1. Process
2. Analysis
3. Synthesis
4. What’s Next
1. Overview: Research Process

Data Collection

A. Passengers & Drivers Interviews

B. Secondary Research:

Analysis

A. Coding Process

B. Statistical Interpretation

C. Causal Relation Diagram

D. Concept Mapping
Observation → Interview questionnaire → Conducted interviews → Transcribed interviews → Coded interviews

Passengers

Drivers

Analysis
A. Passengers Interviews (Feb 07 -21, 2 weeks)

- 48 interviews on route 422 and 213
- 24 Open-ended questions

<table>
<thead>
<tr>
<th>Transportation Choice &amp; Opinions on Pace service</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How many times do you ride Pace each day?</td>
<td>2. Why do you currently ride Pace?</td>
</tr>
<tr>
<td>4. When do you leave to/from work usually? Does this time change?</td>
<td>5. Do you have a Driver’s License / vehicle?</td>
</tr>
<tr>
<td>7. What’s good and bad about using car?</td>
<td>8. What’s good and bad about the experience of riding Pace?</td>
</tr>
<tr>
<td>9. Which means of transportation do you use most often?</td>
<td>10. Which would you prefer to use most often? Why?</td>
</tr>
<tr>
<td>21. What could Pace do to make your ride more pleasurable?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Information Search &amp; Website Use</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Do you carry a cell phone? Do you plan on getting one in the near future?</td>
<td></td>
</tr>
<tr>
<td>14. Do you use the internet? (Skip to question 17 if they say NO)</td>
<td></td>
</tr>
<tr>
<td>15. Do you use the Pace website? What information do you look for on the website?</td>
<td></td>
</tr>
<tr>
<td>16. Do you go online before catching the Pace?</td>
<td></td>
</tr>
<tr>
<td>17. Have you heard of the WebWatch service?</td>
<td></td>
</tr>
<tr>
<td>20. If you could choose a place to get the Pace time table, where would you prefer to get it?</td>
<td></td>
</tr>
<tr>
<td>□ Pace website □ Bus stop (Shelter) □ On the bus □ Other________________________</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extras</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19. How can we make Pace more visible to our riders?</td>
<td></td>
</tr>
<tr>
<td>22. Have you built any social relationships from riding Pace? If so, who and how?</td>
<td></td>
</tr>
</tbody>
</table>
B. Drivers Interviews (Mar 10-24, 2 weeks)

- 24 Open-ended questions

<table>
<thead>
<tr>
<th>Pace service</th>
<th>What would you like to improve on the route you currently drive?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compared to other routes you've driven (if applicable) which was the best one and why?</td>
</tr>
<tr>
<td></td>
<td>Do you usually follow the route precisely (any detours or personal stops)?</td>
</tr>
<tr>
<td></td>
<td>How do you handle the situation when you are delayed?</td>
</tr>
<tr>
<td></td>
<td>Do you think Pace buses and stops are visible enough to attract more customers?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Passengers</th>
<th>What passengers do on the bus?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What do passengers complain about?</td>
</tr>
<tr>
<td></td>
<td>What do passengers compliment about?</td>
</tr>
<tr>
<td></td>
<td>What kind of questions do passengers often have to ask you about?</td>
</tr>
<tr>
<td></td>
<td>Do the passengers ever seem to feel unsafe? When? Who’s usually riding at that time?</td>
</tr>
<tr>
<td></td>
<td>How long is an average bus ride for a passenger?</td>
</tr>
<tr>
<td></td>
<td>Do you think the current service is satisfying to the passengers? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>Do you think the current time schedule is satisfying to the passengers?</td>
</tr>
<tr>
<td></td>
<td>How would having the bus schedule posted help or not help you?</td>
</tr>
<tr>
<td></td>
<td>How do you handle an upset passenger?</td>
</tr>
<tr>
<td></td>
<td>How often do people “flag down” your bus? Do you like this?</td>
</tr>
<tr>
<td></td>
<td>Does the Flagging Down system create confusion amongst the riders? If yes, then in what ways?</td>
</tr>
<tr>
<td></td>
<td>Do riders usually eat or drink on their ride?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service Environment</th>
<th>What kind of changes have you noticed on your route? (Economy, Population, Riders)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How many people are on your route at its busiest time?</td>
</tr>
<tr>
<td></td>
<td>When and where is the bus usually empty?</td>
</tr>
<tr>
<td></td>
<td>Does ridership change depending on day of week or seasonally? Why?</td>
</tr>
</tbody>
</table>
Institute of Design, IIT IPro - ID582
Communication Design Workshop

