TOOLKIT FOR CREATING CITY LEVEL DATA BASELINES FOR CHILDREN
TITLE
TOOLKIT FOR CREATING CITY LEVEL DATA BASELINES FOR CHILDREN

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CONTRIBUTORS
Kanak Tiwari, Ishleen Kaur

SUPPORTED BY
Divya Jindal

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NIUA DESIGN TEAM

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CONTACT
National Institute of Urban Affairs
1st and 2nd floor Core 4B,
India Habitat Centre,
Lodhi Road, New Delhi 110003
India
Website: www.niua.org, www.cfsc.niua.org
TOOLKIT FOR CREATING CITY LEVEL DATA BASELINES FOR CHILDREN
The Bernard van Leer Foundation has been a prominent proponent of the idea of shaping cities for the youngest. Under its Urban95 initiative, the Foundation and its partners have highlighted aspects of urban environment that affect the way young children learn and grow. Over the years, we have come to the understanding that for shaping urban environment for young children, it is important to take meaningful and responsive decisions based on systematically collected evidence and a robust data ecosystem.

At the city level, a more detailed account on the status of young children can be realized through dedicated data repositories capturing everyday city living and the progress of every child. These data banks can be instrumental in fostering a practical understanding of where children spend their time, how they interact with their environments, and how different aspects of the built environment impact their health and well-being. This Toolkit aims to strengthen the capacities of the city authorities and urban practitioners in developing these data banks to reinforce children-centred urban planning, design decisions and policy making.

The Toolkit also emphasizes the significance of neighbourhood-level data collection and analysis through the Infant, Toddler, Caregiver Neighborhood (ITCN) Framework developed by BvLF for the Ministry of Housing and Urban Affairs (MoHUA), with evaluation and monitoring metrics focusing on the adequacy and quality of the infrastructure and services accessed by children and their families. Although administrative data collected at all levels of government provide a good starting point, relevant and reliable neighborhood-level data collected by city authorities can reveal contextual specificities of how young children experience the city. Neighborhood conditions and trends can be used to capture child geographies at the local level and can provide valuable insights to city agencies and policy makers as well as to local practitioners and communities.

Neighbourhoods and cities designed thus can be instrumental in reflecting the interests of families and the society in general. They would likely be inclusive, safe, walkable and cyclable, encourage vitality and recreation for all age groups and ensure access to quality infrastructure and services. Data is a vital strand of this process of making cities child- and family-friendly by giving a voice to the youngest citizens and their caregivers. We urge cities to utilize this Toolkit towards promoting data-driven governance.

Rushda Majeed
Country Representative
Bernard van Leer Foundation
India's future is appearing to be predominantly urban, with cities becoming more complex in scale, functions and patterns. In this increasingly urbanized future, data can have a profound impact on modern city planning and design. Evidence base derived from data, analytics and research can change the way of how cities are planned and built and how the residents live, connect and access services.

Indian cities are enormously varying in scale and contexts. However, because of urban programs like Smart Cities Mission, cities have developed the capacity to leverage technology and digitization to track and tackle various issues and challenges. Numerous everyday examples like air pollution and traffic are being monitored with the help of real time data and trends analysis. However, in this rapidly changing urban context with more and more citizens connecting with cities, the youngest remain the most disconnected, thus making them invisible from city planning and design. The smallest of decisions made by city authorities have impact on the day to day life of children and their caregivers. These young children and their families are also a major subgroup accessing urban infrastructure and services. This makes it critical to integrate the aspects impacting their life and well-being to urban interventions.

Collecting data on children can be the starting point to break away from the system of working in silos and move towards “Collaborative Urbanization”. Moreover, real time data collection on various children relevant indicators can provide a continuous feedback loop to the city authorities and in turn impact the quality of life of a larger sub group of population i.e. resident families in the cities. Having developed two baseline studies capturing the national level data on urban children, the CFSC initiative at NIUA understands the challenges of data collection and existing gaps in the data for children. This Toolkit aims to build the understanding on how city level data banks can be developed, assessed and utilized to fill those gaps and ensure informed decision making.

This Toolkit is a result of the collective effort of CFSC team comprising of Ishleen Kaur and Divya Jindal under the guidance of Kanak Tiwari, Team Lead, CFSC. We look forward to extending our research and advocacy towards shaping cities for children.

Hitesh Vaidya
Director
National Institute of Urban Affairs
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infection</td>
</tr>
<tr>
<td>AMRUT</td>
<td>Atal Mission for Rejuvenation and Urban Transformation</td>
</tr>
<tr>
<td>ANC</td>
<td>Antenatal Care</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infection</td>
</tr>
<tr>
<td>AWC</td>
<td>Anganwadi centres</td>
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<tr>
<td>BMI</td>
<td>Body Mass Index</td>
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<tr>
<td>BvLF</td>
<td>Bernard van Leer Foundation</td>
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<tr>
<td>CBO</td>
<td>Community Based Organisation</td>
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<td>CFCI</td>
<td>Child Friendly Cities Initiative</td>
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<tr>
<td>CFSC</td>
<td>Child Friendly Smart Cities</td>
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<tr>
<td>CSO</td>
<td>Civil Society Organisation</td>
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<tr>
<td>ECE</td>
<td>Early Childhood Education</td>
</tr>
<tr>
<td>GEAG</td>
<td>Gorakhpur Environmental Action Group</td>
</tr>
<tr>
<td>HEAL</td>
<td>Health &amp; Education; Accomplished Living</td>
</tr>
<tr>
<td>ICDS</td>
<td>Integrated Child Development Services</td>
</tr>
<tr>
<td>ICPS</td>
<td>Integrated Child Protection Scheme</td>
</tr>
<tr>
<td>ILO</td>
<td>International Labour Organization</td>
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<tr>
<td>IMR</td>
<td>Infant Mortality Rate</td>
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<tr>
<td>ITCN</td>
<td>Infant, Toddlers and Caregivers Neighbourhood</td>
</tr>
<tr>
<td>MHRD</td>
<td>Ministry of Human Resource and Development</td>
</tr>
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<td>MoHFW</td>
<td>Ministry of Health and Family Welfare</td>
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<tr>
<td>NCRB</td>
<td>National Crime Records Bureau</td>
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<tr>
<td>NCT</td>
<td>National Capital Territory</td>
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<tr>
<td>NDMA</td>
<td>National Disaster Management Authority</td>
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<td>NIDM</td>
<td>National Institute of Disaster Management</td>
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<tr>
<td>NFHS</td>
<td>National Family Health Survey</td>
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<td>Non-governmental Organization</td>
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<td>NIUA</td>
<td>National Institute of Urban Affairs</td>
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<tr>
<td>NPA</td>
<td>National Plan of Action</td>
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<tr>
<td>NSSO</td>
<td>National Sample Survey Organisation</td>
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<tr>
<td>RTE</td>
<td>Right to Education</td>
</tr>
<tr>
<td>SAM</td>
<td>Severe Acute Malnutrition</td>
</tr>
<tr>
<td>SD</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SPM</td>
<td>Suspended Particulate Matter</td>
</tr>
<tr>
<td>UNCRCD</td>
<td>United Nations Convention on the Rights of the Child</td>
</tr>
<tr>
<td>UNCRPD</td>
<td>United Nations Convention on the Rights of Persons with Disability</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations International Children's Emergency Fund</td>
</tr>
<tr>
<td>WASH</td>
<td>Water Sanitation and Hygiene</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
DO YOU WANT YOUR CITY TO ..... 

include children as stakeholders as end users?

have enough evidence on spaces and infrastructure for children?

collect data specifically for young children and their families?

become ‘child & family friendly’?
IF YES, THIS TOOLKIT IS FOR YOU!

To advocate child friendly practices, it is imperative to measure the existing responsiveness of the city towards its resident children population and their families. This can be made possible by collecting data specifically for children and using it scientifically to inform planning and design interventions.

With national urban missions like Smart Cities and AMRUT in play, this is a promising time for cities to leverage data for understanding the existing status of young children and their families. Data banks at city and sub-city levels can help establish the priority areas and resolve issues specific to the overall health and well-being of children in our cities.

This toolkit outlines the process of creating data baselines for children in cities of different urban scales and contexts, also elaborating on how this data can be translated into actionable points for decision makers and city agencies.
WHY DO WE NEED CHILDREN RELATED DATA AT THE CITY LEVEL?

India is home to 472 million children belonging to the age group of 0-18 years, comprising 39 percent of the country’s total population. As per the last Census undertaken in 2011, children constitute 27.2% of the urban population cohort. Out of these 128.5 million (27.2%) urban children, 36.6 million are in the age bracket of 0-5 years. All these data figures provide a fair idea of the staggering share of children in the urban population of India.

However, when narrowed down to availability of data at city level, children are barely visible in datasets and hidden in larger numbers and irrelevant statistics. This leads to children being left out from the overall scheme of planning and designing city infrastructure and spaces. While cities are planning for ‘all’, specific needs of children, especially young children and families get overlooked.

The consequences of city planning without any assessment of the existing conditions are adversely impacts all sections of society, but the magnitude of impact on children is significantly higher as their needs remain unaddressed. Issues arising from this are not only representative of the diminished quality of life for children but for other sections of the society, such as women, elderly and the differently-abled. Thus, for cities to function as nurturing, dynamic communities for all age groups, it is best to plan and design them as better places for children first. This calls for assimilating and collecting data for children to create a strong evidence base that can be used to inform the interventions being undertaken by different city agencies.

Data on Infant and Toddlers is the most crucial as the brain develops at its most rapid pace in the first five years of a person’s life. Besides, because of their small size, young children experience the city differently from adults, making the data on their infrastructure and built environment design very important.

To push forward the agenda of ‘child friendly cities’, the first and foremost step is to collect data on children and where they live, learn, play and how do they use the public spaces and streets of the city.
TERMINOLOGY COMMONLY USED THROUGHOUT THE TOOLKIT

Infants and toddlers: Children belonging to the age bracket of 0-5 years, who are dependent on adults for their needs.

The rationale of taking 0-5 years age group is that by the age of five, 90% of the brain’s capacity has already developed.

Caregivers: This subset includes parents, siblings and other members from the immediate family, who spend time with young children. BvLF focuses on parents and caregivers because the way they nurture and support children in their early years is among the most decisive factors in healthy child development.

Urban95: The Bernard van Leer Foundation’s Urban95 initiative seeks to make lasting change in the city landscapes and in the opportunities that shape the crucial first five years of children’s lives. Urban95 works with urban leaders, planners, designers and managers to ask: ‘If you could experience the city from an elevation of 95 cm – the height of a 3 year old – what would you do differently?'
BACKGROUND

CHILD FRIENDLY SMART CITIES

Child Friendly Smart Cities (CFSC) initiative has been spearheaded by the National Institute of Urban Affairs (NIUA) in partnership with the Bernard van Leer Foundation (BvLF). Since 2014, the aim has been to include the needs of children in the urban policy and planning framework of Indian cities. It has been four years of intense learning, stakeholder engagement, and advocacy on a number of levels towards mainstreaming the idea of child friendly urban environments.

Under the initiative, around nine knowledge products have been developed (available at: cfsc.niua.org). Among these, there are two editions of baseline studies (2016 and 2018) comprising national level datasets on urban children. These studies contributed in putting children at the centre of making cities liveable, inclusive and sustainable.

But, most importantly, these studies were instrumental in drawing attention to the outstanding data gaps and insufficient or inaccessible data on children. Lack of data came out as a major hindrance in prioritization of issues and establishment of their relevance and significance, specifically at the level of the cities.

Moreover, it's been realized that young children (0-5 years) are the most hidden in the existing datasets. The absence of data on early childhood makes this cohort of the population even more obscure and excluded from the overall scheme of urban governance, policies, programs, design and management of cities. The resource allocation for this age bracket is also insufficient. However, it is with the focus on this age group that a city can actually become responsive towards children as well as the society in general.

Thus, it was realized that a data nerve centre must be established at the city level that collates and analyses data for children and families to not only inform urban planning and design interventions, but also act as a common repository for all the city departments.
INFANT, TODDLERS AND CAREGIVERS FRAMEWORK, BVLF

Bernard van Leer Foundation (BvLF) under its focus of shaping and improving existing urban areas for children developed a framework for infant, toddlers and their caregivers in collaboration with the Ministry of Housing and Urban Affairs (MoHUA). This framework comprises of five guiding documents encompassing the policy, planning and design guidelines for making cities ITC friendly. One of these documents; ‘Evolution and Monitoring metrics for ITC neighbourhoods’ lays down indicators for assessing the qualitative and quantitative aspects at the neighbourhood level keeping in consideration the localized needs and built environment aspects associated with children and their caregivers.

BvLF advocates towards investing in this population and helping them build their capacities to participate in future economic growth and the cultural life of cities will undoubtedly be the best investment for a sustainable future.

