CS 171 - Visualization

CrashCaster

Staying Safe in Cambridge

Project Redesign

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Innovative Solution

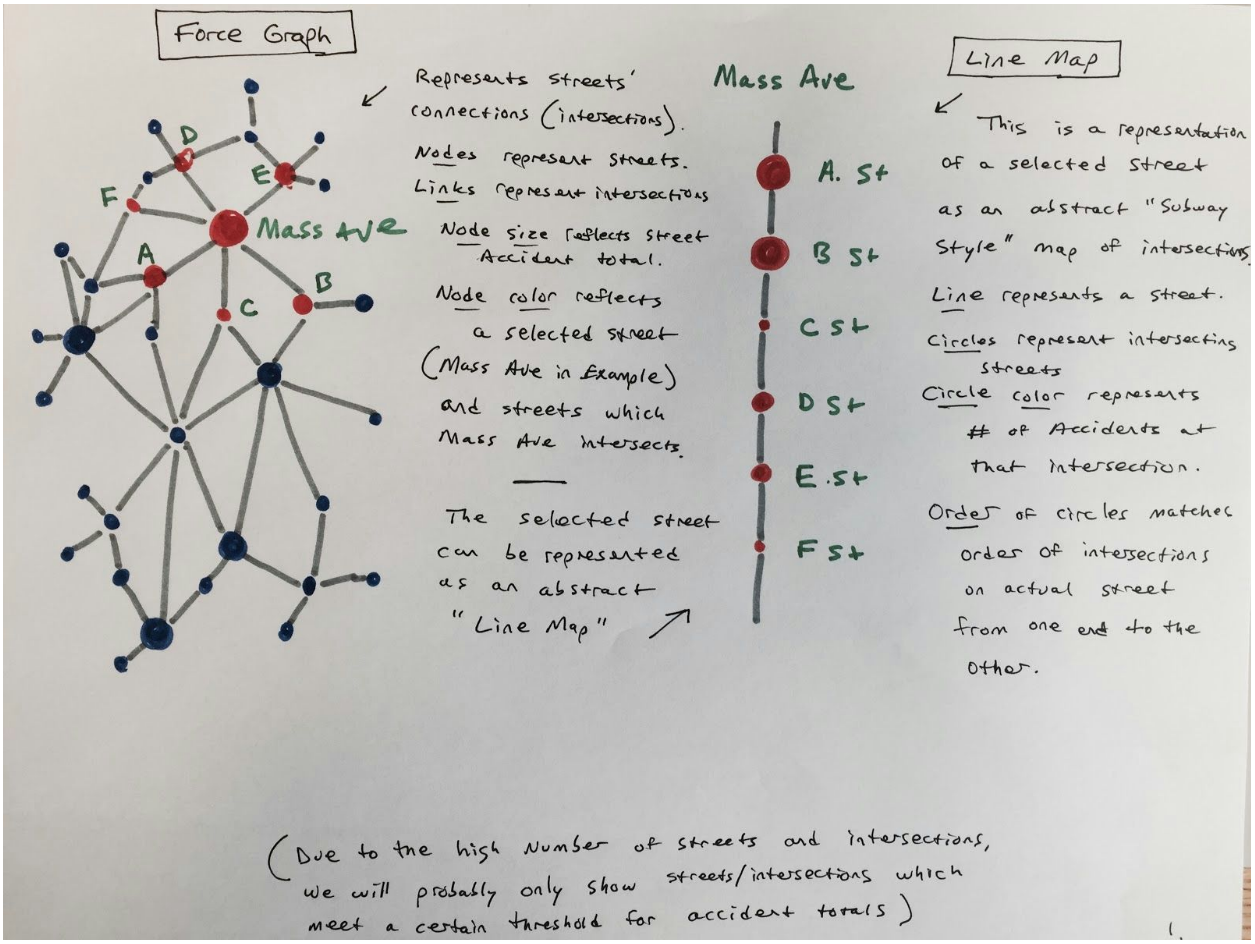
Weakness:

A weakness we identified in our designs is an *overreliance on a map* for representing our key data. While we still feel a map visualization is critical to our project, we also felt the need to create visualizations that do not rely as heavily on the geographic nature of our dataset. We also recognize that the amount of data shown on the map can become overwhelming, and although it is great for seeing overall trends it may not be useful for identifying issues on particular streets.