Pace Transportation System

Analysis
Analysis Process

- Categorizing Codes
- Statistical Analysis
- Concept Mapping
- Causal Relation Diagram
- Synthesis
Grounded Theory: a methodological approach to generate a theory - concepts & properties - from a corpus of textual data

Example #3: A concept coded with a property and its dimensions

(Use of Pace Service: Frequency – Never | Rarely | Often | Frequently)
Concept Property Dimensions of the property

[Reason for transportation choice]
1. How many times (Use of Pace Service: Frequency – Never | Rarely | Often | Frequently) do you ride Pace each day?
   About 4.

- Where do you take it to? (Mobility) (Destination) (Pace Service: Coverage) (Pace Riding: Range – Near | Middle | Distant)
   All kinds of places, I go to Old Orchard, I go upto Highland Park, I go to Glencoe, Brick Court, Glenview, Evanston, I go to every place a Pace goes.
2. Analysis Methods

Quantifiable Data

Qualitative Data
(Reasons, Concepts, Suggestions)

Bar Graphs

Concept Mapping

Causal Relation Diagram
- About half of them licensed
- A significant portion of non-drivers
- Frequent user of public transportation, half of whom preferred car
- Mostly internet users, but only half of whom are Pace website users
- More than half of whom are cell phone users
- Preferred to get time table on the bus / WebWatch on cell phone

3. Statistical Interpretation
● Concepts & properties connected in causal relations
5. Concept Mapping

21. What could Pace do to make your ride more pleasurable?

*Stay in business, and don’t eliminate any routes.*

Sundays, from Old Orchard, from Wilmette, like they use the new area, The Glens, in Glenview, I think there’s a

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Institute of Design, IIT IPro - ID582
Communication Design Workshop
5.1 Experience Comparison

**Pace Transportation System Analysis**

**COST**
- Items with (-) sign are the opportunity costs, for example, car drivers lose the opportunity to relax.

**CAR-DRIVING**
- Physical
  - Driving
- Mental
- Materialistic
  - Car Parking Fuel
  - Maintenance
  - Risk-taking
- Non-materialistic
  - Time for maintenance
  - Longer commuting time
  - (-) Environment *
  - (-) Relaxing
  - (-) Exercise
  - (-) Time for other activities

**Pace**
- Faster Transportation
- (-) Direct transportation
- (-) Visual, auditory and olfactory privacy
- (-) Control of schedules, directions
- (-) Driving fun

**EFFORT**
- Waiting
- Walking
- Transferring
- Standing in crowded buses
- Adjusting schedules

**Way finding**

**Physical**

**Mental**

**Driving**

**Car Parking Fuel**

**Maintenance**

**Risk-taking**

**Time for maintenance**

**Longer commuting time**

**(-) Environment **

**(-) Relaxing**

**(-) Exercise**

**(-) Time for other activities**

**Driving fun**
A. Interpretation

- Trade-offs: control, privacy | lower cost, responsibility
- Car represents power, control, responsibility
- Pace core competency:
  Provide those who are unable to drive transportation service with low cost / speedy & reliable mobility / good connectivity

