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Recommendations for Measuring a Community Economy

Deloitte Recommendations

September 2022

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Deloitte LLP ("Deloitte", "we", "us", etc.) has provided this report to Shorefast. This report outlines recommended data and methods to support informed and place-specific economic development across Shorefast communities. This report also provides unique and novel methodologies to collect and report the data, and other strategic considerations for each community. This report was funded by Deloitte in partnership with Shorefast and the Deloitte Social Innovation Fund.

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Overview and Table of Contents

Project Background

The Shorefast Community Economies Initiative aims to support place-based approaches to economic development

The Shorefast Community Economies Initiative ("The Initiative ") is a "pan-Canadian initiative founded on the understanding that the unit of change is community, that capital must be employed to empower communities, and that place-based approaches are needed to deliver lasting solutions that scale."[1] Five communities across Canada have been engaged by Shorefast to contribute to the Initiative, which include: South Vancouver Island, BC; Hamilton, ON; London, ON; Prince Edward County, ON; and Fogo Island, NL.

Together, the participating communities are working to engage in knowledge sharing around best and promising practices for community-based economic development. The regions will also inform the development of tools to amplify their knowledge of their communities. The five current participating communities represent the first cohort towards Shorefast's longer-term vision of a Community Economies Network. The Initiative is tackling identifying the following focus areas:

- **Collaborative and Governance** Structures that are needed to advance local economies.
- How to **Build Capacity** at the local community level.
- What **Data** is needed, where to get it, who controls it, and where to store it.
- How to **Attract and Retain Capital** in communities.
- How **Policy Environments** will enable local economic agency.
- The role of **Philanthropy** in community economic development.

Deloitte has been engaged by Shorefast to develop a report outlining recommended data, unique and novel methodologies, and strategic considerations to support data-informed and place-specific economic development across the five communities who participated in consultations with Deloitte.
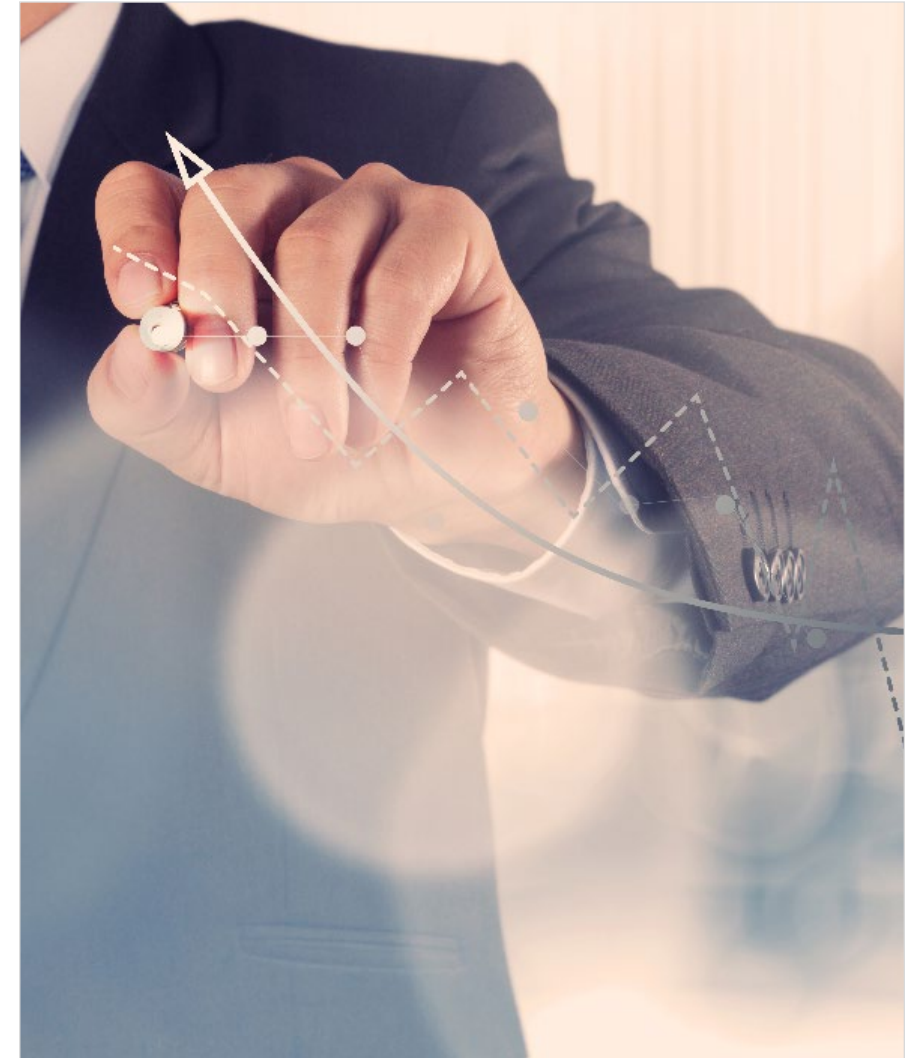
Overview of Methodology

Deloitte executed 3 key activities to support Shorefast's Community Economies Initiative

Data Collection and Overview	Target Consultations	Recommendations on Analytics & Visualization

• Discussion and dialogue with the Shorefast leadership team about the context of The Initiative and current observations on data in economic development in Canada today.
 	
• Reviewing existing community development data, analysis and Initiative materials, as well as relevant public Statistics Canada census metropolitan area (CMA) level community data.
 	
• Developing research questions to each Initiative community to identify key gaps and areas of challenge related to data, as well as connecting with Statistics Canada to discuss availability of non-public economic and community data.
	• Targeted consultations with:
	  – 2-8 stakeholders at each of the Initiative communities to identify the overall economic development context, as well as anticipated topic areas/themes within economic development data for each community between May and July of 2022.
	  – Presentation and consultation on preliminary findings at Shorefast Community Economies Pilot Gathering on June 10th in London, ON.
	
	• Synthesizing key findings and confirming a set of 5-10 meaningful data metrics/themes per community.
		• Developing a report outlining recommended data per community, unique and novel methodologies to collect and report the data, and other strategic considerations.
		
		• Additional advice on other features of the Data Hub for Fogo Island and Prince Edward County including:
		  – Governance and execution considerations (e.g., data sharing, storage);
		  – Visualization features/formats, leading practices; and
		  – Broader risk, security or data sharing considerations.

The Purpose of This Report

In this report we outline common hurdles communities face and provide best practice considerations that communities could consider investing in based on the five themes below

We recognize Canadian communities are challenged with working on a variety of issues. Communities often track core economic data but may face hurdles when gathering, storing, collecting timeliness data, and using data to inform economic development choices effectively. Additionally, communities may face budget constraints, lack investment in data tools and skillsets necessary to harness the power of data. Poor quality data can be misleading, and data deficits can lead to a decrease in the ability to address key concerns of groups in question.

In this document, we provide a framework to collect data, and develop a basic Community Economy Indicator Dashboard to report on economic development data that could be applicable to any community in Canada. Additionally, we provide a series of recommendations on considerations on the type of data that should be collected, and guidance on what methodologies to use. Throughout this document we recommend multiple metrics and methodologies to provide communities with a broad range of options and examples to consider for the future. A potential consideration for communities when considering these metrics is to consider data availability and frequency. We have grouped our recommendations into the following themes:

Sophisticated Diversity, Equity, and Inclusion (DEI) data	Engaging resident-generated data	Refined approaches to measure economic output	Leveraging private sector data sources	Reinventing the economic development office

This report is part of a series of work Deloitte was engaged to complete with Shorefast. Deloitte was engaged to develop analyses and recommendations for a Community Economy Indicator Dashboard; provide insights into what data gaps exist and solutions to bridge or improve them for the five communities consulted; and provide advanced recommendations on leading ways to measure economic forces that are aligned with Shorefast's place-based and community driven approach to create regenerative, equitable and redistributive economic development.

Section 1: Leading Practices in Visual Analytics & Community Economy Indicator Dashboard Recommendations
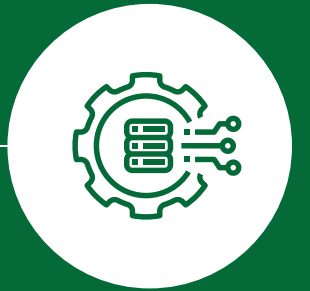
Section 1A: Leading Practices for Data in Economic Development

Considerations

Leading Practices in Data and Economic Development

Communities should balance several factors when identifying meaningful data for policy purposes as part of the Hub

Normalizing community-driven data in policy discussions

Community-driven development programs have shown that given access to information, technical and financial support community members can identify priorities and local development challenges. This is seen in the Ground Truth 2.0 project, please see page 43 for more details. It showcases that residents can collectively agree on their priorities and when supported with the appropriate resources can generate the required data to answer their questions and support their initiatives.[212]

Collecting the right data – CART principles can help qualify if data is meaningful

The CART principle for monitoring activities and metrics is described below:[213]

- **Credible:** data needs to be high quality, consistent, and analyzed accurately. It is important to frame correctly the issue and question you are trying to answer.

- **Actionable:** only collect data that you can commit to use and analyze. Based on the findings derived from the data, community members should understand if there are actions that need and can be executed based on existing resources.

- **Responsible:** ensure that benefits of collecting data outweigh the costs. It needs to consider not only direct costs of collecting data but also opportunity costs which is the idea that the money and time spent to collect the data could have been used elsewhere. It is also important to consider the cost to respondents, and always ensure their privacy is maintained. The benefits must also be considered, as collecting too little data can be detrimental to groups by not highlighting where the problem lies.

- **Transportable:** collect data that can be used for other purposes and placed in a generalized context. Transportable data needs to be transparent which allows communities to share their data.

Meaningful digital data can come in many forms

As the data landscape changes, communities should consider advancing together in collecting data from multiple sources using the CART principle. Digital data sources relevant to economic development can be classified into four types:

- **Data exhaust** consists of passively collected data obtained from people's use of digital devices, and real-time data collected by organizations

- **Online information** consists of news medias and social medial interactions

- **Physical sensors** consists of data from satellites or infrared imagery

- **Resident reporting** is information actively produced by residents

This categorization can help communities to take stock of what type of data they do have and help to develop organized repositories of data.

Ensuring trust and privacy

The trust that residents have on government bodies and community organizations impacts how much data they are willing to share. As outlined on pages 39 and 74 privacy concerns are an increasing concern for sharing data for both individual community members and private companies.

Data visualization is the main way that communities release their data. When publishing data, communities should ensure that data is not identifiable, and re-identification via linking is not possible. **Data sets published need to be cleaned of any sensitive attributes and quasi-identifiers (such as age, gender, zip codes) in order to ensure the privacy of the owners of the data.**[216,223]

Leading Practices in Data and Economic Development (continued)

To get the buy-in required to leverage the full breadth of data available to communities, several factors can be considered

Requirement for specific forms of analyses making can support the case for data assets and investments

When communities mandate that key decisions and policy discussions require specific forms of analyses or thresholds of data to inform choices, this can create demand and momentum for communities to invest in data and data expertise.

- For example, if a new public-private partnership requires an economic impact assessment to be completed via Input-Output modelling this can stimulate the demand for specific research and analyses.

Consideration should ensure analysis requirements are meaningful and focus on more than conventional forms of economic value (e.g., GDP) as a means of helping support further investment in the required data to conduct analysis. For example, if communities mandate the need to show effects on inclusion or ESG targets as part of investment business cases, communities may develop expertise and capacity in the evaluation of these types of metrics in the long term.

Building resources and expertise

Evidence suggests that many governments are not using its existing data to its fullest potential. Many governments may not know how to harness their existing data. Reasons may include legacy technology is still being used, which is slow, outdated and in many cases expensive to maintain. Additionally, information collected may be stored in different siloed platforms. This makes it challenging for data to be compared and pooled with other datasets.

Additionally, due to a decreased cost in collecting data in the recent years many communities may be spending significant resources on data assets but may not have the resources required to analyze and visualized the data collected. This leads to wasted time and effort.

Cities should invest in technical tools, employee knowledge, and skillset. Cities should collect high-quality, valid, and credible data. It is vital to understand when to measure impact and when not to measure it. Investments are particularly important for unstructured data. A way to optimize these investments is to identify what are the most common forms of unstructured data produced by the community and invest in technology that analyzes that type of data. Moreover, some studies suggest that allocating a resource dedicated to the analytics team is essential for success.[220,221,222]

Participating in the open data movement

The open government movement which consist of the government looking to strengthen the relationship among government, residents, and community stakeholders along with a goal to increase government transparency has led to the opening of data portals and increased resident engagement. Additionally, technological developments and new tools for big data, data mining, graphic tools paired with an increase in e-government efforts has stimulated an increase in applications for public agencies. These movements have increased the use of data visualization among governments.[218,219]

Leading Practices in Data Visualization in Economic Development (continued)

Communities can consider entering into more meaningful relationships with local companies and ensuring the full experience of its residents are reported

Fostering an inclusive governance & performance management environment

An inclusive governance model for a shared data asset consists of a multi-stakeholder model (i.e., the government, individuals, NGOs, private sector, academia). **Governments should build structures and platforms that allow residents and other sectors to have meaningful participation in governance. Data visualization is a tool to support inclusive governance.**[217] For example, as seen on page 42, Phoenix has built an online tool for community members to provide their opinions in budgeting by balancing Phoenix's budget with their own priorities.

Performance management refers to the process of ensuring that goals are met in an efficient manner. **Data visualization allows decision makers to make data-driven performance decisions.** Community members can identify areas that are not meeting city targets, and where more funding should be concentrated.

Investing in meaningful partnering with private sector providers

While government reporting on key economic figures (e.g., sectoral performance, demographics etc) continues to be a valuable source of information for communities to draw from, consideration should be given into partnering with private data providers as part of 'regular business' rather than as a one-off data purchase. Moreover, consideration should be given to leveraging discussions with companies related to corporate-social responsibility or community-engagement to enter data sharing partnerships as a complement or substitute for traditional corporate engagement (e.g., donations etc.).

Moving away from reporting the average only

Communities should move away from reporting population averages, and instead look at the individual experience of various groups. For example, instead of reporting total average income in the region, communities could consider reporting income by race, gender, postal code, or other classifications. By doing so it could highlight any income gap and inequality persisting in the economy. Running comparative analysis of different metrics ensures a full picture of what individuals are experiencing in the community and the quality of the socioeconomic outcomes of different groups. Communities should also keep in mind intersectionality of different groups, and how that impacts socioeconomic outcomes. More information on intersectionality can be found on page 24 of the report.

Ensure metrics are commensurable

Community benchmarking is helpful for regions to identify areas of strength and improvement within their communities. However, it is important to ensure a fair comparison of metrics that adjust for difference in the size or characteristics of a community. For example, it is unfair to compare the gross domestic product (GDP) of Toronto to Prince Edward County due to difference in population size. Nevertheless, the GDP per capita is a more meaningful comparison as it adjusts for the different population sizes of the community. Similarly, if one is to compare GDP overtime it is important to look at measures of real GDP (rather than nominal GDP) which accounts for inflation. Measures of real GDP reflect changes in volume overtime and excludes any price effects which allows economic growth to be more appropriately analyzed.

Section 1B: Recommendations to Guide a Community Economy Indicator Dashboard

Recommendations

Recommended Metrics

We recommend that Shorefast communities consider profiling specific metrics under five themes as a baseline as part of the Data Hub

Overview of our recommendations:

Recognizing the Economic Dashboard can serve as a valuable aspirational goal and format, and that each community is confronting a unique set of policy questions, a baseline level of data tracking and reporting across the country could help to support greater data maturity in economic development. Based on our review of leading practices, experience in economic development and engagement with select communities, we recommend communities consider investing in a 'baseline' set of metrics categorized in the following groups:

- Core economic features
- Diversity, Equity, and Inclusion
- Community Driven Metrics
- Resident Experience
- Environment, Social, Governance (ESG)

We note that we expect our recommended metrics to complement classical, ongoing reporting Canadian communities are investing in now (e.g., top line figures related to population, GDP, etc.).

Some points of guidance to frame our recommendations:

- The metrics outlined on pages 14 to 17 are recommended to all communities, but derivations or spin offs to suit other communities could be useful.

- Assessment of the feasibility of each metric to be measured by Canadian communities was not considered. Instead, recommended metrics reflect ensuring a broad, meaningful range of metrics to complement 'classical' economic development figures (e.g., GDP)

- While metrics are communicated at a general level on pages 14 to 17, we recommend considering investing in reporting that further segments information by gender and by race where applicable for more meaningful data.

- Additionally, we recommend investing in location quotients (LQ) to estimate core economic metrics across smaller regions.

- We recommend being cognizant of data deficit, which may lead to "data invisibles" who are often women, elderly, children, migrants, indigenous populations and slum dwellers who are not accounted for in the formal economy.[224]

- We recommend several visualization approaches on pages 14 to 17. We provide further details and best practices of visualizations on Appendix B.

- We note that many of our recommended metrics are currently included, or within the potential scope (if data were available) of the Vital Signs initiative.*

* Vital Signs is a community-driven data program led by the Community Foundations of Canada and local community foundations. Local data collected is used to provide insights on indicators of quality of life, and support locally-relevant solutions. Data collected aligns with the UN's Sustainable Development Goals (SDGs), and includes topics such as housing, poverty, safety, environment, and local arts.

Recommended Metrics

We recommend that Shorefast communities consider profiling specific metrics under five themes as a baseline as part of a consolidated Data Asset in addition to classical economic data

Theme	Metric	Example Sources	Example Optimal Visualization Approach	Example Required Resources/Investment
Core Economic features Note: location quotients (LQ) can be used to estimate core economic metrics across smaller regions.*	• Employment (by sector or industry, proportion of workers in full-time and part-time, self-employed)	• Data from labour force surveys or local government analyses • Vicinity Jobs reports • Conference Board of Canada (paid data)	• Line graph: employment trends over time period, reflecting macroeconomic environment	• Resource(s) to conduct and analyze local labour force survey • Vicinity Jobs provides detailed information at a fee.
	• Unemployment (by sector or industry, proportion of workers in full-time and part-time, self-employed)	• Data from labour force surveys or Statistics Canada/Census data • Conference Board of Canada (paid data)	• Line graph: unemployment trends over time period, reflecting macroeconomic environment	• Resource(s) to conduct and analyze local labour force survey
	• Building permits, housing starts, home sales	• Statistics Canada • Canada Mortgage and Housing Corporation (CMHC) • Canadian Real Estate Association (CREA)	• Heat map: where colors reflect number of building permits • Line graph: housing statistics and home sales over time period, reflecting macroeconomic environment	• Data from the example sources are available in the public domain
	• Population and demographic characteristics (population, age, sex)	• Statistics Canada/ Census data • Conference Board of Canada (paid data)	• Line graph: population trend analysis over time period	• Data from the example sources are available in the public domain
	Key Limitations: Economic metrics can be categorized a leading, coincident, or lagging. Lagging indicators reflect the fallout of events. For example, when the economy declines, firms cut hours of work before they layoff workers. This means the unemployment rate increases after the economy declines. Coincident indicators say how the economy is doing a point in time. Leading indicators provide a signal about the future. As such, there are limitations with respect to economic metrics. Mainly, lagging indicators, such as unemployment, often tell the story of 'what has happened' in the economy, rather than 'what will happen'.			
Diversity, Equity and Inclusion	• Poverty gap: equal to the difference between the ratio of the number of people of color below the poverty line to the total number of people of color and the ratio of number of white people below the poverty line to the total number of white people.	• Data from government collected datasets such as Census and surveys.	• Heat map: where colors reflect different gaps and spreads • Line graph: show the change of the poverty gap over the years	• Data from the example sources are available in the public domain • Resource(s) to analyze and build visualization of data.

* The Location quotient (LQ) is a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region "unique" in comparison to the national average. In more exact terms, location quotient is a ratio that compares a region to a larger reference region according to some characteristic or asset. Suppose X is the amount of some asset in a region (e.g., manufacturing jobs), and Y is the total amount of assets of comparable types in the region (e.g., all jobs). X/Y is then the regional "concentration" of that asset in the region. If X' and Y' are similar data points for some larger reference region (like a state or nation), then the LQ or relative concentration of that asset in the region compared to the nation is (X/Y) / (X'/Y'). Source: https://www.economicmodeling.com/wp-content/uploads/2007/10/emsi_understandinglq.pdf

Recommended Metrics (continued)

We recommend that Shorefast communities consider profiling specific metrics under five themes as a baseline as part of a consolidated Data Asset in addition to classic economic data

Theme	Metric*	Example Sources	Example Optimal Visualization Approach	Example Required Resources/Investment
Diversity, Equity and Inclusion (continued)	• Foreign labour force (migrant stock: migrant stock age 20-64 % of population, underemployment of foreign labour force, average wages of foreign labour force)	• Data from labour force surveys	• Bar chart: comparison of foreign labour force per industry • Line graph: employment trends over time period, reflecting macroeconomic environment	• Resource(s) to conduct local labour force survey to obtain information on migrant labour opportunities, under unemployment, average wages, and to analyze data.
	• Net-income Gini: measures the extent that net distribution of income (post-tax/post-transfers) deviates from a perfectly equal distribution	• Data from labour force surveys • Data from census	• Line graph: show the change of Net-Income Gini over the years	• Resource(s) to conduct local labour force survey to obtain data on average wages and analyze data.
Community Driven Metrics	• Hate crime incidents: count of physical, verbal, hate propaganda, vandalism, threats, and online incidents.	• Data from police reports • Data from community platforms	• Plotted on a map to show were incidents take place (categorized by type of incident)	• Resource(s) to build community platform leveraging police data (partnership would be required) and analyze data.
	• Community safety (e.g., % of population that feels safe walking alone after dark or crime severity index which tracks both prevalence and seriousness of police-reported crimes.)	• Data from local surveys for local perception on safety • Data from Statistics Canada for the crime severity index	• Line graph to show the change overtime of community safety feeling. • Doughnut chart to show % of population feeling safe.	• Resource(s) to conduct local survey (include questions such as: do you walk alone in the community, what safety precautions do you take, what do you do if a stranger asks for your help) and analyze data. • Data from the example sources are available in the public domain
	• Community Vitality – Social Relationships (% of population that reported somewhat strong sense of belonging to community).	• Data from local surveys for local perception on belonging to community	• Line graph to show the change overtime of sense of belonging to community. • Doughnut chart to show % of population feeling safe.	• Resource(s) to conduct local survey (e.g., on a four-point scale what is the sense of community belonging an individual has) and analyze data.

* More information for the metrics outlined on Section 2: Guidance on Impactful Metrics to Consider for Canadian Communities.

Recommended Metrics (continued)

We recommend that Shorefast communities consider profiling specific metrics under five themes as a baseline as part of a consolidated Data Asset in addition to classic economic data

Theme	Metric*	Example Sources	Example Optimal Visualization Approach	Example Required Resources/Investment
Resident Experience	• Housing Affordability: could be measured by analyzing whether a family earning median income could qualify for a mortgage loan on a median-priced family home.	• Income data from Statistics Canada • Housing data from brokers, real estate boards, CHMC	• Heat map: where colors express average housing affordability of certain neighborhoods.	• Data from the example sources are available in the public domain • Resource(s) to analyze data and build visualization approach.
	• Rent Burden: number of renters that pay over 35% of their income on rent over total number of renters.	• Income data from Statistics Canada • Rental data from online platforms such as *Rentals.ca, Realtor.ca* • Rental data from real estate boards	• Bar graph: can look at severely and moderately rent burden. • Line graph to show change overtime.	• Data from the example sources available in the public domain
	• Access to essential amenities, goods and services per region (e.g., neighborhood, postal code). • Essential amenities can be defined as: childcare, parks and open spaces, community facilities, fresh food, health care & pharmacies, financial services, and internet service. • Access can be defined as: areas with more than 50% of households within ½ mile of an essential amenity.	• Data from sources such as: OpenStreetMap, Foursquare	• Heat map: where colors express average distance of a neighborhood from essential amenities.	• Foursquare data available for a fee • OpenStreetMap is available in the public domain. • Resource(s) to analyze data
	• Job quality index: measures different components of job quality such as wages, working conditions, working time, work-life balance, and training.[119]	• Data from labour and company surveys. We recommend analyzing job quality per sector.	• Line graph to show the change overtime • Bar chart to compare job quality index of different sectors.	• Resource(s) to conduct local labour force, company survey and analyze data.

* More information for the metrics outlined on Section 2: Guidance on Impactful Metrics to Consider for Canadian Communities.

Recommended Metrics (continued)

We recommend that Shorefast communities consider profiling specific metrics under five themes as a baseline as part of a consolidated Data Asset in addition to classic economic data

Theme	Metric*	Example Sources	Example Optimal Visualization Approach	Example Required Resources/Investment
ESG	• Waste generation per region (e.g., per neighborhood or postal code)	• Data from Statistics Canada • Data from implementing smarter waste generation software such as Sensoneo	• Line graph to show the change overtime	• Data from the example sources available in the public domain • For more specified data: Resources to purchase software to track waste generation • Resource(s) to analyze data.
	• Air quality of the community	• Data from sources such as: IQAir • Data set up by provinces: such as Ontario and BC. • Air quality monitoring devices	• Line graph to show the change overtime	• Data from the example sources available in the public domain • For more specified data: resources to purchase air quality monitoring devices • Resource(s) to analyze data.
	• Carbon intensity of GDP: measure of how much carbon economies emit (from the consumption of petroleum, natural gas, coal, and natural gas faring) for every dollar of GDP they produce	• Government of Canada: Facility greenhouse gas reporting	• Line graph to show the change overtime	• Data from the example sources available in the public domain

* More information for the metrics outlined on Section 2: Guidance on Impactful Metrics to Consider for Canadian Communities.

