The iCity Urban Informatics for Sustainable Metropolitan Growth

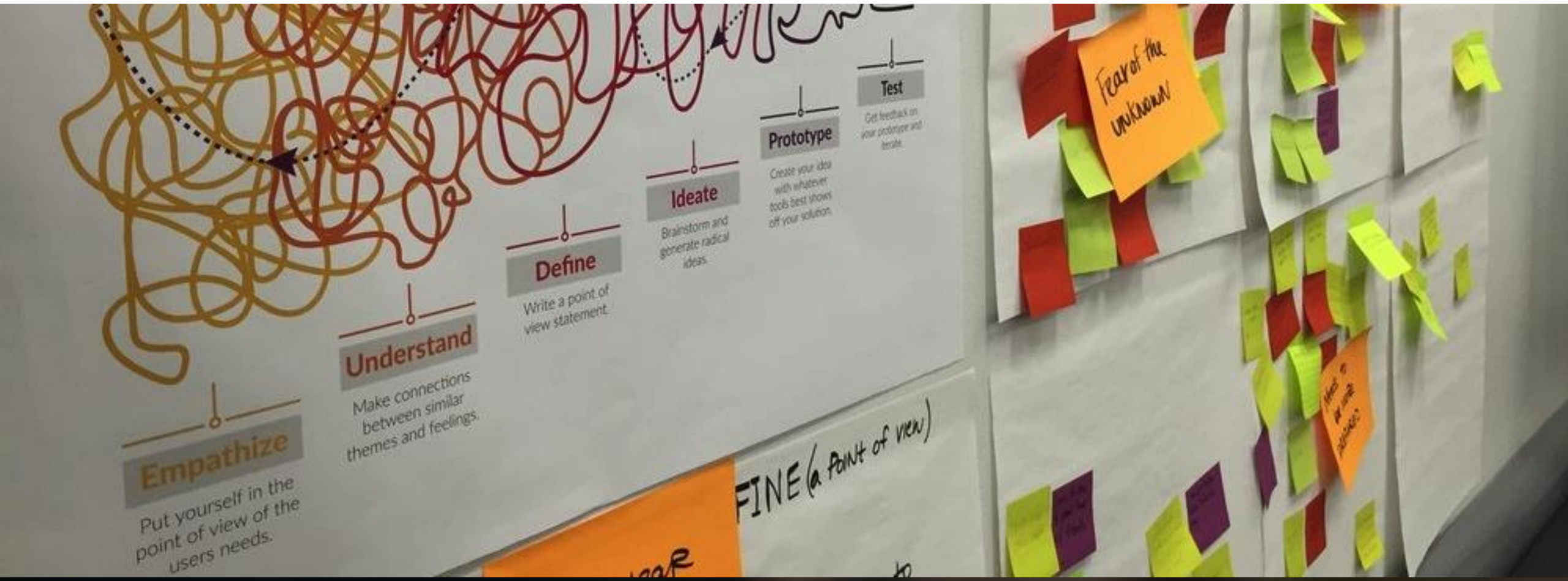
Software Tool Design Charrette (Workshop)

Visualization, Analysis, and Decision Support Technology for Urban Transport: The Next Generation

Theme 3 Data Visualization and Decision Support Team,

led by Sara Diamond, OCAD University

June 7, 2017 1-5 PM



Design Charrette

iCity Theme 3.2 *June 2017*

Workshop / Charrette Activity Agenda

(4 hour time frame) **June 07/2017, 1:00 - 5:00 pm, GB202**

Design Charrette

Introduction

Design Charrette

Introductions: *(15 min., 1:00-1:15 pm)*

Overview of program of activities and workshop process, principles

Initial group allocation, mixed group approach

Explain Activity 1/2/3 sequence:

Activity 1: verify requirements and prioritize use cases

Activity 2: sketch/wireframe tools in the context of use cases

Activity 3: preliminary technology identification and roadmapping, including timeline

Design Charrette

Groups:

COMPLETE STREETS and Parking:

(Matt Roorda, Paul Hess, Sina Bahrami, Megan Katsumi, University of Toronto, David Kossowsky, ESRI Canada, Aaron Barter, Waterfront Toronto, Niki Siabanis, City of Toronto, Dan Sinai, IBM, Jeremy Bowes, Manpreet Juneja, OCAD U)

ILUTE/TASHA Travel Modeling Group

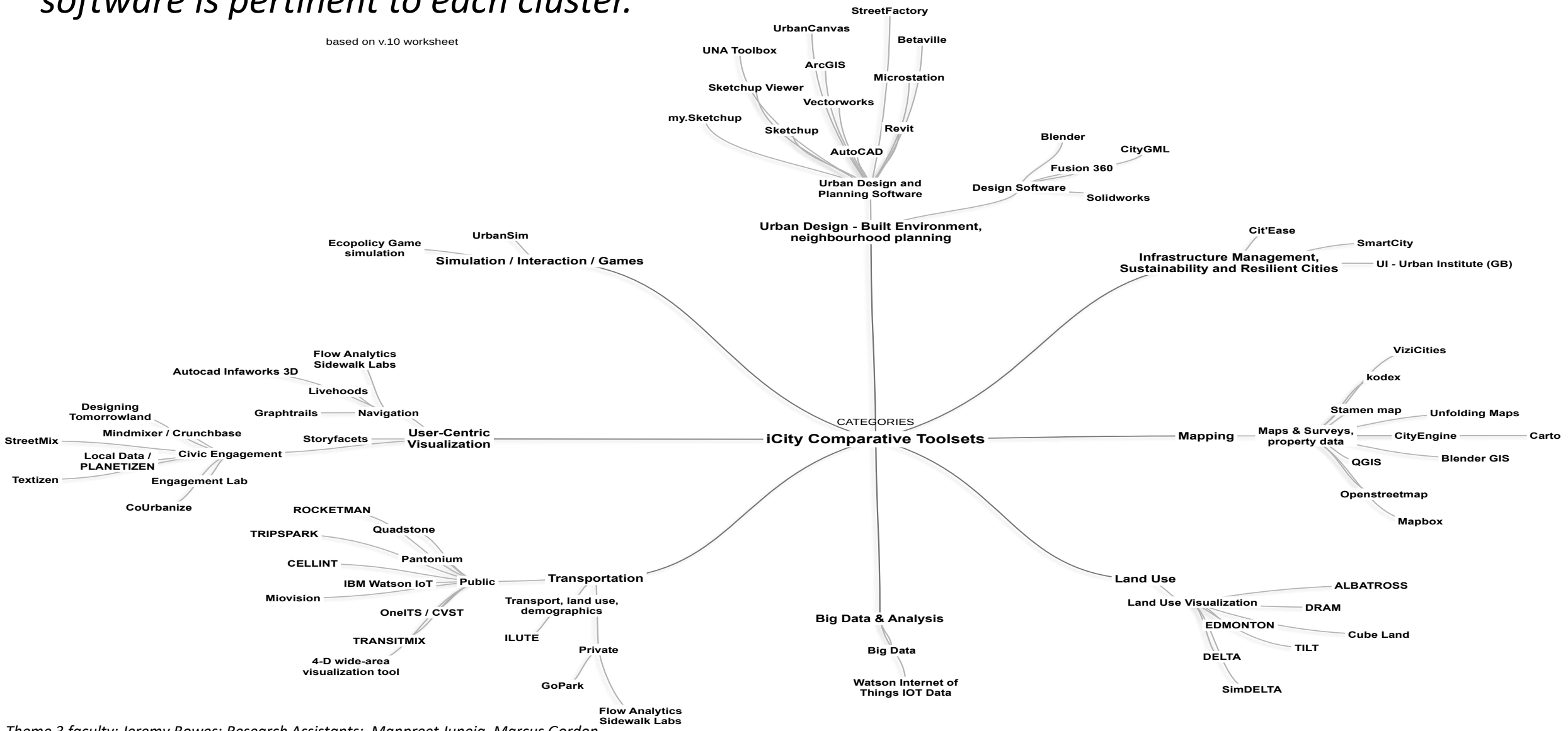
(Eric Miller, James Vaughan, Mark Fox, University of Toronto, Michael Luubert, ESRI Canada, Karel Vrdenberg, IBM, Steve Easterbrook, Sara Diamond, Carl Skelton, Davidson Zheng, OCAD U)

TRAFFIC & TRANSIT Management:

(Baher Abdulhai, Mohammed Elshenawy, Amer Shalaby, Ehab Diab, Ahmed, Siva Srikukenthiran, University of Toronto, Brent Hall, ESRI Canada, Fahad Khan, David Kuperman, James Pertula, City of Toronto, Marcelus Minden, IBM representative, Marcus Gordon, Michael Carnevale, OCAD U)

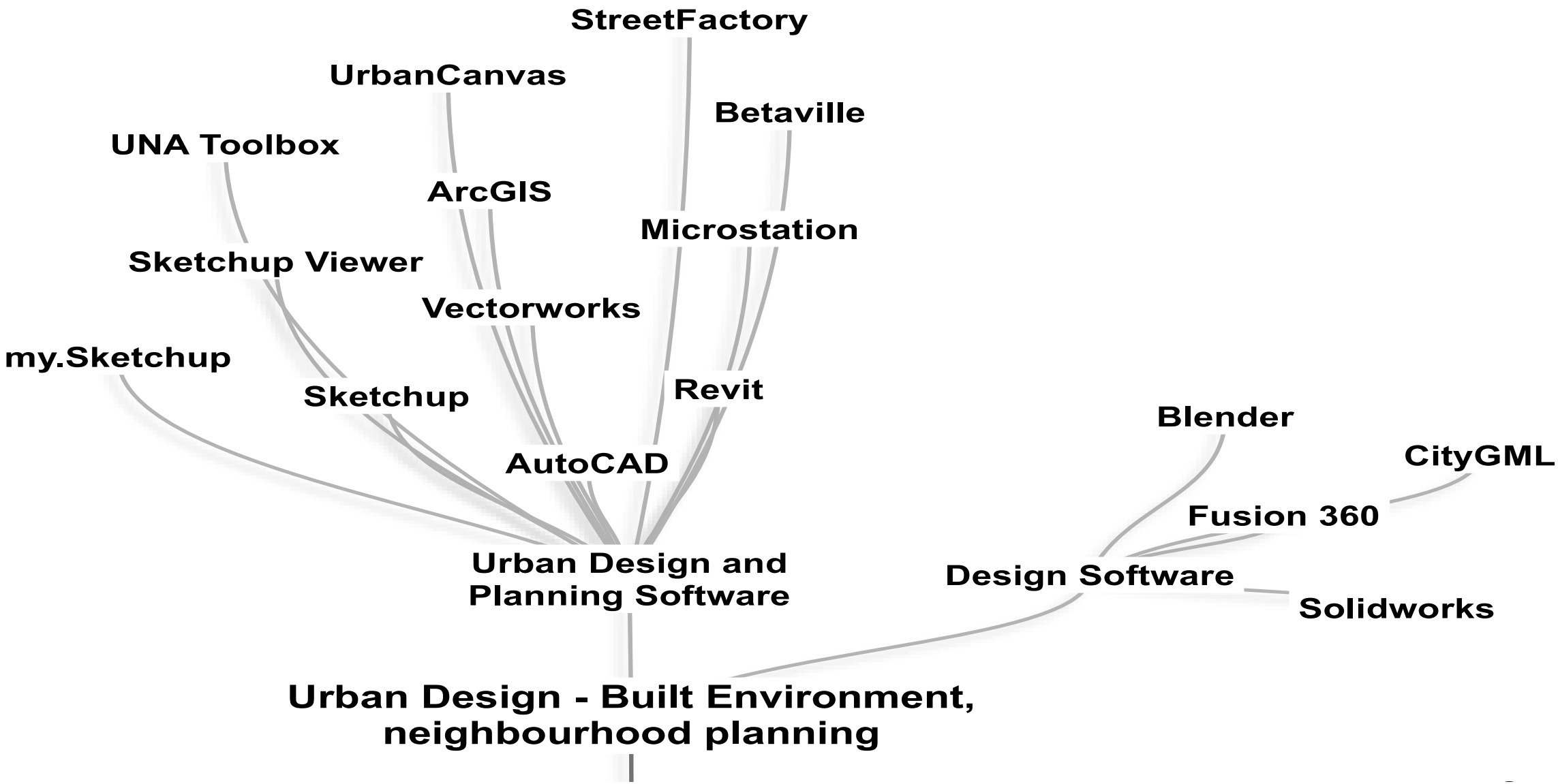
Overview of Comparative Tools & Visualization Types

Intro to comparative mindmap that display visual functionality, and screen capture of what software is pertinent to each cluster.



Theme 3 faculty: Jeremy Bowes; Research Assistants: Manpreet Juneja, Marcus Gordon.

Comparative Toolsets



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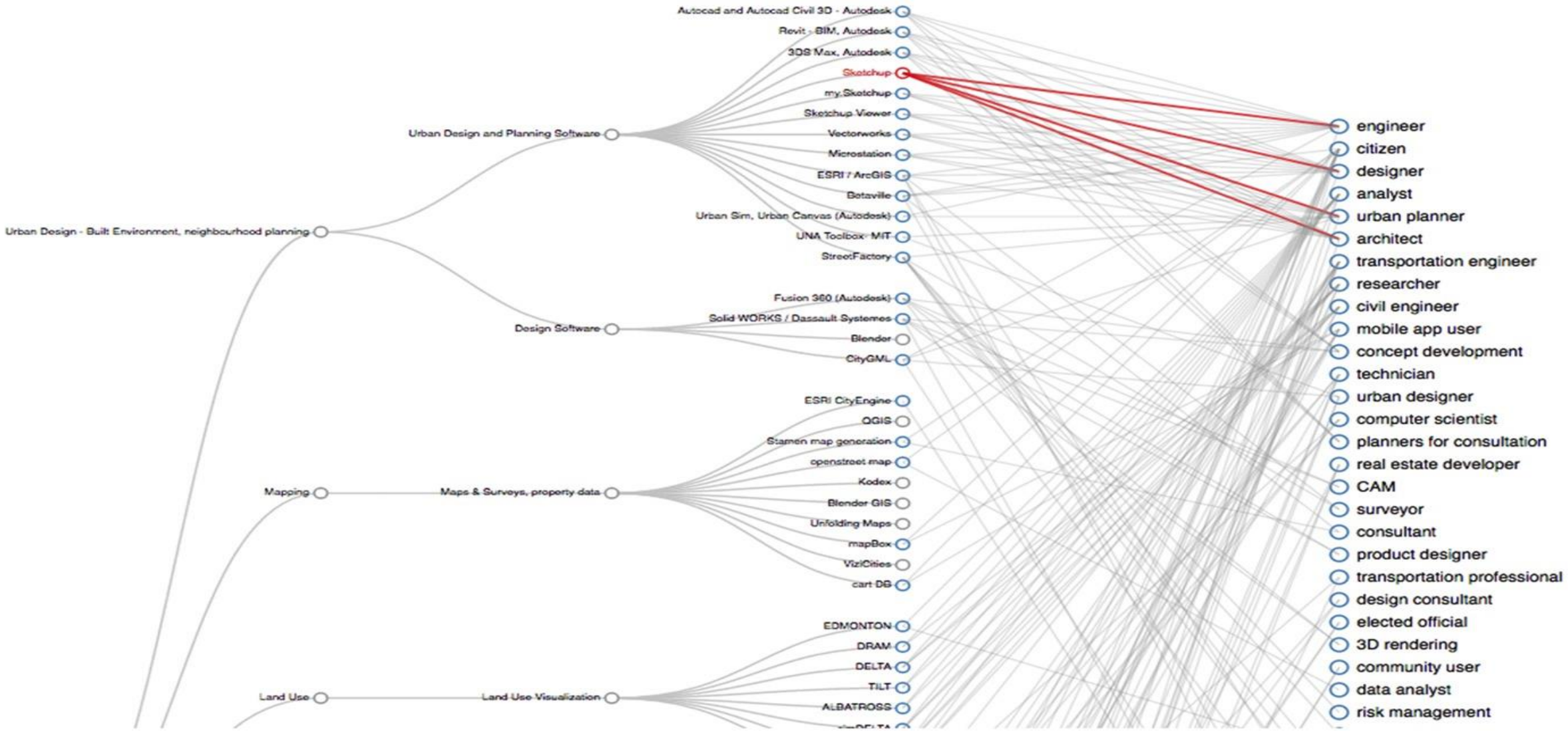
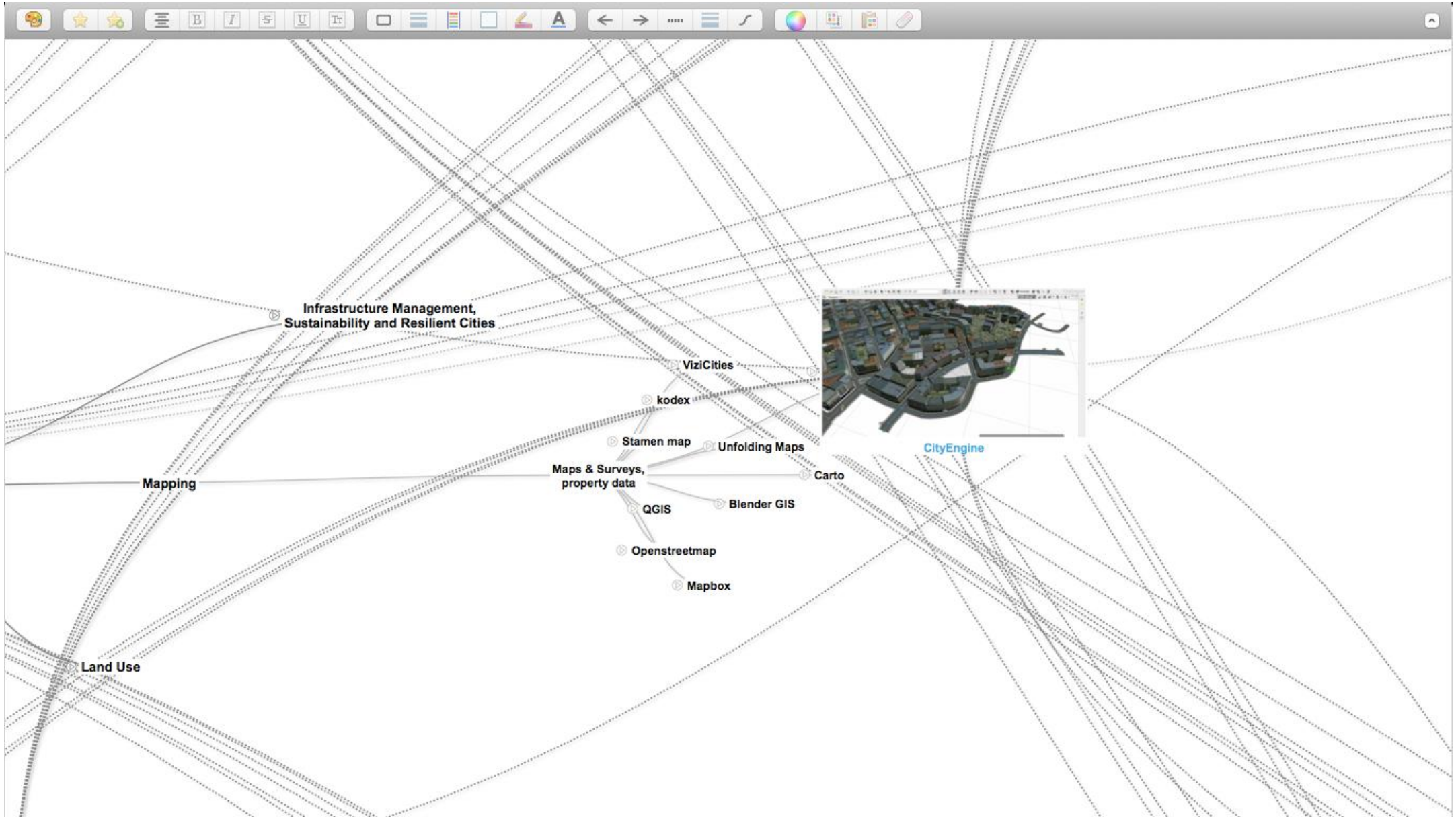
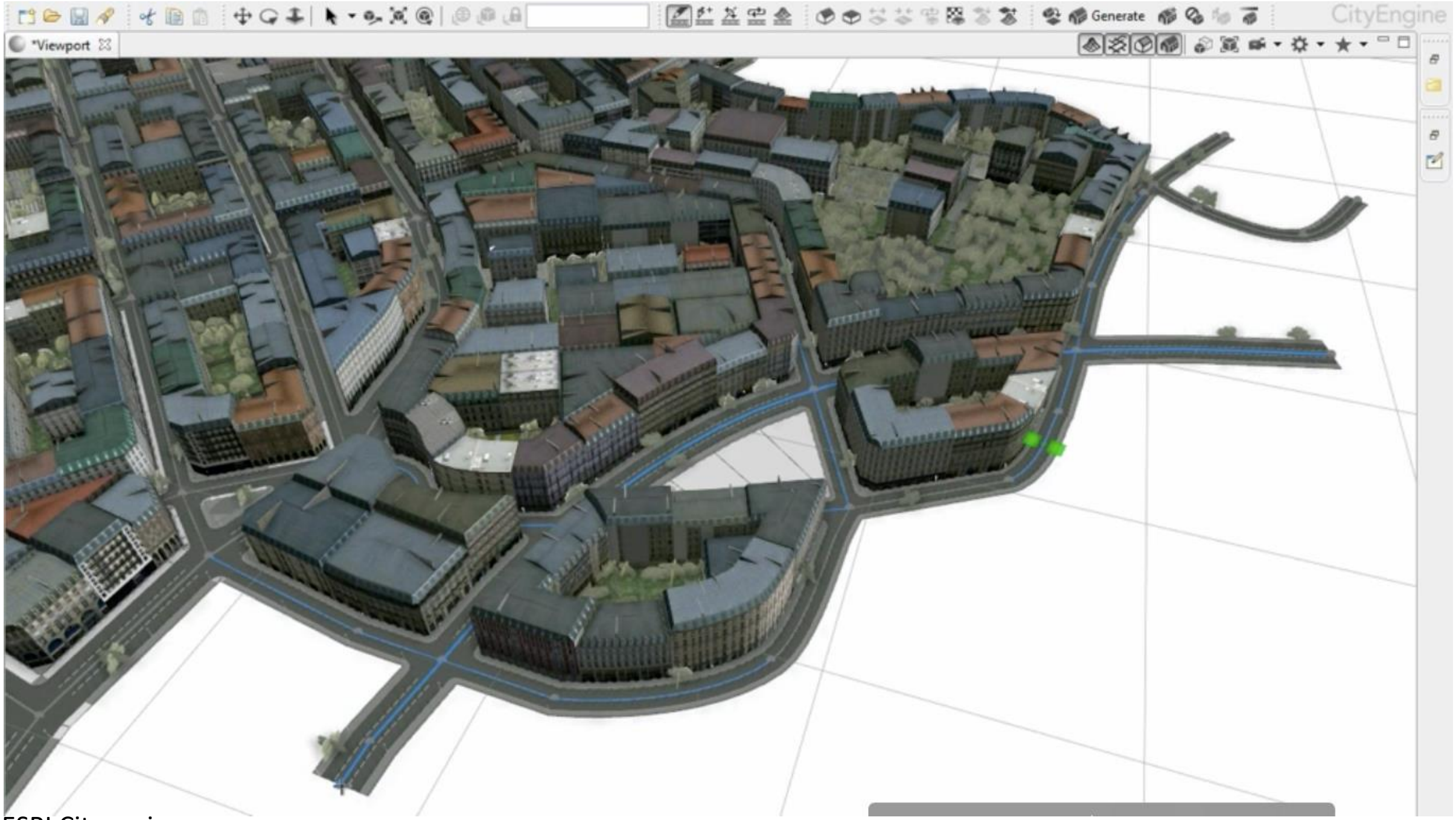
Comparative Toolsets