B. Design Insights

<table>
<thead>
<tr>
<th>For those unable to drive</th>
<th>Low cost</th>
<th>Speedy &amp; reliable mobility</th>
<th>Good connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• the elderly &amp; disables</td>
<td>- avoid fare increase</td>
<td>• faster transportation for some destinations</td>
<td>• live information for all transportation connections on buses</td>
</tr>
<tr>
<td>- helping drivers</td>
<td>- money-saving opportunities for long-term customers: lottery with Pace monthly pass</td>
<td>- may not be a faster transportation, but provides more productive time in better mood</td>
<td></td>
</tr>
<tr>
<td>- ramp or smaller steps</td>
<td>- consistent travel time at any time of the day</td>
<td>- consistent travel time at any time of the day</td>
<td></td>
</tr>
<tr>
<td>- porter for their shopping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• the drunk</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- connecting drinking places</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
5.2 Pace Service Improvement

### SERVICE (13)
- Frequency: increase
- Routes: maintain, add, weekends
- Reliability: night schedule

### FLEET (8)
- Maintenance: cleanliness
- Age: old-new ok
- Bus Size: relative to time & route
- Seats: hand holds
- TV Bus: like - dislike

### DRIVERS (8)
- Drive: safely
- Schedule: keep
- Attitude: friendly/not

### PASSENGERS (6)
- Aid: disabled
- Activities: TV, read, sleep, music
- Schedule: present
- Shelter

### Technical
- Dream: door to door delivery

### Social
- Riding
- Waiting

### Accident investigation
A. Interpretation

- On-the-road activities need balancing
- Sense of control, privacy, protection, and convenience

B. Design Insights

<table>
<thead>
<tr>
<th>Sense of control</th>
<th>Sense of privacy</th>
<th>Sense of protection</th>
<th>Convenience</th>
</tr>
</thead>
<tbody>
<tr>
<td>- flagging</td>
<td>- vending machine for food that's not distracting</td>
<td>- shelters: managed by business associates (coffee, newsstand, ...)</td>
<td>- ticket vending machine on the bus</td>
</tr>
<tr>
<td>- door to door</td>
<td>- organized news papers</td>
<td>- shelter design by art students</td>
<td></td>
</tr>
<tr>
<td>- call buses to pick up</td>
<td>- restroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- customization of services</td>
<td>- family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(volume control, speakers @ chairs, massage chair with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on/off switch)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.2 Pace Service Improvement
5.3 Information & Communication

ADVERTISING
- General Awareness
- TV Ads
- Brand Service Scope
- Pot Holes
- Road Bumps

ROUTE IDENTIFICATION
- Bus Stop Signs
- Flagging
- Connections
- Schedules
- Real-time Bus Info
- Weather-barrier Seats

INFORMATION
- Pace Plans/Proposals
- Multimedia (paper, online)
- Maps
- Connections
- Schedules
- Detailed Real-time
- No TV on Bus
- Public
- Private/Custom

Pace Transportation System Analysis
5.3 Information & Communication

Pace Transportation System Analysis

Internet
- Accesible
- High to Moderate Use
- Not Accesible
- No Use

Pace Website
- Schedule
- Map
- Route/Location
- Job
- Used: Frequently - Infrequently

USE (12)
DON'T (4)

USE (13)
DON'T (4)

HAVE (27)
DON'T (10)

High Accessibility
- Internet
- Too costly

Cell
A. Interpretation

- Accessible & immediate information for ‘when & where’ to ride
- Media & location choices for information

B. Design Insights

<table>
<thead>
<tr>
<th>Immediate &amp; convergent information</th>
</tr>
</thead>
<tbody>
<tr>
<td>- InfoCenter of the whole system on the bus</td>
</tr>
<tr>
<td>- Info call on the bus</td>
</tr>
<tr>
<td>(have button to speak with operator to ask info)</td>
</tr>
</tbody>
</table>

+ more ideas…
• Drivers interviews
• Synthesis: research – design idea matching up