This is the narrative around ‘growth’ that should become part of the national conversation. It is not enough to reduce the infant mortality rate in a country. For a state to have a promising future, it is also essential that we recognize that children need to thrive. One of the ways to manifest this is making children visible in the databases collated by cities.
Who would this toolkit cater to?

This toolkit is primarily a reference guide for the city development authorities, local bodies, elected representatives, planning agencies, service providers and any other department dealing with urban planning and built environment design.

Built environment professionals, civil society organizations, child rights advocates and neighbourhood bodies/community based organizations can also use it to assess gaps at various scales.

Lastly, involvement of the core beneficiaries such as local experts/representatives, community, children and caregivers can contribute to a more comprehensive database especially in the case of collecting primary neighbourhood/ward level data.

LET’S GET STARTED!
PREREQUISITES FOR FORMING A WORK PLAN

Establishing a centre for collating data on children

Cities under various urban flagship missions are becoming more and more oriented to technological advancements and innovations. While there are tools and instruments being developed to facilitate the outreach, monitoring and implementation of these missions, measures must also be taken for a more informed decision making and governance through data revolution and flow of information.

A centre is needed for compiling and organizing the data coming from all the local departments as well as other organizations and academia. Such a centre would also oversee the localization process and continuously monitor and evaluate the progress of cities towards shaping better environment for children and their caregivers.

Cities that have no such provision this is a starting point. However, for cities that have already established data centres and observatories A dedicated unit needs to be set up to:

1. coordinate between different departments.
2. examine and enhance the available data base.
3. look at the existing mechanism of data collection and analysis.
4. sensitize decision makers, service providers and city officials towards needs of children.
5. initiate informed and evidence based decision making with children and families at the centre.
6. translating collated data into children focused city planning, design and management.
FORMING AN INTERDISCIPLINARY CORE TEAM

**URBAN PLANNERS/DESIGNERS**
for integrating the data with city planning and built environment design

**EARLY CHILDHOOD EXPERT**
for bringing the concerns of young children into the data system

**DATA ANALYSTS**
for analysing the collected data and finding outcomes

**SOCIOLOGIST/BEHAVIOUR SCIENTIST**
To make the data collection participatory, and record the social, cultural and behavioural aspects.

**DEMographers**
for data collection, statistical analysis and future projections

**GIS EXPERTS**
for collecting spatial data and mapping the collected data for analysis.

**DEMOGRAPHERS**

**TECHNOLOGY EXPERTS**
for facilitating data collection through technology

(* Shared resources)
Establishing the starting point of the city w.r.t. the stage of implementing data management systems

PILOT STAGE

When a city is beginning to initiate the discourse on becoming child friendly, it is likely that it has only finite data on children and their caregivers. In this case, the data collection exercise needs to start from the scratch with base indicators like whether the city collects any data on children.

Sample indicator: Does the city have data on per capita parks/green spaces?

INTERMEDIATE STAGE

When a city has developed a reasonable understanding and database on the status of children including the demographic data, household level data and basic data on the infrastructure associated with live, play, learn and mobility patterns forming the everyday life of a child and their caregivers.

Sample indicator: Does the master plan/ CDP propose an order/ hierarchy of the parks and play spaces?

ADVANCE STAGE

When a city already has an in depth database and is utilizing this data to inform the interventions for children.

At this level, the city advances to the granular details of the quality of urban interventions for children.

Sample indicator: Are there any guidelines for integrating early childhood play areas/ equipment in different types of parks?
Identifying the scale of the city, governance structure and planning responsibilities

The scale of the city is a crucial attribute in terms of population, geographical extent and decentralization of functions. Before, heading on to the stage of forming a work plan its important to develop a broad understanding of the scale of the city in terms of:

1. resident population/ households (with a focus on children in different age brackets)
2. geographical extent and model of spatial division (sub city/ zone/ area in case of mission cities/ ward)
3. Level of decentralization of functions to understand the varying structures of local government and different departments associated with providing services to children and families.

Example: Delhi
Example: Bhubaneswar/ Pune
Example: Udaipur
Establishing the scope of data collection (considering time and budgetary resources)

The magnitude and scope of the data collection and analysis exercise is governed by time and budgetary resources allocated towards it. In a number of cases, the time and money is not stipulated for data collation in the implementation of policies, missions, interventions or projects. This leads to data becoming an ancillary part rather than a mandatory course of action.

Particularly in the case of children related planning or design interventions, data has been an overlooked aspect rather than a determining factor. Thus, based on the vision and priorities of the city or a project, time and financial resources must be earmarked for collecting and utilizing data.

When collecting data for young children, time becomes an important factor towards providing accurate evidence base. Decennial surveys like the Census of India are unable to provide the most updated or precise data in such cases. Thus, time of collection of data and regularly updating it becomes a crucial part of data on children.

Based on all these, there can be different scenarios.
City level data bank for children and families

Long term extensive exercise with gaps analysis regular updation of datasets

Requires dedicated financial resources and a multidisciplinary team

Data collection for an urban intervention like a redevelopment project

Deep dive with perception and primary surveys of the identified area and activating already existing data

Inventory of real time data that’s collected regularly

It can be time saving if an inventory of indicators that are regularly collected by the city such as air quality, number of births etc. is put in place.

Rapid Assessment
(Refer Page 26)
This can be weeks long with the team required to gather and analyse data for indicators which form a preliminary understanding

Detailed Assessment
(Refer Page 29)
This can last several weeks to several months. It enables a deeper, more nuanced understanding and theorization of a complex challenge or problem.
SCHEMATIC OF CITY LEVEL

- Data Centre
- Establishing the scope of data collection
- Children’s Data Unit with an interdisciplinary core team
- Rapid assessment to get a quick picture of the existing data scene of the city
- Establishing the starting point of the city
- Establishing target population
- Identifying the scale of the city and the governance structure
- Defining indicators
- Data analysis
DATA MANAGEMENT SYSTEM

- Data collection through secondary resources
- Data generation through primary/local level studies
- Informed decision making, Dashboards, Urban design and Planning interventions, Urban observatories

- Data cleaning and consolidation

- Utilization

- Data analysis and Visualization, Trends and projections, Setting priority areas, Identifying pressing issues/gaps across different areas

- Establishing the starting point of the city
- Identifying the scale of the city and the governance structure
- Defining indicators
- Establishing target population
- Rapid assessment to get a quick picture of the existing data scene of the city
- Establishing the scope of data collection

Data Centre
Children’s Data Unit with an interdisciplinary core team
Rapid assessment of the existing status of ITC related data can be used as a formative step by cities to direct the further scope and methodologies before diving into an extensive data collection exercise. Using some core indicators, local bodies can establish a preliminary understanding of the current status of data available on children and families and associated infrastructure and services.

Rapid assessment can be in the form of a checklist, binary questions or the most rudimentary datasets that the local bodies can themselves provide data for. It can help in putting a plan in place for the detailed data collection process; and in some cases also point out urgent gaps and unmet needs of the target population.

Rapid assessment must include the vital indicators that can provide an insight into the major focus areas concerning children and families and how larger city vision and planning strategies include children of all age groups in its story of development.

To understand specifics of ITC group, some big picture indicators and trends such as population density, incoming migration, coverage of basic services etc. also need to be incorporated at this stage. This rapid assessment can also provide a quick picture of the existing data ecosystem of city governments.
INDICATORS FOR RAPID ASSESSMENT

- Crimes against children
- Prevalence of child labour
- Vulnerable children and families (children living in slums or street situations)
- Safety mechanisms/policy

**Socio Economic Indicators**
- Demographic composition (sex ratio, age structure)
- Slum population (poverty status)
- Population Density
- Literacy rate
- Migration flow (number of migrant households)
- Urbanization trend and urban sprawl

**Framework for rapid data profiling of cities relevant to ITC**
- City Vision and how it can incorporate needs of ITC
- Budgetary allocations towards early childhood
- Participation

**Infrastructure and Services**
- Access to basic services (coverage of water supply, sanitation and SWM)
  - Data availability on:
    - Health infrastructure in the city
    - Education Infrastructure in the city
    - Parks and open space infrastructure
    - Housing for families
    - Early childhood provisions

**Governance and Planning**
- Programs/policies relevant to children being implemented in the city
- City master plan/development plan
- Does it include development norms for ITC related infrastructure
- GIS based map
EXAMPLE OF RAPID ASSESSMENT: Assessment of state performance on early childhood well being using four support elements of evaluation

In-depth Assessment
The effectiveness of actions taken by the decision makers are fundamentally dependent on the evidence base created through analysis of quantitative and qualitative data.

For developing a comprehensive understanding and strengthening the evidence based decision making, it is important to undertake a number of baseline studies as well as needs based assessment at the pan city and local level and systematic evaluation of different programs and interventions being implemented in the city.

The different methods for collecting/generating data can be broadly categorized under secondary and primary study. While secondary data collection looks at retrieving information from preexisting sources and records, primary data is information collected and processed directly through observations, surveys, interviews, and focus group discussions.

«This section will build on your existing knowledge on data collection, tailoring it towards how you can collect extensive data on children and families. It would also provide an overview of the different methods of data collection, more specifically for young children. It will also briefly describe the limitations and advantages of different approaches of data collection with respect to children. Lastly, it will provide an outline of the various tools of data collection and best practices with the links to suggested readings and useful resources in case the cities want to learn more on these particular subjects.»

<table>
<thead>
<tr>
<th>BASIS FOR COMPARISON</th>
<th>PRIMARY DATA</th>
<th>SECONDARY DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>Real time data</td>
<td>Past data</td>
</tr>
<tr>
<td>Process</td>
<td>Very involved</td>
<td>Quick and easy</td>
</tr>
<tr>
<td>Source</td>
<td>Surveys, observations, questionnaire, interviews, FGDs etc.</td>
<td>Government publications, websites, books, journal articles, internal records etc.</td>
</tr>
<tr>
<td>Cost effectiveness</td>
<td>Expensive</td>
<td>Economical</td>
</tr>
<tr>
<td>Collection time</td>
<td>Long</td>
<td>Short</td>
</tr>
<tr>
<td>Specific</td>
<td>Always specific to the research team’s needs.</td>
<td>May or may not be specific to the research team’s need.</td>
</tr>
<tr>
<td>Available in</td>
<td>Crude form</td>
<td>Refined form</td>
</tr>
<tr>
<td>Accuracy and Reliability</td>
<td>More</td>
<td>Relatively less</td>
</tr>
</tbody>
</table>
STEP 1

Establishing Target Population
Establishing a target population helps in streamlining the data collection, analysis and updating process as well as identifying the associated stakeholders.

This toolkit has been prepared with a focus on collecting city level data for urban children (0-18 years), particularly young children (0-5 years) and their caregivers.

**Existing data sets available nationally or locally may not conform to the set age range. In such case to establish uniformity from end to end in the whole exercise, the broader target group is 0-18 years with a focused emphasis on 0-5 years.**

### National figures on children and pregnant women in urban India,


<table>
<thead>
<tr>
<th>Percentage of children of total urban population (0-18 years)</th>
<th>Total population of urban children in the age group of (0-5 years)</th>
<th>Registered pregnancies for which the mother received mother and child Protection (MCP) card (%) in urban India</th>
</tr>
</thead>
<tbody>
<tr>
<td>34%</td>
<td>28.5%</td>
<td>87.7%</td>
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</table>
STEP 2

Defining Indicators
After establishing the target population, it is important to device an indicator framework to obtain specific baseline information and align the database with city’s priorities and vision.

The indicators stated and referred in this toolkit have been compiled from the indicator framework formulated by NIUA (I-CHILD at the city level) and BvLF (Evaluation and Monitoring metrics: ITCN framework at the neighbourhood level). Indicators can be selected from among this extensive list and contextualized by cities/users. All these indicators would help the cities to collect data focused on infant, toddlers and children at the city, sub city (ward/zone) and local/ neighbourhood level.

The indicators are spread across various aspects of city planning and built environment design from the lens of various cross cutting areas like health and well-being, care and education, safety, protection and mobility of children and caregivers. These indicators would help capture both quantitative and qualitative data providing cities a broader understanding as well as drawing out critical details of design of urban environment and infrastructure for children.
INDICATORS FOR CHILD FRIENDLY LOCAL DEVELOPMENT (I-ChiLD), NIUA

This document provides indicators to assess the gaps in a city's planning and implementation towards child development with special emphasis on children centric planning and local development.

The rationale for this document stemmed from the need of a database to track child development in an urban environment which can also serve as an urban planning tool. Thus, some of the critical aspects that a database such as I-CHILD needed to track include:

1. **Measures to track childhood** in terms of physical, mental, social, emotional, and cognitive development of children.

2. **Measures to assess the physical and ambient environments in a city** in which a child grows as these help in developing initial skills in learning, interacting, problem solving and decision-making. These environments include different areas and components of the city or urban area, such as educational facilities, the streetscape, or public recreation facilities.

