completing her B.S. in Environmental Science. She has dreams of working for the EPA involving climate change. Her grandma is always supporting her and driving her to succeed.

Like every Saturday morning, Melinda and Rosaletta cook breakfast together. They like to spend time with each other before the busy week begins.

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Now, Melinda, who just finished her biology exam, leaves HINU. Rather than walking home as she usually does, she heads to the bus stop. She is excited, yet sad and worried, to visit her grandmother in the hospital.
Melinda leaves her biology class and heads outside. Just down the drive is the HINU bus stop. She walks toward it and then looks on the map for a route that will take her to the Lawrence Memorial Hospital.
Melinda, an experienced bus rider, knows exactly where she is. She immediately looks at the detail of the HINU route stops. She finds routes with the Hospital stop. Routes 1 and 2 both stop at the Hospital directly. Route 1 will stop will stop their in 5 stops - Route 2 in 6 stops. She waits for Route 1 to arrive.
Melinda identifies the Lawrence Memorial Hospital bus stop and knows she’s arrived at her destination. The entire way here she has been thinking of her grandmother. She gets off the bus and heads to the Main Entrance.
Alvin and Brenda are excited about their new life. They just sold their four bedroom home in Chicago and will be moving to Lawrence, Kansas in a couple of weeks. They heard about Lawrence as being one of the best little places to retire in the Midwest. After a weekend trip to Lawrence last year, they were convinced that this town will be the place where they will live. They were immediately impressed with Lawrence’s history, art, and music scene along with the many quaint shops and restaurants.

Having packed up moving boxes for most of the morning, Alvin and Brenda decided it was time for a break. On the kitchen table, Brenda picks up her travel guide and begins reading where she left off. Alvin finds his unpacked 5 iron and takes a practice swing in the family room.

“Sweetie, not in the house, please! Soon enough you’ll be on the course.
Al, take a look at this.”

She holds up the Lawrence visitor guide and shows him the section on bird watching. “Wow, the Baker Wetlands and Prairie Park Nature Center. Did you pack my binoculars?”

Three weeks have passed. Alvin and Brenda have made the move and are now enjoying retired life in Lawrence, Kansas.

Sitting at an outside cafe on Massachusetts Street, Alvin and Brenda are enjoying a nice Saturday lunch together.

“Are you ready dear?” Brenda asks.

“Chirp, Chirp!” That’s yes in Swallow talk!” Alvin jokes.

The two leave the cafe and walk toward the bus stop across the street. Their journey of bird watching begins.
After having a nice lunch, Alvin and Brenda walk to the Downtown Bus Shelter to catch the bus to the Prairie Park Nature Center. As they approach, they look at the route map to determine which bus they will have to take.
Alvin and Brenda arrive at the map stand. They look out in front of them and see that they are facing Z’s Espresso. They glance at the street sign and realize that they are facing 9th Street. To their right is New Hampshire Street.
Looking back at the map, Alvin and Brenda identify their downtown location. The You ARE HERE marker represents their approximate location. They identify the Prairie Park stop which is south of their current location. The Route 4 connects their starting point to their destination.
Next, Alvin and Brenda read the map details to confirm their location and route planning. They see that they are at the downtown stop facing 9th Street. They identify that all routes come to their stop. They find the Route 4 stop information. They see that the Prairie Park Nature Center is the next direct stop from their location. They see the Route 4 bus approaching and wait to get on.
Brenda sees the sign outside the bus window and smiles. After much anticipation, they have finally arrived at the Praire Park Nature Center.
Carl has been working construction jobs for 35 years. He wasn't fond of school and decided not to attend college after high school. After graduating, he and his best friend took a job tearing down old buildings.

Today, Carl works for a local builder specializing in kitchen renovations. The slow economy has hurt his ability to find work. When Carl is working, his arthritis in his hands slows him down. He worries about his job security and performance.

His wife Judy is concerned about her husband's health as well as the remaining mortgage on their home. She tells him to find another job. Carl is hesitant. He feels his skills are so limited. He doesn't use a computer and is afraid to learn one now at his age.

Carl's face tells all. His eyes are dim, tired looking. His smile is gone. A look of despair remains. He stares at the warm bowl of soup on the dinner table. Judy gets up from her seat and rests her head on his shoulder to comfort him.

"Mike's letting me go. Says he just can't manage to pay me anymore."

Judy embraces her husband. "We'll get through this. We always do," she sighs as she fights away the tears.

Three days have passed since Carl has been unemployed. His sadness in his eyes is hiding behind a look of confidence as he stares himself in the mirror. Judy adjusts his tie. "You look great!" she says smiling.

She walks him to the door and tells him he'll do great at the job fair. She watches her husband walk to the bus stop to catch the bus to Free State High School.
Carl walks down the block to the nearest bus stop. He reads the shelter’s sign which indicates he is at the I-70 Business Center stop on Route 6. Now he must plan his trip to Free State High School.
Carl identifies his location and realizes he is facing East. He looks to plan his route from the I-70 Business Center to Free State. He sees that he will need a transfer because Route 6 doesn't go there.
Carl sees that the next closest transfer point is the Hospital. He waits for the bus to arrive.
Carl arrives at the Lawrence Memorial Hospital. He identifies the Route 1 sign on the bus shelter which will take him to Free State High School. Carl feels confident about his route planning to this point. He walks to the bus shelter and reads the route map.
Looking the map at the Hospital bus stop, Carl quickly identifies his location with a correctly orientated map. He sees the hospital in front of him. He understands he is facing north. Next, he reconfirms his next route to take.
Carl checks the detail of the Hospital Routes. He finds that Free State High School is a stop on Route 1 and 2. Route 1 stops next at Free State. Route 2 arrives at Free State 10 stops later. He doesn't want to arrive late to the job fair, so he waits for Route 1 to arrive.
The bus pulls up to Free State High School. Carl is pleased that his trip went smoothly. He hopes he'll have the same luck on his job interviews.
Appendix

- Final Map and Signage Design  
- New Routes  114 - 195
  - Route 1 - 8 Designs
  - Priority Route Stop Diagrams
  - Proposed Route Transfers
  - Route Priority Matrices
  - Route Priority Graphs
  - Route Stop Matrix Test
- Current System  196 - 210
  - Current System Transfer Matrix
  - Stop Transfers and Travel Times
Final Map and Signage
Looking back at the map, Alvin and Brenda identify their downtown location. The You ARE HERE marker represents their approximate location. They identify the Praire Park stop which is south of their current location. The Route 4 connects their starting point to their destination.
Signage
New Routes

1 2 3 4 5 6 7 8
Route 1