

# DOWNTOWN ATLANTA 2041

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Image Source: <https://www.anderson.wordpress.com/2014/11/24/design-news-atlanta-downtown-fall-2014/>

**A 25-YEAR VISION FOR DOWNTOWN ATLANTA**  
**MSUD/DESIGN + RESEARCH STUDIO, SCHOOL OF ARCHITECTURE**  
**GEORGIA INSTITUTE OF TECHNOLOGY**  
**SPRING 2016**

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# FOREWORD

Downtown Atlanta is a unique place. It has tall buildings, old buildings, new buildings, parks, offices, hotels, a university, a few residences. It has an abundance of attractions and the best public transit in the South. But it lacks an urban vibrancy one would expect in the central city of such a large region. There have been many successful improvements in recent years resulting in a downtown which is poised for reemergence. What it has in greatest abundance is opportunity. Making the most of it will require great skill and ingenuity. The desired outcome, however, is one we are familiar with; active, healthy streets and public spaces where the great diversity of a city can come together every day for both routine and commemorative moments. The question is how? That is the question of this studio.

By Tim Keane

Commissioner, City of Atlanta Department of Planning & Community Development.

# INTRODUCTION

Downtown Atlanta 2041 is a speculative look 25 years into the future at the opportunities available to build on parking lots and create a walkable network of Class A streets and distinctive neighborhoods around Downtown's many assets. The design proposals are based on conversations with stakeholders, analysis of current conditions as well as bold assumptions about the future impact of autonomous vehicles. The work was produced by graduate students at Georgia Tech in the Master of Science in Urban Design, (MSUD) spring 2016 studio, under the direction of Professor Ellen Dunham-Jones in the School of Architecture in the College of Design. The studio had the support of Central Atlanta Progress and sponsorship of the City of Atlanta. However, the views expressed in this report reflect the independent thinking of the students.

Their proposals are intended to contribute to the series of projects and conversations undertaken by the City of Atlanta in 2016 to guide its physical future. Along with the Westside Future Fund's citizen-based planning for the communities near the Atlanta University Center and Mayor Kasim Reed and Planning Commissioner Tim Keane's newly established Atlanta City Studio, Downtown Atlanta 2041 hopes to help Atlantans envision, critique, and discuss the future shape of the city. Should the city's population double in twenty years? If so, where should new residents live and how should they get around? How much of that growth can – and should – occur in Downtown?

These were among the general questions posed to the studio by Commissioner Keane. More specifically in relation to Downtown, he asked the class to identify Downtown's Class A street grid and the means to enhance it so as to attract dramatically more residents to Downtown. Downtown's colliding street grids are made up of relatively small blocks that should contribute to a high degree of walkability. However, Downtown's 95,000 parking spaces significantly inhibit pedestrian activity. Analysis of the locations of Downtown's parking decks and surface lots and research into the potential for autonomous vehicles to significantly reduce demand for parking in the future informed the studio's proposed Class A street network and improvements to the pedestrian and mobility experience.

The capacity of the Class A street network was tested through urban design proposals for four distinct neighborhoods. Each of them illustrates different kinds of carfree or car-light living due to Downtown's excellent transit access and potential autonomous vehicle access (both in the form of shuttle-sized autonomous buses and robotaxis.) Each also imagines new opportunities for green infrastructure. Built largely on top of existing parking lots, each proposal leverages a different set of site-based assets to help illustrate the diverse kinds of neighborhoods possible in Downtown. What might an eco-district look like that takes advantage of our hilly topography? Will Atlanta be ready for bike-oriented urbanism? How can we preserve affordability while growing an arts district? And can we find new ways to capitalize on Atlanta's tremendous green tree canopy while also promoting high density at the heart of the MARTA system?

I would like to personally thank Mayor Kasim Reed, all of the members of City Council, and Commissioner Tim Keane for the opportunity they provided the students to work on these exciting – and not entirely answerable – questions. The sponsorship provided enables the MSUD to continue to support this kind of research and service to the community. I know that I am not alone on the faculty in hoping this is the first of many such sponsored studios.

I would also like to offer my gratitude to the many downtown stakeholders, critics, and advisors who assisted the studio, in particular Jennifer Ball of Central Atlanta Progress. Most of all, I would like to thank the very talented and inspiring students who enthusiastically integrated research and design to provocative ends: Meredith Blakeley, Sarah Jane Bonn, Eric Goldstein, Shijia Huang, Meghan McMullen, Lu Pang, Mikhail Payson, Blake Reeves, Stacy Scott, and Animesh Shrestha.

By Professor Ellen Dunham Jones

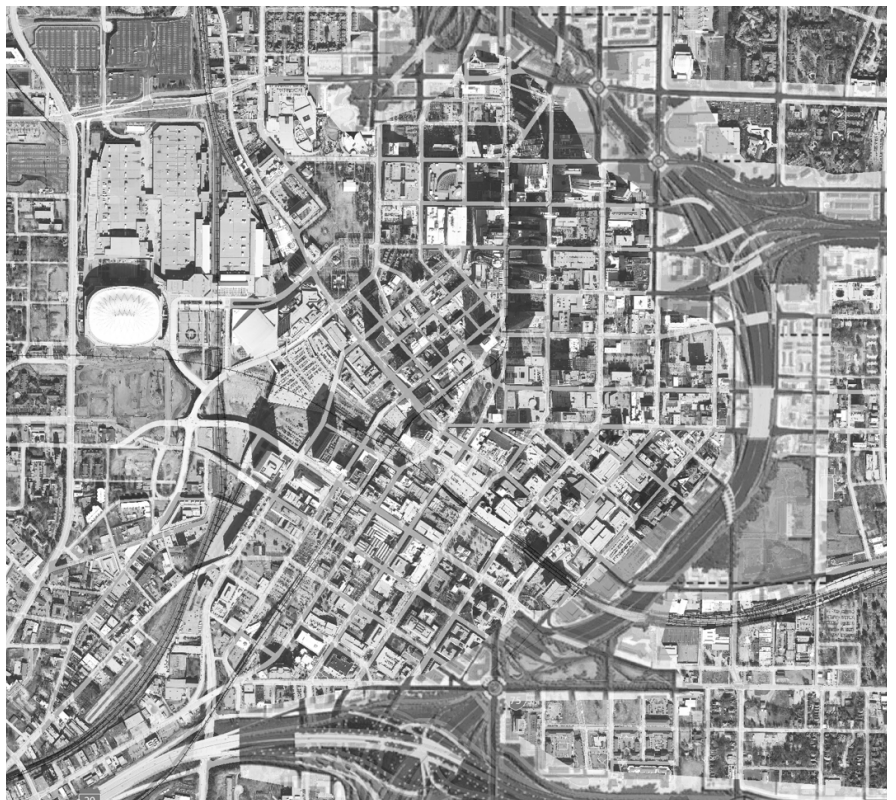


Image Source: Perkins + Will, Atlanta

# UNDERSTANDING DOWNTOWN ATLANTA

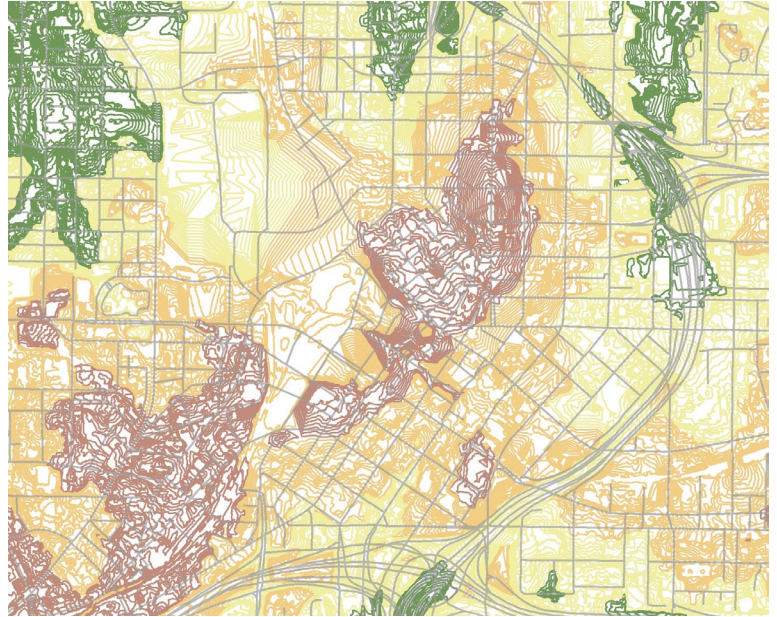
HOW DID THE EXISTING STREET GRID COME TO BE? HOW ARE USES ORGANIZED?  
HOW DO PEOPLE MOVE AROUND AND WHO LIVES DOWNTOWN?

# THE STREET GRID

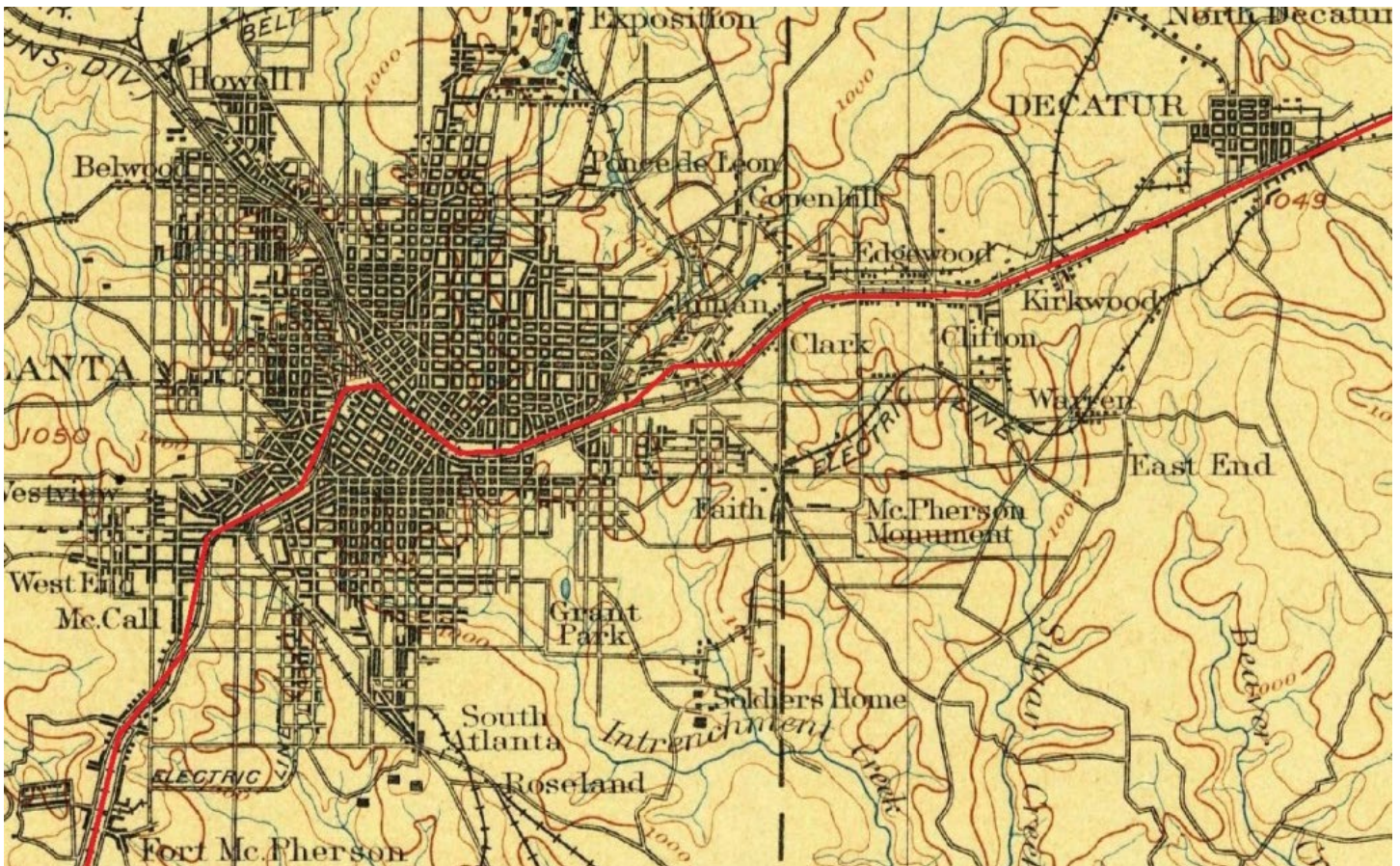
## Topographic Origins

Downtown Atlanta's street grid is highly circumstantial. It did not result from a visionary masterplan or set of unifying ordinances. Its quilt of collided grids evolved in response to topography, railroads, and the land lot lottery.

Long before there were streets, the area that became Downtown Atlanta was defined by ridges, valleys and extensive tree canopy. The Creek Indians established a trail along a ridge line that eventually became Peachtree Street, the city's central spine and a portion of The Eastern Continental Divide. Later, three major railroads also followed the ridges, converging in "the Gulch," a saddle within the Peachtree Ridge that was wide enough to turn a train around and had a spring that fed the steam engines and gave Spring Street its name.



**Downtown Atlanta topography with existing street network.** Red lines show the highest areas, green lines are the lowest. (Source: Blake Reeves, GIS map)



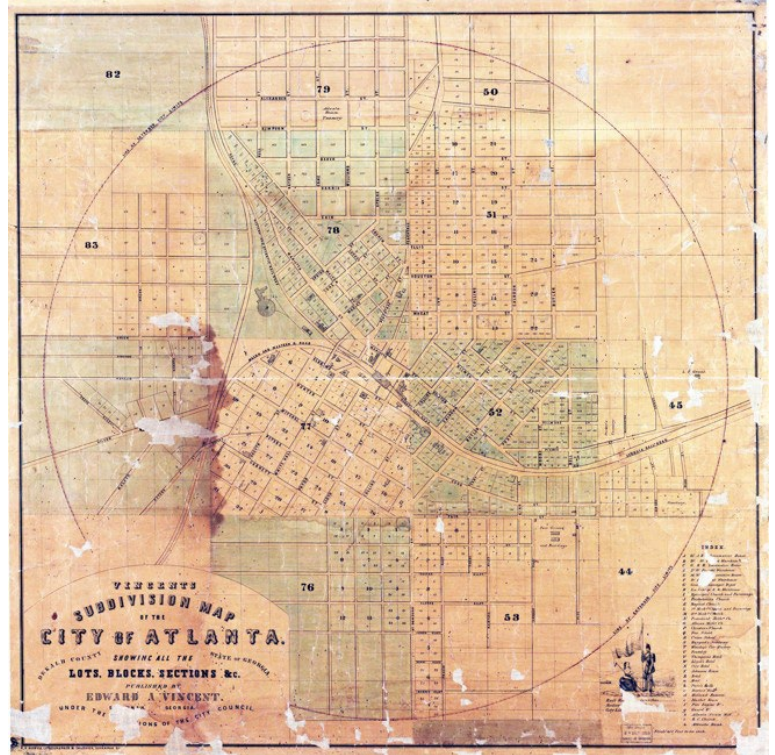
**Eastern Continental Divide in Atlanta** (Source: <http://blog.adaptershack.com/2015/03/10/eastern-continental-divide-probably-not-the-last-youre-going-to-see-of-it-here/>)

# THE STREET GRID

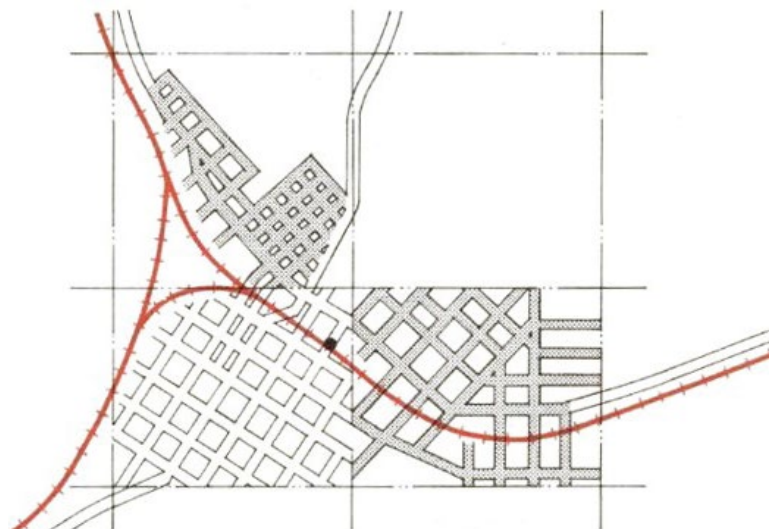
## Evolution of the Street Network

Later landowners tended to connect their new streets to the old streets, often creating odd wedges inbetween the different grids. Several of these have become small parks or plazas. The iconic Flatiron Building takes up one of the wedge sites and is one of the few buildings Downtown to take advantage of its position as a terminating vista. The lack of such terminating vistas to aid in wayfinding, the one-way streets, and the range of block sizes, make the experience of navigating Downtown's colliding grid street network confusing for many.

Return of all one-way streets to two-way, zoning code recommendations addressing terminating vistas, and prioritization of a few routes with consistent high-pedestrian activity and high-design standards, (ie., a network of Class A streets) could replace confusion with a more comprehensible network of distinctive routes and destinations of diverse character.



**1853 Atlanta Subdivision Map.** The 1-mile radius boundary of the city was established in 1847 and overlaid the checkerboard of early lottery land lots. (Image Source: <http://tomitronics.com/peachtree%20road/images/1853vincents.jpg>)



**The first three subdivisions.** Developed by the 1850's, each was oriented to the closest railroad, each with its own block size. (Railroads are shown in red. The lottery lot lines are shown in dot-dash. The central black square indicates the current location of the Five Points MARTA station.)

(Image Source: <http://news.wabe.org/post/atlantas-traffic-woes-trace-back-railroads-land-lotteries>)

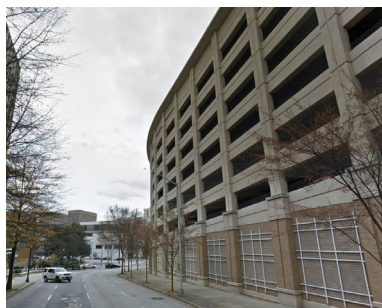
# THE STREET GRID

## Walkability

Downtown's relatively small blocks and relatively narrow streets provide the bones for excellent walkability and connectivity. Pedestrians can choose multiple fairly direct routes to get where they are going – as shown in the studio's color-coded Space Syntax analysis of walkability. By this measure, Fairlie Poplar's small blocks make it the most walkable part of Downtown.

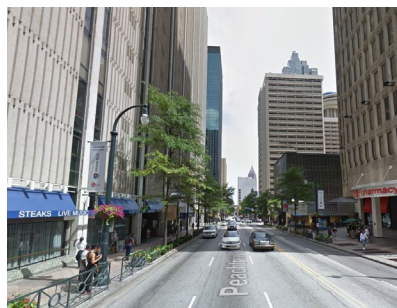
The website Walk Score puts more emphasis on counting the actual destinations within walking distance from a location. Of the 160 Atlanta neighborhoods tracked by Walk Score, Georgia State University, (GSU) and Peachtree Center are considered the most walkable and South Downtown comes in at number five – again indicating Downtown's high walkability. (<https://www.walkscore.com/GA/Atlanta>).

However, walkability also depends highly on the experience of the walk – does it feel safe, comfortable, and are there interesting things to look at along the way? One would expect a Class A street in a downtown to be lined with "active facades": cafes, shop windows, artwork and plantings designed to reward the pedestrian eye. Walk Score does not fully capture these aspects. Using Google Street View, the studio analyzed the ground floor frontage on every block face in the core of Downtown so as to determine which blocks were generally characterized by active facades versus those that predominantly presented blank walls. The results indicate that the vast majority of Downtown's block faces are not pedestrian-friendly. In fact, there is not a single street with continuous active facades running through Downtown. Even Peachtree Street, Atlanta's premier street, has several blocks of surface parking lots and blank facades.



(Image source: Google Street View)

Blank Facades



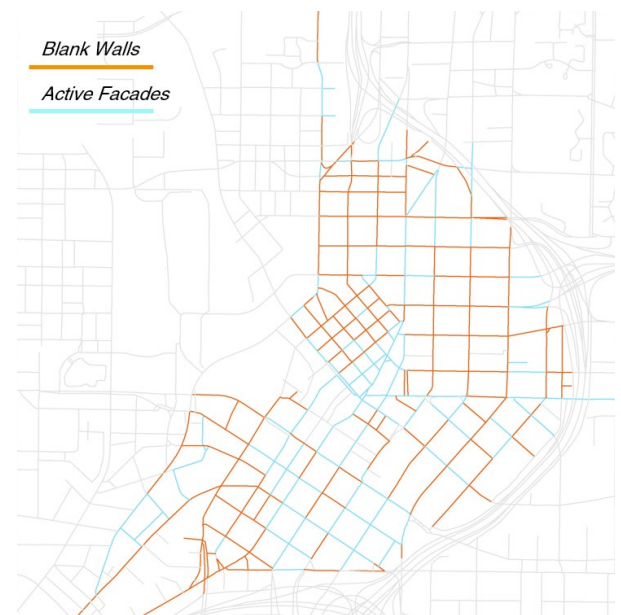
(Image source: Google Street View)

Active Facades



(Map by Shijia Huang)

**Space Syntax Walkability Analysis.** The warmer the color, the more same-distance routes one can walk from any single destination in a set period of time. This means a pedestrian has access to many more destinations than in an area with very large blocks. (Note: the software does not accurately read the highways.)



(Map by Shijia Huang)

### Blank Facades vs Active Facades.

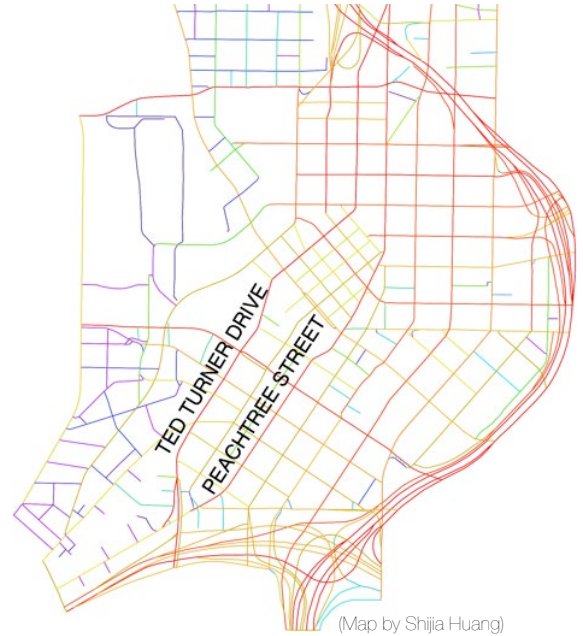
Most of Downtown's streets are predominantly blank walls and there is not a single street with continuously active facades in Downtown Atlanta. (Source: Lu Pang)

# THE STREET GRID

## Walkability

The good news is that buildings change over time and their frontages can be altered. Street grids are much harder to change and Downtown is blessed with good bones. To see which of those bones are more likely to be able to support the kind of active ground floor uses that benefit from a high level of accessibility, the studio did a Space Syntax analysis of connectivity. Given the high number of intersections with other streets, Ted Turner Drive and Peachtree Street are the most connected streets in Downtown. From a network perspective, properties along them are highly accessible and should be the most likely to support lively, pedestrian-friendly uses. That they do not always currently do so, especially Ted Turner Drive, has more to do with the limited design expectations of the street and properties along it – and is likely due to too small of a residential population to support such uses.

Downtown's street network has good bones to support walkability and safe, lively streetscapes. But far too many of its buildings meet the street with blank walls and it currently lacks a large enough residential population to support the businesses needed to enliven its streets.



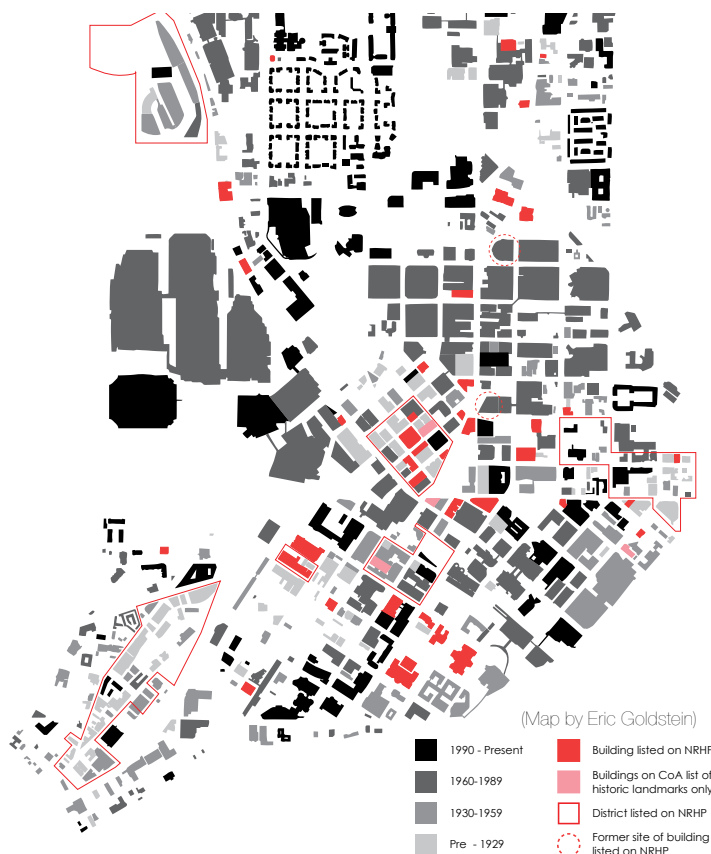
**Space Syntax Connectivity Analysis.** The warmer the color, the more connected that street segment is to all the others and the more likely it is to be able to support retail and other active ground floor uses. (Note: the software does not read highways accurately.)

# USES AND REUSES

## Historic Buildings

Downtown's streets are graced with many historic buildings. Several of the finest are listed on the historic registry, ensuring their protection. However, many more have been demolished and the local stakeholder group was adamant about the need to preserve most, if not all, of those that remain. The studio agreed that even the simple warehouse and commercial buildings have a fine-grain scale, detailing, and urban form that contributes greatly to the walkability, authenticity and unique character of Downtown's public realm. Downtown would benefit greatly from continued efforts to remove the obstacles to adaptive re-use of these assets.

Consideration should also be given to the large number of buildings from the 1950's -70's in Downtown. Many are eligible for historic preservation status but do not contribute to the walkability of Downtown and may be more suited for redevelopment.



**Building Age and Preservation Status.**



**Adaptive Re-Use Opportunity Areas.** South Downtown and Castleberry Hill have several clusters of older buildings that in some cases are, and in other cases could, anchor surrounding redevelopment.

## "Campuses" and Parking

As both Atlanta's historic Central Business District and the seat of state, county, and city government, the Downtown core has long had more jobs than residents. It has evolved into a collection of discrete, managed "campuses" divided by auto-oriented streets primarily serving commuters and predominantly lined with parking.

# USES AND REUSES

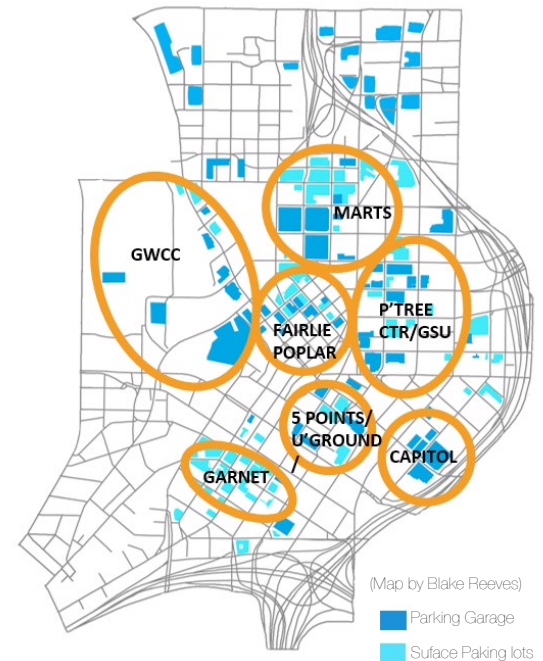
## “Campuses” and Parking

Photographs from the 1890s through the 1920's show busy streets lined with retail shops linked to the surrounding residential neighborhoods by trolleys. However, suburban expansion of both homes and businesses, the dismantling of the trolley lines, construction of interstates, greater reliance on private automobiles, and desegregation led to a dramatically different streetscape by the 1990s. The Merchandise Marts, Hotels, Convention Center, Peachtree Center and Georgia State University, (GSU) buildings from the 1970's and 1980's tended to internalize activity and present blank walls to the street. Elevated walkways further reduced activity on the streets. Despite the construction of MARTA, aging buildings were increasingly torn down for parking lots and garages to service commuters and those driving in for special and sports events. Downtown's population significantly declined in the 1980s. In Setha Low's book *Theorizing the City*, GSU anthropologist Charles Ruteiser says that by 1990, Five Points was a “vacant shell of its former self,” while Downtown as a whole was largely an “archipelagic assemblage of fortified enclaves inhabited in the daylight hours by government office workers, conventioners, and college students, and in the night by a substantial population of homeless persons.”

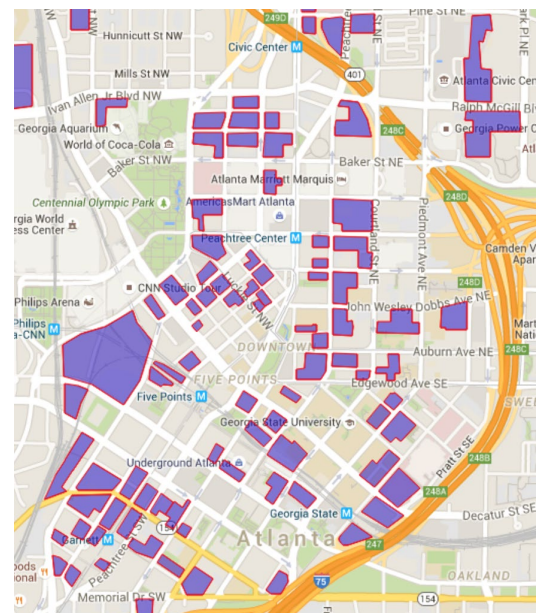
Since then, the construction of Centennial Olympic Park, overhaul of the zoning code to be more pedestrian-friendly, the Streetcar, the emergence of the South Downtown artist district, ongoing investment in student housing by GSU, and the growing market interest in transit-oriented urban living have increased population growth and improved Downtown's prospects.

However, the description of Downtown as an “archipelagic assemblage of fortified enclaves” remains all too true in 2016. Analysis of the locations of Downtown's 95,000 parking spaces reveals clustering of parking around the edges of recognizable centers of activity. The managed campuses – the Georgia World Congress Center (GWCC), the Merchandise Marts, Peachtree Center, GSU, Underground, and the Capitol Complex – tend to maintain their internal streetscapes to a high standard so as to encourage internal walkability. However, they push parking to their edges, creating barriers to pleasant walking between campuses. Instead of dense, walkable, transit-oriented developments (TODs) surrounding the MARTA stations, the landscapes near Five Points & Garnett are dominated by parking, much of it serving the adjacent Federal and County buildings south of Marietta Street. Even the Fairlie Poplar area with its highly walkable, small blocks, is cut off from Centennial Olympic Park by a cluster of parking lots and garages.

**Downtown's “campuses” are great assets to the city and its economy. However, the current pattern of parking degrades the public realm and makes it harder for Downtown to attract new residents. Can Downtown's parking lots be put to better use as new residential neighborhoods with active streetscapes?**



**Parking in relation to Downtown's “Campuses.”** Downtown's 95,000 parking spaces tend to line major streets and cluster around the edges of managed “campus” complexes. The surface parking lots are shown in light blue and parking garages are shown in dark blue.