Complete Streets - Comparative Toolsets



Theme 3 Research Assistant: Marcus Gordon.



ESRI Cityengine

UNA Toolbox

ArcGIS

Microstation

Sketchup Viewer

AutoCAD

3ds max

Vectorworks

my.Sketchup

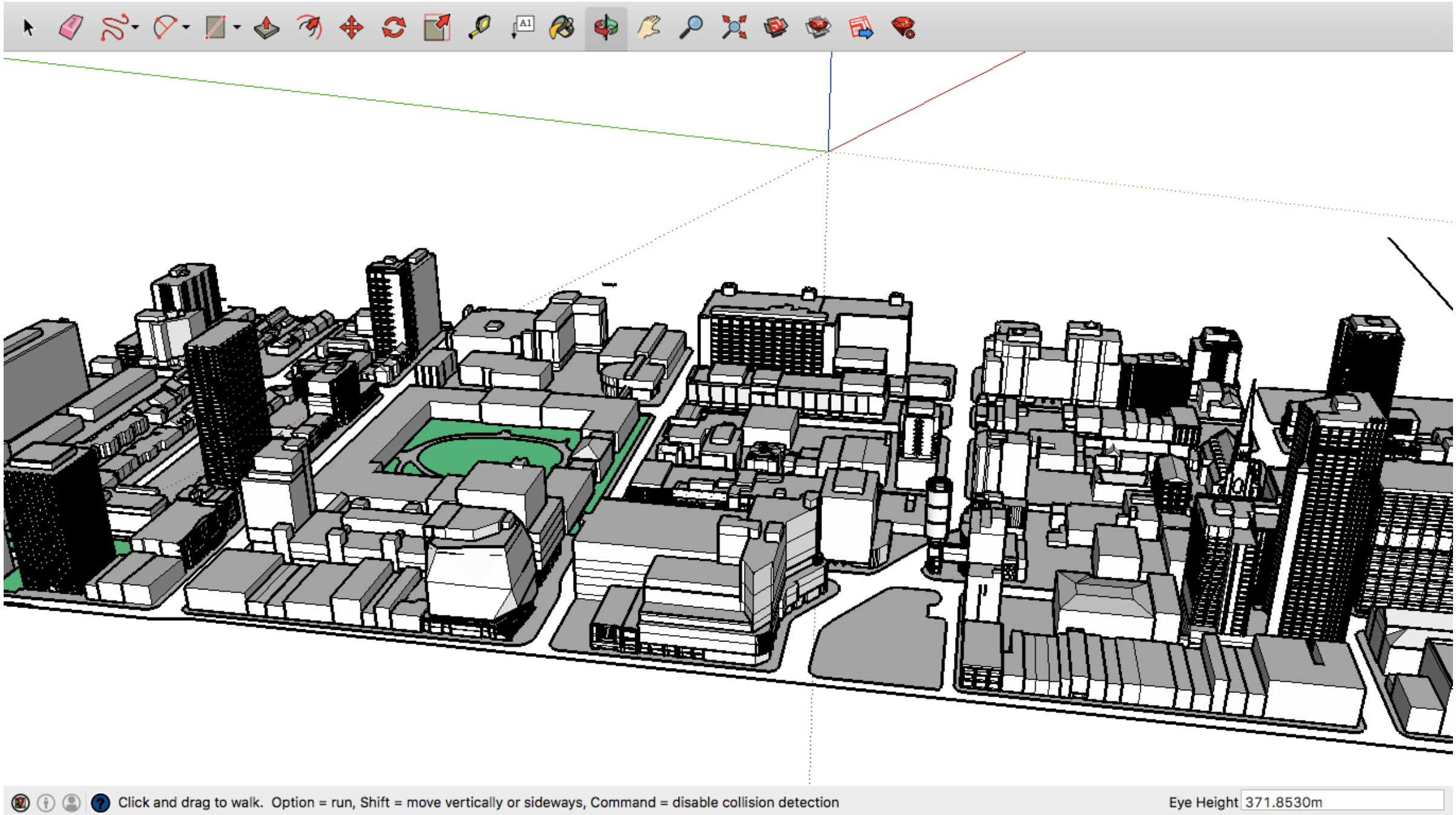
Revit

Sketchup

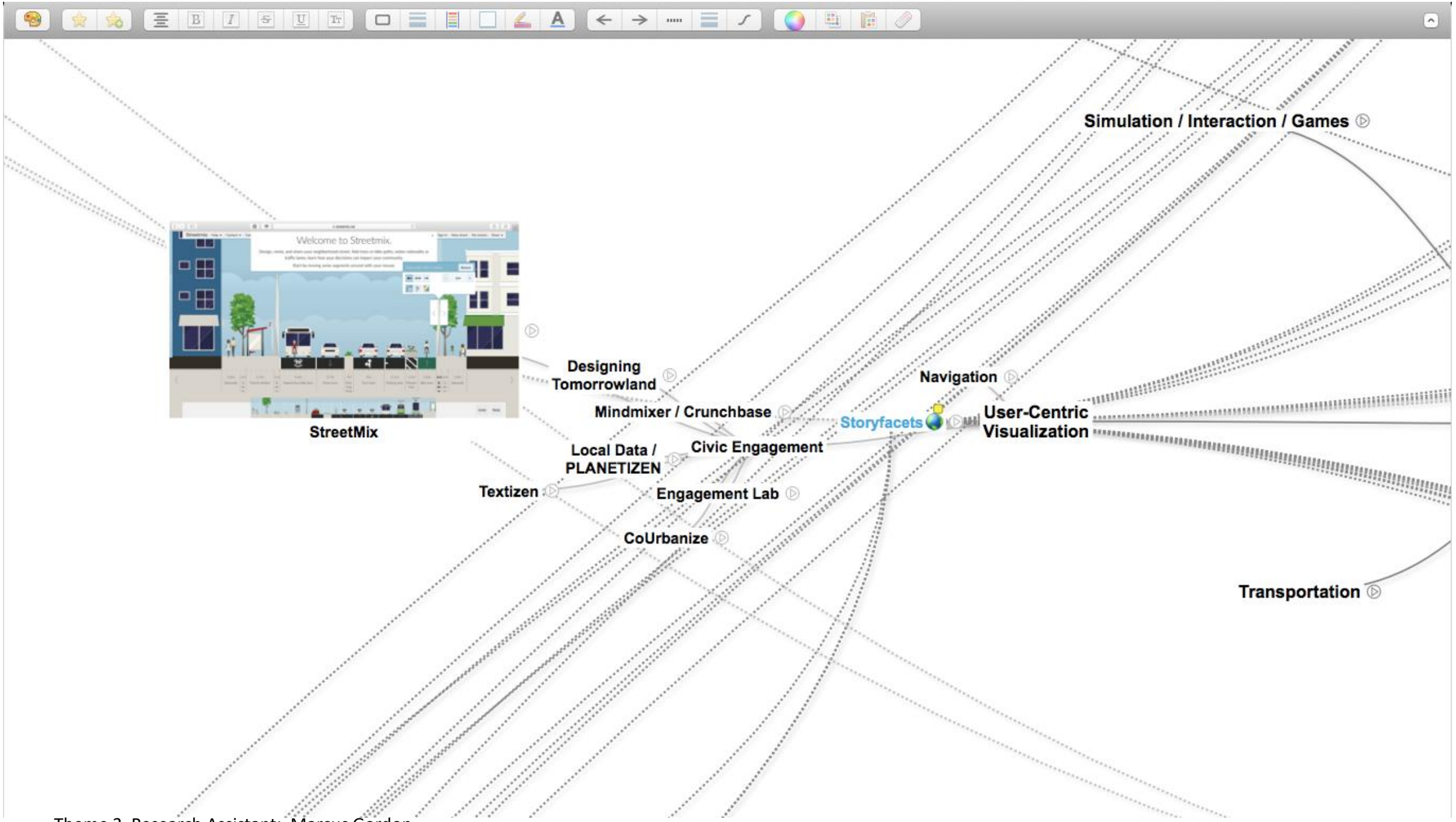
Urban Design and Planning Software

Design Software

Theme 3 Research Assistant: Marcus Gordon.


Click and drag to walk. Option = run, Shift = move vertically or sideways, Command = disable collision detection
Eye Height 371.8530m

Sketchup



Theme 3 Research Assistant: Marcus Gordon.

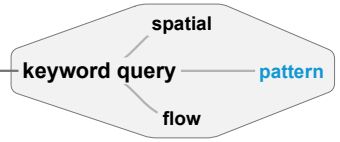
Traffic & Transit - Comparative Toolsets

*based on using the visualization landscape concept map

Visualization Response

Traffic Management

Design Charrette



Pattern / Spatial

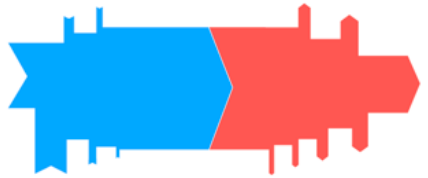
Connection Map

- great for showing connections and relationships geographically
- mapping routes through a single chain of links
- reveals spatial patterns through connection distributions/concentrations

Dot Map

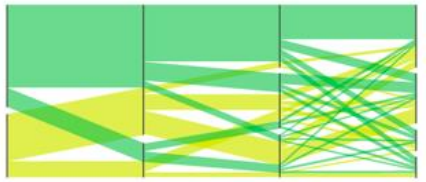
- detecting spatial patterns
- distribution of data over geographical regions
- reveals patterns when points cluster on a map

Pattern / Flow



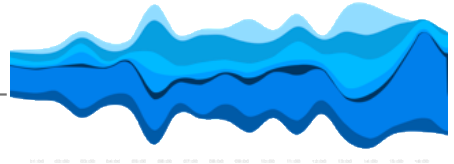
Sankey Diagram

- display flows and their qualities in proportion to one another
- width of arrows and lines show magnitude including flow magnitude
- colour can be used for categories/states



Parallel Sets

- shows flow and proportions (like Sankey)
- each time-set corresponds to a dimension/date
- width and flow path data of a line is a proportional fraction of a category total



Stream Graph

- a variation of a stacked area graph
- values displayed against a varying central baseline
- changes by varying organic shapes resembling river streams

Design Charrette

Activity 1

Design Charrette

Activity 1: Priorities of Use Case Scenarios & Related Viz Needs

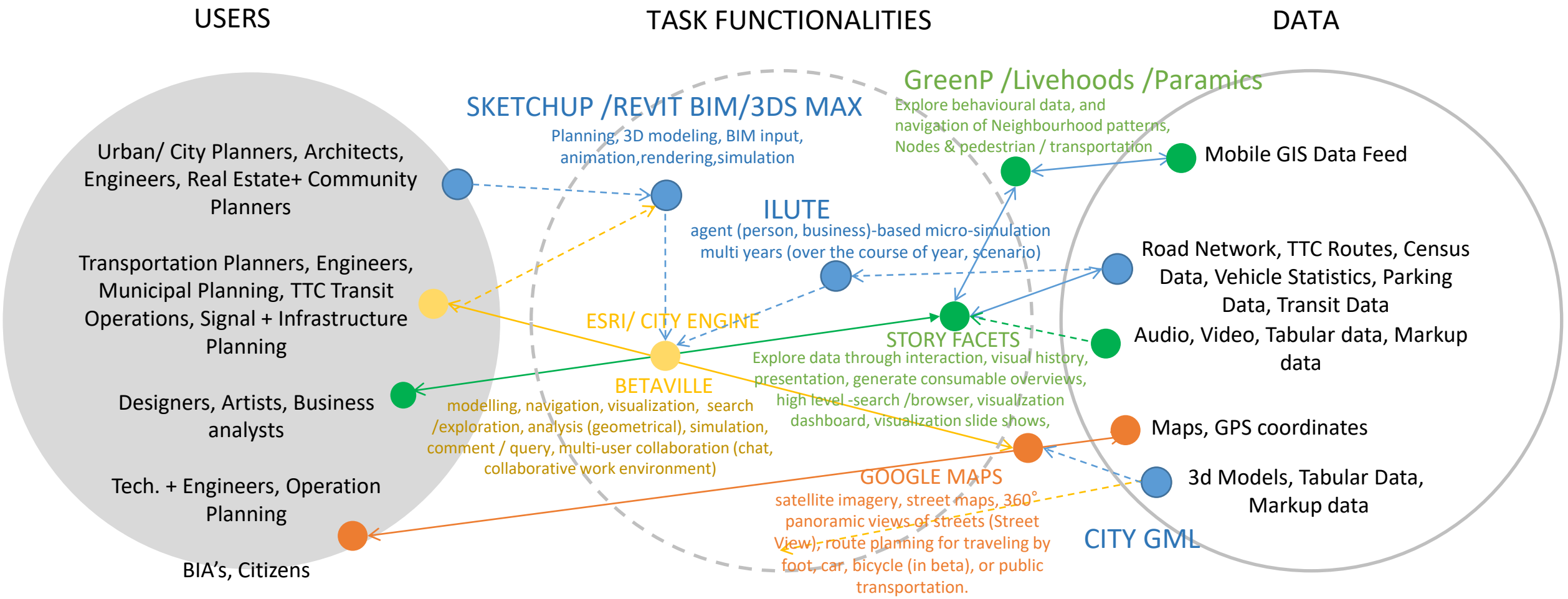
(Identifying priorities, similar use cases)

(Individual teams breakout activity, for working groups 45 min.,1:30-2:00 pm)

*Prioritization of key use case visualization requirements to support iCity research timeframe, and defining of visualization needed to be developed. This activity will help us to map **users** to their **demands** and **preferences** (existing, & new methods) and available / missing data sources.*

Which of these priorities are a focus, and which will we accomplish if additional time or resources are found. The intention here is to concentrate on the use case, essentially building out the full use case "story" scenario from the multiple perspectives of researcher-developers, operators, and communication with stakeholders.

