Use cases

Initial Meeting Work with Complete Streets

Notes iCity **USE CASE Scenarios** Meeting November 2016

Meeting with **Matt Roorda, Megan Katsumi, Shoshanna Saxe**, with comments /feedback Carl Skelton, Manpreet Juneja, Jeremy Bowes

Guiding 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?

Use Case Definitions

Actor – anyone or anything that performs a behavior (who is using the system)

- Municipal Staff Worker (e.g. Toronto City Planner) (designs, or approves design)
- Municipal Staff Worker (e.g. Transportation Services Engineer)
- Consultant (who designs the streetscape, or who includes in an avenue plan), OMB (rules)
- Police and emergency service agencies
- Maintenance providers for roads, plantings, amenities
- Transit agencies
- Advocacy groups: neighbourhood associations, NGO's like TCAT

Stakeholder – someone or something with vested interests in the behavior of the system under discussion (SUD)

- 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. 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, businesses, patrons and street users of parallel roadways

Use Case Definitions

Primary Actor – stakeholder who initiates an interaction with the system to achieve a goal

- May be the municipal staff worker (if dashboard is used by city in-house)
- Are we designing the platform for active use by a variety of interested parties, or only as an extension of design tools offered to professionals to use in camera, to present post-design outcomes to passive partners/stakeholders?

Preconditions – what must be true or happen before and after the use case runs.

- Data assembled
- Study Area defined
- Use case priorities ?
- Study area evaluated as a performance baseline against which to measure need for Complete streets beforehand, and evaluate improvements afterwards.

Use Case Definitions

Triggers – this is the event that causes the use case to be initiated.

- 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
- Adjacent land use changes, 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

Use Case Definitions

Main success scenarios [Basic Flow] – use case in which nothing goes wrong.

- Dashboard gives useful outcomes to the consultant / municipal staff
- Outcomes are used as information base for participants in public meetings
- Outcomes are used by consultant/municipal staff to improve design
- Outcomes used to inform those with decision making power (OMB, Council)
- Dashboard provides effective way for stakeholders and decision-makers to evaluate costs and benefits of alternatives
- Broader access to the dashboard provides for better-informed deliberation and negotiations, earlier in the process when it's least costly and most useful
- Access to a common pre-design platform provides for better transparency/communication between actors, and actor-stakeholder coalitions

Use Case Definitions

Alternative paths [Alternative Flow] – these paths are a variation on the main theme. These exceptions are what happen when things go wrong at the system level.

- Failure to properly study/measure/evaluate a candidate site up front: this is now typical, makes it impossible to evaluate before/after differences
- Inadequate/irrelevant evaluation
- Poor definition of goals
- Hoarding: one actor/stakeholder sequesters the dashboard, only releases info that suits it's narrow agenda- right away, this compromises the value of the tool; over time, this can undermine the credibility of well-executed good-faith initiatives/implementations (this will be typical if the tool is provided exclusively to consultants, who answer to only the actor/stakeholder paying their fees).
- Poor access to relevant comparative cases
- In principle, the two above suggest that the system should be well-integrated with Open Data protocols and resources, and draw on/feed those resources as a matter of course.
- Poorly defined or understood algorithms/rulesets in evaluations & metrics
- Inaccurate base models: mis-measurement of critical dimensions like roadbed and sidewalk widths or curb access issues can lead to false design results

Elements of a Use Case (https://www.usability.gov/how-to-and-tools/methods/use-cases.html)
(Megan K., and Matt R. with additions of examples)

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?

