

# 2018 Methodology Statement: City78 Urban Structuring

A City78® White paper

August 2018



# City78

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## Introduction

A direct correlation exists between the design and structure of the built environment and its impact on productivity and the quality of life of urban dwellers. Therefore, in order to enhance urban productivity and achieve a higher quality of life, urban areas must be intentionally structured to achieve better outcomes. The process of structuring urban areas with these goals in mind specifically involves the identification of economic clusters, the determination of appropriate locations and mix of future uses, the understanding of perceptions held by urban stakeholders about the living environment, and the connection of proposed uses to a transit oriented framework and urban plan. To our partners and clients across the nonprofit, corporate and academic spheres, City78 offers area-specific retail marketplace analysis, synthesis of user-generated, community-centric data on the built environment, projective land use modelling (PLUM) and demographic forecast analyses.

## History *Designing the urban spaces of tomorrow*

The realization that the shape of the built environment structures the life of the urban dweller is not a new discovery. Nevertheless, events in recent years have confirmed the dangers that result from structuring urban areas around the uses in space, rather than for the users of space. Evidence of this can be seen in the urban structuring adopted post-World War II, which fostered a mismatch of work and living areas by advancing auto reliance and segregation of uses. In order to solve the urban problems resulting from this widespread model of urban structuring, a new, focused approach is needed.

There is currently a large and ever-growing consensus that the users of space should be central to urban design and planning; in other words, it is not nearly enough to only ensure that urban systems foster utility, these systems must also enhance the quality of life of urban populations. The result of this people-centric approach is embodied in highly-dense, highly-walkable transit-oriented urban areas, characterized by a mix of uses: the new urbanism.

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## **Determining Quality of Life**

While there are various interpretations as to what urban quality of life entails, there is little disagreement over what it is not; extreme sprawl characterized by a mismatch of offices and housing, supported by automobile-reliant transit systems. This form of urban structuring and location of uses has been proven to lead to a number of health problems through enhancing a lifestyle of reduced physical activity while also stretching urban infrastructure and economic resources. In addition, this mismatch of uses also creates an unfavorable economic environment for agglomeration economies, economies of scale and the development of urban economic clusters.

Although economic opportunities, unemployment rates, and income all serve as variables contributing to the quality of life, there are other factors that should be taken into consideration. These other factors can be best understood through Aristotle's description of eudaimonia, or human flourishing. In regards to urban dwellers' quality of life in the urban environment, eudaimonia is the idea that an individual being is able to achieve self-actualization, maintain good health, access pleasures, pursue employment opportunities, involve oneself in the community and consequently fulfil the pursuit of happiness.

We believe the City, shaped through City78's Urban Structuring framework focused on mixed-use, human-centric development, presents an engine to achieve a higher quality of life characterized by general well-being as well as an improved urban productivity for all users of the urban space.

## **Achieving Higher Urban Productivity**

Cities are agents that stimulate innovation, creativity and productivity. As the global economic system becomes ever-more knowledge-focused (the knowledge economy), it is important to foster urban conditions favorable for innovation. These conditions can be achieved by identifying and fostering new and existing urban economic clusters, which have the potential to secure a competitive edge for cities in the knowledge economy, both now and in the future. The concentration of economic clusters leads to agglomeration economies, characterized by a situation in which the co-location of firms further reduces the cost of production, thus generating a large knowledge pool of skilled professionals, fostering knowledge-sharing between firms and reducing transportation costs.

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## **City78 Urban Structuring**

City78 Urban Structuring is an iterative process that includes a variety of tools to assess variables associated with achieving higher productivity in living environments and a higher quality of life for urban dwellers. Our methodology is rooted in two fundamental ideas. First, that the users of the living environment are the prime actors in determining the correlates of quality of life. Second, that urban form and structuring best improves urban productivity. These goals are achieved through a model that redefines the framework of participatory planning and directly analyzes urban consumers' behavior through user-generated data, demographic, and city data.

City78's model is further strengthened by the fact that the internet already plays and will play a significant role in the creation of spaces which foster the personalization of the urban experience, organic place identity creation, and the shaping of contemporary urban communities. Smartphones, now a necessity for urban living, connect urban dwellers to real-time information about transit, traffic, health services, location reviews, safety alerts, and community news. Cyber communities, public cyberspaces, and web 2.0 applications further redefine the distinctions between the built environment and the virtual environment. These emerging elements of the 21st century urban space have created a relationship in which the internet contributes to an urban actor's process of sorting through multiple sensory and perceptual information as well as the molding of holistic impressions. While some would attribute these new trends to Millennial methods of interacting with the urban space, the reality as well as the potential of entire societies existing dually online as well as in the physical urban space presents planners with unexplored and ever-evolving methods and methodologies for understanding communities and creating actionable urban solutions.

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## Products

### *User-Generated Built Environment Data Analysis*

Using advanced data tools, City78 identifies comments and reviews that urban stakeholders have registered regarding the various uses in the urban space. This data is collected and analyzed from Google and other leading review platforms, and is leveraged to extract trends and narratives held by users of the urban space. Through this analysis, City78 is able to diagnose and develop actionable solutions based on emerging trends which are at the intersection of urban dwellers' wants and needs and the elements of the built environment that influence such needs. These findings are enriched with additional layers of data, such as demographic trends or zoning analyses of the area of study, which collectively have the potential to create a framework that identifies opportunities which enhance urban productivity and urban quality of life. Part of this is achieved through the identification of economic clusters and by tracking recurring topics and narratives in user-generated data. By employing this approach, City78 is able to capture the reactions of users of space in a way that puts real-time, granular and transparent information in the hands of urban stakeholders and community leaders to help them make informed choices in planning and designing highly-dense, highly walkable transit-oriented urban areas.