Complete Streets & Parking



Complete Streets & Parking

Priorities:

•3D model of Complete Street design alternatives - street block (to test variable priorities like capacity, efficiency, safety, perceived quality) to conform to policy /design guidelines

•Survey capability of potential stakeholders (Stated preferences, record answers, generate new questions)

•Ability to vary and compare levels of design; number & dimension of pedestrian/bike/parking/traffic lanes, vehicle and pedestrian crossing points, trees & landscape, building facades and heights, sidewalk widths, street furniture, bike and parking supports, loading zones, and amenities.

•User / Pedestrian Experience; continuity of user navigation and interaction for consistency of survey responses (Visual & Spatial sound; Simulated context noise level)

•Modeling of dimensional levels of detail design; street furniture, landscape and flora, ornament and distinctive deign features.

•Access impact of parking policy, illegal parking, allocation of parking enforcement etc.

•Understanding of influencers on parking choice

Complete Streets & Parking

Discussion questions:

What are the main elements of a complete street that should be modeled and which should be changeable to test?

Physical: Street width, lane use types, sidewalk width, building height, vehicle and pedestrian crossing points, loading zones,

Qualitative: Traffic frequency (noise), lighting levels, street character

Urban Supports: Trees & landscape, Crosswalks, TTC shelters, benches, Signage, parking, bike stations, building canopies

Would visual support be primarily around visualization (modeling) of the street segments, or are there aspects of analytical, and statistical factors that need to be shown as comparisons, or alternate scenarios?..and if so what?

What factors need to be displayed to understand parking patterns & behaviours?

Complete Streets & Parking

Theme 3 Viz suggestions:

The Complete Streets team is looking for ways to build and evaluate 3D models of Complete Streets design alternatives, (comparative visualizations of street elements) to be used to survey stated preferences of potential stakeholders.

- WebGL for high-end simulation graphics representations, with cityengine export to blender to show juxtaposition of two scenarios
- Esri City engine for simulation graphic representation, with option detail input from SketchUp, Revit et al.
- Flythrough experience with plan of scenesA & scenesB

Side-by-side visualization of alternate scenarios on demand for decision support and comparison.

WebGL for high-end simulation graphics representations

- Esri City engine for simulation graphic representation, with option detail input from SketchUp, Revit et al.
- Current view, apply complete streets rules – static screen shots with different priority conditions.

Complete Streets & Parking

Theme 3 Viz suggestions:

Visualization Capabilities that integrate Environmental, Community, and Transportation context - with a series of data displays for different factors that can be changed to model the functions of the street – movement, environment, and place.

•3D block simulation representation, with integrated overlay of display analytics – insight analytics, storey facets

•Customizable Storyboard, selection of data elements focus, different siteline storyboards for users.

Creation / integration of a complete street classification system, type of road, environmental context, community context etc. for comparison metrics that could be used to set / evaluate performance standards for a “complete” street. The tradeoffs of selected elements could be made by comparing completeness metrics.

•In the City engine problem space – procedural rules, Make sense of the rule priorities to generate different designs,

•Custom toolset to rate / tally complete street elements

Complete Streets & Parking

Theme 3 Viz suggestions:

Comparative “modes” to include replay of historical data; real-time display of live data, display of simulation outputs, patterns of recurrent behaviour.

•Varaible time slider tool to review changes / compare

Spatialization “modes” typically require map-based (2D) spatial visualization, but likely to need 4D representation/display to provide for representation of sufficiently complex data/change against that 2D background. (over or at specific times)

•Ability to toggle between views

Interactive guidance and navigation of model, passive fly-throughs for “stated preference surveys”.

•Ability to generate sequential scenes / directional navigation tools

Complete Streets & Parking

Theme 3 Viz suggestions:

Enough detail to for novice users for a rich enough experience of the environment to elicit meaningful preference information from stakeholders; not so much that production pipelines bog down the asset production, or system performance.

Need for a more typical street model with typical street segments than waterfront to model vehicles crossing the sidewalk to parking and loading, as well as articulation of pedestrian/bike/parking/traffic lanes and sidewalk widths, amenities, obstructions.

Recommended visualization methods:

Bubble Chart, Connection Map, Scatterplot, Open-high-low-close Chart, Point & Figure Chart, Population Pyramid, Timeline, Dot Map, Candlestick Chart

ILUTE / TASHA Travel Modeling Group

Priorities:

- 2D map with 3D infographics, Side by Side visual comparison (Alternative Scenarios)
- Rich Geo referenced infographics with switchable layers and zooming
- Historical record of the changes with time
- Origin and Destination matrix
- Ability to display all agents simultaneously, in time series; land use, activity -travel, urban economics, auto ownership, demographics, emissions, energy use
- Demographic demand modeling with updating, eventually agent - based freight modeling
- Household level models; Cost/revenue/capitalization – modeling of real estate value over time
- 2d Map with side by side alternate scenario (Ergo interactivity, fly around, layers)
- Population Synthesis / Occupation Density and dimensions with demographic updating
- Time slider option (Months, years, 30-50 year horizon)
- Intra-zone/trip capture/pedestrian concourse networks

ILUTE / TASHA Travel Modeling Group

Discussion questions:

What are the main elements that are variable to be modeled in comparative scenarios for Tasha?

> Example: Household school and work zones in order to determine mode choice and assignment?

Modeling of assignment based on fare, or congestion?

Is it necessary to change the % of place of residence (PoR), or % place of work (PoW) in each scenario as the PoR / PoW updates?

Do you want to model passengers in the tour -based model?

Should the household mode choice, or the Origin-Destination demand matrices be visualized, and in what form?

What are the factors that the model needs to have variable? For instance: the increase of household income, and number of available vehicles / household on agent choice?

To what extent does the viz model need to respond to changing demographics of households to predict trip behavior change etc.?

Is the housing microsimulation model a separate subsystem to be plugged in, and what is the source of data to update model?

Traffic & Transit Management Group

Traffic Management Priorities:

- Circulation pattern of traffic (Designed, Predicted, Actual), over 24 hrs
- Distinguish between obstructions (Recurrent expected (rush hour), recurrent unexpected (construction), non-recurrent unexpected (accident/weather))
- 3d bars with additional info (like StudentMoveTO)
- Animation/Playbacks for full day cycles
- Block-level data, and at Intersections by lane-data
- Accidents (Degree and duration of blockage)
- Time-slider + pop-ups for bottlenecks, Memory of bottleneck (history)
- Weather conditions, Spatio-temporal viz (weather, road condition)
- Congestion analysis
- Color codded visualization (speed limit)
- Origin Distance Analysis
- Traveler: ATIS (Real time Congestion, Cost analysis, Navigation, Multi-modal transportation, Trip planning)
- Operators: ATMS (Advanced transport management system: Real time congestion, cost)
- Providers: (Real time Cost analysis, congestion, user fed data, ability to share service on the common platform)

Traffic & Transit Management Group

Transit Management Priorities:

- Visualization of AVL Transit performance (GPS vehicle tracking, every 20 seconds) Real-time and Historical, Vehicle bunching patterns, other disruptions- streetcars and buses on access. Time series animation or GeoEvent-based heat maps
- Layers (Weather, Bike share, Obstruction, Pedestrian Volumes)
- Twitter Data Visualization (tweet volumes reporting Delays/complaints)
- Visualization of transit performance (Real-time Designed/actual/deviations)
- Shuttle service (historical data, re-routing, regular routes, delays)
- New shuttle options (historical data, hypothetical, best routes)
- Various Transit performance (wait times)

Traffic & Transit Management Group

Theme 3 Viz suggestions:

Our suggestions stem from an approach that considers the temporal and geospatial qualities of the visualizations. This further dictated the necessity to include frameworks where both 2D and 3D methods are important and even perhaps the ability to overlay these methods. Patterns, spatiality and the ability to analyze flow, remained the focus of our response. However, it is important to note that both **mapping** and **time-based** characteristics were not only a focus, but qualities that were standard and not removable from the equation or solution space.

Agent-based simulation and gaming simulation UI research

Perhaps already familiar territory in both transit and traffic sectors, but we feel compelled to re-iterate its possibilities to be included in the design of your visualizations needs. This reminder is pertinent to our suggestions, as we believe it is an exciting feat to make these within common web development circles.

***Reference**: Daniel Shiffman, Nature of Code*

Consider swarm, boids and flocking algorithms and bioinformatics research for assisting in the design of visualization models.

Common design/development tools could include Processing, Cytoscape, NodeBox, Unity, Blender/Python, 3ds max, Maya and Sketchup.

Traffic & Transit Management Group

Theme 3 Viz suggestions:

Connection to open data sets on weather and road conditions (i.e. weather channel open data, local city news traffic coverage, including live and streaming video feeds of traffic flow, perhaps mashup of known real-time sources to both travelers and operators).

Research network based models related (i.e. Uber deck.gl) and unrelated to transportation and traffic, for analysis insights from other sectors (i.e Netflix vizreal). The Weather Company.

WebGL for high-end simulation graphics representations

CityEngine, Betaville, vizreal, deck.gl, mapbox

RESTful web services for low poly 3D spatial imaging or 2D visualization methods

Betaville, vizreal, deck.gl, mapbox, osm, google transit,

Traffic & Transit Management Group

Discussion questions:

If a vehicle probe model would describe congestion, would any type of spacio-temporal viz be a pop-up to provide specifics?

Do you see an analytics platform as a separate (dashboard) view, or additional info displayed by selecting a tool?

How would you want historical versus real time data to be displayed?

How would you visualize shuttle ops deployment and what is the key to model impacts?

What do you think of project Laika?

Design Charrette

Available Data Representation & Visualization in the Solution Space,

Brent Hall, Michael Luubert, David Kossowsky, ESRI, (20 min., 2:00-2:30 pm)

Presentation and discussion by ESRI - City engine (20 min.)

This builds on initial viz introduction with demonstration of applications to highlight how a case study (Waterfront area) may be used to visualize urban contexts, along with data representation and analytics, and examples of other related applications for each group.

Q u e s t i o n s & B r e a k (15 min.)

Design Charrette

Activity 2

Design Charrette

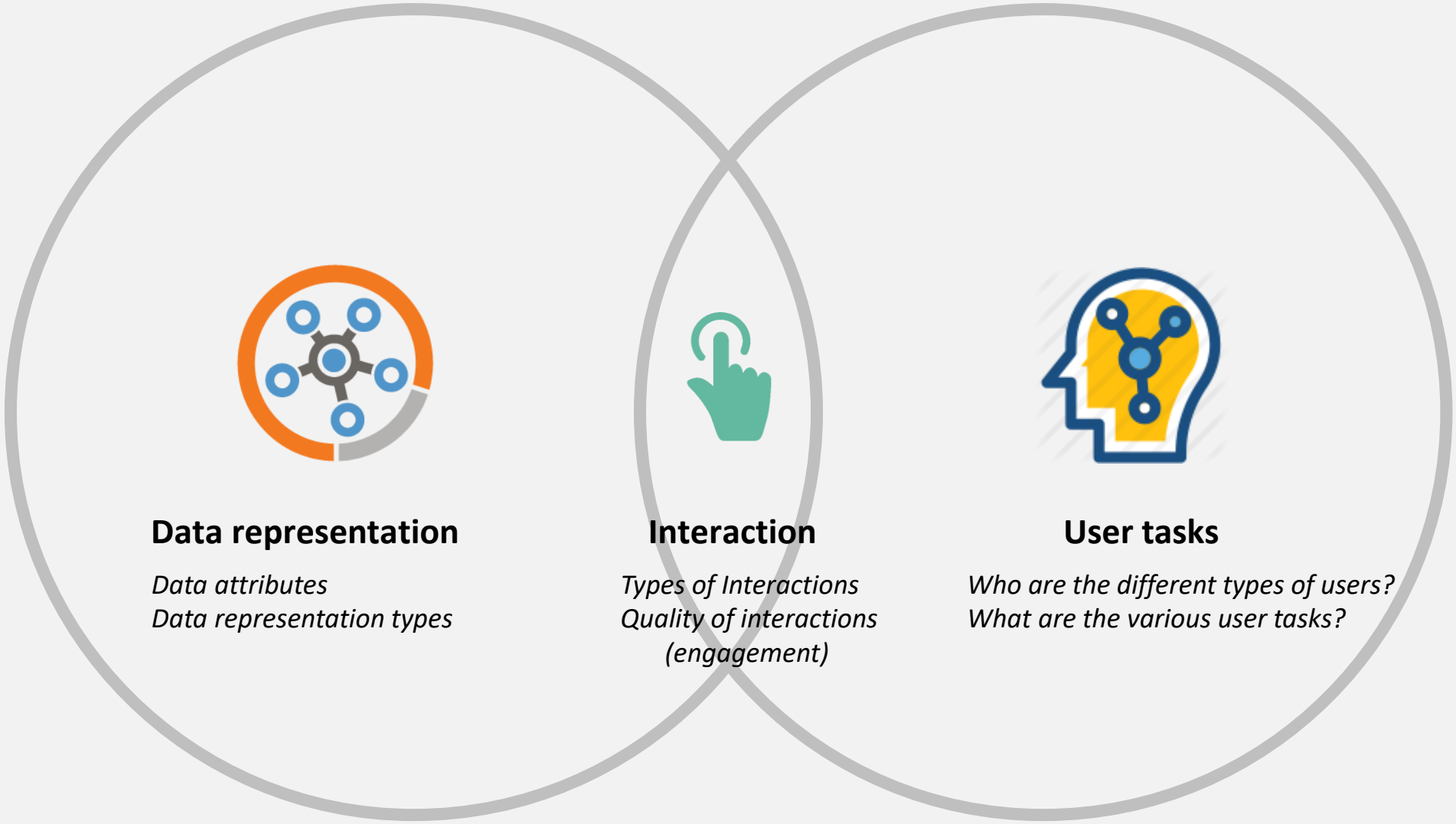
Activity 2: Viz Tool Sketching/wireframing

(available, proposed, and demands for new data & viz representation)

(Individual teams breakout activity, listing and mapping exercise, 75 min., 2:45 - 4:00 pm)

Considering the Waterfront and other case studies presented, and the use cases discussed, the intention is to "mock up" the features/functions/visualizations identified in Activity 1.

This activity involves a highlighting of related tasks, to viz needs, and discussion to help members of the icity team to establish common tools / functionalities that serve combined needs, secondary needs etc., and to identify any intersections and ways to align diverse group needs, shared data and resources.



Data representation

Data attributes
Data representation types

Interaction

Types of Interactions
Quality of interactions (engagement)

User tasks

Who are the different types of users?
What are the various user tasks?

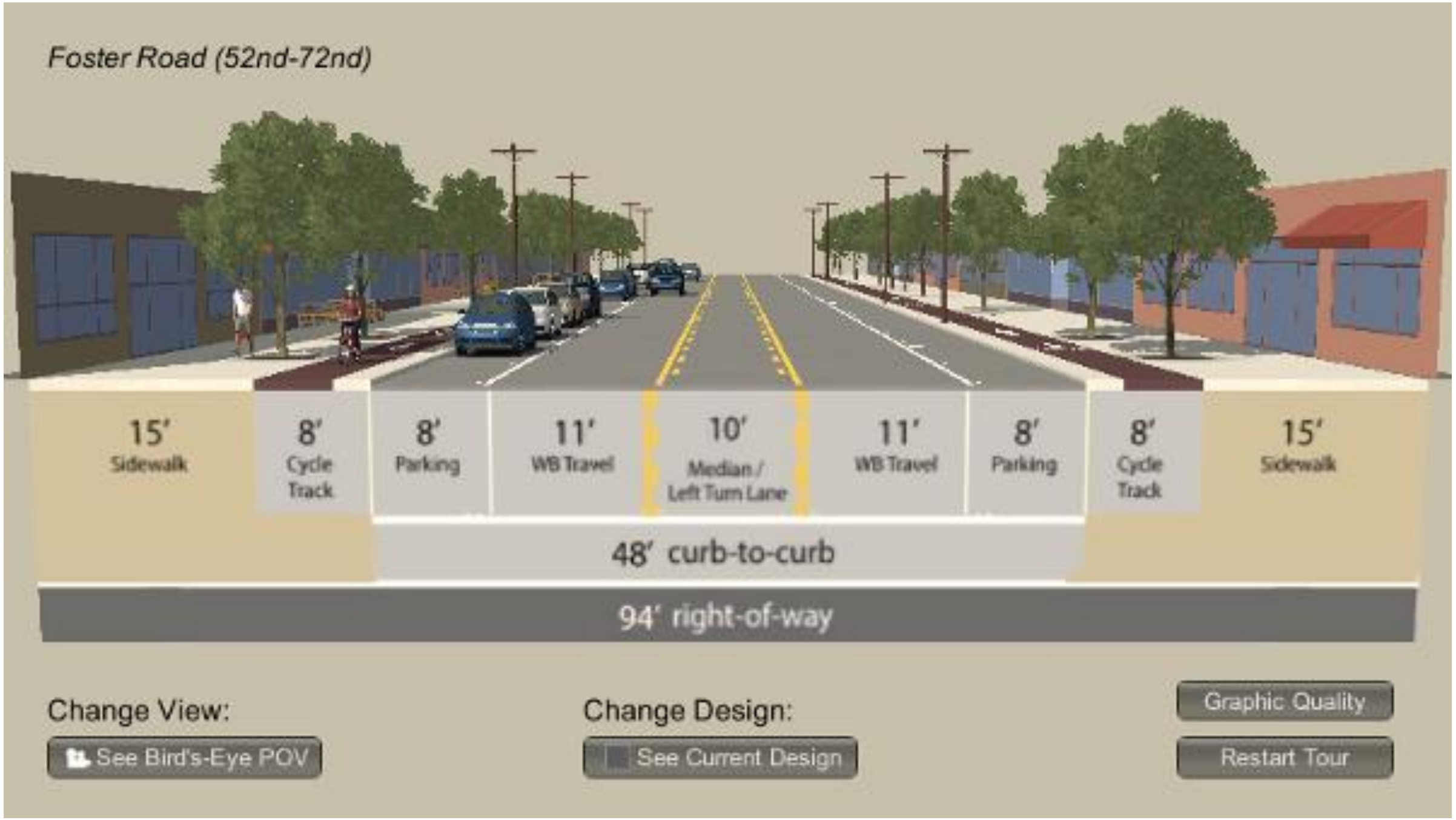
Basic classifications from Literature review on Taxonomy

