Contemporary Infrastructure for the Sustainable Mid-Sized City

Christian Martinez

Follow this and additional works at: https://surface.syr.edu/architecture_tpreps

Part of the Architecture Commons

Recommended Citation
https://surface.syr.edu/architecture_tpreps/331

This Thesis Prep is brought to you for free and open access by the School of Architecture Dissertations and Theses at SURFACE. It has been accepted for inclusion in Architecture Thesis Prep by an authorized administrator of SURFACE. For more information, please contact surface@syr.edu.
Contemporary Infrastructure for the Sustainable Mid-Sized City

Christian Martinez
CONTENTS
A CASE FOR NEW INFRASTRUCTURE
MOBILITY PARADIGM
THE MID-SIZED CITY
CASE STUDY: Syracuse
NEW TRANSPORTATION FRAMEWORK
FRAMEWORK ELEMENTS
MOBILITY THROUGH ARCHITECTURE
RESEARCH
Syracuse (the City) recently developed an Energy Master Plan which envisions a 31% reduction in average municipal vehicle fuel consumption, primarily through increased adoption of sustainable alternatives. The City is in a position to leverage money already invested in multi-modal infrastructure projects. There exists an opportunity to increase use of sustainable transportation alternatives by coordinating with the growing residential community, a new hotel to serve the convention center, and the ongoing emergence of the Syracuse Innovation Quarter (SyrIQ). Team personnel have expertise in planning, designing, constructing, and evaluating the performance of multi-modal transportation systems; GHG modeling, qualification, accounting, monitoring, verify, and reporting; research, development, demonstration, and deployment of clean energy innovations; entrepreneurship; and economic development.

The objective of this project is to assess the feasibility of developing, implementing, growing, and promoting three urban mobility systems: (1) human-powered mobility, through enhanced walkability and bikeability; (2) sharing economy, through car- and bike-sharing; (3) public transportation services being better integrated. Envisioned innovation quarter in the downtown area will integrate these systems on three scales: (1) neighborhood, within the quarter; (2) city, between innovation nodes; (3) region, commuters from major nodes in/out of SyrIQ. The expansion of these mobility systems is anticipated to contribute to the City’s GHG emission reduction goals and accelerate the development of the SyrIQ.

What architectural interventions can operate within a design for a sustainable mobility network specifically for mid-sized cities?

A CASE FOR NEW INFRASTRUCTURE

Embedded within the Feasibility Assessment of Sustainable Transportation: Syracuse study’s goals is an interest in urban mobility particularly in mid-sized cities in America. Well referenced texts tend to deliberate on issues of urban infrastructure in great urban metropolises. This presumes infrastructure improvements can universally have a positive impact on urban mobility irrespective of city size. But is it possible for the prosperity of cities to be augmented by virtue of investing in policy and infrastructure for sustainable transportation through following megalopolis biased guidebooks? Vishaan Chakrabarti advocates for a more urban America in “A County of Cities”, because of their ability to foster a better environment and economy thus leading to increased social equity. He suggests that the performance of cities top that of lesser populated establishments. However, when considering the city of Syracuse we see that its performance issues may be partly responsible due to its shrinking population. If larger and denser cities can support new innovative sustainable transportation networks, how are we sure that mid-sized cities can as well?
By definition, infrastructure sustains a condition of continuous flux: it generates an urban dynamic and stimulates movement to the limits of its own capacity or the endurance of the settlement it has helped to create. A static object that frames flows, it incessantly needs to renew itself and search for alternatives.

What is infrastructure?

“Mobility has become a condition for modern life.” Contemporary society is dependent upon mobility and transportation in urban and regional conditions for work, services and increasingly leisure activities.

Transportation infrastructure is regarded as a primary measure of a city’s success. Therefore, the design of it is viewed as a prominent field for investment. Recent changes of perception, has shifted the outlook of mobility using car-centric plans and ideologies toward more sustainable and shared modes. These are regarded as more efficient in terms of air quality, health, and environmental perspective.