### *Retail Marketplace Analysis*

City78's Retail Marketplace Analysis recognizes the potential that exists in an urban market for specific commercial uses, measuring saturation of the current locations, as well as market potential and identifying existing market retail leakage or surplus. Leakage represents a situation where demand exceeds supply, which means retailers outside the market area are fulfilling the demand for retail products; surplus indicates that supply exceeds the area's demand. The result of this analysis is derived from a direct comparison between retail sales and consumer spending by industry and the existing gap between supply and demand.



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The Leakage/Surplus Factor of study market areas is represented in a range from “-100” to “+100”. Through this analysis, City78 is able to measure retail activity and present recommendations for the location of commercial uses by NAICS industry classification such as the following:

- Food and drink
- Automotive
- Electronics and appliances
- Health and personal care

### ***Projective Land Use and Demographic Forecast Analysis***

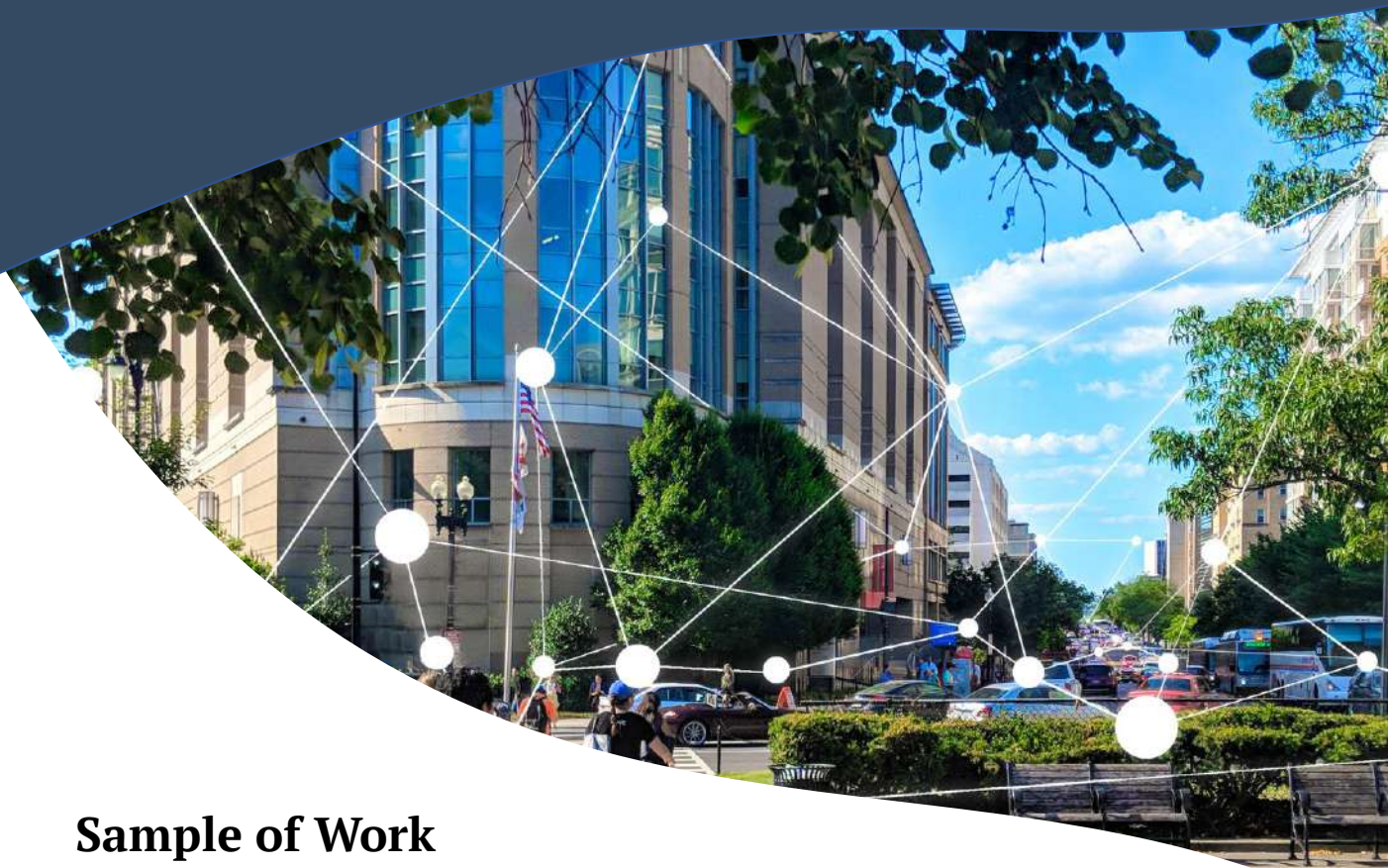
#### ***A) Commercial Use Modelling***

Using models of zoning and land use that advance the ideals and approach of new urbanism, the City78 Projective Land Use and Demographic Forecast model prescribes and forecasts future land use mixes that ensure improved urban productivity and quality of life. The process is achieved by analyzing a variety of socioeconomic factors, demographic trends, market characteristics of specific urban areas, as well as in depth demographic analyses and forecasts. This includes expected population growth/change and recommendations regarding the uses needed to sustain the change in population and expansion in market potential achieved through predictive land use modeling.

#### ***B) Office and Residential Use Modelling***

City78’s approach to assessing land use models for office and residential uses stem from the need to solve the current mismatch between office and residential locations. Using demographic trends and population forecasts, we are able to determine appropriate future office and residential uses in terms of square footage supported by the market while also determining location advantage.

# City78



## Sample of Work

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## Introduction

City78 develops data-driven, human-centric solutions for city governments, companies and community leaders. We bring community-generated data, from Google and other review platforms, together with urban planning analyses to develop nuanced understandings of neighborhoods and cities and create actionable solutions that improve the quality of urban life for all. Our methods are based in the ever-growing belief that mixed-use development promoting community-gearred solutions is essential in solving urban problems stemming from urban spatial segregation and restrictive zoning laws (e.g. congestion, overpopulation, inefficient government funding allocation). These restrictive urban models divide communities, create socioeconomic barriers, and limit access to and the potential of the urban environment. By directly including the community as co-creators of the city, we are able to shift away from the current paradigm of prescriptive urban solutions and instead build ethical, sustainable cities around solutions derived from understanding communities, their histories, needs, perceptions and use of space.