Complete Streets & Parking

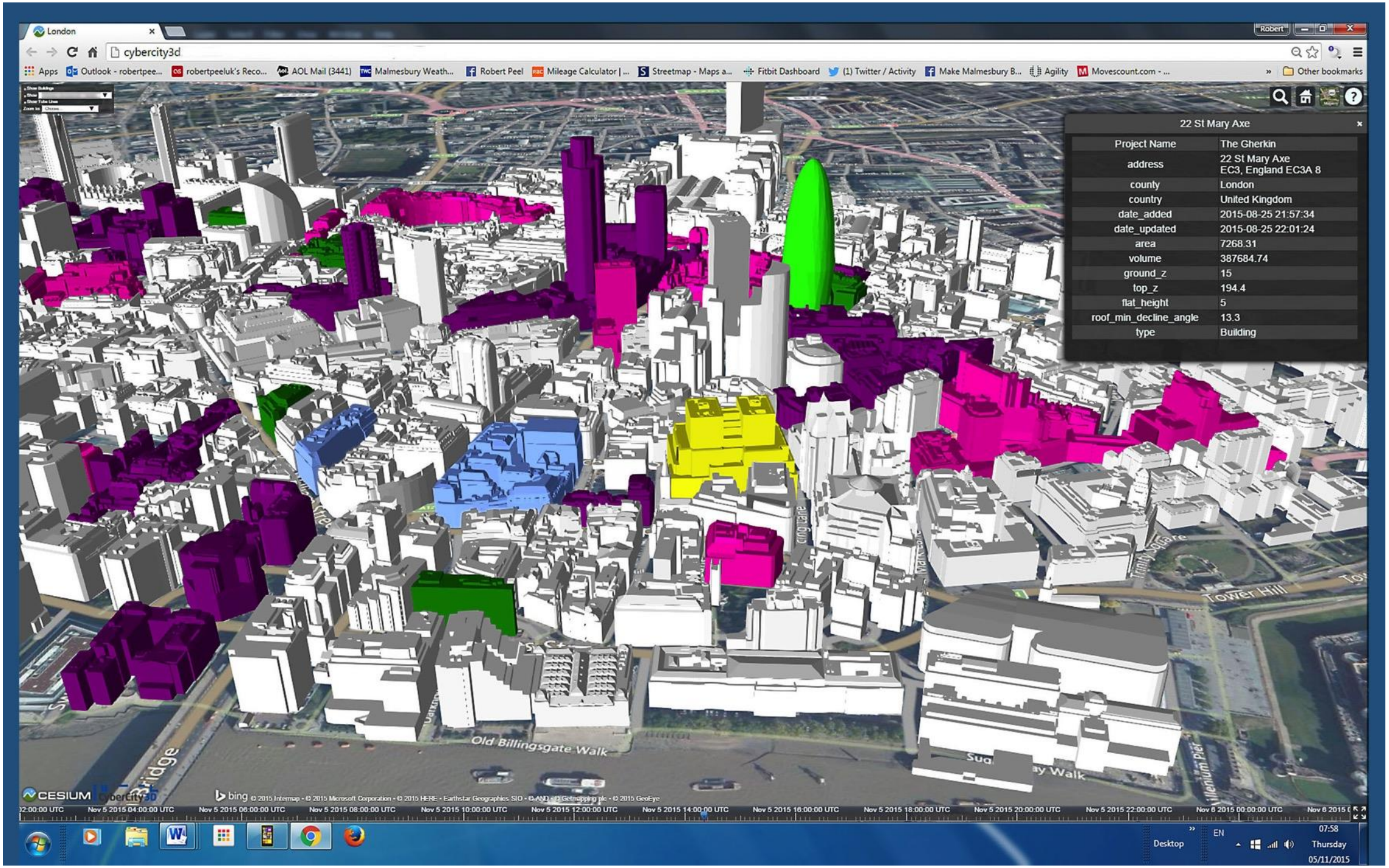
Waymaker


Game
Free Aspect
Maximize on Play
Stats
Gizmos
Hide Trees
Hide Bike Lane
Hide Center Line
Show Center Turn
Show Four Lanes
ROOMS
Right-of-Way Distance
Curb-to-Curb Distance
Press 1-5 for different camera views

Waymaker


Foster Road (52nd-72nd)
15′ Sidewalk
8′ Cycle Track
8′ Parking
11′ WB Travel
10′ Median / Left Turn Lane
11′ WB Travel
8′ Parking
8′ Cycle Track
15′ Sidewalk
48′ curb-to-curb
94′ right-of-way
Change View:
See Bird's-Eye POV
Change Design:
See Current Design
Graphic Quality
Restart Tour

Waymaker

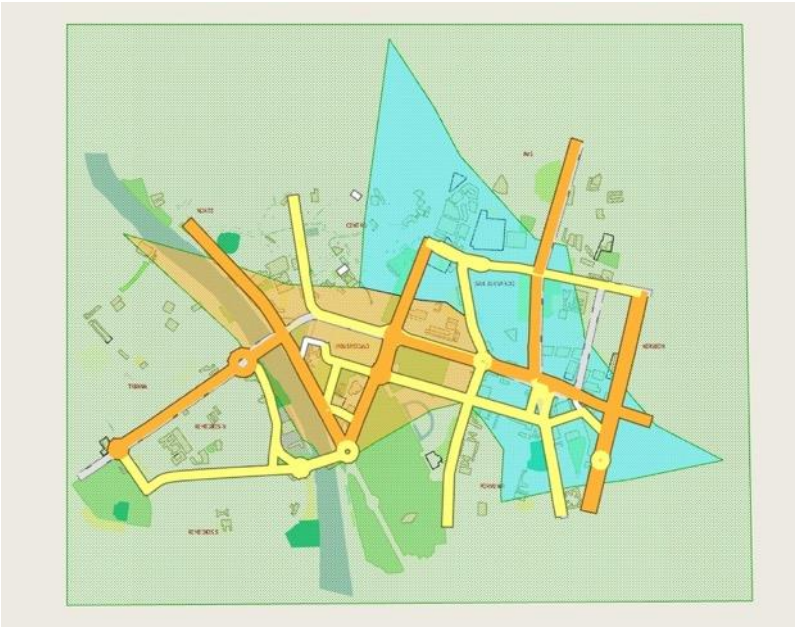


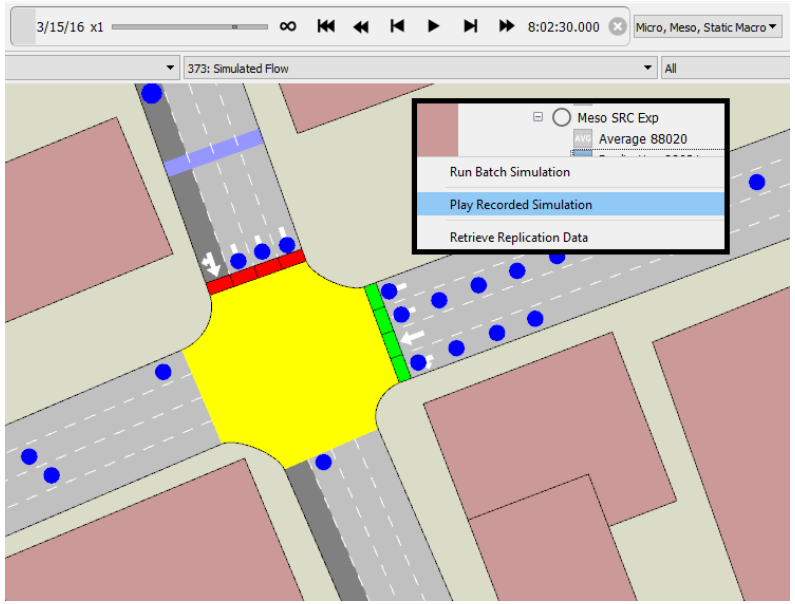
Cybercity – London

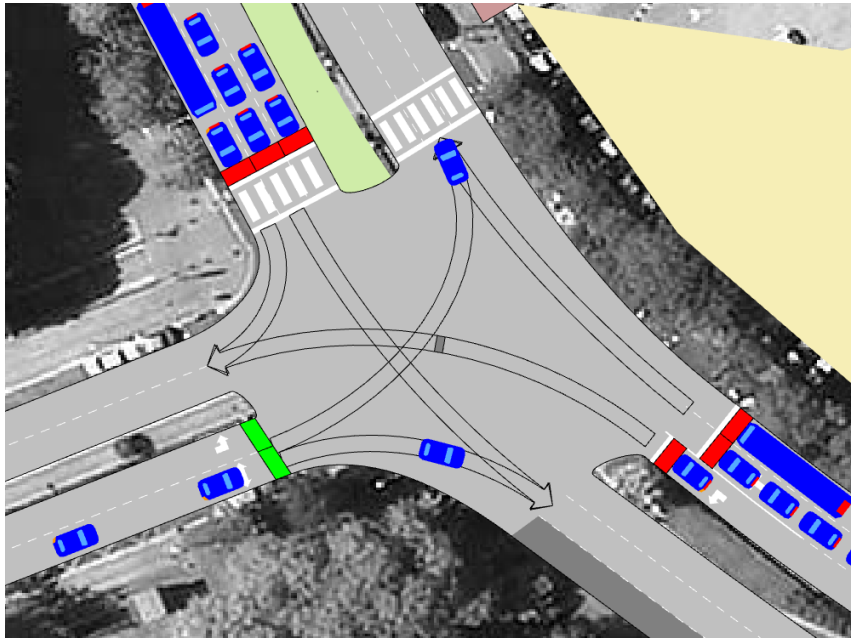
Cybercity US

Cybercity Compatibility – SketchUp, Esri, Autodesk, Cesium

Complete Streets & Parking

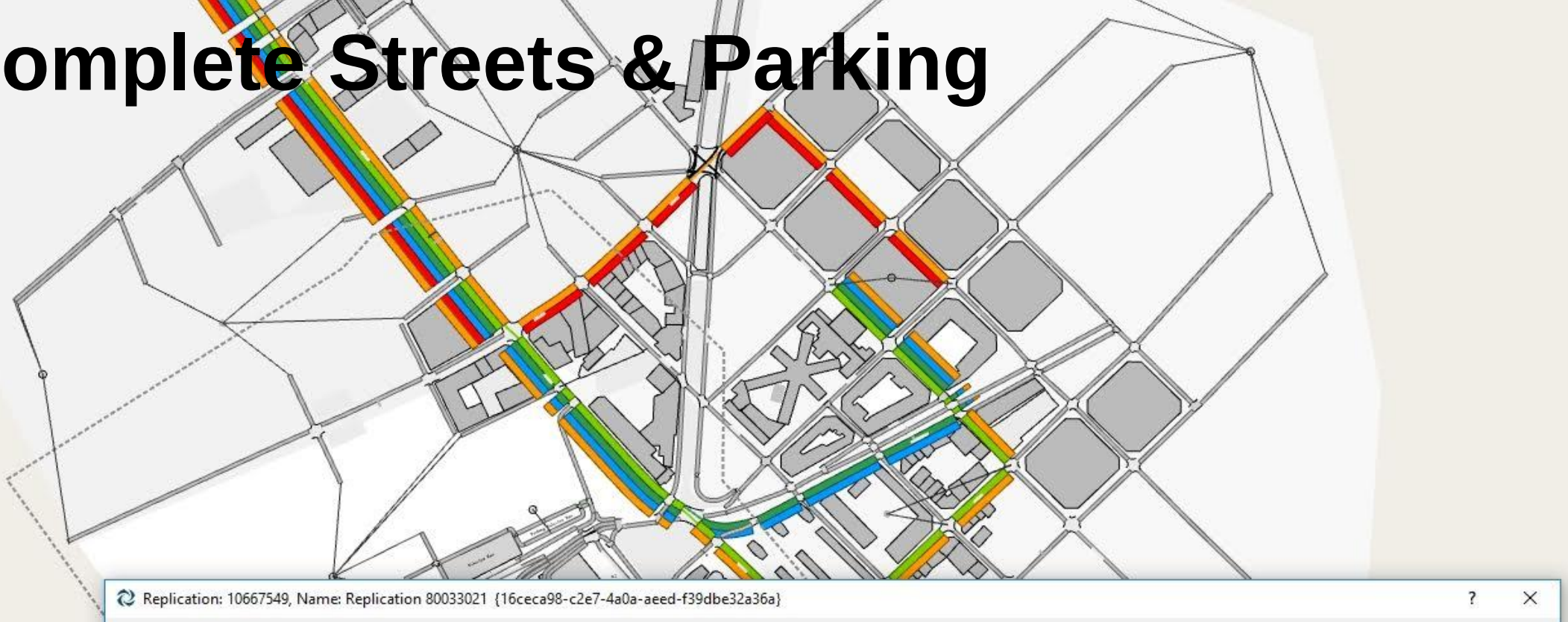






Aimsum – Traffic street Planning

Complete Streets & Parking



Replication: 10667549, Name: Replication 80033021 {16ceca98-c2e7-4a0a-aeed-f39dbe32a36a}

Main | Outputs Summary | Outputs to Generate | Validation | Time Series | Attributes | Path Assignment

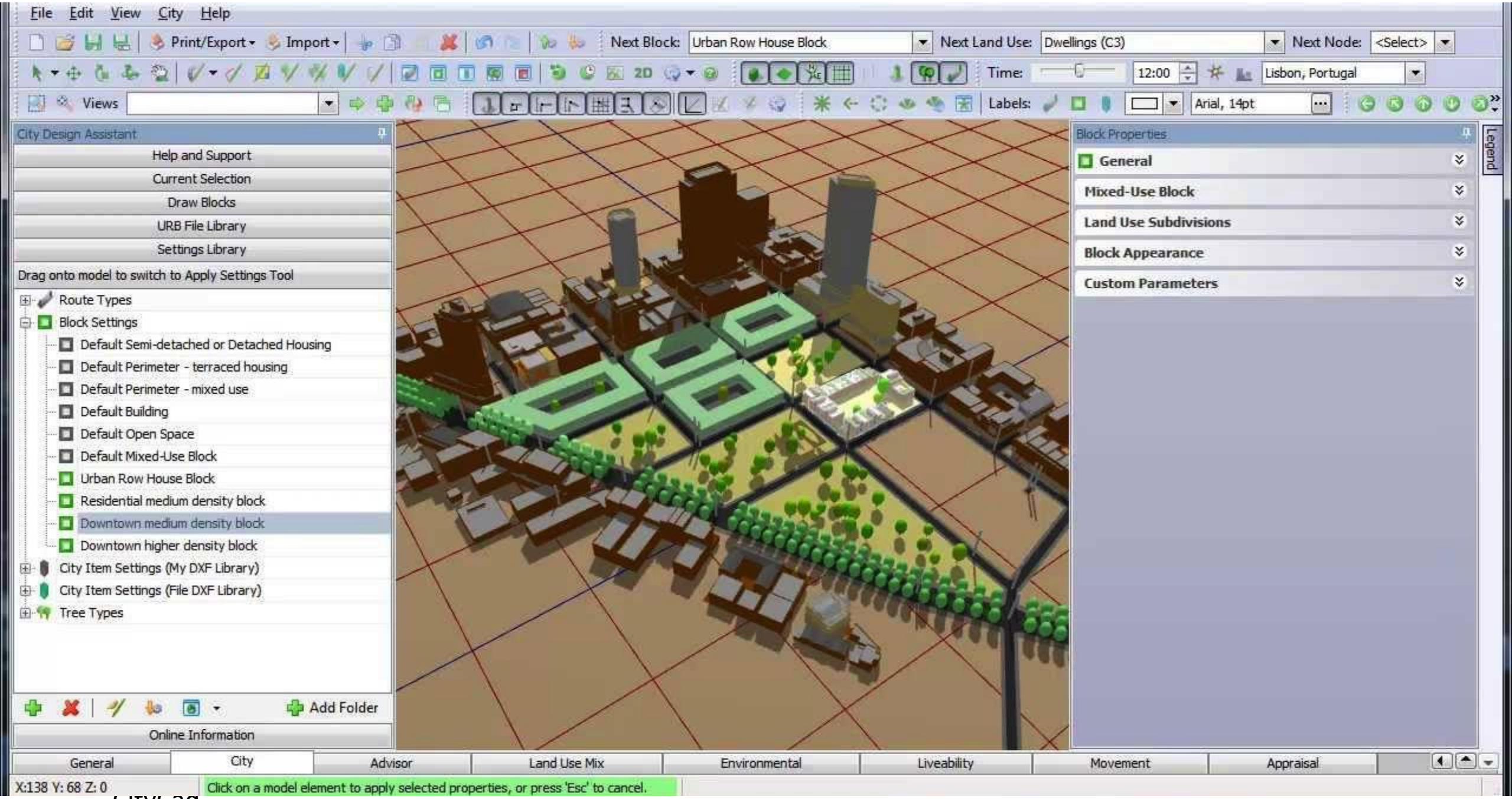
User Class: 2714: Car
Interval: All Warm-Up Included 7:50 - 9:00
Origin Centroid: Any
Destination Centroid: Any
Entrance Section: Any
Exit Section: Any
Sections: And Any
Vehicles Generated: > 0,0
Path Type: All