**Map of Downtown land used for parking.** Out of 95,000 parking spaces, 62% are used under “normal usage”. (Statistic source: Jeshua D. Pringle, “Parking Policies for Resurging Cities: An Atlanta Case Study”, August 2016, Georgia Institute of Technology) This implies there are opportunities for better event parking management, freeing up approximately 1/3 of those parking spaces for other uses. (Image source: <https://breslanta.com/2015/08/23/downtown-atlanta-parking-map/>)

# TRANSPORTATION OPTIONS

Downtown has many great transportation assets and more on the way. In addition to what could be a highly walkable street network of small blocks and relatively narrow streets, Downtown has the best highway and transit access in all of Metro Atlanta. Interstates 75-85 and 20 cross just south of Downtown. The center of the MARTA rail system is located at the crossing of the North-South and East-West lines at Five Points. Multi-modal options have been increasing. The streetcar was introduced in 2014 and bike share in 2016. Both systems – and more infrastructure to support them - are planned to expand. Centennial Park is planned to be the hub for the region's bicycle PATH system. Taxis and various car hailing and car sharing options are well-established. And the State has invested in considerable planning for a multi-modal station in "the gulch" to better integrate regional, local and Greyhound bus terminals with Amtrak and MARTA rail.

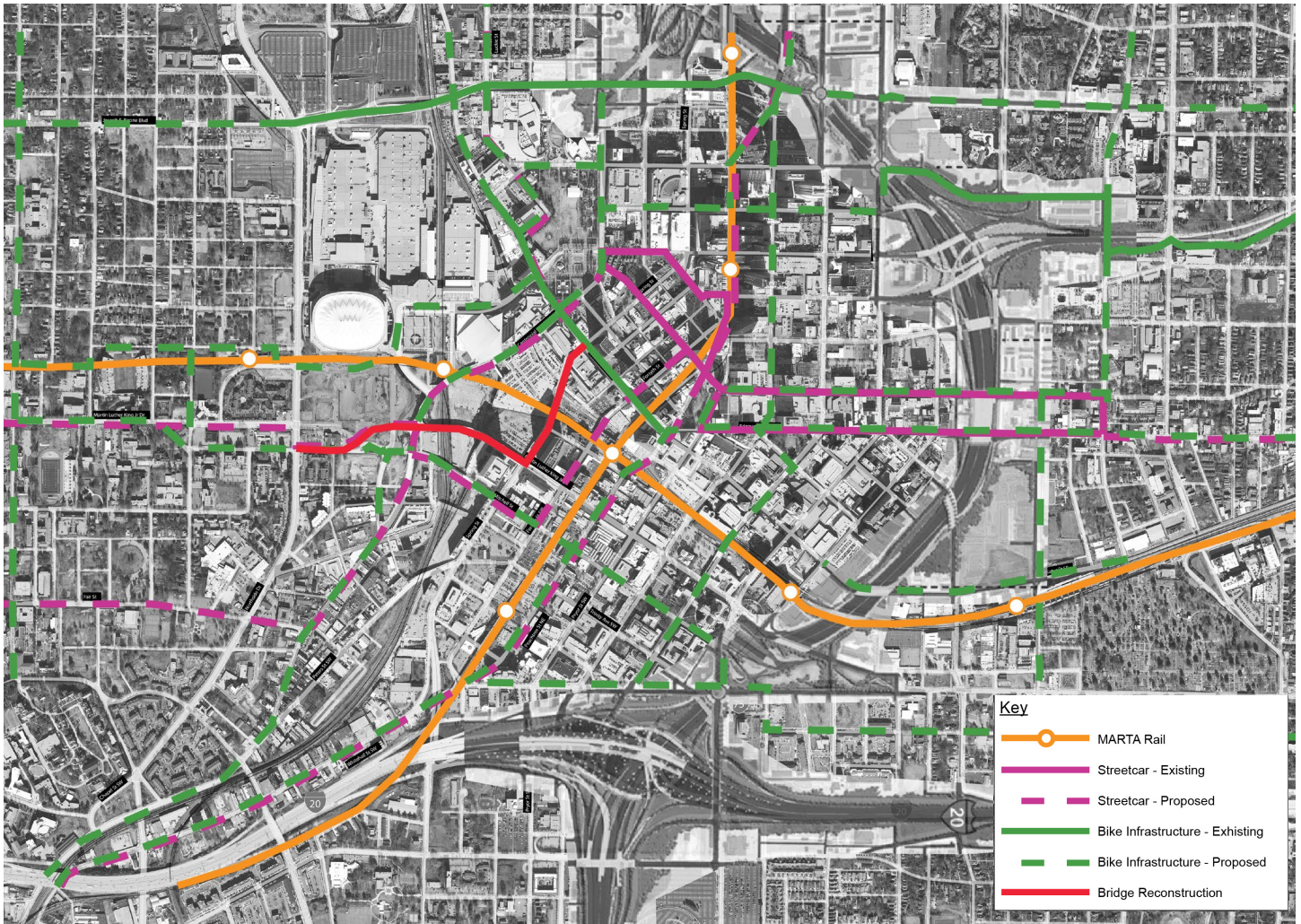
Nonetheless, at present the combination of poor transportation access elsewhere in the Atlanta region and Downtown's access limited mainly to primary streets results in a "first mile/last mile" problem. With abundant parking available Downtown, the vast majority of commuters choose to travel by car and the streets' one-way network encourages them to pass through Downtown as quickly as possible. At rush hour all major streets become filled with "cut through" traffic that diminishes the experience for residents, pedestrians, transit users, and cyclists, in addition to the retailers and restaurants that would like to serve them.

Fewer open businesses and less people on the streets adds to perceptions of fear and crime. During the stakeholder workshop, the studio was told that the downtown hotels on Peachtree and Courtland advise their Convention Center guests to take taxis rather than walk through Downtown to get to the GWCC – even during the day. At night, they advise them to take taxis to Midtown's restaurants.

It will not be easy to unwind the vicious spiral that currently discourages people from using travel modes other than private cars (and reduces the quality of life in Downtown in the process.) The 25-year vision put forward by the studio proposes that several interdependent strategies be considered:

- Identification of key routes whose design standards for the public r.o.w. and private building frontages will create a Class A experience for residents, pedestrians, transit users, cyclists, in addition to retailers, restaurants, and other uses that add vibrancy to the streetscape.
- Redevelopment of parking lots, especially along the A-Streets, with mixed-use buildings designed to attract residents interested in leveraging Downtown's transportation assets instead of owning a car.
- Planning for shared autonomous vehicles and their potentially significant reduction of demand for parking spaces and private car ownership.

# TRANSPORTATION OPTIONS



**Transportation Choices.** Downtown Atlanta has the best transit access in the city (and this map doesn't even include all of the bus routes).

(Source: Meredith Blakeley)

# DEMOGRAPHICS

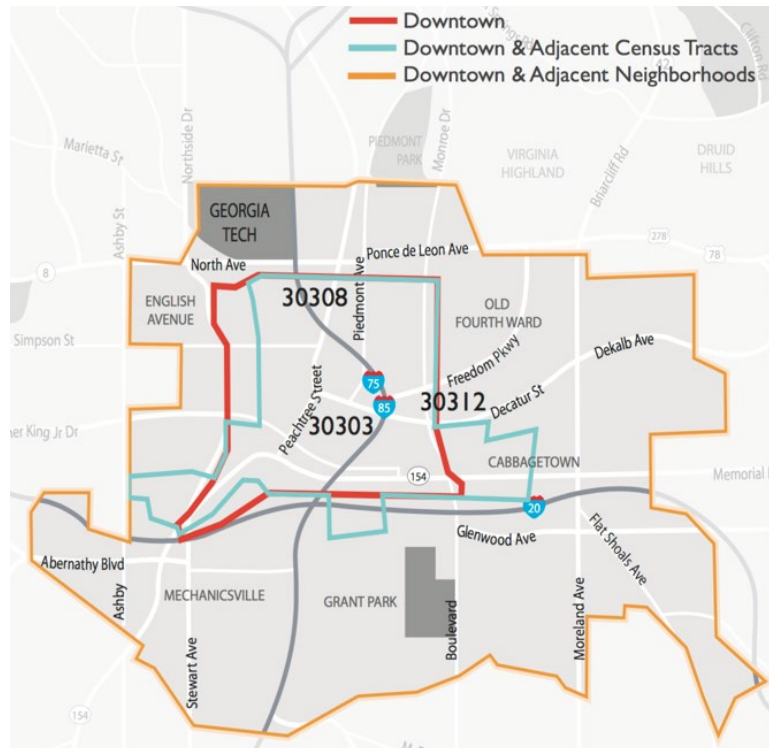
## Current Population

Who lives, works and visits Downtown? The answer depends largely on how one defines Downtown's boundaries. Central Atlanta Progress, (CAP), the local Community Improvement District, defines Downtown as the 4-square mile area within North Avenue to the North, Boulevard Street to the East, I-20 to the South, and Northside Drive to the West. In the 2010 census, this area had 23,202 residents, (an 18.5% increase from 2000 and a 44.8% increase in households), 118,000 workers, and over 20 million annual visitors attending sporting events, concerts, conventions, etc.

(Source: Central Atlanta Progress, online at: [http://www.atlantadowntown.com/\\_files/docs/downtown\\_counts\\_people-v2.pdf](http://www.atlantadowntown.com/_files/docs/downtown_counts_people-v2.pdf))

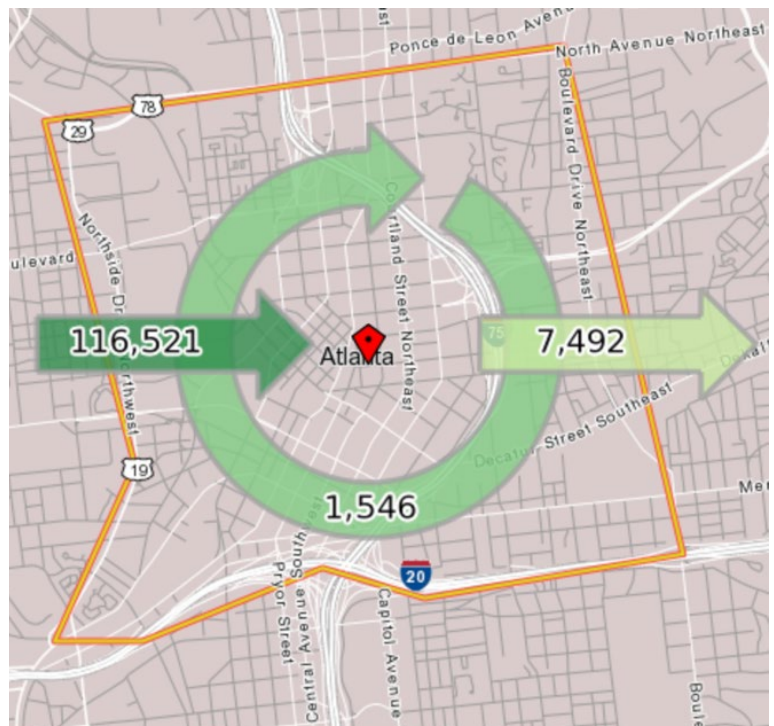
However, if one just looks at the core 30303 zipcode and does not include the more residential areas of Centennial Place, Old Fourth Ward, or Castleberry Hill, the 2014 census shows only 5,582 residents. This is the area where the majority of Downtown's workers are employed and the area with the most severe jobs-housing imbalance. Arguably, it is the area where an influx of more residents could most benefit from the existing transit access and most contribute to enlivening Downtown after dark.

The Downtown core has a mix of professionals, GSU students, artists and others drawn to the emerging arts community in South Downtown, and a significant homeless population, especially near the Garnett MARTA station. In 2010, CAP reported that the average age of a Downtown resident was 30.2 years and that average household income within 1-mile of Downtown was \$36,834, a 46% increase since 2000.



**Central Atlanta Progress Map of Downtown.**

Source: [http://www.atlantadowntown.com/\\_files/docs/downtown\\_counts\\_people-v2.pdf](http://www.atlantadowntown.com/_files/docs/downtown_counts_people-v2.pdf)



**Inflow-Outflow of jobs to Downtown Atlanta in 2014.** Downtown Atlanta sees an enormous influx of workers every day (most arriving by car).

Source: U.S. Census OnTheMap website.

# DEMOGRAPHICS

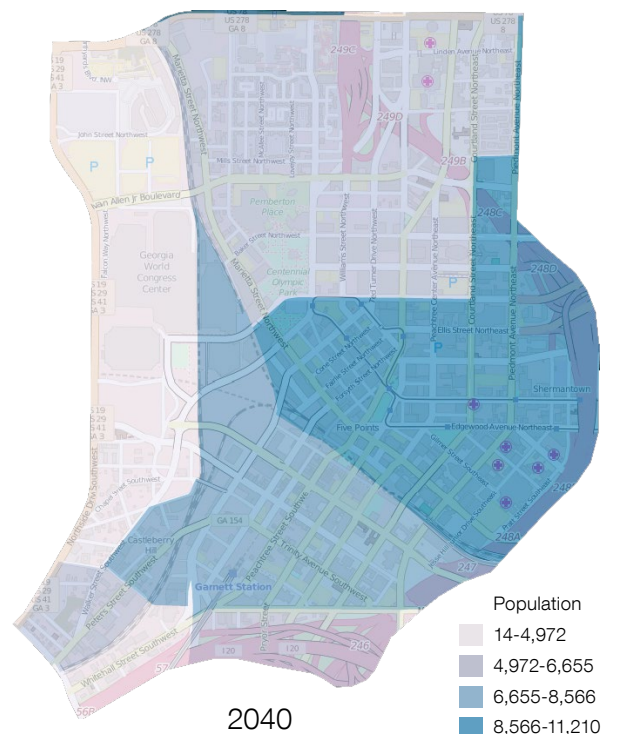
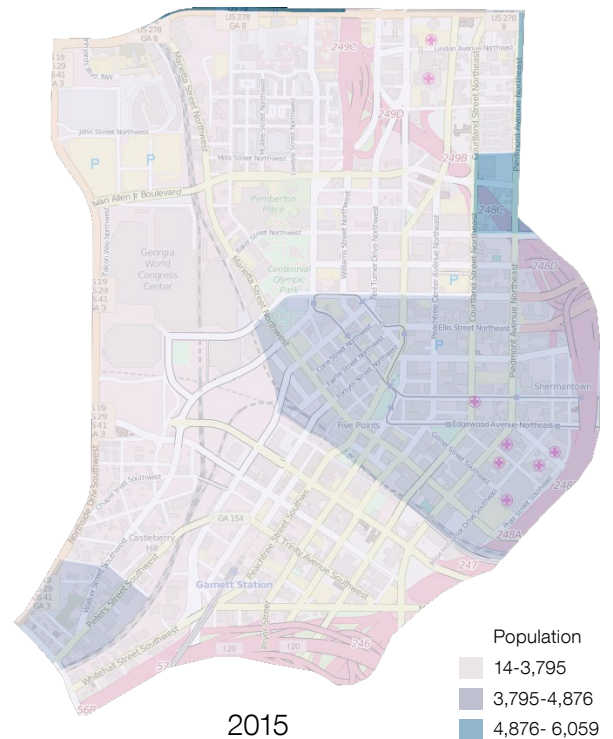
## Growth Projections

The Atlanta Regional Commission, (ARC) projects Downtown's population to increase approximately 132% by 2040, (source, interpolation of ARC Population Forecast map at <http://www.neighborhoodnexus.org>). This would result in a Downtown population of approximately 12,950 in the 30303 core and 53,828 total.

Who will be living in Downtown in the future? Will the Millennials currently filling up Midtown and Buckhead's new apartment buildings migrate Downtown either for its greater affordability, authentic older buildings and diversity, or its better transit access? GSU expects to add upwards of 8,000 new units of student housing in the coming decade. During the course of the studio Post Properties announced new market-rate housing on the on some of the same "Baker Street" parking lots we were studying. How might Downtown distinguish itself from other Atlanta submarkets with more differentiated housing types that build on Downtown's unique centrality and assets? The four hypothetical neighborhood developments proposed by the studio reveal capacity for considerably more growth Downtown than the ARC's projections. What should the density and market goals be?

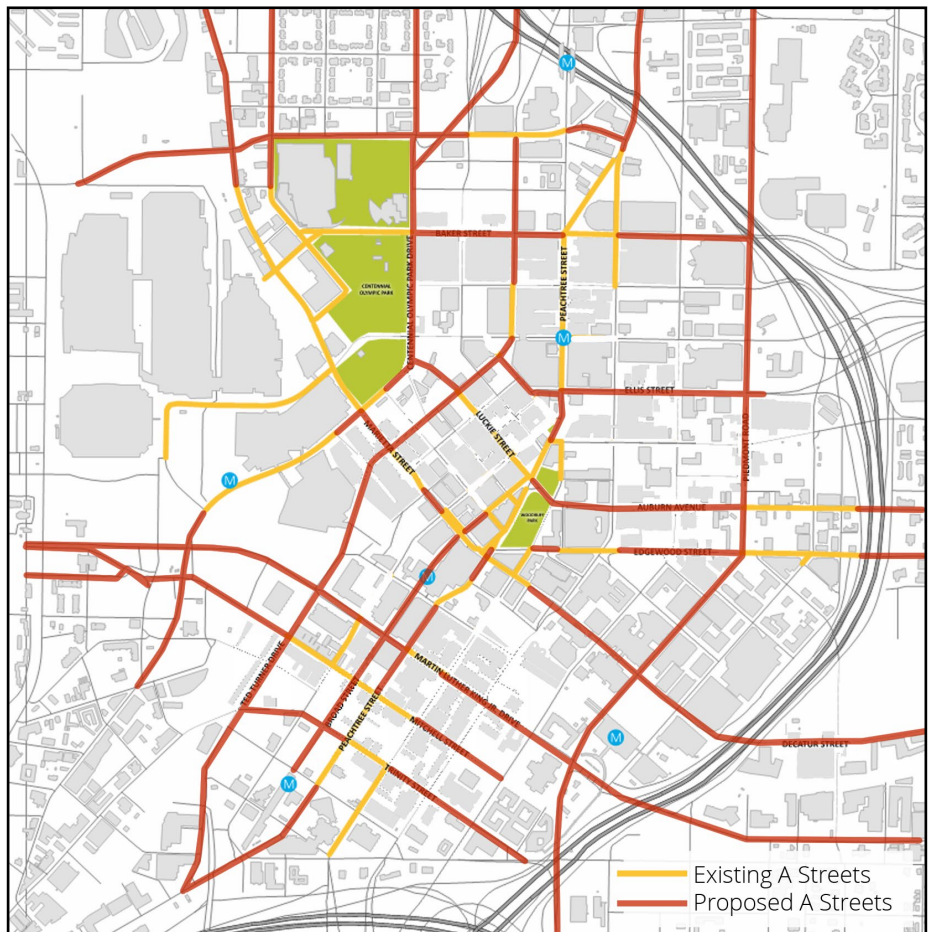
Downtown would benefit from significantly more residents – and has the capacity and assets to attract them. However, the quality and experience of the public realm needs improvement for Downtown to truly leverage its potential.

- The transit access is very good – but not if the walk or bike ride to and from is unsafe or ugly.
- The bones of the walkable street network need more street trees, active uses, and charm to live up to their potential to attract the sizable market interested in a walkable lifestyle.
- The institutional anchors that give much life to Downtown (the Capitol Complex, GSU, Peachtree Center, the Marts, and GWCC) would do well to rethink their use of parking decks as fortified edges to their campuses. Their users – as well as the rest of Downtown – will be better served by more “eyes on the street” and more seamless engagement with neighbors.



**Total Population 2015 and 2040.** Based on ARC's 2015 projections, these maps show considerable densification expected in the Downtown core.

Source: <http://www.weaveatlanta.org/>



## PROPOSED A- STREET GRID

**WHY DISTINGUISH THE CHARACTER OF A, B AND C STREETS? WHICH STREETS SHOULD ANCHOR A NEW RESIDENTIAL NEIGHBORHOODS AND A MORE WALKABLE DOWNTOWN?**

# STREET NETWORK

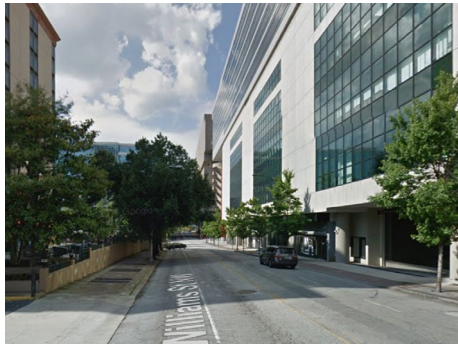
## Hierarchy of Streets



(Source: Google Maps)

### “A” Street

- Signature Streets.
- Destination Retail & Restaurants.
- Buildings front the Street.
- Active ground floor uses foster walkability and 18-hour safety.
- Spatial enclosure, streetscaping, and visual termini enhance aesthetic appeal.
- Two-way traffic at 20mph, and wide sidewalks improve safety and better support retail.



(Source: Google Maps)

### “B” Street

- Neighborhood Streets.
- Local-Serving, Everyday Uses.
- Buildings Front the Street.
- Pedestrian-friendly streetscape and ground floors, mix of active and inactive uses for a quieter street.
- Discrete Service/Garage Entrances.
- Two-way traffic at 20mph with sidewalks .



(Source: Google Maps)

### “C” Street

- Service Streets.
- Service, Delivery and Utilities.
- Buildings' back entrances.
- Parking Access, Truck docks.
- Enable A and B-streets to be Pedestrian Focused.
- One-way traffic at 15mph.
- One-way traffic at 15mph where sidewalks can be minimal.

# STREET NETWORK

## Hierarchy of Streets

The principle benefits of a hierarchical network of A, B, and C Streets are improvements to walkability, safety, and economic development. These are accomplished by targeting prime streets for high-quality pedestrian experiences and destination retail while shifting local uses and the bulk of services to quieter streets. This enables destination retailers and restaurants to achieve the critical mass needed for them to thrive. It recognizes that all streets are not created equal in their ability to support active ground floor uses. And, it encourages the evolution of some streets into quieter neighborhood streets more attractive to residential development. Most importantly, it recognizes that functions that diminish the pedestrian experience, like parking and deliveries, need to go somewhere. If B and C streets are not designated to support them, those uses creep onto what should be the A streets. This is the current situation in much of Downtown.

The first step is to overcome the domination of the street by cars. While convenient access to jobs and special events is both necessary and desirable for Downtown, they can and should be accommodated at slower speeds in narrower lanes. Increasing numbers of U.S. cities are learning from Sweden's Vision Zero program and Britain's Twenty is Plenty movement that slowing speeds can maintain throughput (due to cars traveling more closely together) while dramatically reducing crashes, pedestrian & cyclist injuries and fatalities.

The second step is to increase walkability on designated continuous, safe, attractive A streets with entertaining and comfortable streetscapes. Well known walkable routes aid orientation for visitors. They also help retailers compete with online shopping by providing a high-quality, high-touch, experience that cannot be replicated online. While it seems counter-intuitive, the value of walkability has risen concurrent with new digital technologies. The more time we spend in front of digital screens, the more we crave face-to-face social interaction and community. The more that technology allows us to conduct our lives and business "anywhere," the more we seek out and value those places that offer an enjoyable experience and a unique sense of place. This doesn't seem likely to change any time soon. The generation that has grown up with the most luxurious cars and high-tech devices, is leading the market for bikability and walkability.

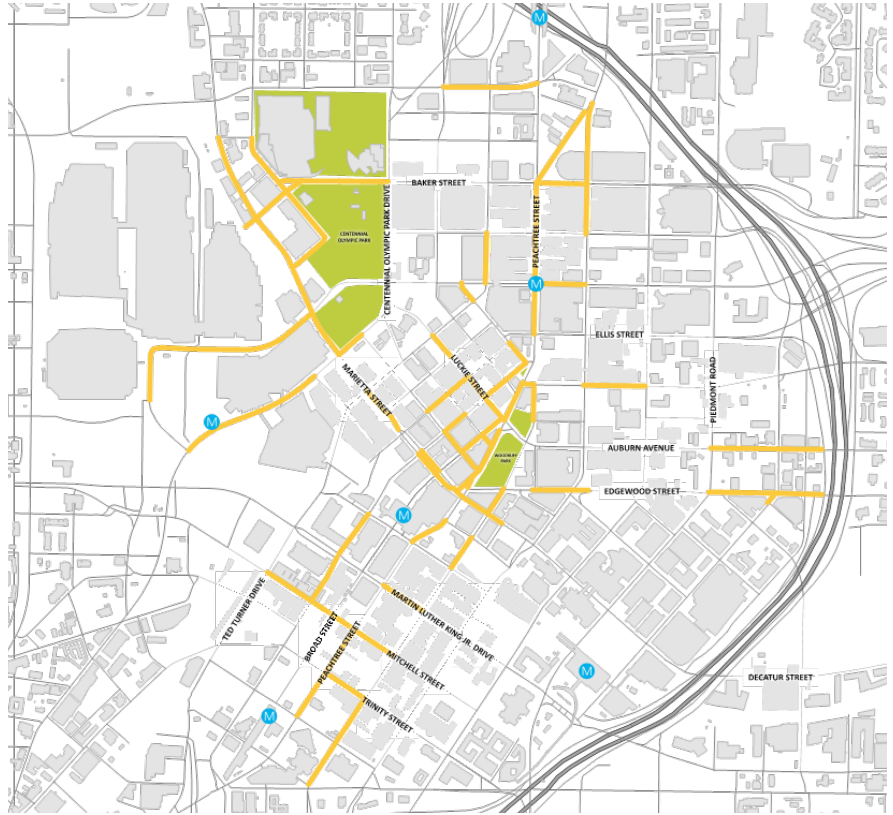
The third step is to attract a critical mass of destination retail. Atlanta lacks a premier retail street ala Chicago's Miracle Mile or New York's Fifth Avenue. Peachtree Street is our signature street – but it does not have consistent active uses, let alone regionally-significant destination retail in Downtown or Midtown. Retailers and restaurants depend upon proximity to other retailers and restaurants and look for locations with a critical mass of both car and pedestrian traffic.

**All three strategies are interdependent. Reducing car domination improves walkability. Improving walkability raises the number of people on the street – which both increases safety and the opportunities for retail to thrive, further adding to the attractiveness of living downtown. More residents downtown increases the number of potential transit users, enabling more frequent transit service. More frequent transit, more lively streets and destinations downtown give workers, tourists, and special event attendees more reasons to linger after work or after their event, (and perhaps even to choose to live downtown) further dampening both rush hour and event-oriented traffic.**

# STREET NETWORK

## Determining Downtown's A-Street Grid

Downtown has several segments of A-streets. Some provide exemplary walkability, character, and spatial enclosure such as the northern section of Broad Street, the boulevarded section of Marietta Street and the western end of Mitchell Street. But the majority of Downtown's streets are B streets. They are neither lively or blighted but lack enough streetlife to feel safe. The east west streets north of Auburn Avenue are particularly lacking in streetlife – much of it absorbed internally in the buildings and the overhead walkways. Several important and well connected routes are so car-dominated that the experience is more like a C street. This is especially true of the one-way pairs: Spring Street and West Peachtree, and Piedmont and Courtland. They primarily serve as car throughput for commuters or events participants.



**Inventory of Existing A-Street Segments in Downtown.** The streets in yellow have active facades at ground level, good walkability, and good spatial enclosure. (Source: Sarah Jane Bonn)

The studio used several criteria for determining the proposed A-Street grid:

- Connecting the existing A-street segments into an evenly distributed network.
- Improving connectivity between Downtown's many "campuses" to each other (for instance, insuring better walkability between the hotels near the Marts and Peachtree Center to the Convention Center.)
- Boosting the opportunities for retail on streets with strong continuity outside of Downtown
- Improving access to existing MARTA transit stations
- Integrating historic and significant buildings into the network
- Identifying opportunities for infill and redevelopment along those portions of the network currently dominated by parking.

# STREET NETWORK

## Determining Downtown's A-Street Grid

Implementation of a high-quality experience throughout the A-Street grid will not happen overnight. However, changes to the public realm could happen quickly. Re-striping to reduce lane widths and incorporate more on-street parking, bike lanes and reduced speed limits is already in progress on several major streets. Conversion of the one-way streets to two-way should happen all at once, network-wide to be most effective. Midtown has begun this process on its smaller streets. This is a good time for Downtown to coordinate with Midtown on conversion of Spring, West Peachtree, Piedmont and Courtland Streets.

Redevelopment of the blank façade buildings and abundant parking lots and garages will take more time. Downtown has substantial infill and redevelopment opportunity sites and the city should try to prioritize redevelopment where it can stitch together A street segments.



**Proposed A Street Grid.** Connecting the A-street fragments into a distributed network connects Downtown's many assets and integrates them into a more synergistic whole, than a collection of discrete "campuses." (Source: Sarah Jane Bonn)

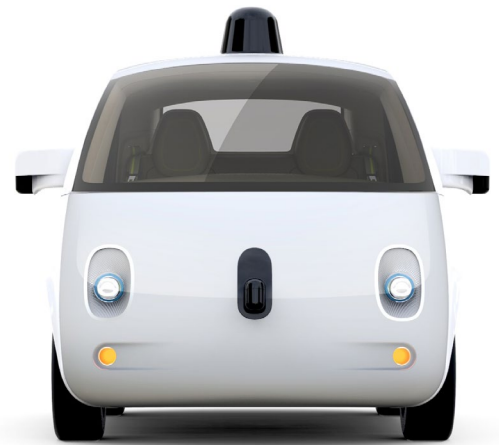


Image source: [www.greentelecomlive.com/wp-content/uploads/2015/06/Google-car-front.jpg](http://www.greentelecomlive.com/wp-content/uploads/2015/06/Google-car-front.jpg)

## **AUTONOMOUS VEHICLES [AV]**

**Will autonomous vehicles change more than just how we get around?  
What might their impact be on Downtown streets, buildings, and parking spaces?  
Could they reduce car ownership, enhance public transit, and contribute to the  
realization of an A-street grid?**

# AUTONOMOUS VEHICLES

## What are “Autonomous Vehicles”?

Autonomous Vehicles (AVs), more casually referred to as “driverless cars,” have been imagined as future possibilities since the 1920’s. That future is rapidly catching up with us. As of June, 2016, Google’s electric driverless cars have self-driven over 1.7 million miles. Helsinki is already planning a publically-owned mobility-on-demand system linking smartphones, driverless cars and buses to bikes and ferries so as to make private car ownership obsolete by 2025. Chinese search engine Baidu in partnership with BMW expects the first wave of AVs not to be cars, but to be buses or shuttles on fixed routes which it expects to have in operation by 2019. Oslo has announced plans to ban private vehicles from the city center by 2019. No one knows which, if any of these technologies, will lead to mass adoption or how long that will take. Many technical hurdles remain in addition to the equally challenging policy hurdles. Should Atlanta take a position of wait and see regarding AVs? Or should it plan for the future it would like to see AVs help to implement? The studio chose to integrate planning for AVs into Downtown 2041 to help Atlanta envision what that future might be and the policies that would be needed to support it.

What exactly are AVs? They are automobiles, trucks, or buses that have an autopilot system allowing them to safely move from one place to another with minimal or no help from a human driver. AVs detect surroundings using radar, GPS, Odometry, and computer vision. Advanced control systems interpret sensory information to identify appropriate navigation paths, as well as obstacles and relevant signage. But there are significant differences in the degrees of automation. In 2013 the National Highway Traffic Safety Administration defined four levels of autonomy. Level one, such as autonomous braking is already very common. By Level 3, a driver is still necessary but they are able to completely shift all safety-critical functions to the vehicle. Level Four is “fully autonomous” and incorporates “connected vehicle” technologies that allow platooning and coordination between vehicles.

