

BDP. Quadrangle

Curtner Urban Leadership Program

TEAM 5 - Data, Measurement & City Building

FRIDAY, APRIL 28, 2023

As a Toronto Region based organization, we acknowledge the land we are meeting on is the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and is now home to many diverse First Nations, Inuit and Métis peoples. We also acknowledge that Toronto is covered by Treaty 13 with the Mississaugas of the Credit. We are all Treaty people. Many of us of have come here as settlers, immigrants, and newcomers in this generation or generations past. We'd like to also acknowledge and honour those who came here involuntarily, particularly those who are descended from those brought here through enslavement.







Matthew Firestone Intern Architect Zeidler Architecture

Kayly Robbins Senior Planner Weston Consulting **Gagan Nijjar** Policy Analyst Durham Region Arleigh Hack Associate Northcrest

Carly Forrester Development Manager Kindred Works



Andre Chin CP







Morning (9:30am - 12:00pm)

- Intro to Data, Measurement and City Building
- Recap of March Session Questionnaire
- Existing Tools and Industry Trends
- Challenges & Limitations
- Presentation & Discussion with Kevin

Lunch (12:00-1:00pm)

Afternoon (1:00pm - 3:00pm)

- Civic Challenge Deep Dive: The Community-Developer Relationship
- Discussion with Liz McHardy (Lura Consulting)
- Civic Challenge Breakout Activity
- Summary / Youtube Video Sidewalk Labs

ULI Housekeeping (3:00pm - 4:45pm)

- Overview of Program Field Trip (20 min)
- Overview of Town Hall (15 min)
- Team 6 Session (30 min)
- Integration Team (1 hour)







Intro to Data, Measurement & City Building

Data & Measurement

<u>Data:</u>

"Facts and statistics collected together for reference or analysis"

DATA

SORTED





Data & Measurement

Measurement:

"The quantification of attributes of an object or event, which can be used to compare with other objects or events"



Myrtle Beach Shark Attacks



Data & Measurement

Storytelling, Complex Understanding & Informed Decision Making



Myrtle Beach Shark Attacks



Data & Measurement in city building and solving civic challenges

- Data and Measurement is not new in this space
- Important for (not limited to):
 - Understanding places, people and problems
 - Tracking progress and assessing solutions
 - Building trust, transparency and accountability
 - Making informed decisions
 - To achieve goals
- Private sector, public sector, non-profits, communities and individuals are using and measuring data every day
- Necessary for improving life in cities for all, but also capable of causing harm







Recap of March Session Questionnaire

Favourite Neighbourhoods

- Yorkville, Toronto
- Adair Park, Atlanta
- Distillery District, Toronto
- Camden Town, London, UK
- Annex, Toronto
- Roncesvalles, Toronto
- Villeray, Montreal
- Santa Teresa, Rio De Janeiro
- Bloor West Village, Toronto
- Beaches, Toronto
- Oak Ridges, Richmond Hill
- Principe Real, Lisbon



Reasons and Measurement Tools (Provided by Participants)

- Diversity: Neighbourhood Profile and StatsCan Data
- Community: Social Connection Surveys
- Historic: Plaques
- Walkable: Walkscore
- Pedestrianized: Traffic Reports
- Accessibility: Travel Mode Surveys
- Safety: Violence Reports
- Affordability: House / Rental Price



Reasons and Measurement Tools Affordability

- Core Housing Need: determines if a household can afford suitable and adequate housing in their community (CMHC)
- CMHC introduced the housing hardside measure



Reasons and Measurement Tools Safety and Accessibility

- Safety
 - Safe Cities Index 2021
 - 76 Indicators
- Accessibility
 - Measuring the Impact of Proximity and Transport Performance (European Commission)
 - Accessibility in absolute terms, (i.e. the total number of opportunities that people are connected to) increases with city size.