## Solutions

City78 offers a number of solutions focusing on:

- Mapping
- Custom data
- Data visualization
- Web design and development

These solutions aim to bring the viewer through data experientially through interactive visualizations as well as uncover and explore nuanced trends and analyses through unconventional data sources and sophisticated GIS analysis.

# Capitol Riverfront & NoMa

Visualizing population trends and future developments for the Capitol Riverfront and NoMa Business Improvement Districts (BIDs).

The interactive slider encourages the viewer to switch between current and future population densities, allowing the viewer to imagine “what will be” in these two fast-developing areas of DC from a data-focused lens.



[Link 1](#)

[Link 2](#)

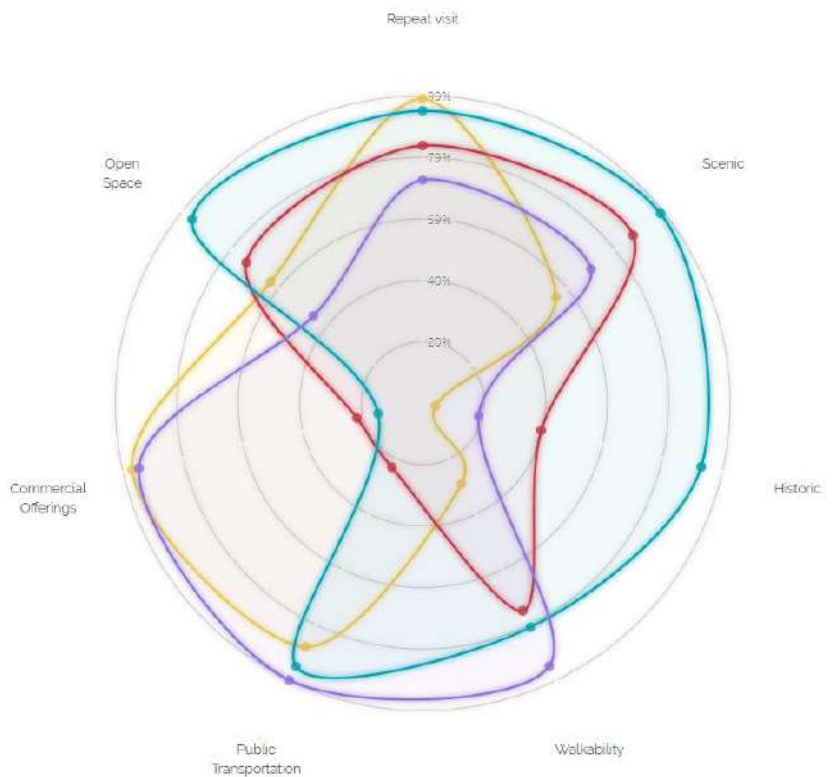






## Sentiment and Community Perception of Space

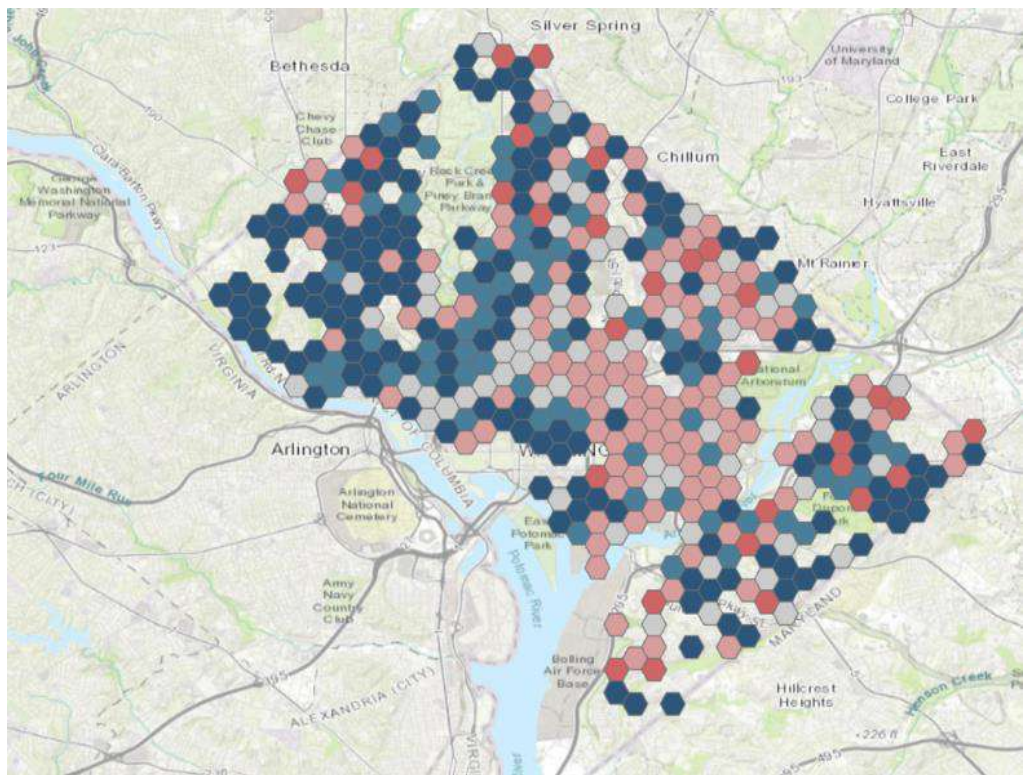
City78 pride itself in its methodological approach in understanding communities operating in the urban environment. Through a set of custom-built scripts which leverage Google Maps and Google Place APIs as well as Natural Language Processing (NLP) libraries, City78 is able to assess community perception and use of space across entire cities.