Tesla began offering a Level 2 autopilot download to owners of its cars in 2015 – with one fatality as a result in 2016. It expects to introduce Level Four technology in 2018, hoping for regulatory approval 1-3 years thereafter. Google believes that full automation is much safer than the lower levels and expects to be selling cars without steering wheels (sometimes referred to as Level Five) by 2020 in addition to operating an advertising fee funded robotaxi service. Uber is also moving in that direction. Its CEO tweeted that he expects Uber’s fleet to be completely driverless by 2030 with fares 75% less than today, (since that’s what goes to the driver) making it cheaper for most households to use a robotaxi than to own a car. Speaking at the 2015 Frankfurt Auto Show, U.S. Secretary of Transportation, Anthony Foxx predicted that driverless cars will be in use all over the world within the next 10 years. In 2016 his agency awarded Columbus, Ohio a \$40 million ‘Smart City Challenge’ grant that in part will be used to develop a fleet of multi-passenger electric AVs to aid in first mile/last mile connectivity. With 75-80% of the operating cost of a bus going to pay the driver, several transit agencies, including Atlanta’s MARTA according to CEO Rukiya Thomas, are considering eventual replacement of standard buses with smaller, much more frequent AV shuttles or Autonomous Rapid Transit (ARTs) on high-frequency routes.

# AUTONOMOUS VEHICLES

## Why Autonomous Vehicles?

Why is there so much interest in AVs? They promise many benefits: safety, convenience, better mobility for non-drivers and more efficient use of vehicles that strain household budgets and yet remain parked over 90% of the time.

- Unlike humans, AVs don't drink alcohol, speed, or engage in distracted driving, the causes of over 85% of the 35,000 average annual American motor vehicle deaths according to the National Safety Council.
- The 200+ hours a year the average American commuter spends behind the wheel can be devoted to less stressful and more productive activities – as can the more than 600 hours a year spent on non-commute trips, (interpolation of the Federal Highway Association's 2009 National Highway Travel Survey.)
- Non-drivers, including children, the disabled, and the growing number of elderly people stand to see their mobility options significantly increased.
- Households could also see their transportation costs significantly decreased. In *"Driverless Car Revolution"*, Rutt Bridges, a venture capital investor, cites studies by Barclay Capital and Columbia University to support his claims that per mile costs of taking a robotaxi will be from one quarter to one half the per mile cost of owning a car – the difference depending in large part on the willingness of riders to pool together. These savings have led to projections of reductions in the U.S. vehicle fleet of 60-90%

Nonetheless, it is also possible that the fleet will increase due to preferences for privately-owned AVs rather than pooled use of robotaxis as well as new ownership by non-drivers. The cost predictions of AVs have also been questioned. Will the number of sophisticated systems required to make them truly safe also make them exorbitantly expensive? For all the claims that AVs will reduce traffic congestion, there are also fears that expansion of the number of empty AVs on the road, either cruising for fares or returning home from a drop-off, will significantly increase congestion. There are also significant concerns about hacking, computer glitches, inattentive drivers operating Level 2 or 3 vehicles, and the prospect of significant job losses (bus drivers, truck drivers, taxi drivers, traditional car insurance companies are just the start of the list.) There is also concern that AVs will compete with and reduce ridership on public transit.

According to Rutt Bridges' estimates, for the cost of a MARTA fare of \$2.50 a robotaxi will be able to take you 18 miles, 24 hours a day door to door. Does this mean that AVs will result in even more people commuting to Downtown by car instead of bus or train? Even if every vehicle was level Four and could platoon efficiently, rush hour and event traffic without transit is a frightening prospect.. Instead, solutions should be sought to seamlessly link AVs to transit stations and to use autonomous technologies to further improve public transit systems.

Georgia Tech GIS Center simulation modeling by WenWen Zhang shows that in Atlanta, each driverless car (Shared AV) can replace 8.9 privately-owned cars.

# AUTONOMOUS VEHICLES

## Autonomous Buses & Autonomous Rapid Transit (ART)

While most of the technology and media attention has been focused on AV cars, the studio found autonomous buses a very promising ingredient for future mobility and better quality streets. Autonomous buses can function on fixed routes or as on-demand systems. Peter Calthorpe and Fehr Peers have tested combining Bus Rapid Transit (BRT) with on-demand specific passenger origins/destinations. They found this provided high passenger capacities, reduced delays, improved rider experience, and reduced emissions and energy consumption per corridor person trip. Anticipating that exclusive BRT lanes may be the first urban network elements to scale to 100% autonomous vehicles, they call this integration of BRT with on-demand service Autonomous Rapid Transit, (ART). Whether on-demand, on a regular bus route or on dedicated lane ART, autonomous buses have several advantages to offer cities seeking to improve the experience of their streets and transit systems.



**Autonomous Bus Prototype.** Driverless systems can overcome much of the cost disadvantage of smaller-sized vehicles while taking advantage of electric power to reduce noise and emissions.

(Image source: <http://gizmodo.com/5-cities-with-driverless-public-buses-on-the-streets-ri-1736146699>)

- By trading the cost of the driver's labor and a bigger vehicle for a greater number of smaller vehicles, the assumption is that ART can run more frequently in busy areas, reducing customer wait times significantly without increasing costs.
- A larger fleet of smaller vehicles can more easily build in the flexibility to respond to on-time, on-demand needs. This might be especially helpful for first mile/last mile trips to and from MARTA stations. Singapore announced the development of such a system in April, 2016. Also in 2016, Tesla announced it is working on a pilotless bus system that could be summoned from a cellphone app or from buttons at bus stops.
- The smaller, zero-emission electric vehicles will be less noisy and disruptive on city streets. Residents, workers, hospitality businesses, and cyclists would experience an improvement in the quality of life on those streets, (although the frequency of the ART will require greater coordination, and likely differentiation, between the bus lanes and the bike lanes.)
- Just as the 360-degree interior cameras in autonomous buses will be linked to security personnel, the 360-degree exterior navigational cameras could provide on-time surveillance of streets, digital "eyes on the street" to aid in crime reduction and other forms of data collection. Mercedes Benz's recently built Semi-Autonomous Future Bus communicates data for the city of Amsterdam on potholes, while receiving information on traffic and light signal changes that it figures into its route navigation.
- When needed, autonomous buses and ART will be able to platoon in convoys in dedicated lanes or on highways, increasing a lane's capacity by 50 to 100 percent while reducing energy consumption. Autonomous trucks have been platooning in remote areas for several years. In 2016, the European Truck Platooning Challenge rolled throughout Europe, leaving a very small gap between vehicles, reducing fuel use up to 15%.

# AUTONOMOUS VEHICLES

## Three Scenarios

Given all of the different technologies and possible impacts, the Studio started by identifying three potential AV scenarios and their impact on urban form:

### 1. The Private AV Scenario: more suburban sprawl

In this scenario, the fully autonomous privately-owned car drives itself. The owner can summon it to come pick them up and can nap, work or do what they please in the car. (Tesla currently offers a Level 2 version of this scenario for highway driving, but the driver must take over on local streets. It is available for a \$2500 download and is expected to come standard with the Model 3 in 2017.) By converting commute time into "free time" this scenario could well foster more suburban sprawl. Households pursuing cheaper housing options or lower density living in more distant locations would no longer have to trade-off a long, stressful commute for those choices. This option could also result in significant increases in congestion and Vehicle Miles Travelled (VMT) if instead of parking at their destination, owners chose to send their cars back home or to remote (presumably cheaper) parking. Alternatively, instead of parking at either their destination or their home, owners could choose to send their cars out as robotaxis to work for them when they're not using the car.

### 2. The Robotaxi Scenario: more urban infill and densification

In this scenario, Uber, Google and any number of others deploy AVs as on-demand robotaxis. Assuming that per mile fares are considerably cheaper than owning a car, this scenario could reduce private ownership of cars. Much as Uber and other carhailing services already do, this scenario makes it easier to live without a car, easier to resolve first-mile/last mile access to transit (in fact, it may increase the radius of what is considered transit-oriented development) and reduces the stress and cost of searching for parking. Wenwen Zhang et al's Georgia Tech study estimated that robotaxi/shared-autonomous-vehicle fleets could reduce the need for parking by up to 90% even with a low adoption rate of 2%. Robotaxis themselves will still need to park at times of low activity, perhaps in remote lots. Jeff Tumlin, author of *"Sustainable Transportation Planning"*, has even suggested they could park on underused highway lanes at such times. This scenario somewhat incentivizes denser, urban living with access to multiple modes of travel. It assumes that the number of robotaxis available at any location would more or less be a function of the density and types of activities. People living and working in denser urban areas would have the shortest wait times and presumably the shortest and cheapest fares.

### 3. The Hybrid Scenario: more diverse choices

This scenario assumes a mix of privately-owned AVs, robotaxis, autonomous buses and ARTs as well as the continued presence of human-driven cars and trucks. In 2012 the Institute of Electrical and Electronic Engineers issued a news release estimating that up to 75% of vehicles on the road by 2040 will be fully automated. This scenario layers modes that serve the biggest variety of development patterns and users. Human-driven pick-up trucks may continue to dominate rural areas for a very long time. Privately-owned AVs may be the most popular choice for lower density suburbs, while robotaxis and ARTs may make the most sense for closer-in suburbs and in-town neighborhoods. Designing roads and parking to accommodate all of them simultaneously will reduce some of the efficiency benefits of AVs (and perhaps the safety.) In the hybrid scenario, the role of policy to steer demand and development towards desired outcomes becomes essential. At the city and regional scale, policies should be considered such as: limiting parking, public ownership and management of a collaborative parking system, limiting certain streets only to AVs or ARTs, taxing vehicle miles traveled, expanding transit-oriented development guidelines and boundaries, and rewriting zoning codes relative to garages and parking.

# AUTONOMOUS VEHICLES

## Impacts of AV on Downtown Atlanta:

The studio chose to pursue the hybrid scenario, anticipating that some human driven vehicles will still be in operation in 2041 but recognizing that the significant adoption of AVs calls for rethinking future streets, future parking and future buildings. The precision of AV navigation is expected to allow significant reductions in lane widths even while increasing the bumper to bumper capacity. Imagine many of Downtown's streets lanes' being significantly reduced to allow for more bike lanes and wider sidewalks. AVs are also expected to be all electric, significantly reducing noise and emissions. Imagine how much more pleasant that would make streetlife Downtown.

AVs are also learning how to self park. Imagine a future where humans don't enter parking garages. AVs will self-park extremely compactly, not needing to open doors or trunks, doubling the capacity of existing parking garages and freeing up existing surface parking lots for redevelopment. If low fare robotaxis and enhanced transit are widely availability and succeed in reducing private car ownership Downtown, future buildings might not incorporate any parking at all.

Wenwen Zhang's modeling of robotaxi/shared-autonomous-vehicles in Atlanta showed that at adoption rates of 2.5-20%, each robotaxi vehicle can replace 8.9 privately-owned vehicles. Buildings will likely need more drop-off/pick-up space in front and will have the opportunity to completely rethink their amenity packages. How might new building types unencumbered by parking address multi-modal transportation, density, sustainability and affordability as new amenities? The current zoning code encourages parking to be hidden in the middle of city blocks. If such parking is no longer needed, imagine all of the new amenities that could be provided to residents.



**The impact of AVs on Downtown.** The introduction of high-frequency Autonomous Buses, robotaxis, and privately-owned AVs into Downtown could lead to streets that are safer and quieter for passengers, pedestrians and cyclists but lively with businesses and people-oriented activities. AVs could significantly reduce the space needed for parking while growing demand for more residential development on Downtown's parking lots, helping to complete the A-street grid. New mixed-use residential building types could populate a series of diverse new neighborhoods linking Downtown's current business and campus districts – further enlivening the life of Downtown. (Image source: The New Yorker, illustration by Harry Campbell.)

# AUTONOMOUS VEHICLES

## Assumptions for Downtown Atlanta 2041:

To coordinate the designs for the four demonstration future neighborhoods, the studio made the following collective assumptions for Downtown 2041. These are not predictions or recommendations, simply assumptions that enabled us to develop our hypothetical design proposals for a more vibrant and more populated Downtown.

### 1st Assumption:

By 2041, an ART system of small autonomous buses will take over the proposed streetcar route, with high-frequency service on a dedicated lane. Additional routes may well be added as needed.



### 2nd Assumption:

By 2041, human-driven cars will continue to need 50% of current parking spaces. Even with residential population increases, growth in AVs and ART will result in a 70%-90% reduction in overall parking. New buildings will not require parking.

### 3rd Assumption:

Roadway lane widths and speed limits will shrink. Lane widths for AVs will be 8' whereas the lane width of human-driven vehicles will be 9' to 10'. Bike lanes will be a minimum of 5' each direction. Speed limits will not exceed 20mph in Downtown except on the highway.



Autonomous Car 8'



Regular Car 9'-10'



Bike 5'



## FOUR FUTURE NEIGHBORHOODS

What kind of new neighborhoods might grow if Downtown's parking lots on today's car-oriented streets were replaced with urban housing, vibrant street-scapes and safer streets? Do these new neighborhoods represent a desirable AV-based future with a more walkable A-street grid?

# FOUR FUTURE NEIGHBORHOODS

Redevelopment of the parking lots and other under-used sites in Downtown provides the opportunity to create diverse, new residential neighborhoods in-between and connecting Downtown's existing "campuses." What might these look like? The studio divided into teams of students to explore four different Downtown sites. Each proposal builds on the existing assets and characteristics of that site to imagine a new kind of neighborhood enriching Downtown 25 years from now.

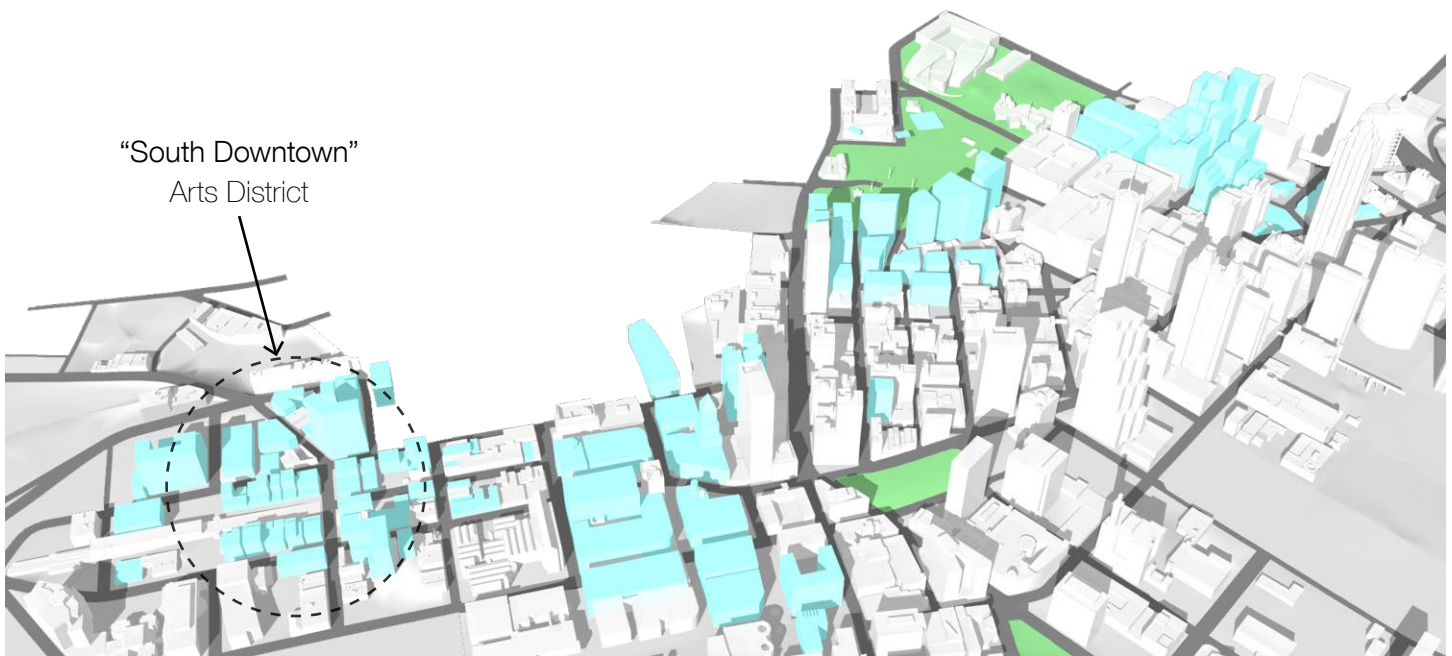
It's impossible to predict market demand 25 years from now. Instead, the students' proposals illustrate market niches and densities they deemed appropriate for their particular sites. This is not to imply that such market niches or densities are necessary. Rather, the proposals are intended to test the capacity for Downtown to absorb new residential development and to stimulate community-wide conversations about desirable futures.

The most radical proposition underlying all four of the proposed neighborhoods is that they introduce little to no new parking even as they densify and remove parking spaces. This comes from assumptions the studio made based on its research into autonomous vehicles and their potential to reduce the need for parking – especially in Downtowns.



**Four Proposed New Neighborhoods.** Each neighborhood proposal envisions redevelopment of parking lots or other underused properties 25 years from now into dense, residential neighborhoods serviced by autonomous shuttle buses and robotaxis in addition to the existing transit system. But, to foster diversity, each explores a different site-based character. (Source: Eric Goldstein)

1. Baker Street  
Eco-District
2. Fairlie Poplar  
Bicycle-Oriented Development
3. Five Points  
Forest in the City
4. South Downtown-Garnett  
Arts District



## **“South Downtown” - Arts District**

One of Downtowns’ advantages is its affordability. This attracts artists and students – and could attract families (a market not being addressed by Midtown’s new housing.) Our proposal seeks to expand on the momentum of new arts venues and organizations in South Downtown and Castleberry Hill but retain affordability and attract families through adaptive re-use, modest infill buildings, economies of scale on larger buildings on select sites, an arts magnet school, and a new restaurant plaza to connect the new arts community to Garnett MARTA station.

# "South Downtown" - Arts District



Proposed Green Space in front of Garnett Station

## Team:

Meredith Blakeley

Lu Pang

Animesh Shrestha

The area around Garnett Station in South Downtown is currently mostly surface parking lots. There are many jobs in the area but the employees commute from other areas of the Metro. With the arrival of autonomous vehicles and improvements to the streets, the parking lots can be redeveloped into residential units and commercial space. A school and green space are included to attract family residents.

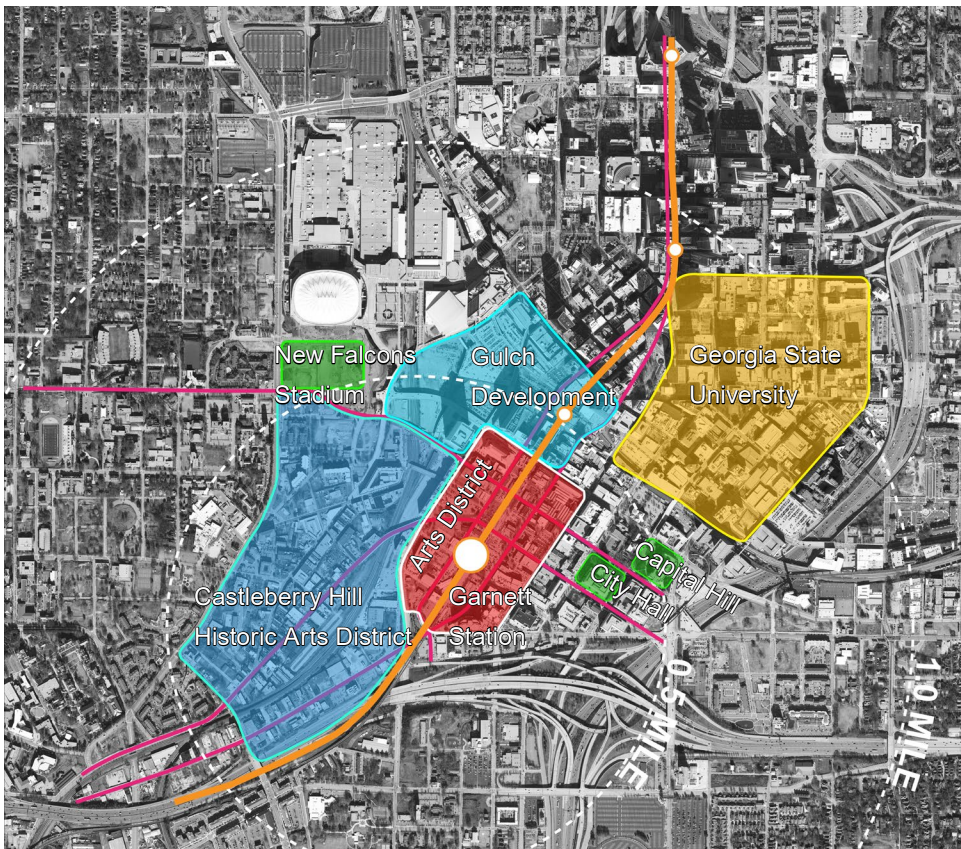
To connect the area to its surroundings, the secondary focus of the revival is to expand the arts community. The proposed school is an arts magnet school with facilities that are open to the community. Providing affordable housing and work space for artists is a priority and will be achieved with affordable, low rise wood construction infill. One hindrance to development currently is the small lot size and the requirement for parking. With AVs and the public transportation system in the area this requirement can be eliminated and each parcel can be developed individually by small developers. A restaurant row and commercial space are proposed for the sides of the MARTA station plaza for gathering and activities throughout the day.

A pedestrian arts loop is created so that as people come out from the MARTA Station there will be different arts, including the culinary arts, for them to engage with. Inside the loop, there is the plaza where people gather together to eat, play, meet, rest and engage. The plaza is surrounded by affordable buildings with retail and restaurants on the ground floor and residential

# "South Downtown" - Arts District

units on the upper floors. Also, inside this loop, there will be a yoga park and a music park where people enjoy music performances, exhibition, and art murals with several other arts spaces like the theatre, workshop, galleries and workshop. Existing building's in and around the loop will be adaptively reused as arts galleries, apartments, shops and workshops. The arts loop is intended to attract and connect to the existing arts venues in South Downtown and the arts neighborhood from Castleberry hill area. Outside the loop, different green spaces will be used for dog park, sports, and an eco-park. The eco-park is proposed as a new use for mid-block areas that no longer need to be devoted to parking. The eco-park will have urban farming and a natural water treatment area (living machine) to clean the grey water from nearby buildings as well as the storm water coming from the bio-swales along the streets. This water will be stored in a cistern and used in landscaping and in toilets of the buildings.

Forsyth Street will be the primary arts corridor and its narrow right-of-way will be restricted to autonomous vehicles only (buses, cars, and robotaxis) to test and demonstrate new technologies. There will also be a bicycle path in the median which is covered so that the people riding bikes will get some shade. The streets will have green bio-swales running along the pedestrian pathway cleaning and slowing the storm water. Bus stops and AV pickup and drop-off place will be frequently provided within walking distance to improve public transportation. The arrival times of the ART buses will be announced by signals to users' phones, making affordable, seamless, wait-free public-transit more convenient than private car ownership.



Context Plan



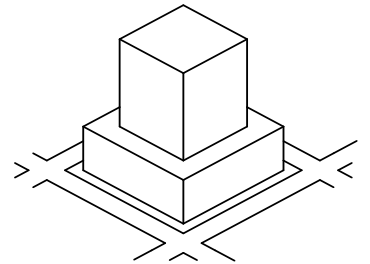
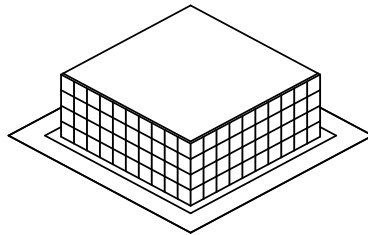
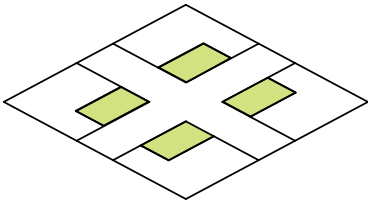
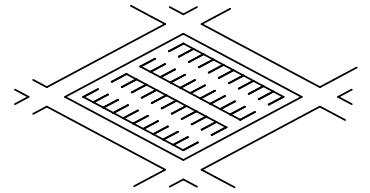
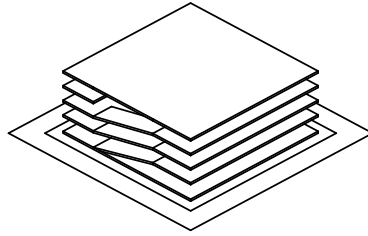
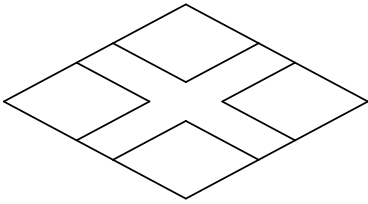
Existing Art Mural



Existing passage to Garnett station

# "South Downtown"- Arts District

## Concept



### Regreening

Creating more green space in existing unused areas for public spaces such green parks, exhibition, performance and plaza areas.

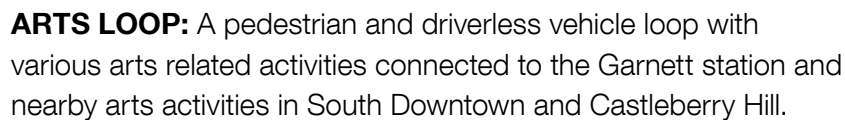
### Reuse

Adaptive Reuse of existing unused buildings such as parking decks to low income housing units, galleries and theatres for artists.

### Re-development

Increase density of the area by building over parking lots and existing empty lots with a compact, walkable, connected mix uses & public space.

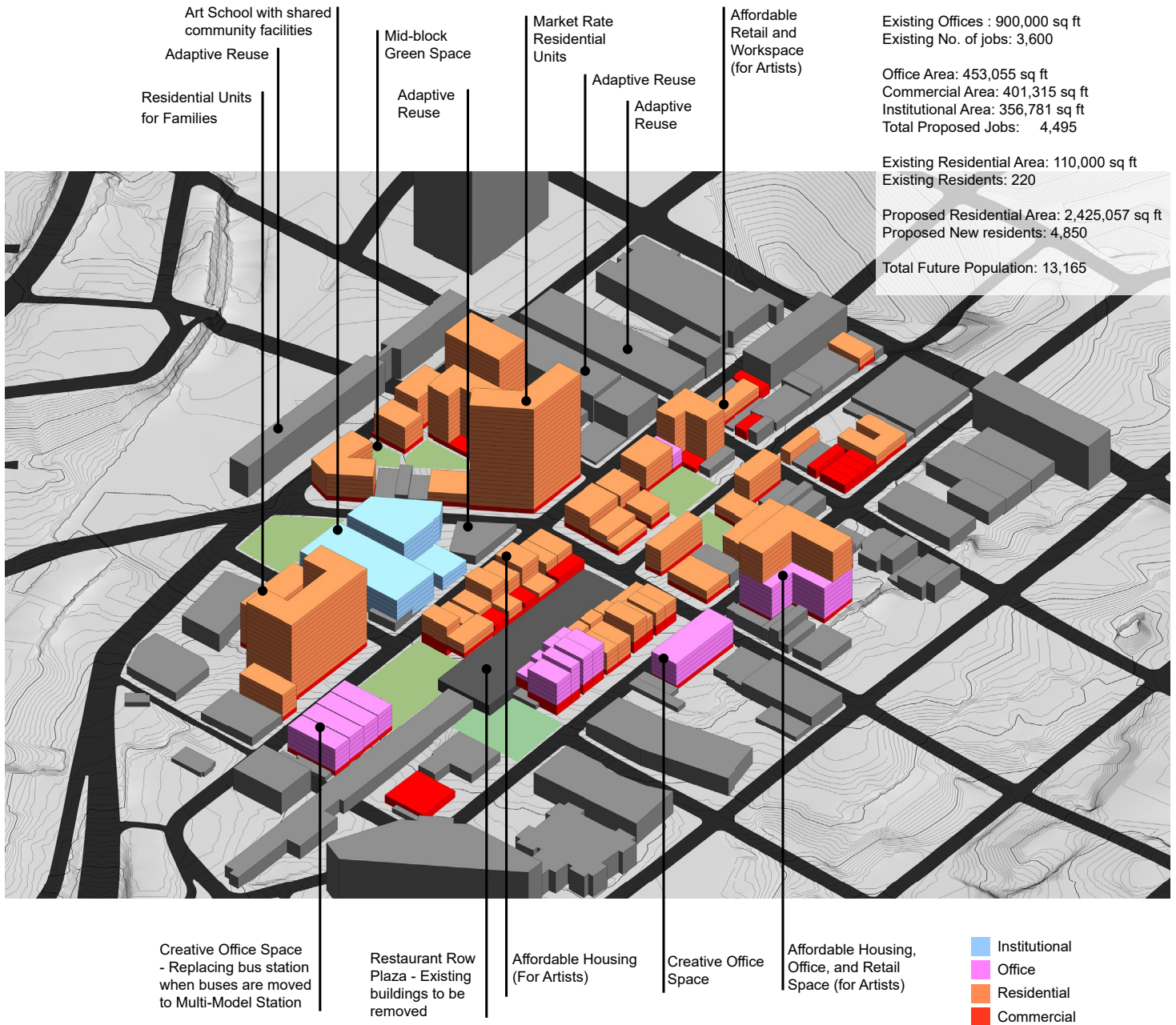
## Concept Diagram



**ARTS LOOP:** A pedestrian and driverless vehicle loop with various arts related activities connected to the Garnett station and nearby arts activities in South Downtown and Castleberry Hill.

# "South Downtown" - Arts District

## Proposed Massing



## Proposed Massing

# "South Downtown" - Arts District

## Master Plan

### Transportation

1. Garnett Station
2. Driverless Car Parking
3. Pick-up & Drop-off Place

### Buildings

4. Multi-family Apartments
5. Arts School
6. Theatre
7. Exhibition Galleries
8. Retail
9. Lofts

### Green Areas

10. Dog Park
11. Eco Park
12. Recreation Park
13. Main Public Plaza
14. Waiting Plaza
15. Yoga Park
16. Music Park
17. Arts Park

- ▲ Wall Arts



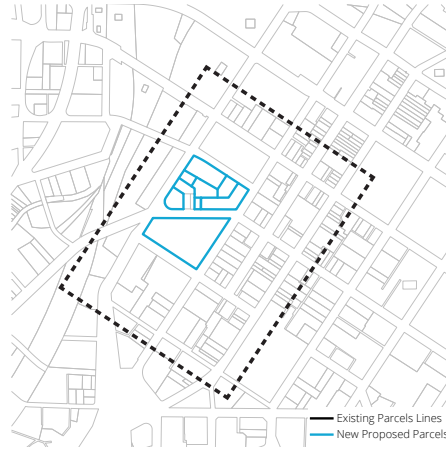
# "South Downtown"- Arts District

## Diagrams



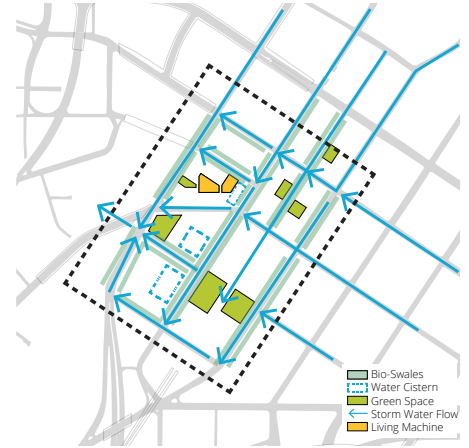
Existing Landuse Map

Shows that more than 70 % of the site is used for parking and has very few Residential buildings.