Overall score

1	Copenhagen	82.4
2	Toronto	82.2
3	Singapore	80.7
4	Sydney	80.1
5	Tokyo	80.0
6	Amsterdam	79.3
7	Wellington	79.0
=8	Hong Kong	78.6
=8	Melbourne	78.6
10	Stockholm	78.0

Reasons and Measurement Tools Walkable and Pedestrianized

- Walkability
 - Walkscore most widely known measure
 - Walkability indicators better predicted actual walking volumes in more affluent neighborhoods.
- Pedestrianized
 - Accident Reports





Reasons and Measurement Tools Heritage

- Surveys are the most common tool used in measuring the economic impact of heritage tourism
- Heritage Register

"Is it too much? There are concerns that adding so many buildings to the registry could hinder intensification in exactly the neighbourhoods that need it the most."



Reasons and Measurement Tools Diversity and Community

- Diversity
 - Statistics (birthplace, ethnicity, religion)
 - Kevin's research found 'City-regions with more diverse populations have higher rates of economic productivity"
- Community
 - Social Capital
 - Sense of Community Index
 - Sense of Community Index adapted for Virtual Communities



Limitations to Questionnaire

- Skipped questions
- Incomplete answers
- Survey fatigue
- Interpretation Issues





Overview of Existing Tools and Industry Trends

Society-level Frameworks

Gross National Happiness (GNH)

- Based on the collective happiness and well-being of a population.
- A more holistic understanding of societal wellbeing



Gross Domestic Product (GDP)

- Based on the total value of goods produced and services provided in a country during one year.
- Economics-based understanding of societal well being.



Local, Smaller Scale Tools

- Toronto ward profiles
- Surveys
- Jurisdictional scans
- Toronto Vital signs
- Stats Can
- Municipalities Open Data
- etc



ESG



Ward 13 - Toronto Centre City of Toronto Ward Profiles 2016 Census

Average Number of People per Household 1.70



Family Composition by Type





Walk Score[®]



Affordable Housing



Executive Summary / Executive

Posthaste: Canada on cusp of rental housing crisis, says RBC, as population growth sets record

Report warns current market shortage could quadruple by 2026 Gigi Suhanic

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Published Mar 23, 2023 • 4 minute read
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Measuring New Development

Tr















What Could the Future be?







Challenges & Limitations

Common Challenges

- Subjective vs. objective data
- Primary vs. secondary data
- Data timeliness
- Incomplete data collection methods
- Data quality (corruption, sample size, missing data)
- Correlation does not equal causation
- GDP as a key measure
- The power of storytelling
- Perception
- Joy as a key measure

Subjective vs. Objective Data

Objective Data

- Factual data
- Why is it not used more often?

Subjective Data

- Human judgement
- Availability flexibility



Primary vs. Secondary Data



Primary vs. Secondary Data

Primary Data

<u>Advantages</u>

- More accurate
- Updated information
- More control over the data
- Privacy is maintained
- Understanding of data is better

<u>Disadvantages</u>

- Time-consuming process
- Costly data cleaning
- Require more labor
- Questionnaire must be easy and understandable
- Experienced person needed to analyze

Secondary Data

<u>Advantages</u>

- Ease of access
- Low cost or free
- New insights from previous analysis
- The study spans over a long period of time
- Anyone can collect the data

<u>Disadvantages</u>

- Not specific to your needs
- Limited control over data quality
- Data can be biased in favor of the person who gathered it
- Data may be out of date
- Anyone can access the data

Other Limitations

- Data Timeliness
- Data collected from different sources
- Incomplete data collection methods
- Data corruption
- Privacy
- Complexity and Bias

Measurement and Feedback Mechanism



- https://www.youtube.com/watch?v=oCuaROuvetE
- Measurement in relation to the feedback mechanism and improvement
- Almost Impossible to do in a city environment
- What is the goal?

Correlation and Causation

- Correlation does not mean causation
- 3rd variable
- Scientific method



Gross Domestic Product (GDP)

- Limitations
- GDP as an idea
- Policies tied to GDP, inequality
- GDP an all consuming metric?
- What do we really want to measure?

GDP: Policies could be developed and entrenched into society



GDP: What do we want to measure?