List Paths | Expand All | Aggregate Intervals | Link Analysis | Action

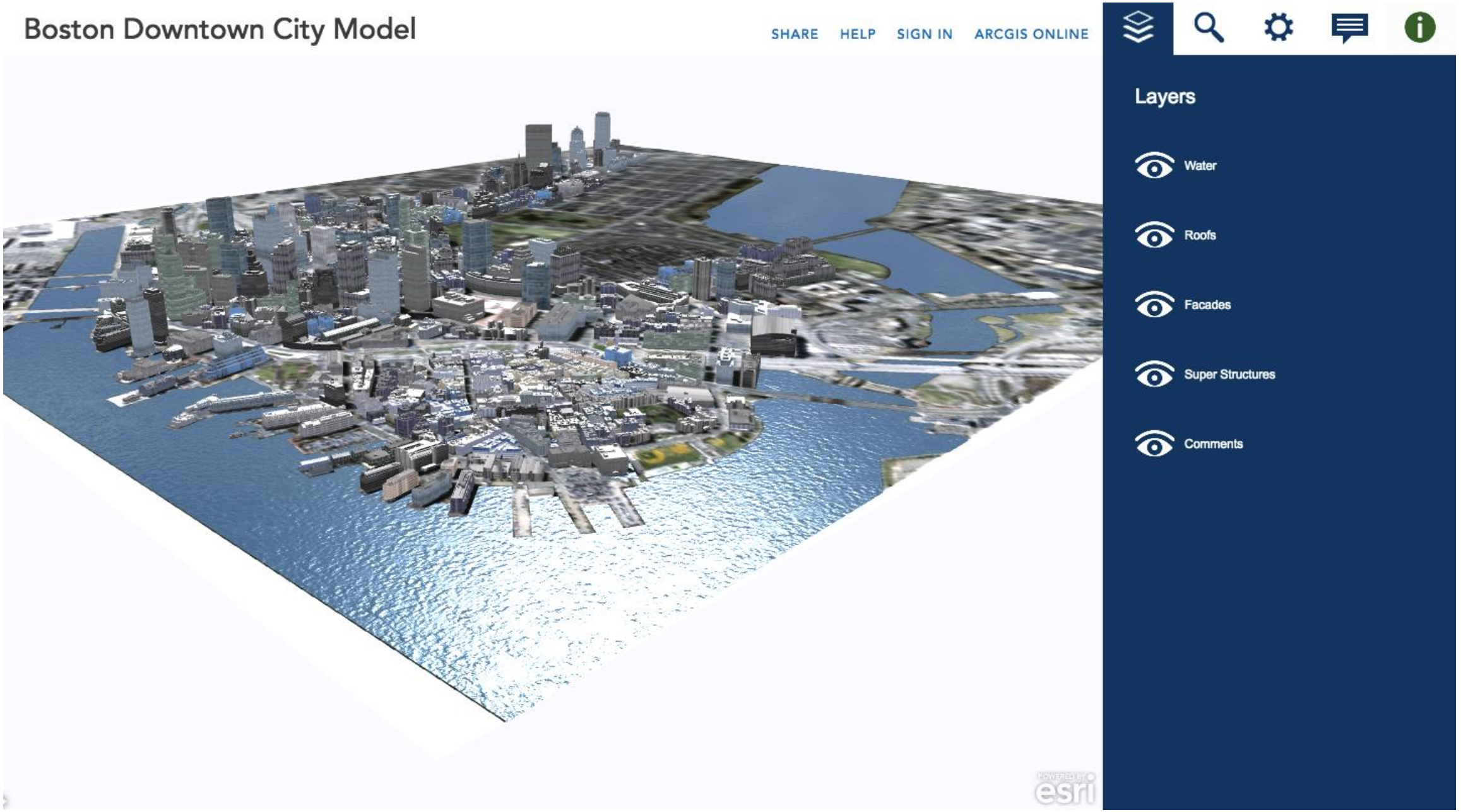
User Class	Origin	Destination	Type	Probability of Cho	Vehicles Generate	Vehicles Arrived	Cost	Distance	Travel Time
2714: Car	2387: 1.Diagonal	2319: ORIGEN	PAR	-	2 (7,68)	2,00	1414,47	1969,69	321,28
2714: Car	2387: 1.Diagonal	2319: ORIGEN	RC	3,98	2 (7,68)	0,00	1297,23	1969,69	0,00
2714: Car	2387: 1.Diagonal	2319: ORIGEN	RC	7,57	1 (3,84)	1,00	1165,38	1742,28	355,96
2714: Car	2387: 1.Diagonal	2319: ORIGEN	PAR	0,26	0 (0,00)	0,00	1124,91	2300,96	0,00
2714: Car	2387: 1.Diagonal	2318: 2.LesCorts...	Mixed		54 (100,00)	54,00	374,21	693,94	74,64

Aimsum – Traffic street Planning

Rescape (3d sketchup plug-in)


File Edit View City Help
Print/Export Import
Next Block: Urban Row House Block
Next Land Use: Dwellings (C3)
Next Node: <Select>
Time: 12:00
Lisbon, Portugal
Views
Labels: Arial, 14pt
City Design Assistant
Help and Support
Current Selection
Draw Blocks
URB File Library
Settings Library
Drag onto model to switch to Apply Settings Tool
Route Types
Block Settings
Default Semi-detached or Detached Housing
Default Perimeter - terraced housing
Default Perimeter - mixed use
Default Building
Default Open Space
Default Mixed-Use Block
Urban Row House Block
Residential medium density block
Downtown medium density block
Downtown higher density block
City Item Settings (My DXF Library)
City Item Settings (File DXF Library)
Tree Types
Add Folder
Online Information
Block Properties
General
Mixed-Use Block
Land Use Subdivisions
Block Appearance
Custom Parameters
Legend
General
City
Advisor
Land Use Mix
Environmental
Liveability
Movement
Appraisal
X:138 Y: 68 Z: 0
Click on a model element to apply selected properties, or press 'Esc' to cancel.

CityCad


Boston Downtown City Model
SHARE
HELP
SIGN IN
ARCGIS ONLINE
Layers
Water
Roofs
Facades
Super Structures
Comments
esri

ESRI - Boston


Boston Downtown City Model
SHARE
HELP
SIGN IN
ARCGIS ONLINE
Layers
Water
Roofs
Facades
Super Structures
Comments

ESRI - Boston

ESRI - Philadelphia

Street Remix

General Questions:

What's the difference between a street segment and a corridor?

What's considered an optimal use of space? ..and are these priorities input as preconditions of the use case?

What's makes a street utilization inconsistent with its demands?..for instance the inability to meet traffic flow demands, or to serve multiple uses?

What makes a corridor deficit?..and is it a product of being inconsistent to meet demands?

The use cases actually seem more like different segments of a single complete workflow, but out of sequence. Are we trying to define a mature system implicitly, and then build out specific pieces of it as proofs of concept?

General Questions:

"Optimal" has to be context-sensitive: the optimal speed of vehicle traffic on Harbord is not the same as the optimal speed of vehicle traffic on Brunswick! for that matter, the optimal speed of traffic on Dundas at Beverley is not necessarily the same as on Dundas at Bloor... does a "corridor" imply uniformity of optimization rubrics through every segment and intersection from end to end, or simply between its end-points?

Do cradle-to-grave capital and operating costs enter into the calculations?

Does projected impact on the overall performance of the surrounding network belong in the Complete Streets evaluation rubric?

Is a street above a subway line a separate use case?

Are we distinguishing between actors and agents? How many flavours of stakeholder do we intend to account for?

General Questions:

Which stakeholder types / groups want, need, and can handle which information, in which form and format?

What combination of technologies communicates effectively, supports appropriate use, and use cases for the largest possible segment of the user spectrum?

Do we intend to include value-capture-based planning in Complete Streets Evaluation?

The full Complete Streets framework includes non-transport issues like public health, environmental impact, etc. Are we going for the whole rubric, or just the direct transportation/circulation factors?

Complete streets - Potential Viz systems

Ideas for visualizations:

Immersive VR

Time Slider for visual history

Holograph-spatio-temporal interactive data

Widgets

Concentric circle for Ranking

Complete Streets & Parking

Links and References

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Links and References

- https://ladcp.maps.arcgis.com/apps/MapJournal/index.html?appid=2a05d2914ad94727a6f6c7ef2d3fc5ed
- http://www.caliper.com/tctraveldemand.htm
- http://www.caliper.com/transmodeler/default.htm
- Ville Vivante.url
- https://www.gapminder.org/
- www.urbansim.com.url

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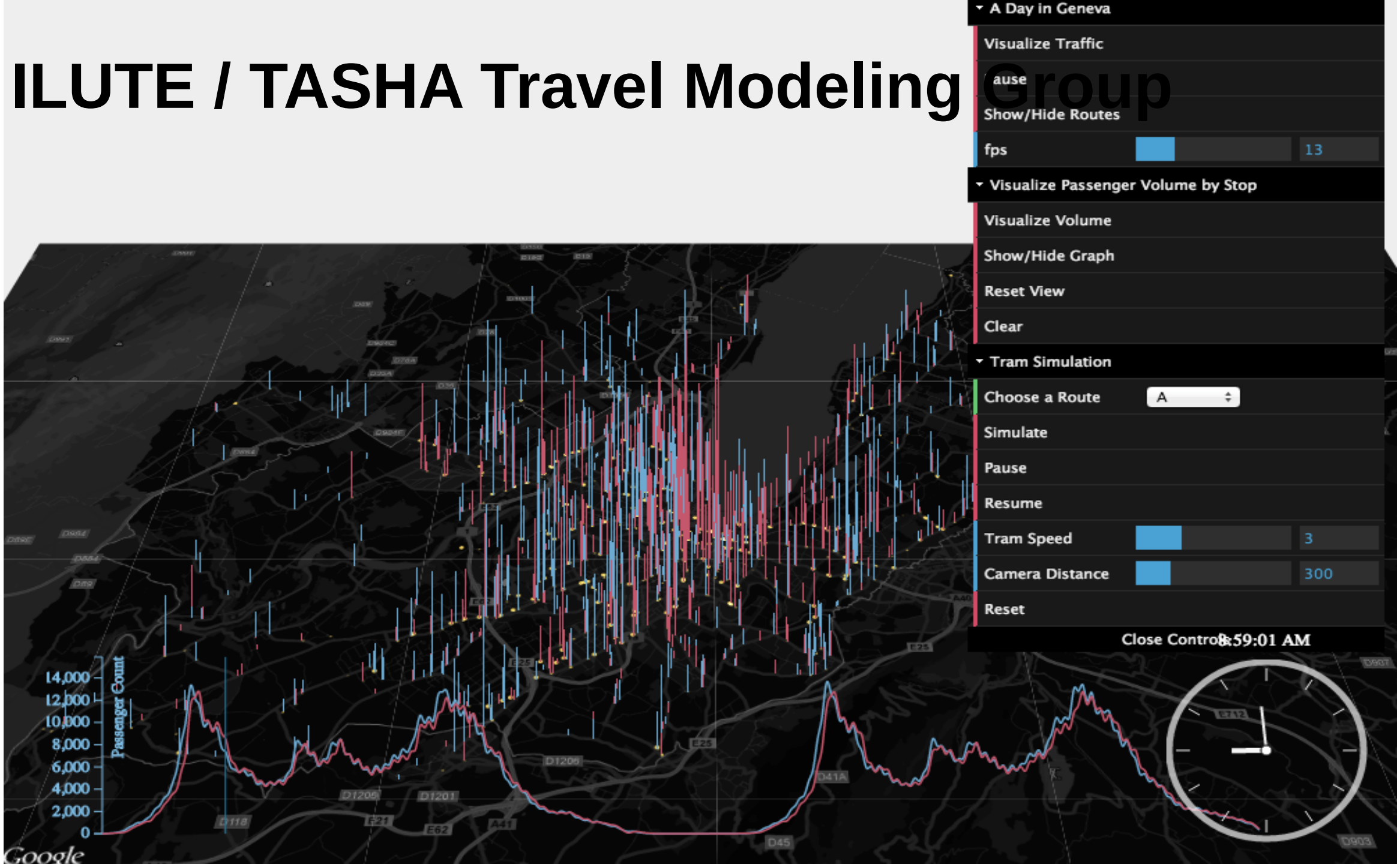

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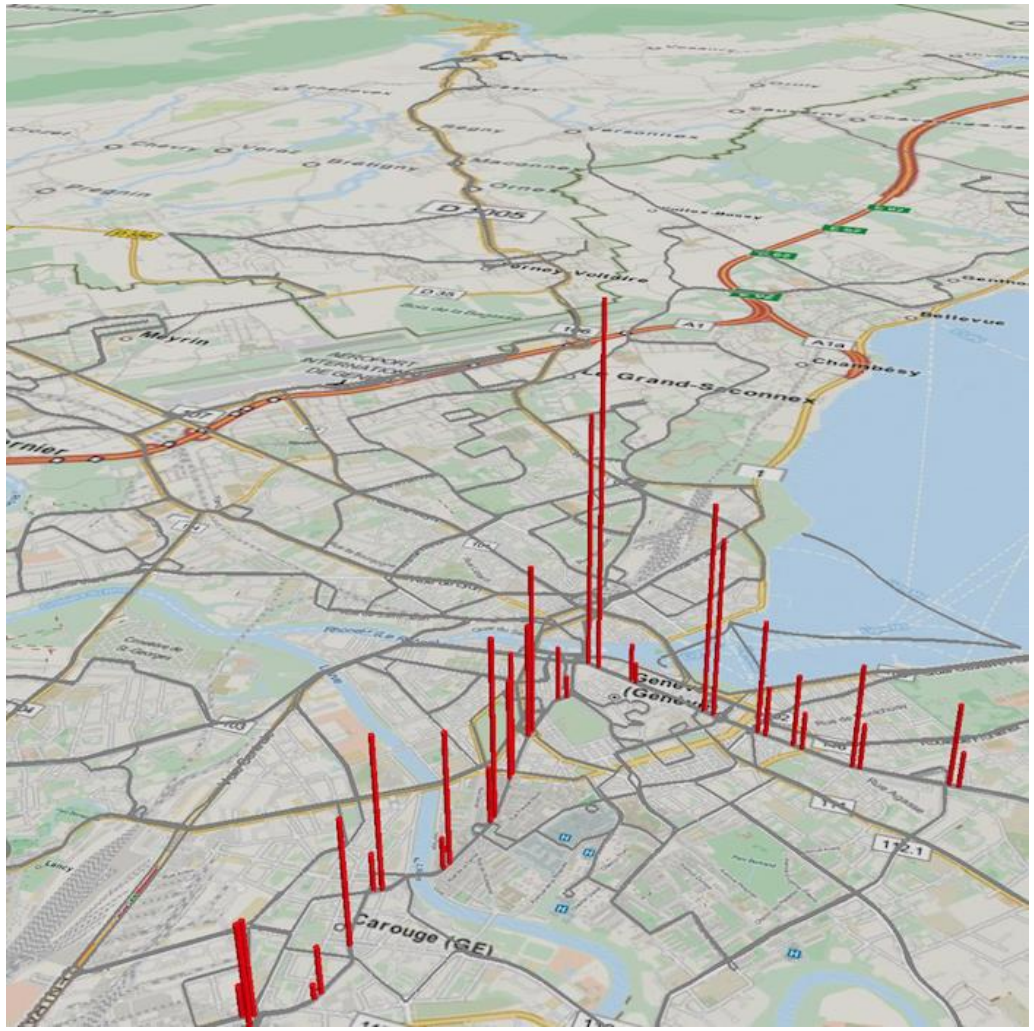