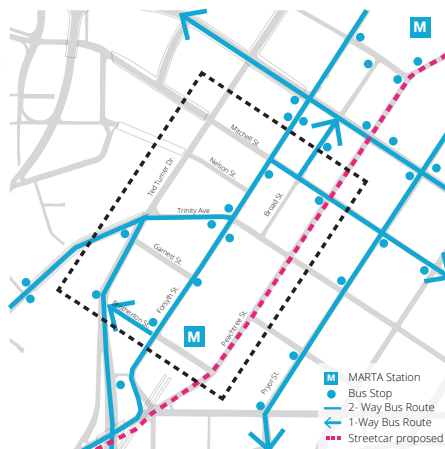
Proposed Parcel lines

To preserve the existing urban fabric and encourage small, affordable development, the proposal makes minimum alteration to the existing parcels except for the areas where the school & high rise buildings are proposed.



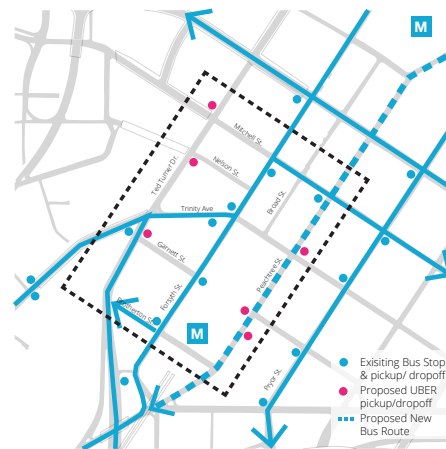
Storm Water Management Diagram

The proposal captures rain water and cleans it using bio-swales and living machines to re-use the water.



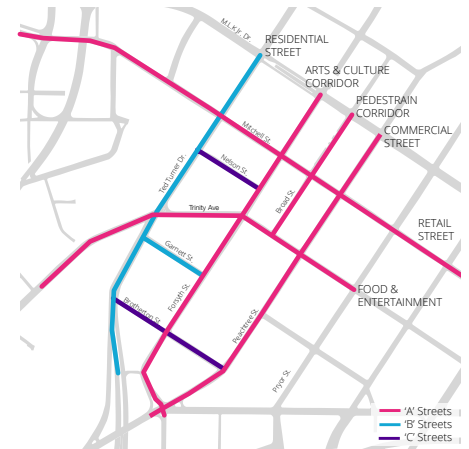
Existing Transportation Plan

The neighborhood has existing bus transportation in the major street with the existing Marta and Greyhound station.



Proposed Transportation Plan

With the introduction of robotaxis there will be more need for pickup/ dropoff points and integration of well located autonomous rapid transit bus stops.



Proposed Street Network

Prosopal of new A-streets, B streets and C streets with C streets as service streets.

# "South Downtown" - Arts District

## Section Perspective



### Imagining Streets, Buildings and Blocks of the Future

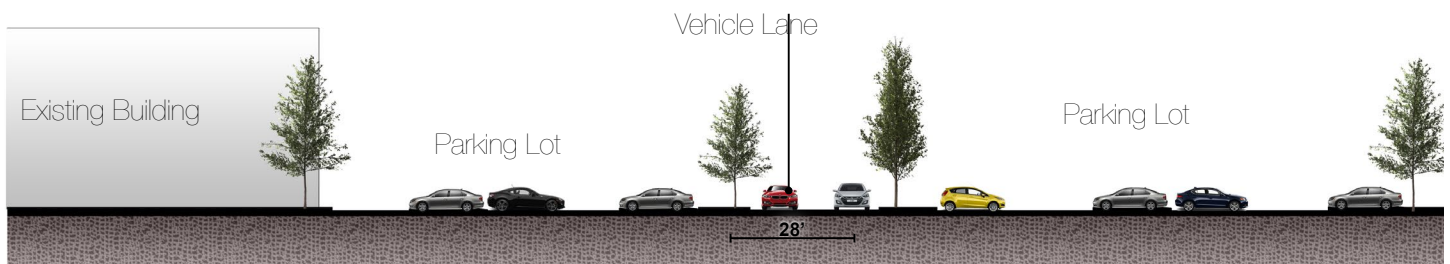
Streets in the futures will have narrower lanes with robotaxis and autonomous buses, storm water management to collect stormwater, and a median lane for bikes with shade and protection by vegetation. New buildings will not have parking. Lobbies will provide real-time information about busses and taxis and accommodate driverless package delivery and trash pick-up from the "rear." Freed from parking, mid-block areas can become recreation areas, gardens, and eco-system services.



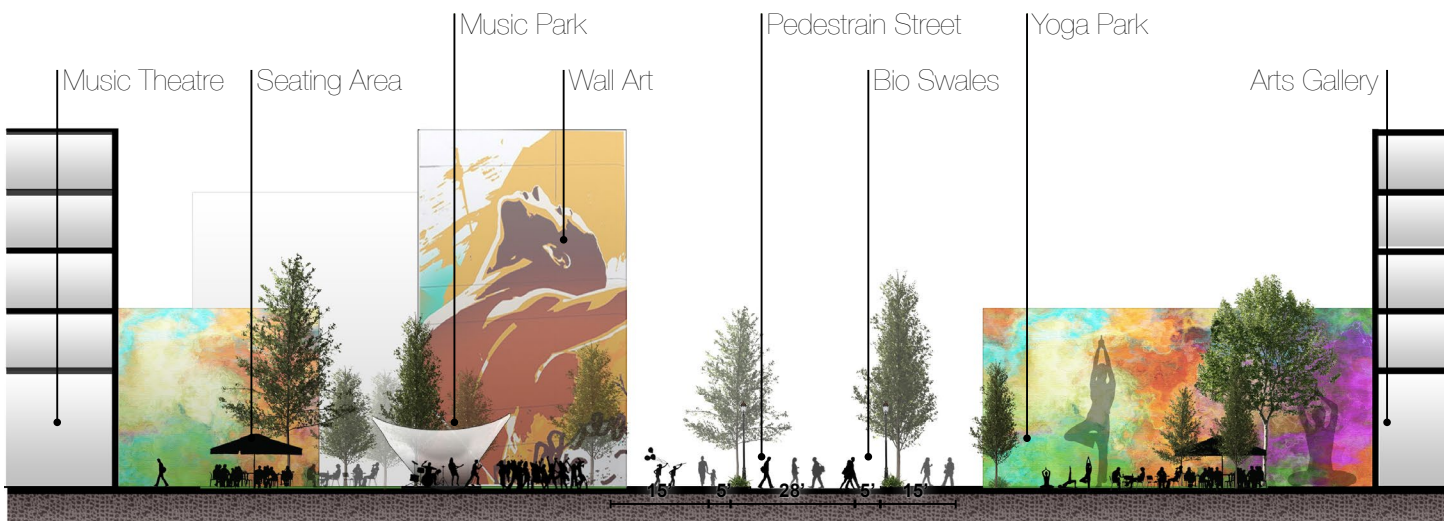
Proposed redeveloped plaza in front of the Garnett MARTA Station lined with restaurants and new housing.

# "South Downtown" - Arts District

## Street Sections



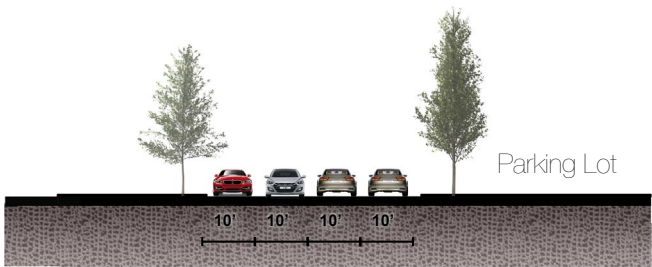
Broad Street: Existing



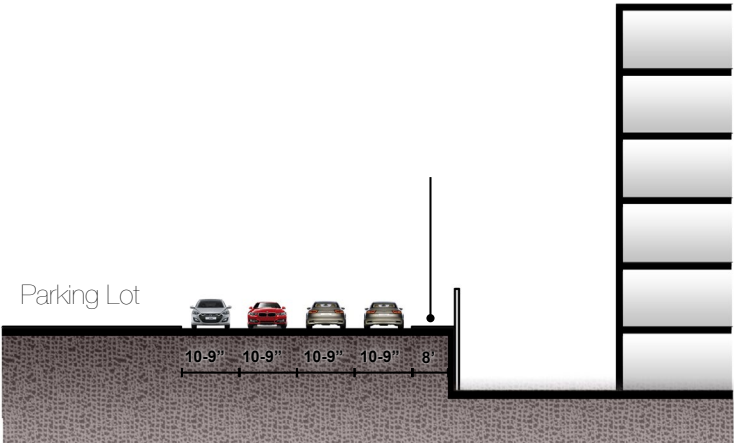
Broad Street: Proposed

# "South Downtown" - Arts District

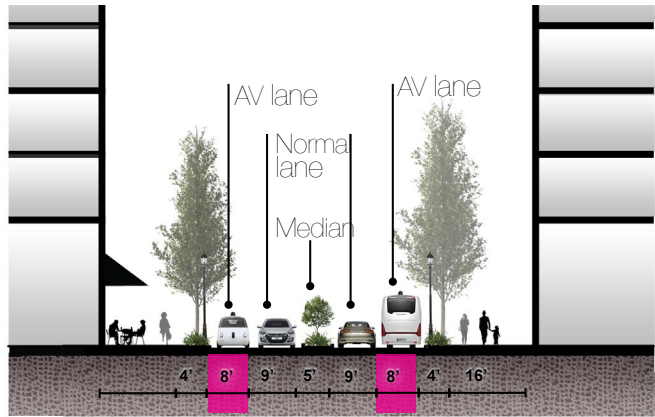
## Street Sections



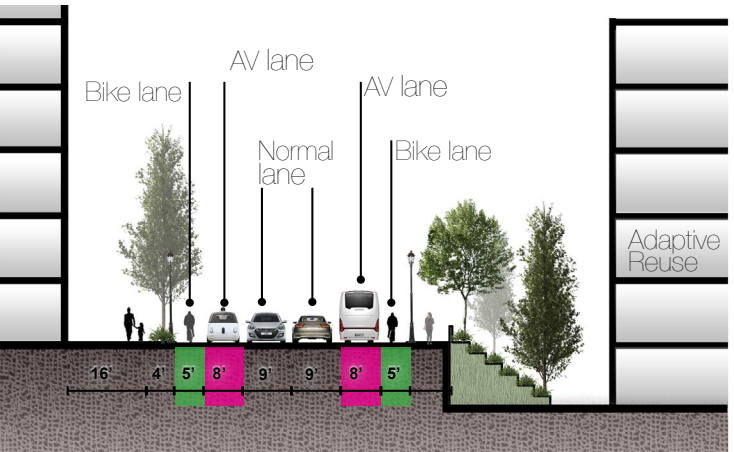
Peachtree Street: Existing



Ted Turner Drive: Existing



Peachtree Street: Proposed



Ted Turner Drive: Proposed

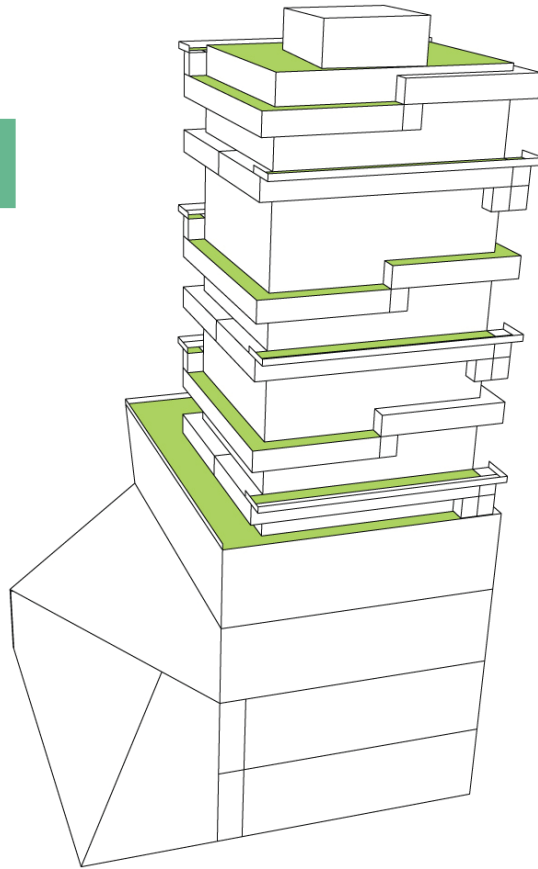


## “Five Points” - Forest in the City

While Atlanta is often called a “City in the Forest,” our proposal for Five Points, inverts that title in order to rethink this central area of downtown as a green oasis within the urban core. In our city that is so well connected to nature, it is vital that we pair a significant increase in the levels of urban density with an increase in environmental experiences. Forest in the City is an imaginative response to that goal that welcomes transit users and offers pedestrians the opportunity to walk through an immersive portal of green.

# “Five Points” - Forest in the City

**Intensifying the experience of Atlanta by combining high-density towers and lush, vertical greenery at Atlanta’s central crossing.**



## Team:

Blake Reeves  
Stacy Scott

Five Points is the symbolic heart of Atlanta. As the juncture of the historic rail lines, the intersection of five prominent streets, and the crossing of the MARTA rail lines, Five Points Intersection and Five Points Station have been central hubs of activity at every step along the history of Atlanta’s development. As we plan for the future, it only makes sense that we further build upon the city’s long-standing nucleus.

In a future where autonomous vehicles decrease personal automobile ownership, the interaction between various forms of transportation is much more crucial. The role of Five Points will be extremely prominent, as it will be the most connected area of the city. With access to every part of Atlanta in just minutes, this area of downtown will be highly sought after for both residents and business locations. Given the intense future demand, we will start planning for Five Points to be Atlanta’s densest area—a rich and dynamic center with a lively pedestrian street scene, a wealth of local amenities, and easy transit access, such that private cars are not needed. With this in mind, the plans for future developments will exclude parking, making a thrilling pedestrian life the highest of priorities.

# "Five Points" - Forest in the City

While the project proposes changes for much of central Downtown, the boldest feat within it is a plan to rethink the Five Points MARTA station as the iconic center of the city. Currently buried under layers of history and infrastructure, the appearance of the city's most important transportation hub is rather unremarkable. It is neither distinguished nor memorable. Forest in the City not only provides a walkable plaza in place of the current station building, but it also strips back the ground surface to expose and celebrate the layers of history below. Large clefts are carved into the plaza to allow light and air into the underground portions of the station, while offering breathtaking views of the city to those on the platforms below. Both the edges of the openings and the buildings above are covered with green life, giving the viewer a sense of standing in an immense, lush valley. This unique composition is crowned with another iconic gesture-- a large statue of the phoenix, the symbol of the city of Atlanta. The statue bursts forth from the openings in the ground, epitomizing both the bird's and the city's rise from the ashes.

Forest in the City creates future value for Five Points, but it also addresses a number of current issues with the site. It adds residents to an area of town that is too often lifeless at night. It offers visual and physical connections between a number of important downtown activity centers. It adds beauty and charm to an area that can feel somewhat bland. It gives significance to the city's most important transportation hub, inviting users to experience MARTA and greater Atlanta. It transforms the MARTA station from a utilitarian facility into the heart of what should indeed be Atlanta's densest transit-oriented development, (TOD.)

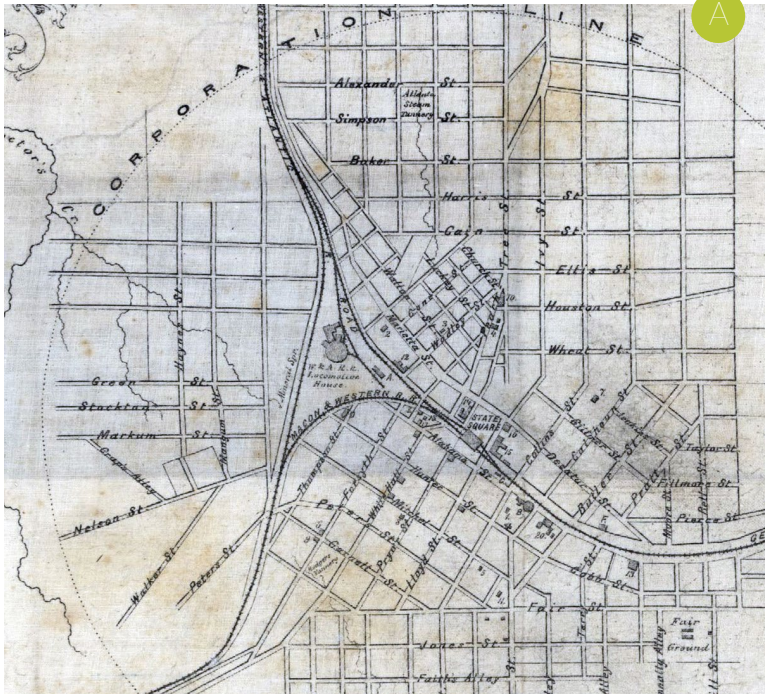
As a concept, Forest in the City exists within a greater framework of the existing Green Line plan. In its current state although it brings density and an iconic interval, it also acts as a punctuation in the Green Line plan with a linear park that offers the user an opportunity to walk through a condensed portal of green space. In addition to trees and plantings at the ground level, buildings in this area will be required to incorporate varied vegetated wall systems and extensive green balconies. With its placement between the Woodruff Park and the Green Line, the Forest in the City complements the Green Line master plan effort to "stitch the city together through public space, transit and daily life," by performing as a corridor.

Many areas of Downtown Atlanta express the historic southern charm of the city with character and scale that are inviting to users. Part of transplanting that spirit would be through using the scale and lessons of vernacular architecture of the buildings on Broad Street, which best embodied the essence of old Downtown. The fine grain storefronts of Broad Street would serve as a precedent for many buildings in the project to create a language for meeting the street that could consistently weave through many areas of Downtown. While some new buildings may possess a large footprint, the use of such fine grain retail units to create a lively ground floor experience retains the charm of Downtown. Not just a veneer to the project, the elements taken from Broad street will not be exclusively material language, but scale, interaction with the street and sidewalk, and strips of transparency.

A major goal of this proposal is to enhance both physical and visual connectivity of our six blocks to the surrounding area. The Forest in the City is to be an important, unique moment of compression and release along the Green Line's intended connection between the Georgia State University campus and the proposed GDOT Multimodal Passenger Station. Similarly, controlled visual porosity reinforces the North and South Downtown connections and linkages to Woodruff Park. Forest in the City is overall a vision of what a microcosm of the goals and values of Downtown Atlanta can be.

# "Five Points" - Forest in the City

## Site History



(Source: <http://tomitronics.com/maps/atlanta.html>)



(Source: [www.pinterest.com/pin/111464159501904113/](http://www.pinterest.com/pin/111464159501904113/))



(Source: [www.pinterest.com/pin/229683649716658129/](http://www.pinterest.com/pin/229683649716658129/))

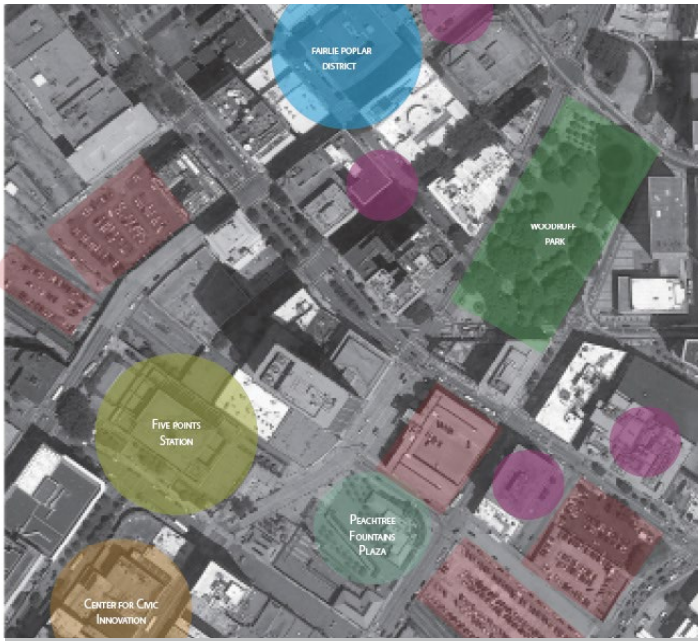


(Source: [www.pinterest.com/pin/229683649717648963/](http://www.pinterest.com/pin/229683649717648963/))

- A. 1864: Atlanta Subdivision Map.
- B. 1951: Aerial view of the intersection of Forsyth and Marietta Streets in downtown Atlanta.
- C. 1940s: View of the intersection at Marietta and Forsyth Streets in downtown Atlanta.
- D. 1892: View of Atlanta's Five Points area showing the old artesian well and streetcar line construction.

# "Five Points" - Forest in the City

## Existing Site Area

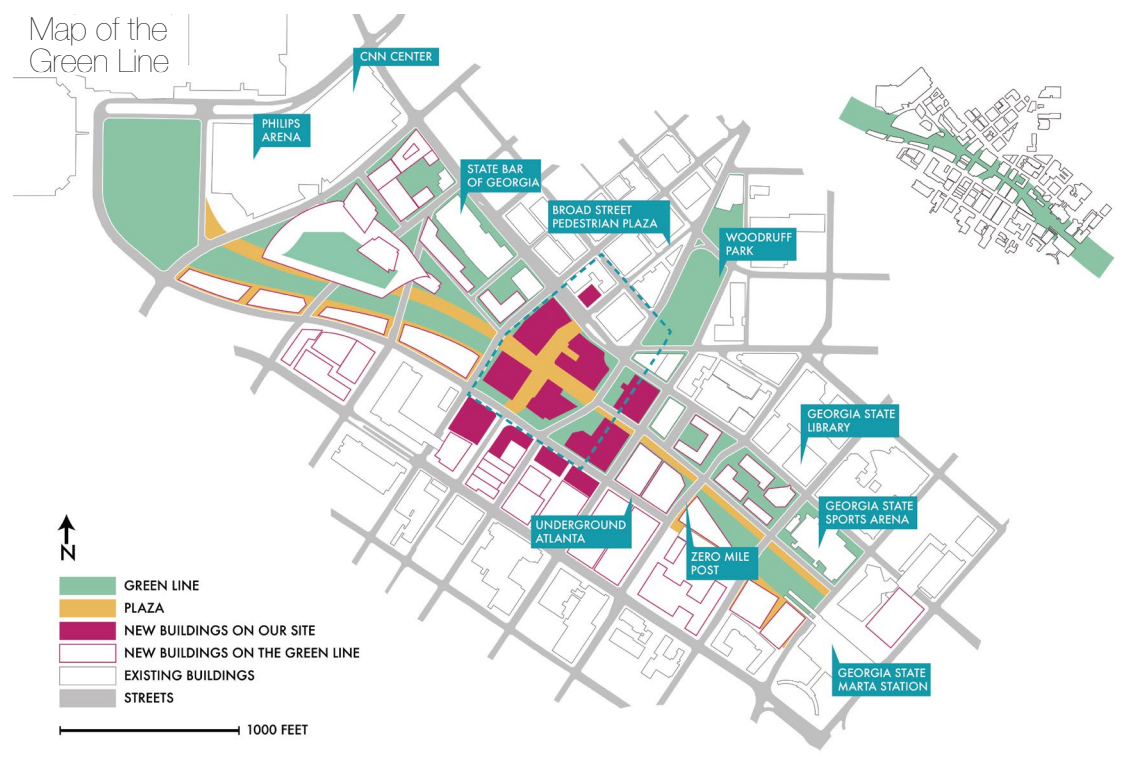
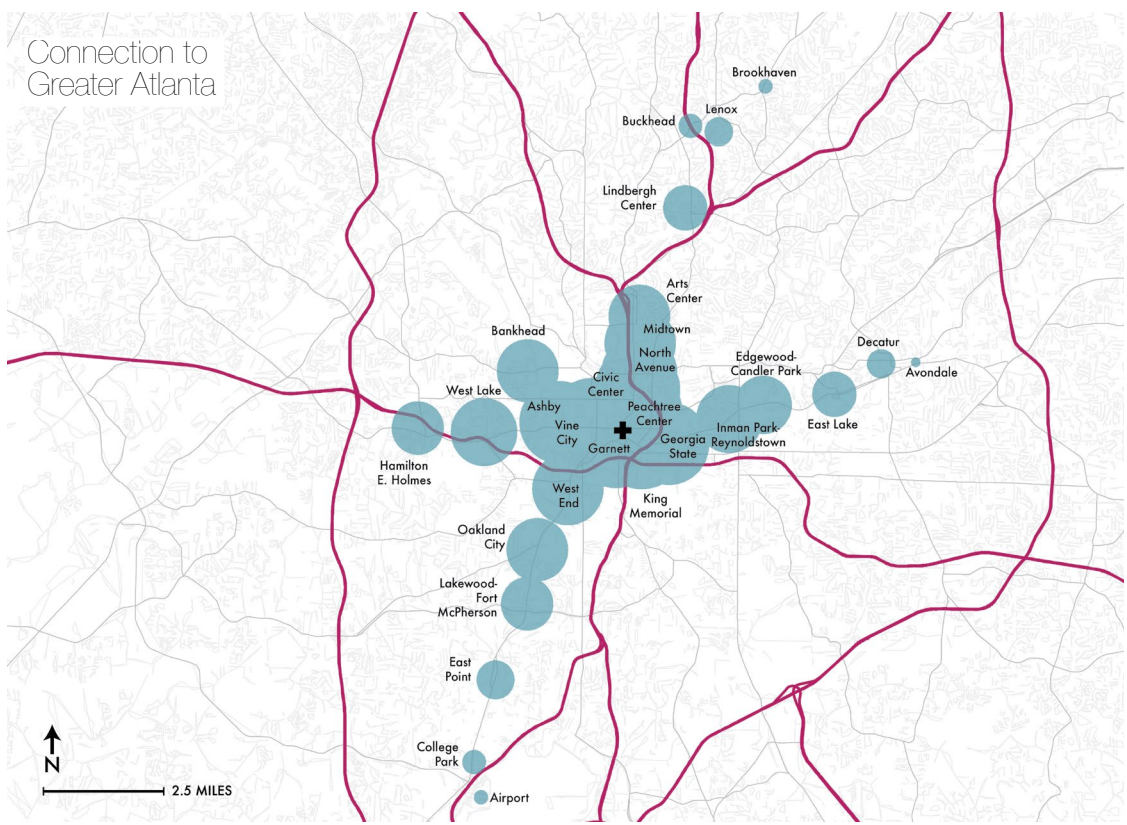


- Georgia State Property
- Parking Area



# "Five Points" - Forest in the City

## Site Analysis

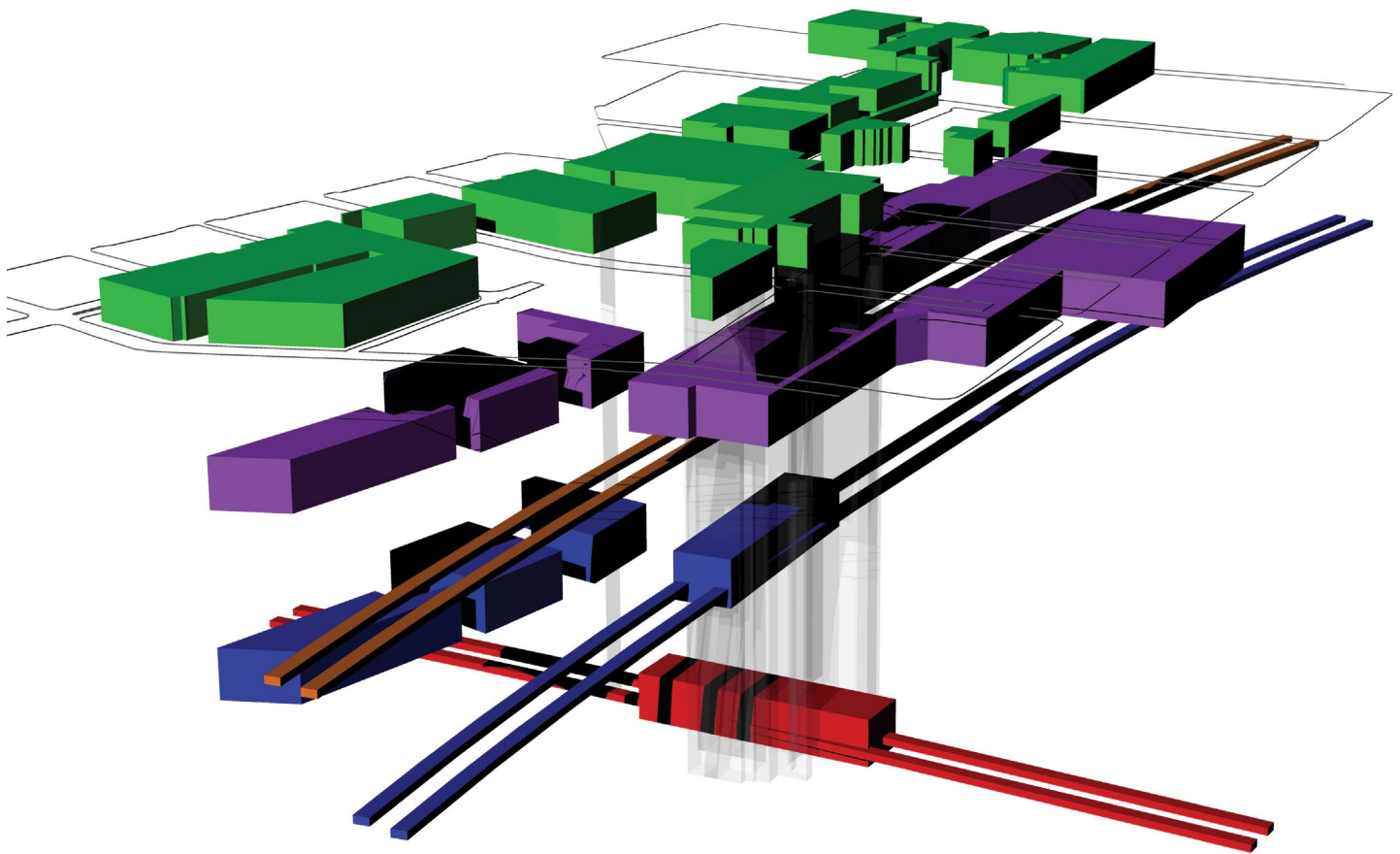


# “Five Points” - Forest in the City

## Zero Parking

- In line with our goals of an environmental sanctuary and to take full advantage of our site's popular transit. Forest in the City will be a Zero- Parking Project.
- Eliminating on-site parking brings down the cost of apartment construction between 20 and 30 percent.
- One driverless car drop off will exist at the mouth of the site and share with service on Alabama street.
- Parking will be eliminated in favor of encouraging a range of non autodependant transportation options: MARTA transit, streetcar, bikes, walking and shared cars.
- Phasing with the single parking garage on site will be implemented to help the community adapt to a no parking environment until it serves as a pedestrian oriented program/playscape for tactical urbanism.