Perception & Storytelling








Perception can be the reality







Which Hat? The power of storytelling





dotterstak one-20090001



Can you relate?

- Gravitational Waves
- Billions of years ago
- Einstein theory

LIGO - A GIGANTIC INTERFEROMETER



Joy and Hedonic Adaptation



What is the motivation?

- Purpose, what is the measurement trying to support?
- Perils of portrayal
- Taking action
- What measurement to take?

Validity and being a skeptic

Nassim Nicholas Taleb > Quotes > Quotable Quote (?)



"I will repeat the following until I am hoarse: it is contagion that determines the fate of a theory in social science, not its validity."

 Nassim Nicholas Taleb, The Black Swan: The Impact of the Highly Improbable

tags: social-sciences, theory

Read more quotes from Nassim Nicholas Taleb

Like Quote

Share this quote:



Presentation & Discussion with Kevin



Kevin Stolarick, PhD

Visiting Researcher, Inclusive Design Research Centre OCAD University

Dubbed the "Official Statistician of the Creative Class", Kevin combines expertise on cities, inclusion, urbanization, statistics, design, and economic development with an appreciation of the importance of finding and sharing the knowledge or "pearls of wisdom" gained from leveraging his research, writing, management and organizational skills. The author of over 100 peer-reviewed articles and commissioned reports, he has presented over 75 invited key-note speeches and presentations and over 100 print, radio, television, and on-line media interviews and appearances. He holds a PhD in Business Administration (Information Systems) and an MBA from Carnegie Mellon, a Masters in Higher Education Leadership, and a BS in Honors in Applied Computer Science. Kevin provided guantitative research and analytical support for Richard Florida's books including The Rise of the Creative Class and Rise Revisited. He continues in collaboration with other researchers in the development of measures, indicators, and approaches for Creative Economy theory with a focus on the economic and social value of inclusion

Measurement Overview

Kevin Stolarick, PhD

Measurement & Statistics

- Key Ideas
- Data Types
- Data Sources
- Describing Data









Example: The S.A.T.

- For 200 college Freshmen, have
 - S.A.T. scores
 - \circ 1st Year college GPA
 - Public/Private High School
 - Gender
- Use statistics to learn about ...

Regional Measures

- Housing
- Economy
- Housing
- Environment
- Health
- Education
- Transportation

- Population
- Recreation
- Arts
- Tolerance
- Crime
- Amenities
- Other

Dimensions of Regional Prosperity

- Growth
- Wealth/Money
- Welfare
 - Education
 - Healthcare
 - Wellness/Health
- Productivity
- Taxes
- Social Contract
- Equality/Affordability
- Inclusiveness

- Environment/Green
- Participation / Social Capital
- Achieving Potential
- Happiness/Satisfaction
- Magnetism
- Competitiveness
- City Size
- Δ 's (deltas changes)
- Cultural/Arts
- Sustainability
- Others?

Impact on What?

- Cultural
- Economic
- Social
- Environmental

Types of Statistics/Measures

- Descriptive
 - Use numbers and graphs to look for patterns and summarize information in the data
 - How many of 200 went to private schools?
- Inferential
 - Use data to make estimates, decisions, predictions, or generalizations about a larger set of data
 - How many HS students go to private schools?

- Unit of Analysis/Experimental Unit
 - Observation (person, object, event) for which data is collected
 - Sample
 - HS students, took SAT, finished 1 yr college
- Population
 - <u>Complete</u> set of units of interest
 - Census
 - All HS students who go on to college
 - Everyone who took the SAT in a given year

- Variable
 - Characteristic, attribute or property about an observation (need not be numeric)
 - SAT verbal score, gender, GPA
- Statistical Inference
 - Estimate or prediction about a population based on a sample
 - 25% attended private high school
- Reliability (Measure of)
 - Degree of uncertainty associated with a statistical inference
 - +/- 5%

- Sample
 - Subset of the population
 - Any subset is a sample
 - 200 HS students in my data set
 - Not all samples are equally good