3. **Measuring and tracking various other components from an urban planning perspective that can affect childhood in urban areas** and can help direct policies to improve child development, e.g. safety and crime, pollution levels, health etc.

One of the objectives of this document is to develop descriptive knowledge on how I-Child indicators could be used by cities in India to assess the gaps with respect to children/ their status in planning/ designing cities.

Read more at: https://smartnet.niua.org/sites/default/files/resources/indicatorsl.pdf
Child Friendly Smart Cities

I-CHILD

**Built Environment**
- Housing
- School
- Open Spaces

**Services & Facilities**
- Physical Infrastructure
- Social Infrastructure
- Special Facilities

**Safety and Mobility**
- Personal Safety
- Traffic Safety
- Mobility

**Ambient Environment and Disaster Management**
- Ambient Environment
- Disaster Management

- Physical, Social, Emotional, and Cognitive Development.
- Impact on a Child’s Health and Education

- Physical And Mental Well-being of Children and Youth
- Provide all Children with Learning Abilities, the Ability to Interact and Communicate with Society

- Children’s freedom to move
- Opportunities To Play Outdoors and Interact With Others
- Facilitating Higher Physical Activity Levels in urban children

- Reducing adverse effects of air, water, noise and soil pollution on children
- better health outcomes for children
- livable ambient environment
- Building resilience against disaster and climate change
EVALUATION AND MONITORING FRAMEWORK: Infant, Toddlers and Caregivers Neighbourhood Framework, BvLF

Evaluation and monitoring metrics document under ITCN framework measures aspects of the city that influence the daily lives of infants, toddlers and caregivers. It contains a set of 65 indicators that officials can use to measure the quality of a neighbourhood for ITC needs. ITC Data indicators are identified for each objective at the neighbourhood level. They contribute to the evidence base at hand for city managers and support a clear understanding of the needs and challenges facing ITCs. The indicators measure the spatial components that influence ITCs experience of the neighbourhood and therefore their overall wellbeing. By providing a measured overview, they signal priorities for decisions and actions.

The indicator set was created through a process of literature review, expert input from the fields of urban management and early childhood development, and a peer review feedback cycle. The key features of the indicator list are:

- To provide a comprehensive view of the conditions of neighbourhood spaces and services pertinent to ITCs.

- To be economical in length: offering the essential data needed to make sound decisions especially around spending.

- Divided into a two-level hierarchy of “core” and “supporting” offering guidance on where what to prioritize in gathering.

These evaluation metrics support a cyclical process of assessment, reviews, learning and improvement. The evaluation metrics are made up of three interrelated parts; data indicators, service level benchmarks and an ITC dashboard.¹

Neighbourhood
Streets
Parks and Open Spaces
Social Infrastructure
Urban Services
Neighbourhood
STEP 3

Identifying data sources
The process of collecting data from all the relevant sources constitutes the secondary data. Secondary data forms the core of the exploratory phase of the data collection process initiated by any city. It is less capital extensive and time consuming and can be instrumental in forming a strong base for the city level data bank. It can also direct the cities at a very initial stage about the various lines of enquiry and alternative course of actions that need to be pursued. It can help in establishing the scope and definition for primary research by highlighting the prevailing issues and data gaps a city has to fill.

However, city officials need to evaluate both the quality of data and the source, making sure that:

1. Data and sources are clearly defined.
2. There is no source bias, particularly in the case of commissioned studies.
3. The data is collected from a reliable source.
4. The time period in which data has been assimilated.

Secondary data can sometimes yield more accurate results that primary data collection exercises conducted in a short span of time. Using multiple sources of data can also assist in confirming/cross checking the authenticity and accuracy of data. This data is usually in a refined form and can be used without any further examination. However, the city level data isn’t readily available in large scale national surveys and needs to be extracted from these databases.
INVENTORY OF DATA SOURCES ON CHILDREN AND FAMILIES: National surveys

CENSUS OF INDIA
1. FREQUENCY: Every 10 years
2. SCOPE: Basic demographic characteristics for the entire resident population
3. POTENTIAL DATASETS: Socioeconomic and demographic characteristics (individual level), Housing amenities, household goods (household level)
4. TARGET POPULATION: Complete enumeration of population statistics down to the district level, state and regional level and can be disaggregated by social categories.

SAMPLE REGISTRATION SYSTEM
1. FREQUENCY: Last SRS study was taken out in 2017
2. SCOPE: State and union territories
3. POTENTIAL DATASETS: Infant mortality widely accepted as a crude indicator of the overall health scenario of a country or a region, child and maternal mortality, natural population growth
4. TARGET POPULATION: In urban areas, the sampling unit is a census enumeration block with population ranging from 750 to 1000.
NATIONAL AND FAMILY HEALTH SURVEYS (NFHS)

1. **FREQUENCY:** Last round of NFHS was published in 2014-15.
2. **SCOPE:** It’s a sample survey providing state and national information for India.
3. **POTENTIAL DATASETS:** Fertility, infant and child mortality, the practice of family planning, maternal and child health, reproductive health, nutrition, anaemia, utilization and quality of health and family planning services. Additionally covers perinatal mortality, adolescent reproductive health, high-risk sexual behaviour, safe injections, HIV, tuberculosis, and malaria, non-communicable diseases, and domestic violence.
4. **TARGET POPULATION:** NFHS 4 covered 640 districts and 568,000 households.

REPRODUCTIVE AND CHILD HEALTH - DISTRICT LEVEL HOUSEHOLD SURVEY

1. **FREQUENCY:** Last round of DLHS (DLHS-4) was published in 2012-13.
2. **SCOPE:** Data published at national level with district estimates.
3. **POTENTIAL DATASETS:** Family planning, maternal and child health, reproductive health of ever married women and adolescent girls, utilization of maternal and child healthcare services at the district level for India. In addition, DLHS also provides information on new-born care, post-natal care within 48 hours, role of ASHA in enhancing the reproductive and child health care and coverage of Janani Suraksha Yojana (JSY).
4. **TARGET POPULATION:** The survey has been planned in 336 districts in the remaining 26 states and Union Territories (UTs) excluding those covered under Annual Health Survey. Around 1400 households with a population of approximately 7000 per district are planned to be covered under this programme.
INVENTORY OF DATA SOURCES ON CHILDREN AND FAMILIES: Examples of studies on children administered by government agencies

RAPID SURVEY ON CHILDREN (RSOC)

1. FREQUENCY: Last RSOC study was published in 2013-14
2. SCOPE: RSOC collected data of about 121,987 children below 6 years from surveyed households in 28 states and Delhi.
3. POTENTIAL DATASETS: It covered aspects of child development, maternal care, school/college attendance among persons aged 5-24 years, early childhood care and pre-school education and the enabling environment like access to drinking water, use of toilet facilities and information on ICDS related infrastructural facilities
4. TARGET POPULATION: Indicators identified by the MoWCD mainly related to the well-being of children below 6 years and their mothers

ELEMENTARY EDUCATION IN INDIA (STATE REPORT CARDS)

1. FREQUENCY: Last study was published in 2015-16 (an annual survey)
2. SCOPE: The study collects data in all the 680 districts in the 36 states of India
3. POTENTIAL DATASETS: Quantitative as well as qualitative information on all the school related variables such as infrastructure, facilities, enrolment and teachers. (*raw data also available)
4. TARGET AREA: More than 1.45 million schools imparting elementary & secondary education have been covered. These include recognised and unrecognised schools as well as madrasas.
District (Udaipur) level information at school geo-portal developed by Department of School Education and Literacy, Ministry of Human Resource Development (Available at: https://schoolgis.nic.in/)
OPEN GOVERNMENT DATA PLATFORM BY GOVERNMENT OF INDIA

This portal is a single-point access to datasets, documents, services, tools and applications published by ministries, departments and organisations of the Government of India. Set up by the National Informatics Centre (NIC) in compliance with the Open Data Policy (NDSAP) of India, OGD platform gives access to government-owned shareable data for public use and community participation.

“This platform provides datasets for a number of broad urban aspects such as drinking water and sanitation, health, education and basic demographic indicators to datasets specific to children such as crime against children, data on elementary schools etc.”
INVENTORY OF DATA SOURCES ON CHILDREN AND FAMILIES: Examples of online open source data

WORLD COUNCIL ON CITY DATA OPEN DATA PORTAL

The WCCD hosts a network of innovative cities committed to improving services and quality of life with open city data and provides a consistent and comprehensive platform for standardized urban metrics. ISO 37120 was developed using the Global City Indicator Facility (GCIF) framework with a network of over 250 cities globally.

The indicators are categorized under 17 themes on city services and quality of life. These indicators can be used to track the city’s progress in delivering city services and ensuring quality of life.

Read more at:
https://open.dataforcities.org/

“Currently, four Indian cities including Pune, Ahmedabad, Surat and Jamshedpur have registered themselves on the portal.

The portal highlights the indicators for which data is not available.”
ASSIMILATING DATA FROM DIFFERENT GOVERNMENT AGENCIES/DEPARTMENTS AT CITY LEVEL
MENT AGENCIES/DEPARTMENTS AT CITY LEVEL

Ministry of Women and Child Development

- National Commission for Protection of Child Rights
- Integrated Child Development Scheme (ICDS)
- Integrated Child Protection Scheme (ICPS)
- State Commission for Protection of Child Rights
- District Welfare Officer
  - Block Level: Child Development Project Officer
  - Cluster Level: Supervisors
- Childline (Child Vulnerability Mapping)

Ministry of Housing and Urban Affairs

- Ministry of Housing and Urban Affairs
- Pradhan Mantri Awas Yojana
- Swachh Bharat Mission
- AMRUT
- Smart Cities Mission
- Town and Country Planning Organization
- Development Authority/Planning agency
- City Improvement Trust
- Municipal Corporations/Ward Committees
- Municipalities/Nagar Palika
- Social Welfare
- Health
- Engineering (Building, Infrastructure and Services)
- Emergency Services
- Nature and Environment
- Solid Waste Management

Ministry of Health and Family Welfare

- Child Health Program (NHM)
- Labour room quality improvement initiative - LAQSHYA
- Mother and Child Tracking System (MCTS)
- National Institute of Public Cooperation and Child Development
- National Commission for Protection of Child Rights
- State Commission for Protection of Child Rights
- Central Social Welfare Board
- Food and Nutrition Board

Department of Empowerment of Persons with Disabilities

- Accessible India Campaign
- The National Trust
- DISHA
- Early Intervention and School Readiness Scheme
- VIKAS
- SAMARTH
- Respite care

Ministry of Social Justice and Empowerment

- District Disability Rehabilitation Centres (DDRC)
- Directorate/Commissioner of Persons with Disabilities

Ministry of Housing and Urban Affairs

- Smart Cities Mission
- Swachh Bharat Mission
- Pradhan Mantri Awas Yojana
- AMRUT
- Municipal Corporations/Municipality/Nagar Palika
- Ward Committees
- Development Authority/Planning agency
- City Improvement Trust
- Health Engineering (Building, Infrastructure and Services)
- Solid Waste Management
- Emergency Services
- Nature and Environment
- Social Welfare

Healthcare:

- Child Health Program (NHM)
- Labour room quality improvement initiative - LAQSHYA
- Mother and Child Tracking System (MCTS)
- Facility Based Newborn and Child Care
- Mother Newborn Care Units
- Facility Based Pediatric Care
- Nutrition Rehabilitation Centres
- School Health Program
- District Early Intervention Centres (DEICs)

Education:

- National Institute of Public Cooperation and Child Development
- National Commission for Protection of Child Rights
- State Commission for Protection of Child Rights
- Central Social Welfare Board
- Food and Nutrition Board

Child Development:

- Integrated Child Development Scheme (ICDS)
- Integrated Child Protection Scheme (ICPS)
- State Child Protection Unit
- District Child Protection Unit
- Childline (Child Vulnerability Mapping)
- District Welfare Officer
- Block Level: Child Development Project Officer
- Cluster Level: Supervisors

Social Welfare:

- National Institute of Public Cooperation and Child Development
- National Commission for Protection of Child Rights
- State Commission for Protection of Child Rights
- Central Social Welfare Board
- Family Welfare Centres
- State Social Welfare Board

Urban Development:

- Smart Cities Mission
- Swachh Bharat Mission
- Pradhan Mantri Awas Yojana
- AMRUT
- Municipal Corporations/Municipality/Nagar Palika
- Ward Committees
- Development Authority/Planning agency
- City Improvement Trust
- Town and Country Planning Organization
- Health Engineering (Building, Infrastructure and Services)
- Solid Waste Management
- Emergency Services
- Nature and Environment
- Social Welfare SPV

Education and Healthcare:

- Child Health Program (NHM)
- Labour room quality improvement initiative - LAQSHYA
- Mother and Child Tracking System (MCTS)
- Facility Based Newborn and Child Care
- Mother Newborn Care Units
- Facility Based Pediatric Care
- Nutrition Rehabilitation Centres
- School Health Program
- District Early Intervention Centres (DEICs)
ASSIMILATING DATA FROM DIFFERENT AGENCIES/ DEPARTMENTS AT CITY LEVEL: Examples of studies/online resources on children developed by different local agencies

1. **Mapping of child care institutions in Delhi** by Delhi Commission for Protection of Child Rights
   Available at: [http://dcpcr.delhi.gov.in/wps/wcm/connect/doit_dcpcr/DCPCR/Publication/CCI+in+Delhi](http://dcpcr.delhi.gov.in/wps/wcm/connect/doit_dcpcr/DCPCR/Publication/CCI+in+Delhi)

2. **Children in street situations- Life on Pune streets** by Pune Municipal Corporation
   Available at: [https://www.pmc.gov.in/sites/default/files/project-glimpses/Pune-Street-Children-Survey-Report.pdf](https://www.pmc.gov.in/sites/default/files/project-glimpses/Pune-Street-Children-Survey-Report.pdf)

3. **Children of Migrant Poor in Kolkata** by Institute of Social Sciences and UNICEF

4. **A quick evaluation study of Anganwadis under ICDS** by NITI Aayog

5. **Report of Committee on Child Labour** by Labour Department, Haryana
   Available at: [https://hrylabour.gov.in/staticdocs/labourActpdfdocs/Child_Labour_Rules.doc](https://hrylabour.gov.in/staticdocs/labourActpdfdocs/Child_Labour_Rules.doc)

6. **City Health Plan 2016 - 2020** by Pune Municipal Corporation and Save the Children
   Available at: [https://www.savethechildren.in/sci-in/files/ba/ba8bb6e7-1484-4fd9-8f0b-811021351c9e.pdf](https://www.savethechildren.in/sci-in/files/ba/ba8bb6e7-1484-4fd9-8f0b-811021351c9e.pdf)
ASSIMILATING DATA FROM GOVERNMENT PROGRAMS/ PLANS/ INITIATIVES

1. Data collected for Smart city proposals
2. Data from Integrated Command and Control Centres set up under the mission

1. Data collected for Service Level Improvement Plans (SLIPs)
2. Data on mission MIS
3. Data collected for Ease of Living Index

1. City Master Plan
2. City Development Plan
3. GIS Plan
4. City Sanitation Plan
5. City Mobility Plan
6. City Heat Maps
7. Disaster Management Plans
8. Satellite Imagery of the city

1. 4 NIC data centres established in New Delhi, Pune, Hyderabad and Bhubaneshwar
2. 30 NIC’s state data centres
ASSIMILATING DATA FROM STUDIES BY THINK TANKS, NGOs AND CBOs

1. **UNICEF India**

   **Suggested Reads:**
     Available at: http://unicef.in/Uploads/Publications/Resources/pub_doc143.pdf
   - WASH Atlas Unpacking the Census 2011 Data on Water & Sanitation, Maharashtra
     Available at: http://unicef.in/Uploads/Publications/Resources/pub_doc51.pdf

2. **Save the Children, India**

   **Suggested Reads:**
   - Life on the street: Street children survey in 5 cities: Lucknow, Mughalsarai, Hyderabad, Patna and Kolkata-Howrah
     Available at: https://www.savethechildren.in/sci-in/media/PDFs/LIFE-ON-THE-STREET-%28Final%29-Rev-4.pdf
   - Situation of Maternal and New Born Health in Urban Slums of Bhubaneswar
     Available at: https://www.savethechildren.in/sci-in/files/ef/eff6b6ff-af30-4051-96f9-a0ad7f327b12.pdf

3. **World vision India**

   **Suggested Reads:**
   - India child well being report 2019
     Available at: https://www.worldvision.in/CMSAdmin/Uploads/IndiaChildWellbeingReport_Web_Sep9th.pdf

4. **Greenpeace**

   **Suggested Reads:**
   - Airpocalypse: Assessment of Air Pollution in Indian Cities

5. **Gorakhpur Environmental Action Group**

   **Suggested Reads**
   - Children focused vulnerability assessment and city resilience action strategy of four cities
     Available at: https://geagindia.org/geag-publications?page=0
STEP 4
Generating Data: Primary data collection
For young children, the extent of their understanding and exploration of the world begins from their homes and surroundings. For ensuring an environment conducive to their development and wellbeing, while also providing them a mix of physical and mental stimuli, a detailed evaluation of their immediate surroundings and neighbourhood is the most crucial part of designing for children. This includes housing, liminal spaces, street patterns, accessibility and design of open spaces as well as learn and care facilities. Besides assessing the qualitative aspects, the adequacy of the infrastructure in terms of numbers is also as important.

In the context of Indian cities, the data dependency is largely on Census and surveys conducted by the federal ministries. All these surveys are a credible sources of data, however, they barely capture the metrics at the city level, particularly for children. Because of this lack of city level data on children particularly infants and toddlers, data generation though primary collection exercises is very crucial for the city. It can be seen as a deep dive towards building an understanding of the city planning and design determinants for development and well-being of children and their families.

The purpose of this section is to build an understanding towards generating first hand data of the perspective of users and their experience of city spaces, making this data more reliable and updated. It also provides an opportunity to the city managers to include datasets and information that is not available through secondary data sources compiled by the city. Moreover, it can capture the qualitative and experiential aspects of local urban environment and infrastructure, which cannot be discerned by secondary data.
Data collection exercise can be streamlined with a better understanding of the focus of the exercise. This focus of data collection can be guided by the local authority based on either the specific subgroups of the target population (for e.g. pregnant mothers or infants), on prevalent issues that may be of concern to the city such as lack of basic infrastructure or on some identified potential areas/vulnerable pockets. All the three methods overlap with each other and stakeholders may be able to influence these identification methods. These different methods are described in detail in this section.

1. Identified subsets of the target population (beneficiaries) or potential stakeholders
One of the ways of focusing the data collection exercise is to center it around either a specific subset of the target population who would be benefitted or the probable stakeholder agencies that would use this data as evidence to inform strategies or design interventions. Establishing this would provide direction to the data collection exercise, at the same time contributing to very diverse outcomes.
For developing a deeper understanding of the intricacies of specific beneficiary or stakeholder groups as well as developing a comprehensive resource having disaggregated data, various alternative approaches of establishing a focus group can be:

**Age groups:** Disaggregating data on the basis of age groups can highlight the specific needs of that age group and provide insights into the existing gaps in planning and design from their vantage point. Based on the existing conditions on site and the dominant densities, the established age group can be further divided into pregnant women, 0-2 years and 2-5 years to capture their distinct needs.

**Caregivers:** Varying data points and perspectives can be assimilated from different caregiver groups. Caregivers can include parents, grandparents, siblings, teachers, ASHA workers (care takers in early childhood centres), child psychologists etc., people who spend most of their time with children and have an understanding of the factors enabling or inhibiting their development and well-being.

**Line Departments:** City level departments responsible for implementing various policies and programs for children or handling the development and maintenance of infrastructure in the city can provide a comprehensive status of the gaps in the city, also providing information on future population projections, demands and unmet targets. These line departments can range from departments like women and child development, education, health, social justice etc.; state commissions like commission for protection of child rights to local agencies responsible for water supply, sanitation and solid waste management or development authorities administering master/development plans.

2. **Sector/ Issue**

Data collection disaggregated on the basis of city wide thematic areas or prevailing issues that effect children and families can be another way to make the whole exercise more streamlined and systematic. This method of data collection can provide a profound understanding and credible evidence on the gaps in particular sectors or the most daunting issues faced by the city.

**Example of Issue- Based Data collection:** This approach to data collection is largely about creating an evidence base for issues that have been already identified by the city managers and what is their impact on children and
### Vital Indicators for Children

<table>
<thead>
<tr>
<th>Health (Physical and Mental)</th>
<th>Pregnant Women</th>
<th>0-2 years</th>
<th>2-5 years</th>
<th>Built Environment Indicators (ITCN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition</td>
<td></td>
<td></td>
<td></td>
<td>NEIGHBOURHOOD</td>
</tr>
<tr>
<td>Counselling during pregnancy and post birth</td>
<td></td>
<td></td>
<td></td>
<td>% of buildings within 300m distance or 5 - 10 min walking distance of a public facilities like day care centres, pre-primary and primary schools, primary health facilities, local markets</td>
</tr>
<tr>
<td>Access to healthcare: Antenatal care, Baby clinics</td>
<td></td>
<td></td>
<td></td>
<td>% of crèches within accessible 500m distance from housing cluster/ work place</td>
</tr>
<tr>
<td>Maternal Education</td>
<td></td>
<td></td>
<td></td>
<td>SOCIAL INFRASTRUCTURE</td>
</tr>
<tr>
<td>Immunizations</td>
<td></td>
<td></td>
<td></td>
<td>Presence of Dispensary in the neighbourhood</td>
</tr>
<tr>
<td>Early Childhood stimulation and development</td>
<td></td>
<td></td>
<td></td>
<td>Presence of affordable health clinic inside (Anganwadi) the neighbourhood</td>
</tr>
</tbody>
</table>

### Well being

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Access to non-polluted and clean urban environment</th>
<th>Prevention against acute respiratory diseases</th>
<th>Exposure to Nature</th>
<th>Time with caregivers</th>
<th>Access to play</th>
</tr>
</thead>
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<td>Access to non-polluted and clean urban environment</td>
<td>Prevention against acute respiratory diseases</td>
<td>Exposure to Nature</td>
<td>Time with caregivers</td>
<td>Access to play</td>
<td>ITCN Indicators capturing critical information across different age groups from birth (-9 months to 0 years) to 5 years, highlighting their fundamental needs and requirements</td>
</tr>
</tbody>
</table>
Pregnant Women

0-2 years

2-5 years

Built Environment Indicators (ITCN)

Vital Indicators for Children

Early Childhood care, education and learning

- Early childhood and pre-primary programs
- Quality primary education
- Cognitive and social skills development
- Early detection of learning disorders
- Safe place for working parents

Access to Basic Services

- Access to clean water
- Adequate Sanitation
- Hygiene/ Hand washing

NEIGHBOURHOOD

- % of buildings within 300m distance or 5 - 10 min walking distance of public facilities like day care centres, pre-primary and primary schools, primary health facilities, local markets

SOCIAL INFRASTRUCTURE

- Total Number of Private kindergarten in the neighbourhood and whether they have attached outdoor space
- % of Government schools that allow usage of school campuses during non-school hours

STREETS

- % of streets with adequate lighting of walk zone/ footpath/ sidewalk at major routes in neighbourhood
- Encroachment on NMT roads at neighbourhood level by Vehicle Parking (%)
- Presence of traffic calming measures in the neighbourhood and average speed of vehicles in the neighbourhood
- Presence of informal way finding in the vicinity of schools and parks
- Presence of no honking zones in the neighbourhood
- Fatality rate for pedestrian and NMT (%)

URBAN SERVICES

- Household level coverage of SWM services through door-to-door collection of waste
- % of parks, schools, and other public plots within the neighbourhoods with rainwater harvesting systems
- Percentage of households with renewable source of energy like Solar/PNG etc.

families. This method can be effective in forming an evidence base and bringing out the different interlinked and overlapping aspects responsible for the exacerbation of issues and their impact on young children. Both sector based (health, education, safety etc.) and issue based (air pollution, stunting etc.) models of data collection can be useful in informing urban programs/policies as well as in forming a rationale for focused interventions towards improving quality of life for children and their caregivers.

3. Location-based data collection:
In this method, city officials can identify locations based on the precedence set by secondary study of the city, identifying pockets in a city that are the most vulnerable and in need of intervention. These areas of intervention can range from wards to neighbourhoods to nodes catering to high footfall of children.

"While sector based method can provide direct outcomes to the associated departments, issue based method looks at integration of different overlapping aspects, thus requiring a comprehensive and collective effort from various city agencies and actors."

Issue based data collection: Data collection based on issue would require studying various interlinked urban aspects. For example, the above figure shows that a number of datasets would need to be collected to study stunting in children in a city; Source: NIUA

For example, Bhubaneshwar, for its parks and open spaces master plan identified five pilot wards after an analysis of various attributes in all the wards of the city based on data assimilated from Census 2011 and an open area focused preliminary analysis.
Location based data collection: Example of Bhubaneswar choosing five priority wards based on a secondary data analysis for further indepth study at the ward level and subsequent interventions based on the data analysis;

Source: Presentation on ‘Utilising data for decision making by Bhubaneswar Development Authority in Urban95 Peer Cities Learning Workshop (25–26 July 2019)
Tools for data collection
After establishing the target population or area the next step is ruminating on the methods that can be used to collect data based on a general understanding and base data from secondary study. There are a number of existing alternatives for collecting data such as sample surveys, focus group discussions, observation based documentation etc. which can bring out the quantitative as well as qualitative aspects at the local level and can be extrapolated to give a general idea of the ward/area in a city. All this local level data can become a base for inferring the overall patterns and conditions at the city level.