## The many Layers of Five Points

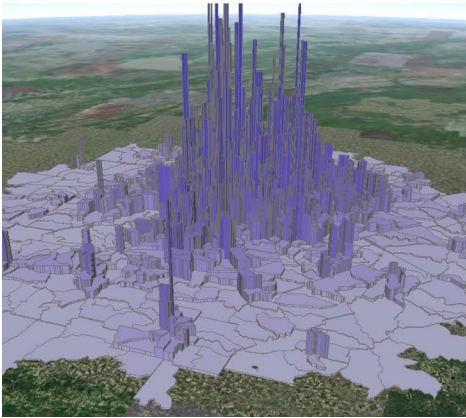


- Surface Level Buildings and Streets
- Concourse Level, Underground Atlanta, Historic Train Tracks, and Parking
- North-South MARTA rails
- East-West MARTA rails

# "Five Points" - Forest in the City

## Three Visions

### VISION I Dense Urban Core



(Source: <http://projects.urbmnet.org/pages/CityAnalysis/index.php>)

### Vision II An Icon for the City



(Source: <http://moviepilot.com/posts/2840834>)

### Vision III Celebrating Green



(Source: Stacy Scott)

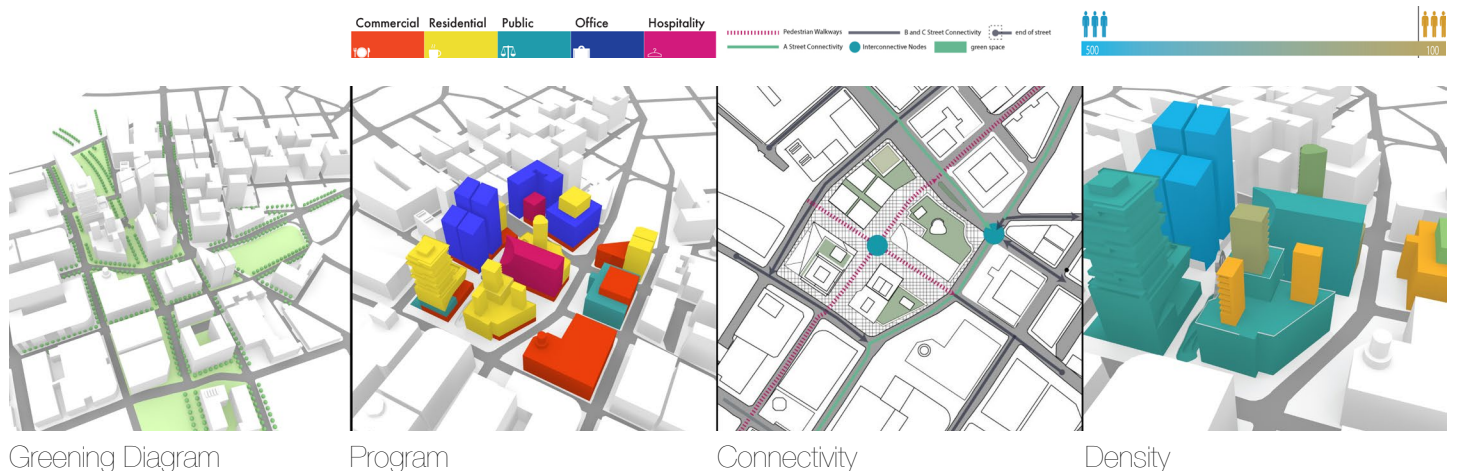
## Solutions

Densify downtown's heart. Connect existing nodes with rich public space. Activate the area.

Celebrate history and expand use of elements of a Downtown Atlanta architectural style.

Green both the public realm and private buildings. Increase beauty, charm, and appeal

## Diagrams



# "Five Points" - Forest in the City

## Proposed Site Plan



# "Five Points" - Forest in the City

## Public Realm Improvement



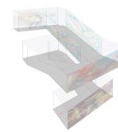
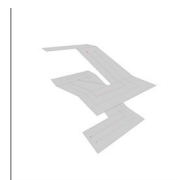
Precedents of vertical green facades, roofs and balconies. (Various sources)



View from above, looking down into the MARTA Five Points Station with the rising Phoenix.

### Parking Garage/ Zero Parking

- Phasing existing parking in the site from car to pedestrian program to allow for adjustment to a zero parking scheme. (i.e.) farmer's market



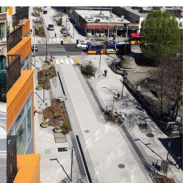
### Intersections

- A new iconic face for five points Intersection
- Reconfiguration of existing street intersection
- Replacing existing public art with a more monumental gesture



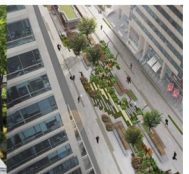
### Shared Streets

- Reimagining slower moving streets as a place that can be shared with pedestrians
- Low traffic allows for a less segregated modal split as well as transitioning between.



### Linear park

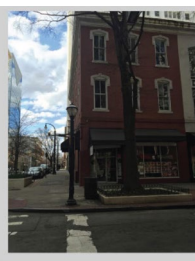
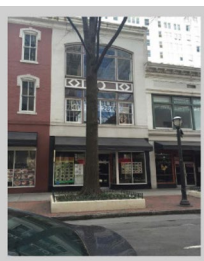
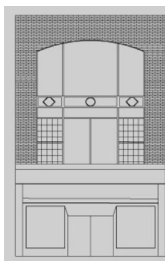
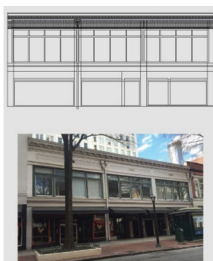
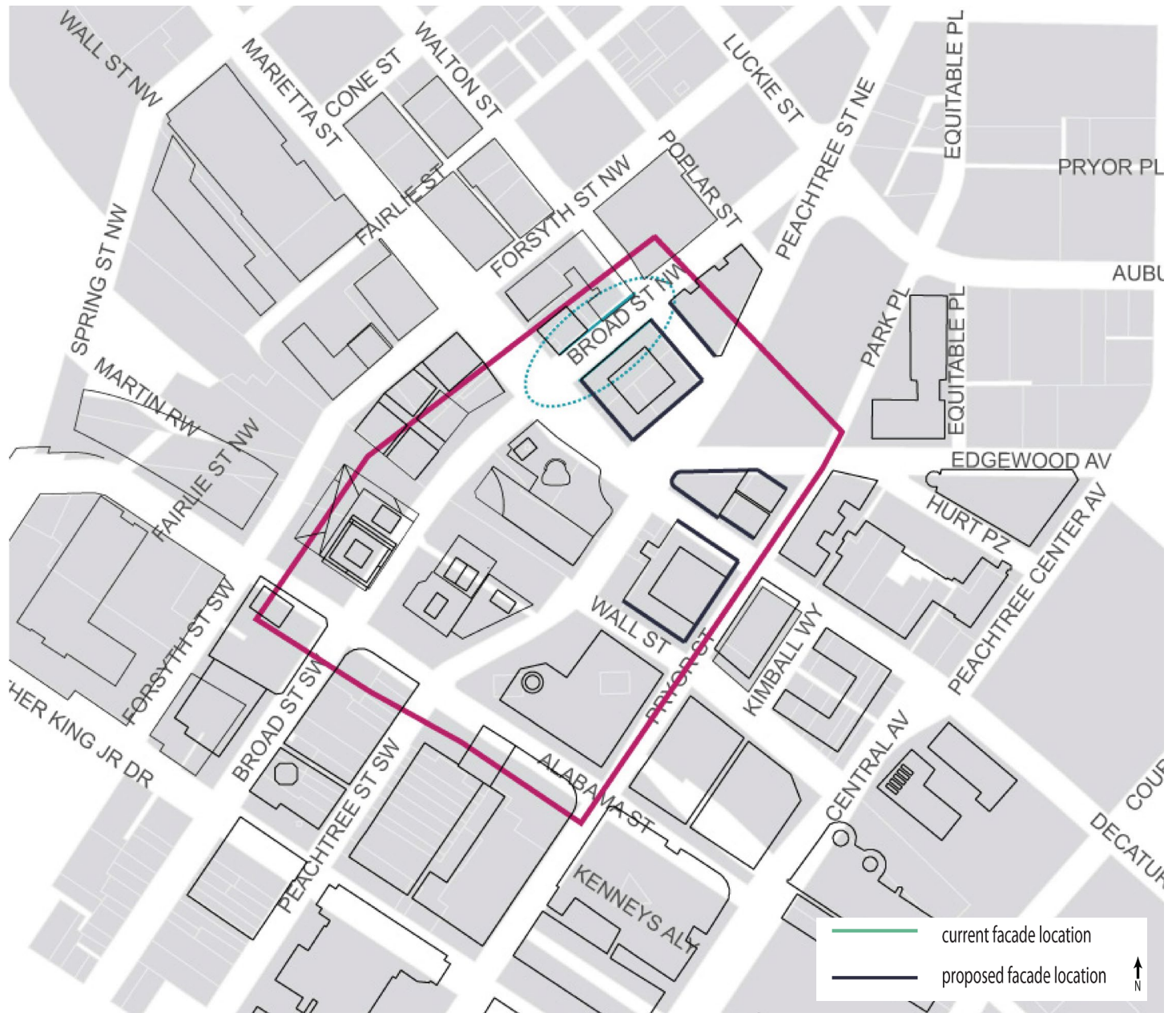
- Creates a corridor between other public green spaces
- Invites users to move through or pause within the public realm with amenities that cater to both.
- Presents opportunities for creative placemaking.



Precedents of greened parking garages, intersections, shared streets and linear park corridors. (Various sources)

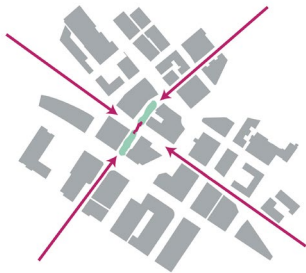
# "Five Points" - Forest in the City

## Study of Downtown Vernacular Facades



# "Five Points" - Forest in the City

## View of the Firebird



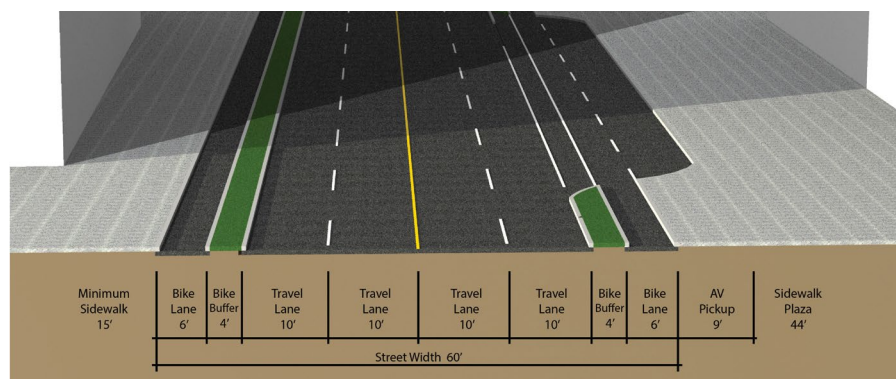
Location map showing views to the Firebird.



View through opened-up Five Points MARTA station with cascading layers of greenery and the rising Firebird sculpture (to be commissioned from an artist).

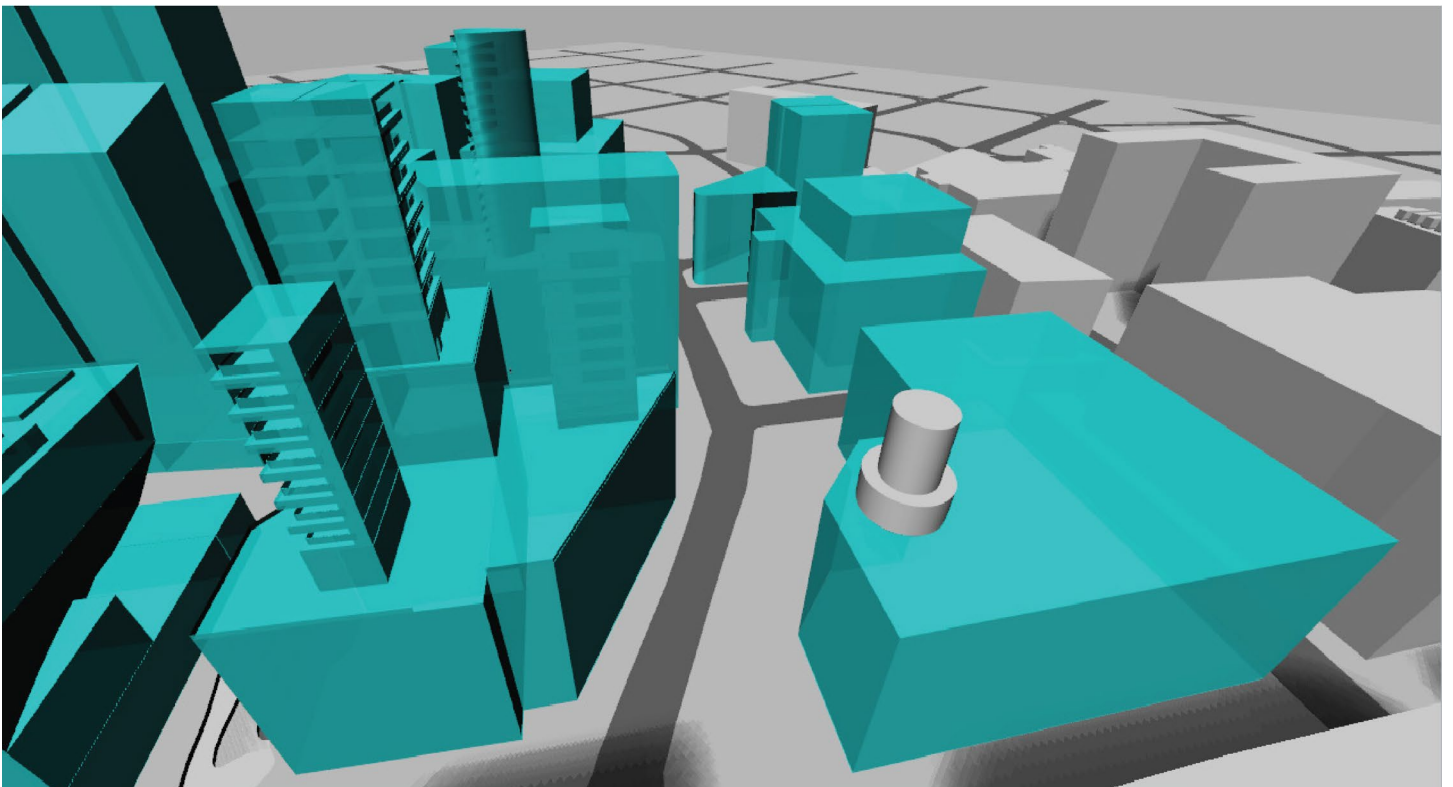
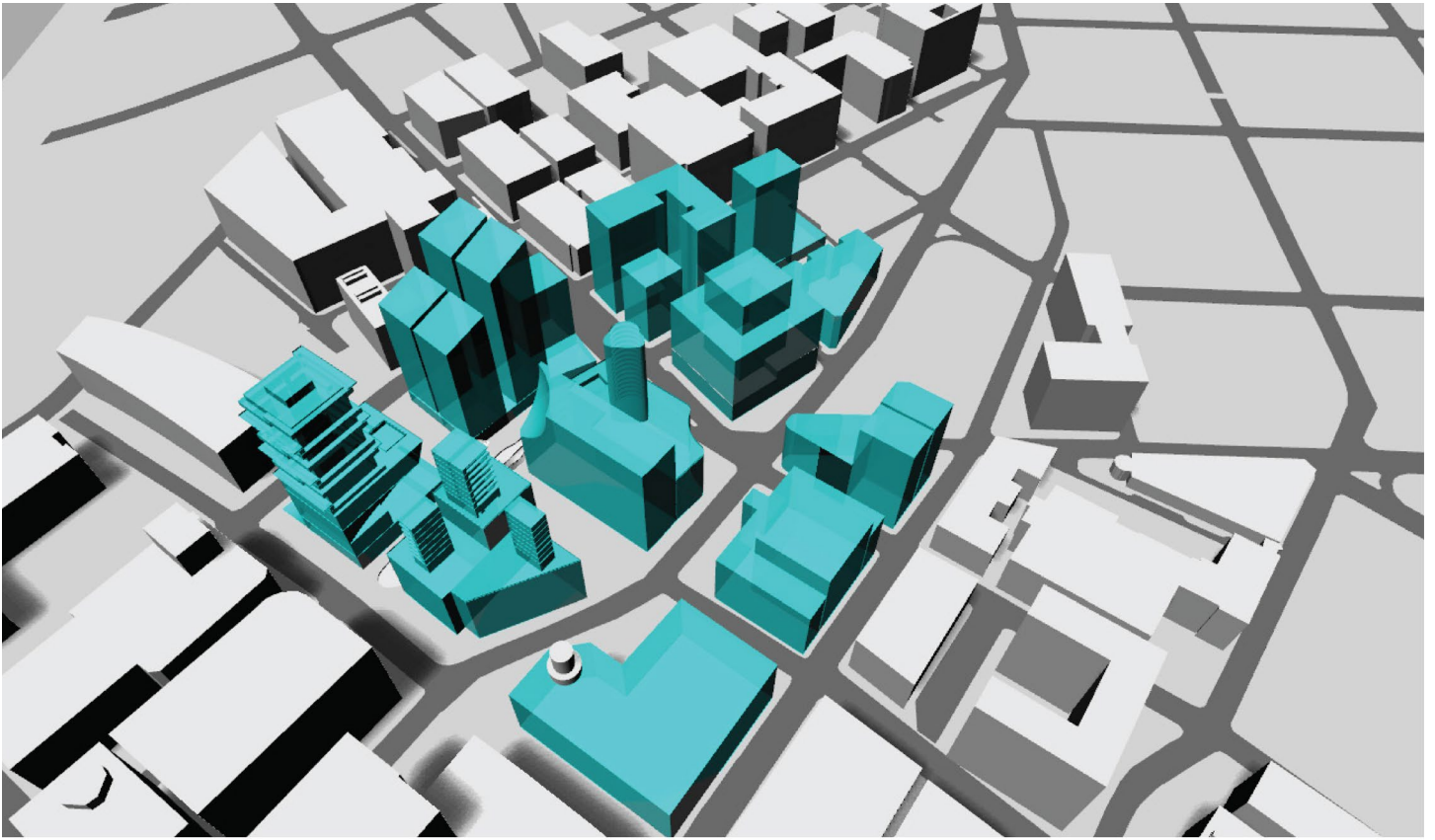
# "Five Points" - Forest in the City

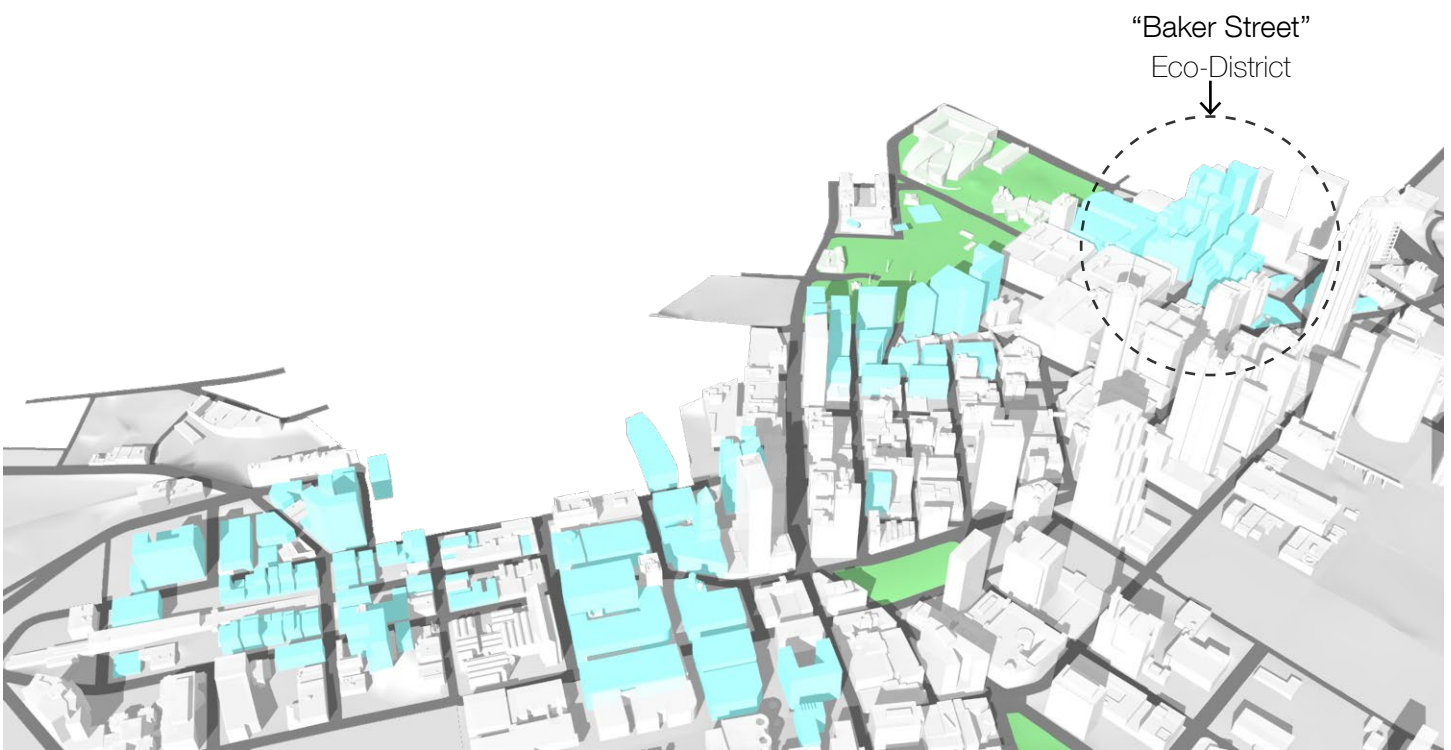
## "A" Street Map



# "Five Points" - Forest in the City

## Aerial Views





## "Baker Street" - Eco District

But for its rather steep hills and current lack of pedestrian-oriented building frontages, Baker Street should be a well-used pedestrian east-west connection between the Hotel District and the Convention Center. But for the area's surface parking lots, Ted Turner Drive and Centennial Olympic Park Drive should be high-quality north-south connections between Midtown and Downtown. Our proposal both increases those connections through our site while it attracts new residents and visitors to the new neighborhood with distinctive Eco-District features and spaces that demonstrate healthy hillside living.

# "Baker Street" - Eco District

## Concept

### Development Potential

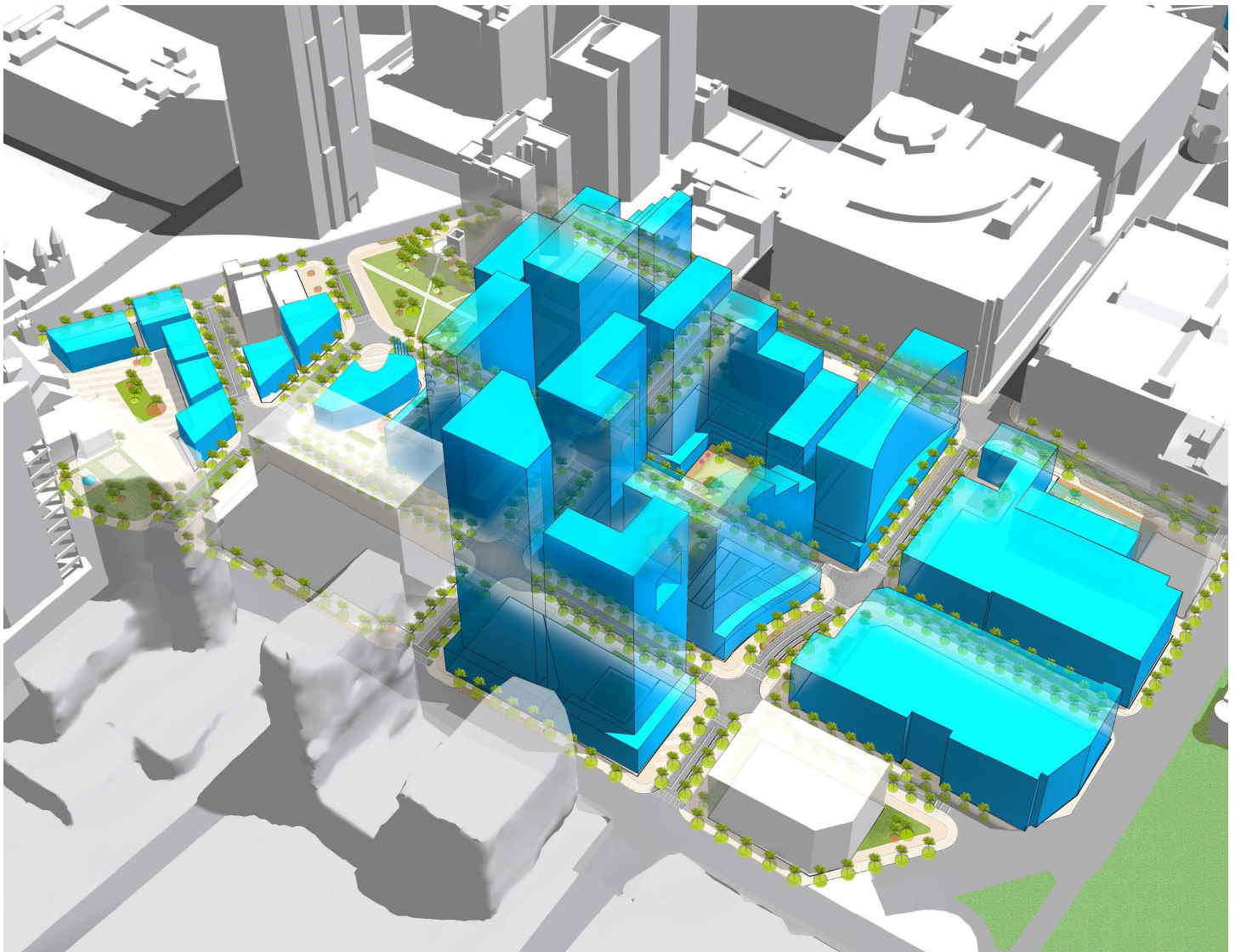
Midtown Boom Serving as a Catalyst

### Pedestrian Connection

Link Tourists to Destination | Create Safe Streets

### Topography as an Asset

Utilize Slope to Enhance Eco-District Systems



Adding Density along the A's

### Team:

Shijia Huang

Sarah Jane Bonn

Eric Goldstein

# "Baker Street" - Eco District

The Baker Street Eco-District is situated on the northern edge of the America's Marts with Ivan Allen Boulevard as its northern boundary, Centennial Olympic Park Drive to the east and Peachtree Street to the west. The six-block segment is positioned in the middle of a number of attractions, new development and hotels making it a frequent spot for tourists or Mart visitors. The prime location and connection to a number of Atlanta attractions would make one believe that this area is bustling with activity; however parking lots, vacant buildings, and parking decks monopolize the site rendering it a less than desirable place to walk. Blank facades and few ground floor uses give little reason for any pedestrian activity and instead become places hotel concierges tell patrons to avoid.

The 25-year vision for this six-block site addresses three key problems that we believe can be turned into assets that will activate street activity and create a lively neighborhood attractive to young and old alike. The three problems include: the number of parking lots and structures, lack of pedestrian connectivity and perception of safety, and topography. Instead, we propose:

- Development potential -The area's positioned so close to the Midtown/Downtown line that we are already seeing development proposals for some of the large swaths of parking lots. The extent of contiguous developable land lends itself to the efficiencies of district heating, cooling, and energy systems and is the basis of our Eco-District approach.
- Pedestrian Connection - The sidewalks are begging for engaging street level design and a more populated, safer experience for pedestrians. Parking lot redevelopment will address this.
- Topography – It is very hilly. Baker Street, in particular, has a significant slope that further inhibits walkability and may not make retail viable. Instead, as part of our Eco-District approach, we treat the drainage of stormwater down the hill as a series of green, cleansing fountains and median gardens, culminating in an urban greenhouse.

The site boast great development potential first off from the sheer number of lots currently occupied by surface parking or stand-a-lone parking decks and also due to the close proximity to Midtown, which is currently a hot bed for development. Should driverless cars become a popular mode of transportation, the need for parking will significantly decline creating opportunities to turn these parking decks and lots into high-rise housing, office, and retail with active ground floors. As of today there are approximate 2550 parking spaces, but over the course of 25 years we project that at least half can be removed creating a dramatic opportunity to build a neighborhood and create an active street. Through strategic investment in streetscaping, energy systems, road conversions, and water filtration systems the streets will not only physically transform but also encourage businesses to locate in the neighborhood.

Currently, the Baker Street area is characterized by minimal pedestrian activity despite the number of hotels and attractions nearby. Few active ground floors and hilly terrain create unappealing sidewalks and push patrons to explore Atlanta via car. Creating a street network that supported retail and A Street functions was the overarching goal of the Studio; however this area took on the distinct task of creating streets that facilitated the flow of tourists while also supporting a sustainable neighborhood. For this to be possible a number of considerations were incorporated. First, we assume that all streets will become bi-directional by 2041. This will strengthen their ability to support retail. The second assumption is that the existing and proposed Streetcar route will transition into Autonomous Rapid Transit in the near future. Extending West Peachtree Place and closing the original Porter Place will contribute to a more integrated street network where the neighborhood meets Peachtree Street.

Additional street changes include transitioning the original four-lane Baker Street to a two-lane street dedicated only to autonomous bus. An ecological-focused median in the center serves two functions, contributing to sustainable living systems and providing a green corridor that is walkable and pedestrian friendly. In and of itself, it becomes an attraction and

# "Baker Street" - Eco District

destination for future residents and tourists alike. Activated ground floors and a Vertical Green House provide attractions along Baker Street, which provide another reason for individuals to walk up and down Baker.

Ted Turner Drive is designed to accommodate commuter Autonomous Buses and cars, mixed with two lanes for private owned vehicles, a southbound bike lane and a northbound shared lane both for bike and autonomous bus. It creates a mix of uses that support the retail and restaurants lining Ted Turner, one of our active A Streets.

William Street serves as an example of a B Street, which will be turned into a three-lane street, with two lanes for private owned vehicles and one dedicated lane for autonomous bus. Because of the specific assumption of autonomous vehicle, pickup and drop-off places and bus stops are necessary for the future to allow for queuing. Our design ensures every block will have two pickup and drop-off places in addition to the existing bus stops, in order to facilitate future users of the shared autonomous vehicles. The physical design of the autonomous vehicle will allow for significant road diets enabling lanes to shrink from 10 feet to 8 feet. This provides more space for pedestrians and our sustainable district concept.

The slope of Baker Street is advantageous to the implementation of a storm water runoff system in the center median. This can also be used as a filtration system that feeds into the water supply for the Vertical Greenhouse. The glass walls in the greenhouse enable the water collection process to be viewed by the public, transforming the cistern and mechanisms used to water the plants into an engaging process. The process resembles that of a Living Machine, where the filtration process begins through the center median and proceeds through cisterns that enable the greenhouse to reuse the storm water to nourish the plants. The plants in turn can be sold at a public market or used to supply the kitchens of nearby hotels. The Greenhouse is placed against the parking garage of one of the Post Apartment buildings, so should the greenhouse need to expand and parking needs decline, it can grow into the unused parking garage space.

The central district power plant is another component of the design. It functions to collect waste heat from sewage and water systems in the area and recycles the energy to provide heating and cooling. The thermal heat exchange (recycled heat) can supply up to 70% of the facility's energy production. The remaining 30% is produced on-site using high-efficiency boilers. The fact that much of the site is not built allows for insulated distribution pipes to be installed under the streets without interfering with traffic before more buildings are constructed. The final step needed is to install energy transfer stations in the buildings mechanical rooms to distribute the heated water through the buildings' pipes. These two systems, the storm water runoff recycling and the waste heat recycling will help to create a more efficient and green eco-district and one that supports a growing neighborhood. The eco-district models energy efficient and sustainable practices that can be emulated in other areas of the city.