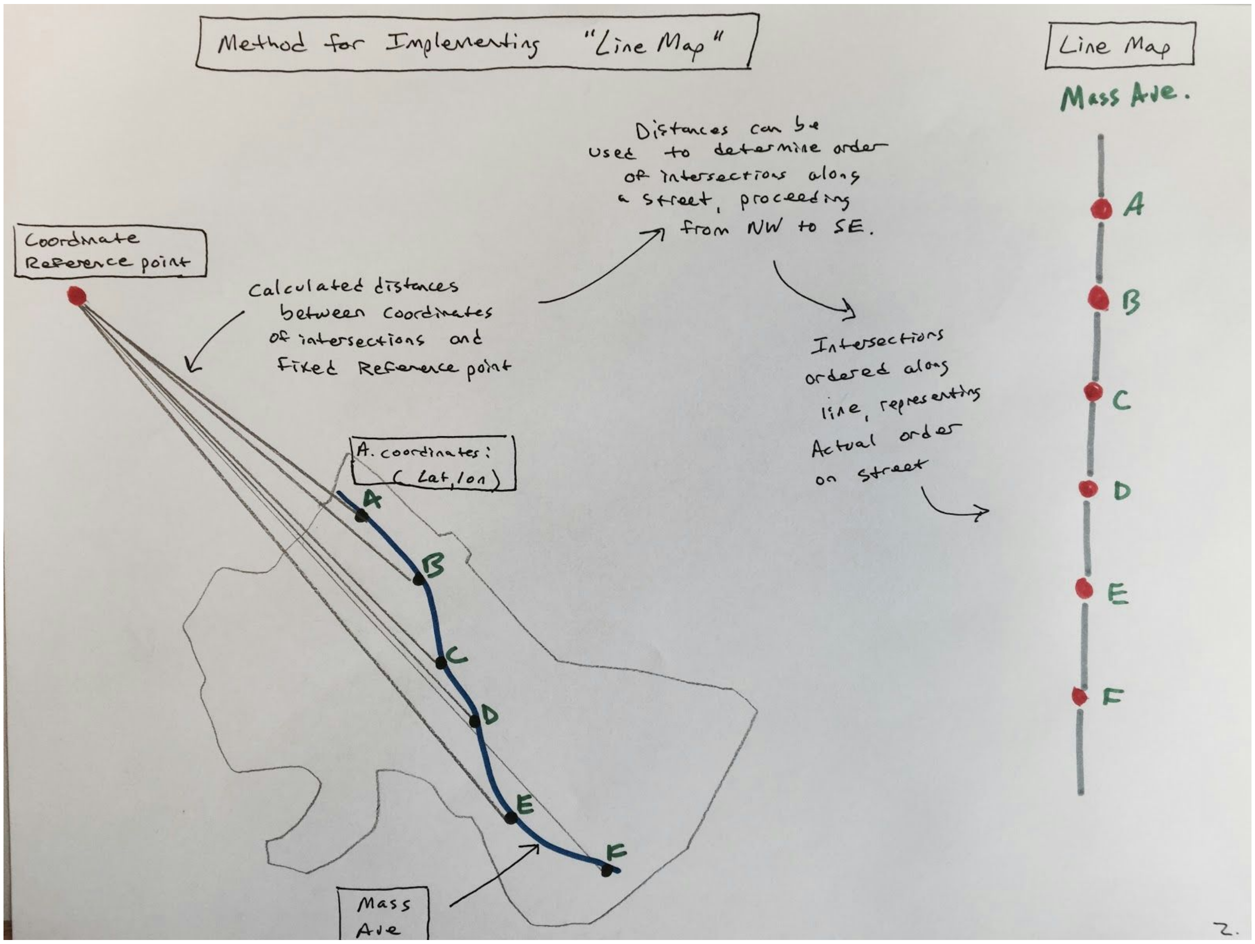
Solution:

Thinking about the question “how do you represent geographic data without a map”, we designed a set of visualizations to support the map and other visualizations which focusses on particular streets and their intersections, without representing their exact geographic location. For representing a street we will use what we’re calling a “Line Map” which is an abstract, subway style diagram, of a particular street and it’s major intersections. The street itself will be represented by a line, while the intersections will be represented by circles along this line, positioned in order of their actual ordering on the street. (This ordering will be determined dynamically by calculating each intersection’s distance to a fixed reference point outside cambridge, using lat/lon coordinates). The circle sizes would represent accident numbers for those intersections. This visualization would answer the question “If I’m driving along a particular street, which intersections are the most dangerous?”. By removing the exact geographic data but retaining order we achieve a visualization that simply and effectively answers this question. The second related visualization is a force graph in which the nodes represent streets and the links represent intersections between streets. Node size would represent total accidents for that street. This visualization would be linked to the Line Map so that a selected node(street) on the Force Graph would create/update an adjacent Line Map.

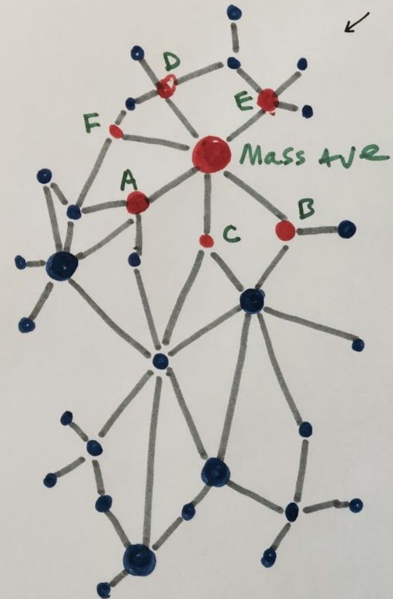
Sketches:



Force Graph
Represents streets' connections (intersections).
Nodes represent streets.
Links represent intersections
Node size reflects street Accident total.
Node color reflects a selected street (Mass Ave in Example) and streets which Mass Ave intersects.
The selected street can be represented as an abstract "Line Map"
Mass Ave
D
E
F
A
B
C
Mass Ave
A. St
B St
C St
D St
E St
F St
Line Map
This is a representation of a selected street as an abstract "Subway Style" map of intersections.
Line represents a street.
Circles represent intersecting streets
Circle color represents # of Accidents at that intersection.
Order of circles matches order of intersections on actual street from one end to the other.
(Due to the high Number of streets and intersections, we will probably only show streets/intersections which meet a certain threshold for accident totals)


Method for Implementing "Line Map"
Line Map
Mass Ave.
Coordinate Reference point
Calculated distances between coordinates of intersections and Fixed Reference point
Distances can be used to determine order of intersections along a street, proceeding from NW to SE.
Intersections ordered along line, representing Actual order on street
A. coordinates: (Lat, lon)
A
B
C
D
E
F
Mass Ave
2.

Force Graph



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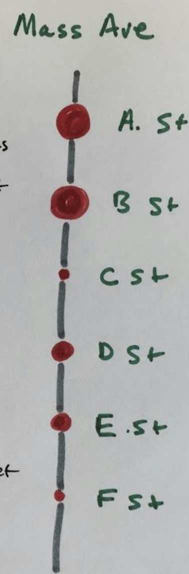