Collecting data from children and parents for the purposes of evaluation can be challenging. Traditional methods of data collection such as surveys and interviews are not effective for young children (0-5 years). It can be difficult to collect data directly from children that accurately and authentically reflect their needs and experiences and in some cases parents may be wary of providing the information.

However, despite the challenges, these processes provide opportunities to parents and children to be heard. Being heard and listened to as respected citizens in their own right enhances children’s feelings of importance in their community. Children can also offer a unique perspective that may help decision makers and service providers develop new perspectives.

“When children have opportunities to be heard and listened to as respected citizens in their own right rather than being viewed as ‘citizens of the future’; their feelings of importance to their community is enhanced.” 11

This section lays down the conventional methods of collecting data which are routinely used as well as some global best practices elaborating on ways in which they can be made more suitable for young children and their caregivers. It also elaborates on a number of new tools leveraging technology and innovation to achieve more in depth and far reaching data findings.
BASIC DATA COLLECTION TOOLS: INTERACTION AND PARTICIPATION BASED

One on One surveys are not an effective method for young children, however, they can be designed to record information from caregivers and community. These surveys have to be designed according to the representative group ranging from interviews with the main caregivers, older siblings, workers at early childhood centres, teachers at primary schools, mobility service providers for schools to community representatives, local CBOs and NGOs working for children.

The surveys can also be designed based on an already identified issue/subject by the local body to assess its scope and magnitude, proportion of the population affected, the infrastructural gaps and their spatial/geographical spread and representation.

If done manually, this exercise can become very expensive and time consuming, especially when large and widely spread geographical sample is taken. An innovative alternative for this is crowd sourcing using social media and mobile applications, that can be designed to get relevant information on different factors affecting children in the city.
**Quantified Cities Movement by CDSA, Pune**

The Quantified Cities Movement has been created by the Centre for Development Studies and Activities (CDSA) to enable citizens to participate in the process of monitoring and improving their city. The QCM framework is designed to help citizens and the government identify problems, agree on solutions and manage the city on a day to day basis. The iNagrik app is at the heart of the QCM framework and enables citizens to report, track and share issues and solutions from all around your city. The platform aims to improve urban planning and create resilient cities by building transparency and accountability through facilitating all citizens to participate in the process of decision making at the local level.

The Pune Municipal Corporation has included the Quantified Cities Movement as one of the 15 proposed smart cities initiatives for Pune City. The reports from this app will be submitted to the Pune Municipal Corporation (PMC), elected representatives and Civil Society Organizations (CSOs) in order to formulate evidence-based, decentralized participatory local area plans.¹²

**Tools and Technology:**

**Mobile application, Citizens Dashboard:** Citizens registered with QCM can track the reports which they have uploaded to the system as well as the action taken by the authorities through maps, graphs and infographic

**Administration dashboard:** Grievances or emergencies reported through iNagrik app get routed through QCM framework to respective administrative departments in order to respond to problems.

**Expertise required:** can be used by anyone regardless of age, gender or occupation; Administrative officer placed at the local agency

**Read more at:** https://qcmweb.org/
DATA COLLECTION AND MAPPING: INFRASTRUCTURE AND SERVICES

Data Package for Infants, Toddlers, and Caregivers in Tirana, Albania

The data package is designed with a narrow lens to measure the qualities of a city: focusing on issues that pertain specifically to infants, toddlers, and their caregivers. It has six dimensions, each covering a group of indicators that can be monitored over time, with initial benchmarks established whenever possible:

• **Material wellbeing** assesses monetary deprivation at the household level and income inequality by neighbourhood.

• **Healthy start to life** covers the most pressing issues—infant mortality, breastfeeding, and baby-infant nutrition—especially among the most vulnerable economic groups.

• **Education** monitors children’s participation in the formal education system, the number of education facilities, and caregivers’ involvement in early childhood development.

• **Trauma** exposure targets exposure of children and mothers to factors such as partner violence, household drug abuse, and sexual abuse.

• **Environment and built environment** together monitor infrastructural improvements to make the city more walkable, safe, clean, and health.

These indicators can be visualised on maps and are easily translated to a visual dashboard—a tool that the municipality of Tirana would develop.

These data and tools provide an unprecedented opportunity to characterize the built and social environments of urban spaces and urban health.¹³
Tools and Technology:
Mobile app, Outcome Dashboard, GPS system, GIS based interface for analysis

Expertise required: Trained volunteers for collecting site based information, Urban professionals, Early childhood experts and GIS experts for analysis

Read more at:

Indicators make neighborhoods visible in new ways to designers, July 26 Source: Twitter, @Qendra_M
Map My Community, Dr. Sophie Hadfield,

It is a research app enabling researchers to gather data on participant's use of the built environment, movement through and their feelings and experiences of it. There are three components to the mobile app:

Map my week: Gathers data on everyday life, mobility and use of community space.

Explore that space: This feature enables the research team to pre-define specific areas of the urban environment to prompt information from users.

Capture that: This enables participants to share with researchers their emotional responses to specific features of the built environment. They are able to take photographs and comment on what they like or think needs improving.

The project collected evidence about the experiences of children and young people in across 20 informal housing settlements across Delhi.

It aims to influence city master plans, zonal development plans and urban development policies – leading to creation of child friendly cities.14

Data Collection and Mapping: Behaviour and Use of Space

Tools and Technology:
Mobile App, Outcome dashboard

Expertise required:
App that can be used by older children after training to capture city experience from their vantage point

Read more at:

Urban researchers and children experts to extract information from data recorded by them.
DATA COLLECTION:
WEB-BASED PUBLIC PARTICIPATION GEOGRAPHIC INFORMATION SYSTEMS (PPGIS)

Responses from the Maptionnaire survey of my Health Geography class, https://maptionnaire.com/blog-list?year=2017

One example on online PPGIS system is Maptionnaire. It is a map-based survey tool which facilitates simple and effective public participation. The online questionnaire editor allows for the independent creation, customization and publishing of survey projects.

Maptionnaire enables planners and researchers to collect, analyze and visualize map-based data, as well as citizens to co-design project areas and express their preferences and opinions.  

It has been used in various participatory studies on urban environment for children, such as:

1. How Children Can Influence City Planning – Bringing Public Participation to Schools; Available at; https://maptionnaire.com/blog-list/bringing-public-participation-to-schools

By incorporating a range of enjoyable and challenging activities, and different tools, these activities can be made more effective for children.

Focus group discussions are organized discussions to capture the perceptions and point of views of a group of people. This can range from the members of a community or an association of residents to a group of parents, teachers, ASHA (anganwadi) workers, child experts or any other group closely related to or working closely with children. Parents and children are unlikely to share information with people they do not know or trust. Local NGOs and CBOs working on ground can be instrumental in building and maintaining relationships of trust and organizing these discussions.

**Tools and Technology:**
No specific tools and technology required,

**Expertise required:**
Presence of familiar people like teachers/ local representatives/ caregivers or a local CBO can be effective for discussion with children.

**Read more at:**
https://www.gcph.co.uk/assets/0000/6008/Hands_Up_Survey_report.pdf
Involving children in the process i.e., design, implementation, analysis can provide personal insights of how children perceive spaces used by them.

Conducting a co-design session with 3-6 years age group is especially challenging because of the children’s developmental stage. For children of this age, it is important to invite parents or teachers to the sessions, because they can help to fully understand what the children are saying, doing, or making and can provide greater context. This can be done using various exercises.

**Context mapping**—This method lets you understand a child’s world—what they value or like and how they perceive different aspects of their day to day environment.

**Pop up/ Tactical interventions**: Pop up/ tactical interventions can help demonstrate the use and likeability of any space for children using temporary interventions, eventually leading to permanent design measures.

**CO-DESIGNING**

Read more at: https://studiolab.ide.tudelft.nl/studiolab/codesignwithkids/tools/

**Exploratory models**

LEGO workshop organized by ARUP and BvLF to find solutions from young children children related to issues of streets, buildings, cities, role of open spaces and air quality in cities. Source: Presentation by Sachin Bhoite from ARUP, London at CFSC conference on Reimagining Urban Childhoods (March 2019)
BASIC DATA COLLECTION TOOLS: OBSERVATION BASED

Audits are basically field studies requiring systematic observation. They provide an opportunity to assess the qualitative aspects of built environment and establish their inter-linkage with health and well being of the children in the community. They can be instrumental in bringing out contextual factors and fine grained details affecting resident children and their families and can also be used for ground truthing of an existing database.

**Toolkit for measuring urban experiences of young children**

In collaboration with Bernard van Leer Foundation’s Urban95 program, Gehl has developed tools to better understand the experience of small children (ages 0-5) and their caregivers in cities. This tool provides insight into public life by helping understand the life of a place and what physical changes to the environment will create a more sustainable and liveable city for all. It can be used at different levels of the planning process depending on the intended outcomes. The tools presented are tailored to small children and their caregivers and can be used to record the following:

- **People moving count:** people moving through an area at a given time
- **Stationary activity mapping:** kinds of stationary activities are happening in a place
- **Intercept surveys:** information about why caretakers and their children are spending time in a place
- **Sensory mapping:** maps how children’s senses can be used in the built environment

**Expertise required:** Trained researchers/ surveyors or architecture/ urban studies students

**Read more at:**
Urban95 walking tours led by BvLF looks at the public spaces from a height of 95cm, the average height of a healthy 3-year-old using an Urban95 viewing stick. This can help urban planners, designers and policy-makers to integrate early years thinking into improving city environments, to observe and reimagine cities from the vantage point of a child.18

Read more at: https://bernardvanleer.org/news/participants-reflect-on-urban95-london-walking-tour/

The BvLF team hosted a walking tour in London where participants were encouraged to take the perspective of young children and consider potential issues and solutions they saw in different public spaces. This helped in actively engaging the planning and design communities as well as the city officials.

BvLF representatives with Urban95 Walking stick, Source: https://bernardvanleer.org/cases/convenings-bring-new-ideas-on-urban95-and-parents/

THE FIVE MINUTE WALK

The 5-minute walk, also known as the “pedestrian shed” is considered to be the distance people are willing to walk before opting to drive. Based on the average walking speed a five-minute walk is represented by a radius measuring 400 meters. This rule of thumb is used to determine access to destinations within neighborhoods.

A tool has been developed by Morphocode that explores various urban metrics, based on walking distances of a designated location. The tool provides access to location-specific data in a fast and intuitive way, covering topics like land use mix, access to destinations and mobility. Read more at: https://morphocode.com/the-5-minute-walk/

LAND USE MIX

<table>
<thead>
<tr>
<th>LAND USE</th>
<th>TIMES SQUARE PLAZA</th>
<th>CORONA PLAZA</th>
<th>MYRTLE AVENUE PLAZA</th>
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<tbody>
<tr>
<td>ONE &amp; TWO FAMILY</td>
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<tr>
<td>MULTI-FAMILY</td>
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<td>TRANSPORTATION</td>
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<td>PUBLIC FACILITIES</td>
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<td>PARKS</td>
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<tr>
<td>VACANT LAND</td>
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<td>NO DATA</td>
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</table>
Behavior mapping is an objective method of observing behavior and associated built environment components and attributes. It provides researchers with an innovative method of assessing behavior linked to detailed physical characteristics of outdoor areas. With physical environment and behavior connected, the concept can be applied in design research, linking setting type and level of physical activity in understanding the impact of design on children’s behavior.

The “affordances” approach helps investigators understand how the physical components of built environments stimulate, attract, or “afford” children’s activities.

**Tools and Technology:**
- Built environment base maps

**Expertise required:**
- Early childhood experts, Architects/
- Built environment designers/
- Landscape architects

**Read more at:**

In a study on *Behaviour Mapping: A Method for Linking Preschool Physical Activity and Outdoor Design*, to illustrate the sensitivity of behaviour mapping as an innovative method for assessing built environment components and attributes associated with physical activity levels, data from two childcare centers was analysed. Observers were trained to observe children’s behaviour and physical activity. Conclusively, behaviour mapping when used in conjunction with existing validated tools for measuring physical activity can be used to accurately link environmental components and affordances of behaviour settings to children’s activity.
In this method of observation based data collection, photo/video documentation is used to collect to build the narrative of children’s experience of the city spaces. The main advantage of this method is that it is free from subjective predispositions. It can be an effective method to capture the evidence for young children, who can communicate their ideas more precisely. The qualitative aspects as well as the behavioural patterns of children in different physical contexts can be key outcomes of this method.