# "Baker Street" - Eco District

## Development Potentials

### New Developments



(Source: [www.midtownatl.com/\\_files/images/dev-activity-map\\_thmnl.jpg](http://www.midtownatl.com/_files/images/dev-activity-map_thmnl.jpg))



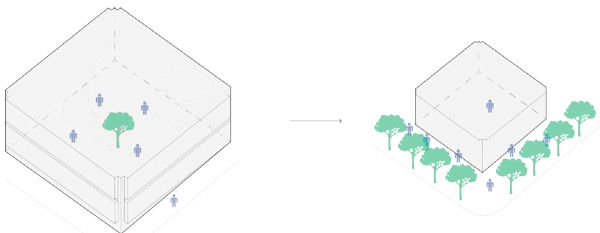
Over **14,000** RESIDENTS IN MIDTOWN (AS OF 2014)



**3** NEW DEVELOPMENT PROPOSED ON OR ADJACENT TO OUR SITE

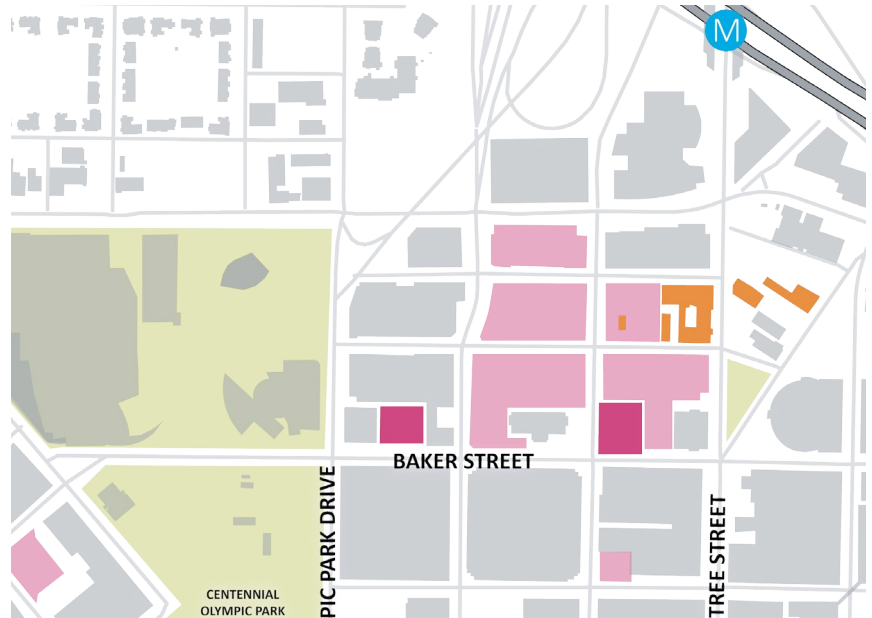


**1662** PROPOSED RESIDENTIAL UNITS BY 2041



Turning Building Inside Out

### Parking Lots = Opportunity



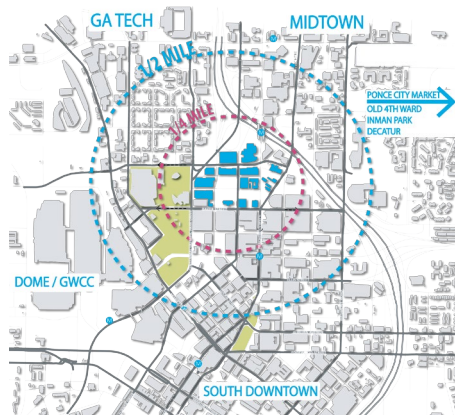
2550 APPROXIMATE NUMBER OF PARKING SPACES

1260 PARKING SPACE REMOVAL

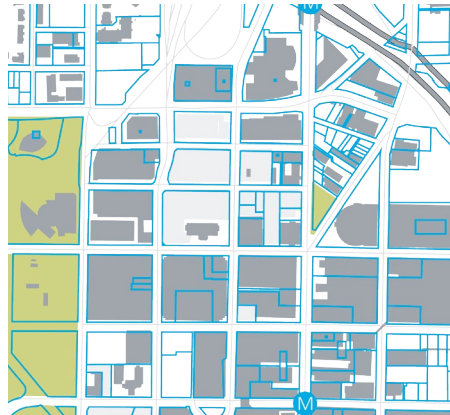
**1290 TOTAL PARKING FOR OUR SITE**

BUILDING REMOVAL CRITERIA:

- VACANT
- STAND ALONE PARKING GARAGE
- PRIME DEVELOPMENT SITE (NOT HIGHEST AND BEST USE)



Regional Connections



Parcel lines & Ownership



Key Investment Map

# "Baker Street" - Eco District

## Masterplan

### VISION FOR THE ECO DISTRICT



## Key Investment Timeline

### 2016

Number of Residents: 271  
Hotel Units: 792  
Parking Spaces: 2550

#### Strategic Investment:

- Road Changes to Two Way
- Capital Investments in Streetscaping to prepare for Sustainable Systems

#### Policy Implementation:

- Expand Building Reporting & Benchmarking
- Create Aggressive Goals for Carbon Neutral Buildings in 2041
- Cap on Parking in Transit Rich Areas

### 2025

Number of Residents: 678  
Hotel Units: 1192  
Parking Spaces: 2990

#### Strategic Investment:

- Porter Place Re-Aligned
- Bake Improvements Initiated
- Baker Road Diet

#### Policy Implementation:

- Parking Consolidation
- Incentives for Renewable Energy Use
- Programming for Pedestrian Streets
- Affordable Housing Components

### 2041

Number of Residents: 1662  
Hotel Units: 1992  
Parking Spaces: 1290

#### Strategic Investment:

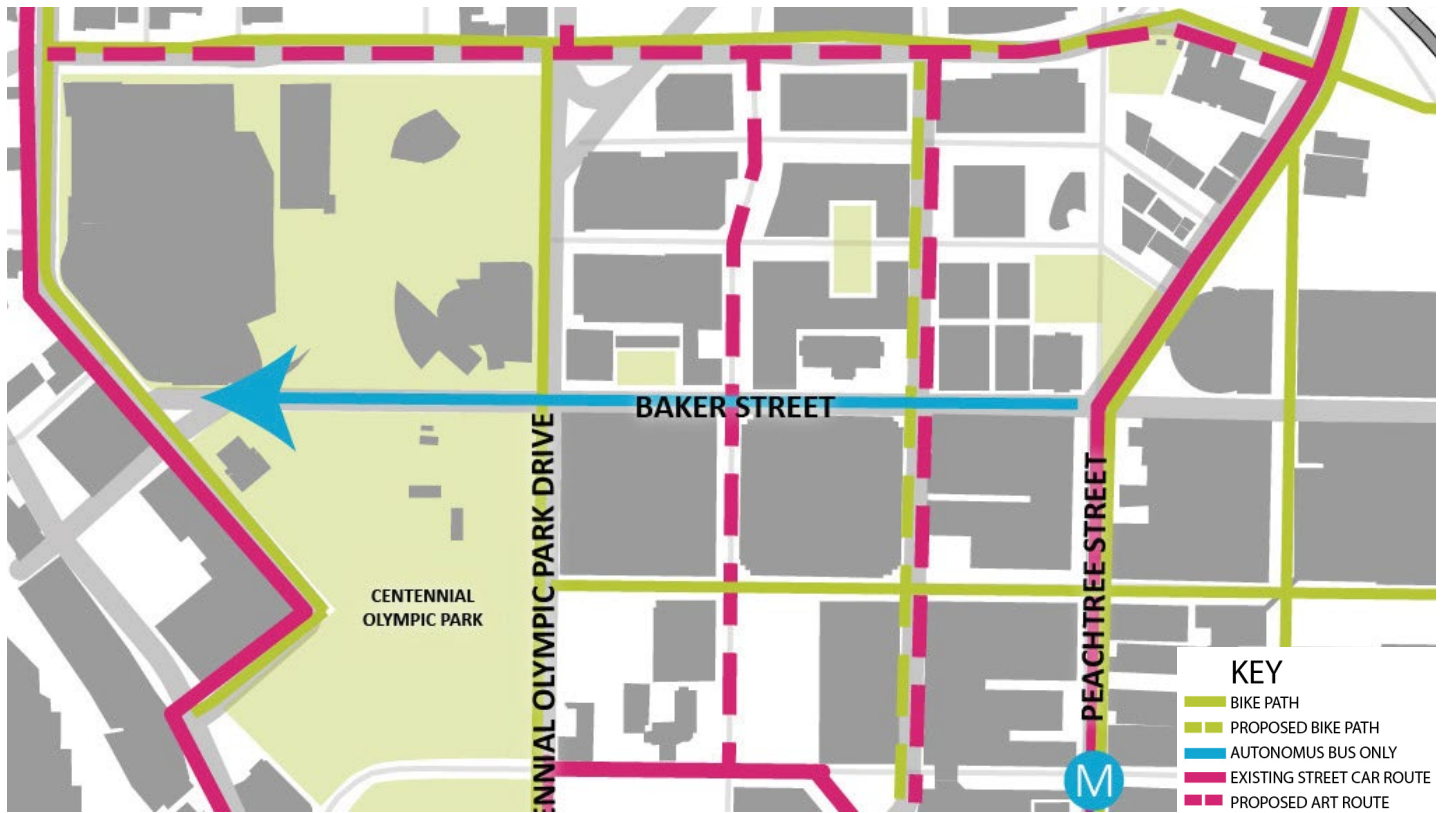
- Vertical Green House
- Land Acquisition for Parks and Green Space
- Simpson St Autonomous Vehicle Drop-Off
- Baker Street to ART Only

#### Policy Implementation:

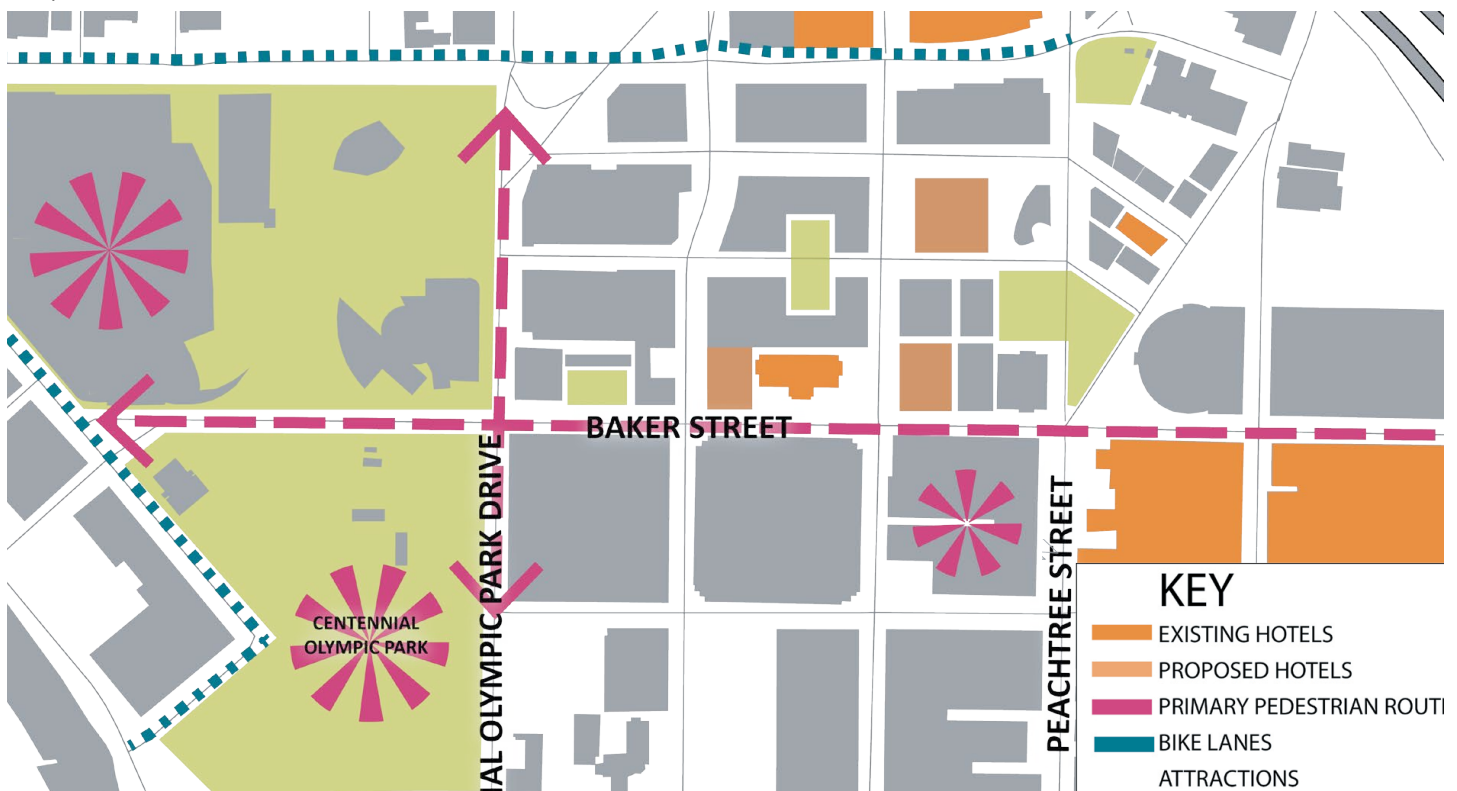
- Aggressive Strategy for enhancing sustainable loops
- Selected Pedestrian and ART Streets

# "Baker Street" - Eco District

## Street Network



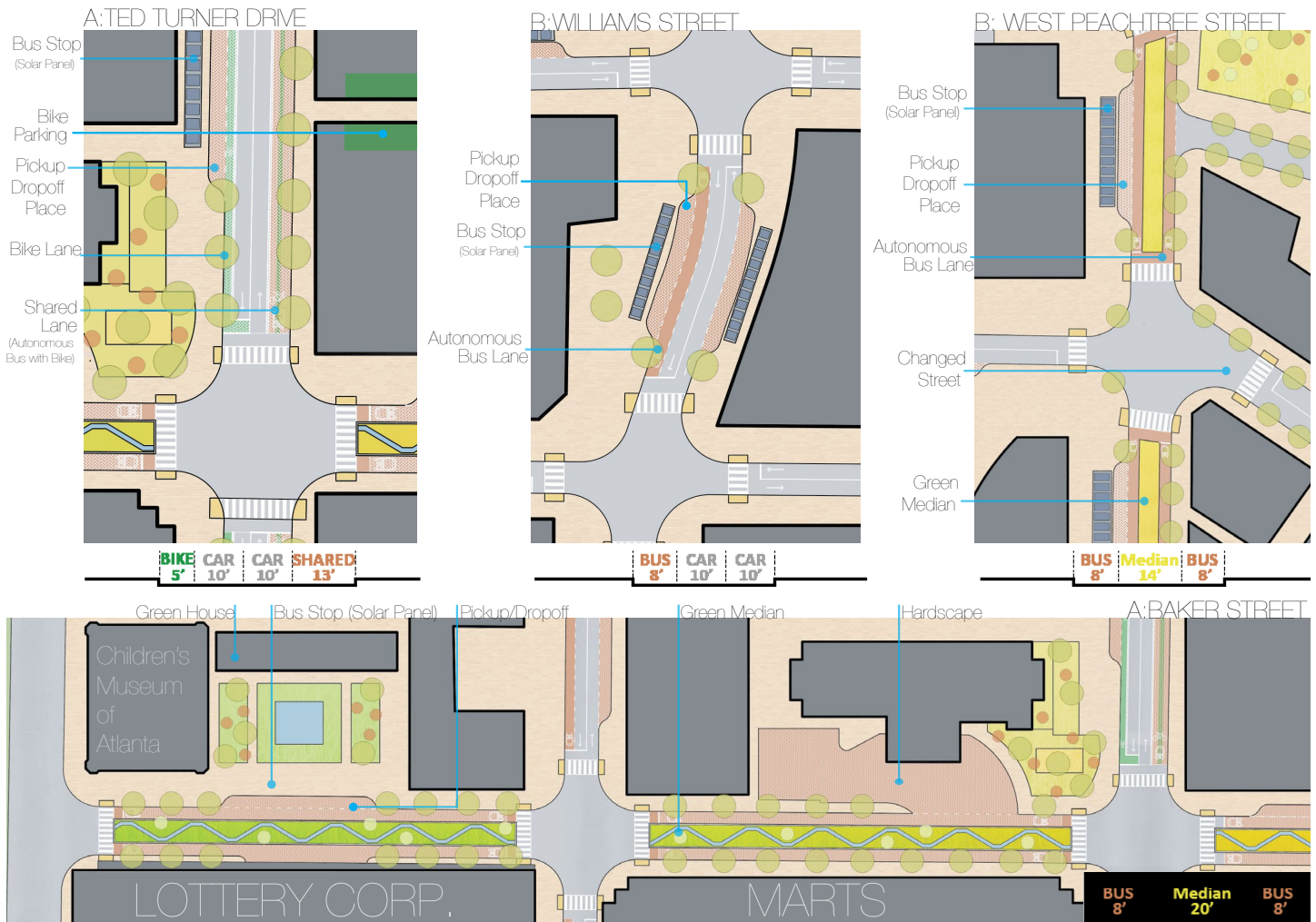
## Proposed Transit Routes



## Safe routes for tourists

# "Baker Street" - Eco District

## Street Proposals



### Assumptions

- All streets become Bi-Directional.
- The StreetCar will transition into Autonomous Rapid Transit (ART).

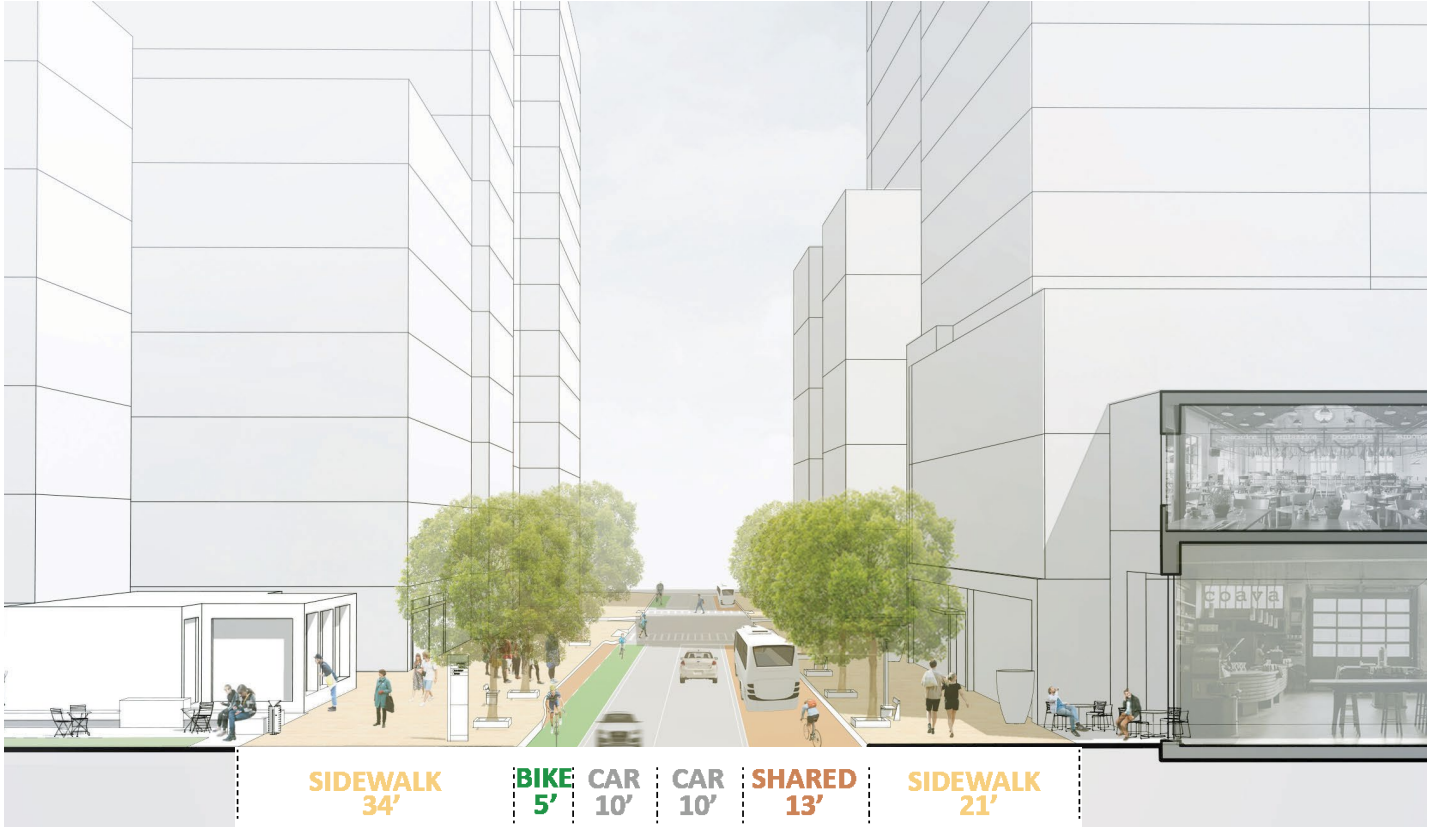
### Proposal

- Baker becomes Active Tourist Street by becoming pedestrian and Autonomous Bus Only.
- Porter Place is re-aligned with grid.
- Reduce Ted Turner and Williams to three Lanes.

# "Baker Street" - Eco District

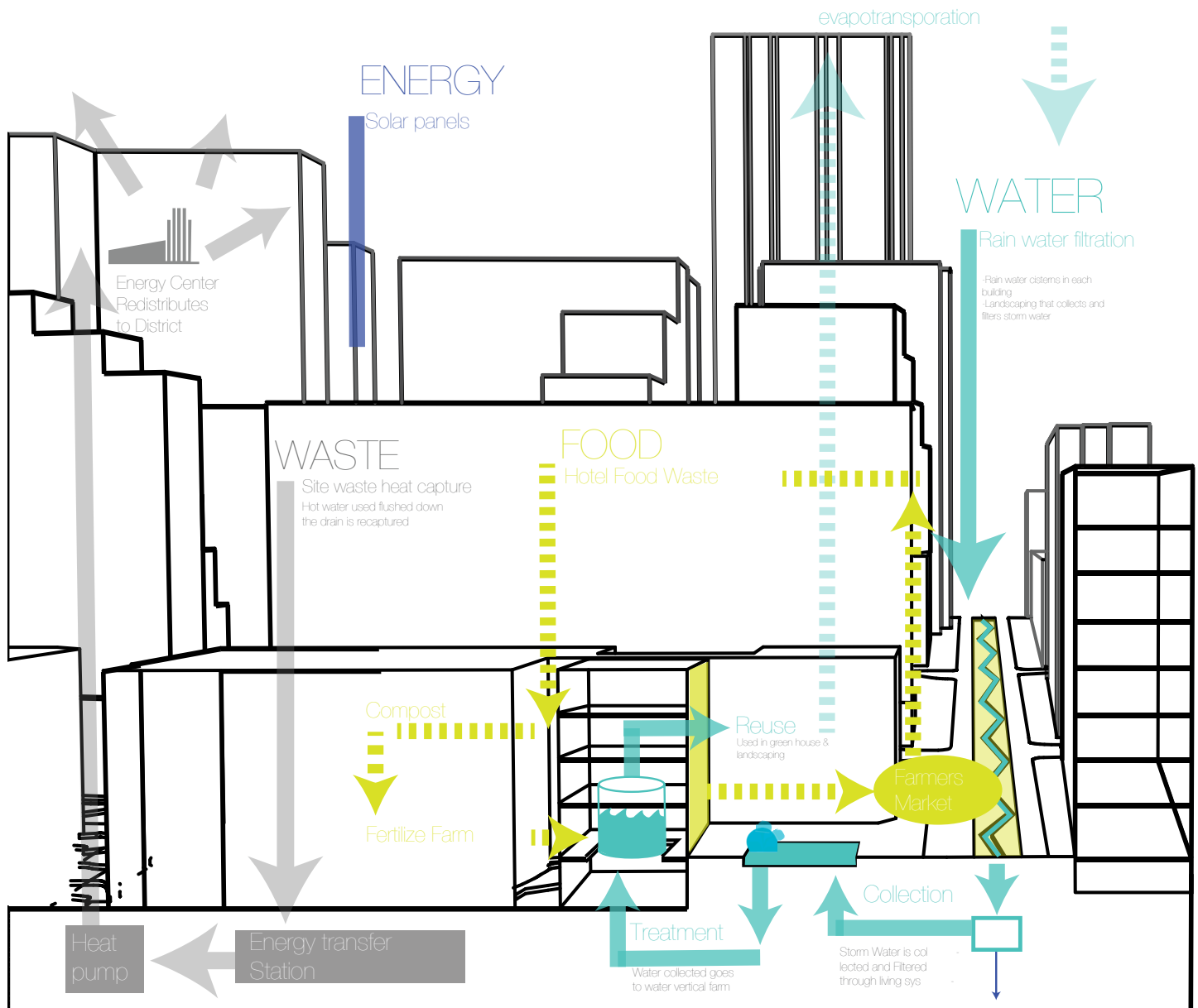
## Street Proposals

TED TURNER STREET SECTION - THE FUTURE OF AN A STREET



# "Baker Street" - Eco District

## The Eco-District



### Water

- Integrated Storm Water Management.
- Filtration.

### Food

- Increase number of neighborhood food assets.

### Waste

- Central Energy System and Energy Transfer Station captures waste heat from sewer.

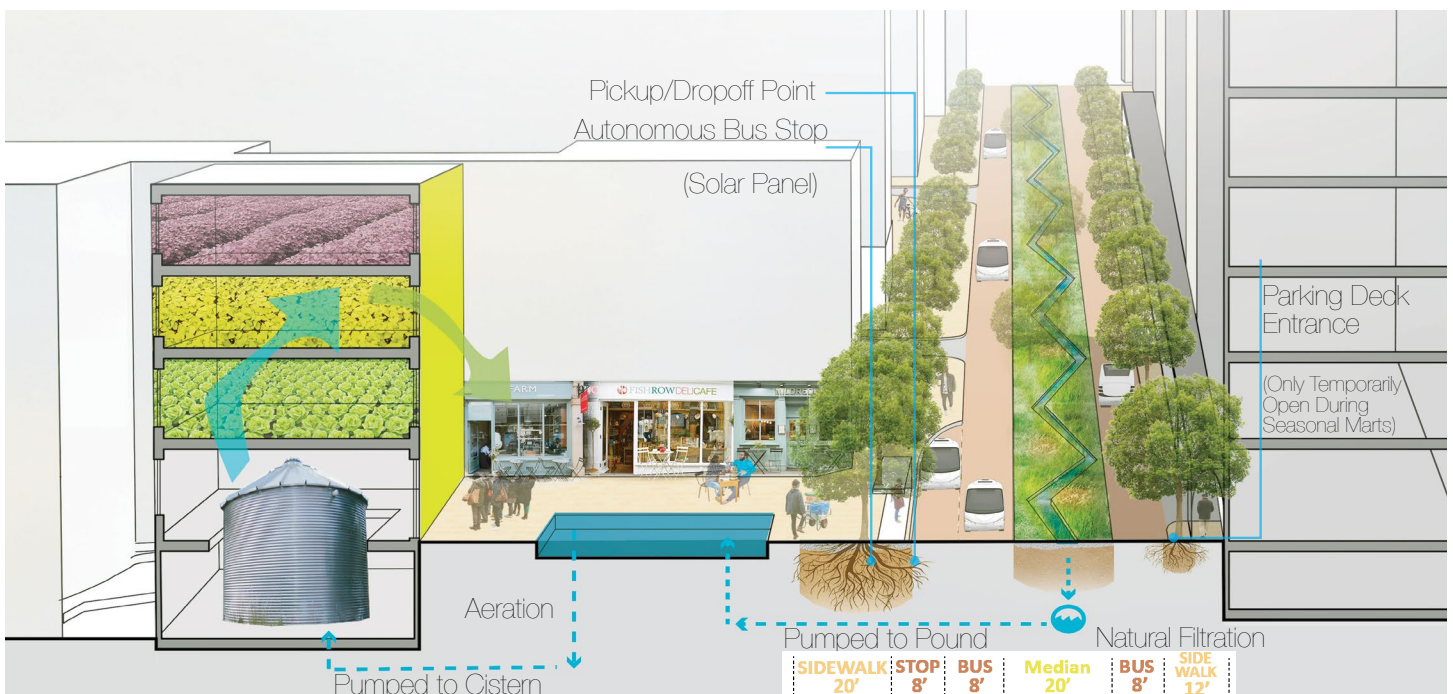
### Energy

Existing: 3 Buildings LEED Certified; 3 Energy Star

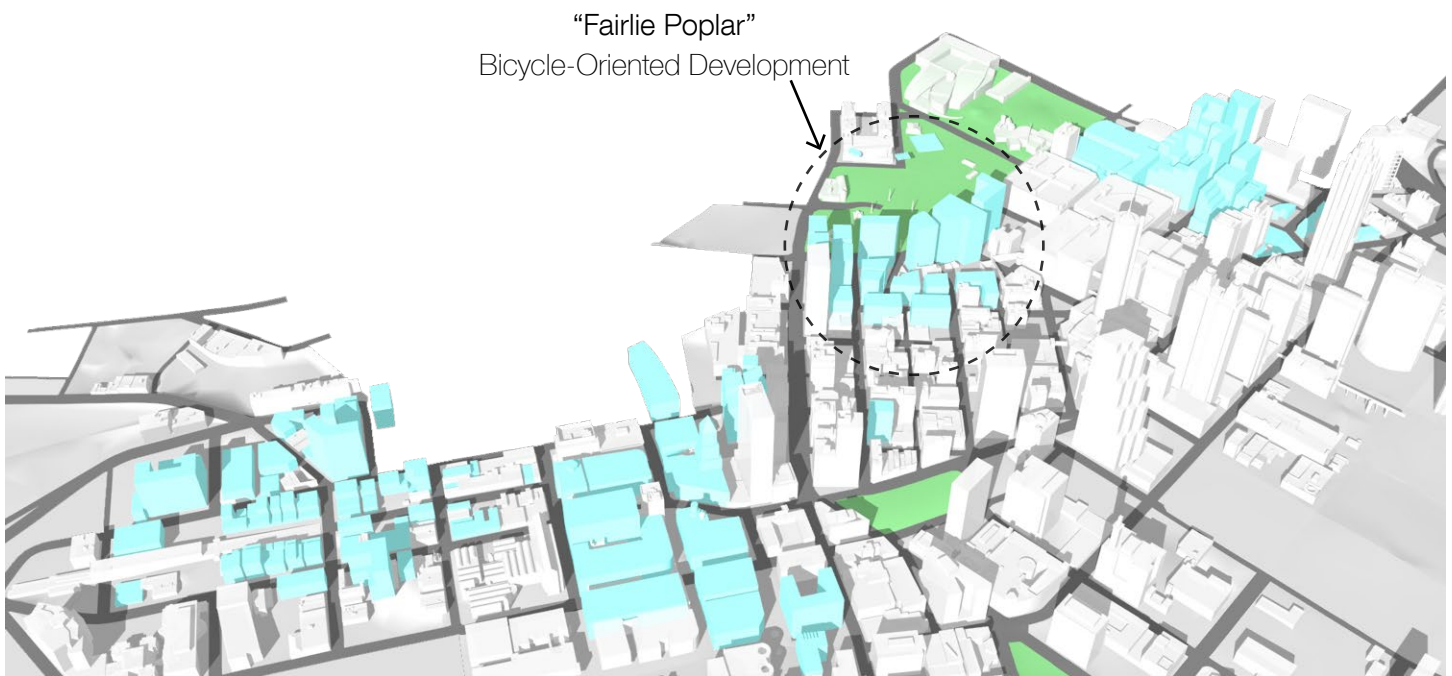
Proposed: Central Energy Center, Solar Panels on the Marts

# "Baker Street" - Eco District

## Water Management



Baker Street - Utilizing Slope for Water Filtration



# "Fairlie Poplar" - Bicycle-Oriented Development

Our proposal seeks to redevelop a six-block area at the seam between two great assets: the historic charm and walkable streets of Fairlie Poplar and the views and active recreation offered by Centennial Olympic Park. Currently dominated by parking lots for events parking, we propose fronting Downtown's premier park with a high-density, signature skyline before tapering development down to a more intimate scale along Ted Turner Drive. Building on the PATH Foundation's designation of Centennial Park as the hub for Metro Atlanta's regional bike trail network, our proposal explores the site's opportunities to attract residents, visitors and businesses to bike-oriented development.