Example Data Governance Recommendations and Considerations

Shorefast should consider their data governance strategy for the Community Economy Indicator Dashboard and future Data Hub assets

	Recommendations	Considerations
Data ownership	• Communities should manage and control their own localized datasets and data assets even if they are being leveraged/uploaded into a central shared asset	• Roles and responsibilities for data ownership should be clearly defined. For example, datasets should have an assigned owner to manage dataset and control access. • Communities should have the required skillsets for management of data
Data storage	Storage options can vary depending on the capabilities, resources, and data maturity of the community. Examples of data storage options: • Shared network drive • Structured Query Language (SQL) Database • SharePoint • Cloud storage: Microsoft Azure, Google Cloud, ArcGIS Hub	• Datasets should be stored in one central location to avoid data duplication and simplify access and data governance • Data catalogs should be utilized to manage datasets and support data discovery for users • Shared network drive may not be appropriate for any sensitive data due to the need for access control • For smaller communities with limited resources, network drive or Structured Query Language (SQL) database storage may be more feasible options • Communities with more resources and larger, complex, or sensitive datasets may require SharePoint or a cloud storage platform
Public/ audience roles	• Community leaders and end users should be involved in the design and testing phase of the Hub to ensure maximum impact • Consume and share assets to grow user base of the data hub in the public • Public-facing data assets should be designed to meet accessibility guidelines (e.g., Web Content Accessibility Guidelines (WCAG)) to be accessible by people with disabilities to ensure full community participation • Provide commentary and suggestions for new reporting via structured feedback requests	• To further gain buy-in, consideration could be given to developing structured feedback gateways for users to provide feedback (e.g., focus groups, comments inbox or an ongoing resident/ expert advisory panel)

Recommended Capacity Building Tactics

We recommend communities build capacity by increasing data literacy as a critical first step for the Hub

Given the early stages of the Data Hub Initiative, and the understanding that different communities will have varying degrees of data visualization expertise, investing in baseline capacity building exercises could be beneficial to the Initiative. Key examples are profiled below:

Data Walk: A solution to increase data literacy in a community is to develop a Data Walk like the initiative developed by the Urban Institute Elevate the Debate. Data Walk "is an interactive way for community stakeholders, including residents, researchers, program administrators, local government officials, and service providers, to engage in dialogue around research findings about their community." [197]

- **The data walk builds the capacity of individuals who are not familiar with data, facilitates conversation, provides residents with tools to understand their own perspectives, allows researchers to contextualize their data.** When conducting a data walk it is important to understand the goals of the data walk for example: do you want to gather more information on the existing data, do you want to build a consensus within the community, do you want to empower community stakeholders, or debrief the group with findings? It is important to present the right data, and easy to understand visualizations.

Other important considerations:[198] the information commissioner's officer in the UK has published **a data sharing code, to give members of the community confidence in sharing data.** A recommended best practice is to have a data sharing agreement between the parties. The agreement should outline who are the parties of the agreement, the purpose of the data sharing initiative, what organizations will be involved, who and what data will be shared, the lawful basis for sharing, if there are any special category data, and what are the access and individual rights. In the data sharing agreement, the key legislative and legal provisions should be outlined, the model form seeking individuals' consent for data sharing, and a diagram to help decide whether to share data.

Benefits of a Data Walk: The Data Walk approach makes residents more comfortable with data and helps them understand the importance of data. As a result, it encourages community members to share their data.

Supporting Case Study: the Data Walk example is taken from the Urban Institute Elevate the Debate program which conducted a data walk with youth and adults living in a public housing development in Washington DC to address a project in designing sexual health and safety curriculum. The Data Walk consisted of sharing and discussing findings and have the team involved share critical program recommendations.

Example Resources Required:

- Need to bring together community members to conduct the data walk. Require resources to advertise the program and recruit the community members (reach out to individuals, put up flyers, advertisements online).

- Community members may require incentives to participate in the data walk.

- Requires a data community member to lead the data walk (it is encouraged to form smaller groups to facilitate conversation and make it easier to manage).

Section 2: Guidance on Impactful Metrics to Consider for Canadian Communities

Overview of General Guidance Recommendations

Below we outline the key challenge and observations of each main section. The detailed recommendations, reference sources, approaches, and sample sources are outlined in the respective section

Sophisticated Diversity, Equity, and Inclusion (DEI) data	Engaging resident-generated data	Refined approaches to measure economic output
Key Challenge: Current DEI data often relies heavily on racial composition statistics and do not capture intersectionality between groups. **Key Observations:** Communities should ensure they are measuring inclusive growth, studying the relationship between racialized/traditionally marginalized populations and social outcomes, and accounting for all the groups within the community. **Recommended Key Reference Sources:*** • Inclusive Development Index • Community Well-Being Index (CWB) • Inclusive Recovery in US Cities • Equitable Growth Framework Manual **Recommended Example Approaches:** • Heat Ready • The Care Economy	**Key Challenge:** Collecting resident data often has key challenges due to privacy concerns, survey fatigue, and response bias. **Key Observations:** Communities should promote resident engagement by developing community platforms and highlighting the benefits of sharing data to encourage data sharing. **Recommended Example Approaches:** • City Hotlines • Racial Incident Hotline • FundPHX • Ground Truth 2.0 Project *Additional approaches outlined in Appendix A* • Corona Report • Open Humans	**Key Challenge:** Current classic economic metrics have limitations, and our economy has evolved such that additional metrics should be measured to ensure a complete view of the economy. **Key Observations:** Communities should ensure a breadth of data is included when assessing an economy and should ensure that non-traditional sectors of the economy such as the gig economy are also measured. **Recommended Key Reference Sources:*** • The Urban Environment and Social Inclusion Index • Genuine Progress Indicator • Canadian Index of Wellbeing • Commitment to Development Index • Quebec Economic Health Index • Global Innovation Index • The SocioNeeds Index (Health Equity Index, Food insecurity index, mental health index) • Gig Economy Index • Online Labour Index • Job Quality Index • OECD Job Quality Framework *Additional reference sources in Appendix A* • World competitiveness ranking

* Reference sources refers to sample indices identified. Within each index we provide a list of recommended metrics that communities can leverage from the indices.

Overview of General Guidance Recommendations

Below we outline the key challenge and observations of each main section. The detailed recommendations, reference sources, approaches, and sample sources are outlined in the respective section

Leveraging private sector data sources

Key Challenge:

Communities often face budgetary challenges, competing priorities, and challenges of sharing data among the community.

Key Observations:

We recommend communities to build a culture where data-sharing is the standard, develop data sharing platforms, and explore partnership with private companies to obtain data.

Recommended Sample Private Sources:

- Uber Movement
- Waze for Cities
- Streetlight
- Numina Street Light API
- Foursquare
- Google Earth Outreach
- Global Fishing Watch
- Supermarket Chains
- Reddit
- Twitter
- FieldView
- MLS Home Price Index
- Haver

Recommended Example Approaches:

- The Smart Columbus Operating System
- Cisco Smart + Connected Digital Platform
- The Catapult Network

Reinventing the economic development office

Key Challenge:

One of the challenges faced by the economic development office is the lack of quantitative skills in the team.

Key Observations:

We recommend building a diverse economic development office, with individuals with different skillsets to optimize the use of data in economic development.

Recommended Example Approaches:

- Skillset taught at the Master of Economic Development and Innovation at Waterloo
- Skillset taught at the Erasmus University Rotterdam Master of Health Economics
- International Economic Development Council target areas

Section 2A:

Diversity, Equity and Inclusion

Diversity and Inclusion [1/14]

As communities seek to advance inclusion, ensuring the data used to inform choices is as meaningful as possible is imperative

Context & Challenges

- **Reliance on racial composition statistics:** Currently, diversity reporting and metrics often focus heavily on confirming representation levels (e.g., what share of a community self identifies as a certain group). This information often lacks insight on the experience and quality of the socioeconomic outcomes of groups (e.g., diversity metrics of companies focus on the number of people that fit within a category but may not measure other outcomes such as employee experience, progression rates, etc.).[66]

- **Complexity and intersectionality:** Oftentimes, a person's racial, ethnic, or gender background cannot be classified into one category. Grouping diverse people into one category could decrease data integrity and meaningful insights.[57] For example:
  - **Racial identities are not fixed, and an individual's perception of their identity may change depending on how, when, and where a question is posed.[64]**
  - **Grouping all non-white ethnicities together or, all Asian ethnicities could be ineffective as different ethnic groups experience unequal degrees of discrimination and may be experiencing the economy, or society differently.[65]**

- **Survey bias:** Individuals who respond to a survey related to their socioeconomic experiences might not be representative of the community.[60] Surveys that are not designed to capture adequate diversity can lead to data deficits and "data invisibles", which often includes women, the elderly, children, migrants, Indigenous populations, and others who may not be traditionally accounted for in the formal economy.[70]
  - **As a result, decisions informed by survey data may not be able to consider a full range of perspectives.**

- **Lack of clear policy objectives:** Data collection exercises (e.g., surveys) or consultations that specifically target diverse populations require skillful design to be effective. Research initiatives designed without a clear objective can be harmful and detrimental to immigrants, racialized, 2SLGBTQ+, and other communities.[64] For example, without a clear design race/ethnic/gender may be collected as the only level of analysis which can lead to incomplete and misleading narratives as outlined above in the point of complexity and intersectionality.

- **Privacy, sensitivity and trust:** Indigenous experts say that communities should control data in order to rebuild trust. We recommend communities to control where and how data is used and increase transparency to regain the trust of Black and Indigenous communities to collect race-based data.

- **Lack of DEI skills in the economic development office:** The Harvard Business Review refers to numerous studies showing a lack of diversity (e.g., skillsets, race, gender, experience, as well as cultural, educational and work background) in any team impedes success, performance and innovation. Studies show that diversity produces better outcomes.[105]

- **Participating communities' context:** As part of the first phase of the Community Economies analysis, each community was consulted about the data they currently hold.

Diversity and Inclusion [2/14]

We advise communities to build indices that measure inclusive economic growth

Considerations for communities

Consider measuring inclusive economic growth instead of exclusively economic growth. Inclusive economic growth means "growth that is distributed fairly across society and creates opportunities for all, where people from different backgrounds can benefit from growth, new technologies and globalization". Place-based policies – that focus on using the unique resources in a location - are helpful to design and promote inclusive growth. Place based policies can be encouraged by communities tracking the metrics that matter to them most at a local level. [144]

Example source	Rationale	Background	Recommended Metrics	Methodology

Inclusive Development Index (IDI)[78,138] **(1/3)**	• The IDI looks holistically at a community by not only relying on growth and development metrics but also accounting for inclusion, intergenerational equity, and sustainability data.	• The IDI was designed as an alternative to the GDP and is a project of the World Economic Forum's System Initiative on the Future of Economic Progress. It assesses the performance of 103 countries.
		
		• The IDI assesses the economic performance of countries under three pillars: growth and development, inclusion, and intergenerational equity sustainable stewardship of natural and financial resources.
			• We recommend communities to consider the following metrics:
			  – Healthy life expectancy
			  – Employment-to-population ratio
			  – GDP per capita
			  – Labour productivity
			  – Net-income Gini
			  – Poverty rate
			  – Wealth Gini
			  – Median Income
			  – Adjusted net savings (excluding carbon damage) as a percentage of Gross National Income
			  – Carbon Intensity of GDP
			  – Public Debt (as a share of GDP)
			  – Dependency Ratio
			
			Please see the next two pages for additional information.
				• The IDI separates economies into advanced and emerging economies as they are not fully comparable due to different definitions of poverty. The criteria used to categorize the economies into advanced or emerging economies are based on per capita income level, export diversification, and degree of integration into the global financial system.
				
				• The data is aggregated and converted into an IDI score based on a 1-7 scale (1 is the worst, and 7 the best). It reports a country's overall IDI score and the 5-year trend IDI. The trend is also used to identify whether an economy is receding, stable, or advancing.

Diversity and Inclusion [3/14]

We advise communities to build indices that measure inclusive economic growth

Example source	Recommended Metrics

Inclusive Development Index (IDI)[78,138] (2/3)	• **Growth and development:**
	
	  – **Healthy life expectancy** – average number of years a person can expect to live in "full health" (excluding years with diseases and/or injuries).
	    – *Source of data: The Global Burden of Disease Database, Institute for Health Metrics and Evaluation.*
	
	  – **Employment-to-population ration** – is the proportion of a country's working population (ages 15 and older) that is employed**.**
	    – *Source of data: : World Development Indicators, World Bank; Key Indicators of the Labour Market database, International Labour Organization (ILO).*
	
	  – **GDP per capita** – GDP is measured as the sum of value added by all its producers less the value of intermediate goods and services consumed in production.
	    – *Source of data: World Development Indicators, Word Bank.*
	
	  – **Labour productivity** $= \dfrac{Gross\ Domestic\ Output}{Total\ employment\ in\ the\ economy}$
	    – *Source of data: World Development Indicators, Word Bank.*
	
	• **Inclusion data:**
	
	  – **Net-income Gini** – measures the extent that net distribution of income (post-tax/post-transfers) deviates from a perfectly equal distribution. In the Gini index 0 represents perfect equality, while 100 is perfect inequality.
	    – *Source of data: F. Solt, 2016, "The Standardized World Income Inequality Database," Social Science Quarterly 97; SWIID Version 6.0, October 2017.*
	
	  – **Poverty rate** – for advanced economies like Canada, relative income poverty is defined as less than half of the respective median national income (adjusted for size of household, taxes, and transfers).
	    – *Source of data: Organization for Economic Co-operation and Development (OECD); World Development Indicators Online, World Bank.*
	
	  – **Wealth Gini -** measures the distribution of wealth (where wealth is defined as both financial assets and non-financial assets accounting for debt). In the Gini index 0 represents perfect equality, while 100 is perfect inequality.
	    – *Source of data: Credit Suisse Global Wealth Databook 2017.*
	
	  – **Median income** – median of daily per capita income (or consumption expenditure in 2011 purchasing power parity dollar)
	    – *Source of data: PovcalNet, World Bank*

Diversity and Inclusion [4/14]

We advise communities to build indices that measure inclusive economic growth

Example source	Recommended Metrics

Inclusive Development Index (IDI)[78,138] **(3/3)**	• **Intergenerational equity and sustainability**
	
	  – **Adjusted net savings (excluding carbon damage) as a percentage of Gross National Income (GNI)**
	
	    – *Net savings = net national savings + expenditure on education − depletion of energy − depletion of minerals − depletion of forests − damage by particulate emissions.*
	
	    – *Source of data: World Development Indicators Online, World Bank.*
	
	  – **Carbon intensity of GDP –** a measure of how much carbon economies emit (from the consumption of petroleum, natural gas, coal, and natural gas flaring) for every dollar of GDP they produce
	
	    – *Source of data: US Energy Information Administration (EIA) Historical Statistics for 1980-2013; World Development Indicators, World Bank; The Shift Project Data Portal.*
	
	  – **Public debt (as a share of GDP) –** gross debt are all the liabilities that require payment of interest and/or principal (special drawing rights, currency and deposits, debt securities, loans, insurance, pensions, standardized guarantee schemes, and other accounts payable)
	
	    – *Source of data: World Economic Outlook Database, April 2017.*
	
	  – **Dependency ratio -** the data is shown as a proportion of dependents per 100 working-age people.
	
	    – *Source of data: World Development Indicators, World Bank.*

Diversity and Inclusion [5/14]

We recommend communities to take into consideration the experience of all groups in a community. Below we detail a case study tailored to measure the socio-economic and wellbeing of First Nations and Inuit communities in Canada

Considerations for communities

Ensuring a breadth of data is included when assessing DEI (continued).

Example source	Rationale	Background	Recommended Metrics	Methodology

Community Well-Being Index (CWB) [148] **(1/2)**	• Instead of only reporting the number of individuals in First Nations and Inuit communities the CWB focuses on reporting the educational, labour, and economic outcomes of communities.
	
	• The CWB focuses on the experience and quality of the socioeconomic outcomes of First Nations and Inuit communities.
		• The CWB was developed in 2004 to account for socio-economic conditions within First Nations and Inuit communities in Canada as a replacement for the Human Development Index (HDI), which is used by the United Nations Development Program.
		
		• The index database includes communities, referred to as census subdivisions (CSDs), that are affiliated with First Nations bands, reserves and settlements, as well as those within 4 regions of Inuit communities that have signed Land Claim Settlements. Only communities with a population of over 65 people are included in the index.
		
		• Some areas that impact well-being, such as health or language are not yet measured. Although the Auditor General, as well as Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and Indigenous Services Canada (ISC) have expressed an intention to broaden the factors considered in the index, limiting it to census data for the time being allows the ISC to compare scores of wellbeing "of First Nations and Inuit communities over many decades while also comparing them with non-Indigenous communities".[146] The index can therefore track changes related to these components over time.
			• We recommend communities to consider the following metrics:
			  – Education
			  – Labour force activity
			  – Income
			  – Housing
			
			Please see the next page for additional information.
				• The scores of each component can range from 0 to 100 and are calculated based on weighted averages of the relevant variables where needed and are averages of the residents in the community. Similarly, the overall CWB index score also ranges from 0 to 100.
				
				• Although not specified, the methodology appears to be the equally weighted average of the component scores that appear when selecting communities on the interactive maps. [148]
				
				• Results and CWB scores, along with community name and population are presented on an interactive map.[147] Limitations to this index include the fact that non-Indigenous residents who live in these communities are included in the census, and therefore, although it was determined that overall CWB patterns are not impacted by this, the score should not be used as a proxy.

We recommend communities to take into consideration the experience of all groups in a community. Below we detail a case study tailored to measure the socio-economic and wellbeing of First Nations and Inuit communities in Canada

Example source	Recommended Metrics
Community Well-Being Index (CWB) [148] **(2/2)**	The index focuses on data that is already collected through the Census of Population, as well as the 2011 National Household Survey*, which was a Canada-wide voluntary survey, replacing the census for that year, and therefore is limited to the following components, which are calculated based on varying variables: • **Education** - variables include the proportion aged 20 or older with at least a high school certificate (two thirds weighted) and the proportion of those aged 25 or older with a university degree (one third weighted) • **Labour force activity** - equally-weighted variables include labour force participation and employment, both ages 20 to 64 • **Income** - total income per capita • **Housing** - equally-weighted variables include quantity (proportion with no more than one person per room) and quality (proportion living in a dwelling that does not need major repairs)

*The 2011 National Household Survey was made available for every community in Canada with at least 65 residents and differed from Canada's Census of Population in that it was a sample size and a more condensed version.

Diversity and Inclusion [7/14]

We advise communities to understand the socioeconomic experience of different groups. Below we detail a case study that relates to inclusion and whether socioeconomic features are being felt and experienced equally across races

Considerations for communities

Study the relationship between racialized/traditionally marginalized populations and social outcomes. Collecting race-based data supports more equitable outcomes. It allows communities to better understand groups' experiences and where inequalities persist. For example, health inequalities (also known as health disparities) refers to collecting race-based data in the health sector and were shown to be impactful and meaningful during the COVID-19 pandemic.[77] Nova Scotia, started collecting race-based data in healthcare in spring of 2022 by asking individuals to self-identify their race when they renew their health card, at birth, or opt in online.[158]

Example source	Rationale	Background	Recommended Metrics	Methodology
Inclusive Recovery in US Cities[15] (1/2)	• As communities experience economic growth, it is important to understand who is benefiting from the growth. • The Inclusive Recovery study provides visibility in the relationship between economic growth, social and racial inclusion. The Inclusive Recovery study also provides insights on how cities' inclusion metrics change overtime.	• The Inclusive Recovery study investigates the ability of residents with lower income and residents of color to be a part of and benefit from economic prosperity through an Inclusion Index. The Inclusion Index is available across four decades and allows cities to track progress over time, compare themselves with other cities, and measure inclusive recovery which is the idea of overcoming economic distress whilst providing opportunities for everyone. • The Urban Institute collected data on 274 US cities across four decades for the years of 1980, 1990, 2000, 2013, and 2016 (using 2013 instead of 2010 due to the Great Recession). The years chosen were based on data availability.	• We recommend communities consider the following metrics: – Income segregation – Rent burden – Share of working poor residents – High school drop out rate – Racial segregation – Racial gaps in homeownership – Poverty gap – Racial education gap – Share of city's population that are people of color – Employment growth – Median family income – Unemployment – Housing vacancy rate. *Please see the next page for additional information.*	• The Inclusion Index is measured by combining the Economic and Racial Inclusion Index. • The metrics outlined in the next slide are turned into z-scores in order to become comparable (mean is standardized to zero). A z-score of one means that the value is one standard deviation away from the mean. The z-scores are aggregated and divided by the number of indicators in the index. • Then, each city is ranked based on their z-score. Cities are ranked on a scale of 1 to 274 (a city that is ranked 1 is the most inclusive city that year). Cities are benchmarked to one another (as the ranking is based on cities' z-scores) which controls for macro-level events. • Cities are also classified based on their economic health as distressed (ranking in the bottom third of the sample), healthy (top half of the sample), and other. • Cities are classified based on the change between the current year's economic health and last decade to identify if cities have recovered, always been healthy, always distressed, or other. The results allows researchers to analyze how economic health and inclusion are related over time.

We advise communities to understand the socioeconomic experience of different groups. Below we detail a case study that relates to inclusion and whether socioeconomic features are being felt and experienced equally across races

Example source	Recommended Metrics

Inclusive Recovery in US Cities[15] (2/2)	• For all the metrics below except for racial segregation (which is collected from Brown University's American Community Project) the data is obtained from the US Census Bureau, American Community Survey. Therefore, for the recommended metrics to be workable the data would need to be captured via government reporting.
	
	 • Economic inclusion metric uses data on:
	   – **Income segregation** – "Computation of segregation between families above and below each income distribution bucket at the census tract level. These are then averaged (weighted by income comparative to the median income) to construct the city-level measure"
	   – **Rent burden** $= \dfrac{number\ of\ renters\ that\ pay\ over\ 35\%\ of\ their\ income\ on\ rent}{total\ renters}$
	   – **Share of working poor residents** $= \dfrac{number\ of\ families\ below\ the\ poverty\ level\ with\ a\ householder\ that\ worked\ full-time\ year-round\ in\ the\ past\ 12\ months}{number\ of\ families}$
	   – **High school drop out rate** – percentage of 16 to 19 years old not in school and without a high school degree.
	
	 • The racial inclusion metric uses data on:
	   – **Racial segregation** $= \left(\dfrac{1}{2}\right) * \left(\left(\dfrac{number\ of\ people\ of\ color\ in\ census}{number\ of\ people\ of\ color\ in\ city}\right) - \left(\dfrac{number\ of\ non-hispanic\ white\ in\ census\ tract}{number\ of\ non-hispanic\ white\ in\ city}\right)\right)$
	   – **Racial gaps in homeownership** $= \left(\dfrac{number\ of\ non-hispanic\ white\ in\ owner-occupied\ units}{number\ of\ non-hispanic\ white\ in\ occupied\ units}\right) - \left(\dfrac{number\ of\ people\ of\ color\ in\ owner-occupied\ units}{number\ of\ people\ of\ color\ in\ occupied\ units}\right)$
	   – **Poverty gap** $= \left(\dfrac{number\ of\ people\ of\ color\ below\ the\ poverty\ line}{number\ of\ people\ of\ color}\right) - \left(\dfrac{number\ of\ white\ people\ below\ the\ poverty\ line}{number\ of\ white\ people}\right)$
	   – **Racial education gap =** Percentage of people of color (older than age 25) with a high school degree or more minus the percentage of white people (older than age 25) with a high school degree.
	   – **The share of the city's population who are people of color.**
	
	 • The economic health index measures the strength of the economy by looking at :
	   – **Employment growth** $= \dfrac{number\ of\ people\ employed\ in\ current\ decade - number\ of\ people\ employed\ in\ previous\ decade}{number\ of\ people\ employed\ in\ previous\ decade}$
	   – **Median family income in the past 12 months**
	   – **Unemployment** $= \dfrac{number\ of\ people\ unemployed\ (not\ currently\ employed\ or\ actively\ seeking\ employment\ (excluding\ military))}{number\ of\ people\ in\ labour\ force}$
	   – **Housing vacancy rate** – percentage of housing units that are for sale or rented/sold but unoccupied.

We recommend that communities explore whether groups have equal access to opportunities in the economy

Considerations for communities

Study the relationship between racialized/traditionally marginalized populations and social outcomes – continued.

Example source	Rationale	Background	Recommended Metrics	Methodology
Equitable Growth Framework Manual: City of Charlotte[11,168] (1/3)	• Different groups in a community may have different access to amenities, housing, employment opportunities, and may be impacted differently by changes in the environment. • It is important to collect and track where inequalities lie in order to be able to address them.	• The city of Charlotte adopted equity metrics focused on access (proximity refers to households being within ½ mile of a location) and environmental justice. The indicators are compared to highlight where vulnerable populations are concentrated and observe where progress is being made. • The data used is based on the Quality-of-Life Explorer, a website dashboard which is created in partnership with the City of Charlotte, Mecklenburg County and UNC Charlotte Urban instate, and with the participation of several towns.	• We recommend that communities consider the following indices: – Access to essential amenities, goods and services – Access to housing – Access to employment – Environmental justice All indices are composed of several metrics. *Please see the next two pages for additional information.*	• The source data used for the equitable growth framework manual - Quality-of-Life Explorer - gathers locally sourced data. – The city is divided into grid cells which are "based on 2018 ACS 5-year estimates by block group" – Each index is composed of several metrics. – For each metric and grid cell, if it meets the "opportunity criteria" the grid cell receives a score of 1 and if not receives a score of 0. *Please see additional information on each specific criteria in the next slide.* – The scores for the metrics are aggregated to make up the index. • The data is presented as a graphical map output which outlines the most and least accessible counties per measure. • Additionally, the metrics are overlayed with the concentration of population vulnerable to displacement. Vulnerable populations were identified based on poverty rate, educational attainment, race (as historical structural racial and systematic policies may create disadvantages), and age (areas with a rate higher than the county-average of residents aged 65 or older are identified as potentially vulnerable). • Potential other metrics that can be used to identify areas where populations are vulnerable to displacement includes ethnicity, disability, owner-occupied single-family housing, land values, average single-family home size, adjacency to current/proposed mass transit corridor.

We recommend that communities explore whether groups have equal access to opportunities in the economy

Example source	Recommended Metrics

Equitable Growth Framework Manual: City of Charlotte[11,168] **(2/3)**	• Below we outline the metrics that make up each of the four indices and their opportunity criteria (if they meet the criteria, they are assigned a score of one, if they do not meet the criteria, they are assigned a score of zero). The scores of the metrics are summed up to calculate the index value:
	• **Access to essential amenities, goods and services**
	  – Proximity to childcare/early childhood education, parks, open spaces, community facilities, fresh food, health care and pharmacies, financial services, and internet services.
	    – **Criteria:** areas are considered to have equitable access to amenities if more than 50% of households are within half a mile of the measured amenity.
	• **Access to housing** is defined as the ability for all residents to access housing options that meet their needs and economic conditions.
	  – **Housing unit diversity** – measures mix of housing type in an area.
	    – **Criteria:** areas with between 20% and 80% of single-family detached housing units.
	  – **Housing cost** - calculates the average housing costs compared to affordable housing cost (for households earning the citywide median household income).
	    – **Criteria for housing ownership:** area where 30% single-family homes are affordable.
	    – **Criteria for rental:** areas that have affordable households for those earning less than the citywide median renter income (assuming 30% of income is used for housing costs).
	  – **Housing size** – measures the size of ownership housing and size of rental housing.
	    – **Criteria:** areas where 25% of homes are under 1,500 square feet .
	  – **Subsidized housing** - measures the extent of affordable housing available based on the presence of development-based rental assistance.
	    – **Criteria:** presence of development-based rental assistance.
	  – **Tenure** – measures the mix of ownership and rental housing in an area.
	    – **Criteria:** areas where 0% and 80% of housing units are multifamily.
	  – **Level of (re)investment** – measures the level of increased investment of housing in an area.
	    – **Criteria:** areas where average per-permit cost is between $25,000 and $100,000.