<table>
<thead>
<tr>
<th>Design Ideas</th>
<th>Quotations from interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMART CARD + TABLET</td>
<td>. Do you use the Internet? (Skip to question 17 if they say NO)</td>
</tr>
<tr>
<td>(Basu)</td>
<td>Um, occasionally, if I'm ah, looking for like &gt;movie&lt; times, or, uh, uh, looking</td>
</tr>
<tr>
<td></td>
<td>. How can we make Pace more visible to our riders?</td>
</tr>
<tr>
<td></td>
<td>Ugh..maybe have more routes around...and internet is good, &gt;tv&lt;.(f_422)</td>
</tr>
<tr>
<td></td>
<td>. Do you access in the new buses you have &gt;TV&lt; and all.</td>
</tr>
<tr>
<td></td>
<td>I have seen it, I don't even pay attention to the TV and all.(f_213_codedInter)</td>
</tr>
<tr>
<td></td>
<td>. What could Pace do to make your ride more pleasurable?</td>
</tr>
<tr>
<td></td>
<td>Nothing. I don't really like the small new buses though the ones with the &gt;</td>
</tr>
<tr>
<td></td>
<td>. How about the inside of the bus? I like the ones with the &gt;TV&lt; and the cu</td>
</tr>
<tr>
<td></td>
<td>. So, it's schedule issues. How about the inside of the bus? Do you prefer the</td>
</tr>
<tr>
<td></td>
<td>No, those busses are too small for seven o'clock. This one older is fine. But</td>
</tr>
<tr>
<td></td>
<td>. They should take out the television sets... They are useless....They dish</td>
</tr>
<tr>
<td></td>
<td>Somebody is... I don't even know what they're selling. I hate them. I don't like</td>
</tr>
<tr>
<td></td>
<td>. What could Pace do to make your ride more pleasurable?</td>
</tr>
<tr>
<td></td>
<td>Turn on tv's; they play only commercials. The &gt;noise&lt; is annoying, especially</td>
</tr>
</tbody>
</table>
Pace Transportation System

Synthesis

Company - Pace ERA Analysis - Pace Possible Things to
- Evidence Map - Precursors (what was left)
- ERA Analysis/ trends - Characteristic of transportation
- User Profile of Bus Riders/Car Users
- Pace Operating Analysis - refs System analysis
- Chicago System analysis - Technology Analysis
- Bus as visual - Tracking/Seek
- Competitive Analysis i.e. Pace vs. Metra

Big Culture Change

Public Education

Disincentive Fuel Tax

User Experience

Network

Infrastructure Adaptation Sys

PRO SHAPE CHAIN SHAPE AIR SHIPS MAKE MONEY

Incentives

Frequent Rider

Small

INFO STRUCTURE WEBSITE

Expanded Services

More Routes

More Times per Day

180°
International

Use icons and multiple languages in signage, brochures, and other materials to reflect the linguistic diversity of PACE riders

Advertising

• Explicitly state acceptance of CTA cards
• More robust but silent television commercials
• Ads on Google for Pace
• Ads on Pace for Google
Numbers
Reduce confusion by using distinct and descriptive route names (213a and 213b instead of 213 and 213; 422 Lake instead of 422)

Redesign schedules
More intuitive design and formatting of paper and online schedules
Ticker tape display system
Real time arrival and departure information at all bus stops and CTA stations

Brand Communication
Promote Pace as a
• People-friendly transportation system
• Environmentally friendly system
Friendly Endorsements
Endorsements from current Pace riders displayed in various locations

Publicizing Interests
Advertising routes people can take to fairs, concerts and other local destinations of interest
Rider Feedback

On-the-bus drop boxes where riders can deposit new ideas, compliments and suggestions — non-anonymous riders would automatically be entered into contests for free ticket vouchers and other prizes

Map on the Bus

Graphic representations of the bus route posted on the bus
Paper Media Bank
Supply magazines and newspapers to riders for their enjoyment

Informational Brochures
Provide general information about the Pace system in one concise brochure
**Transfers**
Greater transfer flexibility on Pace and with other Chicago transportation.