# "Fairlie Poplar" - Bicycle-Oriented Development

## Existing Conditions Analysis



Surrounding Uses



Topography



Building Footprints



Existing Uses



Parcel Ownership



Prevalence of Parking

### Team:

Meghan McMullen

Mikhail Payson

### Site Context

The Fairlie Poplar case study site sits at the nexus of the historic Fairlie-Poplar neighborhood, Centennial Olympic Park, major event venues, and AmericasMart. The six-block study area extends to Centennial Olympic Park to the west, Andrew Young International Boulevard to the north, Ted Turner Drive to the southeast, and Marietta Street to the southwest.

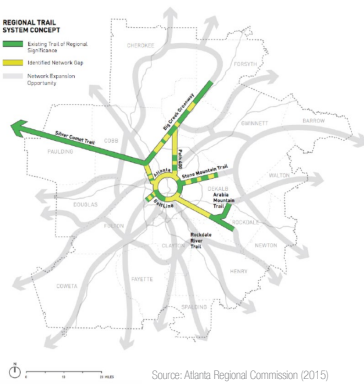
# "Fairlie Poplar" - Bicycle-Oriented Development

## Existing Conditions Analysis

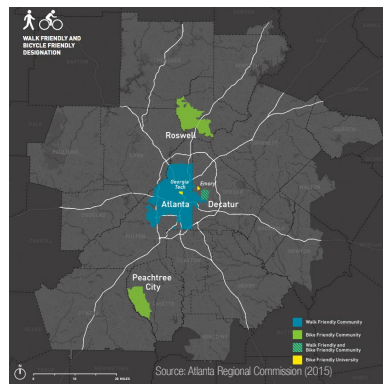
### Existing Conditions

Within the site, the Tabernacle concert venue, SkyView Ferris wheel, and Centennial Tower office building serve as key landmarks, accompanied by several smaller commercial buildings, hotels, and a midrise condominium. The predominant land use is parking, taking the form of both surface lots and garages, with a total of more than 2,400 spaces. The neighborhood block grid is fairly porous, with typical block sizes around 230 feet by 380 feet. The Atlanta Streetcar and MARTA bus stops provide transit access within the site, and the Five Points and Peachtree Center MARTA rail stations are each located within 0.15 miles of the site. There are no significant stormwater issues within the site; however, there is a downward slope from the Peachtree Ridgeline toward the neighboring west side neighborhoods and Proctor Creek watershed, where flooding poses a serious issue.

## Site Positioning



Centennial Olympic Park as planned hub for regional bike trail system



No existing "bike friendly communities" within the City of Atlanta



Leverage connectivity and grain to position as a center of cycling and active living

### Site Positioning and Design Principles

The site's porous grid network, central location, and proximity to MARTA service are well suited to a neighborhood with limited reliability on personal vehicles, and its adjacency to Centennial Olympic Park—the designated hub for the PATH Foundation's regional bike trail network—uniquely positions it as an area with the potential to become Atlanta's most bikeable neighborhood. The proposed site concept is centered upon facilitating an active lifestyle by leveraging its parkside location, designing with bikes in mind, and creating a neighborhood with both intimate and grand spaces that invites residents and visitors alike to wander and make themselves at home within the public realm.

# "Fairlie Poplar" - Bicycle-Oriented Development

## Future Fairlie Poplar

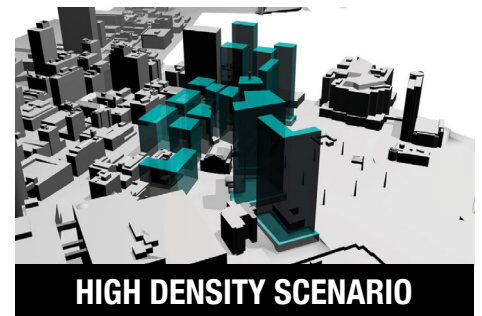
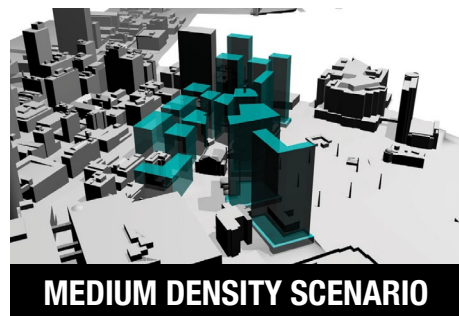
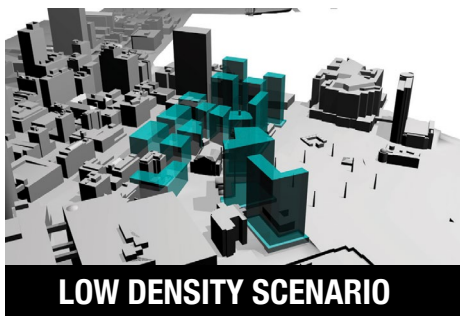
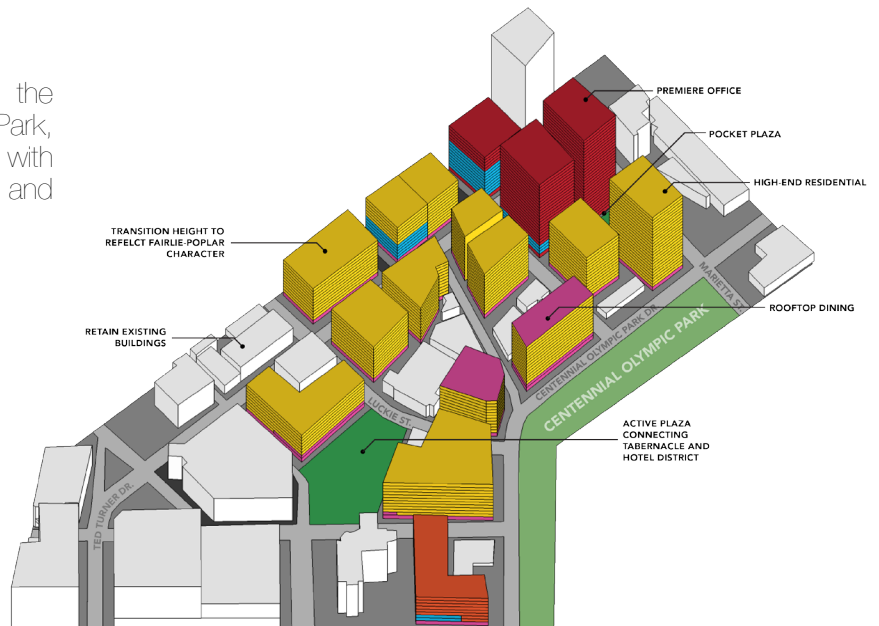


## Illustrative Site Plan

The future Fairlie Poplar vision extends the neighborhood west toward Centennial Olympic Park, replacing parking lots and underutilized sites with dense, active uses and using complete streets and public plazas as the seams between buildings.



22%	OFFICE	758,882 SF
4%	HOTEL	142,450 SF
5%	PARKING	167,578 SF
2%	OPEN SPACE	53,214 SF
60%	RESIDENTIAL	2,086,505 SF
8%	RETAIL/RESTAURANT	269,112 SF



 **1,565**  
NEW HOUSEHOLDS

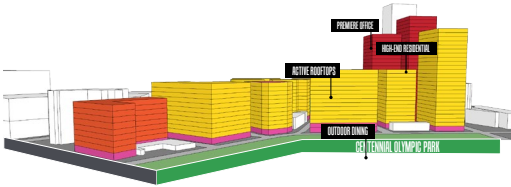
 **3,912**  
NEW RESIDENTS

 **4,769+**  
NEW PERMANENT JOBS

 **559**  
PARKING SPACES

# "Fairlie Poplar" - Bicycle-Oriented Development

## Guiding Design Principles



1 Leverage Parkside Location

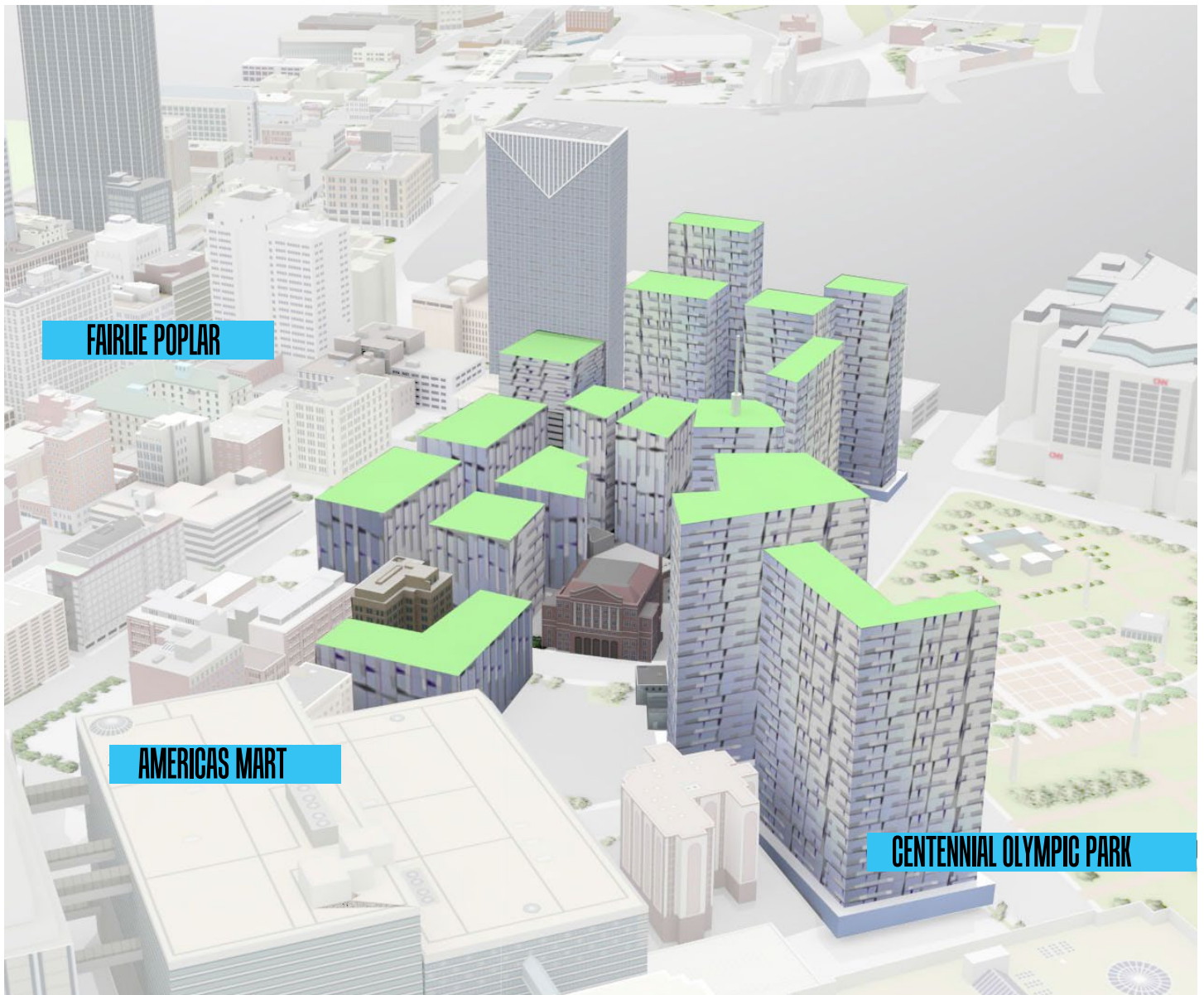


2 Design with bikes in mind

(Image source: <http://www.fastcoexist.com/3031392/the-case-for-protected-bike-lanes>)



3 Create a neighborhood with both intimate and grand spaces



# "Fairlie Poplar" - Bicycle-Oriented Development

## Proposed Street Network

### ASSUMPTIONS

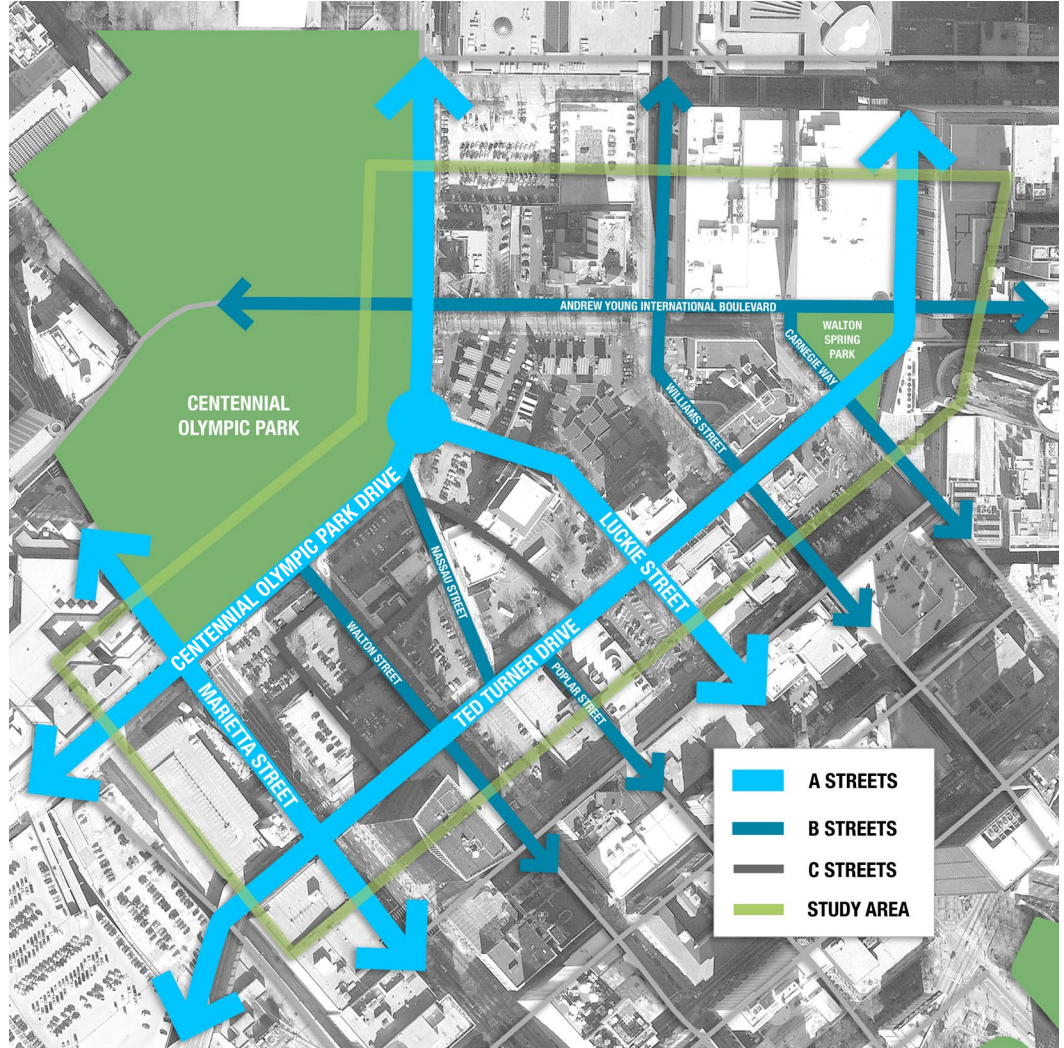
ADOPTION OF AUTONOMOUS VEHICLES AS **ROBOTAXIS** IN A HYBRID SCENARIO

**REDUCTION OF PARKING** CAPACITY BY 50 PERCENT

**AUTONOMOUS RAPID TRANSIT** REPLACES STREETCAR AND BUS

RETENTION OF **MARTA** RAIL

EMPHASIS ON **ACTIVE MODES**



### MODE PRIORITIZATION

HIGHEST



#### WALKING

- ▶ GENEROUS, INTERESTING SIDEWALKS
- ▶ POROUS, NAVIGABLE NETWORK



#### BIKING

- ▶ CONTINUOUS NETWORK OF BIKE LANES
- ▶ BIKE PARKING AND AMENITIES



#### TRANSIT

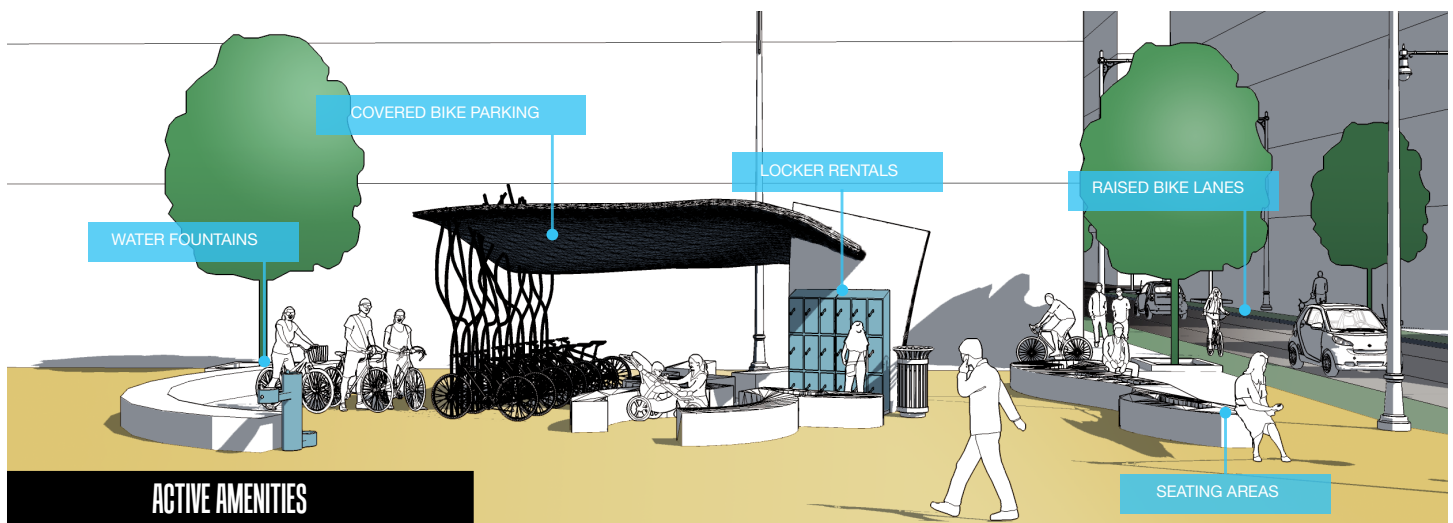
- ▶ FREQUENT AND RELIABLE
- ▶ CONNECTS MAJOR DESTINATIONS



#### PERSONAL VEHICLES

- ▶ DROPOFFS + DISTRICT PARKING SYSTEM
- ▶ SHIFT TOWARD AUTONOMOUS VEHICLES

LOWEST



### ACTIVE AMENITIES

# “Fairlie Poplar” - Bike Oriented Development

## Proposed Street Network

### Proposed Street Network

The proposed street network prioritizes 1) pedestrians, 2) cyclists, 3) transit riders, and then 4) drivers. The speed limit will be reduced to 20 miles per hour, and complete streets policies will be implemented to make room for all users, especially those using active modes. Tree wells and planting areas are designed as bioswales wherever possible to maximize the use of right of way for stormwater management, in addition to transportation. The A Streets running through the site are Centennial Olympic Park Drive, Ted Turner Drive, and Luckie Street. Two new service roads are categorized as C Streets, and all others fall into the B Street category.

### Pedestrian Infrastructure

Sidewalks throughout the site will be widened to 15 feet to accommodate sufficient travel space and a five-foot furniture zone for street trees, light posts, and street furniture.

### Bicycle and Infrastructure

The proposed bicycle infrastructure system dramatically increases the provision of bicycle facilities in the neighborhood, which currently lacks any bike lanes whatsoever. Andrew Young International Boulevard and Luckie Street will have five-foot, raised bicycle lanes in each direction, offering protected lanes with ease of access to the destinations on either side of the street within a limited right of way. Centennial Olympic Park Drive and Carnegie Way will have two-way, protected cycle tracks. Walton Street, Nassau Street, and Poplar Street become shared streets with porous pavers and traffic calming features, allowing cyclists to use the full width of the road, along with other mode users. Wayfinding will be installed throughout to orient riders to nearby destinations. Covered bicycle parking, rental lockers, a bike share station, water fountains, public restrooms, and rest areas will be positioned throughout the area.

### Transit Service

The existing streetcar and bus service will be replaced with autonomous rapid transit (A.R.T.), smaller, driverless buses that arrive at frequent intervals to improve convenience to users. Andrew Young Boulevard, Luckie Street, Ted Turner Drive, and Marietta Street will have dedicated A.R.T. lanes to facilitate this rapid service. Vehicles should be equipped with bike racks to allow for intermodal accessibility.

### Vehicular Circulation

One-way streets are converted to two-way streets throughout the area, improving its navigability. Both driver and driverless vehicles are permitted on all roads, but shared streets will only be used for local traffic at a speed of 5 miles per hour. Service access areas are provided for loading at the Tabernacle venue. A district parking approach is proposed, consolidating spaces into a few garages located on Ted Turner Drive and Andrew Young International Boulevard. Drop-off zones will be located along Ted Turner Drive instead of parallel parking and in select pull off areas elsewhere in the site, facilitating

### Proposed Public Space

Centennial Olympic Park provides a large-scale, recreational public space just next to the site, and proposed improvements to the park promise to improve its utility to the neighborhood. To complement this amenity, two smaller public spaces have been proposed within the site to offer more intimate, urban plaza experiences. The first is a small plaza along Marietta Street, and the second is a slightly larger plaza between Andrew Young International Boulevard and Luckie Street, leading up to the Tabernacle and drawing people through from AmericasMart and nearby hotels. The space helps to provide an additional

# “Fairlie Poplar” - Bike Oriented Development

## Proposed Street Network

pedestrian connection through the site's primary superblock, and by lining it with active use (such as outdoor dining and residences with balconies), incorporating public amenities (like a restroom and bicycle parking), and programming it with a variety of vendors and activities, it can function as the neighborhood's outdoor lobby gathering space.

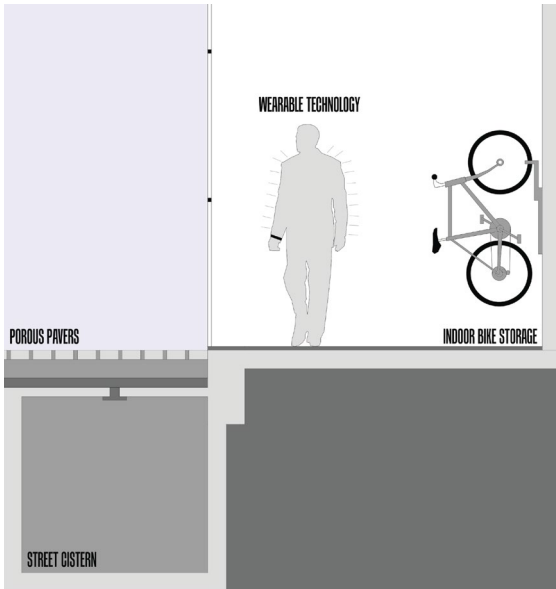
### Proposed Buildings

The ground floors of all buildings should feature active uses and be designed with more than 60 percent transparency, fenestration, and human-scale detailing. The building types and massing for the site will reflect the character of adjacent areas. On the east edge, along Ted Turner Drive, the site faces the historic Fairlie-Poplar District with buildings at a mid-rise scale. The majority of the buildings will be market rate and affordable residential with a neighborhood feel connecting with the B streets running east to west. On the west edge is the border of Centennial Olympic Park, creating a prime opportunity for upscale residential with a park side view, designed with distinctive architecture to create a skyline for the city. In between the collapsing of these scales are the places of public interaction, such as the plaza in front of the Tabernacle or shared roads with neighborhood programs.

The buildings for both scales were conceptualized as two building types with different opportunities. The mid-rise buildings will be designed traditional tower blocks so that they may reflect Fairlie-Poplar and so that create immersive and interactive facades to give people a reason to use the street. The luxury apartments can be in the style of the Vancouver Pavilion where the first two floors have a larger base for public interaction before setting back into a tower that can go up for thirty floors. The tops of the buildings can be designed individually so that it brings character to the skyline and a depth of experience in the process. For both the mid-rise and high-rise buildings, the common thread between them will be the use of green roofs where they can begin to inform a landscape and act to facilitate the building and the world with environmental systems developed.

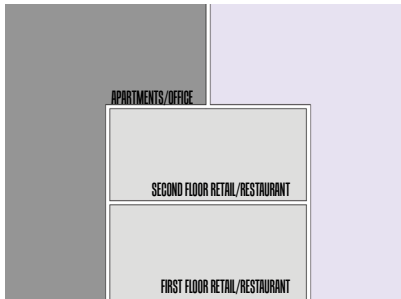
# "Fairlie Poplar" - Bike Oriented Development

## Proposed Buildings



### SMART GLASS

GLASS DESIGNED TO CONTROL THERMAL, LIGHTING, AND OTHER CONDITIONS



### ACTIVE GROUND FLOOR

POROUS FACADES

PUBLIC ACTIVITY ON GROUND FLOOR

RETAIL, RESTAURANT, AND NEIGHBORHOOD PROGRAMS



### CENTENNIAL OLYMPIC PARK SKYLINE

# "Fairlie Poplar" - Bike Oriented Development

## Street Networks

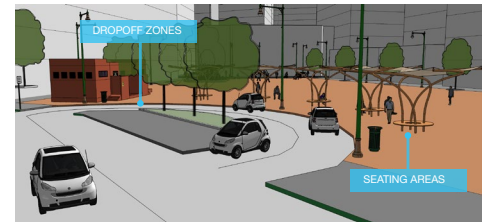
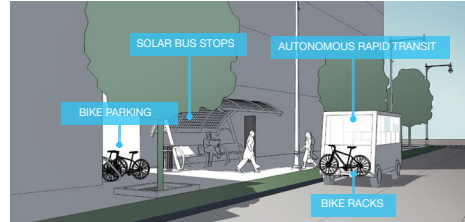
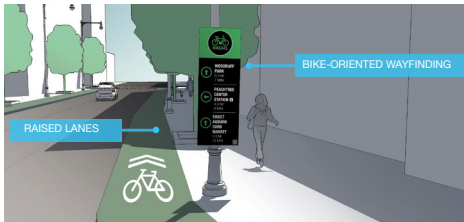
## PROPOSED BICYCLE INFRASTRUCTURE



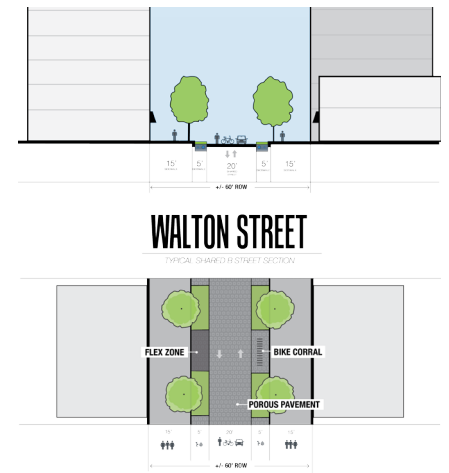
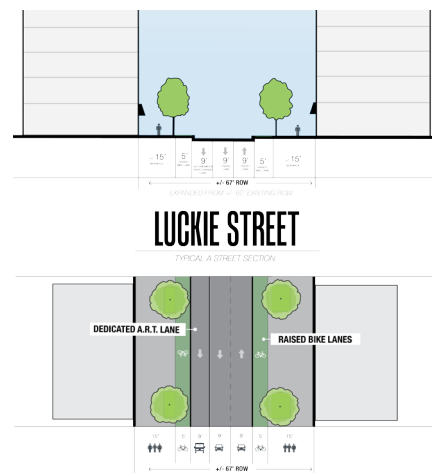
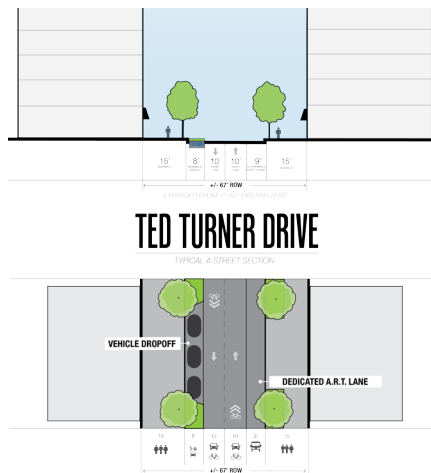
## PROPOSED TRANSIT INFRASTRUCTURE



## PROPOSED VEHICULAR CIRCULATION



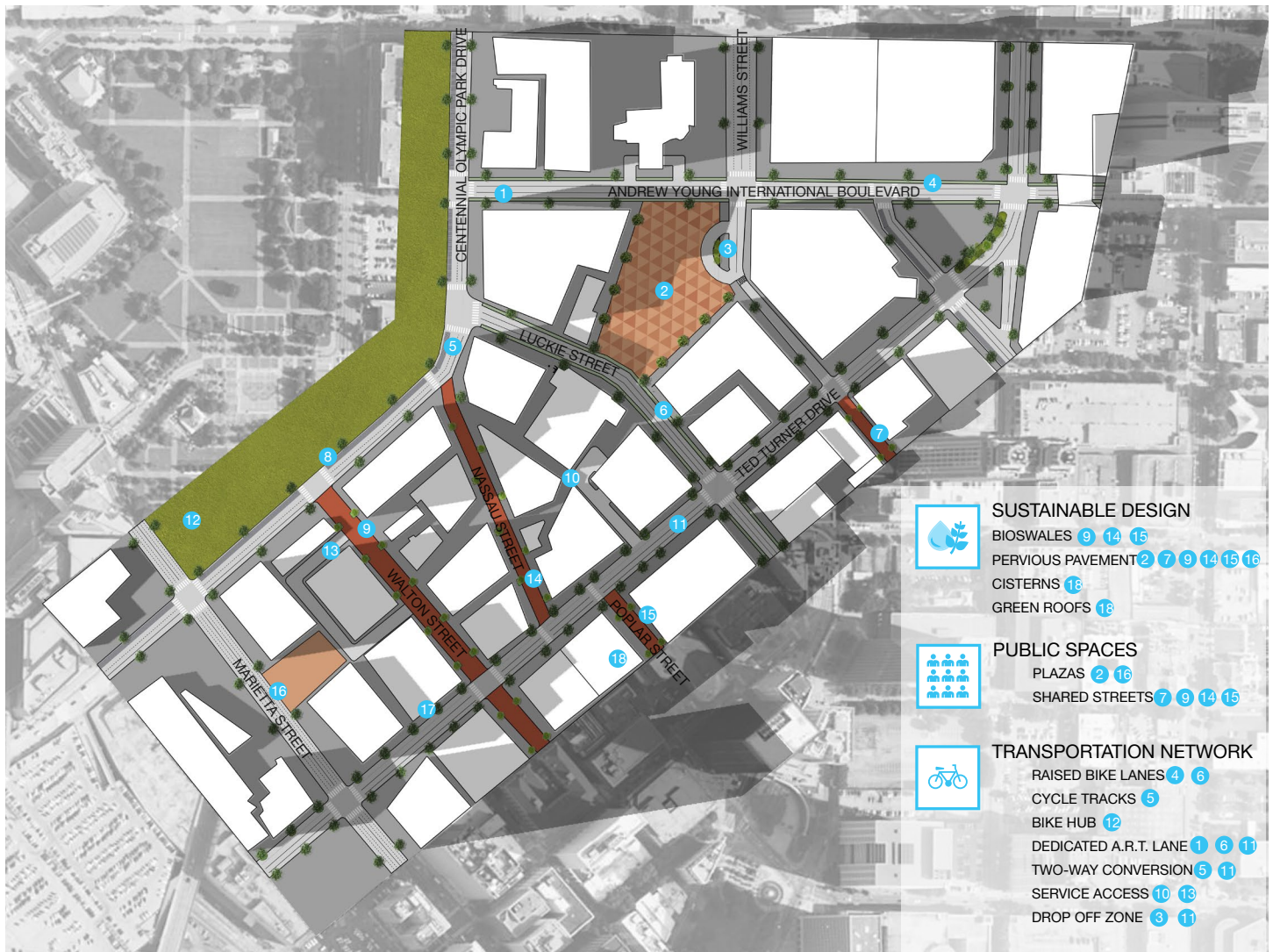
## Proposed Street Sections

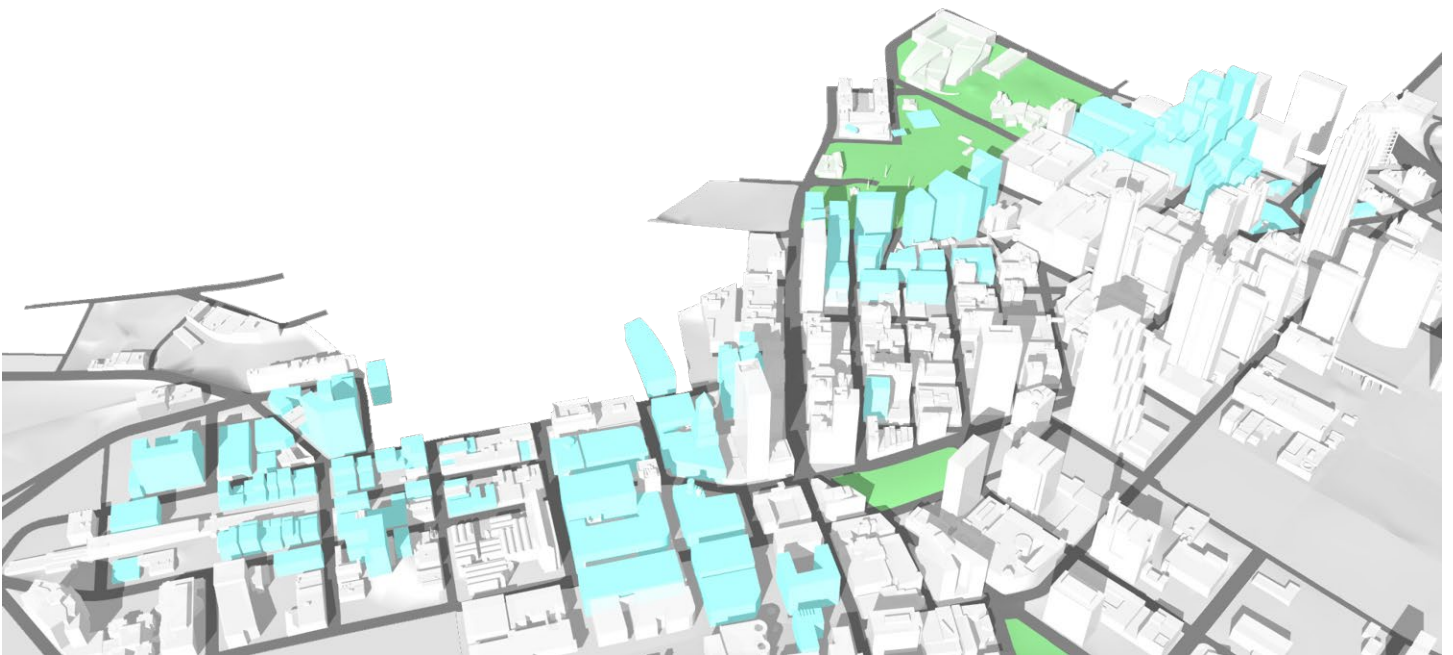


## Policy Recommendations | Street Network

# "Fairlie Poplar" - Bike Oriented Development

## Master Plan





The combined additional development of these four new Downtown neighborhoods is 21,400,000 square feet. If 70% of that is residential, that equates to approximately 60,000 new residents in just these areas alone.