## Hex Maps, Clustering and Anonymized Data

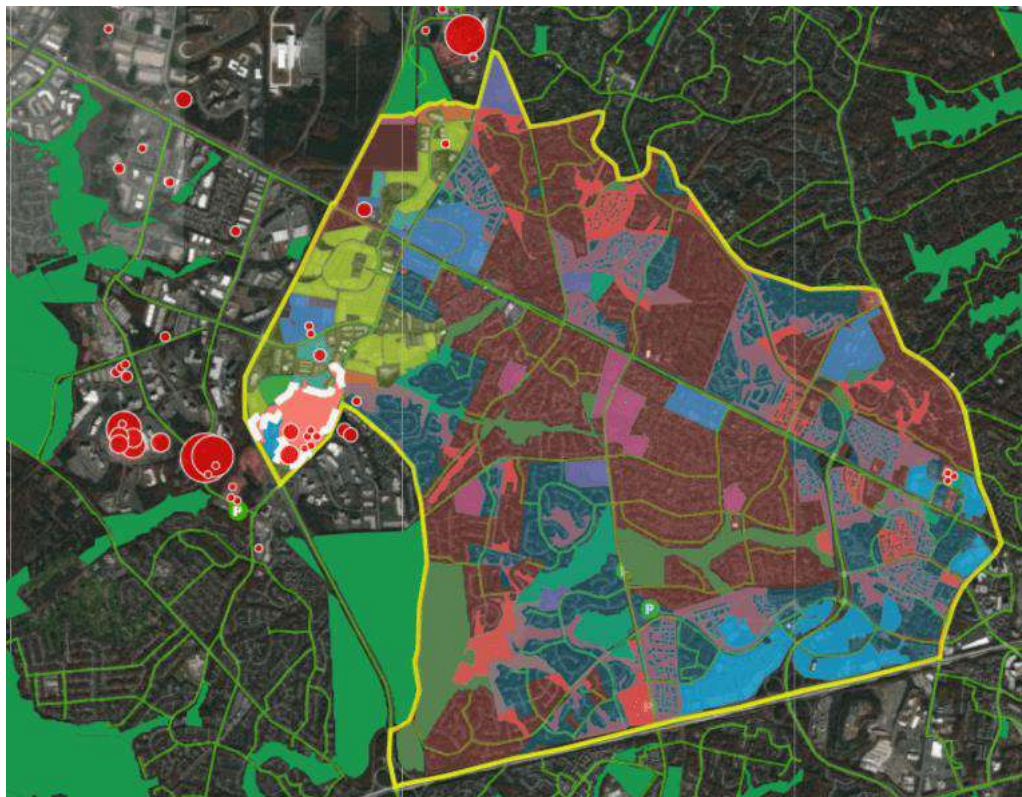
Hex maps are used for a variety of reasons: sometimes it is due to data concerns or anonymity, others it is to evaluate trends by clustering the data. The map to the right was for a project assessing AirBnB locations and optimal placement of dockless bikes and scooters.



Made with ArcGIS.

## Projected Land Use Modeling and Future Developments

Interactive maps can be made for different kinds of users; in the case of the map to the right, mapping current zoning, planned future development funding as well as a number of other variables caters towards an expert audience rather than general viewership.







## Situating Models in the Here and Now

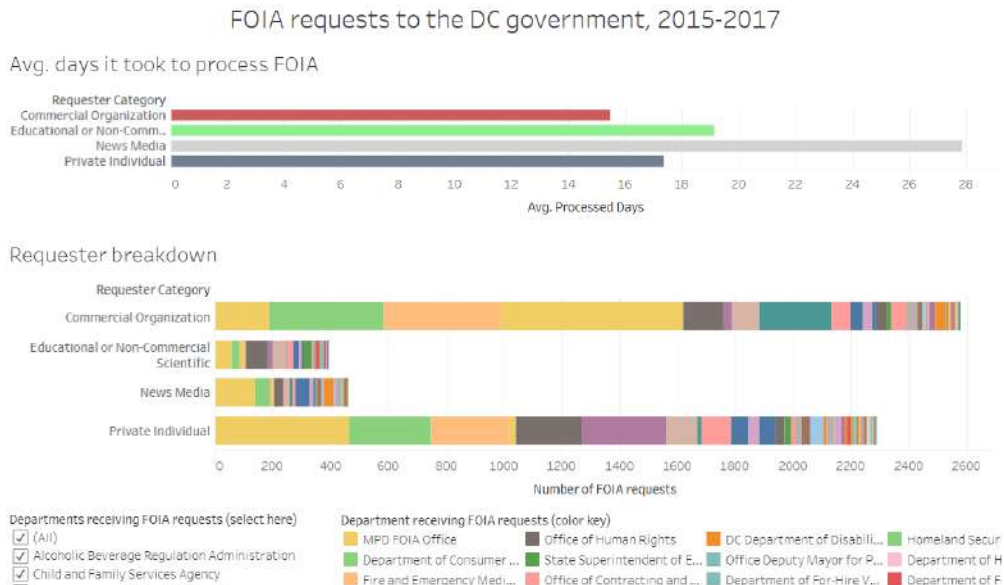
The City78 team believes strongly in visualizations and models that appeal both to the expert user as well as the layperson. The images above and below depict hypothetical energy savings if prominent structures in cities adopted a prototype miniature solar panel.