Regardless, of the change in perspective, the need for movement into, out of, and throughout a city is foremost. Thus design of urban infrastructure geared for performance and even experience.

MOBILITY PARADIGM

“Mobility has become a condition for modern life.” Contemporary society is dependent upon mobility and transportation in urban and regional conditions for work, services and increasingly leisure activities.

Transportation infrastructure is regarded as a primary measure of a city’s success. Therefore, the design of it is viewed as a prominent field for investment. Recent changes of perception, has shifted the outlook of mobility using car-centric plans and ideologies toward more sustainable and shared modes. These are regarded as more efficient in terms of air quality, health, and environmental perspective.

Regardless, of the change in perspective, the need for movement into, out of, and throughout a city is foremost. Thus design of urban infrastructure geared for performance and even experience.
THE MID-SIZED CITY

Defining the mid-sized city is essential for this investigation. City population does not only attribute to make a city 'mid-sized' or medium sized. Other aspects that may be included and to be examined are:

- Metropolitan population
- Population density
- City area
- Socio-cultural history
- Urban rates of mobility
CASE STUDY: Syracuse

Since 1950, the City of Syracuse has experienced significant population loss. This has been attributed by the suburban sprawl paradigm that continues to put pressure on transportation infrastructure. The city has recently developed and implemented projects to transform the car-centric urban landscape toward a more sustainable and human scale landscape. Some projects to highlight which emphasized on human-powered mobility and public transportation are the: Onondaga Creekwalk, Connective Corridor, Centro Transit Hub, and Intermodal Transit Center. Each of these projects can be seen as individualized efforts toward improving sustainable transportation in the city, however, there is potential for failure due to a lack of system integration. I will look into these efforts and others planned for Syracuse as one city wide project that is comprised of integrated and complimentary interventions intended to create a comprehensive multi-modal network.
Using the research from the FAST: Syracuse study, this project will push forward into developing a possible architectural application that hosts and supports new and enhanced pedestrian, bicycling, sharing economy, and public transportation infrastructure. This may be investigated through a means of designing a sustainable mobility hub for the proposed active and public transportation network of Syracuse.

This thesis will consider the proposed mobility network for Syracuse as its framework for the investigation. It will look to incorporate instances for providing links between modes of transportation, sharing economies, and travel destinations.

**NEW TRANSPORTATION FRAMEWORK**

This project will focus on aspects of urban mobility through modes of sustainable transportation. These include:

- **Walkability** - An urban design aspect that measures ease, convenience, and safety of walking in a city. This measure takes into account accessibility to pedestrian infrastructure, proximity to destinations, and range of activities in pedestrian landscapes.

- **Bikeability** - A measure for the profiency of a city to foster and promote a friendly bicycling environment. This includes safety for bicyclist and the breadth of the infrastructure network among other factors.

- **Public Transportation** - A shared mobility service for the general public to use as passengers for traveling to and from destinations. Modes of this service include, city and regional buses, trolley/streetcars, trams/lightrail, passenger trains, rapid transit, and intercity bus and rail services.

- **Sharing economy** - The services allow of this model allows users to gain access to a shared amenities for a short term rental fee and/or membership fee through an online portal.

- **Mobility Hub** - A transportation center designed to serve instances of high-frequency transit. Typically offers a wide range of mobility services and transportation alternatives such as walking, bicycling, public transit, etc.
This thesis aims to identify the role architecture plays in urban transportation infrastructure, mainly how it can enhance, support and/or even initiate improved sustainable transportation modes and change social perceptions of travel within mid-sized cities.