Expansion of use case

(and extension based on meeting discussion)

Goals

support street design analysis/evaluation

support street design communication

Actors

designer

policy maker

non-technical user (general public)

commercial interest? (out of scope)

Use Case Summary

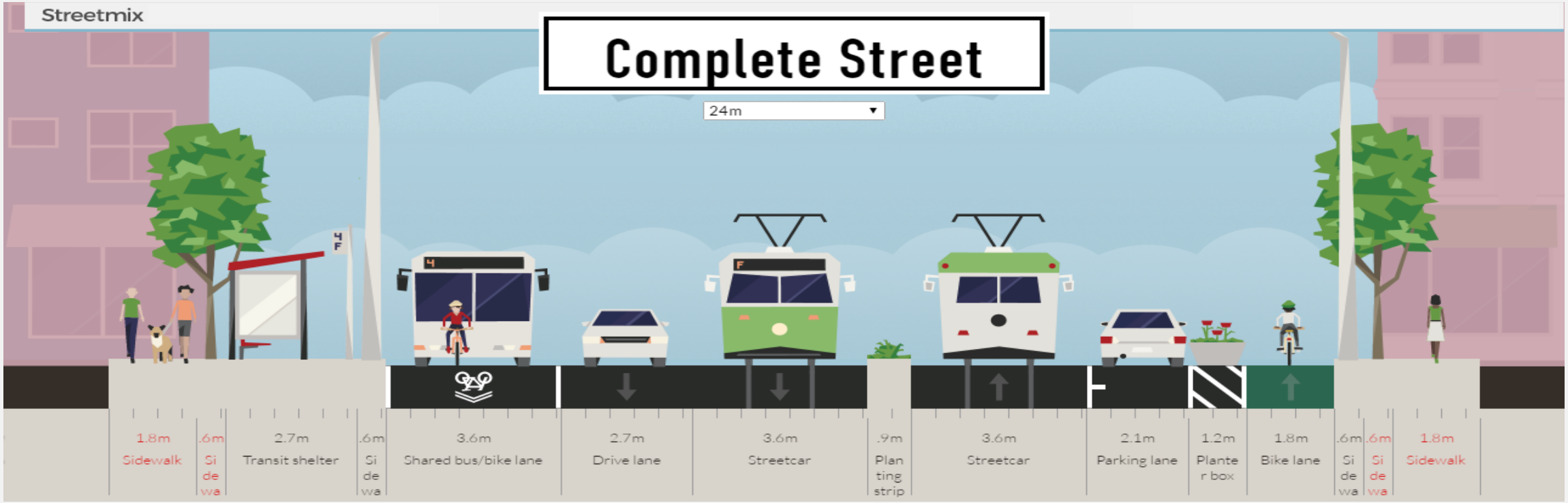
Optimize use of space in a corridor

Evaluate consistency of street design with respect to usage demands

Identify deficit corridors

Communicate street design

Communicate street design and implications



Expansion of use case

(and extension based on meeting discussion)

Use Case 1: optimize street design

(Analysis support; via original use case)

user inputs:

- corridor demands by mode and purpose,
- corridor constraints (e.g. available space),
- available technology relevant for space sharing,
- parameters to reflect priorities

system outputs:

- quantify tradeoffs in street design (in order to determine optimal solution)
- optimal street design: identification and allocation of (including relevant dimensions) vehicle lanes, dedicated transit lanes, bicycle lanes, pedestrian walkways, social space, and parking.
- guidance on use of cyber-technology

Use Case 1	Optimize use of space in a corridor	
Goal in Context	Designer (consultant or municipal worker) wants to determine the best configuration /performance mix in a particular corridor.	
Preconditions	Accurate data about corridor, constraints, and priorities is available.	
Success End	Optimal design / configuration of space correctly identified and conveyed to user.	
Failure End	Optimal design / configuration of space incorrectly identified and/or not conveyed to user.	
Primary & Secondary Actors	Primary: Designer Secondary:	
Trigger	User needs to determine how space should be used for a particular corridor	
Description	**Step**	**Action**
	1.	User specifies corridor constraints: available right of way, built environment
	2.	User specifies available technology
	3.	User defines parameters to indicate priorities
	4.	System determines optimal use
	5.	System recommends design to achieve optimal use
	6.	System recommends cyber-technology to achieve optimal use
Extensions	**Step**	**Branching Actions**
Variations	**Step**	**Branching Actions**
	4a. 4a1.	No optimal solution System conveys competing alternatives and tradeoffs
Related Information	City street information (dimensions, usage)	
Priority	High	
Performance	TBD (e.g. how long should this use case take?)	
Frequency	High	
Open Issues / Questions	What role does technology play? How are initial priorities / preferences for design conditions set? What/how are the tradeoffs quantified and measured? (metrics) Is the solution simply optimal with respect to the user-specified priorities, or do different methods for quantifying costs play a role? e.g. optimal solution to minimize travel delay, maximize access to facilities, or minimize conflicts between pedestrians and other modes..	