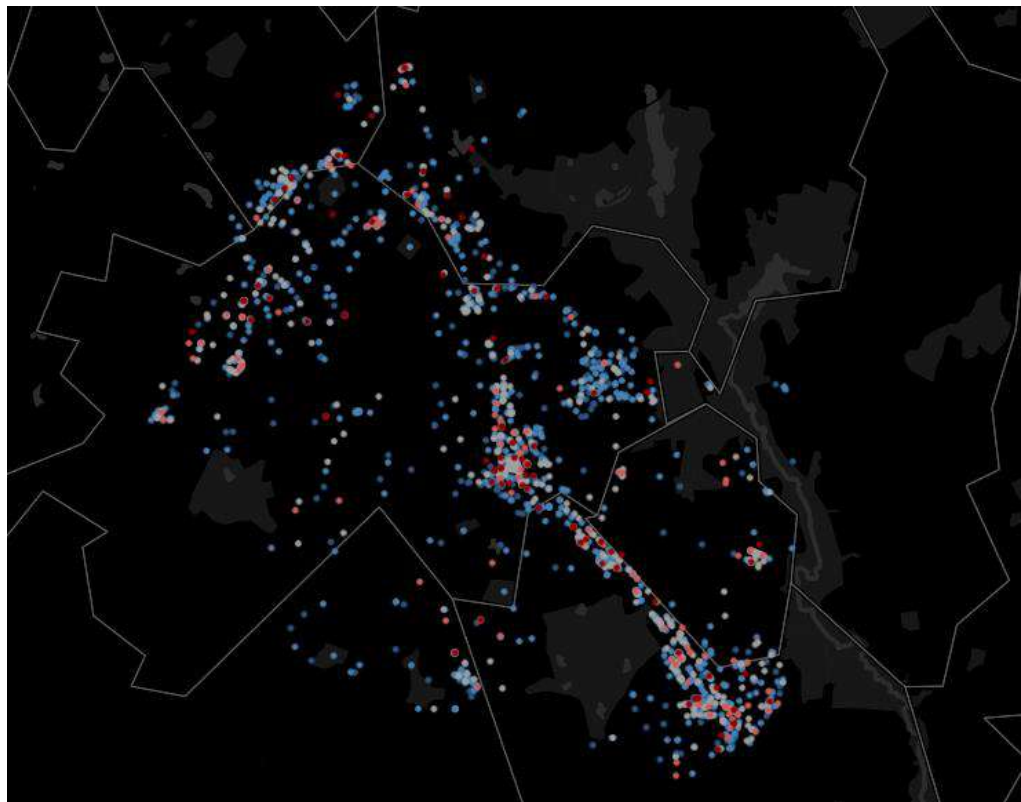
## Esri, Open Data and Custom Databases

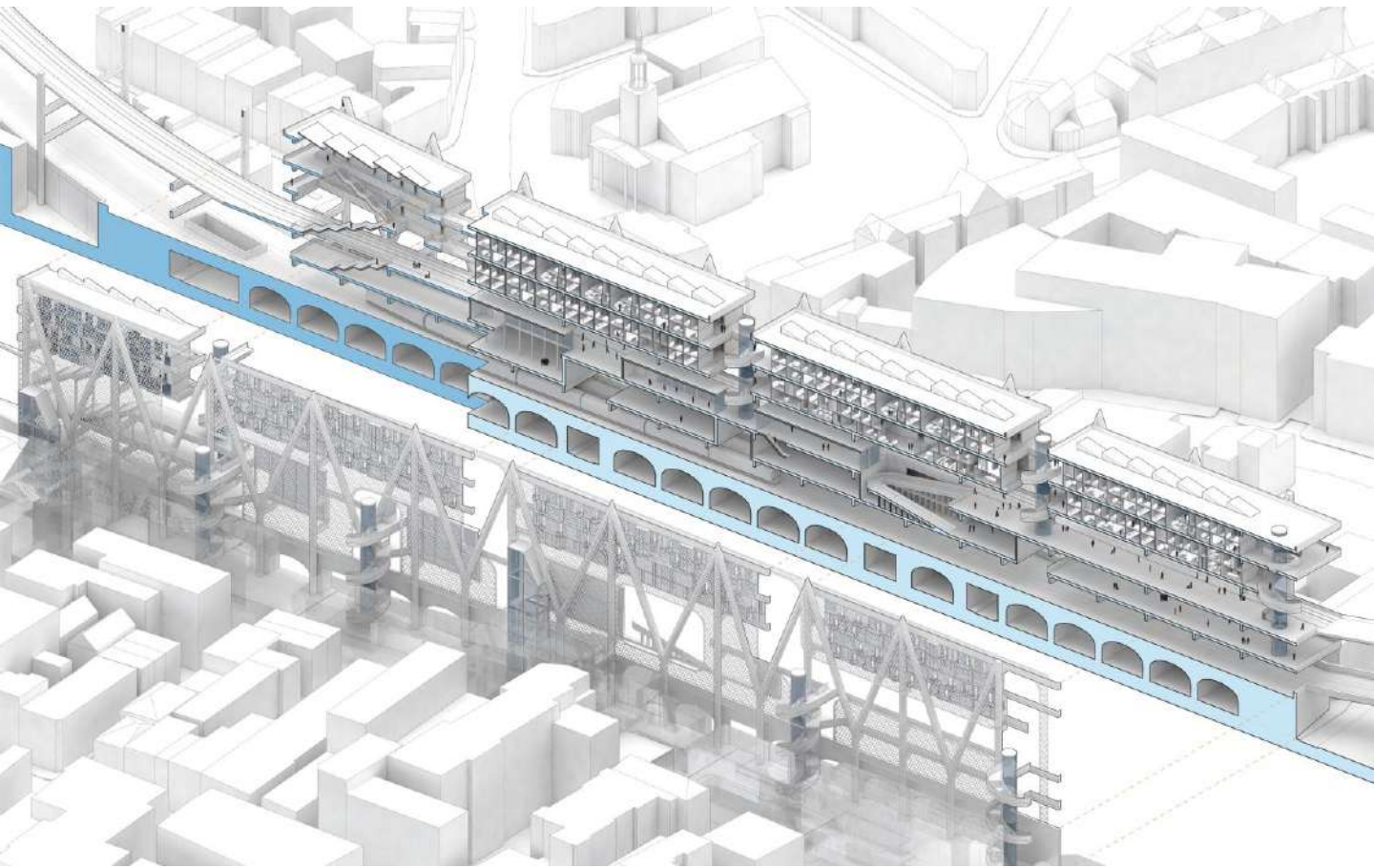
City78 draws on a wide variety of data, both open and proprietary. These include Esri's Business Analyst, open data, custom-built datasets, and more.