- Representative Sample
 - Any sample whose characteristics are "typical" of the population
- Random Sample (of n observations)
 - Every possible sample of size n has an equal chance of being selected from the population
 - Every member of the population has an equal chance of being included
 - Only as good as ability to identify and list the population

Sampling Methods

- **Random** generated or tables
- **Stratified** random within classifications
- **Systematic** ordered population, every kth observation
- **Cluster** divide population into sections, census (all) random sections
- **Convenience** easy to get; "man on the street"; person on the Internet

Data Types - Variables

- Qualitative
 - Classification information; not meaningful numbers
- Quantitative
 - Numeric information

Measurement Levels

- Nominal Name only
 - Gender, public/private high school
- Ordinal Order only
 - HS Rank, good/better/best, Likert (1-5)
- Interval Order and differences; not ratios
 - Year in college, temperatures, calendar time
- **Ratio** Order, differences, and ratios
 - \circ $\,$ Age, SAT score, measurements, clock time $\,$

Data Collection

- Secondary someone else collected
 - Published data, known source
- Primary you collect
 - Experiment
 - Survey
 - Observation

Public Data: Geographic Precision and Data Specificity



Using Measurement Wisely

- Asking the right (kind of) questions
- Allowing for problems/issues
 - Measure of reliability
 - Nonrandom samples
 - Selection bias incorrect population
 - Non-response bias unanswered question
 - Measurement error variables are "off"

Evidence-based decision making

Evidence-based decision making

versus

Decision-based evidence making

But, is there really a difference????

Lies, Damn Lies & Statistics

- Impact of data/variable choice
 - Total number vs. percentage
- Impact of presentation
 - Scale, color, size
- Impact of text/description

Time Series Plot – Voter Turnout



Time Series Plot – Voter Turnout



Impact of Description

"For the third presidential election in a row, voter turn out continued to rise at unprecedented levels."

versus

"The historic trend of voter apathy continues with turnout for the presidential election well below levels of even 30 years ago."
Inclusive Statistics



Tails of the Tails





For every complex problem there is an answer that is clear, simple, and wrong.

H. L. Mencken

EVALUATING COMPLEXITY PROPOSITIONS FOR IMPROVING PRACTICE

Hallie Preskill and Srik Gopal with Katelyn Mack and Joelle Cook



Characteristics of Complex Systems	Propositions for Evaluation		
A complex system is always changing, often in unpredictable ways; it is never static	Design and implement evaluations to be adaptive, flexible, and iterative		
Everything is connected; events in one part of the system affect all other parts	2 Seek to understand and describe the whole system, including components and connections		
Information is the fuel that drives learning and helps the system thrive	3 Support the learning capacity of the system by strengthening feedback loops and Improving access to information		

*for "evaluation" read "measurement"

Characteristics of Complex Systems	Propositions for Evaluation
Context matters; It can often make or break an initiative	A Pay particular attention to context and be responsive to changes as they occur
Each situation is unique; best principles are more likely to be seen than best practices	5 Look for effective principles of practice in action, rather than assessing adherence to a predetermined set of activities
Different sources of energy and convergence can be observed at different times	6 Identify points of energy and influence, as well as ways in which momentum and power flow within the system

Characteristics of Complex Systems	Propositions for Evaluation
Relationships between entities are equally if not more important than the entities themselves	7 Focus on the nature of relationships and interdependencies within the system
Cause and effect is not a linear, predictable, or one-directional process; it is much more iterative	8 Explain the non-linear and multi-directional relationships between the initiative and its intended and unintended outcomes
Patterns emerge from several semi-independent and diverse agents who are free to act in autonomous ways	9 Watch for patterns, both one-off and repeating, at different levels of the system