Use Case 1 - optimize street design

This use case provides decision support around optimal street design, with the inputs of corridor modes, demands, purposes and constraints (available space and relevant dimensions) and key priorities defined to determine an optimal solution for street design and mode sharing. Outputs of query includes quantity tradeoffs in street design: identification and allocation of (including relevant dimensions) vehicle lanes, dedicated transit lanes, bicycle lanes, pedestrian walkways, social space, and parking.

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User Type: designer, planners, architects, technicians, transportation engineers & operations, citizens

Tasks: visualization, search /exploration, analysis (geometrical), comment / query, dataset visualization, dataset history and analysis history visualization, decision support

Preconditions: corridor type by mode & purpose, corridor constraints (width etc.)

Engagement Level: expose (consuming, learning and viewing) involve (interacting) analyze (finding trends) synthesis (testing hypothesis) Decide (Deriving decisions)

Interaction: Walk, Bike, Drive, Transit modes, pan, scroll, zoom , select, annotate, measure, (annotate measurement?)

Data Visualization: 2D & 3D views, 3d charts, 3d Scatter Plot, Geo-Data

Open / Private Data Source: agnostic

Data Format (input): parameters to reflect priorities, 3D models, Markup

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?

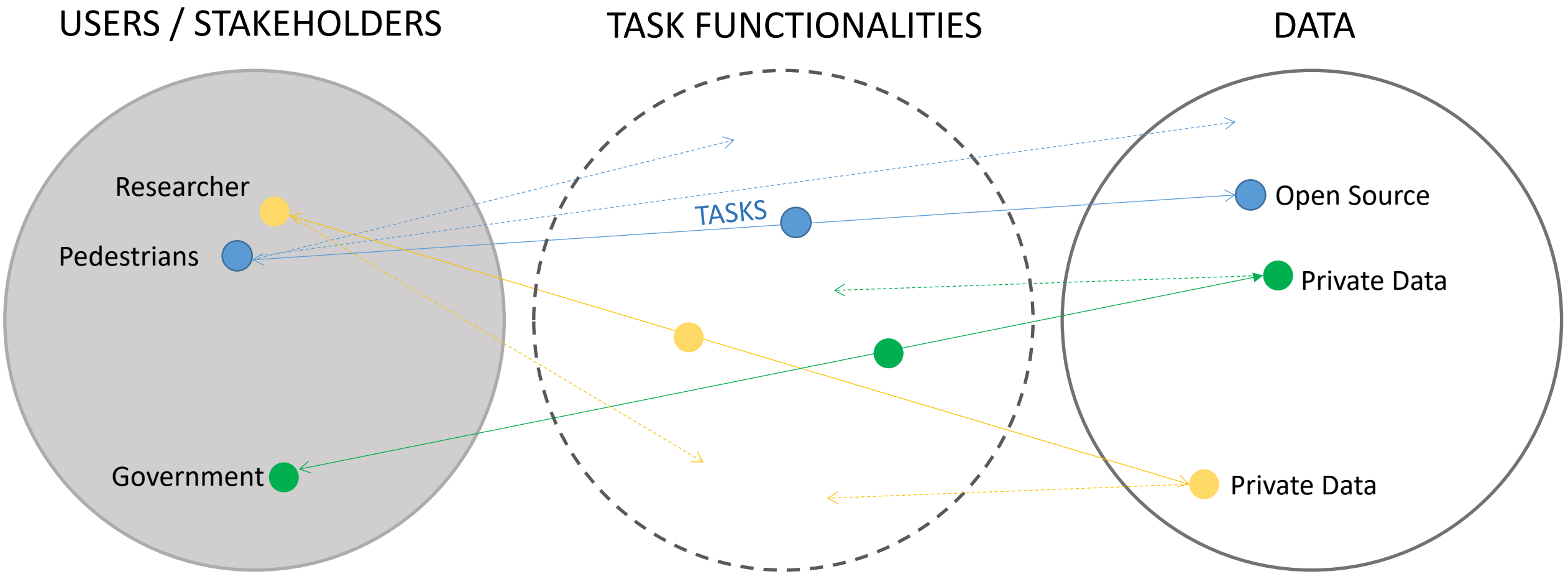
Is a street above a subway line a separate use case?