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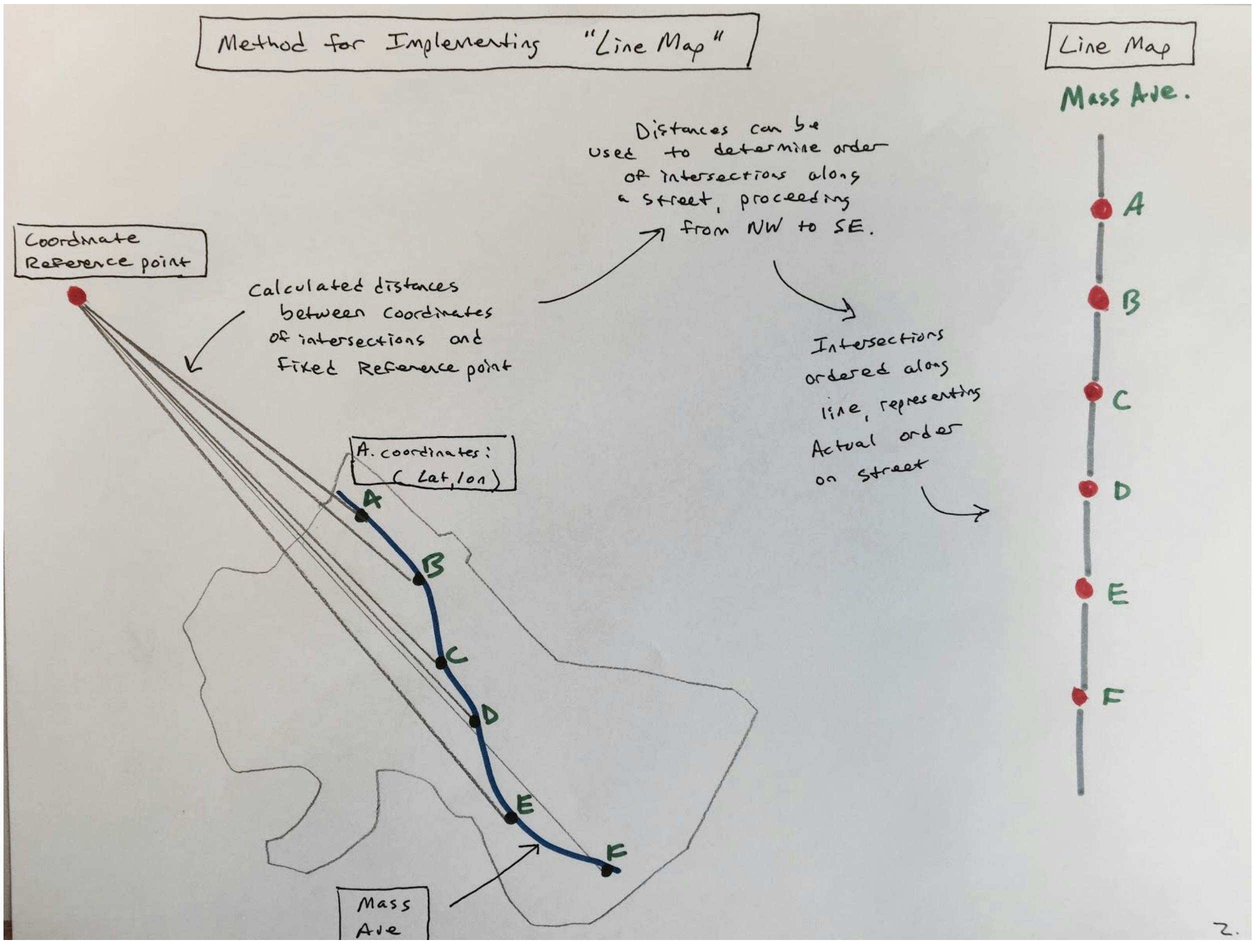
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Line Map
Mass Ave.
A
B
C
D
E
F
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A. coordinates: (Lat, lon)
Mass Ave
2.

Feedback Integration

Weakness:

As part of our peer feedback we received we found that there was some weakness in the *transition points* of our design. Particularly the lead-in to the “Visual Tour” and helping lower cognitive load as the user traverses the key visual points we are driving them through.