**Photovoice in Growing up Boulder program, Colorado, USA**

Photovoice is a creative method that helps children easily assess strengths or concerns about their community and to communicate these ideas both visually and verbally with policymakers, city leaders or researchers. It was used for:

1. Assessing Neighbourhoods and Public Spaces
2. Adapting the Assessments with Young Children
3. Personal Expression
4. Engaging young people with disabilities

Under Growing up Boulder, children were given coloured cardboard frames and a camera. Young people frame and photograph elements of their environment they like (in green) or do not like (in red). This is useful when collecting qualitative data as children get to articulate in detail what they like or dislike about their neighbourhood.21

Coloured cardboard frames to show elements children like and dislike about their neighbourhoods, Source: Derr,V, L.Chawla, M.Mintzer, W.van Vliet (2013) A city for all citizens: Integrating children and youth of the marginalized population into city planning. Buildings, Special Issue on designing spaces for city living22
In partnership with Growing Up Boulder, Boulder Journey School, the teachers and students (ages 1-4) participated in the Walking Laboratories project – with an emphasis on what they enjoyed and what made them feel unsafe on the street. In this process, young children enjoyed:

1. construction spray paint on the street for its colours and variations;
2. a variety of textures on the environment: grass, cement, gravel;
3. play affordances at different heights – children enjoyed playing in the water ditch, stepping down off the sidewalk, climbing onto the median; and
4. places to stop and safely explore the built environment

Students did not appreciate signs of neglect and waste, such as:

1. trash along the street (they wanted to stop and pick it up);
2. graffiti on street signs;
3. dog excrement;
4. street signs that were knocked over; and cracked sidewalks

Read more at:
### DATA COLLECTION: ITCN MONITORING AND EVALUATION METRICS

#### Indicators

<table>
<thead>
<tr>
<th>Neighbourhood</th>
<th>Streets</th>
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<tbody>
<tr>
<td>• % of buildings within 300m distance of a green space above 125sqm</td>
<td>• Presence of walk zone/ footpath/sidewalk at major routes in neighbourhood</td>
</tr>
<tr>
<td>• % of buildings within 300m distance or 5 - 10 min walking distance of a public facilities like day care centres, pre-primary and primary schools, primary health facilities, local markets</td>
<td>• Provision and quantity of public seating to stop and rest, by neighbourhood</td>
</tr>
<tr>
<td>• % of crèches within accessible 500m distance from housing cluster</td>
<td>• % of clear and unobstructed pedestrian footpath of total road length</td>
</tr>
<tr>
<td>• Number of good quality housing area park spaces in the neighbourhood</td>
<td></td>
</tr>
<tr>
<td>• Number of good quality neighbourhood park spaces in the neighbourhood</td>
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<tr>
<td>• % of Organised green open space in the neighbourhood</td>
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<tr>
<td>• Per Capita organised green open space for a neighbourhood</td>
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</tbody>
</table>
**Data collection**  
(Secondary)  

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Data generation</th>
<th>Frequency (in years)</th>
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<tbody>
<tr>
<td>Land Use Plan</td>
<td>Observation based (e.g. Five minute walk radius)</td>
<td>5</td>
</tr>
<tr>
<td>Satellite Imagery</td>
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</tbody>
</table>

| Land Use Plan/ Data from the MoWCD                                       | Observation based (e.g. Five minute walk radius) | 5                    |
| Satellite Imagery                                                       | Observation based (e.g. Five minute walk radius)/ Community FGDs, Interviews | 5                    |

| Land Use Plan                                                           | Observation based (e.g. Five minute walk radius)/ Community FGDs, Interviews | 5                    |

| City mobility plan                                                      | Mobile apps like Safety Pin and Inagrik (with the option of geotagging) | 5                    |
| Area/ street improvement plans under Smart Cities Mission               | Observation based (e.g. Five minute walk radius)/ Community FGDs, Interviews | 5                    |

| Municipal Corporation/ Council Urban street Design guidelines (ideal)    | Observation based (e.g. Five minute walk radius)/ Community FGDs, Interviews | 1                    |

| Municipal Corporation/ Council Urban street Design guidelines (ideal)    |                               |                      |

| Municipal Corporation/ Council Urban street Design guidelines (ideal)    |                               |                      |

**Data generation**  
(Primary)  

**Frequency**  
(in years)  

<table>
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</table>

| Land Use Plan/ Data from the MoWCD                                       | Observation based (e.g. Five minute walk radius)/ Community FGDs, Interviews | 5                    |

| Land Use Plan                                                           |                               |                      |

| City mobility plan                                                      | Mobile apps like Safety Pin and Inagrik (with the option of geotagging) | 5                    |
| Area/ street improvement plans under Smart Cities Mission               | Observation based (e.g. Five minute walk radius)/ Community FGDs, Interviews | 5                    |
### Streets

- % of streets with adequate lighting of walk zone/ footpath/ sidewalk at major routes in neighbourhood
- Street light spacing in the neighbourhood
- Encroachment on NMT roads at neighbourhood level by Vehicle Parking (%)
- Presence of traffic calming measures in the neighbourhood and average speed of vehicles in the neighbourhood
- % of one way streets in a neighbourhood
- % of total street length closed to 4 and 2 wheeler traffic
- Presence of informal way finding in the vicinity of schools and parks
- Presence of no honking zones in the neighbourhood
- Fatality rate for pedestrian and NMT (%)

### Parks and Open Spaces

- Average no of time per week caregivers engage with their 0-5 in outdoor playing/activities in organised green spaces/ recreation spaces
- Average duration of visits for infants, toddlers and their caregivers at park facilities
### Data collection (Secondary)

- Guidelines for pedestrian facilities (2012), Indian Roads Congress
- Municipal Corporation/ Council Urban street Design guidelines (ideal)
- Municipal Corporation/ Council Traffic Police Department
- Transport Department
- Traffic Police Department

### Data generation (Primary)

- Observation based (e.g. Five minute walk radius); NGOs like The Footpath Initiative, ITDP, WRI
- Observation based, Mobile apps like Safety Pin and Inagrik
- Observation based, Community FGDs, Interviews
- Observation based (Urban95 walk), Community FGDs, Interviews with children as well as caregivers
- Observation based (e.g. Five minute walk radius/ Urban95 walk)/ Community FGDs, Interviews with children and caregivers

### Frequency (in years)

- 5
- Annual
- Annual
- 5
- Annual/ For area based development or an urban design intervention
- Annual
Parks and Open Spaces
- % of area in parks dedicated to play spaces suitable for young children 0-5
- Presence of natural materials in play equipment (y/n) by play space (y/n), natural areas (e.g. greenery, sand, safe and clean water) as percentage of total play space
- Number of parks that have quality seating, facing 0-3 play areas
- % of parks at neighbourhood level with free public drinking water, toilets and other facilities for families
- Frequency of maintenance of parks
- % of municipal budget allocated for open spaces or parks (including management/maintenance and programming)

Social Infrastructure
- Total Number of Private kindergarten in the neighbourhood and whether they have attached outdoor space
- % of Government schools that allow usage of school campuses during non-school hours
- Presence of affordable health clinic inside (Anganwadi) the neighbourhood
### Data collection (Secondary)

<table>
<thead>
<tr>
<th>Source</th>
<th>Data generation (Primary)</th>
<th>Frequency (in years)</th>
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</thead>
<tbody>
<tr>
<td>Municipal Corporation/ Council, Data from AMRUT(SLIP)</td>
<td>Observation based (Urban95 walk), Community FGDs, Interviews with children as well as caregivers</td>
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<tr>
<td>Garden department/ Municipal Corporation/ Council, Data from AMRUT(SLIP)</td>
<td>Interviews with RWAs, children as well as caregivers</td>
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<td>State Education portal, Education department, Municipal Corporation/ Council</td>
<td>Observation based, Community FGDs, Interviews with school authorities</td>
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<tr>
<td>Education department, Municipal Corporation/ Council</td>
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<tr>
<td>Municipal Corporation/ Council ICDS monitoring cell (state level) Data.gov.in</td>
<td>Observation based, Community FGDs, Interviews with ASHA workers</td>
<td>Annual</td>
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</tbody>
</table>
### Social Infrastructure
- Presence of Dispensary in the neighbourhood
- Community based organisations deliberately inviting women to planning meetings and delivering recommendations to ULB

### Urban Services
- Household level coverage of SWM services through door-to-door collection of waste
- % of parks, schools, and other public plots within the neighbourhoods with rainwater harvesting systems
- Percentage of households with renewable source of energy like Solar/PNG etc.

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<thead>
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<tr>
<td>Swachh Bharat Mission Data</td>
<td>Community FGDs, Interviews with RWAs, local CBOs</td>
<td>Annual</td>
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**City mobility plan**
- Area/ street improvement plans under Smart Cities Mission
- Mobile apps like Safety Pin and Inagrik (with the option of geotagging)
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STEP 5
Data Cleaning and Consolidation
Data available across various agencies, government departments and CSOs is in a raw form and needs to be made comparable. For credible data outputs that can inform city initiatives, it’s important to extract the crucial findings from a pool of collected data. Data consolidation is an important step towards integration of data from multiple sources into a single destination wherein different data sources are put together, or consolidated, into a single data store. Data consolidation helps in effective data analysis and reduces inefficiencies of the whole process, thus, improving the quality of data considerably.

1. **Disaggregation**: Children cannot be considered as a homogenous group of 0-18 years as defined by the Census while planning and designing cities. City baseline on children must have data disaggregated for age, gender, geographic location, abilities, economic, social and cultural background etc.; for which this needs to be designed into the data collection and consolidation stages.

2. **Granularity**: Based on the data collected and intended outcomes, the level of detail can be regulated at this stage of the process. This can also be characterized as the scale at which these datasets start informing the policy, program or any built environment intervention.

3. **Standardized terms and definitions**: Standardized definitions of terms that are internationally comparable must be used while creating these baselines. Due to

![Diagram showing the process of data consolidation and strategies](image)

**Dataset:** *Children with disabilities*

- **Disaggregation**
  - Age brackets
  - Gender
  - Vulnerability (such as street children)

- **Granularity**
  - Different types of disabilities

- **Consolidated dataset**
  - Data on physically challenged children in the age group of 3-5 years

---

disparities in definitions, the calculations vary leading to inconsistencies between different data sources or among different city departments.

During data cleaning, standardization of data sets is also important. While data from one source is for the age group 0-5 years, another source would be for 0-6 years, while yet another source would give data for 4-9 years.

4. **Time frame:** There is a high probability that data from different sources or departments might have different years in which it has been collected and published. Census, which is a decennial data source becomes obsolete when considering the age bracket of 0-5 years. Thus, while data consolidation, it is important to validate and put together data that’s most updated.

5. **Validation/ Authentication:** For the assimilated data to eventually inform decision making, it is important to test the validity of the data and the authenticity of the data resource. One way of this is reviewing the same dataset in two to three data resources.

Another way to check the authenticity of statistical as well as spatial data by the city authorities is to undertake groundtruthing exercises where a representative from the team can visit and verify the data collected from the area of intervention. This can be easily carried out in the case of local data collection exercises.

6. **Removing inconsistencies**
The last step towards data consolidation and cleaning is removing inconsistencies. In some cases, different resources provide different data for the same indicator. In such cases, it is important to remove inconsistencies to avoid confusion at a later stage.
Disaggregated Authentication

Time frame

Integration and consolidation

Granularity

Repetitions and inconsistencies

Universal/standardized definitions

Datasets ready for analysis

Authentication

Inconsistency
STEP 6
Data Visualization and Analysis
Data analysis is important to assess, visualize, evaluate and understand the relevance of data collected. The purpose of data analysis is to extract useful information from the raw data and use it to inform decision making. This step is a big part of investigating the quality of urban life and developing an evidence base for an informed policy, planning or design intervention.

Data analysis and interpretation becomes all the more important for young children as they cannot express themselves or voice their concerns, yet they are the critical mass using/accessing a number of city services and infrastructure. It is important to analyse their experiences and numbers to give them voice, enumerate them as users of city spaces and services and ensure their needs are included in the planning and design of a city. This information is also necessary to identify gaps in infrastructure and locations/sectors that need focused attention. Sharing and integrating data across the variety of systems accessed by children and families is crucial to providing decision-makers with complete and accurate information that they can use to shape and improve cities.

In this section, we look at different ways to analyse the city data. The analysis can be either

**Quantitative** in which the survey/administrative data is evaluated using different techniques to identify important trends or gaps across various subgroups, establish priorities, project for future or monitor impacts of different policies or programs.

Or

**Qualitative**, wherein data is analysed to reduce it to testable explanations or research findings which subsequently inform the strategies.

Data analysis can be used to develop accurate and reliable evidence base which can be used to shape the city spaces and quality services, making them more effective and efficient for children and their families.
BASIC ANALYSIS TOOLS: COMPARISON BASED

Benchmarking refers to a process of critically evaluating a city’s services and infrastructure against a desired level of performance. These benchmarks can be global or national or they can be defined by a city/community as per its context. Benchmarking is important for urban local bodies to understand where they can be doing better and how they can improve. Benchmarking can also be instrumental for periodic monitoring and evaluation, performance management and modification of urban policies as well as interventions.