Diversity and Inclusion [11/14]

We recommend that communities explore whether groups have equal access to opportunities in the economy

Example source	Recommended Metrics

Equitable Growth Framework Manual: City of Charlotte[11,168] **(3/3)**	**Access to employment**:
	• **Proximity to employment** – measures number of jobs per acre.
	  – **Criteria:** areas with over one job per acre are considered to have access to employment opportunity.
	• **Employment in commute shed** – calculates "the job density within a 2.5-mile area surrounding each grid cell, to indicate the accessibility of jobs within an approximate 20-minute commute shed."
	  – **Criteria:** areas with job density within a 20-minute commute shed greater than 1.0 jobs per acre.
	• **Wage levels** – looks at the wages of the jobs outlined in the "employment in commute shed" metric. Low wage is categorized as less than $40,000 per year and living wage as $40,000 per year or more.
	  – **Criteria**: areas where more than half of jobs pay a living wage.
	• **Middle skill jobs** – accessibility of jobs that only require some post-high school education or training within the community shed of each grid cell.
	  – **Criteria**: area where 25% of accessible jobs are considered "middle skills".
	• **Knowledge base job** – accessibility of jobs that requires 4-year college degree or higher within the community shed of each grid cell.
	  – **Criteria**: areas where over 20% of jobs are considered "knowledge base jobs".
	
	Environmental justice:
	• **Tree canopy** – measures percentage of land covered by tree canopy.
	  – **Criteria:** Over 50% of land covered by tree canopy.
	• **Impervious surface** – measures percentage of impervious surface.
	  – **Criteria**: "Areas with 25% or less impervious land (<40 acres)."
	• **Proximity to heavy industry uses (transportation infrastructure)** – examines the percentage of households that are within half a mile of heavy industrial uses (freeways, expressways, railroads and/or the airport).
	  – **Criteria:** "Areas with less than 25% of households within ½ mile of heavy industrial use (transportation infrastructure)."
	• **Floodplain** – calculates the percentage of households within the floodplain.
	  – **Criteria:** "Areas with less than 25% of households within the floodplain are considered to have minimal exposure to the risks of the flooding."

Diversity and Inclusion [12/14]

We recommend that communities explore how different groups in the community are exposed to climate-related risk

Considerations for communities

Study the relationship between racialized/traditionally marginalized populations and key climate-related risk

Example source	Rationale	Background	Recommended Metrics	Methodology
HeatReady [71,169]	• Canadian communities are increasingly facing the challenges of climate change and diversity, equity, inclusion. As communities get colder how are different groups impacted by the change in weather? • In communities, inclusion can be observed when the provision of public services is equal, and targets vulnerable organizations. • HeatReady is an initiative that measures the temperature of different areas in Phoenix overtime. By collecting localized temperature data, Phoenix can track temperature overtime and identify which areas require investment to mitigate climate risks. • HeatReady data can help promote heat equity by mitigating heat islands and reducing inequitable distribution of heat risks across different groups that live in the same area. It helps understand how climate change and DEI relates to one another by overlaying income with temperature, and location.	• HeatReady is a program developed to identify, track and prepare for rising temperatures. Data gathered from the HeatReady program showed that temperature varied thirteen degrees between different neighborhoods. • Heat is overlayed with income and location, and by doing so it allows people to derive inferences on how different groups (such as different income levels, and newcomers) are adapting to climate change. • For example, data collected in the Heat Ready program shows that low-income groups are the most vulnerable to heat waves and associated risks such as negative health, and socioeconomic consequences. By identifying these patterns, it allows the city to prioritize certain neighborhoods and walkable routes for future cooling investments, new buildings to be built with airflow in mind, and prioritize locations for non-profit agencies to position themselves to offer cooling stations.	• The data from the heat sensor is being collected and used to create a long-term database to track the city's progress in reducing heat inequities. – **Surface temperature –** represents the heat energy given off by land, buildings, and other surfaces and can be collected by devices such as satellites or "traverses of air temperatures". – **Heat inequity –** compares data on the city's hottest neighborhoods over time and how it overlaps to a neighborhood's income level. – **Shade cover**	• To leverage this methodology, public organizations would need to install heat monitor sensors in locations across the city. The heat sensor is used to identify temperatures, humidity, and amount of shade cover across the city overtime. • The data can then be used to inform investments related to heat mitigation and create an assessment to measure the city's heat readiness. • Like HeatReady, the University of Wisconsin leveraged a similar methodology to measure heat islands.

Diversity and Inclusion [13/14]

We recommend that communities explore novel metrics that provide insights on underreported activity in sections of the economy that can help develop an informed view on resident experience

Considerations for communities

Example source	Rationale	Background	Recommended Metrics	Methodology

The care economy[9,167]	• The care economy is composed of paid and unpaid childcare, elder care, and health care. It is an important segment of the economy that is often underreported or unaccounted for because the work of unpaid care is not measured.
	
	• The lack of data in the care economy means that adequate support such as skills development, public investment, and appropriate compensation often does not occur in a community. Data needs to be collected to identify areas of need and provide equitable access to quality care.
	
	• Undergoing analysis to estimate the monetary value for the care economy or unpaid household activities will support in increasing equitable data and capturing economic and societal output that is often missing from traditional economic metrics.
	
	• The care economy will provide greater insight about the lived experience of community members which can help guide user maps and use cases to build a more equitable community.
		• Day-to-day tasks, such as cleaning, cooking, and caring for dependent children and adults are productive activities.
		
		• However, assigning economic importance to such activities can be challenging as they are often done outside of the market economy and do not have an observable monetary value.
		
		• Often, people involved in the care economy are women, and often women of color or immigrants.
			• **Hours of informal care** – can be captured using either a diary or recall method through primary research.
			
			  – **The diary method** consists of an individual in the care economy continuously reporting the activities they complete over a time period.
			
			  – **The recall period** individuals list the time they spent doing an activity in the past week.
			
			• It must also be taken into consideration that often care work is performed at the same time as regular activities of daily living. Therefore, to calculate the attributable hours of care, researchers can use a base comparison group that does not require care. Alternatively, during the recall method researchers can ask caregivers how many less hours it would have taken them if the care recipient was in good health.
				• The value of the care economy can be estimated by looking at unpaid health care, caregiving, health-promoting, and reproductive labour. Researchers have leveraged time-use data (collected from primary research) which is the amount of time an individual devotes to care work.
				
				• To measure the monetary value of unpaid care there are two general methods typically used by researchers:
				
				  – **Replacement cost** (the cost of hiring someone to do the care work) this is often divided by two types of activities and so assumes the cost of a housekeeper and a nurse.
				
				  – **Opportunity cost** (the value if the person were to work in the market) this is more challenging as researchers need to identify what activity was displaced by caregivers.
				
				• The hourly wage can be based on hourly earnings estimates or through research that analyzes an individual's willingness to pay for the care service or the minimum amount a caregiver is willing to accept to provide one additional hour of work.

Diversity and Inclusion [14/14]

We suggest that communities focus on supporting and learning from equity seeking groups and collecting metrics at a local level

Additional considerations for economic developers

- **Understand the various forms of diversity that exist from a definition perspective by studying intersectionality and neurodiversity.** Relying solely on one type of categorization leads to the omission of several aspects of people's lives. Education levels, gender, age, and other variables lead to cumulative social vulnerabilities. Additionally, neurodiversity refers to the idea that people experience and interact with the world around them in many ways.[151]

  - Conventional quantitative methods to measure intersectionality include cross-tabulation analysis which is used to study the relationship between two variables (one variable is placed in the columns of the table, and another variable in the rows of the table). More advanced methods include regression models with interaction terms which is a variable that is constructed from the product of two different variables. For intersectionality, the two variables would be between different social positions (e.g., gender and ethnicity, sexual preference, and ethnicity).[157]

- **Invest in DEI expertise.** Many development organizations and communities may not have DEI expertise, historical, and social background. Organizations would benefit from building DEI expertise and adapting to leading language, research methodologies and including this domain as a key requirement/skill set in every economic development office. For example, it is important to understand leading language such as the difference between being treated equally (where it is assumed that everyone benefits from the same support), equitably (where everyone is given tools to have equal access) compared to removing a systematic barrier for inequality to be addressed. The International Economic Development Council (IEDC) outlines the importance of embedding diversity, equity and inclusion (DEI) internally in an Economic Development Organization and among its developers to ensure it can be implemented in its practice areas.[107]

- **Connect with and support local equity seeking group associations and bodies.** Understand their perspectives, challenges, and what data they hold.

  - **For example**: East Preston Empowerment Academy (EPEA) is a local equity association partnered with the Nova Scotia Department of labour and Advanced Education to empower and equip individuals with the tools to enhance their employability through accessible programming and combat disparities faced by the local Black communities. By connecting with EPEA, communities can understand the challenges and barriers to education, and employment faced by Black communities.

- **Understand the broader federal funding, provincial funding, or municipal funding which may support diverse and equity seeking residents, entrepreneurs, business owners and others.**

Case Example: Vital Signs communities adhering to best practices[76]

- Vital Signs is a Canadian community-driven data program. The program uses local knowledge to measure the vitality of a community and support action towards improving collective quality of life.

- **Indices:** Some cities are currently reporting their Gini Index, a measure of income distribution.

- **Example of cities that are looking beyond demographic metrics:**

  - **Toronto:** reports the relationship between race and police perception.

  - **Calgary:** segmented some of their survey results by race, and so showcased the experience and socioeconomic outcome of different groups.

  - **Victoria:** outlined differences in working status during COVID-19 and police street checks by ethnicity/race.

# Section 2B:

Engaging Resident-Generated Data

Collecting data from residents [1/6]

Residents have access to and can be valuable sources of data that can inform decision making. We encourage communities to engage residents in the data collection process in order to understand community needs

Context & Challenges

- **Privacy violations:** An increasing concern for residents when presented with an opportunity to share data or engage in data activities with local governments are privacy violations. For example, there has been an increasing concern with the use of social media data for policy and research purposes due to recent cases of data breaches.[83]

- **Survey fatigue**: Increasingly, businesses and societal organizations are requesting feedback in the form of brief surveys. This can drive a feeling of fatigue which occurs when respondents become bored, tired, or do not have an interest in the survey. Survey fatigue leads to lower response numbers and lower data integrity.[60]

  - **The respondents might be overwhelmed by the number of requests they have received for feedback.**

  - **The respondents might abandon a survey because parts of the survey are not applicable to them or understand how their input will be used.**

- **Response bias:** Individuals may respond to questions in the same way, and not provide genuine and accurate information when given the opportunity to provide data to inform policy leading to response bias.[60]

- **Low digital maturity:** Resident-centric service models are increasingly important for communities as residents become more tech-savvy. However, digital maturity for local organizations and governments are typically low.[85] Often organizations have outdated software, old technology infrastructure, may lack the skills to negotiate in a contemporary technology marketplace, and lack skills in data governance and analytics.

- **Inconsistent data collection standards:** Different organizations and sectors often have different standards in the production of data which makes it hard to compare data.[57]
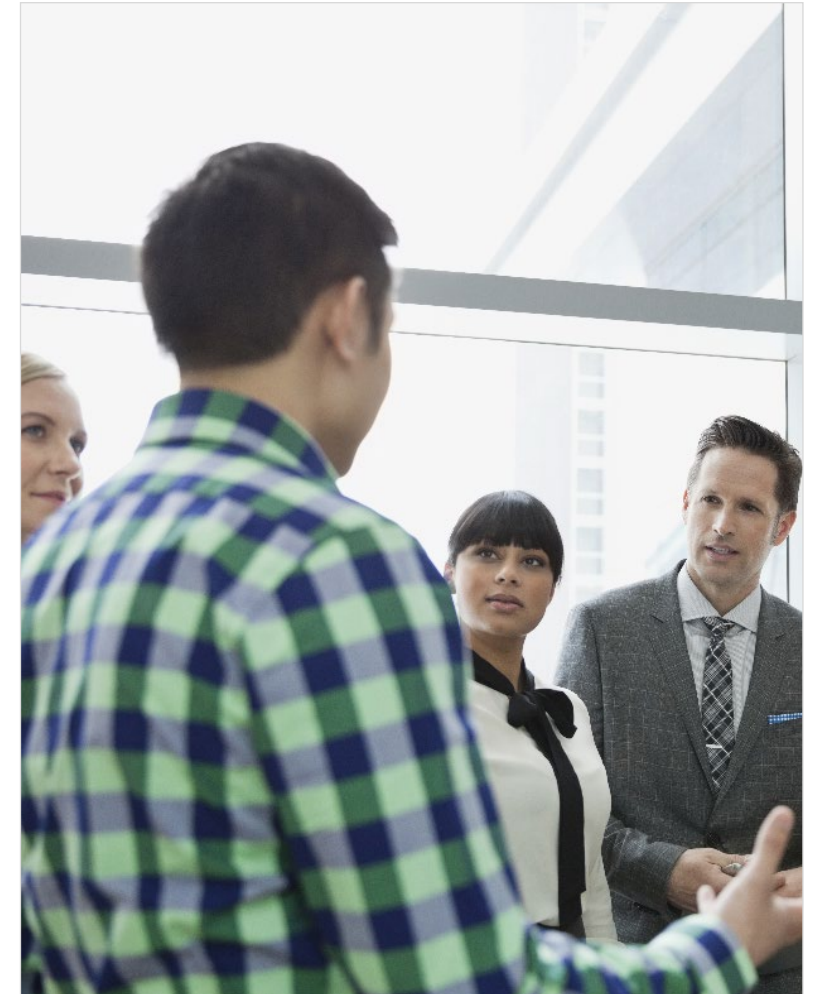
Collecting data from residents [2/6]

We encourage communities to promote resident engagement by developing platforms designed for community collaboration

Considerations for communities

Example source	Rationale	Background	Recommended Approach
City Hotlines	• When individuals are asked to share data via city surveys, they usually do not see what happens to their feedback. This leads to a decrease in the incentive to share data. • When engaging with city hotlines residents can see that their feedback leads to better services in their city.	• Boston's 311 platform (BOS:311) allows residents to request several services through the platform. Residents can share their concerns through the phone, application, Twitter or the BOS:311 website. Residents can also track their requests. • Other cities such as Somerville (311 Service Center) and Kansas City (311) have also adopted a similar strategy for their 311 platforms. Kansas City has had the application for over a decade which allows them to track resident satisfaction overtime.[1]	• Individuals can take a picture of their problems (e.g., a pothole that needs to be fixed, a street that needs to be cleaned, or graffiti that needs to be removed) write a description, select a location and upload it to the platform.[2] Individuals can also ask questions about a city service. • City planners can then use that data to understand what services the city requires the most, who and where those services are required. Residents can look at statistics and track their requests. • The data from the city hotlines can be aggregated to measure metrics such as: – Top services requested by residents – Segregated service needs by neighborhood – Hate incidents such as illegal graffiti – Proxy for resident satisfaction • Implementing a City Hotline would require an investment in a new municipal asset that would likely require core infrastructure cost and ongoing staffing. Example of estimated costs and efforts: – Initial set up of call center platform, applications, websites, and training costs. The call center platforms is the costliest method and depends on expected number of calls. For example, Boston's 311 hotline receives around 5,762 calls per week.[177] – Agent costs to run the call center platform. Number of agents depends on expected number of calls. – Technological upgrades to add reporting capabilities, and resources for emergencies.

Collecting data from residents [3/6]

We encourage communities to promote data sharing of sensitive information by providing a safe and private platform for residents to share information

Considerations for communities

Individuals are more likely to share their perspective if they see that their opinion is taken into consideration and actions are taken in response to their feedback.

Example source	Rationale	Background	Recommended Approach

Racial Incident Hotline[8]	• Hate crimes are usually underreported to the police. The racial incident hotline aims to speed and ease the process of reporting hate crime and incidents.	• British Columbia is creating a hotline for residents to report non-emergency racist incidents and receive support and referrals. The hotline aims to simplify the reporting of incidents and allow for faster responses.
		
		• The data aggregated from the hotline will be used to support anti-racism initiatives such as legislation and better race-based data collection.
			• The government aims to perform consultations with Indigenous partners, Black, and other racialized or faith communities to help inform city priorities.
			
			• The aim is for the hotline to be multilingual and delivered by personnel other than the police.
			
			• The data of the racial incident hotline can be compiled to measure:
			  – Number of hate crimes and incidents
			
			• The Racial Incident Hotline is potentially a significant cost as this is a new municipal investment. Estimated costs and efforts:
			  – Initial set up of call center platform.
			  – Agent costs to run the call center platform. If agents are expected to speak several languages, there is an added cost.
			  – Technological upgrades to add reporting capabilities, and resources for emergencies.

Collecting data from residents [4/6]

Communities should encourage resident opinions by proving an easy platform for residents to voice their concerns

Considerations for communities

Individuals are more likely to share their perspective if they see that their opinion is taken into consideration and actions are taken in response to their feedback (continued).

Example source	Rationale	Background	Recommended Approach

FundPHX[86, 130]	• Data on resident satisfaction of city programs are often based on surveys (that usually have low response and response bias) or number of residents participating in a program overtime.
	
	• FundPHX is an online tool that Phoenix residents can use to share their thoughts on how a city's budget should be allocated. Therefore, it provides a view on resident's satisfaction and priorities based on their budget allocation.
		• FundPHX is an online tool (accessible both through one's smartphone or computer) that allows residents to share opinion and priorities on Phoenix's proposed budget. It is available both in English and Spanish.
		
		• FundPHX outlines the budget in detail in an easy to digest format. The resident can see how much each service costs, and the financial impact that changes in service levels would have. The tool is linked to the inventory of programs and detailed per department.
		
		• The aim of the city is to increase transparency and involve more people in the budget allocation. It can be noted that public consultations can be accessible but understanding projected government financial records can be difficult to understand by non-experts. Thus, FundPHX can help to support more active, informed civic engagement.
			• The tool was launched in 2020 and includes the 2022-23 budget proposal. The budget is split into expenditure categories and presents the user with questions on whether a certain sum of money should be allocated or not to a category. A resident can allocate money to programs they wish to see grow.
			
			• The tool has a legend on top which outlines to the resident if they are balanced, have a surplus, or deficit based on their choices. The user can share their progress with others and finally submit it to the City Council. The recommendations are compiled in a monthly basis and shared with the City Council.
			
			• The data collected from the FundPHX can be compiled to understand:
			  – Resident's priorities and satisfaction over time (by demographics) – i.e., which programs do residents want to see grow compared to which programs they have less interest in. The city reports which categories were most changed by individuals.
			
			• Implementing a similar application would require significant front-end infrastructure, ongoing, and resource cost. The explicit costs from FundPHX are not available in the public domain. Estimated efforts include:
			  – A resource(s) with application developers' skills to build the platform or hire an external vendor to build the platform.
			  – Agent cost to monitor the email feedback from individuals.

Collecting data from residents [5/6]

We recommend communities highlight the benefits of data in order to encourage residents to collect and donate data

Considerations for communities

Residents have the capability to collect data and communities can incentivize the collection of data by providing residents with the tools to collect data, the platform to share the data, and a common purpose on why the data must be collected.

Example source	Rationale	Background	Recommended Approach

Ground Truth 2.0 Project [5,134,170]	• Often policy decisions are made through a top-down approach due to lack of data and participation of residents.
	
	• The Ground Truth 2.0 Project aims to put residents at the center of environmental monitoring by using a bottom-up approach. Residents are incentivized to collect and share data to maintain their living conditions.
		• The Ground Truth 2.0 Project believes that residents are ready to share data, but they need to have the right technology to do so.
		
		• For example, in Belgium, residents are measuring air quality and traffic noise. In Sweden, residents are gathering water samples during different events. The data residents collect will be used to improve the living conditions of the city by studying climate adaptation and mitigation.
			• First, the Ground Truth 2.0 Project brings together residents to collectively decide the data they are interested in monitoring. Then, they provide the residents with the technology required to collect such data. The project also aims to connect residents, managers, scientists, and politicians to access and share information.
			
			• The format of the data varies but many of the cities have created an online platform a "citizen observatory" where residents can input their observations.
			
			  – **Wildlife reporting** was collected through an app and website where individuals could input data on wildlife sightings and construction.
			
			  – **Air quality** was collected using a carbon-detecting sniffer device coupled with a GPS.
			
			  – **Water samples** were collected using water sample kits and residents collected water from different lakes over a period.
			
			  – **Heat stress** – residents can measure temperature levels using their cell phones. An application uses battery temperature readings via a direct heat transfer model to measure temperature.
			
			• The data of residents' observations along with GIS data and open-source data is used to build a visualization of the data as a 3D world that can be used for scenario planning. The resident information is aggregated on top of the 3D world visualization to view the cities under different stakeholder observations.

Collecting data from residents [6/6]

We encourage communities to outline clear responsibility and accountability protocols to encourage residents to share data

Additional considerations for economic developers

Consider enhancing ethical dimensions that are critical to trust to ensure clear responsibility and accountability.[62]

- Organizations and communities are increasingly using new types of technologies to analyze data. An example, is Artificial Intelligent (AI) that is increasingly being used by organizations to analyze data. It is important to set up "Trustworthy AI" to ensure ethical use, reliability, and most importantly user confidence in AI. The US Department of Defense (DoD) created guiding principles to safeguard ethics and build an AI strategy that is trustworthy. The framework uses five principles to guide the AI:

  - **Responsible** - DoD personnel are responsible for the development, deployment and use of the AI

  - **Equitable** - minimize potential biases in the AI

  - **Traceable** - transparent and auditable methodologies, data sources, design procedure, and documentation

  - **Reliable** - well-defined uses that are subject to testing and governance

  - **Governable** - designed to fulfil intended functions, and ability to disengage when showing unintended behaviour.[61,129]

Section 2C:

Refined Approaches to Measure Economic Output

Enhanced Approaches to Measure Economic Output [1/27]

Some economic metrics offer a limited view of the development of a community and often do not outline progress being made outside the formal economy

Context & Challenges

- **Choice of metrics measured:** The choices made of what variables are measured to make up an economic metric is subjective and impacts the final value of the metrics and policy implications.[27] For example, should property prices be included in the consumer price index? Will unpaid work be considered in the gross domestic product calculation?

- **Our economy has evolved:** When classic economic indicators were developed the economy was heavily focused on production, consumption mainly consisted of tangible assets, and employment was concentrated in manufacturing. For example, monitoring the prices of necessities such as butter and clothing was sufficient to measure inflation. Similarly, when gross domestic product (GDP) was established as a standard tool to measure an economy in 1944 the American economy was heavily based on production, and consumption was heavily concentrated around appliances and cars.[123,124] Now a days, the economy is more complex as individuals consume free assets such as Google Maps, and other services that play critical roles to the economy but may not be captured in output related calculations. Additionally, many individuals are self-employed and may have flexible contracts which may not be adequately captured in classical employment/wage related economic metrics.[27]

- **Limited data sources:** Traditional economic metrics that serve as inputs into GDP for example are often hard to access for entities outside the government.

- **Additional examples to limitations to classic economic metrics:**

  - **Gross domestic product (GDP)**, represents the value of all final products and services produced in a period and is often the standard metric used to measure an economy and its growth. However, GDP often excludes components that do not involve monetary transactions such as household work and the informal economy. Additionally, GDP does not account for the distribution of wealth, environmental impact of the economy, and quality of life improvements. To measure a community's development, communities should measure basic human needs, foundations of wellbeing and opportunity. Economists suggest extending GDP and using other metrics to fill in the gaps, otherwise GDP measures can be misleading and incomplete.

    - For example, GDP 2.0 separates economic growth by income to understand who prospers when the economy grows.[29]

  - **Unemployment,** represents all individuals who are willing, able, and actively looking for a job but cannot find one. This approach omits discouraged workers (people who are unemployed, want and are eligible for employment but have stopped looking for a job) from the calculation and often does not account for the informal and gig economy. It usually does not reflect factors such as how many people are underemployed, chronic unemployment, and the wage gap.[30,31]

  - **Vulnerability of risks and quality of employment** are not often fully captured or measured within classical economic data. For example, risk of unemployment is most often captured as "the actual rate of unemployment, without differentiating [determinants such as] the probability of becoming unemployed and the expected duration of unemployment".[132] Likewise, policy practice focuses predominantly on job quantity, rather than job quality.[133]

Some economic metrics offer a limited view of the development of a community and often do not outline progress being made outside the formal economy. We recommend communities invest in novel metrics, measure activities beyond traditional economic activity, and indices in order to obtain a holistic view of the economy

Context & Challenges

- **Identifying risks and vulnerabilities:** For economic development leaders, proactively identifying risks and vulnerabilities is imperative, and a feature of policy and planning that can be difficult to accomplish when relying on historical data. Examples include:

  - **New Businesses Viability,** measuring how many business are opened in a period, usually does not outline whether those businesses can make sustainable profits or are vulnerable.[23]

  - **Median Household Income,** refers to the income earned by a household where 50% of households in a region earn above and the other 50% earn below that value. It often does not capture impacts of potential increases to cost of living on quality of life or general levels of affordability in the economy.[33]

Case Example: Vital Signs communities adhering to best practices[76]

Many communities are reporting metrics beyond traditional economic metrics in their Vital Signs.

- **Nanaimo:** reports on the number of people working in the arts, culture and film industry, how many visits the museum has, library items circulated, and other arts and culture metrics in their vital reports.

- **Guelph and Wellington County**: reported the impact of COVID-19 on food insecurity, mental health, alcohol and substance abuse.

- **Edmonton:** reports the percentage of people (age and gender) working multiple jobs in the gig economy. Edmonton also reports on mental health, activism, engagement, philanthropy, and technology uses.

- **Pictou County:** reports on health & wellness (e.g., chronic illness, mental health), transportation statistics, environment (e.g., boil water advisories, air quality), and sense of belonging.