Propositions	Description	Helpful Tools/Methods
Design and implement evaluations to be adaptive, flexible, and iterative.	Evaluation needs to be nimble and open to periodic "refreshes" as stakeholders constantly learn from feedback. Evaluators must be comfortable with shifting gears as needed.	 Flexible evaluation plans and budgets
Seek to understand and describe the whole system, including components and connections.	It's important for the evaluators to know how and why different components interact. This is to be treated as a "dynamic" and ongoing activity, rather than one-off.	 Systems Mapping Social Network Analysis Interviews
Support the capacity of the system to learn by strengthening feedback loops and improving access to information.	Evaluation can help improve and strengthen the system's capacity to learn through the collection, analysis, and co-interpretation of data. As data are collected and analyzed, learning conversations with stakeholders and insights into how and where the system is responding to the initiative's activities can be particularly useful.	 Rapid Feedback Debriefs Summaries/Learning Memos Critical Incident Reviews After Action Reviews

Pay particular attention to context and be responsive to changes as they occur.

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Context must be explicitly studied as part of the evaluation.

Evaluation should also measure ways in which the initiative affects the context.

Evaluation findings should be interpreted and grounded in context.

Look for effective principles of practice in action, rather than assessing adherence to a predetermined set of activities. Evaluation should identify and explicate how effective principles of practice are alive in the work.

Data and insights about how, where, and with whom the principles show up can provide a rich source of learning.

Identify points of energy and influence, as well as ways in which momentum and power flow within the system. Evaluation needs to look for times and places where energy, influence, power, and momentum show up within the system.

This may include examples of how individuals and organizations are building new or different connections, power dynamics, and patterns of engagement.

- Timeline of key events
- Review of information related to context, including print and social media, demographic information, and other publicly available data

- Interviews
- Reflective Practice
- Design Labs
- Interviews
- Focus Groups
- Most Significant Change
- Appreciative Inquiry
- In-depth Case Studies
- Systems Mapping
- Focus Groups
- Ripple Effect Mapping
- Observations
- Digital Storytelling
- Snap Shot Surveys
- Bellwether Interviews
- Social Network Analyses

Focus on the nature of relationships and interdependencies within the system.

Evaluation should capture and describe relationships and interdependencies between various parts of the system.

With each key relationship, it's important to understand its nature, its strength, and its longevity.

Explain the non-linear and multi-directional relationships between the initiative and its intended and unintended outcomes. Evaluation should capture the complex relationship between cause and effect.

This process involves tracking the pathway between an initiative and its outcomes, and understanding how it varies under different conditions and circumstances.

Systems Mapping

Social Network Analyses

- Surveys
- Interviews
- Digital Storytelling
- Web Analytics
- Interviews
- Focus Groups
- Appreciative Inquiry
- Media Tracking
- Observations
- Ripple Effect Mapping
- Contribution Analysis
- Causal Diagrams

Watch for patterns, both one-off and repeating, at different levels of the system. Evaluation needs to pay close attention to patterns as a way to gauge the coherence in the system.

Attention should also be paid to the ways certain patterns (both productive and unproductive) repeat themselves at multiple levels of a system.

- Observations
- Interviews
- Focus Groups
- Surveys
- Time Series Designs

Measurement & Impact

























"94.73% of all statistics are made up on the spot."

Anonymous



Discussion with Kevin

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Civic Challenge Measurement & Reframing the Community - Developer Relationship

Reframing the Community - Developer Relationship





What is the problem?

- A range of stakeholders and diverse communities = diverse opinions and experience.
- Differing and competing values, priorities, mandates and goals.



What is the problem?

- Fear of change within a community
- Negative perceptions of the development industry
- Lack of trust and transparency
- Mis-understanding of scope and influence (who does what?)



What do we currently measure?