If contextual indicators are chosen a per citizen’s desires (in this case young children and families), this system can help the cities in defining a long term vision of improvement and roadmap to achieve it. Benchmarks are established in one of four ways:

- Comparisons to past performance
- Comparisons to peer cities/wards at local level
- Comparisons to accepted service level benchmarks/industry standards
- Setting a performance target to be achieved

**Binary**
In this there are only 2 options when assessing performance.
(1 - Acceptable, 0 - Unacceptable)

For example, presence of affordable health clinic inside (Anganwadi) the neighbourhood.

**Numerical**
In this scores are linked to quantifiable, numerically-measurable Indicators

For example, number of tot lots
- More than 6: Thriving (3 points)
- 4 - 6: Striving (2 Points)
- Less than 6: Surviving (1 Point)
- No tot lots: (0 Points)

**Subjective**
In this scores are linked to a subjective assessment

For example, maintenance of parks
- Excellent: 4 points
- Good: 3 points
- Acceptable: 2 points
- Poor: 1 point
- Very poor: 0 points
Monitoring progress by comparing against benchmarks, Columbia

A template developed by Local Data Action Solutions Initiative (2018-2019) to evaluate the progress of cities over the years towards targeted benchmarks and the levels they are trying to achieve.

The red areas in this template are the immediate areas of concern.

**SDG City Progress Heat Map; Localizing the SDGs in Colombian Cities Through the Cómo Vamos City Network (April 2019)**

**BENCHMARKS**

(Setting a performance target to be achieved)
Urban Benchmarking, San Francisco

The city dashboard created by San Francisco show how the city compares to peer jurisdictions across performance metrics for libraries, parks, air quality, water usage, and pavement condition index, using both publicly available and survey data.

It has been noted thorough this exercise that benchmark comparisons are not always apples-to-apples. However, benchmarking results provide useful context for the public and policymakers to assess and to identify areas for further research and awareness in the city.²⁴

PARKS

Updated February 2019

**Park Access & Park Personnel**

Parks are more than an aesthetic addition to the city: they are places where communities come together to learn, relax, and play. For the first time, in 2017 100% of San Franciscans lived within walking distance to a park (within a half mile). In 2017, the San Francisco Recreation and Parks Department devoted about 9 full-time equivalent personnel to parks for every 10,000 residents. This is more than the peer average.

<table>
<thead>
<tr>
<th>Percent of Residents within Half Mile Walk to Park, 2017</th>
<th>Full-time Equivalent Personnel per 10,000 Residents, 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco 100%</td>
<td>Peer Average 86%</td>
</tr>
<tr>
<td>8.5</td>
<td>7.1</td>
</tr>
</tbody>
</table>

**Dog Play Areas**

Dog parks, also known as "off-leash dog areas," are one of the fastest growing park amenities in major US cities. San Francisco has 3.6 dog parks per 100,000 (human) residents, which is more than the peer average.

<table>
<thead>
<tr>
<th>Dog Parks per 100,000 Residents, 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco 3.6</td>
</tr>
</tbody>
</table>

**What about park quality?**

While we don’t have park quality measures for all our peers, San Francisco keeps track of park quality through quarterly park standards evaluations. You can read the most recent annual report here. Previous reports are available here.

**Park & Recreation Expenditures**

In fiscal year 2017, San Francisco spent more money per resident than most peers: $236 per resident annually. While other organizations may invest in a city’s parks, these expenditures are only for each city’s parks department.

The Recreation and Parks Department (REC) spent a higher proportion on Operations (75% of spending) and a lower percentage on Capital improvements (25% of spending) than our peers. San Francisco’s capital improvement expenditures only include funds appropriated in REC’s budget, and may not include some funds appropriated through other funding sources. For more information: Monthly Parks Capital reports.

**Comparison with peer cities as an example of Urban Benchmarking** highlighting the gaps and desired level of services and infrastructure, Available at: https://sfgov.org/scorecards/benchmarking/livability
Relevant Global And National Benchmarks

1. Global Indicators and Benchmarks

   **Suggested Reads:**
   - LEED v4 for Neighborhood Development;
     Available at: https://www.usgbc.org/resources/leed-v4-neighborhood-development-current-version
   
   - Mercer’s Livability Index; Available at: https://www.imercer.com/ecommerce/products/quality-of-living

   - AARP livability index; Available at: https://livabilityindex.aarp.org/livability-defined

2. National Indicators and Benchmarks

   **Suggested Reads:**
   - Service Level Benchmarks, MoHUA
     Available at: https://asci.org.in/sslb/SLB%20toolkit.pdf
   
   - Municipal Performance Index Assessment Framework, MoHUA
     Available at: https://smartnet.niua.org/eol19/pdf/MPI_Methodology.pdf

   - URDPFI Guidelines; MoHUA
     Available at: http://mohua.gov.in/upload/uploadfiles/files/URDPFI%20Guidelines%20Vol%201.pdf

   - SDG India Index;
     Available at: https://sdgindiaindex.socialcops.com/Yujbcq9d44/state-ut-rankings/basic#3/23.00/81.26

3. Contextual Indicators and Benchmarks

   **Suggested Reads:**
Weighing is giving relative importance of the indicators. A value is assigned to each indicator based on its impact on the target age group or its importance in a set of priorities targeted by the city. The value of the weight indicates its suitability and impact on the final objective. The weighing criteria can also be aligned to the needs of the caregivers and the community by involving them in the rating process of the indicators.

For example, while assessing the streets of a neighbourhood from the vantage point of an infant/toddler and their caregivers, the indicators can be given weightage on the basis of their impact on the walkability and mobility, as shown in the table below.

<table>
<thead>
<tr>
<th>Evaluation category</th>
<th>Indicators</th>
<th>Subjective Weights (In terms of importance: 5 (High) to 1 (Low))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>% of crèches within accessible 500m distance from housing cluster</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>% of buildings within 300m distance or 5 - 10 min walking distance of a</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>public facilities like day care centres, pre-primary and primary schools,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>primary health facilities, local markets</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>% of streets with walk zone/footpath/sidewalk at major routes in</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>neighbourhood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of streets with adequate lighting</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Provision and quantity of public seating to stop and rest, by</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>neighbourhood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of clear and unobstructed pedestrian footpath of total road length</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Encroachment on NMT roads at neighbourhood level by Vehicle Parking (%)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Presence of traffic calming measures in the neighbourhood and average</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>speed of vehicles in the neighbourhood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of one way streets in a neighbourhood</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Presence of informal way finding in the vicinity of schools and parks</td>
<td>2</td>
</tr>
<tr>
<td>Convenience</td>
<td>Presence of no honking zones in the neighbourhood</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Accessibility for baby strollers</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Crosswalks/safe crossings</td>
<td>5</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>Natural landscape elements/shaded trees</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Art/Sculptures on the streets</td>
<td>1</td>
</tr>
</tbody>
</table>
Another example can be while defining range between 0-10, 0 equals the insignificant impact of the indicator, range 1–3 represents a significantly less important indicator, range 4–6 as low importance indicators (complementary, supplementary, secondary, incidental, indirect, and no impact), 7–8 as average significant indicators (imperative, mandatory, or required indicator), and 9–10 as high importance indicator (fundamental, essential, decisive, definitive). Factoring in weights thus provide accurate insights and results and drawing priority areas for decision makers.
Using scoring as a way of data analysis can make a city more efficient. It brings out the evident issues and gaps in the city for the city authorities and decision makers. For a city, these scores can be allocated to different wards/areas based on their performance on various parameters/priorities decided by the city representatives.

The scoring exercise can be made more relevant and participatory by involving caregivers as well as older children in allocating a score to their neighbourhoods/wards.

**WALKSCORE Mobile app**

Walk Score measures the walkability of any address using a patented system. For each address, Walk Score analyzes hundreds of walking routes to nearby amenities. Points are awarded based on the distance to amenities in each category. Amenities within a 5 minute walk (.25 miles) are given maximum points. A decay function is used to give points to more distant amenities, with no points given after a 30 minute walk.

Walk Score also measures pedestrian friendliness by analyzing population density and road metrics such as block length and intersection density. Data sources include Google, Factual, Great Schools, Open Street Map, the U.S. Census, Localeze, and places added by the Walk Score user community.25

**City & Neighborhood Rankings**

To rank cities and neighborhoods, we calculate the Walk Score of approximately every city block (technically a grid of latitude and longitude points spaced roughly 500 feet apart).

Each point is weighted by population density so that the rankings reflect where people live and so that neighborhoods and cities do not have lower scores because of parks, bodies of water, etc.

<table>
<thead>
<tr>
<th>Walk Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90–100</td>
<td>Walker’s Paradise</td>
</tr>
<tr>
<td></td>
<td>Daily errands do not require a car.</td>
</tr>
<tr>
<td>70–89</td>
<td>Very Walkable</td>
</tr>
<tr>
<td></td>
<td>Most errands can be accomplished on foot.</td>
</tr>
<tr>
<td>50–69</td>
<td>Somewhat Walkable</td>
</tr>
<tr>
<td></td>
<td>Some errands can be accomplished on foot.</td>
</tr>
<tr>
<td>25–49</td>
<td>Car-Dependent</td>
</tr>
<tr>
<td></td>
<td>Most errands require a car.</td>
</tr>
<tr>
<td>0–24</td>
<td>Car-Dependent</td>
</tr>
<tr>
<td></td>
<td>Almost all errands require a car.</td>
</tr>
</tbody>
</table>

Walkscore Methodology, Available at: https://www.walkscore.com/methodology.shtml
Ward Quality Score (WQS) carried out a 6-month survey of the city’s infrastructure and services in all the 198 wards and analyzed findings under five major categories, defined as key determinants of urban quality of life. These categories are:

- Water – continuity, quality
- Environment – air, noise
- Sanitation – involving solid waste management and public toilets
- Mobility – including street lighting, pedestrian and driver safety, public transport
- Public amenities – parks

Data was collected through ground survey and spatial analysis and was assessed against national and international benchmarks to yield scores on a scale of 1 to 10. The scoring system made it easy to see at a glance the quality of any given ward’s infrastructure and delivery of services.

WQS aimed to inform ward-level budgetary allocations with the ultimate goal of transforming urban quality of life across areas that affect all urban citizens. Further, it empowered citizens and elected representatives by giving them objective data to help drive the demand for better quality of life.26
Quantifying patterns and identifying trends is a type of predictive analytics making use of historical data and transitions over a course of time. This technique can be used to extrapolate data and make projections about future scenarios and anticipate future needs. This can be helpful in reorganizing city’s priorities and better target efforts and resources as well as in informing policymaking.

In case of ITC group, this method can be instrumental in projecting not only the future population and corresponding infrastructure demands, but also their health metrics and performance.

**Spatio-temporal trend of mortality from bronchitis and asthma in regions of Delhi, 2001–2012.**

X-axis represents number of deaths and y-axis represents year.

One of the most common ways to analyse a public place such as parks or streets is to analyse the usage/movement patterns with context of time. Whether the data represents hourly pedestrian counts or location of activity hubs, its relationship with time points or intervals help build an analysis of public spaces and their usage in general. Such analysis can also be used to give insights on use of public spaces at a neighbourhood scale in relation to time and location.

**Pedestrian patterns in Melbourne CBD**

An exercise was undertaken to examine the hourly counts of pedestrians taken from sensors spread around the city and the pedestrian sensor data available on Open Data Melbourne. Featuring a series of interactive graphics, it was used to guide through common techniques for visualizing time series data and explore the city’s pedestrian dynamics. From the sensor data exploration spread across different times of the day and different days of the week suggestions were made towards relieving the pressure on market street by placing more weekend activities near stations in the city.²⁸

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Pedestrian patterns in Melbourne CBD (2016), Monash University; Available at: http://visiphilia.org/2016/04/03/big-data-challenge-day
BASIC ANALYSIS TOOLS: SPATIAL ANALYSIS

Spatial analysis allows to solve complex location-oriented problems and better understand where and what is occurring in a city. It goes beyond mere mapping to studying the physical characteristics of areas and helps forming relationships between them and quality of life.

Different information is organized in the form of layers which can be stacked together to derive new information, address city issues and make informed decisions. It can also be used for data visualization, establish patterns spatially and for integrated city planning, design and management.

Most cities need to begin with base data from a few sure-fire sources of data that can be used to build a contextual base map for a city. Some of the available data sources are:

- Satellite Imagery
- Boundaries and Places
- Demographic Maps
- Street layout
- Land use plans
- Transportation plans
- Urban systems

Different base layers of a city that GIS map can represent

To identify gaps in child care access in Philadelphia, an analysis was conducted of existing child care services and childcare demand using locally available data. The results of the analysis were put on a PolicyMap Integrated Mapping Tool, along with other helpful indicators showing the number of young children and existing childcare resources, like certified and uncertified child care centers, and Head Start centers.\[^30\]

This gave providers a tool for siting new child care centers, gave investors and policy makers a tool for targeting resources to increase high-quality child care access, and gave parents a tool for finding high-quality child care centers near where they live and work.