We advise communities to build indices that encompass different aspects of economic growth and align with the UN Sustainable Development and environment, social and governance (ESG) goals

Considerations for communities

Ensuring a breadth of data is included when assessing an economy. Communities should consider using an index to report on a broader range of metrics related to the economy that could include data on the environmental, social, racial and economic inclusion of a community.

Example source	Rationale	Background	Recommended Metrics	Methodology

The Urban Environment and Social Inclusion Index (UESI)[14,17] (1/3)	• The UESI index can help a community to better measure the equity and social inclusion of neighborhoods. The UESI is built using the UN Sustainable Development Goal Indicators as basis for the UESI metrics measured.
	• This type of index can be used for communities that are interested in focusing on environmental, social and governance (ESG) policies and wish to align their objectives to the UN Sustainable Development Goals.
		• The UESI displays how cities are performing at an environmental and social equity level. UESI's guiding principles include being spatially-explicit by incorporating geographical data to examine patterns and movement in urban areas. It compares how different cities perform against each other by normalizing the data to the scale of 0-100.
		• UESI aims to understand discrepancy in environmental performances, incorporate equity to highlight socioeconomic trends, build on sustainable development goals, focus on outcome, and build a reproducible and transparent framework.
		• The research is led by a joint initiative between the Yale School of Forestry and Environmental Studies and Yale-NUS College. They currently report on 40 cities including Montreal and Vancouver in Canada.
			• We recommend communities to consider the following metrics:
			  – Environmental Concentration Index
			  – Particular matter (PM) exceedance
			  – Urban heat island index (UHI)
			  – Tree canopy cover loss
			  – Tree cover per capita
			  – Water stress
			  – Wastewater
			  – Proximity to public transit
			
			Please see the next two pages for additional information.
				• The UESI measures how close a neighborhood is in achieving an identified policy target and gives a score from 0 (worst performance) to 100 (top performance).
				• The targets are high performance benchmarks defined by international or national policy goals related to inclusion and well being. Key examples include:
				  – Tree cover per capita uses UN SDG goal of 15 meters per capita .
				  – Air quality uses scientific thresholds (PM indicator uses the World Health Organization's goal of 10 micrograms/m³ limit per exposure).
				• UESI also graphs the concentration curves of selected metrics related to air pollution, climate change, urban tree cover, sustainable public transportation, and water resource management on top of the Lorenz curve to study the distribution of the environmental outcome in relation to income distribution. *Additional information on the next slide.*[14,17]

Enhanced Approaches to Measure Economic Output [4/27]

We advise communities to build indices that encompass different aspects of economic growth and align with the UN Sustainable Development and environment, social and governance (ESG) goals

Example source	Recommended Metrics

The Urban Environment and Social Inclusion Index (UESI)[14,17] **(2/3)**	• All the data required to leverage the index is available online. For example: UESI uses satellite data from remote sensing, official statistics reported by government, census neighborhood, block-level data on population, and Nature Conservancy's Urban Water Blueprint data. We recommend communities leveraging the index to measure metrics such as:
	
	• **Equity and social inclusion**
	
	  – **Environmental Concentration Index (ECI):** Measures the distribution of the environmental outcome in relation to a scenario of perfect equity. It is a graphical analysis of the Lorenz curve (which outlines the cumulative percentage of national income) compared to the concentration curves of the environmental and social outcomes outlined below.
	
	    – *How it is done:* The x-axis is the cumulative proportion of a city's population, and the y-axis is the cumulative proportion of income, environmental, and social outcomes. In the Lorenz curve, the 45-degree line represents perfect equity. If the concentration curve is above the 45-degree line, it indicates that environmental outcomes are more heavily allocated to those with less income. The opposite holds true if the line is below the 45-degree line.
	
	• **Air**
	
	– **Particulate matter (PM) exceedance:** Average percentage of the population exposed to PM levels at 10 $\mu g/m^3$, 15 $\mu g/m^3$, 25 $\mu g/m^3$, and 35 $\mu g/m^3$ which represents World Health Organization targets in its air quality guidelines.
	
	• **Climate**
	
	  – **Urban Heat Island Index (UHI):** measures the day temperature (measured at 1:30 pm) and nighttime temperature (measured at 1:30 am) of the 15-year (2003-2017) mean difference in the land surface temperature of urban and non-urban land cover within a city.
	
	    – *How it is done:* both data sets are obtained from the Moderate Resolution Imaging Spectroradiometer satellite. Each neighborhood UHI is compared to the entire city. [14,17]

Enhanced Approaches to Measure Economic Output [5/27]

We advise communities to build indices that encompass different aspects of economic growth and align with the UN Sustainable Development and environment, social and governance (ESG) goals

Example source	Recommended Metrics
The Urban Environment and Social Inclusion Index (UESI)[14,17] (3/3)	**Tree cover** **Tree canopy cover loss** is the total area of urban tree loss from 2001 to 2016, benchmarked against the baseline in 2000. The data is obtained from the Global Forest Change database. **Tree cover per capita** measures the tree cover extent per person living in an area. The data is obtained from the Global Forest Change database. **Water** **Water stress** is the ratio of surface water withdrawn, relative to the total annual natural availability of surface water. **Wastewater** is the percentage of the population connected to sanitation networks, and the percentage of wastewater that is treated before released back into the environment. **Transportation** **Proximity to public transit (PPT)** is the median distance within a neighborhood required for individuals to reach a public transit stop (data from OpenStreetMap) from their residences. *How it is done:* The distances are calculated as the shortest distance from randomly selected points within a neighborhood to the nearest public transportation stop.

We advise communities to develop indices that report equity, wellbeing, leisure, culture, and environmental impact of the economy

Considerations for communities

Consider using indices that measure a community's performance holistically and accounts for the environmental impacts of economy growth, the distribution of wealth, and sectors of the economy that are not typically measured in traditional economic metrics.

Example source	Rationale	Background	Recommended Metrics	Methodology
Genuine Progress Indicator (GPI)[172] **(1/3)**	• The GPI be used as a substitute for gross domestic product (GDP), since it includes all the same measures, but differs from it in that it links consumption to quality of life, considers welfare when accounting for defensive expenditures, includes non-market benefits and costs, as well as other social and environmental GDP shortcomings, such as sustainability and inequality.	• The GPI was developed by Clifford Cobb, Ted Halstead and Jonathan Rowe in 1995. Due to inconsistencies between countries, it was difficult to compare results, and as of 2021, the efficacy of GPI 2.0 (with streamlined processes) is being tested in some U.S. States and Canada.	• The measures that make up GPI consists of three categories that are made up of a total of 26 indicators, categorized into three main themes. – **Economic** – **Environmental** – **Social** Each indicator either increases or decreases the GPI. *Please see the next two pages for additional information.*[172]	• The GPI formula is $GPI = C_{adj} + G + W - D - S - E - N$, where the 26 indicators can be categorized into one of the components of the equation below. – C_{adj} = personal consumption with income distribution adjustment – G = capital growth – W = unconventional contributions to welfare (e.g., volunteerism) – D = defensive private spending – S = activities that negatively impact social capital – E = costs associated with the deterioration of the environment – N = activities that negatively impact natural capital

We advise communities to develop indices that report equity, wellbeing, leisure, culture, and environmental impact of the economy

Example source	Recommended Metrics

Genuine Progress Indicator (GPI) [172] **(2/3)**	• **Economic**
	  – **Personal Expenditure data (+)**
	    – Money spent on goods and services for personal use and consumption. Extraction from national or state accounts.
	  – **Income Inequality (+ or -)** based on the Gini Coefficient.
	  – **Adjusted Personal Consumption (+)**
	    – Sample methodology: the personal consumption expenditure is divided by the income inequality metric. It then becomes the base from which all metrics are either added or subtracted.
	  – **Consumer Durable Costs (-)**
	    – Sample methodology: "flow equal to 20% of [consumer durable] original cost, depreciation and the interest rate that could have been achieved if the money had been invested instead." [172] Subtracted to avoid double counting.
	  – **Underemployment (-)**
	    – $Underemployment = number\ of\ underemployed\ people\ *\ hours\ not\ provided\ per\ constrained\ worker\ *\ hourly\ rate$
	  – **Consumer Durables Services (+)**
	  – **Net Capital Investment (+ or -)**
	
	• **Environmental**
	  – **Water, air, noise pollution (-)**
	    – Air pollution is "damage cost estimates associated with air pollution to households, infrastructure, and the environment, excluding health or mortality cost." [172]
	    $Cost = pollution\ data\ *\ cost\ per\ unit\ of\ air\ pollution\ damage$
	  – **Net Loss of wetland and farmland (-)**
	    – Subtracting for loss of "purified water, wildlife habitat, and other ecosystem services provided by wetland" and "sustainable local food supply, esthetic, scenic, and historic values, decreases in water quality and flood control as well as degraded wildlife habitat provided by farmland" [172].
	  – **Net loss of forest cover (-)**
	    – "Subtracting for loss of forests and associated goods and services provided by them including flood control, air and water purification, biodiversity, habitat, medicinal products, as well as esthetic and recreational value" [172].

We advise communities to develop indices that report equity, wellbeing, leisure, culture, and environmental impact of the economy

Example source	Recommended Metrics

Genuine Progress Indicator (GPI) [172](3/3)	• **Environmental**
	  – **Climate change (-)**
	    – *Climate change = marginal social cost of CO2 emissions* per year * *energy consumption*
	  – **Ozone depletion (-)**
	  – **Non-renewable resource depletion (-)**
	
	• **Social**
	  – **Volunteer work and domestic labour (+)**
	    – Volunteer work: calculate based on the number of volunteer hours in the community multiplied by an average wage rate.
	    – Domestic labour: Based on daily hours of housework per capita such as meal preparation, cleaning, repairs, parenting, and the cost of hiring outside help to perform equivalent tasks
	  – **Crime (-)**
	    – *Cost of crime = defensive expenditures to avoid crime + direct cost of property crimes*
	  – **Personal Pollution Abatement (-)**
	    – *Personal Pollution Abatement = cost of solid waste disposal + cost of sewage and septic systems + cost of automotive air filters and catalytic converters*
	  – **Commuting (-)**
	    – *Cost of commuting = cost of vehicle * percent vehicle use for commuting + cost of public transit + cost of commuting using local wage rate*
	  – **Automobile accidents (-)**
	    – *Automobile accidents = number of accidents * cost per accident*
	  – **Higher education (+)**
	  – **Services of highways & streets (+)**
	  – **Family breakdown (-)** refers to the negative economic costs associated with divorce and excessive amounts of time spent watching television.
	  – **Lost leisure time due to increased economic output (-)**

We advise communities to develop indices that report equity, wellbeing, leisure, culture, and environmental impact of the economy

Considerations for communities

Example source	Rationale	Background	Recommended Metrics	Methodology

Canadian Index of Wellbeing (CIW) [80,149,109,180] **(1/3)**	• Traditional economic indices and metrics, such as GDP, often focus exclusively on economic factors.
	• The CIW aims to measure progress in people's overall wellbeing, to determine progress in areas that impact a person's quality of life beyond the economy.
	• The initiative describes the CIW report at a national level is a "[c]ompanion to national discourse on GDP"[180], while the description of the community-level report focuses on wellbeing of residents.[180]
		• The CIW was developed at the University of Waterloo (UWaterloo) and includes a group research associates made up of professors and staff from the UWaterloo, as well as professors, directors, advisors, managers, and researchers from various universities, research units, and Canadian and International organizations.
		• The composite index consists of eight domains:
		  – Living standards
		    – Healthy population
		    – Democratic engagement
		    – Community vitality
		    – Environment
		    – Leisure and culture
		    – Time use
		    – Education
		• Communities that have participated in and been provided with research reports, custom applications, and/or wellbeing surveys by the CIW include Guelph, Kingston and Oxford County, ON; Victoria, BC; Wood Buffalo, AB; and the province of Novia Scotia.
		• The reports currently published by CIW on different provinces and regions in Canada are available here.
			• Each domain is calculated based on eight key social, health, economic, and environmental indicators, for a total of 64 metrics (e.g., % of population who report having 5+ friends, life expectancy at birth, Gini coefficient, etc.).
			
			Please see the next two pages for additional information.
				• Changes in wellbeing are tracked similarly to a stock index. Raw data from the 64 indicators are collected from both its Wellbeing Survey, as well as from resources such as Statistics Canada, Canadian Centre for Economic Analysis, Parks Canada, among others. Instructions on where to find the entire list of data sources is included in the next slide. This data is then entered in a spreadsheet by year and indicator. Examples of this raw data include:
				  – A scaled response
				  – Percentage of a population
				  – Objective measure of a tangible feature
				• For indicators that are calculated irregularly, estimates are calculated based on the time series trend. The base year is then set to 100 for all indicators, and percentage change from the base year is calculated.[109] Percentage changes in the trend represent either an improvement, or a deterioration in wellbeing.[80,149]
				• The recommended interval to create a trend line is for surveys to be conducted every five years. Surveys are distributed to a random sample of households in the community. The initial survey is based on high level questions relating to the eight domains, resulting in data that is then weighted and distributed according to community characteristics (e.g., geographically, by gender, etc.). Additional survey(s) are then distributed with more focused questions that were identified as significantly impacting wellbeing in the specific community.[176]

We advise communities to develop indices that report equity, wellbeing, leisure, culture, and environmental impact of the economy

Example source	Recommended Metrics

Canadian Index of Wellbeing (CIW)
 80,109,149, 174 **(2/3)**
	• Below we outline a few of the total 64 indicators that make up the eight domains of the index. Each domain is made up of one or more dimensions, which are further made up of either both sub-dimensions and indicators, or simply of indicators. The complete list, including sources, is available on CIW's website under "What we do" and "Domains and indicators".
	
	 • **Community Vitality:**
	  – **Social Relationships:**
	    – % of population that reported somewhat strong to very strong sense of belonging to community
	    – % of population reporting unpaid, formal volunteering for groups or organizations
	  – **Community Safety:**
	    – % of population that feels safe walking alone after dark
	    – Crime severity index, which is a Statistics Canada index that tracks both prevalence and seriousness of police-reported crimes.
	
	 • **Leisure and Culture:**
	  – **Participation:**
	    – Average number of hours volunteering for culture and/or recreation organizations
	    – Average number of nights away on vacation trips to destinations at least 80km from home
	    – Expenditures on all culture and recreation as a percentage of total household expenditures
	
	 • **Environment:**
	  – **Freshwater:**
	    – Annual water yield in Southern Canada (km^3)
	  – **Biotic resources:**
	    – Total farmland in hectares (this metric impacts food security)
	    – Ecological footprint
	      – Routledge has published a research paper from Dalhousie University which explains a method to estimate an ecological footprint at a municipal level, using both the national ecological footprints and the Canadian land use matrix. From there, the estimated provincial footprint can be further broken down by community. While this is useful for a more detailed look at communities, the CIW looks at Canada's footprint at the national level, and therefore either method could be adopted.[174]

We advise communities to develop indices that report equity, wellbeing, leisure, culture, and environmental impact of the economy

Example source	Recommended Metrics
Canadian Index of Wellbeing (CIW) [80,109,149, 174] **(3/3)**	**Air:** **Ground level ozone (population weighted in parts per billion)** - This metric directly impacts individuals' health, especially respiratory health. **Absolute greenhouse gas emissions (megatons of CO_2 per year)** - Measurements for both indicators are available through Environment and Climate Change Canada. **Education:** **Social and emotional competencies:** - Amount of time spent in talk-based activity with 0- to 4-year-old children (these activities include any interaction that involves conversation, including reading and helping with homework). **Basic educational knowledge and skills:** - Ratio of students to educators in public schools. **Overall academic achievement, attainment, and participation** - Average expenditure per public school student (in constant dollars for elementary and high school students). % of population aged 25 and older participating in education-related activities. % of 25- to 64-year-olds in population with a university degree. - Average annual Canadian undergraduate tuition fees (in constant dollars). - High tuition fees impact levels of participation in education, and high student loans can negatively impact quality of life in other areas (e.g., housing, food, leisure activities, etc.). % of Canadians 20 to 24 years of age in labour force completing high school Many of the metrics listed above can be found through Statistics Canada surveys. For the purpose of CIW's research, a secure data repository is used at the UWaterloo, and includes data from sources such as Statistics Canada, Canada Survey of Giving, Childcare Canada, Childcare Resource and Research Unit, Parks Canada: National historic sites attendance, CIBC, etc. Additional sources are available at Domains and indicators	Canadian Index of Wellbeing	University of Waterloo (uwaterloo.ca). CIW also circulates a CIW-Community Wellbeing Survey and stores the data collected in its data repository.

We suggest communities measure the impact of economic policies and economic health. Below we outline some examples for communities to leverage

Considerations for communities

Consider using indices that measure a community's performance holistically (continued).

Example source	Rationale	Background	Recommended Metrics	Methodology

Commitment to Development Index (CDI) (1/2)
 82, 111
	• This index measures indicators and policies that affect other countries.
	
	 • While the index is extensive and conducted at a national level, some of the domains are made up of indicators that relate to areas of interest brought up in consultations (e.g., Migrant Integration Policy Index, Fishing Subsidies, etc.). As an example, attracting people (migration) is a sign that the economy is vibrant and interesting.
		• The Center for Global Development (CGD) launched the Commitment to Development Index (CDI) in 2003 to rank countries on policies that affect the economic development of other countries.
		
		 • The CDI ranks 40 countries (e.g., Sweden, France, Norway, Canada, etc.) on their commitment and performance related to selected policies (e.g., relating to development finance, migration, trade, etc.) that impact other countries.
			• 40 indicators are summarized across 8 policy areas:
			   – Development finance
			   – Investment
			   – Migration
			   – Trade
			   – Environment
			   – Health
			   – Security
			   – Technology
			
			 A country's score is a weighted average of its scores on the component's indicators. *Please see the next page for additional information.*
				• Scores in the CDI are standardized so they can be aggregated. [111] For negative measures, the lower is better (e.g., greenhouse gas emissions). Based on scores, the countries are ranked 1-40 (e.g., Sweden, which has a score of 100 is ranked 1, and India, which has a score of 0, is ranked 40).
				
				 • The results are posted to a dashboard, with a breakdown of each country's performance by percentage in each of the eight policy areas.
				
				 • All data is publicly available and retrieved from sources such as the OECD database or the Finance for International Development (FID) working paper, which includes data on the flow of cross-border funding from countries outside of those included in the OECD database. [82]

We suggest communities measure the impact of economic policies and economic health. Below we outline some examples for communities to leverage

Example source	Recommended Metrics

Commitment to Development Index (CDI) (2/2) [82, 111]	• **Environment:**
	  – **Fishing Subsidies:** % of subsidies (fishing subsidies less payments by fisheries sector) to total fishing sector output.
	    – For the purpose of this index, this indicator has a negative impact on country scores, as it is found to cause overfishing, which negatively impacts communities and leads to depletion of fishing stocks.
	• **Trade**:
	  – **Agricultural subsidies:** % of direct subsidies to total agricultural output, using data from the three most recent years.
	    – This indicator carries a weight of 20% when calculating the average for overall trade.
	    – Subsidies relating to tariffs are excluded from this percentage, as tariffs are accounted for separately within the trade component.
	  – **Trade logistics:** Measured by the World Bank using its Logistics Performance Index. Includes different details on Canada's infrastructure relating to trade (e.g., export time and distance/ port or airport supply chain (distance - km, lead time - days), export time and distance, import time and distance (port or airport supply chain, or land supply chain), % of shipments meeting quality criteria (for both agencies and documents), clearance time without or with physical inspection in days, etc.[181]
	• **Migration:**
	  – **Immigrant Inflow:** measured as number of immigrants per 1,000 population (for the sake of this country-level index, this indicator is poverty-weighted by country of origin, resulting in a higher score for hosting migrants from poor countries).
	    – This indicator carries a weight of 30% when calculating the average for overall migration.
	    – *Weighted Migrants Score$_j$= ($\sum^n_i$ Weighted Migrants$_{ji}$)/Population$_j$, where*
	      – *Weighted Migrants$_{ji}$ = the number of migrants arriving in country j from country i, multiplied by country i's income weight, and*
	      – *Population$_j$ = the population of country j in thousands*
	    – The weighting accounted for in the above measure is calculated using the following formula:
	    – *Weight$_x$ = (1/GNI$_X$)/(1/GNI$_L$) = (GNI$_L$/GNI$_X$), where*
	      – *GNI$_X$ = GNI per capita (PPP) of country X, and*
	      – *GNI$_L$= Average GNI per capita (PPP) of LICs.[82]*

Enhanced Approaches to Measure Economic Output [14/27]

We suggest communities measure the impact of economic policies and economic health. Below we outline some examples for communities to leverage

Considerations for communities

Consider using indices that measure a community's contribution to, or performance in comparison to its overarching region.

Example source	Rationale	Background	Recommended Metrics	Methodology

Quebec Economic Health Index (1/3) [112, 113]	• This index was designed to both compare Quebec's economic health to Canada's economic health over time, as well as to highlight how it contributes to Canada's economy.[112]	• The index was developed by a global consulting company, an economist specialized in the Quebec economy, and a committee of experts to measure Quebec's economic health relative to Canada's as a whole.
		
		• It measures Quebec's economic health (i.e., its strength and robustness) by tracking 30 variables divided into five thematic groups.[113]
			• Data is collected to feed into the following five different thematic groups:
			  – Industrial demographics
			  – Investment
			  – Growth
			  – Human capital
			  – Environment
			
			Please see the next two pages for additional information, including some of the metrics that make up the five thematic groups.[112]
				• The Index follows Canada's leading economic institutions methodologies[113] and looks at trends over 10 years, making it a structural index.
				
				• Details of how the data is gathered or calculated are not included in the Quebec Economic Health Index publication, and we have not been able to locate it within the public domain.[112]

Enhanced Approaches to Measure Economic Output [15/27]

We suggest communities measure the impact of economic policies and economic health. Below we outline some examples for communities to leverage

Example source	Recommended Metrics

Quebec Economic Health Index (2/3)
 112, 113
	• Since the Quebec Economic Index has not included details in its report on how some of its metrics are calculated, we have included metrics used for other indices where they relate:
	
	 • **Industrial demographics:**
	
	   – New companies & closure:
	
	     – **Relating metric** from the Innovative Metrics for Economic Development:
	
	       – Establishment church (i.e., establishment births + deaths in a year, as a share of all establishments at the beginning of the year)
	
	         – The EDA sources this data from Census SUSB. Statistics Canada has data on monthly business openings and closures.
	
	       – Number of firms categorized under North American Industry Classification System (NAICS) 813.
	
	         – Sourced from the United States (U.S.) Bureau of Labour Statistics.
	
	       – Number of firms that have no paid employees and subject to taxes
	
	         – Sourced from the Census
	
	       – Share of workforce employed in occupations that involve a high level of thinking creatively (i.e., involving developing, designing or creating)
	
	         – Sourced from USDA Economic Research Service, which identifies and sums creative occupation participants using census data[179]
	
	   – Industrial concentration
	
	   – Companies sold to foreign interests
	
	 • **Investment:**
	
	   – R&D expenditures
	
	   – Fixed capital stock per capita
	
	   – Investment in information and communication technologies (ICT) as % of GDP

Enhanced Approaches to Measure Economic Output [15/27]

We suggest communities measure the impact of economic policies and economic health. Below we outline some examples for communities to leverage

Example source	Recommended Metrics

Quebec Economic Health Index (3/3)
 112, 113
	• Since the Quebec Economic Index has not included details in its report on how some of its metrics are calculated, we have included metrics used for other indices where they relate:
	 • **Growth:**
	  – Private foreign direct investment (FDI)
	  – Private domestic investment abroad
	  – Exports & imports
	  – Venture capital
	   – **Relating metric** from the Innovative Metrics for Economic Development:
	    – Number of clients assisted in obtaining funding (e.g., angel, seed, or venture capital)
	    – Number of funding competitions or events supported (e.g., angel, seed, or venture)
	    – Number of grants that supported capacity-building activities
	     – All three are sourced from two surveys sent to grantees from two selected grant programs in the United States over a span of four months. Additional metrics were collected in the survey.[179]
	 • **Human capital:**
	  – Working-age population (15 to 64 years old)
	  – Employment rate
	  – Long-term unemployment rate
	  – Post-secondary graduation rate (of both immigrants & total population)
	 • **Environment:**
	  – Waste generation: measured in amount of waste generated and disposed of on a residential, commercial and industrial level.
	  – Air quality: measures levels of fine particulate matter (PM 2.5), ground-level ozone (O_3), Sulphur dioxide (SO_2) and nitrogen dioxide(NO_2).
	  – Sources of electricity generation: measured as a proportion of renewable energy to renewable and non-renewable energy combined.
	  – Greenhouse gas emissions: measured in megatons per year. An increase in levels would negatively impact the overall index.[112]

Enhanced Approaches to Measure Economic Output [17/27]

We recommend communities look beyond traditional growth metrics and instead measure drivers of growth such as competitiveness and innovation

Considerations for communities

We recommend communities look beyond traditional proxies for innovation and competitiveness and measure a holistic set of metrics to calculate potential economic growth.

Example source	Rationale	Background	Recommended Metrics	Methodology

Global Innovation Index (1/3) [108]	• Communities often do not have meaningful metrics that measure innovation/innovation capacity. The number of start-ups in a community is usually used as proxy for innovation.
	
	• However, this approach can be limited in its ability to capture the ecosystem of factors required to support innovation.
	
	• However, as pointed out by one of the stakeholders during our consultations many large companies, universities, and other entities are leading innovation in different sectors.
	
	• The Global Innovation index aggregates different metrics to create a comprehensive measure of innovation.
		• The Global Innovation Index measures the innovation performance of economies by looking at three stages of innovation (science and innovation investments, technological progress, and socioeconomic impact).
		
		• Published by the World Intellectual Property Organization (WIPO) "in partnership with the Portulans Institute, the Confederation of Indian Industry (CII), the Brazilian National Confederation of Industry (CNI), Ecopetrol (Columbia) and the Turkish Exporters Assembly (TIM)" [108]. Nearly 95% of the world's population, 132 economies, is reflected in GII's model.
			• The GII is composed of 81 indicators divided into two sub-indices:
			  – **Innovation input sub-index** (with five input pillars)
			  – **Innovation output sub-index** (with two input pillars).
			
			Please see the next two pages for additional information of some of the indicators that make up the Global Innovation Index.
				• Appendix I of the GII report includes an in-depth explanation of the methods used in calculation.
				
				• In summary, the methodology entails most "indicators [being] normalized into the [0,100] range, with higher scores representing better outcomes" [108].
				