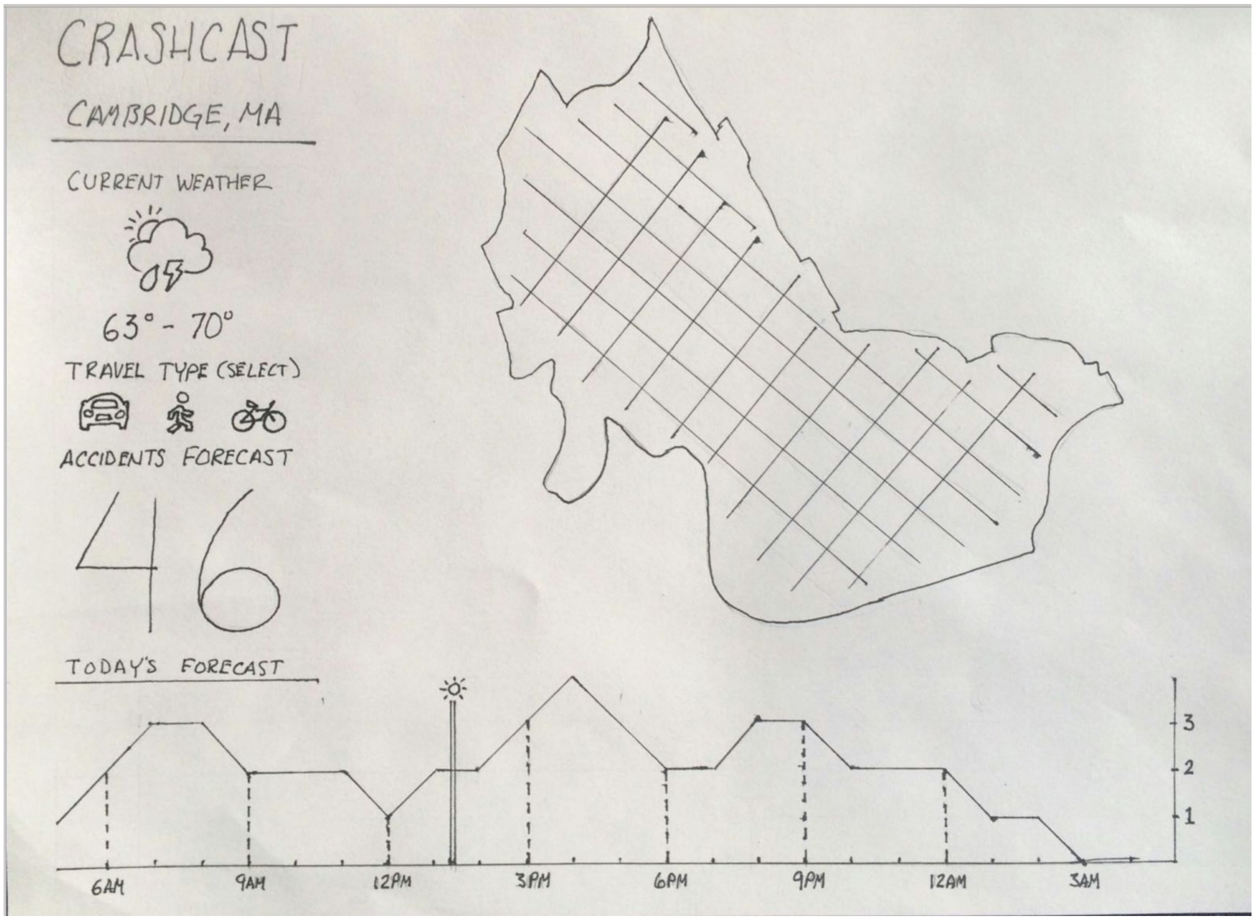
Solution:

As a result, we have modified our flow and simplified the initial design points to enable the user to acclimate to the capability and story we are trying to drive.