Developer

- Objective stats/facts about a project or place
- Development impacts (short and long term)

Community

• Community feedback and participation

Objective Project Information

- Angular Planes
- Setbacks
- Stepbacks
- Sidewalks
- Landscape



Objective Project Information Height



Objective Project Information

- Gross Floor Area
- Parking Infrastructure
- Cycling Infrastructure
- Unit Counts
- Amenity indoor
- Amenity outdoor

General Project Description	Proposed		
Total Gross Floor Area	83 635		
Breakdown of project components (m ²)			
Residential	68 628		
Retail	1692		
Commercial	13 315		
Industrial			
Institutional/Other			
Total number of residential units	982		

Section 1: For Stand Alone Zoning Bylaw Amendment Applications and Site Plan Control Applications

Automobile Infrastructure	Required	Proposed	Proposed %
Number of Parking Spaces		332	
Number of parking spaces dedicated for priority LEV parking			
Number of parking spaces with EVSE			

Cycling Infrastructure	Required	Proposed	Proposed %
Number of long-term bicycle parking spaces (residential)		800	
Number of long-term bicycle parking spaces (all other uses)		132	
Number of long-term bicycle parking (all uses) located on:			
a) first storey of building			
b) second storey of building			
c) first level below-ground		532	
d) second level below-ground		400	
e) other levels below-ground			
Development Impacts Shadows









Sep 21 - 11_18 AM - DST

Development Impacts Wind Studies



Development Impacts Traffic

Figure 4-3: Net Site Traffic Volumes



Community Benefits POPS





Corner Forecourt



This residential forecourt at "Centro" in Scarborough Centre includes seating, artistic elements and landscape features.

Community Benefits Affordable Housing





Community Feedback



Community Feedback



Figure 4: A screenshot of the project Social Pinpoint page, shortly after closing for comments on July 5, 2022.

Community Feedback



Challenges with Measurement

- Whose opinions are being measured?
- What kind data are we measuring
- How are we measuring that data?
- How do we measure success or progress in a neighbourhood?





Discussion with Liz McHardy





Liz McHardy, MBA – Partner

Liz specializes in organizational design, training, and collaborative planning – especially in developing community and corporate sustainability plans. Her approach focuses on empowering people to discover, dream, design, and deliver. Liz is a creative and strategic systems-thinker and uses appreciative inquiry methods to establish integrity and trust in process participants. She is a strong and respected integrator, ensuring that community values and ideas are synthesized and embedded into public policy in every project she works on. Liz, has an MBA from Royal Roads University, and is also an accomplished speaker, trainer and proponent of "Guided Learning".







Civic Challenges Breakout Activity

Civic Challenge Breakout Activity

Similar to how we examined our civic challenge, we want to hear your thoughts on how "data" and "measurement" apply to the other Team civic challenges!

Team	Challenge
1	Diverse Places and the Practice of Democracy
2	Built form Housing; Vertical Density and Joy in Community Building
3	Finding Belonging in the City and Active Celebration
4	Building a Culture of Long-Term Pedestrianization
5	Reframing the Developer/Community Relationship

Civic Challenge Breakout Activity

- 1. What data could support your understanding of the problem and how might you measure progress?
- 2. What are the challenges with finding and obtaining this data?
- 3. What are the different perspectives and stakeholders in this challenge (present or missing)? How might they use and interpret data differently or otherwise be impacted by this study?
- 4. What challenges do you foresee in tracking/measuring progress?



Summary and Case Study Sidewalk Labs

When you see the following images, what comes to mind?









Case Study - Sidewalk Labs

- Sidewalk Labs is creating smart cities; technology (sensors and cameras everywhere) under the guise of helping you get from point A to B and getting you information
- **Issue** = collection of personal information
- **Challenge** = embed privacy into the smart city to prevent privacy harms from arising
- **Solution** = strip data of personal identifiers; what/how the data can measure will be different, nevertheless you still have data
- "Everybody wants personally identifiable data"

Public Data: Geographic Precision and Data Specificity



Session Summary

- Sidewalk labs was an example of the negative side of data, measurement and city building (what happens when you lose sight)
- Various data tools that help us measure in our work research, planning, city building, etc.
- Key is to use the tools (data/measurement) to understand, track progress, assess solutions while building trust, being transparent, providing accountability and making informed decisions
- Community/Developer relationship and the use of data/measurement and building trust
- Important to consider these and more as the future with data/measurement and possibilities seem endless



Questions? Comments?

Thank you!