				• Both sub-indices (innovation input sub-index and innovation output sub-index) carry the same weight when the overall GII score is calculated by taking the average of both. [108]

Enhanced Approaches to Measure Economic Output [18/27]

We recommend communities look beyond traditional growth metrics and instead measure drivers of growth such as competitiveness and innovation

Example source	Recommended Metrics

Global Innovation Index (2/3) [108]	• The data necessary to calculate the Global Innovation Index is sourced from many public sources such as the web of Science (Clarivate), web of knowledge, UNESCO Institute for Statistics (UIS) online database, the OECD's Main Science and Technology Indicators (MSTI) database, and others. All data sources are listed on page 19 of the GII report. We recommend communities leveraging the index to measure metrics such as:
	
	• **Innovation Input Sub-Index**
	  – **Institutions**
	    – **Ease of starting a business:** an index based on the average of scores for each component indicator (e.g., procedures required to start a business, time and cost to complete these procedures, paid-in minimum capital requirement).
	  – **Human capital and research**
	    – **Education:** expenditure on education, % GDP; pupil-teacher ratio, secondary; tertiary enrolment, % gross; graduates in science and engineering
	  – **Infrastructure**
	    – **ICT access:** is a composite index that equally-weights five ICT indicators:
	      – Fixed telephone subscriptions per 100 inhabitants
	      – Mobile cellular telephone subscriptions per 100 inhabitants
	      – International Internet bandwidth (bit/s) per internet user
	      – Percentage of households with a computer
	      – Percentage of households with internet access
	  – **Market sophistication**
	    – **Ease of getting credit** is based on the legal rights index (range 0-12) and the depth of credit information index (range 0-8). (*Note this more relevant at a country-level*).
	      – Legal rights index: measures "whether certain features that facilitate lending exist within the applicable collateral and bankruptcy laws." [108]
	      – Depth of credit information index: measures "coverage, scope and accessibility of credit information available through credit reporting service providers, such as credit bureaus or credit registries." [108]

Enhanced Approaches to Measure Economic Output [19/27]

We recommend communities look beyond traditional growth metrics and instead measure drivers of growth such as competitiveness and innovation

Example source	Recommended Metrics

Global Innovation Index (3/3) [108]	• **Innovation Input Sub-Index**
	  – **Business sophistication**
	    – **Knowledge-intensive employment:** sum of people in categories 1 to 3 as a percentage of total people employed.
	      – Category 1: Manager, legislators, senior officials; 2 Professionals; 3 Technicians and Associate Professionals.
	    – **Percentage of firms offering formal training to their permanent, full-time employees.**
	    – **GERD (Gross Domestic Expenditure on R&D) financed by business, %**
	    – **University-industry R&D collaboration:** data often collected through a survey question: "In your community, to what extent do businesses and universities collaborate on research and development (R&D)?" [108] [1 = not at all; 7 = to a great extent]. *Note this more relevant at a country-level.*
	• **Innovation Output Sub-Index**
	  – **Knowledge and technology outputs**
	    – **Labour productivity growth, %:** growth rate of GDP per person employed (labour productivity is equal to output per unit of labour input).
	    – **Software spending, % GDP:** includes the "total value of purchased or leased packaged software, such as operating systems, database systems, programming tools, utilities and applications. It excludes expenditures for internal software development and outsourced custom software development." [108]
	    – **High technology manufacturing, %.**
	  – **Creative outputs** (*Note this more relevant at a country-level).*
	    – **Entertainment and media market (per thousand population, 15–69 years old):** consumer and advertising spending across different entertainment and media segments.
	    – **Creative goods exports, % total trade:** Total value of creative goods exports (current US$) over total trade.

Enhanced Approaches to Measure Economic Output [20/27]

We advocate for economies to measure the health and food security of its residents. The indices outlined below provide examples that communities can leverage

Considerations for communities

Consider investing in measuring community performance beyond economic activity. Examples include health equity, food insecurity, and mental health. Additionally, arts, culture, and recreation facilities are important to foster a culture of health, well-being, responsibility, and inclusivity in communities. Individuals who participate in recreational activities also benefit from skills development, and empowerment.[55,56]

Example source	Rationale	Background	Recommended Metrics	Methodology

The SocioNeeds Index® (1/2)[141]	• Traditional economic metrics often do not measure food security, physical and mental health of communities. These metrics should be tracked in order to gather data on the wellbeing of residents, and for communities to see vulnerability and areas of potential socioeconomic challenge.
	
	• The SocioNeeds Index® compiles metrics on health equity, food insecurity, and mental health.
		• The SocioNeeds Index® Suite uses "integrated analytics to identify optimal investment areas for advancing health equity"[141], and in doing so, captures public policy domains that are vital for communities and are often excluded in traditional economic classic metrics such as GDP.
		
		• The Suite was developed by the Conduent Healthy Communities Institute (HCI) for communities across the United States (US). The institute works with different hospitals and health organizations, departments, as well as non-profit organizations within those communities, providing them with an HCI Platform, and an interactive map to compare index scores between neighborhoods within the city or county.[141]
		
		• Two examples of communities that are using the index are the city of Houston, Texas, led by the Houston State of Health[115] and The County of Gwinnett, Georgia.[143]
			• The overall index provides a composite score that is made up of three indices that capture where action is needed in health and socioeconomic dimensions.
			
			  – Health Equity Index
			  – Food Insecurity Index
			  – Mental Health Index
			
			• Overall, the SocioNeeds Index® only provides a brief overview online as they sell their methodology and services to communities. In order to obtain detailed information, communities will need to directly contact Conduent Healthy Community Institutes.
			
			Please see the next page for additional information on the sub-indices of the SocioNeeds Index.
				• "All zip codes, census tracts, counties, and county equivalents in the [US] are given an index value from 0 (low need) to 100 (high need).
				
				• To [identify] areas of highest need in the community, the selected locations are ranked from 1 (low need) to 5 (high need) based on their index value relative to similar locations within the region"[89].

Enhanced Approaches to Measure Economic Output [21/27]

We advocate for economies to measure the health and food security of its residents. The indices outlined below provide examples that communities can leverage

Example source (2/2)	Recommended Metrics
Health equity index (HEI)[88,115]	• The HEI measures social determinants correlated with preventable hospitalizations and premature death.[115] "[T]he highest index values are estimated to have the highest socioeconomic needs correlated with preventable hospitalizations and premature death"[88]. • The data included in this index relates to income, employment, education, and household environment and is sourced from Claritas, 2021.
Food insecurity index [89,115]	• The Food Insecurity Index measures the relationship between access to food, economic, and household conditions. "Communities with the highest index values are estimated to have the highest food insecurity, which is correlated with household and community measures of food-related financial stress such as Medicaid and SNAP enrollment"[116]. • The data included in measuring this index relates to income, household environment, and wellbeing, and is sourced from Claritas, 2021.[89]
Mental heath index[93,115]	• Measures social determinants and health factors correlated with self-reported poor mental health.[115] "[T]he highest index values are estimated to have the highest socioeconomic and health needs correlated with self-reported poor mental health"[93]. • Data used in the index calculation is sourced from Claritas, 2021, American Community Survey, and CDC Places Project. The indicators measured related to access to care, physical health status, transportation, employment, and household environment.

Gross domestic product and other economic metrics often do not measure non-traditional jobs such as those found in the gig economy. Below we outline some indices that organizations and researchers have used to size the gig economy

Considerations for communities

Consider investing in novel metrics and methodologies that account for how the economy is today and specific characteristics of the community economy. The gig economy is increasingly important to the economy and measuring it via surveys or vacancy status changes on online labour platforms provides a more complete view of the economic activity of a community.

Example source	Rationale	Background	Recommended Metrics	Methodology

Gig Economy Index™ [96,143]	• Many communities use Gross Domestic Income (GDI) to measure the economy based on money earned (e.g., wages, profits, taxes, etc.) versus gross domestic product (GDP) which measures the value of goods and services produced.
	
	• Gig economy workers may not always report their income, intentionally or due to lack of awareness, and it can therefore be overlooked in the GDP or GDI calculation.[143] The Gig Economy index can therefore be a useful to complement the GDP/GDI.
		• The Gig Economy Index measures the attributes and composition of the current gig economy. "Gigs" are jobs that last only a short period of time/as much as a company feels is needed.
		
		• The gig economy includes many forms of economic activity such as driving for ridesharing firms, doing tasks found on digital marketplaces, specialized consulting jobs in different fields, and many others.
		
		• Individuals are often working many positions at the same time. The gig economy is evolving in terms of skills required and salary opportunities.
		
		• The Gig Economy Index was developed by PYMNTS in collaboration with Hyperwallet (a PayPal service).
			• Conducting research like the one seen by the Gig Economy Index can provide insight into metrics such as:
			  – Gig economy participation
			    – Categorized by gender, season
			    – Where they source their gigs (i.e., via digital marketplaces)
			  – Skill level required for gigs
			  – Gig workers education levels
			  – Gig workers income levels
			  – Primary gig payment methods
			  – How frequently gig workers are compensated
			  – Reason for gig economy participation
				• The data was collected through surveys, with responses from "10,051 U.S. – based participants" [96].
				
				• The survey measured the share of surveyed workers who participate in the gig economy and of those who pursued ad hoc employment because of flexibility, who performed nonseasonal work, share with college degrees, how payments were made, and share those who were not employed outside the gig economy.
				
				• "PYMTS broke [down the] responses into four categories based on age, gender, education and income"[96]. Actual methods of calculation are not specified, although results published appear to be percentages of overall respondents and categories.[96]

Enhanced Approaches to Measure Economic Output [23/27]

Gross domestic product and other economic metrics often do not measure non-traditional jobs such as those found in the gig economy. Below we outline some indices that organizations and researchers have used to size the gig economy

Considerations for communities

Consider investing in novel metrics and methodologies that account for how the economy is today and specific characteristics of the community economy – continued.

Example source	Rationale	Background	Recommended Metrics	Methodology
Online Labour Index (OLI) [79, 117, 127]	• Gig and freelance jobs are a significant component of the economy nowadays. Employment in these areas are not captured in traditional economic metrics and so it leads to underreporting of jobs employed and economic activity taking place.	• The Online Labour Index (OLI) measures the utilization of online labour platforms over time, across countries, and occupations. • The OLI measures the supply and demand of online freelance overtime. Vacancy status changes, occupation classification, and employer country are tracked on the five largest English-language online labour platforms that represent an estimated 60% of the online traffic for English labour platforms[117] and include different types of contracting, such as online piecework or hourly freelancing. • The OLI was created by Otto Kässi and Vilil Lehdonvirta at the Oxford Internet Institute, and Martin Hadley helped with data visualization.	• The information gathered from the Online labour Index provides information on the **utilization of online labour.** The metric can be studied by occupation, and by employer country.	• The Online Labour Index is measured by tracking the number of projects across different platforms over time. 1. Platforms are selected based on visitor counts from the 40 most-used platforms. These counts were obtained from Alexa Ranking, an Amazon company that tracked website analytics. The free service, however, was discontinued on May 1, 2022, and a similar service is provided by Semrush for a fee.[127] 2. Periodically, information from the platforms is retrieved automatically from selected platforms through software, a process known as a "crawl", to track the status of vacancies (i.e., open, in progress, or completed) and to calculate the number of new and filled vacancies between crawls. • This index does not account for vacancies not posted, or status changes that happen between the periodic crawls. The time series is normalized since aggregates are not possible based on periodic and limited methods of gathering the data.[79]

We recommend communities to measure data beyond traditional unemployment data and report on the quality and vulnerability of a job

Considerations for communities

Consider measuring metrics beyond traditional economic figures to capture the well-being of residents **over time.** For example, only looking at how many jobs are created in an economy only looks at one perspective of economic growth. Measuring the quality of a job provides information on the well-being of individuals. Additionally, good quality jobs drives labour force participation, and productivity which leads to better economic performance.

Example source	Rationale	Background	Recommended Metrics	Methodology

Job quality index (JQI) (1/3) [100, 119]	• Economic developers are coming to an agreement that it is better to have better quality jobs in an area rather than more jobs. Policy makers are increasingly encouraging the creation of high-quality jobs.
	
	• The quality of employment is often not fully captured or measured within classical economic data.
	
	• The job quality index measures the level of quality of jobs in a community and can be used to measure progress overtime.
		• The JQI "is based on a series of sub-indices (wages, non-standard employment, working conditions, working time and work-life balance, training and interest representation) that attempt to capture different aspects of job quality" [119].
		
		• The index was developed by the European Trade Union (ETUI) to measure job quality among 28 countries in the European Union.
			• The index is composed of six sub-indices composed of different indicators. The six sub-indices are:
			  – Wages
			  – Forms of employment and job security
			  – Working time and work-life balance
			  – Working conditions
			  – Skills and career development
			  – Collective interest representation
			
			• Data is sourced from European Working Conditions Survey (EWCS), the EU Labour Force Survey (LFS), the database on the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS).
			
			Please see the next two pages for additional information on the different indicators that make up the six sub-indices.
				• Apart from wages all sub-indices have values that range from 0-100% which are the share of respondents that report a certain work characteristic. Data is adjusted so that higher scores always means better job quality.
				
				• Wages are expressed in monetary terms – measures earnings adjusted for the purchasing power parity.
				
				• To compute the overall index the components (indicators) of each dimension are calculated using a weighted average (weights are specified in ETUI-A5, page 39).
				
				• An overall non-weighted average is calculated of the six dimensions.[100]

Enhanced Approaches to Measure Economic Output [25/27]

We recommend communities to measure data beyond traditional unemployment data and report on the quality and vulnerability of a job

Example source	Recommended Metrics

Job quality index (JQI)[100,119] **(2/3)**	• Job quality is composed of many variables, and often there are positive synergies in the features of jobs. Therefore, it is very important to look at different facets of a job to measure job quality. It is shown that "high levels of collective interest representation are associated with higher wages, better outcomes in terms of skills and career development, and better quality of working conditions."[100]
	
	• **Wages**
	   – Average net monthly earnings from main paid job, adjusted for purchasing power parity (which is the amount of goods or services that a unit of currency can buy at a given point in time).
	   – Real compensation per employee (which refers to compensation after accounting for inflation) .
	
	• **Forms of employment and job security**
	   – Temporary employment (contracted workers who perform a job for a short period of time) as a share of total number of employees multiplied by the share of temporary workers indicating that their main reason was that they could not find a permanent job. Data obtained from the EU labour force survey.
	   – Part-time employment as a share of total number of employees multiplied by the share of part-timers indicating that main reason was that they could not find a full-time job. Data obtained from the EU labour force survey.
	   – Question in the European Working Conditions Survey (EWCS) that measures residents' thoughts on whether they "might lose [their] job in the next six months."[100]
	
	• **Working time and work-life balance**
	   – Based on responses from the EWCS: Share of workers working more than 48 hours a week.
	   – Average of share of workers on shift work on Saturday, Sunday and evenings. Data obtained from the EU labour force survey.
	   – Question in the EWCS on whether working hours fit with family/social commitments.
	
	• **Working conditions**
	   – Questions in EWCS on work intensity such as view on working at a very high speed, working with tight deadlines and not having enough time to get the job done, etc.
	   – Questions in EWCS on work autonomy such as degree one can choose or change order of tasks, methods of work, speed of work, etc.
	   – Questions in EWSC on physical work factors such as: noise; high/low temperature; breathing in smoke, etc.

Enhanced Approaches to Measure Economic Output [26/27]

We recommend communities to measure data beyond traditional unemployment data and report on the quality and vulnerability of a job

Example source	Recommended Metrics

Job quality index (JQI)[100, 119] (3/3)	• **Skills and career development**
	   – Share of population (25-64 years) participating in education/training over four weeks prior to survey.
	   – Question in EWSC that measures people's thoughts on whether their "job offers good prospects for career advancement." [100]
	• **Collective interest representation**
	   – Collective bargaining coverage.
	   – Trade union density.
	   – Questions in EWSC on employee representation in the company/organization such as trade union or works council, health and safety delegate, etc.

Enhanced Approaches to Measure Economic Output [27/27]

We recommend communities to measure data beyond traditional unemployment data and report on the quality and vulnerability of a job

Considerations for communities

Consider measuring metrics beyond traditional economic figures to capture the well-being of residents over time – continued.

Example source	Rationale	Background	Recommended Metrics	Methodology

OECD Job Quality Framework[99,118]	• The OECD quality framework provides a structure to assess job quality focusing particularly on aspects that are shown to have a direct impact on worker well-being.	• The OECD Job Quality Framework measures and assesses the quality of jobs, which "is strongly related to the quality of individuals' lives and well-being"[118].
		• Developed by the Statistics Directorate of the Organization for Economic Co-operation and Development (OECD) developed this framework with the Employment, Labour and Social Affairs Directorate.
			• The framework measures the following three dimensions:
			  – **Earnings quality** (purchasing power parity (PPP) adjusted gross hourly earnings in USD)
			  – **Labour market security** is measured with two indicators:
			    – **Risk of unemployment** the product of unemployment risk (based on probability of becoming unemployment and the average length of time of becoming unemployed) multiplied by (one minus) unemployment insurance.
			    – **Risk of extreme low pay** is "set as an absolute value of net hourly earnings of one US dollar, after purchasing power parity adjustments."[99] The extreme low pay is defined as a single earner who works full time and cannot provide for those concerned.
			  – **Job strain/quality of working environment**
			    – Measured by the incidence of job strain: the level that individuals have more demand than resources.
			    – **Job demands** accounts for time pressures and physical health risk factors.
			    – **Job resources** refers to work autonomy, learning opportunities, and job relationships.
			• Data is sourced from the OECD Job Quality database and the 6th European Working Conditions Survey and International Survey Program Work Orientations Module III for 2005.
				• The framework is composed of different methodologies for each indicator, where they consider not only quantitative measurements, but also context of well-being perceived by individual workers for many of the indicators.
				• The data is collected for each metric outlined, and reported in their respective units (i.e., earnings quality in USD PPP; labour market insecurity and job strain in percentage). The data is segregated by sex, age, and education level which allows the viewer to gain some insight on the differences in job quality across different group categories.

Section 2D:

Leveraging Meaningful Private Sources of Data

Private Sector & Data Sharing [1/6]

The private sector often tracks consumer data for corporate objectives that can help to inform public policy. We advise the public government and communities to use private sector data to drive community progress

Context & Challenges

- **Siloed platforms:** Governments can lack knowledge on how to harness their existing data. Information collected may be stored in different siloed platforms. Reasons may include legacy technology is still being used, which is slow, outdated and in many cases expensive to maintain.[15]

- **Privacy and security concerns:** As previously outlined, stakeholders increasingly demand accountability and transparency. Local governments must ensure maximum cybersecurity.[85] Additionally, private companies may be unwilling to assume the risk associated even with passing on anonymized data to a community or government organization to adhere to their own data privacy or sharing rules/commitments.

- **Added complexity and hierarchies:** As local governments partner with external groups there is added governance complexity and hierarchies within the team.[85]

- **Cost:** Private sector data can be bought by community organizations but can be costly. Budget constraints and competing priorities in many communities makes the allocation of budget and employee time difficult to fund data collection.[84]

- **Limited expertise or availability:** Communities and economic development organizations may not have the expertise, time, or resources to engage and analyze the data available.

Considerations *(please see the next five pages for additional information)*

Incentivize data sharing among communities.

- For example, the Chan Zuckerberg Initiative awards grants to researchers who are collaborating across disciplines.[61]

Consider allocating funding, training, and education for data gathering and analysis.

- Communities should consider building awareness on the importance of data and developing leaders who are 'data-champions'. It is important for leaders to understand the importance of data for them to allocate resources towards data analytics. Studies suggest that allocating a resource to the analytics team and creating a data-scientist role is necessary to leverage the 'true value of data analytics'.[90]

Ensure data is anonymized, aggregated, and secured to overcome privacy and security concerns.

Encourage governments to develop supportive legislations to encourage data sharing from the private sector.

- For example, the Personal Information Protection and Electronic Documents Act (PIPEDA) which applies to private enterprises across Canada (except in provinces that have already established similar privacy legislations) does not explicitly address whether anonymized data is still subject to the act. It can be argued that anonymization means that data is no longer about an identifiable person and so PIPEDA does not apply. However, there is always the risk that data can be re-identified. For example, in the New York Taxi case in 2014 bloggers re-identified the medallion numbers of taxis and limousines. The current ambiguity in the act raises risks to companies. Companies who are currently sharing anonymized data minimize their risk by only sharing a sub-set of data or adding random noise to datasets. Establishing rules on anonymization and clear expectations around consent could encourage more companies to share their data.

Private Sector & Data Sharing [2/6]

We advocate for local government and communities to use available or on demand private sector data to enhance city planning decisions

Leading methodologies for communities to consider

There are several examples of meaningful private sector data that could help to inform key domains of economic development or sectoral policy. Some companies have anonymized and published their data online, while others offer their data at a fee. Please see below additional examples on how private sources can be leveraged by communities.

Policy/Area of Opportunity	Example private sources that can be leveraged by communities	Example metrics that can be measured	Execution considerations for communities
City Planning (e.g., infrastructure decisions, public transportation planning, and day to day operations)	• **Uber Movement** data can be used for traffic optimization, analyze how long it takes users to travel from point A to point B, and others.[18]	• Travel time variability • Build a transportation scorecard	• The data is free, can be downloaded, and is aligned with open standards. The data includes over 700 cities and 17 million trips per day.
	• **Waze for Cities** allows for more efficient traffic monitoring, knowledge on constructions, events, floods or other factors that may impact traffic.[87]	• Traffic patterns and trends • Crash frequency • Crash risk modelling	• Cities can fill out an application form to be part of the program. A city must fill certain qualifications such as geographical diversity, technical capability, and others.
	• **Streetlight** provides transportation data for all modes, including number of trips, travel time, travel distance, trip purpose, demographics.	• Travel time variability • Travel distance • Trip purposes	• Typically costs between $15K and $30K depending on data requirements.
	• **Numina Street Intelligent API** uses sensors placed on outdoor fixtures to provide insight on people, vehicles and street environment.[74]	• Daily pedestrian/car count for regions	• The sensors pre-process data and then erase data to create datasets that are anonymous and secure. Price is not available in the public domain but can be requested.[92]
	• **Foursquare** includes data on where a user is and what activity they are doing. It uses data of 105 million global points of interest and over 500 million devices. It uses human, software, and third-party verification to ensure POI data integrity.[91]	• Foot traffic • Shopping patterns • Popularity of different venues	• Price not available in the public domain but can request pricing for enterprises.
	• **Google Earth Outreach** includes geospatial data as an analytical tool for researchers.[74]	• Open space/tree canopy mapping	• The Open Data Kit tool in the Earth Outreach enterprise price is not available in the public domain but can be requested.[94]

Private Sector & Data Sharing [3/6]

Private sector data can be used to provide alternative sources of information for metrics such as inflation, and quality of life measures

Policy/Area of Opportunity	Example private sources that can be leveraged by communities	Example metrics that can be measured	Execution considerations for communities
Fishery	• **Global Fishing Watch** measures fishing activity worldwide using Automatic Identification System (AIS) tracking data by Spire Global. AIS uses GPS-like transporters to broadcast vessel location, identity, speed, and other information.[74]	• Human activity on sea/vessel portal	• **Global Fishing Watch** is committed to provide data and code freely.[98] However, an important consideration is that it will require resource(s) training or hiring of an individual who can manipulate such data.
Inflation	• **Supermarket chains in Netherlands** partnered with Statistics Netherlands to create the consumer price index (CPI) based on scanner data. Both price and weight is derived from the scanner data. The price taken from the scanner is used to compute the price indeces.[74] The supermarket chains account for 50% of the supermarket market share and 5% of the CPI-weight in the Netherlands.	• Consumer price index (CPI)	• Communities can consider developing a partnership with local supermarket chains to measure CPI more effectively (as data is obtained in a more specific level) and frequently.
Quality of Life	• **Reddit** provides a public API to extract information from its website. Researchers have used Reddit data to study public health.[74]	• Proxy for resident sentiment	• **Reddit's** API is available to the public for free. However, an important consideration is that it will require resource(s) training or hiring of an individual who can manipulate such data.
	• **Twitter:** Researchers have used Twitter's API to analyze public tweets for emotional context. We Feel is a software that can categorize Twitter sentiments[74] – The Las Vegas health department collaborated with the University of Rochester to test an app that they created to improve protocols for food inspections within the city using Twitter data. – Researchers have analyzed the content of tweets to approximate violence, or sentiments to generate an index of socio-economic wellbeing. The tweets can be tracked overtime to understand if there has been a change overtime.[20] – Researchers have used information harnessed in users' personal tweets to identify complaints made across a city, and to identify areas of improvement.[19]	• Proxy for resident sentiment for services, and locations • Proxy for socio-economic wellbeing • Hate incidents (security measures)	• **Twitter's** essential API is available to the public for free. Individuals can request additional access for archived data, and less limitations in the scraping of the data by contacting Twitter.[95] However, an important consideration is that it will require resource(s) training or hiring of an individual who can manipulate such data.

Private Sector & Data Sharing [4/6]

Private sector data can be used to complement data sources in areas such as agriculture and housing

Policy/Area of Opportunity	Example private sources that can be leveraged by communities	Example metrics that can be measured	Execution considerations for communities
Agriculture	• **FieldView:** provides an API that farmers can access agriculture data related to weather, yield analysis and field data.[74]	• Weather data • Crop performance	• **FieldView Drive** is a device that allows businesses to collect streamed data across your farming operation. Basic datasets can be obtained for free and a fee for full API access.[74,97]
Housing	• **MLS Home Price Index (HPI):** is a tool developed by the real estate boards of Calgary, Fraser Valley, Greater Montreal, Greater Vancouver, Greater Toronto, and the Canadian Real Estate Association. HPI provides home price levels and trends on residential markets of over 18 major housing markets. The MLS HPI tracks price levels relative to a base period. It includes transactional data for home sales via the MLS Systems at the participating real estate boards.[162]	• Housing prices and trends • **Housing affordability:** could be measured by analyzing whether a family earning median income could qualify for a mortgage loan on a median-priced family home. The calculation assumes a down payment of 20% of home price, and a monthly principle and income payment that cannot exceed 25% of the median family monthly income.[178]	• **MLS Home Price Index (HPI)** is available to download in Excel format in the Canadian Real Estate Association website. The current price index is free of charge.

Private Sector & Data Sharing [5/6]

We advocate for communities to develop data sharing platforms to facilitate data sharing among different entities and devices in the community

Considerations for communities

Consider building a culture where data-sharing is the standard. Consider developing an open-data policy with clear data standards to avoid siloed platforms and ensure ease of data sharing. Many communities have developed performance dashboards which allows residents to be involved in the community tracking of metrics.[61] The increased transparency motivates residents to be more involved in the data gathering process.