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

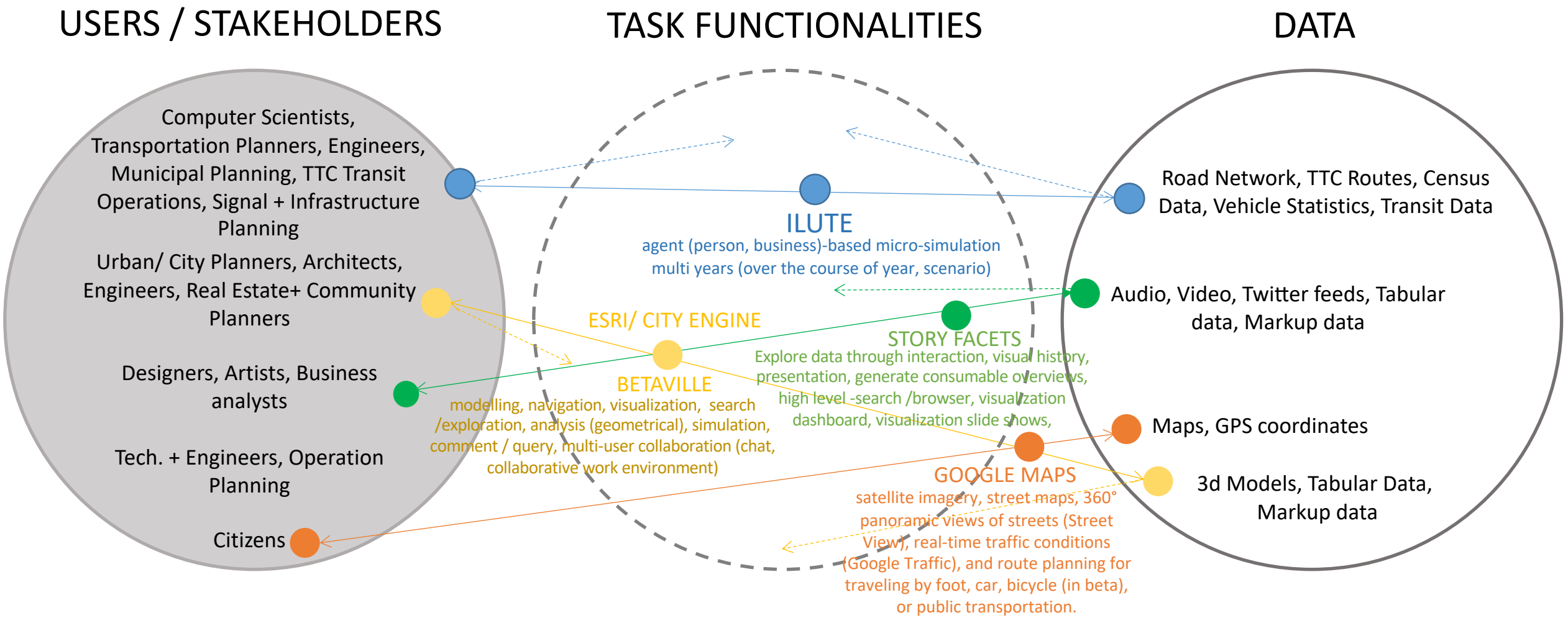
General Questions:

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

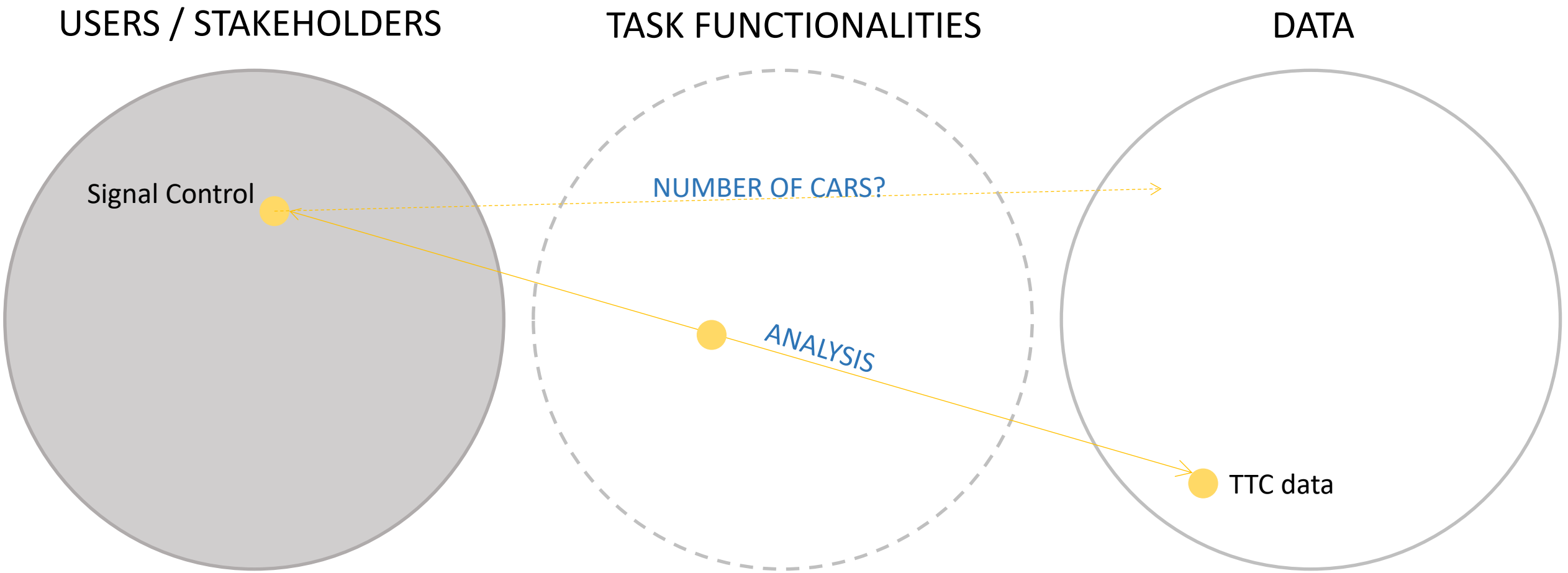
The full Complete Streets framework includes non-transport issues like public health, environmental impact, etc. Are we going for the whole rubric, or just the direct transportation/circulation factors?