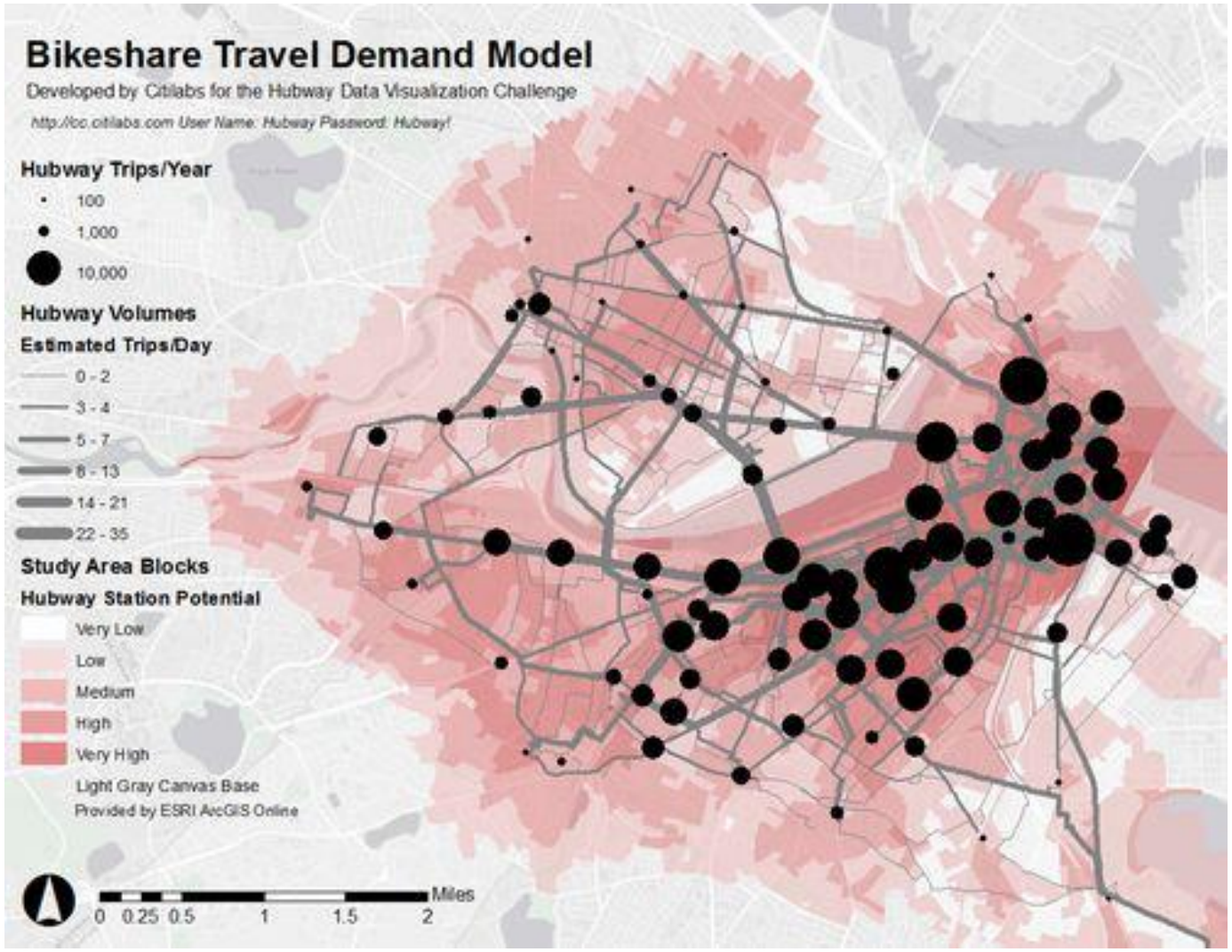

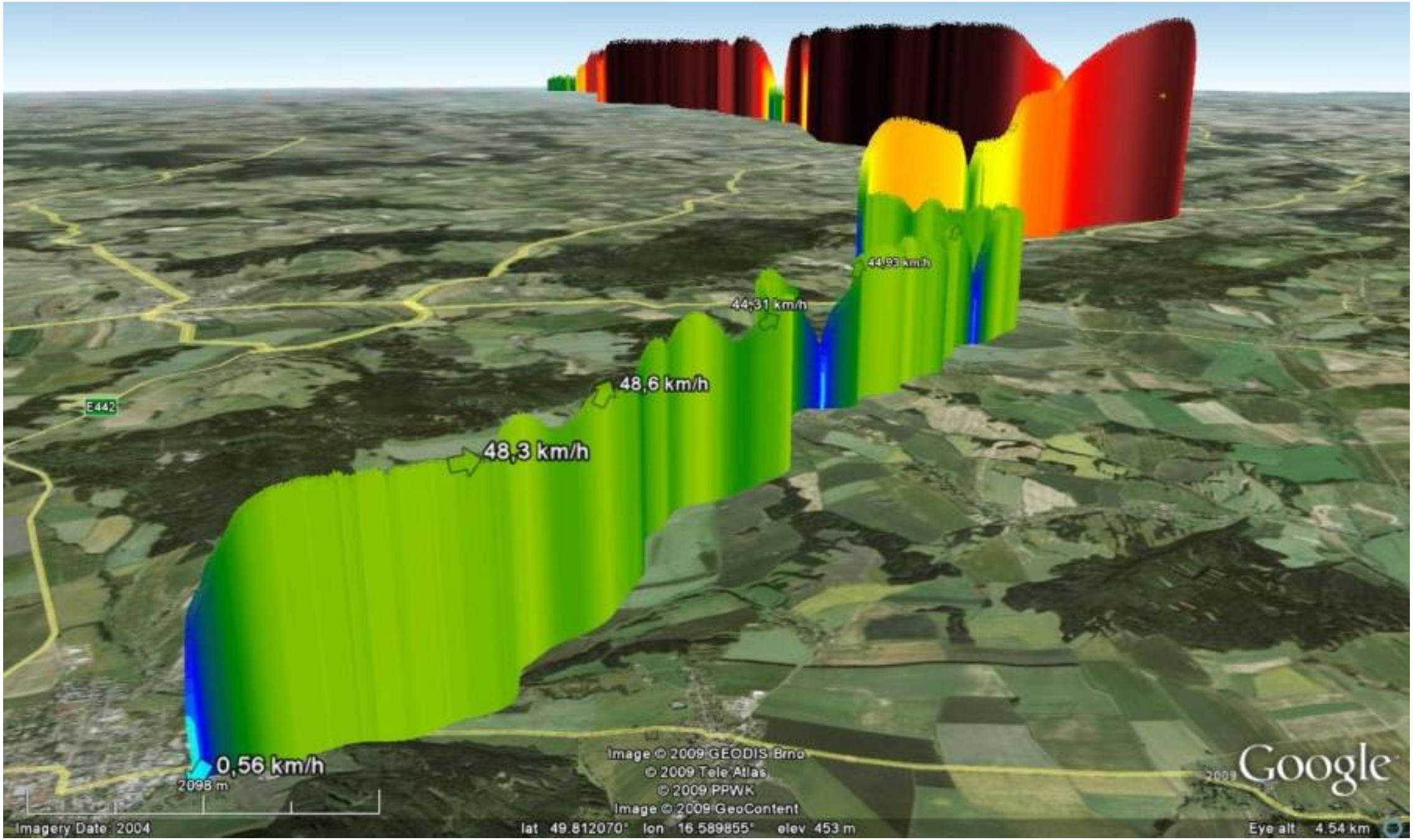
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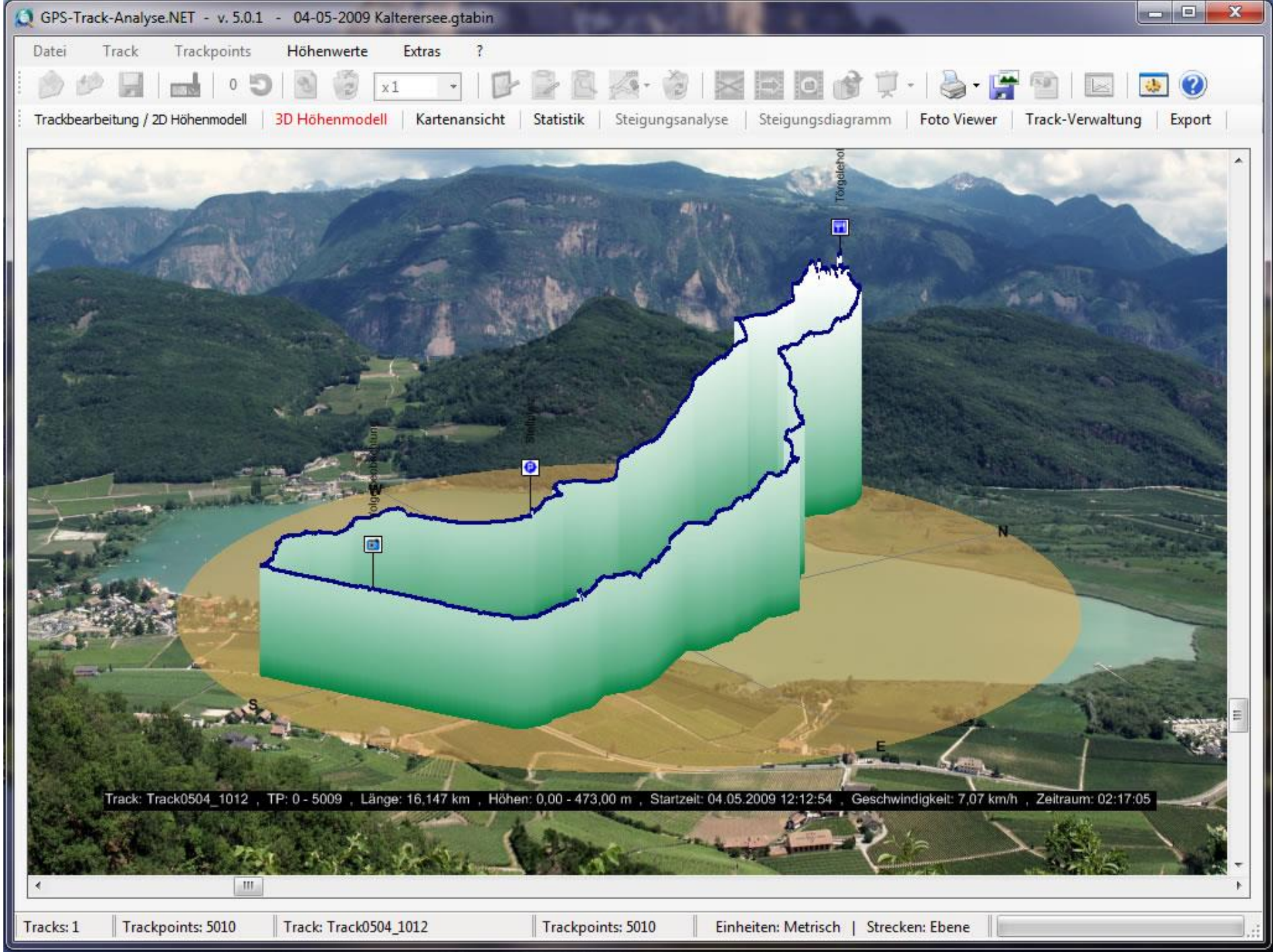
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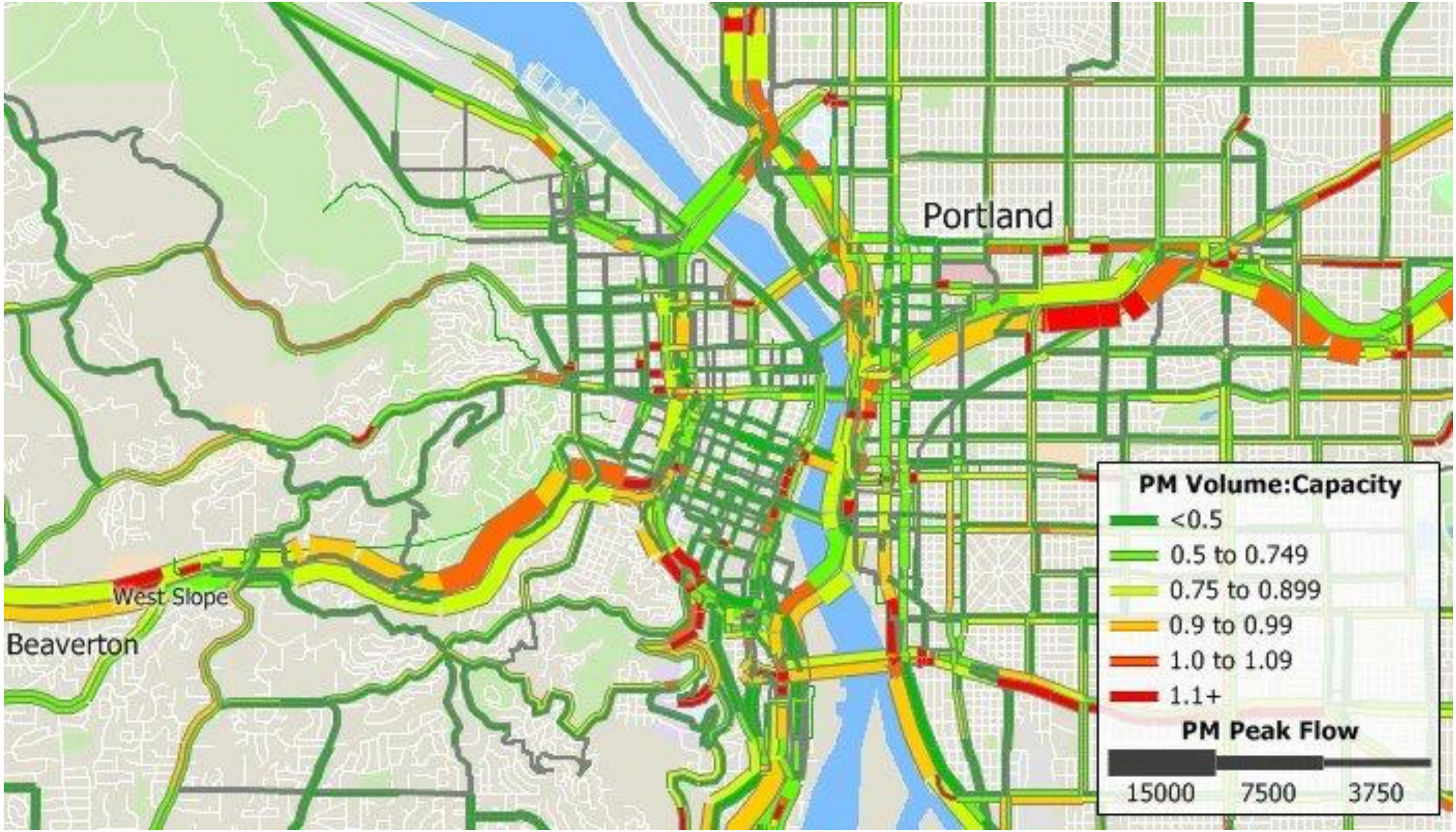
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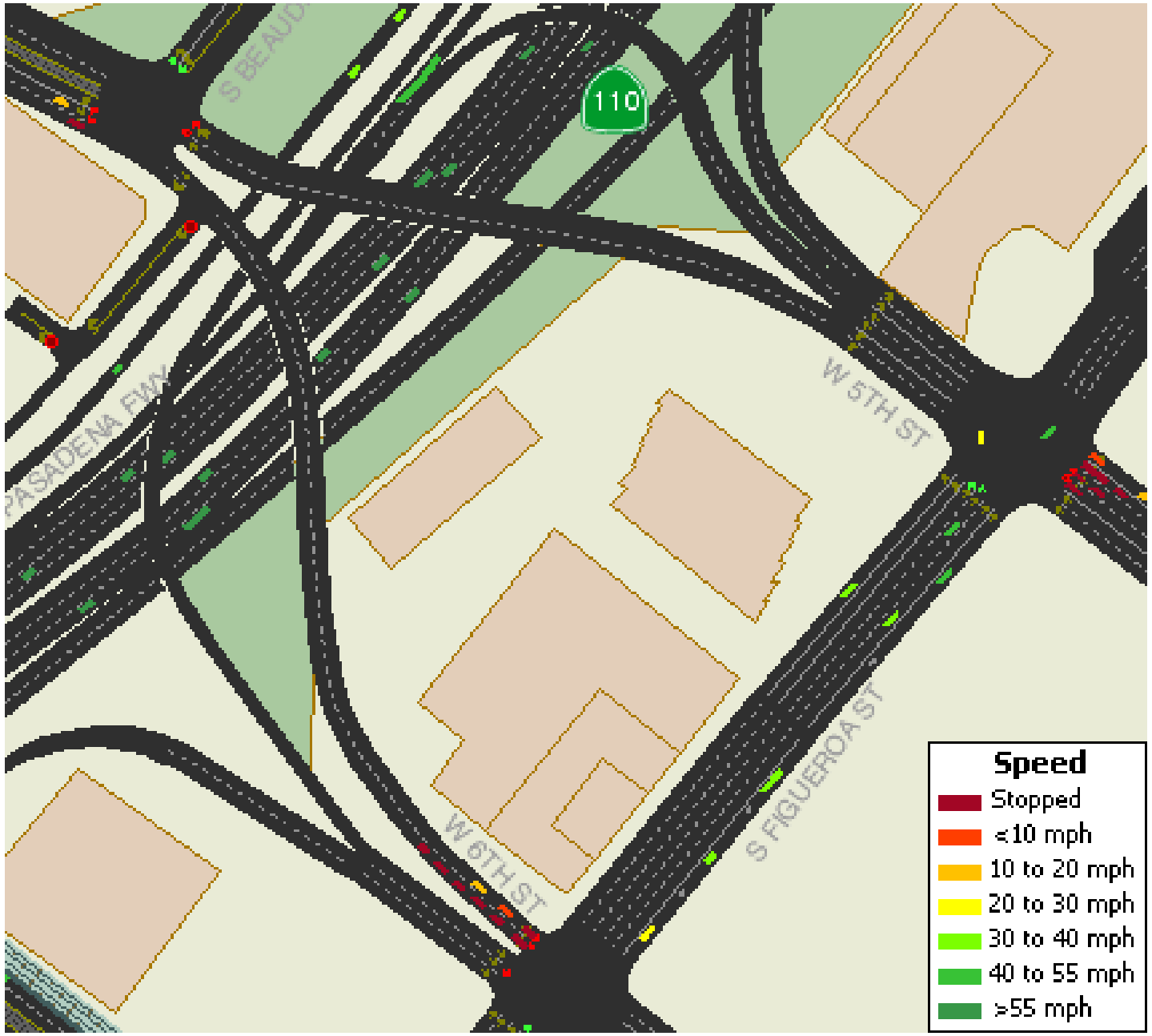
A WALKING TOUR IN ROME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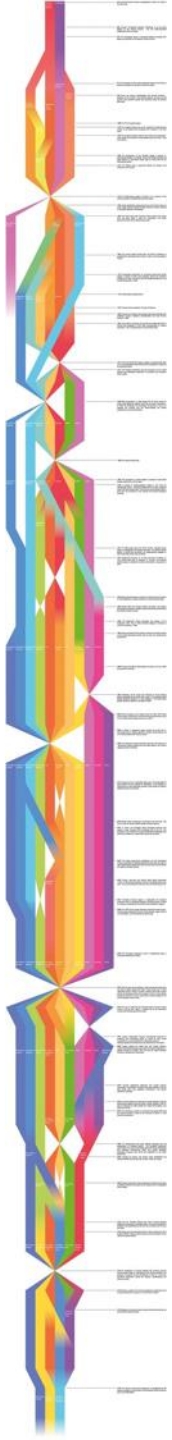