## Citywide Commercial and Public Spaces Assessment

Visualizes average review score of all public and commercial spaces registered in Google. The map is interactive, and allows users to hover over each space, with a tooltip box stating the name, address, average review, and hours of operation of the location.

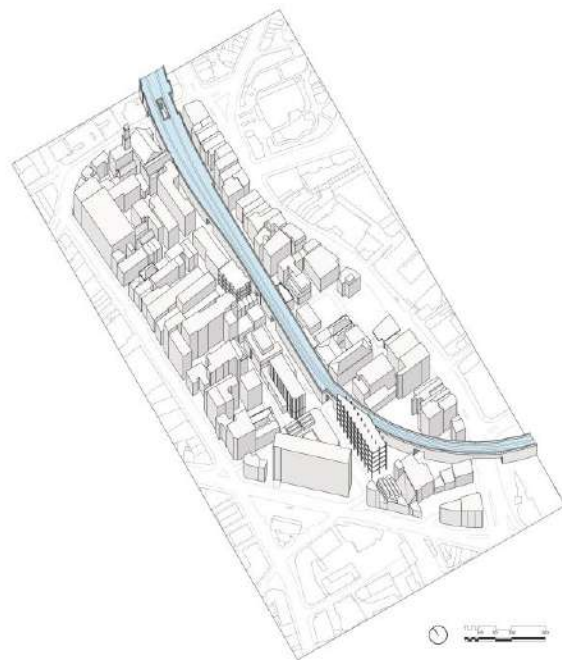


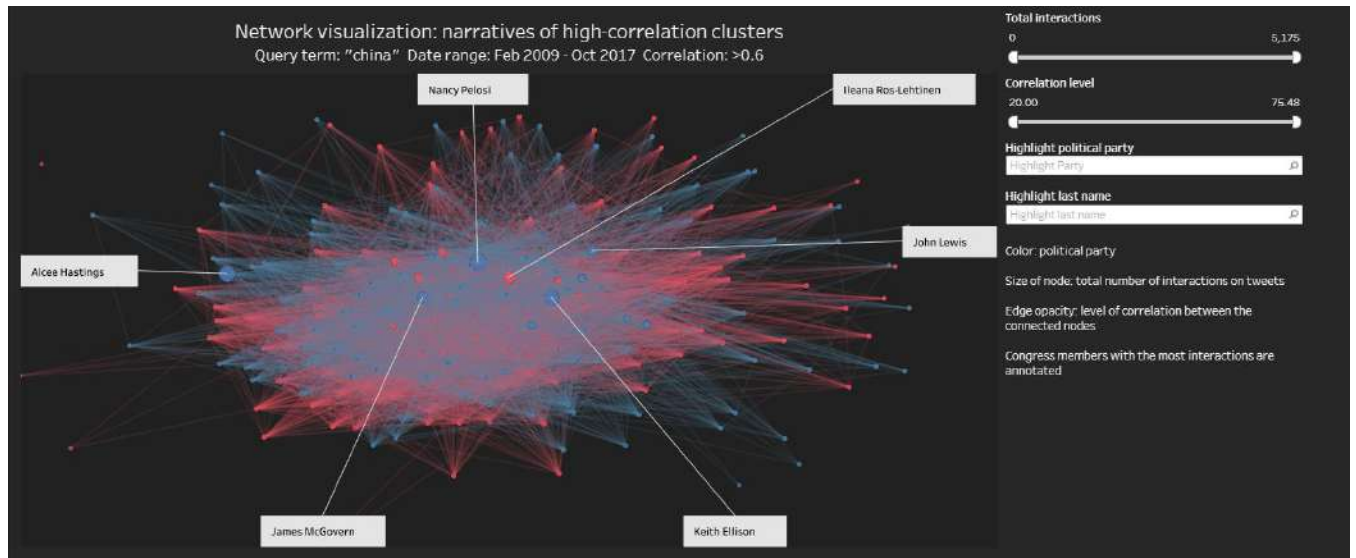


## Models to Reinvent Urban Space

City78 translates raw data into concise population trends, community perception and use of space indices, etc. City78 delivers all this in clear visuals to help the viewer fully understand our models.

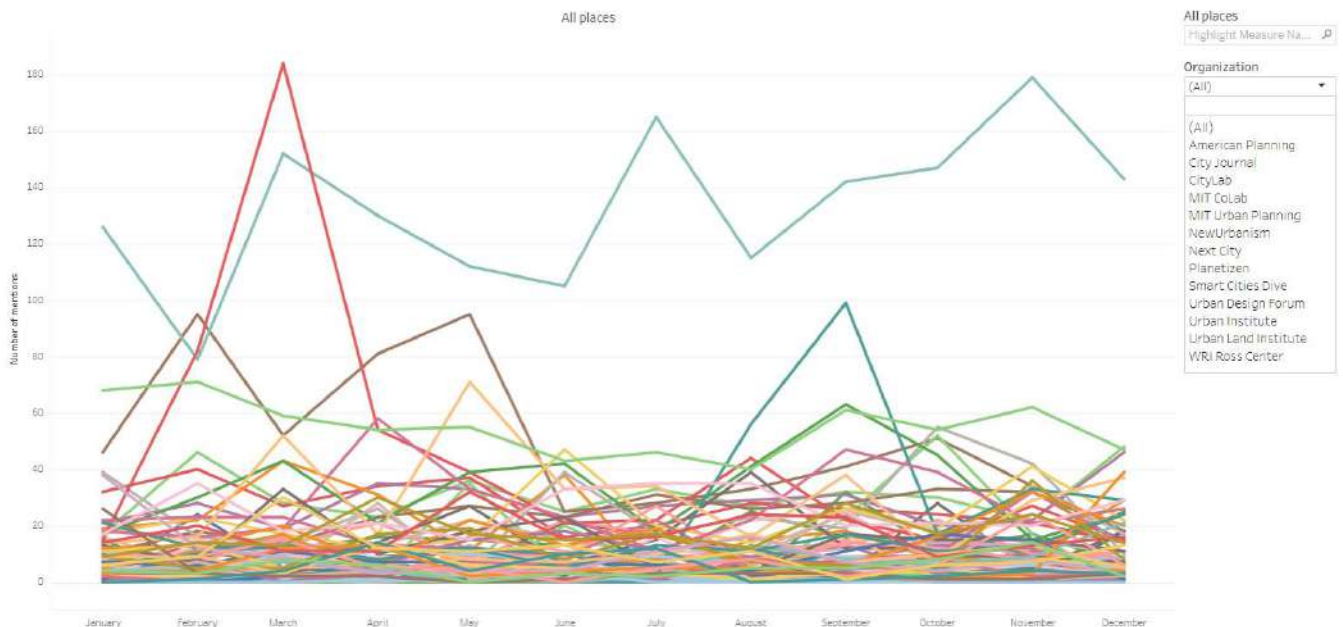
The model above imagines a community center housing multiple uses built upon abandoned railway lines running through London.