Example source	Rationale	Background	Data Sharing Approach

The Smart Columbus Operating System	• Data sharing is key to accelerate economic development.
	• To improve data sharing it is key to have a clear policy and standard for data sharing among the community. Data sharing also needs to overcome siloed platforms and have a faster and easier route to gather data.
	• The Smart Columbus Operating System aims to ease data sharing among the community.
		• The Smart Columbus Operating System is an online data platform that allows residents to contribute their own datasets to the city government and provides open data to the public.[36] The hub provides visual data ingestion interface and allows data from many sources to be added and integrated.
		• The initiative expects that there will be different users of the data such as the government, health and human resource organizations, entrepreneurs, universities, and the private sector.[35]
		• As of now the city of Columbus, Ohio is supporting the platform through funding, but the city is engaging with private partnerships for long-term operations and ownership.
			• The data is evaluated by a data curator to ensure it aligns with the Data Management Plan and Data Privacy Plan. The components of the system must be open source, widely used in development community, and well documented.[35]
			    – **Data Management Plan:** outlines how data within the operating system is added, made accessible, and or stored.[173]
			    – **Data Privacy Plan:** "details the privacy and security controls for all aspects of the Smart Columbus data environment that collect, use, and/or share PII"[175]
			    – **Data Curation Requirements:** Datasets needs description, data dictionary, metadata from the dataset and elements that make up the data.
			• Since the system is built on open source it allows other cities to use the code for their own data management platforms. Individual users can navigate the data by searching using a keyword, tag, file format or organizations.
			• The Smart Columbus Operating System has over 2,000 datasets. Example datasets include mobility-related data sets which contains information such as county boundaries, zoning districts, food deserts, and infant birth weight.[36]

Private Sector & Data Sharing [6/6]

We advocate for communities to develop data sharing platforms to facilitate data sharing among different entities and devices in the community

Considerations for communities

Consider building a culture where data-sharing is the standard (continued).

Example source	Rationale	Background	Data Sharing Approach

Cisco Smart + Connected Digital Platform[103,104]	• Data sharing often faces issues due to siloed platforms.
	• Platforms such as the Cisco Digital Platform allows for data of different departments to be compiled into one data source overcoming the challenge of siloed data.
		• Cisco created a cloud service dashboard for cities to aggregate real-time data from the city.
		• Cities that have already tested the platform include Kansas City, Jaipur, Bangalore, Copenhagen, Dubrovnik, and Paris.
			• The dashboard is composed of several Cisco systems such as Cisco Industrial Routers and Gateway, Cisco Edge Intelligence, Cisco Industrial Asset Vision. A city can choose to connect a range of capabilities to the Cisco Cloud. The service costs a fee and communities interested can contact Cisco for more information.
			• The platform will securely gather and compile in the platform data from:
			  – Third party sensors – Devices
			  – Street cameras – Connected systems and objects

The Catapult Network [159,160,161]	• Collaboration among businesses, academics, community organizations, and the public sector allows for strategic relationships and encourage more demand-led research.	• The Catapult Network aims to bridge the gap between research and industry. Businesses can collaborate with the Catapult network, develop joint programs and help build strategic relationships. Part of the Catapult Network is Digital Capital that focuses on helping businesses and entities advance their digital technologies. • The Catapult network spans over forty locations across the United Kingdom. It brings together technology and innovation centers across a range of sectors.	• The Catapult network provides support to their network such as expertise (e.g., connection to subject matter experts), facilities, and R&D infrastructure needed to accelerate research, develop technologies, and scale up. • Catapult fosters collaboration between the different entities through activities such as collaborative projects and contract research. By providing a shared space for networking and development it hopes to encourage local data sharing and collaboration among the community. • Additionally, Digital Catapult is driving the Trust Framework and Data Sharing Lab initiatives that aims "to create common standards and a reference architecture" for data sharing. The idea is to make residents the center of a consent-based data sharing solution which accounts for privacy and societal benefits.

Section 2E:

Reinventing the Economic Development Office

Economic Development Office [1/2]

We recommend building a diverse economic development office with individuals from different backgrounds and skillsets to optimize the use of data in economic development

Challenges and limitations

- **Traditional focus on investment:** In many cases, economic development organizations have been directed to focus on investment attraction and retention. These components of economic development can help to drive important economic activity but can draw from a similar sales/business engagement talent pool and orient teams towards investment oriented economic development, and potentially limit other domains (e.g., community led economic development, resiliency etc.).

- As a result, employment opportunities for these domains can be limited relative to the number of jobs available for investment attraction.

- **Lack of data science expertise and attracting new talent into economic development:** Often, economic developers are asked to advance their skills related to data science informally on the job. Economic development offices can struggle to attract and retain dedicated data scientists/quantitative experts to drive initiatives and data collection/design processes. Additionally, overtime new domains and areas of expertise arise such as food security, DEI etc. This means that new skill sets are required, and more open job postings arise.

- **Funding requirements can drive proprieties away from the goal of building a diverse economic development office:** communities often have competing priorities and so with limited budgets and resource limitations the goal of building a diverse economic development office may not take priority in front of so many other deliverables.

Economic Development Office [2/2]

We recommend building a diverse economic development office with individuals from different backgrounds and skillsets to optimize the use of data in economic development

Considerations

We recommend building an economic development office with both quantitative and qualitative skills in the team. Some important skills to have include:

- Good understanding of finance and budgeting

- Ability to network and liaise between the economic development committee and/or community to support, encourage, and advise local businesses

- Research and analytical skills

- Understanding of infrastructure and real estate development, including land use planning and zoning

- Good understanding of government, legislative processes and public relations.[122]

Examples

- **The Master of Economic Development and Innovation (MEDI) at Waterloo** prepares its students with a range of topics necessary to succeed in the economic development field. The curriculum covers the following:
  - Theories, frameworks, policy and practice of economic development.
  - Analytical tools, management and policy tools for economic development and sustainability.
  - Entrepreneurship, innovation, industrial location theory and concepts, land development planning, social entrepreneurship and scaling social innovation, stakeholder engagement, collaborations and partnerships, sustainable cities, enterprise marketing and social accountability.[121]

- **Erasmus University Rotterdam has a Master of Health Economics** which prepares its students by covering the following:
  - "40% Quantitative: Applied economics and Health Technology Assessment
  - 35% Health Economics (micro & macro perspective)
  - 25% Electives (global health or pharmaceutical market or health technology assessment or health care markets)"[120]

- **The IEDC** states the importance of economic developers understanding the intersections of, and/or specializing in the following areas:
  - Business retention & expansion
  - Marketing & attraction
  - Entrepreneur and small business development
  - Technology commercialization
  - Real estate development
  - Finance
  - Workforce development
  - Strategic planning
  - Disaster recovery & resilience
  - International opportunities[106]

Appendix A

Guidance on Impactful Metrics to Consider for Canadian Communities: Additional Considerations

Additional Considerations for Communities

In the following section we outline additional consideration of impactful metrics that Canadian communities could consider

In the following section we outline additional guidance on impactful metrics for Canadian communities to consider.

First, we outline two additional examples of resident engagement projects (the CoronaReport, and Open Humans) that encouraged residents to donate their own data.

Second, we outline an additional example (World Competitiveness Ranking) of Enhanced Approaches to Measure Economic Output but at a country level.

The purpose of this section is to provide additional example of data collection methods and metrics for communities to consider investing and implementing.

Additional Examples – Collecting Data from Residents in the Health Space

We recommend communities highlight the benefits of data in order to encourage residents to collect and donate data

Individuals are more likely to share data if it is used for the greater good (e.g., to help find treatments and cures for diseases) or if it will result in a direct benefit to them. Patients that are the owners of health data for new drugs and treatments are increasingly supportive of data-sharing due to the clear benefit from improved health care.[61]

Example source	Rationale	Background	Recommended Approach
Corona Report [4]	Communities have a hard time tracking and collecting private information. They must highlight the importance of data and how it can be used to improve the overall wellbeing of a community to incentivize individuals to share data. For example, during the COVID-19 pandemic many individuals were incentivized to share their experience and data for the 'greater good'.	During the COVID-19 pandemic, the Scottish Collaboration for Public Health Research and Policy and the University of Edinburgh developed the CoronaReport. The application was created for residents to record their experiences of COVID-19 and the effect the pandemic had on their lives. Individuals could create an account and share instances of their lives that changed due to the pandemic.	Individuals download the CoronaReport and in the application they can select their location, activity or write a personal report and share what they are feeling. Individuals can choose how much data to share for the report. The data collected is anonymized and shared in the CoronaReport platform so that other residents can see how others are feeling and how the pandemic is impacting their lives. The aim of the platform is to build a real-time and accurate depiction on how the pandemic is impacting the way people live and work. Applications such as the CoronaReport can provide insight on data such as: • Resident experience and sentiment • Recreational activity
Open Humans[3,131]	Some platforms, such as Open Humans, allows individuals to post their projects and have others donate their data. Open Humans allows individuals to choose where, to who, and to what cause to donate their data. It empowers individuals to choose what they do with their own data.	An example of a project in Open Humans is Quantified Flu, which aims to see whether wearables can predict when individuals are getting sick. Overall, research suggests that data on wearables will allow residents to better access and control their own personal heath record, and the aggregated health data will have direct impacts on care planning and medication compliance. Wearable data can provide a more complete picture of health than only the traditional clinical data.	For the project Quantified Flu, individuals upload self-reported incidents of illness, daily check-ins on symptoms, viral test results, and wearable data from their smart watches such as Fitbit, Oura, Apple Watch, Garmin, and Google Fit. Currently, 216 individuals have volunteered to donate their data. The data is aggregated and de-identified and shared publicly. The users can choose to opt out of sharing their data at any time. Data from Quantified Flu can be used to calculate metrics such as: • Levels of physical activity – proxy for maintenance of health • Stress levels – proxy for mental health

Additional Examples - Enhanced Approaches to Measure Economic Output at a Country Level

We recommend communities look beyond traditional growth metrics and instead measure drivers of growth such as competitiveness and innovation

The following metric measures competitiveness ranking at a country rather than a community level. However, the metrics that compose the indices can be used as an inspiration of other factors a community can measure.

Example source	Rationale	Background	Recommended Metrics	Methodology
World Competitiveness Ranking (1/3) [101]	Competitiveness is the sum of many parts and can reflect performance on several dimensions. For investment attraction purposes, expressing competitiveness can be an important input into broader business activities. Expressing rankings on specific components of competitiveness can help to isolate particular comparative advantages at the national level.	The World Competitiveness Ranking "analyzes and ranks countries according to how they manage their competencies to achieve long-term value creation"[101]. Developed by the International Institute for Management Development (IMD) World Competitiveness Center to measure economies beyond GDP, considering dimensions that are political, social and cultural.	The World Competitiveness Ranking can be broken down into four themes: • **Economic performance** (domestic economy, international trade, international investment, employment prices) • **Government efficiency** (public finance, tax policy, institutional framework, business legislation, societal framework) • **Business efficiency** (productivity & efficiency, labour market, finance, management practices, attitudes and values) • **Infrastructure** (basic infrastructure, technological infrastructure, scientific infrastructure, health and environment, education) Each theme has statistics, survey data, and background data. The World Competitiveness Ranking is composed of a total of 334 indicators. *Please see additional information on the next two slides on some sample indicators.*	The IMD collects data of 334 criteria from international, national and regional statistics, as well as from their own Executive Opinion Survey that is circulated annually to mid- to upper-level managers to measure market participant perceptions. A sample is selected from respondents to represent all sectors across each of the 64 economies studied, proportional to GDP in size. Over 5,800 executives returned survey responses to the IMD in 2021. This allows the index to include non-measurable components and business executives' future perceptions, such as "management practices, corruption, adaptive attitudes and the agility of companies"[101]. The standardized value for each criterion is calculated, and they are grouped into sub-factors which are then aggregated with equal weights. An in-depth methodology is described under Methodology and principles of analysis in World Competitiveness Rankings – IMD.[101]

Additional Examples - Enhanced Approaches to Measure Economic Output at a Country Level

We recommend communities look beyond traditional growth metrics and instead measure drivers of growth such as competitiveness and innovation

Example source	Recommended Metrics

World Competitiveness Ranking[101] **(2/3)**	The World Competitiveness Ranking can be broken down into four themes. The World Competitiveness Ranking has a total of 334 metrics. Although the metrics in the index are global, communities could consider adopting and tracking them for policy planning purposes. Below we outline some of the most novel metrics:
	Economic performance:
	• **Employment**
	   • **Youth exclusion:** share of youth population (15-24) not in education, employment or training.
	• **Prices**
	   • **Apartment/office rent:** 3-room apartment monthly rent/total occupation cost (US$/Sq.M per year).
	   • **Cost of living index:** index of a basket of goods & services including housing
	   • **Food costs:** food costs as a percentage of household final consumption expenditure
	   • **Gasoline prices:** premium unleaded gasoline US$ per liter
	
	Government efficiency
	• **Public finance**
	   • **Pension funding** is measured in the survey, it reports managers' thoughts on whether pension funding is adequately addressed for the future
	   • **Tax evasion** is measured in the survey, it reports managers' thoughts on whether tax evasion is a threat to the economy
	• **Tax policy**
	   • **Real personal taxes** is measured in the survey, it reports managers' thoughts on whether real personal taxes discourage people from working or seeking advancement
	• **Institutional framework**
	   • **Bureaucracy** is measured in the survey; it reports managers thoughts on whether bureaucracy hinder businesses activity
	• **Business legislation**
	   • **Unemployment legislation** is measured in the survey, to what level unemployment legislation provides an incentive to look for work
	   • **Immigration laws** is measured in the survey, it reports managers thoughts on to what extent immigration laws prevent a company from employing foreign labour
	• **Societal framework:**
	   • **Aging of population:** population over 65 as a percentage of total population

Additional Examples - Enhanced Approaches to Measure Economic Output at a Country Level

We recommend communities look beyond traditional growth metrics and instead measure drivers of growth such as competitiveness and innovation

Example source	Recommended Metrics

World Competitiveness Ranking[101] (3/3)	**Business efficiency**
	• **Productivity and efficiency**
	   • **Use of digital tools and technologies** is measured in the survey to understand to what extent companies use their digital tools and technologies efficiently to improve performance.
	• **Labour market**
	   • **Renumeration spread** ratio of CEO to personal assistance renumeration
	   • **Foreign labour force – migrant stock:** migrant stock, age 20-64, % of population
	• **Finance**
	   • **Access to financial services:** proportion of adults with a bank account or mobile-money-service provider
	• **Management practices**
	   • **Entrepreneurial fear of failure:** % indicating that fear of failure would prevent them from setting up a business
	
	Infrastructure
	• **Basic infrastructure**
	   • **Air transportation and quality of air transportation:** number of passengers carried by main companies, and quality of air transportation as it encourages business development.
	• **Technology infrastructure**
	   • **Mobile telephone costs:** monthly blended average revenue per user
	   • **Internet bandwidth average speed**
	• **Health and environment**
	   • **Universal health coverage index:** coverage index for essential services (0-100)
	• **Education**
	   • **Women with degrees:** share of women who have a degree in the population 25-65

Appendix B

Additional Guidance on Leading Practices in Visual Analytics

Leading Practices in Visual Analytics

In the following section we outline data visualization best practices

In the following section we outline best practices for data visualization including when to use different chart types and design considerations to make charts easy to understand. The following common chart types are included:

- Bar charts

- Pie charts

- Doughnut charts

- Line charts

- Scatterplot

- Maps

The information in this appendix can assist Shorefast when developing dashboards to ensure that chart selection makes sense for the desired analysis and meets user needs.

Leading Practices in Visual Analytics

Data Visualization Best Practices – Bar Charts

Bar charts are the most versatile of all chart types. They are best used to show change over time, compare different categories, or compare parts of a whole.
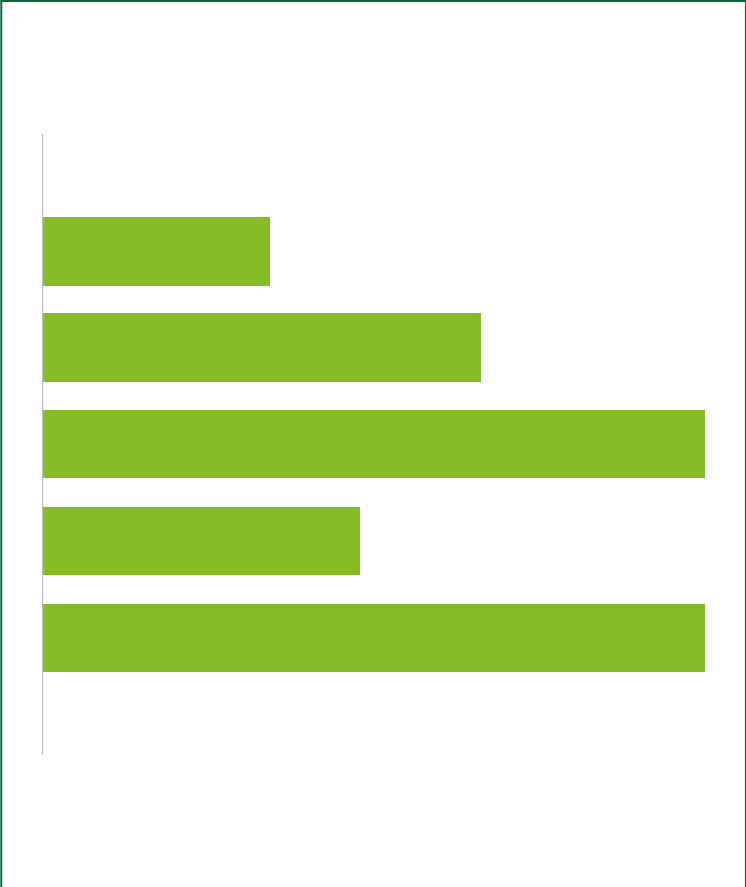
Vertical bar charts are also known as column charts. They are best used for chronological or grouped data and are also useful when visualizing negative values below the x-axis.
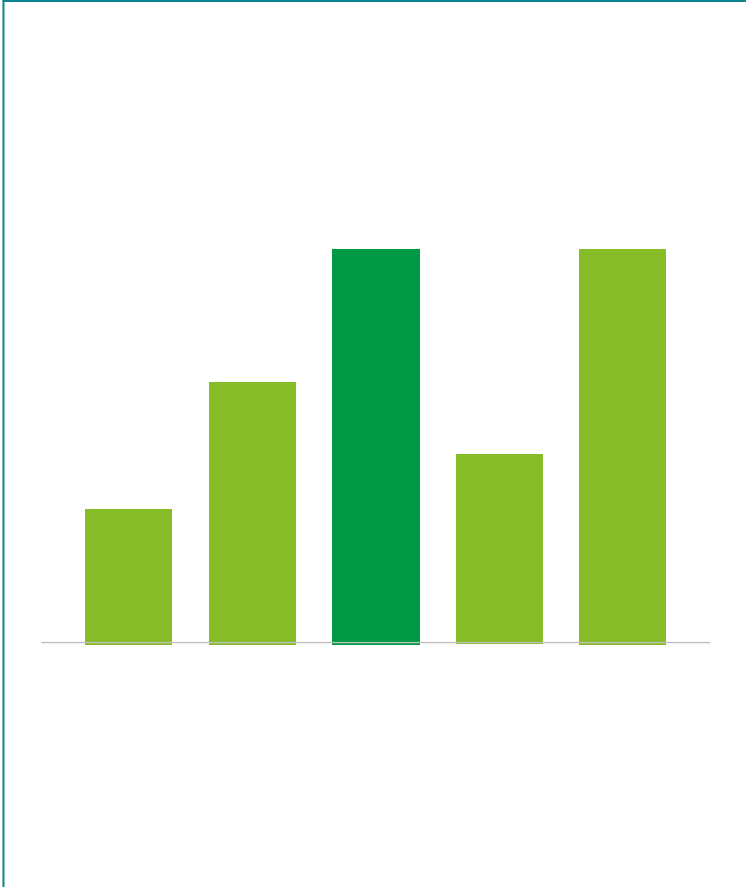
Stacked graphs are best used when there is a need to compare multiple part-to-whole relationships. These can use discrete or continuous data, oriented either vertically or horizontally.
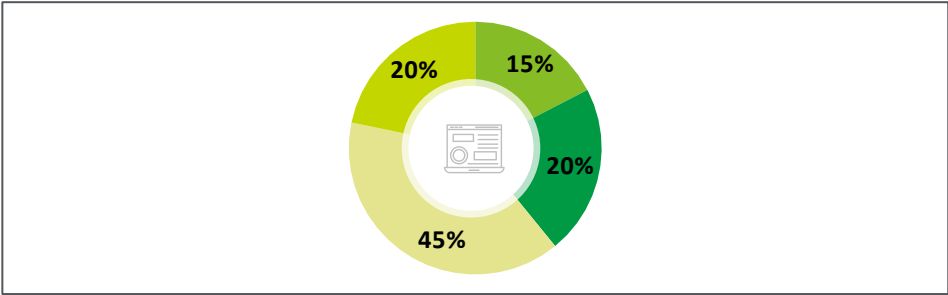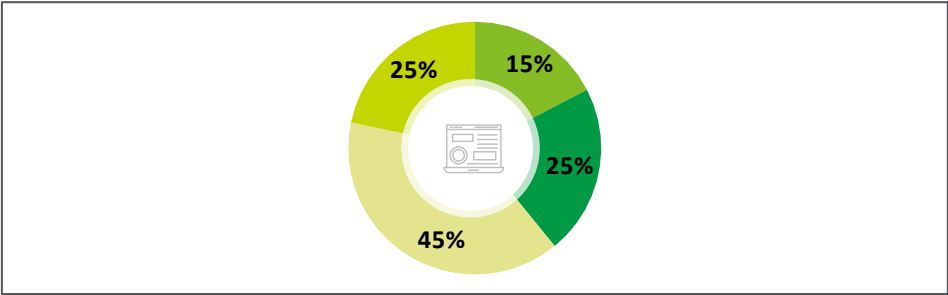
Leading Practices in Visual Analytics

Data Visualization Best Practices – Bar Charts

	NO	**YES**
Start the y-axis value at **zero**.		
Use **horizontal** labels.		
Use **consistent** colour, unless multiple colours have **specific meanings**.		
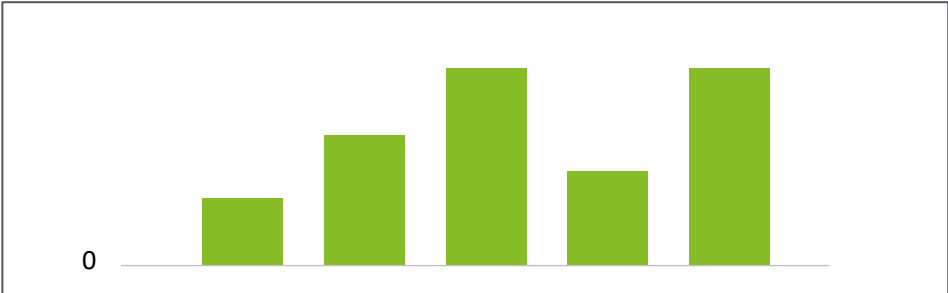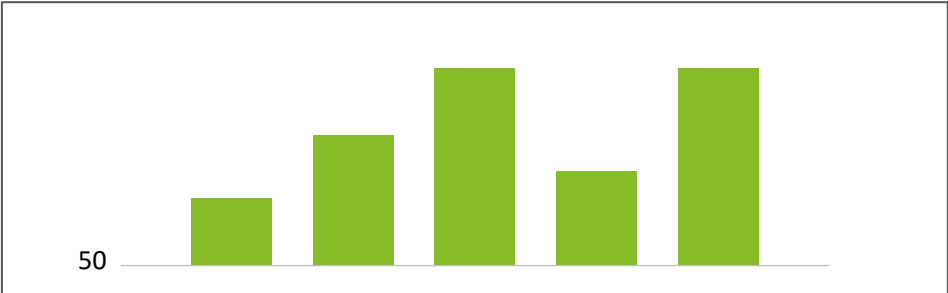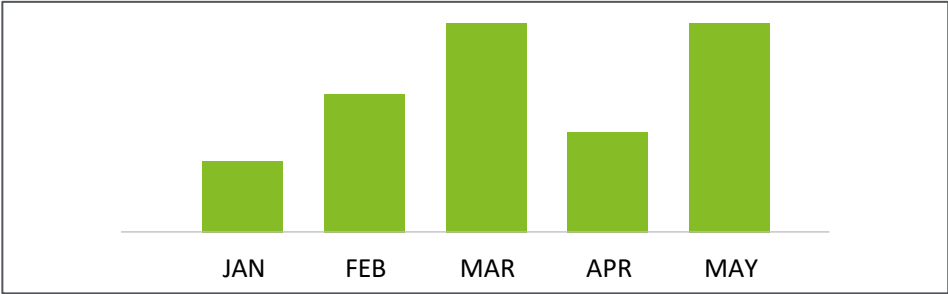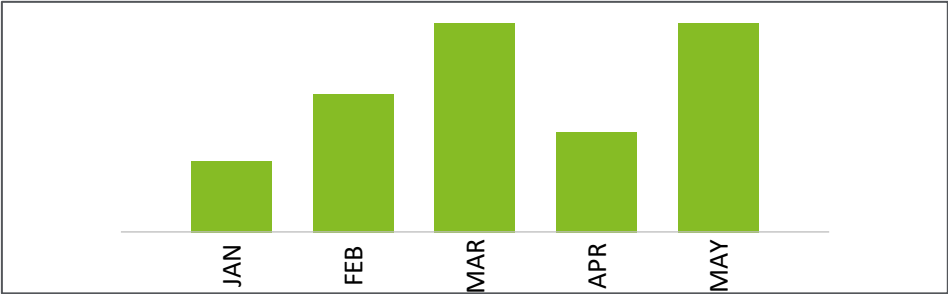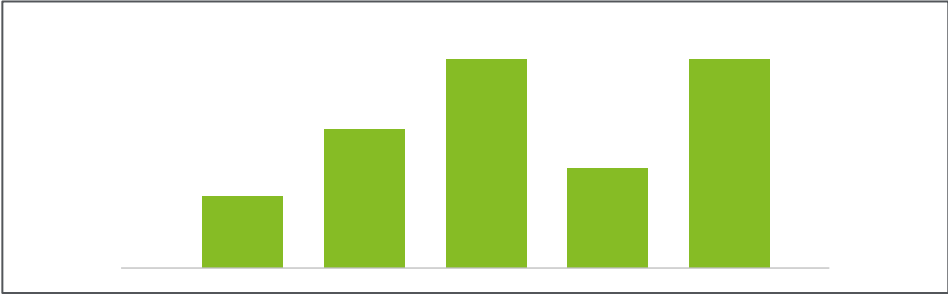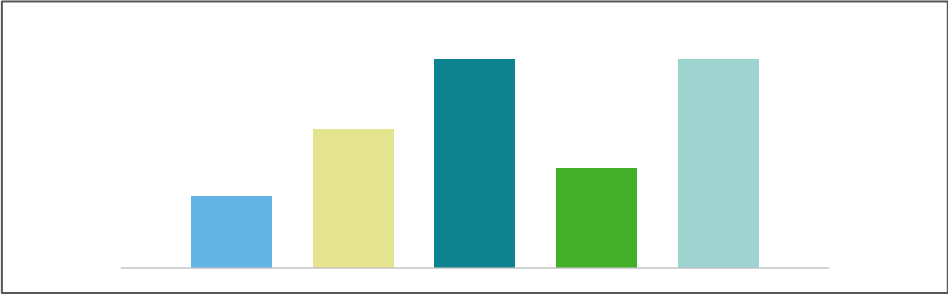
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Data Visualization Best Practices – Pie Charts

- Pie charts are best used for making part- to-whole comparisons with discrete or continuous data.