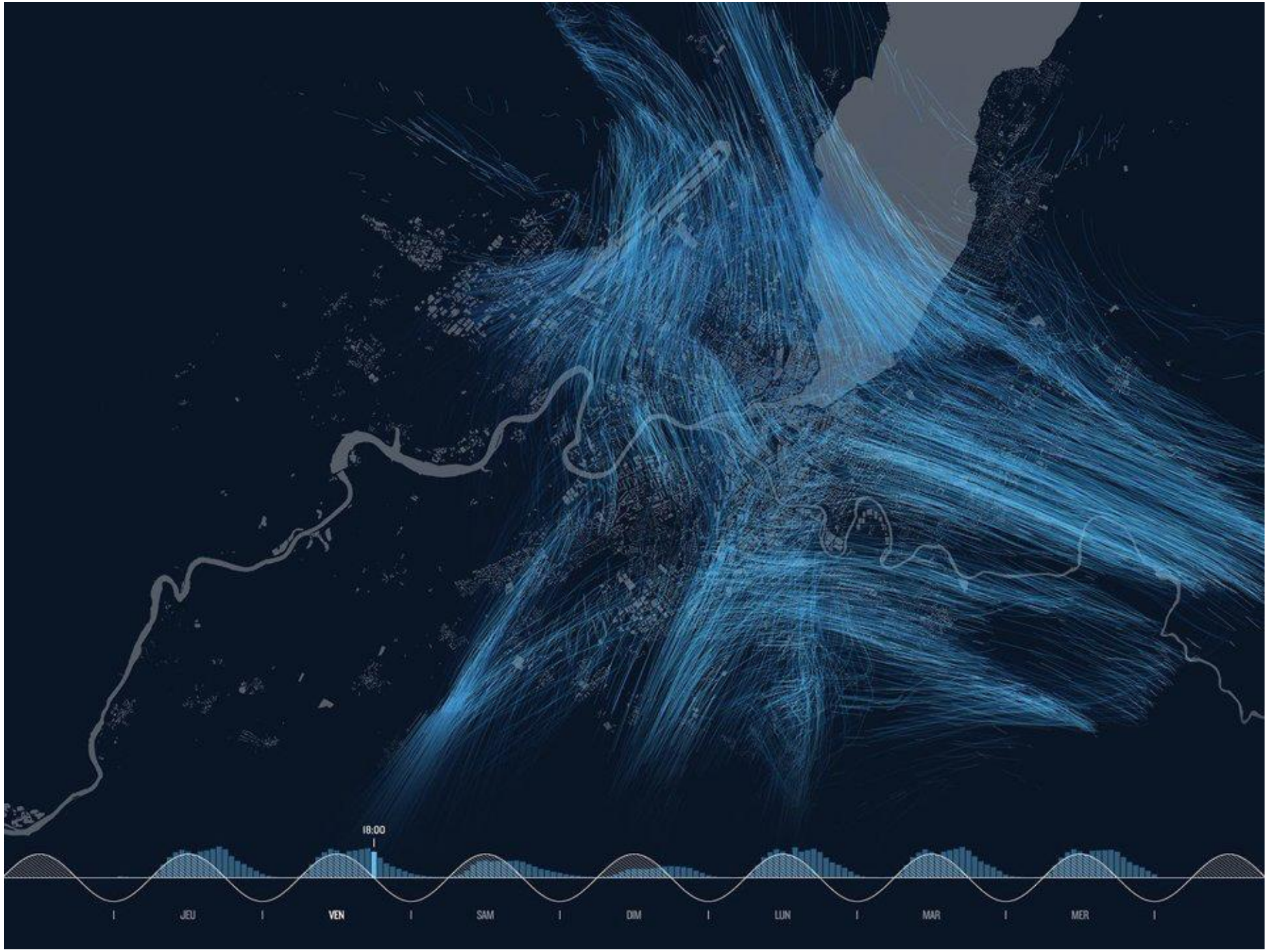
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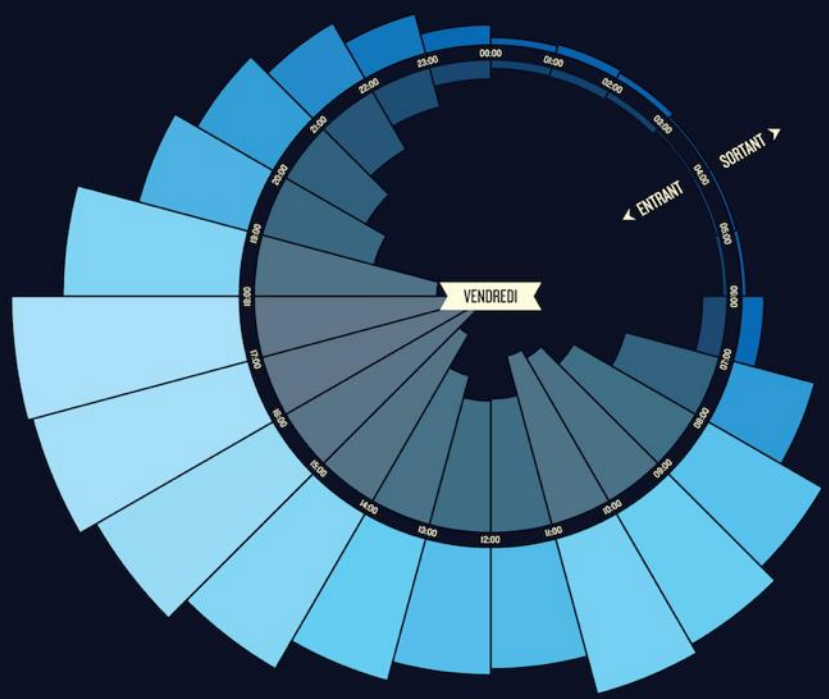
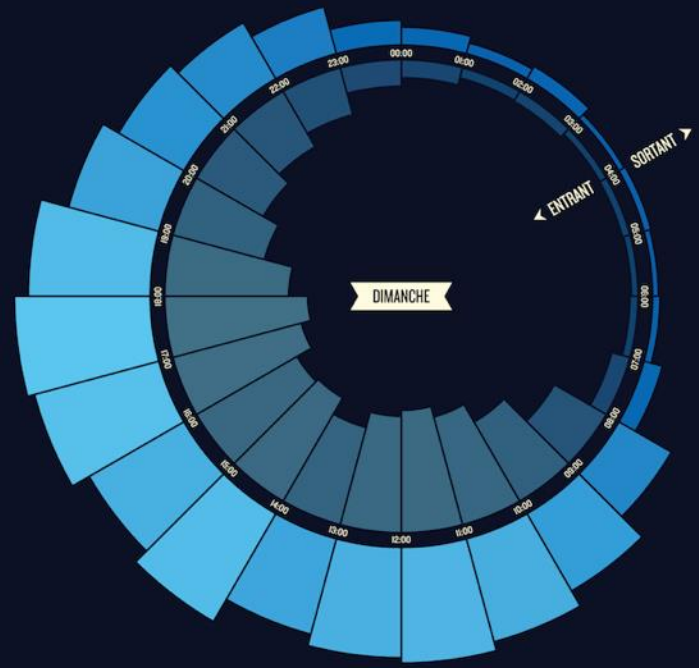
VILLE VIVANTE

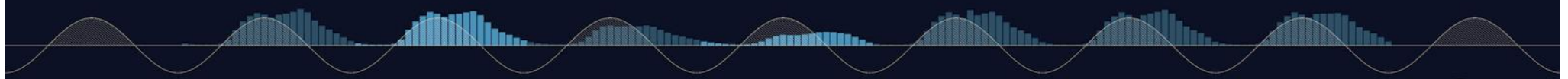
FLUX ENTRANTS ET SORTANTS

Dans quelle direction les flux des personnes se dirigent-ils dans une période de 24 heures? Cette visualisation illustre les mouvements entrants et sortants au centre-ville durant une journée dans le cercle de gauche en comparaison des mêmes mouvements durant le week-end dans le cercle de droite. Les heures de la journée sont représentées par des formes rectangulaires ordonnées autour d'un cercle. La longueur et la luminosité de ces formes montrent l'importance de l'activité durant cette période. Les formes placées à l'intérieur du cercle présentent les mouvements entrants et celles placées à l'extérieur du cercle, les mouvements sortants du centre-ville.

In what direction do people move over the duration of 24 hours? This visualization illustrates movements coming into the center of the city versus activity going out, for a weekday on the left and the weekend on the right. The hours of the day are represented as wedges ordered around a circle. The length and brightness of each wedge shows the amount of activity during this time. The wedges inside the circle stand for movement coming into the center while the wedges on the outside illustrate movement going out.





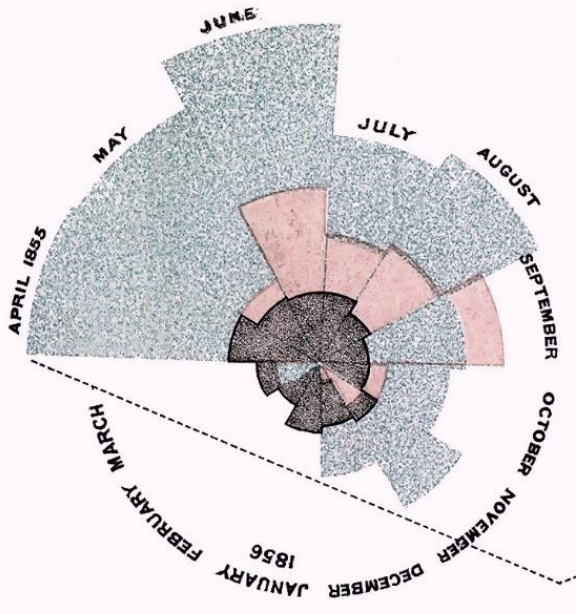


APERÇU DE LA SEMAINE | JEU | VEN | SAM | DIM | LUN | MAR | MER

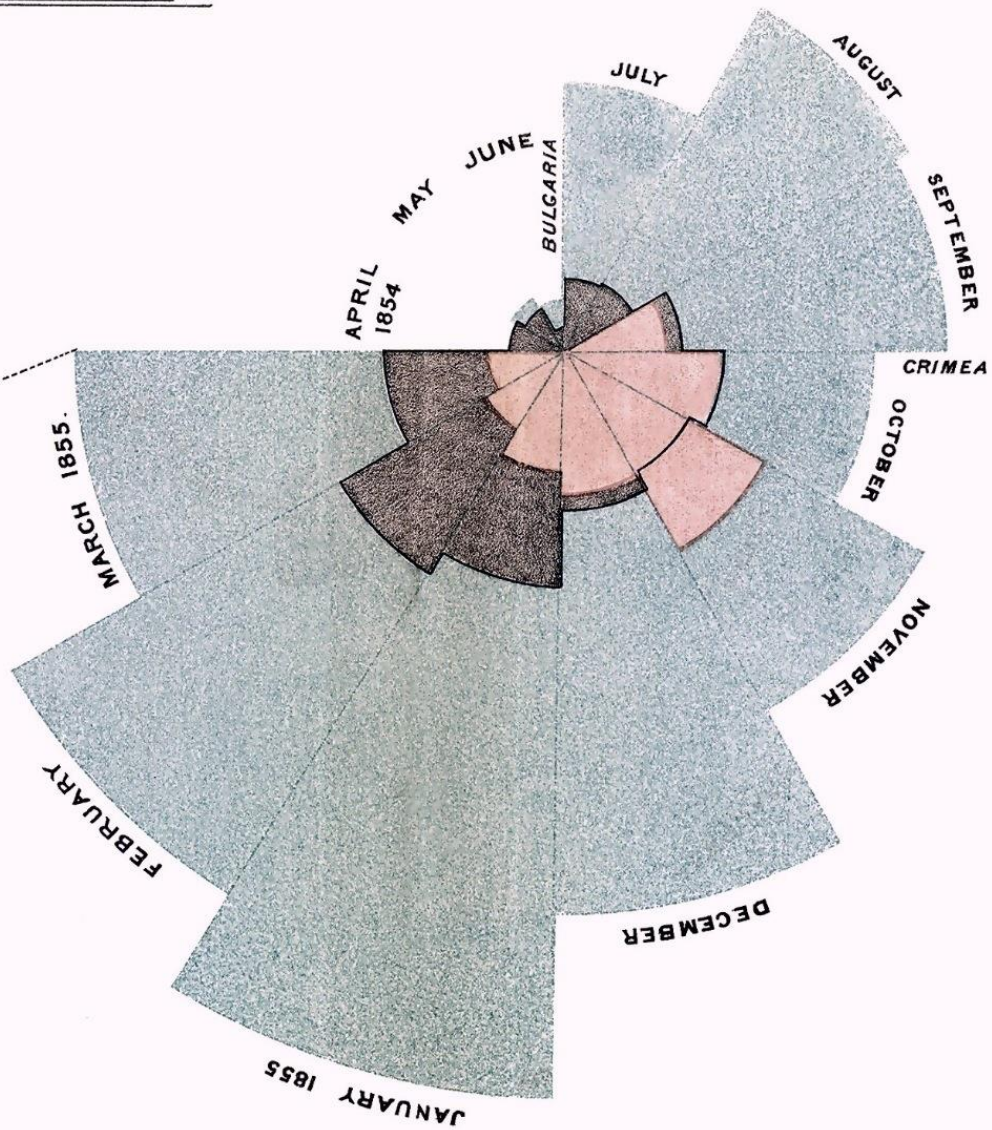
lift

DIAGRAM of the CAUSES of MORTALITY IN THE ARMY IN THE EAST.

2.
APRIL 1855 to MARCH 1856.



1.
APRIL 1854 to MARCH 1855.



The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.

The blue wedges measured from the centre of the circle represent area for area the deaths from Preventible or Mitigable Zymotic diseases; the red wedges measured from the centre the deaths from wounds; & the black wedges measured from the centre the deaths from all other causes.

The black line across the red triangle in Nov.r 1854 marks the boundary of the deaths from all other causes during the month.

In October 1854, & April 1855, the black area coincides with the red; in January & February 1856, the blue coincides with the black.

The entire areas may be compared by following the blue, the red & the black lines enclosing them.

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite.

Paris, le 20 Novembre 1869.

Les nombres d'hommes présents sont représentés par les largeurs des zônes colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en travers des zônes. Le rouge désigne les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M.M. Thiers, de Ségur, de Fezensac, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre.

Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davoust qui avaient été détachés sur Minsk et Mohilow en ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.

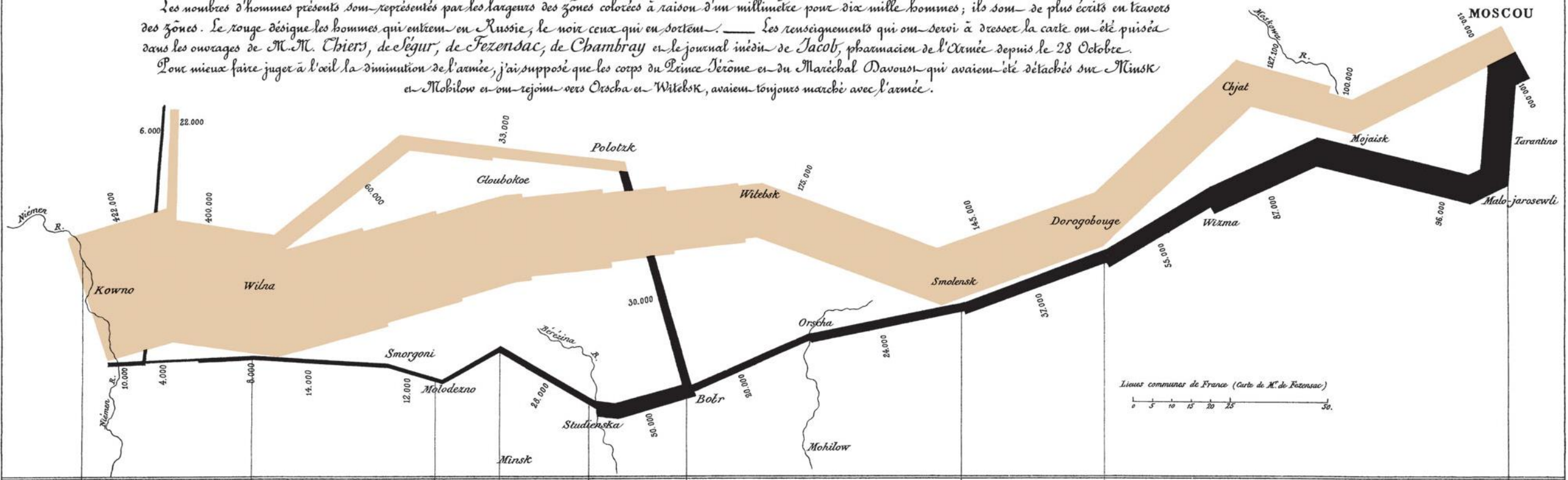
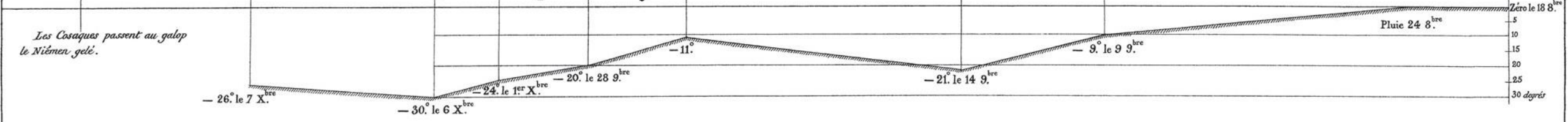


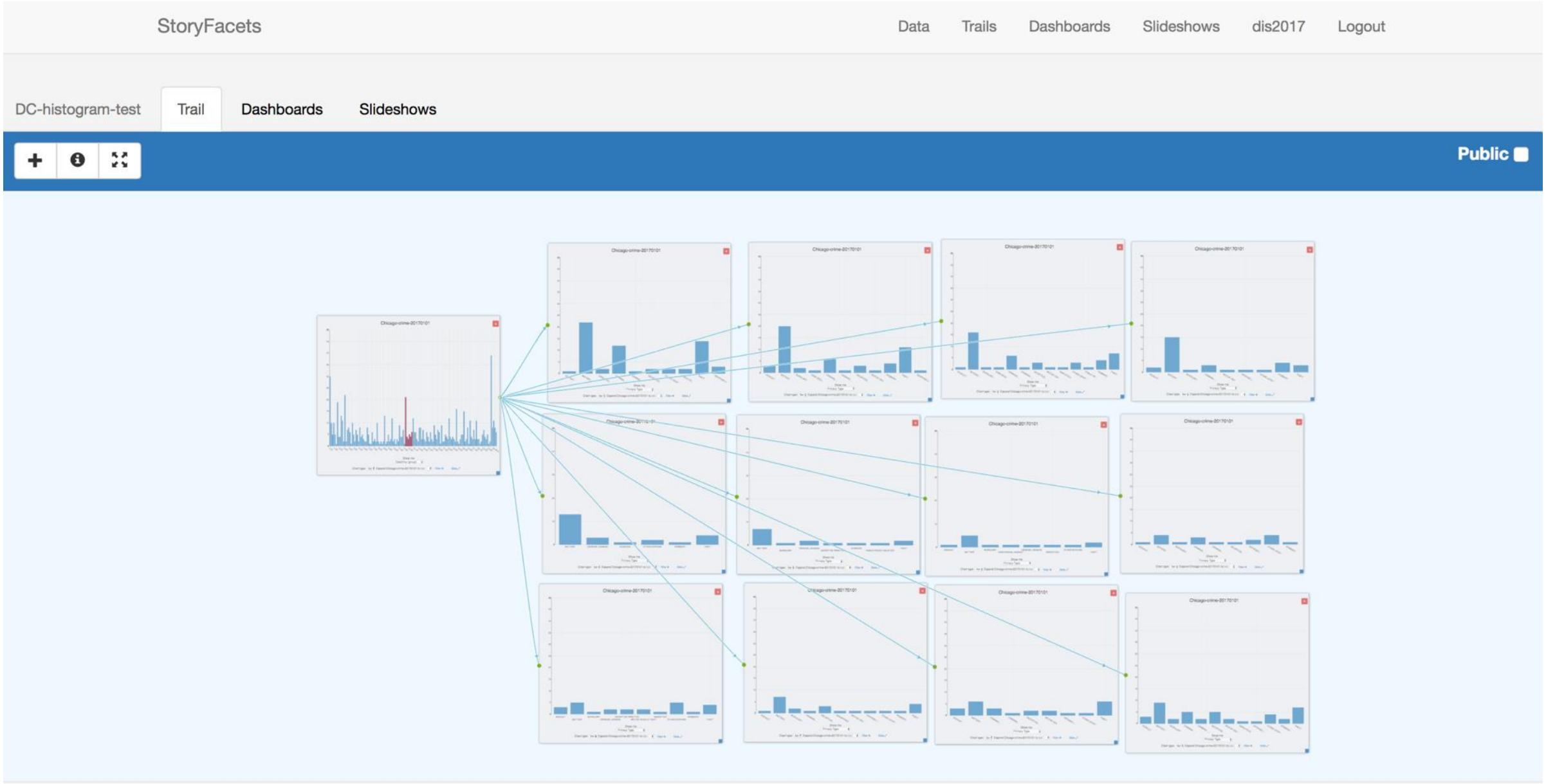
TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.



Autog. par Regnier, 8. Pas. Ste Marie St Gain à Paris.

Imp. Lith. Regnier et Dourdet.