## Twitter and Online Communities

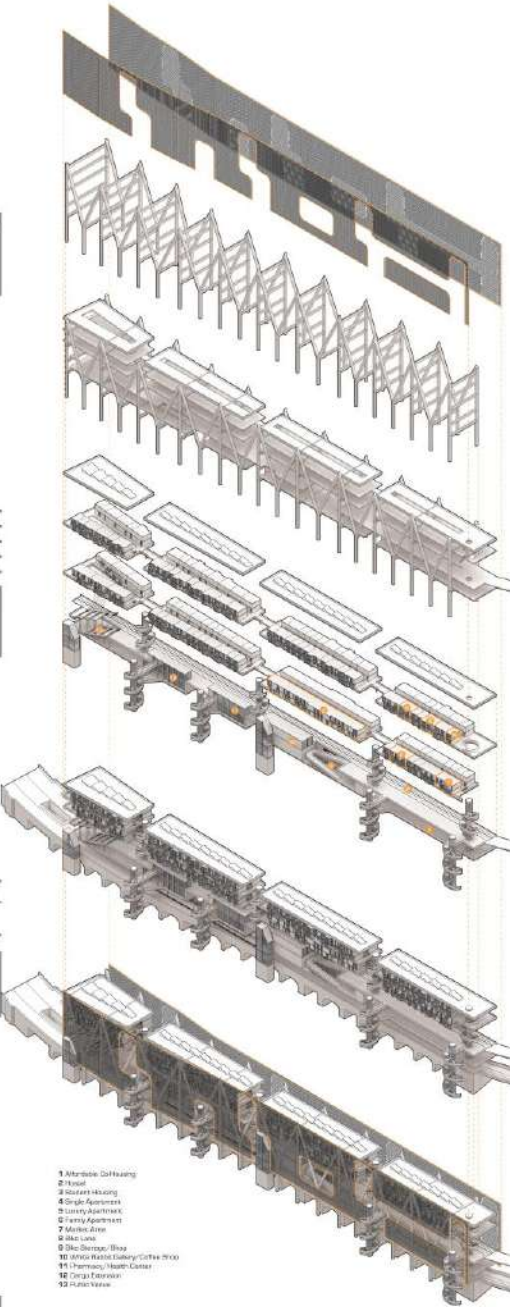
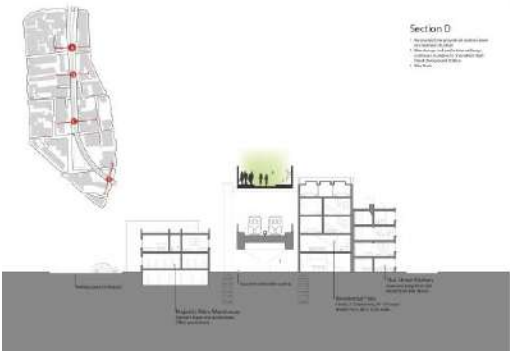
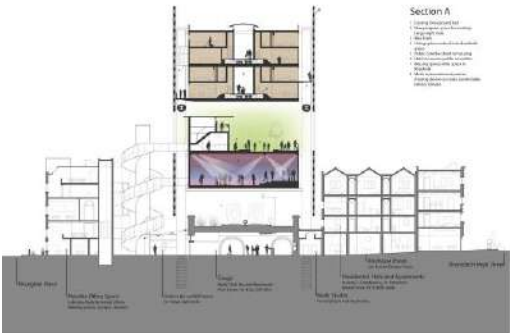
Online communities are becoming increasingly essential to understand in order to better assess the built environment. In some ways, our devices have become our primary means of expression. City78 has developed custom tools to understand online communities and transpose our findings into tangible recommendations for cities.





# Design Conceptualization

City78 realizes urban development through sophisticated architectural designs and modeling.

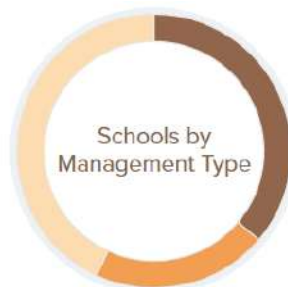


- 1 Affordable Housing
- 2 Retail
- 3 Medium-density
- 4 Single Apartment
- 5 Luxury Apartment
- 6 Family Apartment
- 7 Medium-density
- 8 Office Land
- 9 Office Building / Shop
- 10 Office Building / Office Floor
- 11 Pharmacy / Health Center
- 12 Office Building
- 13 Office Building