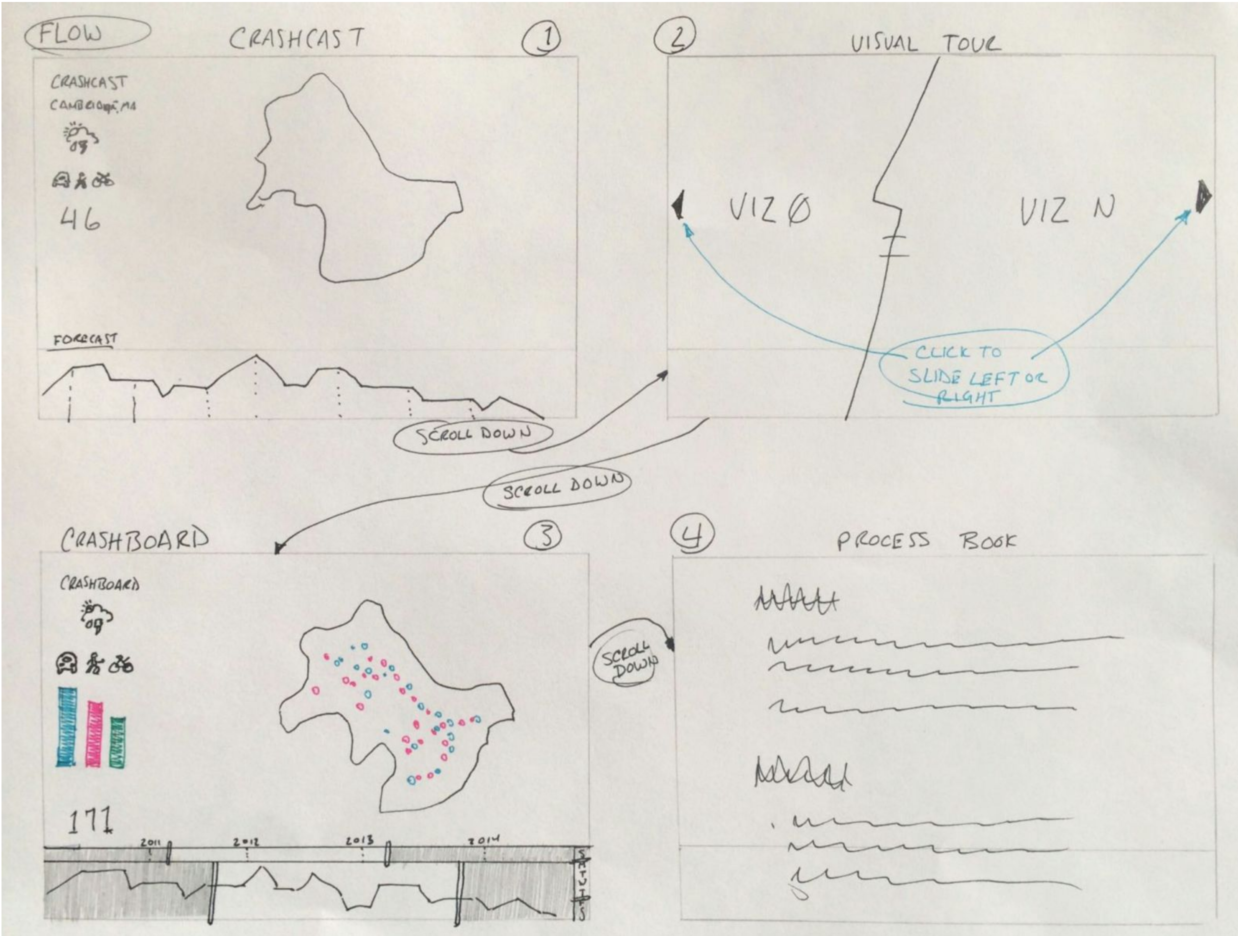
- We have simplified the “Crashcast” forecast landing page to be less interactive; but,more informative on the key points the forecast is trying to assist the user with.
- We then transition the user to the introductory storytelling elements, then build those in stages to the conclusion of the story we want to tell.
- We then transition the user to the “Crashboard” which gives them the full interactive experience as shown in our “Crashcast” Analytics view previously.

Sketches:

Simplified “Crashcast” landing page



Redesigned page flow from "Crashcast" landing page through "Visual Tour" through "Crashboard" followed by the "Process Book".


FLOW
CRASHCAST
1
CRASHCAST
CAMBRIDGE, MA
46
FORECAST
SCROLL DOWN
2
VISUAL TOUR
VIZ Ø
VIZ N
CLICK TO SLIDE LEFT OR RIGHT
SCROLL DOWN
CRASHBOARD
3
CRASHBOARD
171
2011
2012
2013
2014
SCROLL DOWN
4
PROCESS BOOK