To do so this project will propose an architectural intervention or perhaps set of architectural intervention tailored for mid-sized cities through an investigation of its integration with the vision of a new urban mobility network in Syracuse, NY. This investigation will suggest the need for sustainable transportation within mid-sized cities as well as the potential need for synchronization of urban planning efforts and urban design with the application of architectural mobility actuators.
“The Fun Palace was not a building in any conventional sense, but was instead a socially interactive machine, highly adaptable to the shifting cultural and social conditions of its time and place.” (Mathews 2005)

Multimodal transfer facilities of contemporary society have capitalized on the activity they cultivate. Especially in larger cities, these facilities are highly active and often engage in activities beyond mobility and transportation. Mobility and transportation is what brought people there, but this has been supplemented with shopping, sightseeing, meeting, entertainment, etc. At one end of the spectrum, this thesis will look into sustainable mobility but will speculate on the impacts beyond mere transportation for work. The investigation will look into the potential of mobility structures that accelerate leisure activity and a range of urban experiences specific to the mid-sized city.
RESEARCH

Mapping
Precedent Study
Site Scoping
we find that they also rely on car travel to get to them.

The city yearned for a segment of a multi-use path

are not well accommodated although the Creekwalk is

5M

drawing attention from outside the Syracuse citizenry

5M

accommodate its suburban condition in the city and the

extension to the previously named Carousel Center,

portion of the parking area to an air landing strip.

Recent revenue ventures in the city have aimed at

drawing attention from outside the Syracuse citizenry

Ju

---

TOURISM CATALYST

mapping tourism influence in urban design
Conventional forms of public transportation in Syracuse claims presence in the urban landscape by adapting to the infrastructure laid by the automobilized collective. A prominent rail transit network was stripped away to make space for the rise of car travel. A bus-train network followed in its shadow to serve a population in need of mobility throughout the city. Working as a fluid and adapting to the landscape of the city, public transportation rarely reaches its own architectural form. It serves as a connector between modes of the city. This proves difficult because of the reliance on the destination to promote and make public transportation a more viable option for its population. Architecture may allow it to become more fixed as we have seen in the transit hub example but it will only serve its own purpose. It remains infrastructure without becoming infrastructure.
provides another example of a priority to provide more sustainable mobility for the community. Funding for the project was under a year and was led by Syracuse University and the City of Syracuse. The project received many forms of support, from a varied group of stakeholders including funding from the Syracuse University Foundation and a public-private partnership. The project included many forms of green transportation, such as protected bike lanes, improved sidewalks and pedestrian and bicycle only thoroughfares. This project has been transformative for the city, as it has lead to sustainable mobility in the city. However, the project does not extend beyond the campus boundary, it is a dedicated corridor that links the campus with the downtown neighborhood to engage in shopping, dining, and traffic engineers have taken responsibility and been leaders in the design and implementation of the project. Green transportation in Syracuse is dominated by its dependence on individual car ownership and use. As part of the Syracuse University Campus Framework, the university has proclaimed itself as a major stakeholder in the design and implementation of transportation solutions. The university has taken the lead in funding and implementing these projects, and has been a major player in the development of new infrastructure spaces made to appear more convenient, cheaper, and healthier than conventional car use. The university's role in funding and implementing these projects has been transformative for the city, as it has lead to sustainable mobility in the city. However, the effects are not yet felt and not nearly quick enough.
Amsterdam Arena Transferium
Rob Schuurman
Amsterdam, Netherlands

Source: photovoltaik.eu

Suburban Attractor
Parking Plus
LTL Architects
Westbury, NY, USA
Amsterdam Arena Transferium
Rob Schuurman
Amsterdam, Netherlands

Source: www.rsaud.com
Haluchère Mobility Hub
AUP
Nantes, France

Source: archdaily.com
Västerås Travel Center
BIG
Västerås, Sweden

Source: dezeen.com
Nørreport Station
GPA & COBE
Copenhagen, Denmark

Source: archdaily.com

Intermodal City Plaza
Jersey Corridor Project
Michael Graves & Peter Eisenman

Source: dwell.com
Lower Manhattan Expressway Project
Paul Rudolph

Source: Library of Congress via www.loc.gov
Lower Manhattan Expressway Project
Paul Rudolph

Source: Library of Congress via www.loc.gov
Contemporary Infrastructure for the Sustainable Mid-sized City
REFERENCES


Contemporary Infrastructure for the Sustainable Mid-Sized City

Christian Martinez