- They are most impactful with a small data set.

- All segments must add up to 100%.
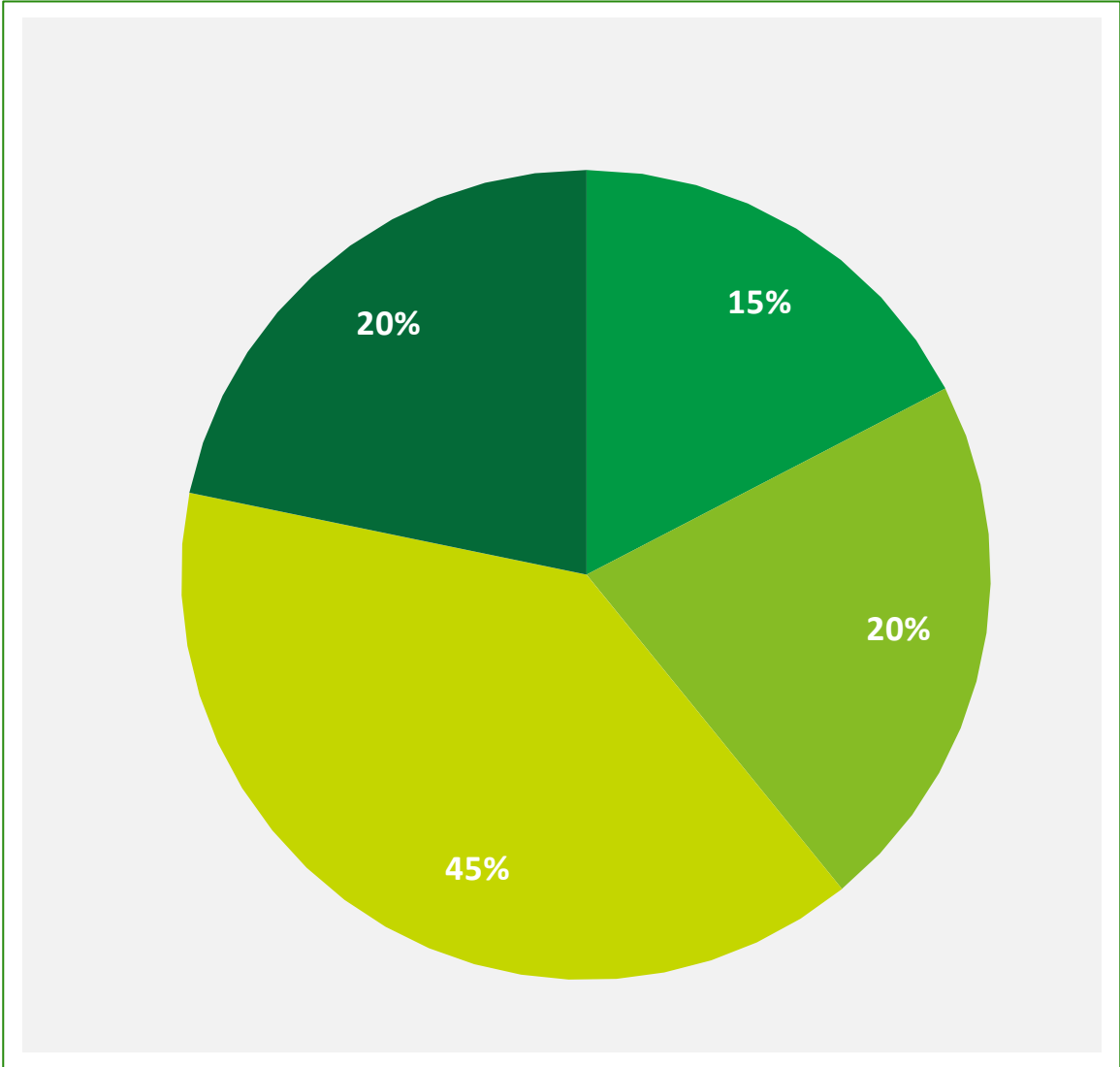
Leading Practices in Visual Analytics
Data Visualization Best Practices – Doughnut Charts

- Variation of pie chart; often preferred because it is visually more accurate.

- Reduces distortion of segments at centre.

- This type also enables the inclusion of a total value or design element in the centre.
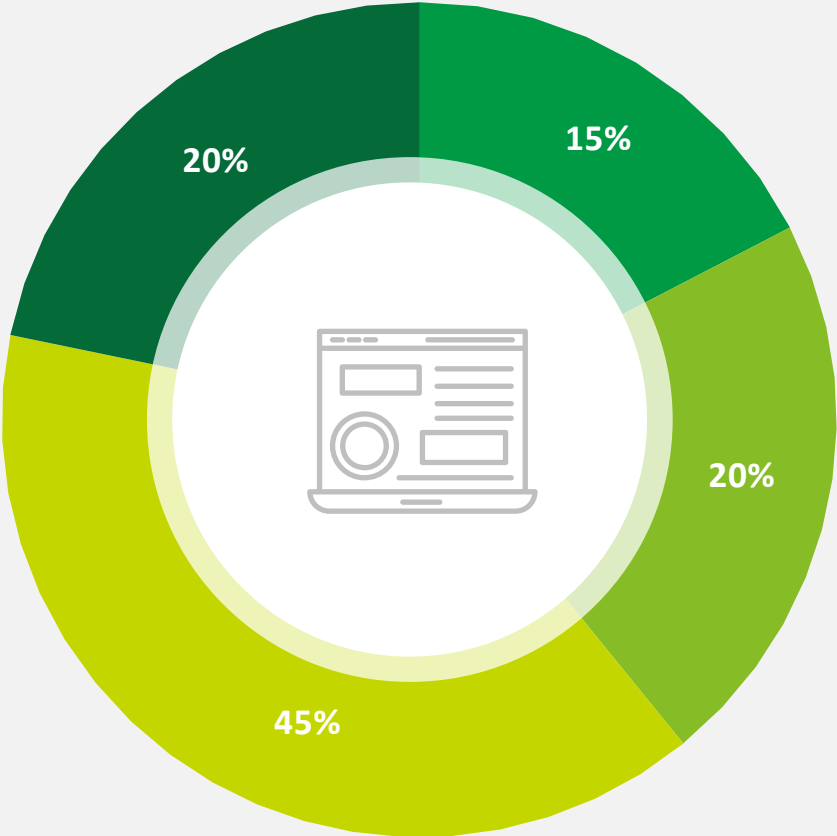
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Data Visualization Best Practices – Doughnut Charts

NO	YES

Make sure all data adds up to 100%.

NO chart:
- 15%
- 25%
- 45%
- 25%

YES chart:
- 15%
- 20%
- 45%
- 20%

Visualize no more than five categories per chart.
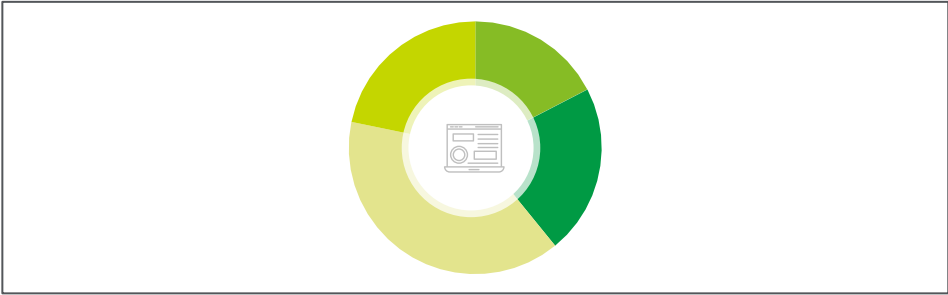
Do not use multiple pie charts for comparison.
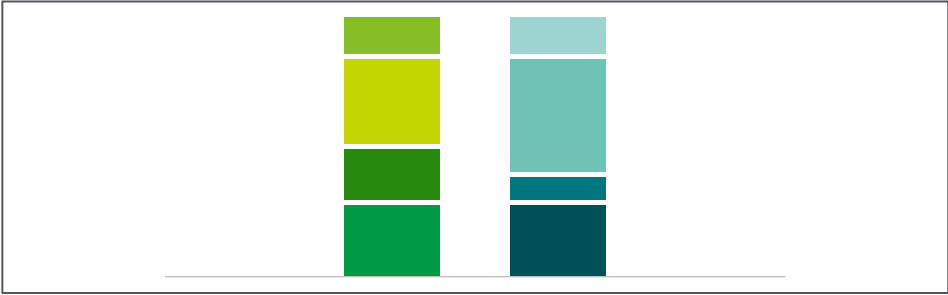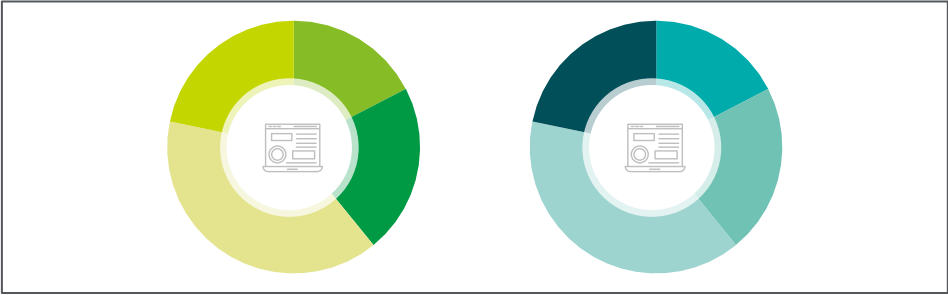
Leading Practices in Visual Analytics
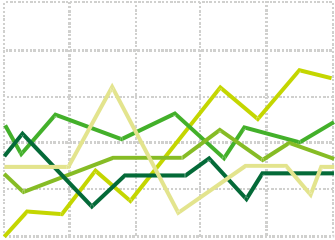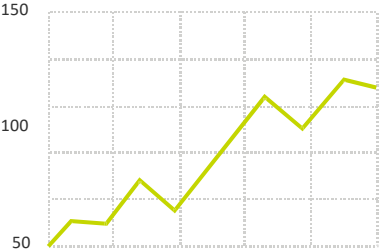
Data Visualization Best Practices – Line Charts

Line charts are used to show time-series relationships with continuous data.
They help show trend, acceleration, deceleration, and volatility.

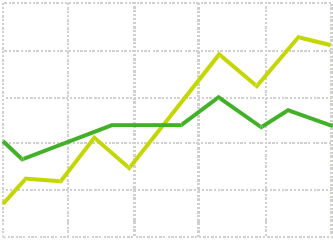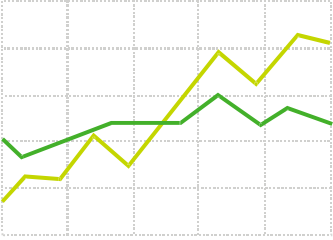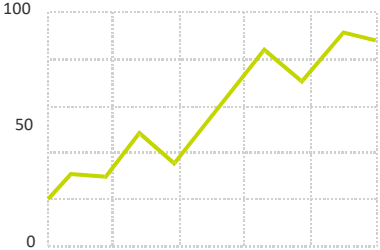Start the y-axis value at **zero** if possible.

Don't plot more than **four** lines.

Use only **solid** lines.

NO

YES
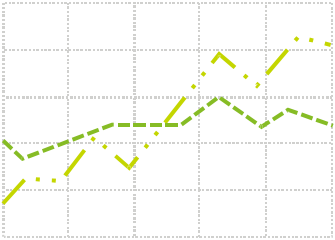
Leading Practices in Visual Analytics

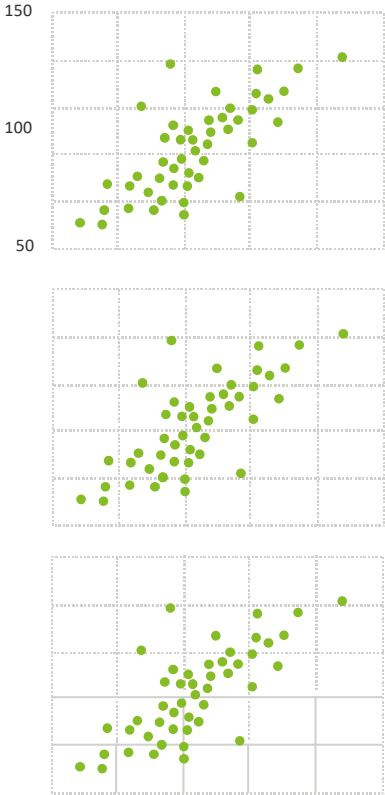Data Visualization Best Practices – Scatterplots

Scatter plots show the relationship between items based on two sets of variables, plotted as x and y coordinates.

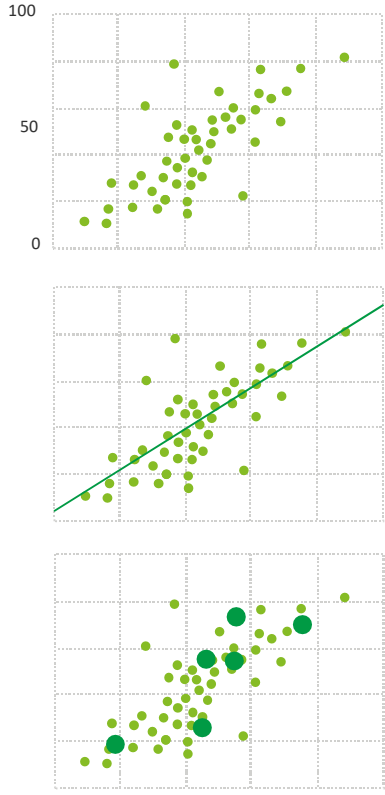Always start the y- axis value at **zero**.

Use **trend lines** to show overall trends in data.

Additional data levels can be visualized through **dot size** and **colour**.

NO

YES

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Data Visualization Best Practices – Maps
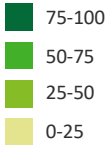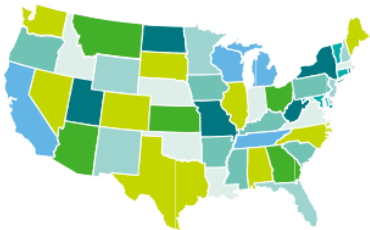
Heat maps display categorical data, using intensity of colour to represent values of geographic areas or data tables.

NO
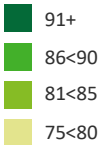
YES

Use **simple**, non-distracting outlines.
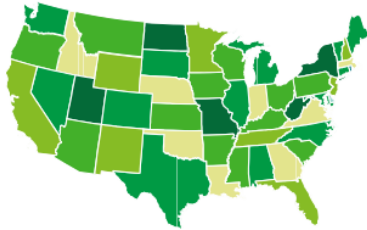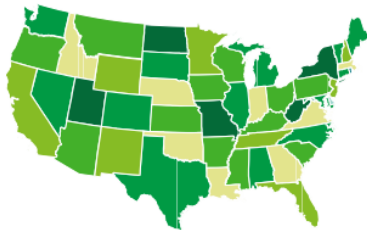
Avoid **excessive** colours. Use a **monochromatic** colour palette where possible.

Use **data ranges** that reflect the specific data.
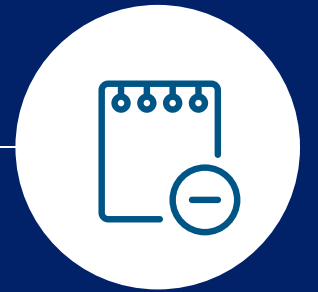

75-100

50-75

25-50

0-25

91+

86<90

81<85

75<80

Appendix C: Sources

Sources

1. 311: From a Hotline to a Platform for Citizen Engagement. Government Technology. Available at: 311: From a Hotline to a Platform for Citizen Engagement (govtech.com)
2. BOS: 311. City of Boston. Available at: Boston 311 | City of Boston
3. Open Humans. Available at: Home - Open Humans
4. CoronorReport. Google Play. Available at: CoronaReport - COVID-19 reports for Social Science - Apps on Google Play
5. Blog: Using data collected by citizens for stakeholder participation and decision-making. Available at: Blog: Using data collected by citizens for stakeholder participation and decision-making - Ground Truth 2.0 (gt20.eu)
6. A lot of private-sector data is also used for public good. Available at: A lot of private-sector data is also used for public good | Computerworld
7. Using Satellite Imagery to Find Villages In Need. Available at: DataKind - Case Study
8. Racist incident hotline to be created in British Columbia. BC Gov News. Available at: Racist incident hotline to be created in British Columbia | BC Gov News
9. Care Work in the Recovery Economy: Towards a Caring Economy. Gender and the Economy. Available at: Care Work in the Recovery Economy: Towards a Caring Economy | Gender and the Economy (gendereconomy.org)
10. The Behavioural Insights Team: Update Report 2016-17 BIT_Update-16-17_E_.pdf (netdna-ssl.com); Anticipatory government: Preemptive problems through predictive analytics Predictive analytics in government | Deloitte Insights
11. A Playbook for Equitable Economic Development: Guidance on identifying structural racism and implementing equitable practices. International Economic Development Council. Available at: Final_IEDC_Playbook_Web_(1).pdf (iedconline.org)
12. Fighting food poisoning in Las Vegas with machine learning Fighting food poisoning in Las Vegas with machine learning (phys.org); Anticipatory government: Preemptive problems through predictive analytics Predictive analytics in government | Deloitte Insights
13. Jakarta's plan for predictive government. Gov Insider Available at: Jakarta's plans for predictive government | GovInsider
14. Urban Environment & Social Inclusion Index. Available at: Urban Environment & Social Inclusion Index Home | Data-Driven EnviroLab (datadrivenlab.org)
15. Measuring Inclusion in America's Cities. Available at: Measuring Inclusion in America's Cities (urban.org)
16. Fostering a More 'Cultured' City through Inclusion: Metrics for Sense of Belonging for Migrants in Chinese Urban Areas. Science Direct. Available at: Fostering a More 'Cultured' City through Inclusion: Metrics for Sense of Belonging for Migrants in Chinese Urban Areas - ScienceDirect

17. Metrics for Sustainable and Inclusive Cities. Urban Environment & Social Inclusion Index. Available at: 2018_UESI_Full_Report.pdf (datadrivenlab.org)

18. Uber movement. Available at: Uber Movement: Let's find smarter ways forward, together.

19. The Role of Social Networks in Urban Planning. Available at: The Future Role of Social Networks in Urban Planning (blogthinkbig.com)

20. Using Social Media Data to Understand Cities. Available at: Using Social Media Data to Understand Cities (cmu.edu)

21. Place Pulse. Available at: Overview ‹ Place Pulse — MIT Media Lab

22. Making Sense of Cities Using Social Media: Requirements for Hyper-Local Data Aggregation Tools. Available at: Making Sense of Cities Using Social Media: Requirements for Hyper-Local Data Aggregation Tools (razschwartz.net)

23. Redefining Economic Development Performance Indicators for a Field in Transition. Center for Regional Economic Competitiveness. Available at: Redefining-Economic-Development-Performance-Indicators-for-a-Field-in-Transition-CREC-2017.pdf (creconline.org)

24. Why GDP is not an accurate measure of economic growth. World Economic Forum. Available at: Why GDP is not an accurate measure of economic growth | World Economic Forum (weforum.org)

25. Wellbeing as the lens for decision-making in Canada. Canadian Index of Wellbeing. Available at: Home | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca)

26. The inclusive development index 2018. World Economic Forum. Available at: The Inclusive Development Index 2018 - Reports - World Economic Forum (weforum.org)

27. Why we need to understand the limitations of economic figures. University of Amsterdam. Available at: Why we need to understand the limitations of economic figures - University of Amsterdam (uva.nl)

28. Performance measurement in economic development – even the standard can't live up to the standard. Brookings. Available at: Performance measurement in economic development – even the standard can't live up to the standard (brookings.edu)

29. A review of limitations of GDP and alternative indices to monitor human wellbeing and to manage eco-system functionality. Elsevier. Available at: A review of limitations of GDP and alternative indices to monitor human wellbeing and to manage eco-system functionality (advancesincleanerproduction.net)

30. Why unemployment is no longer the best indicator of the economy's health. The Guardian. Available at: Why unemployment is no longer the best indicator of the economy's health | Greg Jericho | The Guardian

Sources

31. SA's unemployment numbers don't take informal sector into account – GG Alcock. BizNews. Available at: SA's unemployment numbers don't take informal sector into account (biznews.com)

32. Performance Measurement in Economic Development. EDAC ACDE. Available at: Microsoft Word - Final Report - Performance Measurement in Economic Development - EDAC Project Sept version_REV _2_.doc

33. How Meaningful are Median Household Income Estimates? The University of Utah. Available at: How Meaningful are Median Household Income Estimates? - Kem C. Gardner Policy Institute (utah.edu

34. THE IMPORTANCE OF DATA SHARING FOR THE ECONOMY OF TOMORROW. International Banker. Available at: The Importance of Data Sharing for the Economy of Tomorrow (internationalbanker.com)

35. Smart Columbus Operating System. Available at: Smart Columbus Operating System | SmartColumbus

36. The Benefits of Data Sharing: What Cities and Business Are Doing Right. Capalino. Available at: The Benefits of Data Sharing: What Cities and Businesses Are Doing Right – Capalino

37. Smart Columbus Operating System Leverages Data To Improve City Services, Transportation. Smart Cities Connect Media & Research. Available at: Smart Columbus Operating System Leverages Data To Improve City Services, Transportation – Smart Cities Connect

38. Yelp Open Dataset. Yelp. Available at: Yelp Dataset

39. Yelp's Local Economic Outlook: Using Data to Track Small Business Opportunity & Economic Health in America. Yelp. Available at: Yelp's Local Economic Outlook: Using Data to Track Small Business Opportunity & Economic Health in America | Yelp - Official Blog

40. Economic Graph Research. LinkedIn. Available at: Economic Graph Research (linkedin.com)

41. Helping Communities Use Data to Make Better Decisions. Issues in Science and Technology. Available at: Helping Communities Use Data to Make Better Decisions (issues.org)

42. Healthcare Data Sharing Connects the Dots for COVID-19 and Beyond. Health IT Analytics. Available at: Healthcare Data Sharing Connects the Dots for COVID-19 and Beyond (healthitanalytics.com)

Development | United Nations)

43. The Use of Data Visualization in Government. IBM Center for The Business of Government. Available at: The Use of Visualization in Government.pdf (businessofgovernment.org)

44: Data Visualization for Government Agencies. Collabion. Available at: Data Visualization For Government Agencies (collabion.com)

45. Data Visualization: A Primer. Government of Canada. Data Visualization: A Primer | Open Government, Government of Canada

46. How data visualization in the government can empower dialogue. Policy Options Politiques. How data visualization in government can empower dialogue (irpp.org)

47. Why Benchmarking Matters for Open Data. Data-Smart City Solutions. Available at: Why Benchmarking Matters for Open Data | Data-Smart City Solutions (harvard.edu)

48. 7 Benefits of Benchmarking for Local Government. Available at: 7 Benefits of Benchmarking for Local Government – Envisio

49. Peer Community Comparison. Community Economic Development Smart University of Wisconsin-Madison. Available at: Peer Community Comparison – Community Economic Development (wisc.edu)

50. A New, Powerful Data Tool For Cities. Forbes. Available at: A New, Powerful Data Tool For Cities (forbes.com)

51. Economic Impact: Working more from home has implications for economic development, site selection and urban planning. Richmond Times-Dispatch. Available at: Economic Impact: Working more from home has implications for economic development, site selection and urban planning | Business News | richmond.com

52. THE IMPLICATIONS OF ACCELERATING AUTOMATION ON SITE SELECTION AND ECONOMIC DEVELOPMENT. Strategic Development Group. Available at: Changes in Site Selection Strategies - Strategic Development Group

53. The Site Section Process Has Changed. Available at: The Site Selection Process Has Changed (franchising.com)

54. The Relationship Between Community and Economic Development. Available at: The Relationship Between Community and Economic Development - Econsult Solutions, Inc.