[Read more at: https://www.policymap.com/customer-story/childcare-map-philadelphia/](https://www.policymap.com/customer-story/childcare-map-philadelphia/)
BASIC ANALYSIS TOOLS:
ROOT CAUSE ANALYSIS

Root cause analysis (RCA) is a systematic process for identifying “root causes” of problems and an approach for responding to them. RCA is based on the basic idea that effective management requires more than merely “putting out fires” for problems that develop, but finding a way to prevent them.

This way of analysis helps in establishing the existing complex linkages, breaking down a problem into small, detailed parts to better understand the big picture and creating a chart of all of the possible causal factors, to see where an issue has originated.31

1. Education can create opportunities for better health
   - Income/resources • Social-psychological benefits
   - Healthy behaviours • Healthier neighbourhoods

2. Poor health can put education at risk (reverse causality)
   - Attendance • Concentration
   - Learning Disabilities

3. Conditions throughout people’s lives can affect both education and health

Why Education Matters to Health: Exploring the Causes, Centre for society and health, Virginia commonwealth university; Available at:https://societyhealth.vcu.edu/work/the-projects/why-education-matters-to-health-exploring-the-causes.html
STEP 7
Using data for informed outcomes
Developing children based data repositories at the city level can be instrumental towards bringing governance, infrastructure and a city’s youngest citizens together. Focusing on children also brings into picture family as a unit while planning and designing cities, thus expanding the scale of population being considered and provided for.

This toolkit is designed to serve as a template for any Local Authority (LA) that wishes to build a stronger understanding of built environment and its impact on developmental, health and well being outcomes of young children through “**Data and Evidence**”. It addresses how ULBs can collect data, include perspectives of children and parents, make informed policies, strategies and plans, work with communities, sensitize staff and inform citizens to respond to the particular needs of children.

The toolkit also aims to restructure the existing way of working in silos and bring together various departments/ agencies of the city to form a “**collective understanding**” of the status of children in the city.

Using data to answer questions like:

- How is city addressing the live, play learn needs of young children and families?
- What are the places frequented by children and their families on the scale of cities as well as neighbourhoods?
- How are young children using these spaces? (Behavioural Aspects)
- How do the planning and design of these spaces contribute to their quality of life and development?
- Where are they walking, sitting and playing?

This last section explores various outcomes and innovations that have been manifested by different cities and institutions towards building data repositories on young children and families.
Quantitative Data collection and analysis: Overlaying the density of young children (0-6 years) extracted from the Census of India, and the location of anganwadis in Delhi sourced from ICDS (MoWCD), a GIS based analysis was carried out the ward level.

It was observed that the anganwadis are sparsely distributed in fringe areas where density of children is high.

In a report by NCPCR (2011), total no. of children left out stands at 13,62,553. (1.3 million)

Qualitative Data collection and analysis: The observation based analysis showed that the quality of built environment and services in these anganwadis are not upto the mark and there are no common standard design norms being followed.

Inaccessible for young children, pregnant mothers
Potential health risks on the way and in the surroundings of the Anganwadi centres
INFORMING DECISION MAKING

City level data collection and analysis on children and the infrastructure and services used by them, can be used to inform the urban planning and design decisions towards mainstreaming their needs. The evidence generated can inform a city’s master planning process towards the inadequacies and gaps in the quantity based on the population densities. The qualitative analysis and narrative can provide them an understanding about the built design elements that need to be incorporated to improve the quality of life of young children.

Outcome: **Key Recommendations to Master Plan of Delhi 2041 on child care facilities:**

1. Include childcare services like anganwadis, crèches, day cares as a mandatory social infra at housing area/ neighbourhood level in the greenfield development as well as redevelopment projects.

2. Use both population as well as distance while micro planning.

3. Ensure uniform distribution on the basis of densities of young children and settlement typology.

4. Develop norms and space standards for built environment design of child care facilities.

5. Include the ‘0’ of 0-5 years i.e. pregnant mothers and children with disabilities while designing and planning childcare facilities.

6. Integrate facilities such as anganwadis, family welfare centres, primary health centres with community centres.

7. Provide childcare provisions in the design of rental housing for migrant families.

8. In denser areas of Delhi, where anganwadis cannot afford an open space for children, they can be integrated with the tot lots, neighbourhood parks.
CITY LEVEL INVENTORY OF SERVICES
FOR CHILDREN AND FAMILIES

City level inventories for children related services can provide an overview of the range of city services such as health, education, social, recreational and safety and response services accessed by children and their families. These studies are crucial to not only list down those services and responsible agencies at one place but also ensuring integrated and comprehensive planning towards providing equal opportunities and rights to all children.

The Bernard van Leer Foundation in collaboration with the Turkish Economic and Social Studies Foundation (TESEV) undertook a project titled “Analyzing and Mapping Services for Children and Family in Istanbul District Municipalities” to produce a comprehensive inventory of social services for children and family provided by district municipalities. The study project aimed to develop policy proposals for improving the geographic distribution and qualities of these services within a framework of the socio-economic differentiation of Istanbul districts.

The Project was envisioned as a step towards the integration of the aimed activities under Istanbul95 program with the social service infrastructures of the municipalities. The project consisted of three main stages.

1. Data Collection
   A survey was designed and initially piloted in 5 municipalities. The feedback received from the municipalities was incorporated in the survey. The technical details of the survey were explained to the municipal staff and in some cases a dedicated personnel was assigned for data gathering and coordinating between different directorates.

   At the end of the fieldwork process, of the 39 district municipalities had been surveyed and detailed data on services provided by the municipalities for children and family such as education, health, parks and green spaces, and social aid was gathered.

2. Preparation of Active Website
   The outputs acquired at the end of the first two stages of the project (“Stratification of Neighborhoods with respect to Age and Mean Real Estate Values” maps and data gathered in fieldwork) were combine to create an interactive website designed to be the ultimate produc of the project. In addition to assessment of the current
situation, the website presents actual data in an understandable format to decision makers that they can develop data driven decision making and concrete policy proposals.

3. Inventory of Services

The data on following children related services were collected:

- Service units: Daycare Centres and Nurseries
- Health Units
- Psychological Counselling Units
- Other Service Units like children libraries, coordination centres for the disabled etc.
- Green Spaces

Read More at: https://bernardvanleer.org/app/uploads/2018/03/istanbul95.rapor_1.pdf

Interactive website for Analyzing and Mapping Services for Children and Family in Istanbul District Municipalities; Source: https://istanbul.kent95.org/en/greateristanbul
DATA DRIVEN DECISION SUPPORT SYSTEM

Data driven support systems are one of the most sophisticated methods of data collection, analysis and dissemination adapted by cities worldwide. They offer the potential to harness the power of data, spatial mapping and analysis in one platform. These systems, with the help of GIS can provide an understanding of existing and anticipated city problems and their geographical location and spread. This system can assist in navigating specific problem areas and achieve better informed planning outcomes for city bodies.

ISDSS is an integrated web based GIS enabled system, an ongoing initiative currently supported by NIUA and Bernard van Leer Foundation. This Decision Support System aims to analyse the levels of vulnerabilities Delhi schools are facing with relation to emergencies & the availability of basic services, environmental facilities etc.

NIUA realized that children’s exposure to environmental and climate change risks in the places where they live, play and grow affects their health every stage of their life. Using online GIS and web technologies and schools as a focal point, this application can produce graphical and spatial outputs to help city managers and decision makers correlate community profiles and their vulnerabilities.

The Decision Support System (ISDSS) demonstrates how readily available technology (GIS) and data can be combined for accurate and effective decisions especially in crisis situations.

At present this application has been divided into two parts. The city level data of major services has been captured for 272 wards in Municipal Corporation Area. The levels of vulnerabilities schools of 204 wards are facing in terms of availability services have been represented in the theme based queries. (designed keeping in view of 3 disaster scenarios, flooding, earthquake and fire).
INTEGRATED SPATIAL DECISION SUPPORT SYSTEM

The query based outcome which has been generated through GIS analysis, is shown in the form of layers here. The queries have been set based on three disaster scenarios, i.e. Flooding, Earthquake and Fire. The outcomes reflect the vulnerabilities of the schools - During, Pre and Post emergencies.

Some City level Vital information which an

The user interface of ISDSS, Available at: https://cfsc.niua.org/
CITY PERFORMANCE SCORECARDS

City scorecards serve as a benchmark for city efforts towards strengthening their efficiency towards providing for the residents. It acts as a good performance monitoring system for the local agencies, to measure and track progress across various parameters and provides a snapshot of the existing status. This also encourages the different wards/ neighbourhoods to innovate and city authorities to incentivize the better performing units to foster a healthy competition and effectiveness.

City Performance Scorecards provide timely information on the efficiency and effectiveness of San Francisco government in eight highlighted service areas. The goal is to provide citizens and policy makers with information that makes government smarter and more effective. The information gathered and analyzed is shared with City leadership so that they can make the best possible decisions about how to deliver services efficiently, effectively and strategically to residents.

The highlights of the San Francisco Performance Scorecards include 80 indicators in eight service areas: Livability, Public Health, Safety Net, Public Safety, Transportation, Environment, Economy, and Finance.

The City Performance Division of the Controller’s Office helps departments to:

1. Make transparent, data-driven decisions in policy development and operational management;
2. Align programming with resources for greater efficiency and impact; and
3. Access or create the tools they need to innovate, test, and learn.

Read more at: https://sfcontroller.org/controller%E2%80%99s-office-releases-annual-performance-results-city%E2%80%99s-public-services
Park maintenance scores are evaluation results using standards developed by the Controller’s Office and the Recreation and Park Department (RPD). Park maintenance scores are based on performance standards for 12 categories of park features, including lawns, children’s play areas, and restrooms, and include questions about park maintenance and appearance. The standards measure the success of maintenance in delivering parks that are clean, safe, and ready for use. The standards do not measure facility design, or consider demand for recreational amenities or ecological sustainability, nor do the standards substitute for professional assessment of structural integrity.\(^{34}\)
URBAN OBSERVATORIES

Urban Observatories are the most recent innovation towards collecting valuable data on various parameters of functioning in a city. Huge amount of real time data is being amassed from the various sensors in cities to these observatories such as air quality, traffic violations, pedestrian count, noise levels, crime, solid waste management etc. These observatories hold a lot of potential for collecting real time data on resident children and families, related infrastructure and services and track indicators of their overall health and well being.

The Indian Urban Observatory includes data sets like air quality, heat map, cleanliness score, calculates real-time safety index of a route based on data on real-time status of streetlights, past crime records, presence of police stations and bus stops, land-use of areas on the route, crime rate, etc.

All in all the observatory is working on 10 core areas such as solid waste management, water, waste water management, mobility, education, health.
DYNAMIC AND REAL TIME DATA DASHBOARDS

Urban dashboards streamline complex data into easy to understand visual elements. Thus, they are a vital tool for the decision makers as well as the citizens to provide them a snapshot of the data on where they live. Having the option of being constantly updated, they can provide a real time picture of the city parameters and thus ensure transparency, better decision making, constant monitoring and citizen awareness as well as participation.

Child well being dashboard (Ontario) is an interactive map of Waterloo Region's neighbourhoods that houses data for each neighbourhood. This enables citizens to visualize the differences between neighbourhoods to better understand the strengths and needs in the communities in which they live and serve. The Child Wellbeing Dashboard contains pieces of data which have been designated as ‘indicators’ of child wellbeing, helping to understand child wellbeing and to measure the progress. The Child Wellbeing Dashboard is useful as part of a systematic approach to understanding the local community for planning, understanding and evaluation.

There are four indicators on the Dashboard: Fundamental Needs, Health, Learning and Relationships.

Social Cohesion Index (#): Refers to the level of cohesion families experience in their neighbourhood.

The Kindergarten Parent Survey asked parents/caregivers about the likelihood that neighbours would get together and deal with problems; act as role models for children; be willing to help each other; watch out for the safety of children; and keep their eyes open for possible trouble.36
Endnotes

1 BvLF (2018), Early Childhood Matters, An Article titled ‘Urban95: creating cities for the youngest people’ by Patrin Watanatada, Knowledge for Policy Director, Bernard van Leer Foundation; Available at: https://bernardvanleer.org/ecm-article/2018/urban95-creating-cities-for-the-youngest-people/

2 How states can improve well-being for all children, from birth to age five, Mckinsey(2018), Available at: https://www.mckinsey.com/industries/public-sector/our-insights/how-states-can-improve-well-being-for-all-children-from-birth-to-age-five

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