ILUTE / TASHA - Comparative Toolsets



Theme 3 Research Assistant: Davidson Zheng

Traffic & Transit Management Group

Links and References

Consider swarm, boids and flocking algorithms and bioinformatics research for assisting in the design of visualization models.

Common design/development tools could include Processing, Cytoscape, NodeBox, Unity, Blender/Python, 3ds max, Maya and Sketchup.

Connection to open data sets on weather and road conditions (i.e. weather channel open data, local city news traffic coverage, including live and streaming video feeds of traffic flow, perhaps mashup of known real-time sources to both travelers and operators).

Research network based models related (i.e. Uber deck.gl) and unrelated to transportation and traffic, for analysis insights from other sectors (i.e Netflix vizreal). The Weather Company.

WebGL for high-end simulation graphics representations

CityEngine, Betaville, vizreal, deck.gl, mapbox

RESTful web services for low poly 3D spatial imaging or 2D visualization methods

Betaville, vizreal, deck.gl, mapbox, osm, google transit,

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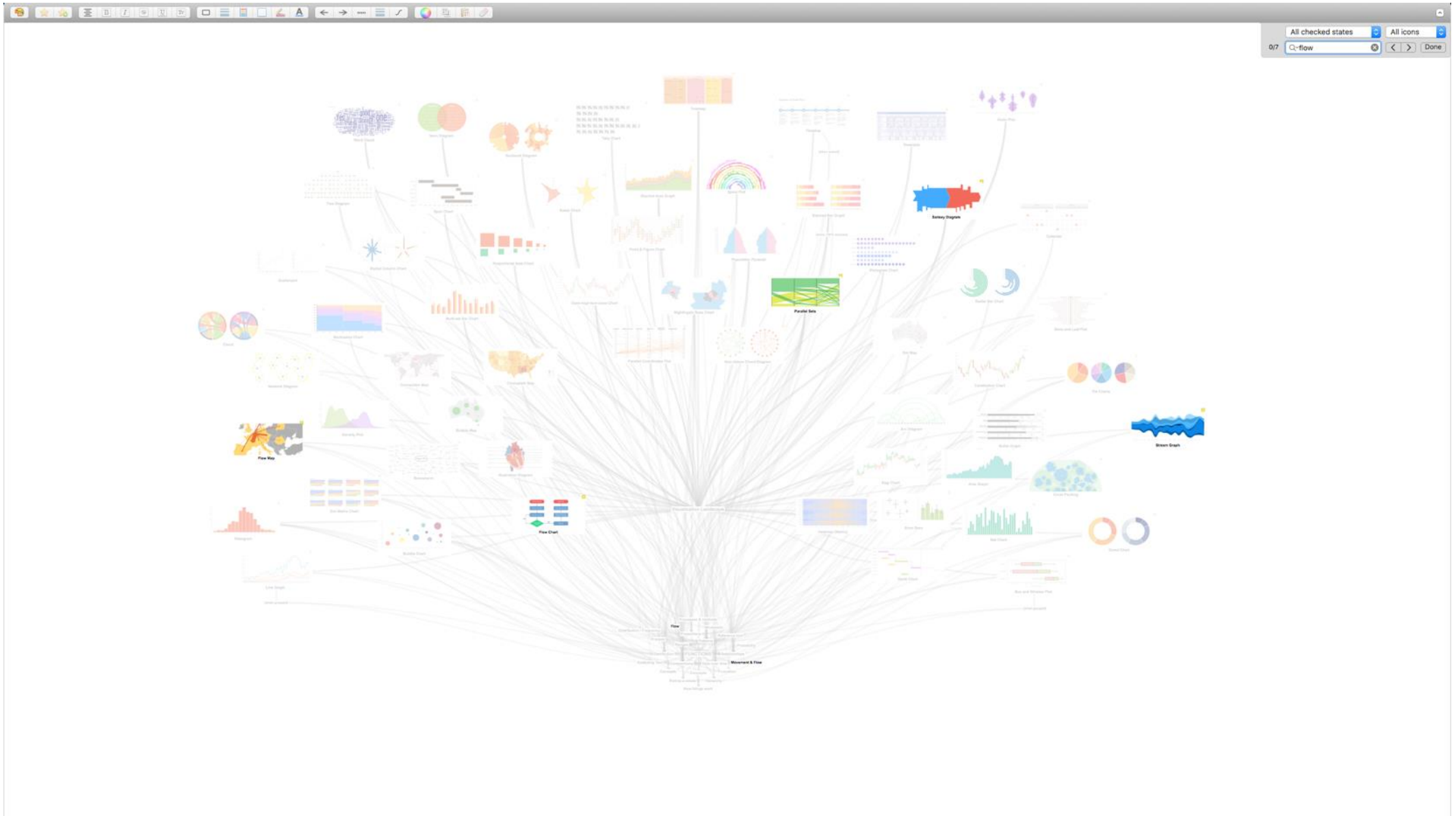

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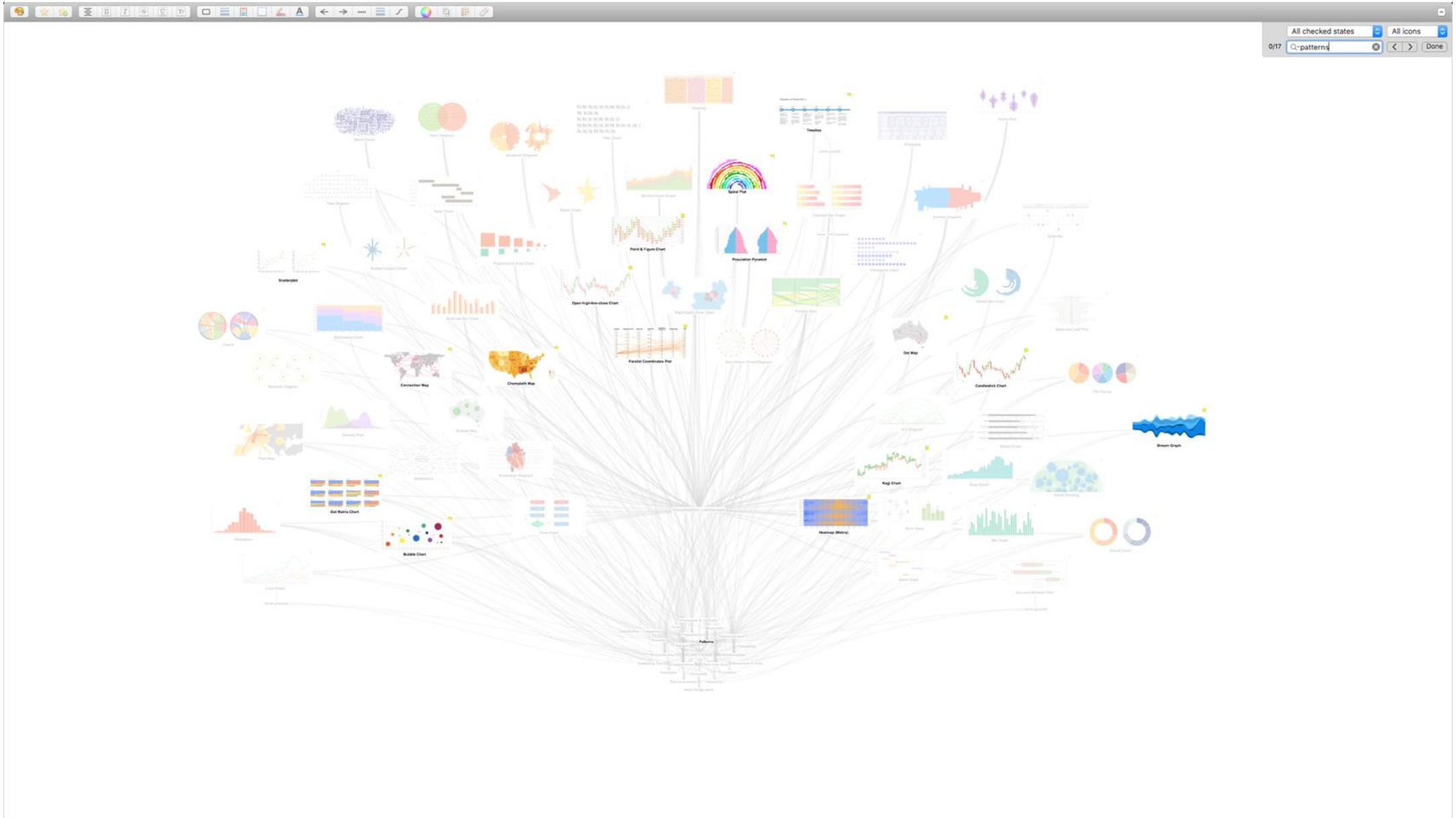

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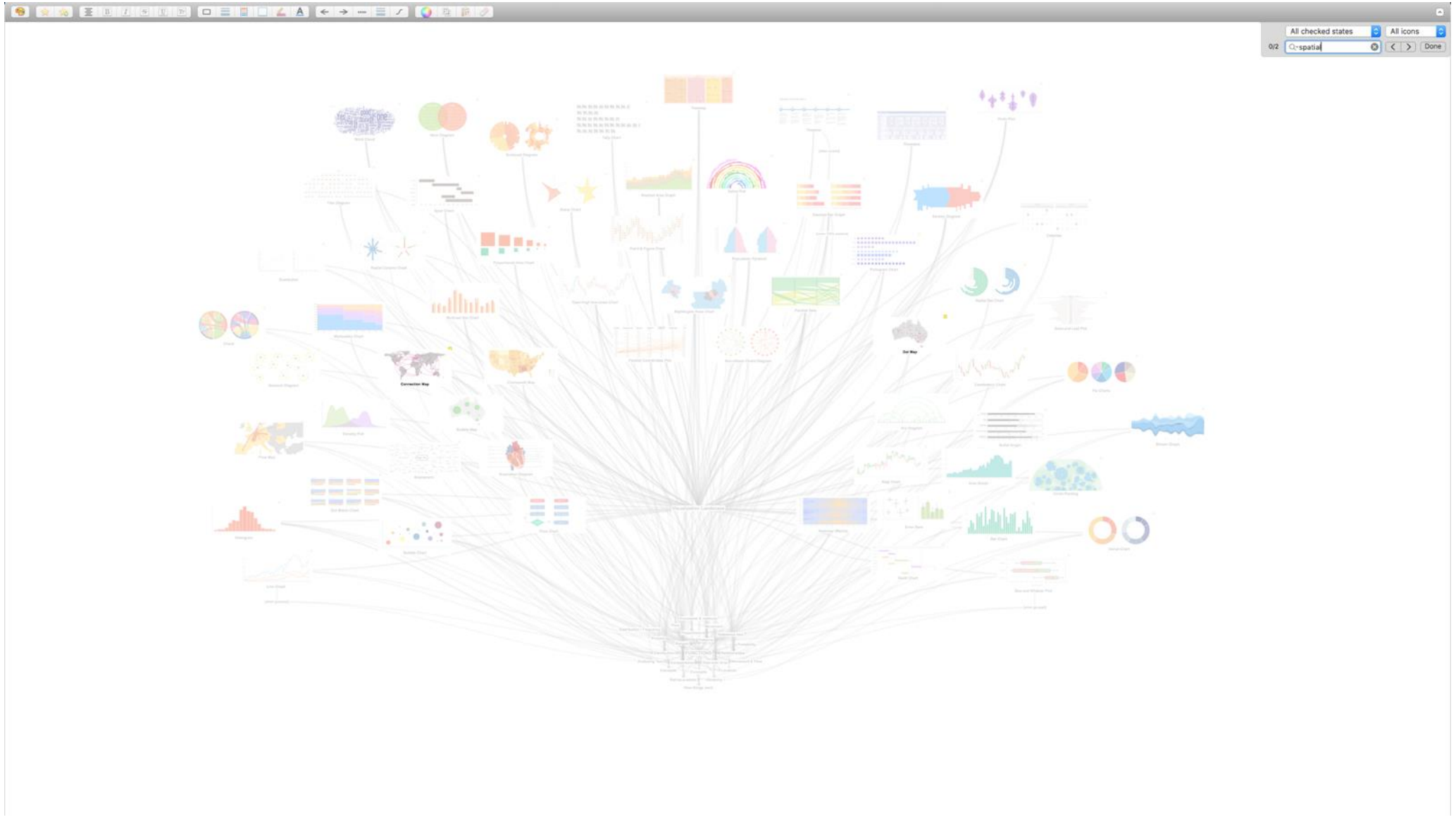

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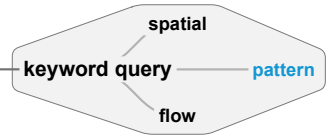
*based on using the visualization landscape concept map

Visualization Response

Traffic Management

Design Charrette



Pattern / Spatial

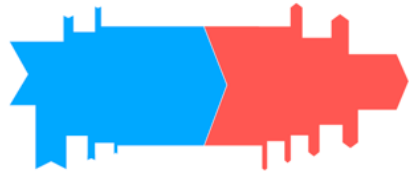
Connection Map

- great for showing connections and relationships geographically
- mapping routes through a single chain of links
- reveals spatial patterns through connection distributions/concentrations

Dot Map

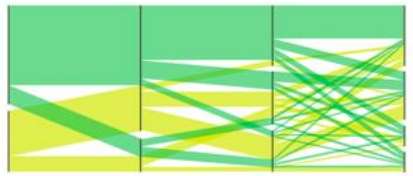
- detecting spatial patterns
- distribution of data over geographical regions
- reveals patterns when points cluster on a map

Pattern / Flow



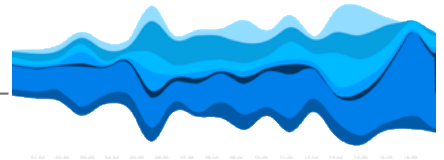
Sankey Diagram

- display flows and their qualities in proportion to one another
- width of arrows and lines show magnitude including flow magnitude
- colour can be used for categories/states



Parallel Sets

- shows flow and proportions (like Sankey)
- each time-set corresponds to a dimension/date
- width and flow path data of a line is a proportional fraction of a category total



Stream Graph

- a variation of a stacked area graph
- values displayed against a varying central baseline
- changes by varying organic shapes resembling river streams

Design Charrette

Activity 3

Design Charrette

Activity 3: Roadmapping Viz Strategies / ideas

(implementation strategies / platform choices)

(Mixed group breakout activity, 45 min., 4:00 - 4:45 pm)

The groups strategize viz requirements, both those that have no available representations, and those related to comparative applications. We ask each group to brainstorm about realistic and appropriate implementation based on activities 1 and 2, around strategies to build scenarios /prototypes specs of visualization use, platform choices and the kinds of desirable interaction tools.

Design Charrette

Wrap-up: summary and next steps

(15 min.)

Questions for further research:

How to accommodate users, task functionality, and data types to enhance user experience?

Do specific users need specific functionality?

What are the guidelines around privacy, accessibility of levels of information, and task functionality by users?

Design Charrette

Resources

Vocabulary

Users & Use Case Definitions

Actor /Persona
Name: description of persona character behaviours, profile of interest, familiarity with system, broad goals, etc. Also Gender, age, nationality, occupation etc.

Researchers: efficient and effective representation of historical patterns, test-bed for system change concepts, communication medium to address stakeholders

Operators: end-users of commercialized variants of research tools, traffic management analytics, visualization assistance, collaboration tools for workflow, systematic capabilities

Service Providers: tools to avail services, information, (to upload and to link other data)

Stakeholders (citizens, agencies, decision-makers): to the extent that stakeholders are engaged in the research cycle, the tools must be usable/intelligible for laypersons, and/or an effective means of communication to them in the hands of researchers.

For example; City Councilor whose jurisdiction includes the study area, Agencies with jurisdiction, e.g. Waterfront Toronto, Residents of the study area, Businesses of the study area, and business groups e.g. Business Improvement Areas (BIA), Cyclists, pedestrians, drivers, delivery vehicles, TTC, garbage collection, emergency services, Patrons of the businesses and other facilities fronting on the street: schools, hospitals, churches, etc., All city residents, residents, businesses, patrons and street users of parallel roadways.

Users & Use Case Definitions

Scenario of Urban System application
Description of actions / activities that actor(s) are involved in, desired information & uses, related story / narrative of user experience, context of their urban needs / use / access to the system to accomplish their desired task.

Description of Tasks Description / outline of desired task and use type: being accomplished

Preconditions – what are the requirements to use this technology? Accessibility to platform, understanding of interface & functionality, Data accessible? Study Area defined Use case priorities?

Triggers This is the event that causes the use case to be initiated. For example; City decides to modify the streetscape, possibly triggered by need to repave, or repair the underground utilities, City contracts with a consultant to undertake a planning study, or holds a design competition, Advocates call for a preliminary evaluation/study/implementation, Changes to adjacent land use, e.g. Transit-Oriented Development; other rezoning; changes to nearby road/transit access, High accident rate, Changes in use mix, New Area Plan under consideration , etc., All city residents, residents, businesses, patrons and street users of parallel roadways, etc.

Users & Use Case Definitions

Task Interaction: How are you using this software / tool?

Operations to navigate the model and data information: Orbit, Walk/ fly-through, pan, scroll, Zoom, Filter, pivot, linking, select, annotate, transform (move, scale, rotate), measure, (annotate measurement?),zooming inset, brushing and linking, scrolling, panning, filter, pivot, compare, microsimulation etc.

Data Visualization: What is the preferred visualization and functionality of tools needed?

Format of data visualization: 3d Bar charts, 3d Pie chart, 3d Scatter Plot, Geo-Data, Bar chart, Pie chart, Gather plot, Markup language,(binary matrix) Binary format (mtx) files, Excel (tabular data) Csv data, high level - interactive digital maps with on/off information layer switching, call-out boxes, KML and GML support, etc

Technical Parameters

- Integrability: ability to ingest and display the various data types and formats; access to common/each other's data/outputs to provide for e.g. interaction between traffic and transit models; compatibility with other tech used by the researchers e.g. Esri ArcGIS Pro, CityEngine, Insights; IBM IoT; XTMF

- Extensibility: Researchers must be able to add new functionality to the tools as needed over time

- Durability: to be really useful, the tools must remain available beyond the iCity project horizon, and/or maintain long-term portability of assets and outputs

Guiding questions: Use Cases

Who are the **users** / stakeholders / actors / groups? – operators versus stakeholders?

What are the **preconditions** for the use case? – identified study area, available data, etc.

What are the use case **priorities**? How are initial priorities / preferences for design conditions set?

What are the **triggers** for this use case?

What are the **outcomes** of a **successful use case scenario**?

What / how are the tradeoffs quantified and measured? (metrics)

How do we determine an improvement in conditions for different stakeholders?