55. How Can Recreation Strengthen My Community? Available at: How Can Recreation Strengthen My Community? (perfectmind.com)

56. Recreation, leisure and sports. Community-Based Rehabilitation: CBR Guidelines. Available at: Recreation, leisure and sports - Community-Based Rehabilitation: CBR Guidelines - NCBI Bookshelf (nih.gov)

Sources

57. Data collection challenges and improvements. Available at: Data collection challenges and improvements | Victorian Government (www.vic.gov.au)

58. Key takeaways on Americans' views about privacy, surveillance and data-sharing. Available at: Americans' views about privacy, surveillance and data-sharing | Pew Research Center

59. Citizens Willing to Share Personal Data with Government in Exchange for Enhanced Customer Services, Accenture Survey Finds. Available at: Citizens Willing to Share Personal Data with Government in Exchange for Enhanced Customer Services, Accenture Survey Finds | Accenture

60. Understanding Survey Fatigue in a Community Context. Available at: Understanding Survey Fatigue in a Community Context – Lehigh Valley Community Hub (lehighvalleyhub.org)

61. Reset default to "share". Available at: 7 lessons for data sharing in government | Deloitte Insights

62. Data-sharing in government: why it's time for a new approach. Available at: Data-sharing in government: why it's time for a new approach | by Richard Pope | Project on Digital Era Government | Medium

63. New Report Examines the Role of Arts and Culture in Fostering Social Cohesion and Community Well-Being. Available at: New Report Examines the Role of Arts and Culture in Fostering Social Cohesion and Community Well-Being | National Endowment for the Arts

64. Confronting Racism with Data: Why Canada Needs Disaggregated Race-Based Data. Available at: Race-Based-Data_ESPCFeatureReport_Feb2021.pdf (edmontonsocialplanning.ca)

65. Canada needs to talk about race and student outcomes: Robson. Available at: Canada needs to talk about race and student outcomes: Robson | Academica Group - Research and Consulting for Higher Education

66. 3 reasons why traditional diversity metrics don't work. Available at: 3 reasons why traditional diversity metrics don't work | Culture Amp

67. Defining and Measuring Gig Work. Available at: 3-2-20-Defining-Measuring-Gig-Work.pdf (rockinst.org)

68. Labour Force Survey (LFS). Available at: Surveys and statistical programs - Labour Force Survey (LFS) (statcan.gc.ca)

68. Going for the Gold: Cambridge, Memphis, Phoenix All Level Up. Available at: Going for the Gold: Cambridge, Memphis, Phoenix All Level Up | by What Works Cities | What Works Cities Certification | Medium

69. A Data-Driven Mindset Helps Austin Reimagine Public Safety. Available at: A Data-Driven Mindset Helps Austin Reimagine Public Safety | by What Works Cities | What Works Cities Certification | Medium

70. Data-Driven Development Pathways for Progress. World Economic Forum. Available at: Data-Driven Development - Reports - World Economic Forum (weforum.org)

71. Phoenix is ready for more rapid growth. Medium. Available at: Phoenix Is Ready for More Rapid Growth | by What Works Cities | What Works Cities Certification | Medium

72. How local governments can harness the power of their data. Open Access Government. Available at: How local governments can harness the power of their data (openaccessgovernment.org)

73. TfL And Waze Agree Data Exchange To Manage London's Streets. Available at: TfL And Waze Agree Data Exchange To Manage London's Streets (silicon.co.uk)

74. LEVERAGING PRIVATE DATA FOR PUBLIC GOOD. Available at: existing-practices-report.pdf (datacollabouratives.org)

75. Measuring what matters most. Available at: WBA-sevensystemstransformations-report.pdf (worldbenchmarkingalliance.org)

76. Vital Signs. Available at: Vital Signs – Community Foundations of Canada

77. The Importance of Collecting Race-based Data to Ensure More Equitable Health Outcomes by Jeffrey Thompson. Available at: Canadian Association of Urban Financial Professionals (CAUFP) – The Importance of Collecting Race-based Data to Ensure More Equitable Health Outcomes by Jeffrey Thompson

78. The Inclusive Development Index 2018. Available at: World Economic Forum (weforum.org)

79. The Online Labour Index. Available at: The Online Labour Index | The iLabour Project (ox.ac.uk); How the Online Labour Index is constructed. Available at: How the Online Labour Index is constructed | The iLabour Project (ox.ac.uk); Website Crawling: A Guide on Everything You Need to Know. Available at Website Crawling: A Guide on Everything You Need to Know | Sovrn Blog

80. Canadian Index of Wellbeing. Available at: About the Canadian Index of Wellbeing | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca); Research Associates. Available at Research Associates | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca)

81. Genuine Progress Indicator (GPI). Available at: Genuine Progress Indicator (GPI) Definition (investopedia.com); GGBP Case Study Series: Genuine Progress Indicator: GGBP Case Study Series_United States_Genuine Progress Indicator.pdf (greengrowthknowledge.org)

Sources

82. The Commitment to Development Index 2021. Available at: Commitment to Development Index | Center for Global Development | Center for Global Development | Ideas to Action (cgdev.org); CDI Methodological Overview Paper. Available at: cdi-methodology-2021.pdf (cgdev.org); FID Working Paper. Available at WP529-FID-Mitchell-Full.pdf (cgdev.org). Note: Each indicator has a separate methodology paper that is available by clicking through the domains to each individual indicator.

83. Key Social Media Privacy Issues for 2020. Available at: Social Media Privacy Issues for 2020: Threats & Risks (tulane.edu)

84. Barriers to implementation of open data strategies in small, medium, and large municipalities in British Columbia. Available at: Barriers to implementation of open data strategies in small, medium, and large municipalities in British Columbia (uvic.ca)

85. Overcoming digital transformation challenges in local government. MNP Digital. Available at: Overcoming digital transformation challenges in local government (mnpdigital.ca)

86. FundPHX. Available at: FundPHX - The Dollars and Sense in Phoenix's Budget

87. Waze for Cities. Available at: Waze for Cities - Wazeopedia

88. Conduent Healthy Communities Institute HEI: Houston Public Health Data Portal :: SocioNeeds Index® Suite :: 2021 Health Equity Index (houstonstateofhealth.com)

89. Food Insecurity Index. Available at: Houston Public Health Data Portal :: SocioNeeds Index® Suite :: 2021 Food Insecurity Index (houstonstateofhealth.com);

90. Data Analytics for Local Government: A Scoping Study of NSW and recommendations to enhance service delivery and customer experience. Available at: Data Analytics for Local Government: How can Local Government use Data to Enhance Service Delivery and Customer Experience (uts.edu.au)

91. Foursquare. Pricing | Foursqure - Independent Location Data Platform

92. Numina. Numina | Know Your Streets - Multimodal data for urban planners & facilities managers

93. Mental Health Index. Available at Houston Public Health Data Portal :: SocioNeeds Index® Suite :: 2021 Mental Health Index (houstonstateofhealth.com)

94. Google Earth Outreach. Available at: Google Earth Outreach

95. Developer platform. Available at: Getting Started with the Twitter API | Docs | Twitter Developer Platform

96. Gig Economy Index. Available at Gig-Economy-April-19.pdf (pymnts.com)

97. Field View. Available at: FieldView 360˚ (climatefieldview.ca)

98. Global Fishing Watch. Available at: Sustainable Ocean Management - Technology | Global Fishing Watch

99. Job quality. Available at: Job quality – OECD; Cazes, S., A. Hijzen and A. Saint-Martin (2015), "Measuring and Assessing Job Quality: The OECD Job Quality Framework", OECD Social, Employment and Migration Working Papers, No. 174, OECD Publishing, Paris, https://doi.org/10.1787/5jrp02kjw1mr-en; Measuring and Assessing Job Quality: The OECD Job Quality Framework | READ online (oecd-ilibrary.org)

100. European Job quality Index. Available at Job quality index (JQI) | etui; 'Bad jobs' recovery? European Job Quality Index 2005-2015. Report available at ETUI-A5

101. World Competitiveness Ranking. Available at World Competitiveness Rankings – IMD

102. The use of supermarket scanner data in the Dutch CPI. Available at: The use of supermarket scanner data in the Dutch CPI (1).pdf

103. Cisco Develops New Data-Sharing Platform to Enrich Smart Cities. Available at: Cisco's New Data-Sharing Platform For Smart Cities | Albany Beck (albanybeckps.com)

104. Cisco IoT Operations Dashboard. Available at: Cisco IoT Operations Dashboard – Cisco

105. Diverse Teams Feel Less Comfortable – and That's Why They Perform Better. Available at Diverse Teams Feel Less Comfortable — and That's Why They Perform Better (hbr.org)

106. Economic development: The people and the profession involved in building robust, resilient and inclusive economies. Available at IEDC_What_is_Economic_Development.pdf (iedconline.org)

107. A Playbook for Equitable Economic Development. Available at Final_IEDC_Playbook_Web_(1).pdf (iedconline.org)

108. Global Innovation Index 2021. Available at Global Innovation Index | Tracking Innovation through the COVID-19 Crisis; GII Report. Available at gii-full-report-2021.pdf; Note: report can also be accessed directly on the Global Innovation Index website in this same citation by clicking "Download Report".

109. Our Index. Available at Our index | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca)

Sources

110. About CDI and Key Findings. Available at Commitment to Development Index | Center for Global Development | Center for Global Development | Ideas to Action (cgdev.org)

111. The Commitment to Development index: 2021 Edition. Methodological Overview Paper. Available at cdi-methodology-2021.pdf (cgdev.org)

112. Quebec Economic Health Index. Available at Quebec Economic Health Index | PwC Canada; Quebec Economic Health Index: A look at the economy and an analysis focused on the environment. Available at 2019 Quebec Economic Health Index (pwc.com); PwC Canada unveils results form the 3rd edition of its Quebec Economic Health Index. Available at PwC Canada unveils results from the 3rd edition of its Quebec Economic Health Index (newswire.ca); PwC Canada launches the second edition of the Quebec Economic Health Index. Available at PwC Canada launches the second edition of the Quebec Economic Health Index | Markets Insider (businessinsider.com)

113. PwC Canada unveils results form the 3rd edition of its Quebec Economic Health Index. Available at PwC Canada unveils results from the 3rd edition of its Quebec Economic Health Index (newswire.ca)

114. Quebec Economic Health Index: A look at the economy and an analysis focused on the environment. Available at 2019 Quebec Economic Health Index (pwc.com)

115. SocioNeeds Index® Suite. Available at Houston Public Health Data Portal :: SocioNeeds Index® Suite (houstonstateofhealth.com)

116. "How Does It Work" popup on Houston Public Health Data Portal :: SocioNeeds Index® Suite :: 2021 Food Insecurity Index (houstonstateofhealth.com)

117. How the Online Labour Index is constructed. Available at How the Online Labour Index is constructed | The iLabour Project (ox.ac.uk)

118. Job quality. Available at Job quality – OECD

119. Job quality index (JQI). Available at Job quality index (JQI) | etui

120. Curriculum: Health Economics. Available at Curriculum Master Health Economics | Erasmus University Rotterdam (eur.nl)

121. Master of Economic Development and Innovation (MEDI). Available at Master of Economic Development and Innovation (MEDI) | Graduate Studies Academic Calendar | University of Waterloo (uwaterloo.ca)

122. Characteristics of an Effective Economic Development Officer. Available at Characteristics of an Effective Economic Development Officer » SSEER

123. The Post World War II Boom: How America Got Into Gear. Available at The Post World War II Boom: How America Got Into Gear – HISTORY

124. GDP: a brief history. Available at GDP: a brief history – Foreign Policy

125. GDP is outdated, here are the alternatives. Available at: What alternatives are there to GDP? | World Economic Forum (weforum.org)

126. Disaggregating growth. Available at: Disaggregating growth - Equitable Growth

127. Alexa Rank Checker Tool. Available at Free Alexa Rank Checker | Check Alexa Traffic Ranking of any Website (rankwatch.com); Alexa. Available at End of Service Notice (alexa.com); Used to work with Alexa? Team up with Semrush to meet your data needs. Available at Team up with Semrush–The Best Alexa Alternative

128. Restoring trust to help in race-based data collection could be 'impossible'—unless communities control the data, say Indigenous experts. Available at: Restoring trust to help in race-based data collection could be 'impossible'—unless communities control the data, say Indigenous experts - The Hill Times

129. DOD Adopts Ethical Principles for Artificial Intelligence. Available at: DOD Adopts Ethical Principles for Artificial Intelligence > U.S. Department of Defense > Release

130. New FundPHX Tool Allows Residents to Participate in the City Budget Process. Available at: New FundPHX Tool Allows Residents to Participate in the City Budget Process - My Hyperlocal News

131. Accessing and Using Data from Wearable Fitness Devices. Available at: Accessing and Using Data from Wearable Fitness Devices (ahima.org)

132. Measuring and Assessing Job Quality: The OECD Job Quality Framework. Available at 5jrp02kjw1mr-en.pdf (oecd-ilibrary.org), p. 18

133. Ibid, p. 6

134. Ground Truth 2.0 – A bottom-up, citizen-focused approach to environmental monitoring. Available at: Ground Truth 2.0 – A bottom-up, citizen-focused approach to environmental monitoring | News | CORDIS | European Commission (europa.eu)

135. Balancing sustainable livelihoods and biodiversity management. Available at: Balancing sustainable livelihoods and biodiversity management - Ground Truth 2.0 (gt20.eu)

136. Community-based sustainable natural resource management. Available at: Community-based sustainable natural resource management - Ground Truth 2.0 (gt20.eu)

Sources

137. Environmental quality of life in Flanders. Available at: Environmental quality of life in Flanders - Ground Truth 2.0 (gt20.eu)

138. Technical Notes and Sources – The Inclusive Development Index. Available at: The Inclusive Development Index 2018 - Reports - World Economic Forum (weforum.org)

139. The Global Competitiveness Report. World Economic Forum. Available at: WEF_TheGlobalCompetitivenessReport2020.pdf (weforum.org)

140. World Economic Outlook. International Monetary Fund. Available at: World Economic Outlook - Frequently Asked Questions (imf.org)

141. Healthy Communities Institute: SocioNeeds Index® Suite. Available at HCI SocioNeeds Index Suite (conduent.com).

142. Live Healthy Gwinnett. Available at Gwinnett County :: Gwinnett Homepage (livehealthygwinnettdata.com)

143. Underground Economy Strategy 2018-2021. Available at Underground Economy Strategy 2018-2021 - Canada.ca

144. Policies to support sustainable, inclusive, and digital economic development in rural and smaller communities in Canada. Canada 2020. Available at: *Policies_to_support_sustainable_inclusive_and_digital_economic_development_in_rural_and_smaller_communities_in_Canada-2.pdf (canada2020.ca)

145. The Community Well-Being index. Available at The Community Well-Being index (sac-isc.gc.ca)

146. About the Community Well-Being index. Available at About the Community Well-Being index (sac-isc.gc.ca)

147. Community Well-Being index map. Available at Community Well-Being index map (sac-isc.gc.ca)

148. Report on trends in First Nations communities, 1981 to 2016. Available at Report on trends in First Nations communities, 1981 to 2016 (sac-isc.gc.ca)

149. Canadian Index of Wellbeing: Community of users. Available at Community of users | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca); Domains and indicators. Available at Domains and indicators | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca)

150. Gross Domestic Income (GDI). Available at Gross Domestic Income (GDI) Definition (investopedia.com)

151. What is neurodiversity? Available at What is neurodiversity? - Harvard Health

152. London Poverty Research Center. Available at London Poverty Research Centre - Alliance 2030

153. WHAT IS THE EAST PRESTON EMPOWERMENT ACADEMY (EPEA)?. EPEA. Available at About EPEA — East Preston Empowerment Academy (epeacademy.com)

154. Hamilton Police Release 2021 Hate Crime Statistics. Hamilton Police Service. Available at Hamilton Police Release 2021 Hate Crime Statistics

155. BIPOC Survey. All Welcome Here. Available at: BIPOC of PEC Survey – All Welcome Here Rural BIPOC Association

156. Ontario schools to collect race-based data in effort to reduce educational disparities. The Globe and Mail. Available at: Ontario schools to collect race-based data in effort to reduce educational disparities - The Globe and Mail

157. Intersectionality in quantitative research: A systematic review of its emergence and applications of theory and methods. Available at: Intersectionality in quantitative research: A systematic review of its emergence and applications of theory and methods - PMC (nih.gov)

158. Race-based data in healthcare. Available at: Race-based data in healthcare - Government of Nova Scotia, Canada

159. Catapult network. Available at: Home - The Catapult Network

160. Digital Catapult and Open Data Institute Response to the Government Chief Scientific Advisor's report on distributed ledger technologies. Available at: 295966255-Digital-Catapult-and-Open-Data-Institute-Response-to-the-Government-Chief-Scientific-Advisor-s-report-on-distributed-ledger-technologies.pdf (theodi.org)

161. Catapult Digital. Available at: About us - Digital Catapult | Digital Catapult (digicatapult.org.uk)

162. MLS® Home Price Index Methodology. Available at: MLS® HPI Methodology ENGL (crea.ca)

163. Anonymization? Think Again. BCF. Available at: Anonymization? Think Again | BCF Business Law

164. Canada: Risks Of Anonymized And Aggregated Data. Mondaq. Available at: Risks Of Anonymized And Aggregated Data - Privacy Protection - Canada (mondaq.com)

165. CPPA: identifying the inscrutable meaning and policy behind the de-identifying provisions. Barry Sookman. Available at: Personal data deidentification under CPPA (barrysookman.com)

166. In Data We Trust. Unlocking the Value of Data in Ontario. Available at: In Data We Trust: Unlocking the Value of Data in Ontario (occ.ca)

Sources

167. Quantifying Family Spillover Effects in Economic Evaluations: Measurement and Valuation of Informal Care Time. Available at: Quantifying Family Spillover Effects in Economic Evaluations: Measurement and Valuation of Informal Care Time | SpringerLink

168. Equitable Growth Framework Manual. Available at: Equity Metric #4: Environmental Justice | Charlotte Future 2040 Comprehensive Plan (cltfuture2040plan.com)

169. Measuring Heat Islands. Available at: Measuring Heat Islands | US EPA

170. Citizen science experience sharing at Wageningen University and Research. Ground Truth 2.0 Available at: Citizen science experience sharing at Wageningen University and Research - Ground Truth 2.0 (gt20.eu)

171. Measuring Prosperity: Maryland's Genuine Progress Indicator. The Solutions Journal. Available at: Measuring Prosperity: Maryland's Genuine Progress Indicator - The Solutions Journal

172. Estimates of the Genuine Progress Indicator (GPI) for Oregon from 1960–2010 and recommendations for a comprehensive shareholder's report.

173. Data Management Plan. SmRt Columbus. SCC-E-DataManagementPlan-Update-v1.pdf (d2rfd3nxvhnf29.cloudfront.net)

174. Calculating ecological footprints at the municipal level: What is a reasonable approach for Canada? Available at Calculating_ecological_footprints_at_the_municipal.pdf

175. Data Privacy Plan. SmRt Columbus. SCC-D-DataPrivacyPlan-AnnualUpdate-V2_0.pdf (d2rfd3nxvhnf29.cloudfront.net)

176. City of Guelph. Available at City of Guelph | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca); Kingston, Frontenac, Lennox & Addington. Available at Kingston, Frontenac, Lennox & Addington | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca)

177. MAYOR WALSH LAUNCHES BOSTON311. Available at Mayor Walsh launches Boston311 | Boston.gov

178. Methodology: Housing Affordability Index. Available at: Methodology: Housing Affordability Index (nar.realtor)

179. Innovative Metrics for Economic Development. Available at https://eda.gov/files/performance/Innovative-Metrics-ED-Report.pdf

180. How it Works. Available at How it works | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca).

181. The Work Bank Logistics Performance Index. Available at https://lpi.worldbank.org/domestic/performance/2018/C/CAN#chartarea

182. UK Economic Fleet Estimates and Fleet Enquiry Tool - Methodology Report. Seafish. Available at: UK Economic Fleet Estimates and Fleet Enquiry Tool - Methodology Report — Seafish

183. A spatial method to calculate small-scale fisheries effort in data poor scenarios. Plos One. Available at: A spatial method to calculate small-scale fisheries effort in data poor scenarios (plos.org)

184. How Weather Affects Fishing: All You Need to Know. Fishing Booker. Available at: How Weather Affects Fishing: All You Need to Know (fishingbooker.com)

185. Estimation Methods Overview. Noaa Fisheries. Available at: Estimation Methods Overview | NOAA Fisheries

186. PolyU Study Finds Tourists Resilient to Hong Kong Weather. Hotel Online. Available at: PolyU Study Finds Tourists Resilient to Hong Kong Weather – Hotel-Online

187. Big Data and Weather: The Impact on Touristic Destinations. DFRC. Available at: Big Data and Weather: The Impact on Touristic Destinations – DFRC

188. Weather, climate, and tourism performance: A quantitative analysis. ScienceDirect. Available at: Weather, climate, and tourism performance: A quantitative analysis – ScienceDirect

189. An Empirical Estimation of the Underground Economy in Ghana. Hindawi. Available at: An Empirical Estimation of the Underground Economy in Ghana (hindawi.com)

190. Underground Economy's Measurement Methods. Research Gate. Available at: https://www.researchgate.net/publication/286126165_Underground_Economy's_Measurement_Methods/link/5a327e07458515afb600338f/download

191. H + T Index Methods. Available at HTMethods_2016.pdf (cnt.org); About the Index. Available at About the Index | H+T Index (cnt.org)

192. TRACKING ANTI-MUSLIM INCIDENTS REPORTED ACROSS CANADA. National Council of Canadian Muslims. Available at: NCCM – National Council of Canadian Muslims | Tracking anti-Muslim incidents reported across Canada

193. Open Hamilton. Available at: https://open.hamilton.ca/

Sources

194. Current Ways to Measure Tourism Activity. Available at: Current Ways to Measure Tourism Activity | Filodiritto

195. Tourism satellite account 2019. StatsNz. Available at: Tourism satellite account: 2019 | Stats NZ

196. Tourism Satellite Account: Recommended Methodological Framework. Available at: Tourism Satellite Account: Recommended Methological Framework

197. Data Walks. Metropolitan Housing and Communities Policy Center. Available at: Data Walks: An Innovative Way to Share Data with Communities (urban.org)

198. Data sharing agreements. ICO. Available at: Data sharing agreements | ICO

199. Effects of Transit-Oriented Development on Affordable Housing, Job Accessibility and Affordability of Transportation in the Metro Green Line Corridor of Los Angeles (CA). Available at Effects of Transit-Oriented Development on Affordable Housing, Job Accessibility, and Affordability of Transportation in the Metro Green Line Corridor of Los Angeles (CA) (reconnectingamerica.org)

200. Big Data and Agriculture: A Complete Guide. Available at Message from Talend.

201. CDI Methodological Overview Paper. Available at: cdi-methodology-2021.pdf (cgdev.org)

202. Canadian Index of Wellbeing: Total farm land (hectares). Available at Total farm land (hectares) | Canadian Index of Wellbeing | University of Waterloo (uwaterloo.ca)

203. After Tax Income Gini coefficient. Available at Census Mapper.

204. The Inclusive Development Index 2018 Summary and Data Highlights. Available at WEF_Forum_IncGrwth_2018.pdf (weforum.org)

205. Migration & Homelessness: A Summary of Evidence. Available at Migration & Homelessness in Canadian Communities: A Summary of Evidence - Kelowna Homelessness Research Collaborative (KHRC) (ubc.ca); Full Report. Available at KHRC-Full-Report-Migration-Homelessness_KW_March-7-2022.pdf (ubc.ca)

206. Explore CIMI Data. Available at Search, Rank or Compare - ICMI (integrationindex.ca)

207. OECD.Stat: International Migration Database. Available at International Migration Database (oecd.org)

208. The Methodology of Counting the Homeless. National Library of Medicine. Available at: The Methodology of Counting the Homeless - Homelessness, Health, and Human Needs - NCBI Bookshelf (nih.gov)

209. Can we measure homelessness? A critical evaluation of 'Capture–Recapture' . Methodological innovations online. Available at: (PDF) Can We Measure Homelessness? A Critical Evaluation of 'Capture-Recapture' (researchgate.net)

210. Community Supports. London Canada. Available at: Community Supports | City of London

211. How Small Communities Across Canada Can Attract and Retain Newcomers. Pathways to Prosperity. Available at: Beyond-The-Big-City-Report.pdf (p2pcanada.ca)

212. Community Driven Development. The World Bank. Available at: Community-Driven Development Overview: Development news, research, data | World Bank

213. Ten Reasons Not to Measure Impact—and What to Do Instead. Stanford Social Innovation. Available at: Ten Reasons Not to Measure Impact—and What to Do Instead (ssir.org)

214. UN Global Pulse (May 2012) Big Data for Development: Challenges and Opportunities. Available at: Microsoft Word - BigDataforDevelopment-UNGlobalPulseMay2012.docx

215. Data-Driven Development Pathways for Progress. World Economic Forum. Available at: Data-Driven Development - Reports - World Economic Forum (weforum.org)

216. Quasi identifiers and the challenges of anonymizing data. Basalt. Available at: Quasi identifiers and the challenges of anonymizing data - Basalt

217. More Inclusive Governance in the Digital Age. Data-Smart City Solutions. Available at: More Inclusive Governance in the Digital Age | Data-Smart City Solutions (harvard.edu)

218. Big Data for Sustainable Development. United Nations. Available at: Big Data for Sustainable Development | United Nations

219. The Use of Data Visualization in Government. IBM Center for The Business of Government. Available at: The Use of Visualization in Government.pdf (businessofgovernment.org)

220. How local governments can harness the power of their data. Open Access Government. Available at: How local governments can harness the power of their data (openaccessgovernment.org)

221. Unstructured Data: What Is It and Where Do Local Governments Produce It? Available at: Unstructured Data: What Is It and Where Do Local Governments Produce It? | Data-Smart City Solutions (harvard.edu)

222. Data Analytics for Local Government: A Scoping Study of NSW and recommendations to enhance service delivery and customer experience. Available at: Data Analytics for Local Government: How can Local Government use Data to Enhance Service Delivery and Customer Experience (uts.edu.au)

223. Privacy-Preserving Data Visualization: Reflections on the State of the Art and Research Opportunities. Available at: (PDF) Privacy-Preserving Data Visualization: Reflections on the State of the Art and Research Opportunities (researchgate.net)

224. Has remote work changed the travel landscape?. Available at: Has remote work changed the travel landscape? - ABC News (go.com)

Sources

224. Data for development impact: Why we need to invest in data, people and ideas. World Bank Blogs. Available at: Data for development impact: Why we need to invest in data, people and ideas (worldbank.org)

225. Community Living. Available at: Safety Questionnaire.pdf (communitylivingbelleville.org)

226. The Gig Economy and its Effects on Racialized and Immigrant Populations in Toronto. MDB Insights. Available at: MDB Insight – The Gig Economy and its Effects on Racialized and Immigrant Populations in Toronto (icecommittee.org)

227. The Greater Moncton Regional Workforce Development Strategy. MDB Insights. Available at: GM-Regional-Workforce-Strategy_Nov12_2019.pdf (3plus.ca)

228. WHY HATE CRIMES ARE UNDERREPORTED–AND WHAT POLICE DEPARTMENTS HAVE TO DO WITH IT. News@Northeaster. Available at: Why hate crimes are underreported–and what police departments have to do with it - News @ Northeastern - News @ Northeastern

229. Hate crimes, incidents in Hamilton are underreported, police say. CBC. Available at: Hate crimes, incidents in Hamilton are underreported, police say | CBC News

Deloitte.