**Rewards**
Give coupons to good citizens and frequent riders (frequent rider miles)

**Expanded service**
Increase the number of routes and times on Sundays

**Bus on Demand**
Provide door to door service
Shopping Services
Create routes tailored for weekend shoppers and provide space on the bus for their purchases

Route Frequency
Vary the frequency of buses on particular routes during rush hour and other pre-determined times

Tickets
Charge less money for a shorter distance

Cleanliness
Keep buses clean
Music
Provide music channels on the bus, accessible to anyone with headphones and preemptible by the bus PA system

Route Customization
When a bus driver is able, deviate from the scripted route to better suit the needs of the rider (e.g., drop passengers at their homes at the end of a shift when the bus is otherwise empty)

Safety Walkers
Provide as a service an escort to walk people to their front doors, scheduled ahead of time
Better Seats
Add tables to chair backs and make seats more comfortable

Bathrooms
Provide for “bio breaks” either on the bus or at stops

Different Sized Units
Provide smaller units for more sparse routes and larger buses on busy routes
Shelters
• Provide heat
• Provide more comfortable seats
• Add more Pace information at each shelter
• Develop multiple designs for shelters

Kiosks at Major Transfer Points
• Install kiosks at major transfer points
• Provide route information
• Provide smart card that remembers route preferences
  • doubles as RFID transit card
  • allows Pace to monitor route usage
• Emphasize landmarks and events on relevant routes
Suburban Landmark-Based Trip Planning

Apply to web-based trip planner
Highlight landmarks on paper schedule/route maps
Advertise suburban attractions as destinations outside the city
• negotiating with attractions to subsidize
• loss of money from Pace/CTA connection

Connections
Provide electrical sockets and wireless connections
Vending
Sell coffee and snacks at bus stops as well as headphones, ear plugs and digital content at stops or on the bus

Smart Card + Tablet
interface at the back of each seat with both generic and personal mode to process orders, provide information, entertain, and connect

Smart Card + Pace Database + Direct Mail System
Smart Card access to Personalize Database
Process Orders
Ticket / Monthly / Bulk Ticket pass Purchase Point
Take user input for route preferences
Take user opinion on PACE services

Provide Information
Generic
schedule, routes, transit info
city / suburban events and activities

Personal
read and prompt user’s account info
inform mileage earned and special deals
inform special event that the user might be interested in
Entertain
“Neighborhood at a glance” calendar of events and:
• Local and national news
• Games and Features

Connect
Connect local businesses and community by creating a network with local retailers and service providers
• Offer a database of service providers and retailers with updated promotional information to the customers
• Offer pick up and delivery services on special buses
Single Seats
If space allows, have more single bus seats available for passengers

Spotless Shelters
Keep shelters impeccably clean and therefore more inviting
Bus Only Lane / Carpool Lanes
Create a special lane for busses in order to avoid the delays due to traffic, providing timely service

Customer Appreciation Day
On occasional customer appreciation days, prepackaged snacks would be handed out to riders, free tickets for future use could be given, or coupons from local businesses. This would be geared towards all riders, regardless if they were frequent riders or not.

Local Business Affiliation
Link up with local businesses and hand out coupons to be redeemed by riders at their establishment. This can be done during Customer Appreciation Days, to frequent riders, or to random riders.
Taxes/incentives/smart power
  tax credits for using Pace
  city taxes subsidizing Pace, lowering fares
  corporation involvement
  tax-exempt payroll deduction for Pace fare

Frequent rider/buyer benefits
  Tax gas to retrofit the bus fleet to be more energy efficient and green.

TiVo
  Add TiVo to buses
Drivers’ view points, tying back to our analysis & synthesis process....