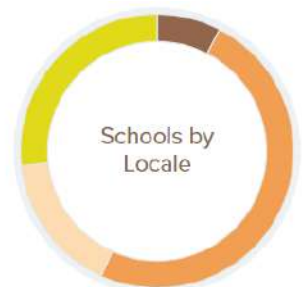
2014

Click donuts for Trends and  
Details



Schools by Management Type

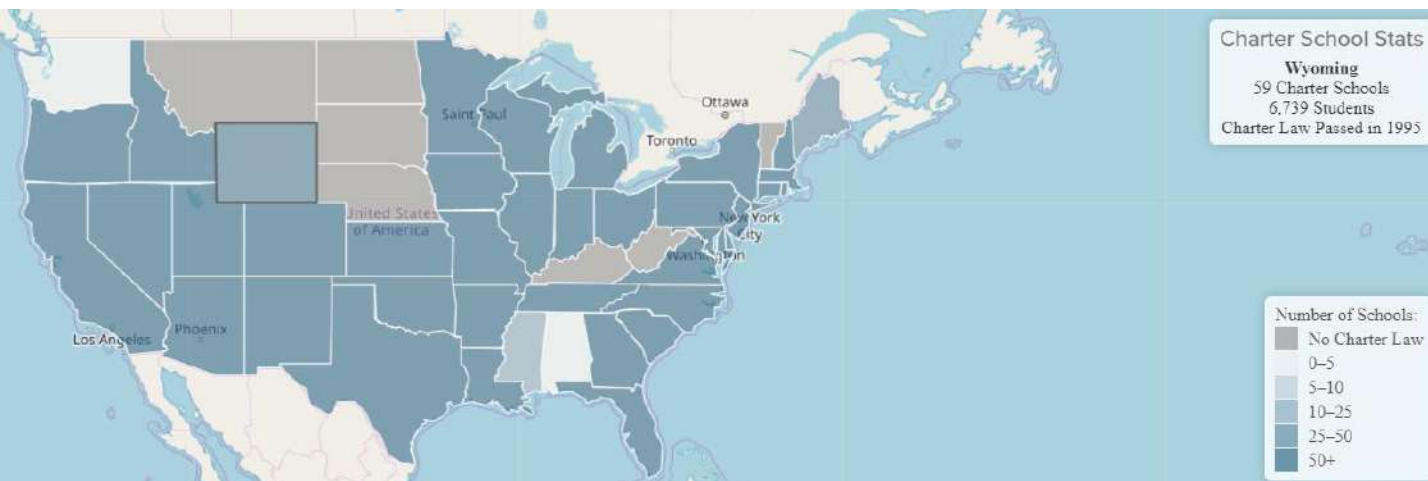
CMO	36%   1,680
EMO	21%   960
Freestanding	43%   2,000



Schools by Locale

Urban	8%   200
Suburban	49%   1,300
Town	17%   438
Rural	27%   707

2014



## Custom Interactive Dashboards

City78 brings unique data and findings directly to the viewer through interactive, intuitive dashboards. Pictured above is a dashboard to assess school data across the US.

[Link](#)

## Science, Technology, Engineering, and Mathematics (STEM) Access and Enrollment in the Nation's Schools

A closer look at access and enrollment in Algebra I.

— U.S. DEPARTMENT OF EDUCATION



Powered by IHSNED and the 2015-16 Civil Rights Data Collection

f t in

f t in

f t in

f t in

\* Grouped  
□ Stacked

### Introduction

#### The importance of STEM

In today's era of technological innovation, students need to gain knowledge and skills in order to solve difficult problems, gather and evaluate evidence, and make sense of information they receive. Students can develop and strengthen these skills by studying science, technology, engineering, and mathematics subjects, otherwise known as STEM (<https://www.ed.gov/1>). A strong STEM education is a bonus for all students. As the demand for new skills grows, we must prepare students to develop innovative solutions for the challenges of the 21st century.

A strong STEM education is increasingly recognized as a path to employment. The need for STEM knowledge and skills will grow and continue into the future (<https://www.ed.gov/1>). The Secretary of Education has outlined a comprehensive education agenda that includes promoting science, technology, engineering, or math (STEM) education with a particular focus on computer science as a key priority (<https://www.ed.gov/1>). The agenda focuses on expanding access to STEM and computer science courses for all students. According to the Office of Innovation and Improvement, more than half of all STEM jobs in 2018 will be in computer science-related fields. Computer science knowledge will help prepare students for the changing economy (<https://www.ed.gov/1>).

The data story explores both access to and enrollment in Algebra I using the 2015-16 Civil Rights Data Collection (CRDC). In terms of access, the data story looks at the types of schools that offer Algebra I classes and the students who have access to those courses because they are enrolled in those schools. In terms of enrollment, the data story looks at the students who actually enrolled in Algebra I classes that are offered. As we will see through the story, just because students have access to Algebra I classes does not mean they actually enroll in those classes.

Our charts are interactive! Hover over or click on chart elements to learn more about specific data points.



Let's take a closer look at Algebra I access and enrollment at the district level, school level, and by different student characteristics. We will begin with an overview of all grades and then transition to focus on 8th grade Algebra I.

#### School Level

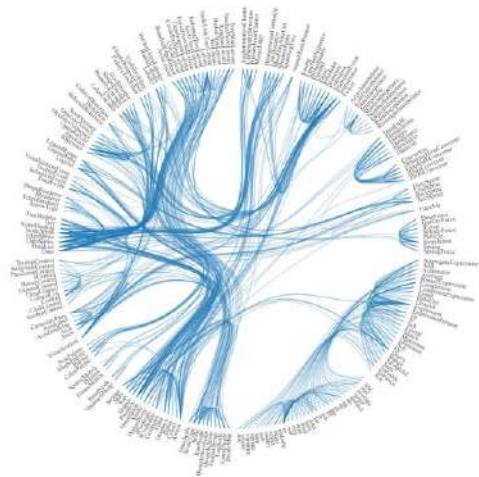
Schools were most likely to offer Algebra I in 9th or 10th grade.

Using the data

The data file used for this chart has been downloaded.



About 69 percent of schools offered Algebra I in 9th grade compared with 64 percent of schools for 9th or 10th grade and 50 percent of schools for 11th or 12th grade.



## Comprehensive, End-to-End Solutions

While some projects call for simple webpage design in order to best deliver content to the reader, others require more complex interactive visualizations.