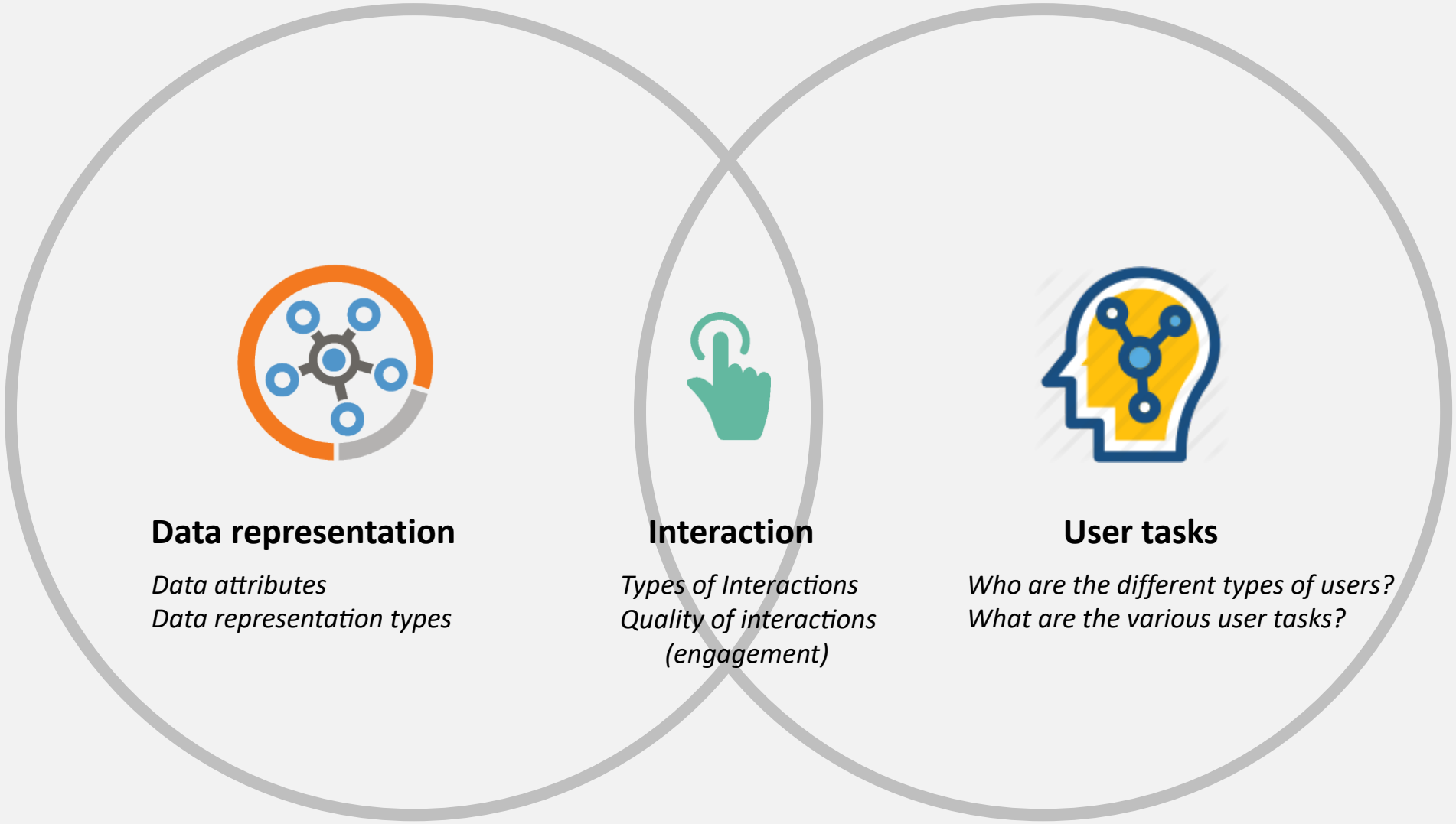
Compararive Methodology: Users, Tasks and Data



Compararive Methodology: Users, Task Functionality and Data



Compararive Methodology: Example - Users, Tasks and Data



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

Conclusions:

1. Broader Scan of (Existing and Needed) Applications
2. Better Understanding of :
   - User Groups
   - User Tasks
   - Existing Data Types and Required Data-sets

3. Build a common understanding of various terminologies and concepts amongst our team
4. Identify overlaps in each of the above categories to help us refine the framework for the user-interface / dashboard
5. Along with the framework for interface, this also helped us refine our frame-work for User-testing.

Next Steps:

Joint workshops with each team to help refine the content and refine framework for user-interface.

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?