## CONCLUSIONS

**Is Downtown Atlanta 2041's vision desirable? Achievable? What are the next steps?**

# CONCLUSIONS

Downtown Atlanta 2041 presents a bold vision for the future. Distinctive neighborhoods rising from former parking lots link Downtown's various campuses and assets while populating a walkable network of Class A streets that are lively day and night with residents eager to ditch owning a car in favor of walking, biking, MARTA, autonomous buses and robotaxis. The vibrancy helps retail and restaurants thrive and helps employers compete for the next generation workforce. Reduced reliance on private cars increases affordability for households and environmental sustainability for all of Atlanta.

The vision is deliberately ambitious – especially in terms of increasing the number of residents living in Downtown. Just by densifying a portion of Downtown's surface parking lots, (the Studio's proposals altered very few existing parking garages,) the neighborhood proposals demonstrate capacity for approximately 60,000 new residents. This is five times the Atlanta Regional Commission's projections for 2040. Is it an unbelievable amount for the market to absorb? Perhaps. But it's more believable when compared to Midtown's current boom. The Midtown Alliance's Development Activity report of August, 2016 shows a total of 9,161 units planned or in construction in 2016. At that rate, one can conservatively estimate the addition of approximately 11,500 new residents every 3 years. That rate is exceptionally high and not likely to continue for 25 years. But precisely because Midtown is rapidly running out of easy redevelopment sites, development activity is increasingly likely to shift to Downtown. The roll-out of AVs may well accelerate this shift. While Midtown is already working on transportation improvements to serve all those new residents, Downtown is better positioned to design for higher density with much lower rates of car ownership.

Is all that density desirable? Not everyone is a fan of densification. Opposition to higher density is typically based on three fears:

- fear of the cars that come with new residents and the negative impacts on traffic.
- fear that tall buildings cast shadows and block views.
- fear of overcrowded sidewalks, transit and public spaces.

Downtown 2041's proposals hope to mitigate these fears while expanding the benefits of higher density – more amenities, more frequent transit, safer, livelier streets and more affordable mobility. Instead of increasing car trips, the proposals are designed to boost walking, bike, transit and robotaxi trips. At the same time, the students designed the massing of buildings to work with the context and the reality of construction and land costs. From 20+ story buildings fronting Centennial Park and along Simpson Street to 14-story towers at the Five Points MARTA station down to smaller, affordable infill construction in most of South Downtown. They added new parks to balance densification and provide community-building green spaces. We may have underestimated the need and desirability for even taller buildings, but we believe these measures allow densification without congestion and allow Downtown to grow into the prominence it deserves.

Is the vision feasible? Will there be a strong enough market for robotaxis and ART to privilege living in Downtown? We don't know. A vision is not about what's feasible today. It is about what's desirable and what steps need to be taken to steer policy and development in that direction. The students, themselves representatives of the "next generation," designed neighborhoods that they would like to live in. The studio hopes that the proposals will provoke larger community discussions about the desired future of Downtown that will further shape and enrich the vision.

In the meantime, there are several next steps needed to start unwinding the vicious cycles that currently work to fragment Downtown and begin instead to accelerate implementation of the walkable A-street grid:

- change one-way streets to two-way streets, lower the speed limit, narrow lanes and add on-street parking as a transition to dedicated ART lanes and AV drop-off/pickup space.
- manage existing parking better so as to reduce construction of new parking and change the zoning code accordingly
- prioritize completing Peachtree and MLK as A-streets.
- target streets that are getting private investment and new residents with streetscaping improvements (such as Piedmont and Edgewood).
- incentivize incremental infill of ground floors of parking garages with street-facing shops & activities – and decouple parking from residential and office rents.

Finally, there is always need for further study. In particular, Downtown Atlanta 2041 recommends attention be given to the precise planning and policy recommendations needed to ensure that Atlanta benefits rather than suffers from autonomous vehicles. The National Association of City Transportation Officials, (NACTO) issued a policy statement on Automated Vehicles in June, 2016 that provides guidance for the kind of policies cities will soon need in order to advance mobility in positive rather than destructive ways.

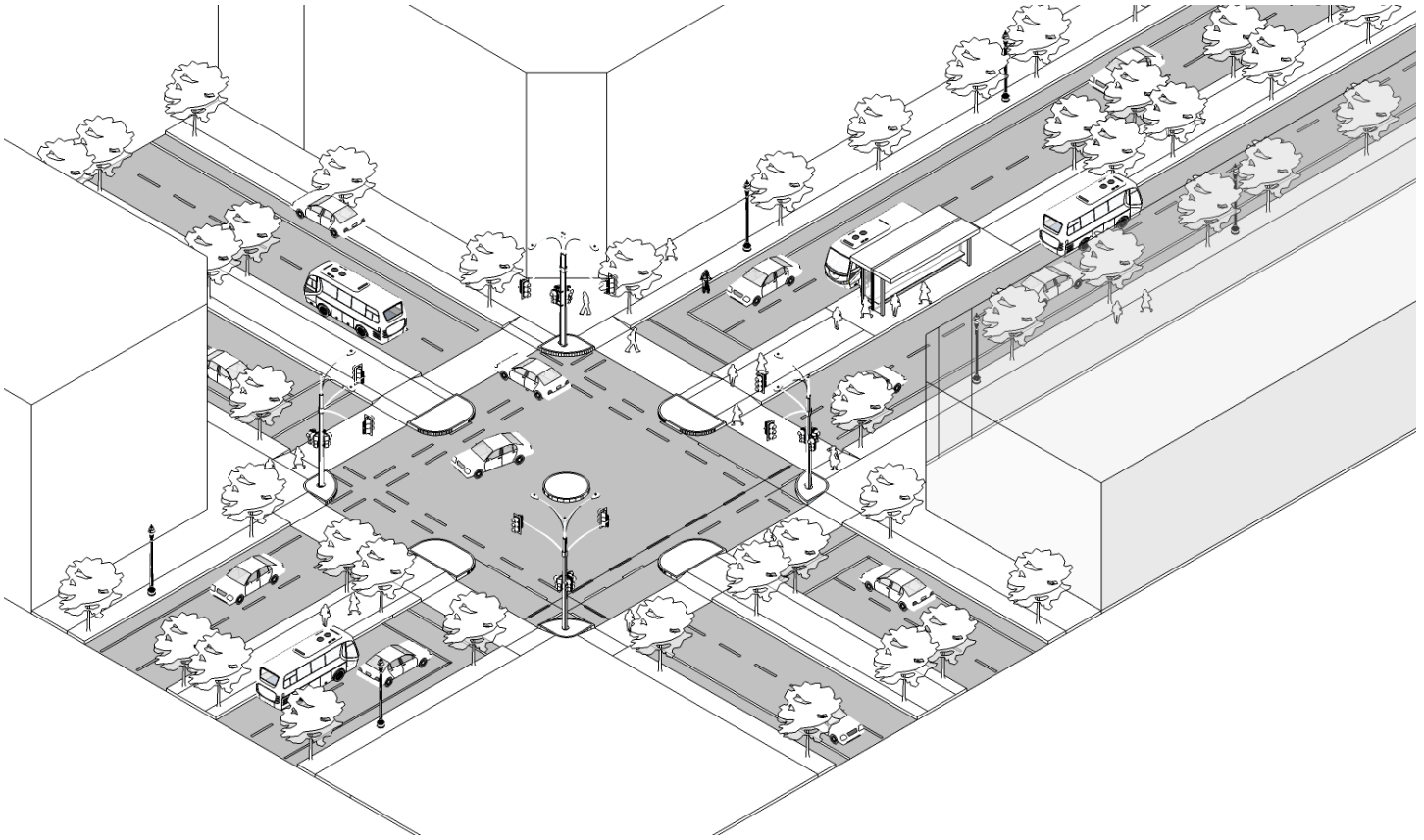
Given Metro Atlanta's high dependence on automobiles, the Metro is at high risk of experiencing higher levels of congestion and VMT if the Private AV scenario plays out. The region as a whole needs to plan for and develop policies for AVs. However, the City of Atlanta is best positioned to take the lead in this conversation. And, Downtown is the place to start. Downtown is where robotaxis and ART stand to provide the most benefits to street life and real estate investment. By asserting its leadership in AV policies and systems, Downtown will reassert its centrality to Metro Atlanta and help to spread the benefits of AVs to shape the future Atlantans want.

# **APPENDIX / TOOLKIT**

## **Downtown Atlanta 2041 Research**

**Future Streets: Private AV Scenario,  
Robotaxi Scenario and Hybrid Scenario**  
Downtown Atlanta 2041 Research

# Private AV Scenario



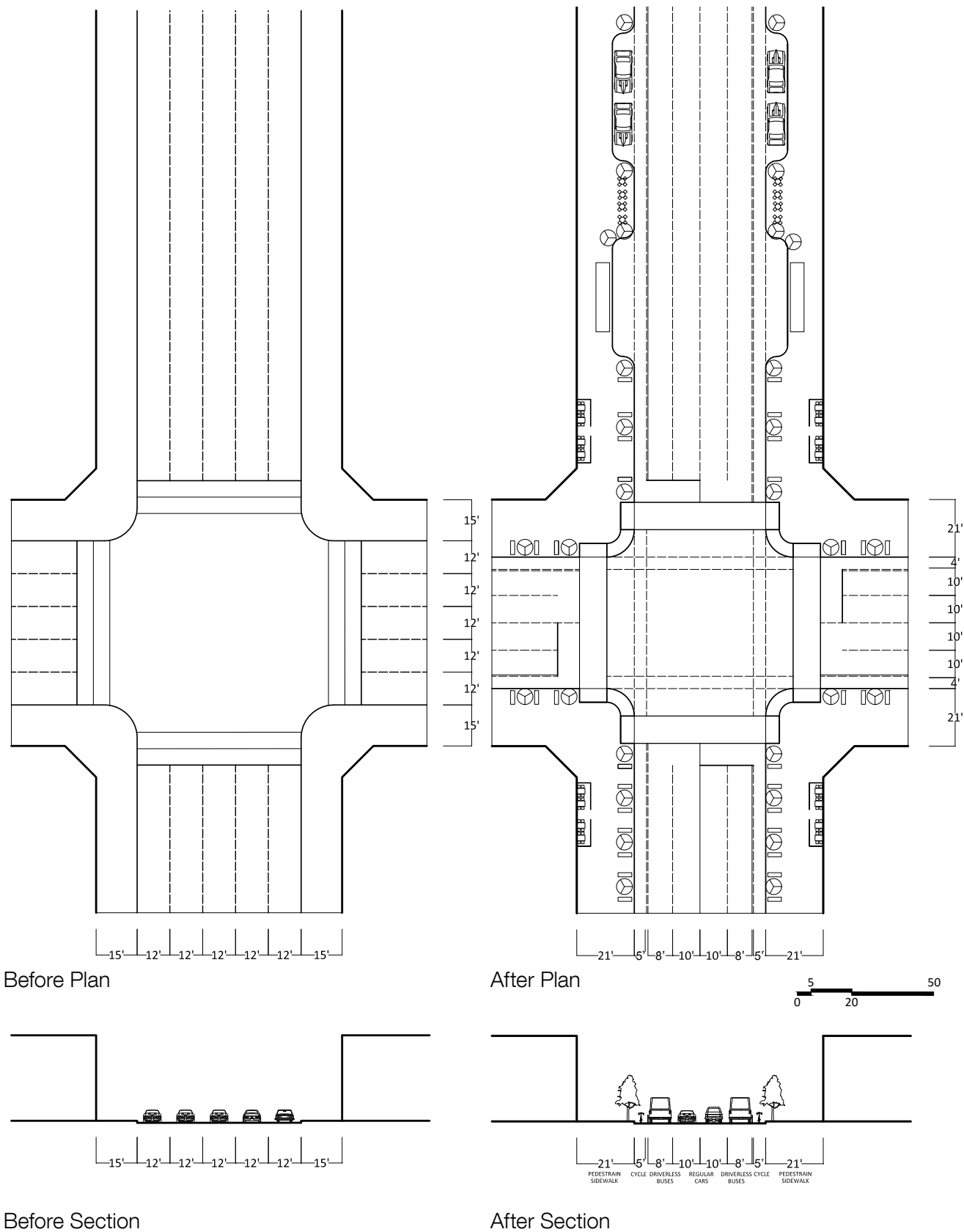
In this Scenario, there are human-driven vehicles as well as private driverless cars. Driverless buses and bikes will be given more priority than regular vehicles to encourage people to choose to ride them instead of taking cars. Their slower speeds will improve street quality. There is a separate lane for driverless cars and bike whereas regular vehicles will have only a single lane. There are two options for the bus-stop, either in the regular sidewalk or in the median boulevards which is also used as pedestrian promenade.

High frequency buses will be so convenient that most people will prefer them to cars. Therefore, the quality of the bus stops will also need to be improved. The bus stop will be a multi-purpose public space where people can get information about the buses, buy a meal in the retail shop, or simply read a book from library while waiting for the bus. People who don't want to wait for the bus can either rent an electric bike or just take an Robotaxi which is next to the bus stop. The commercial A and B streets will have outdoor seatings and cafes making the sidewalks more lively and filled with people. Whereas, the Residential A streets will be more eco-friendly with porous pavement and bioswales running along the sidewalks to harvest the rain water which will be stored in a reservoir below the existing buildings. The C streets will be more of a shared street design since they are mostly service streets. Here, pedestrians and vehicles will share the same street, increasing the possibility of future improvements in the street.

By Animesh Shrestha

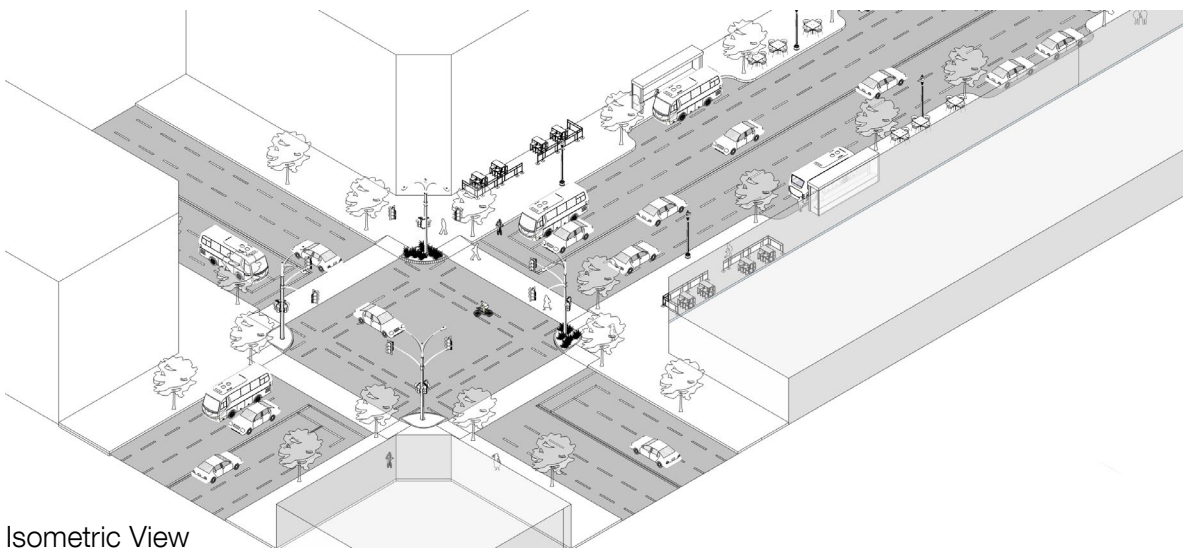
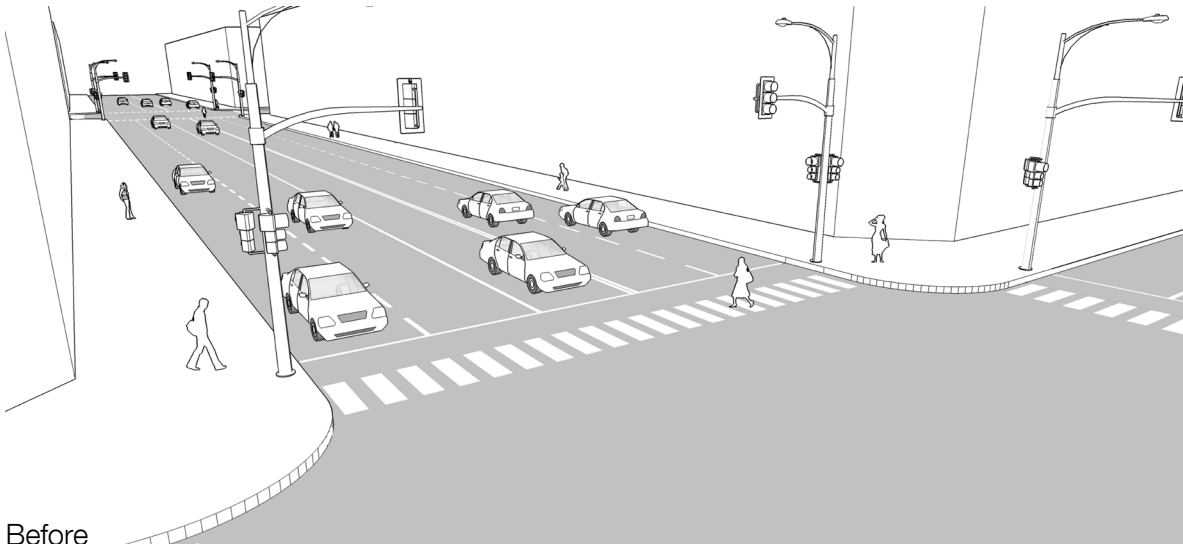
# Private AV Scenario

## "A" Streets with Bus Stops at Sidewalks



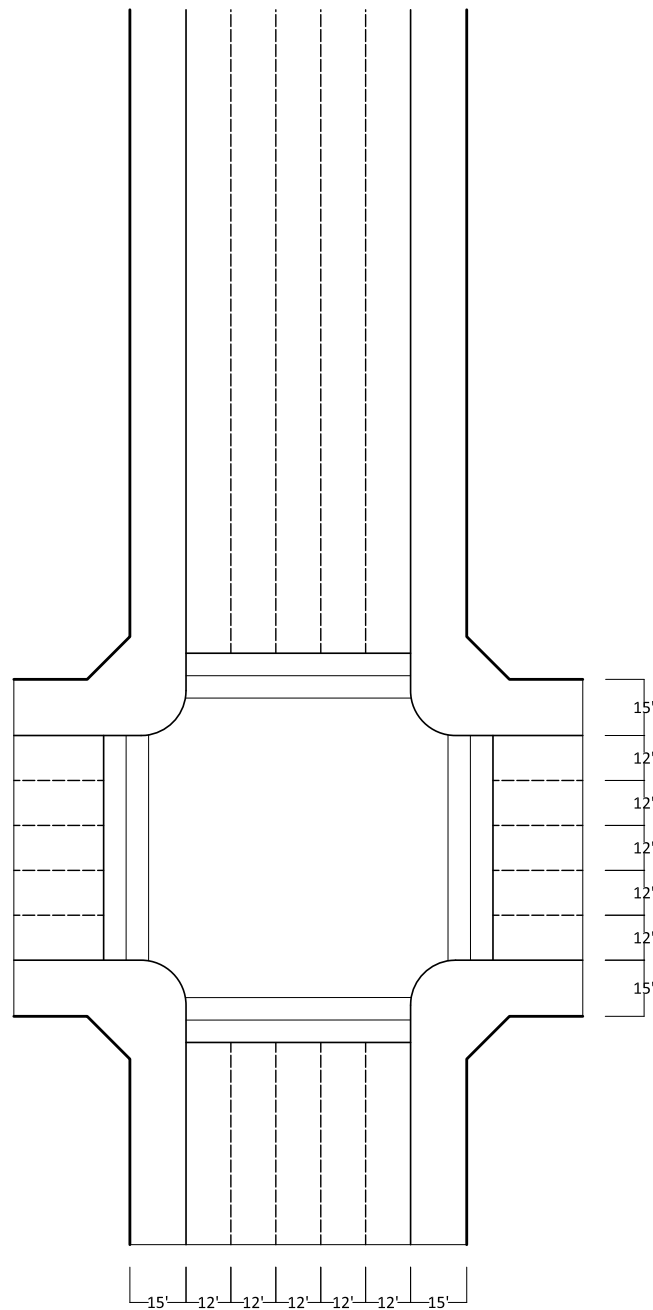
# Private AV Scenario

## "A" Streets with Bus Stops at Sidewalks

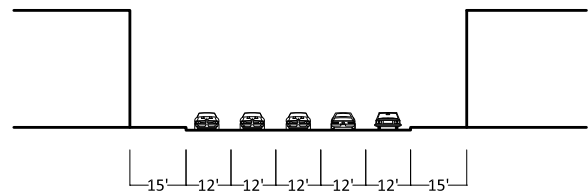


# Private AV Scenario

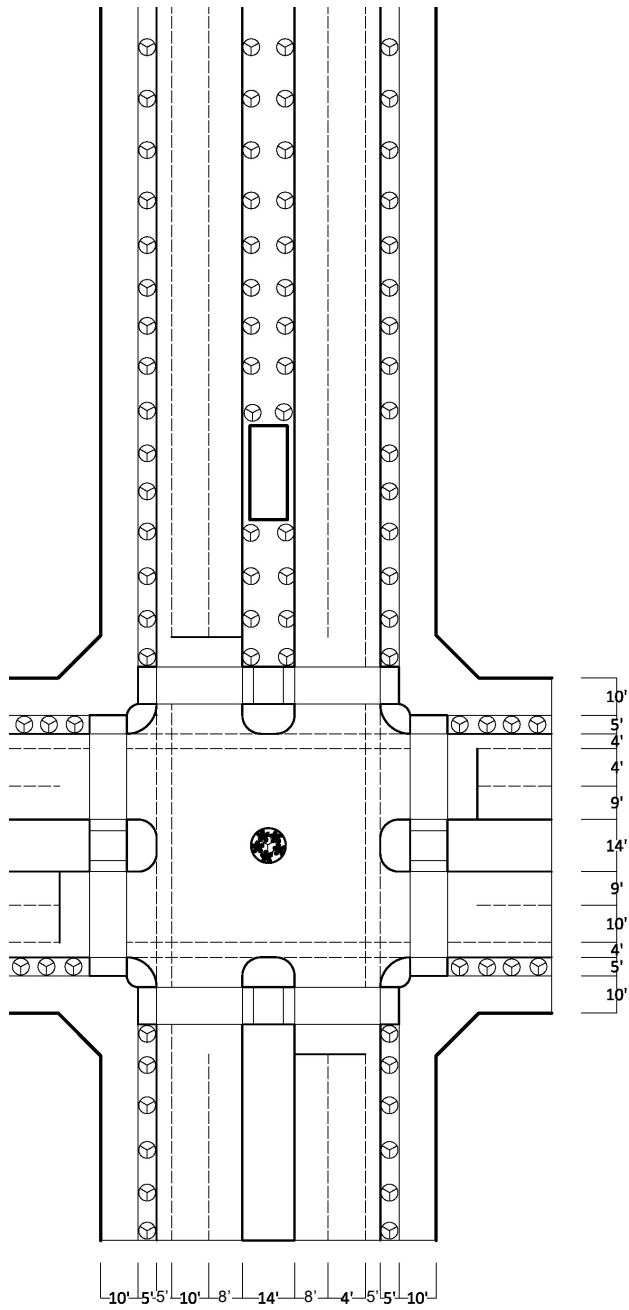
## "A" Streets Bus Stop in the Median



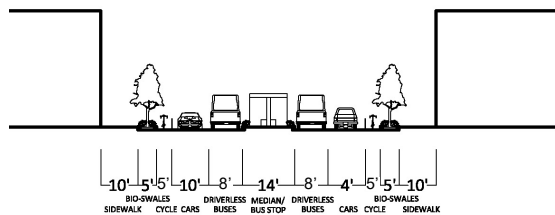
Before Plan



Before Section



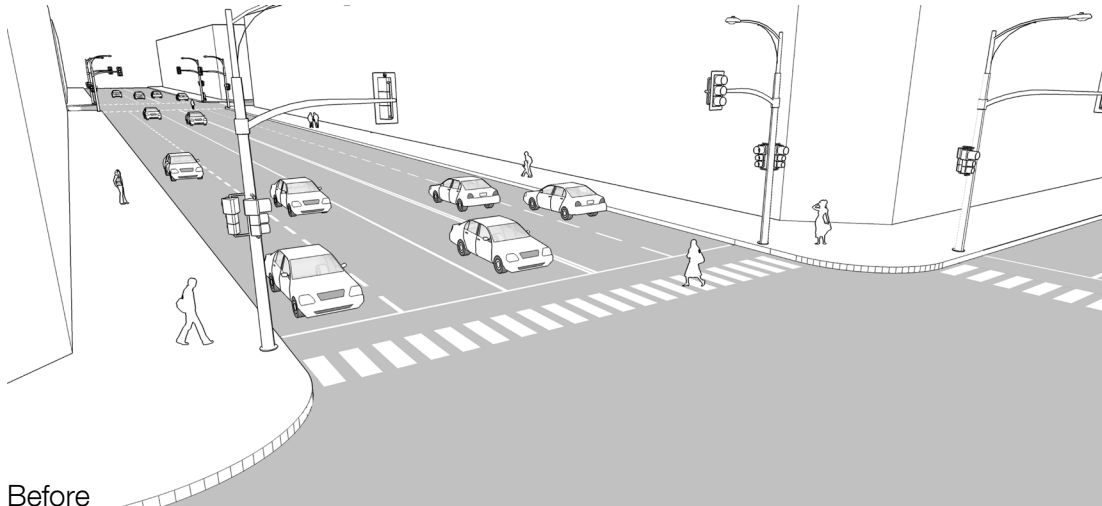
After Plan



After Section

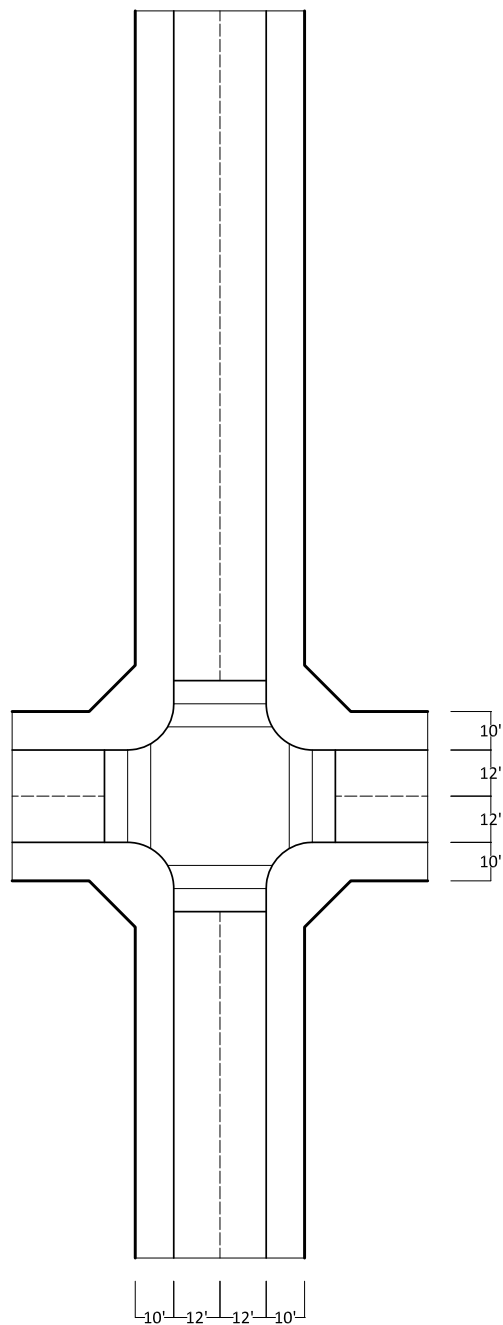
# Private AV Scenario

## "A" Streets Bus Stop in the Median

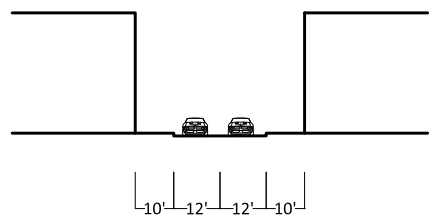


# Private AV Scenario

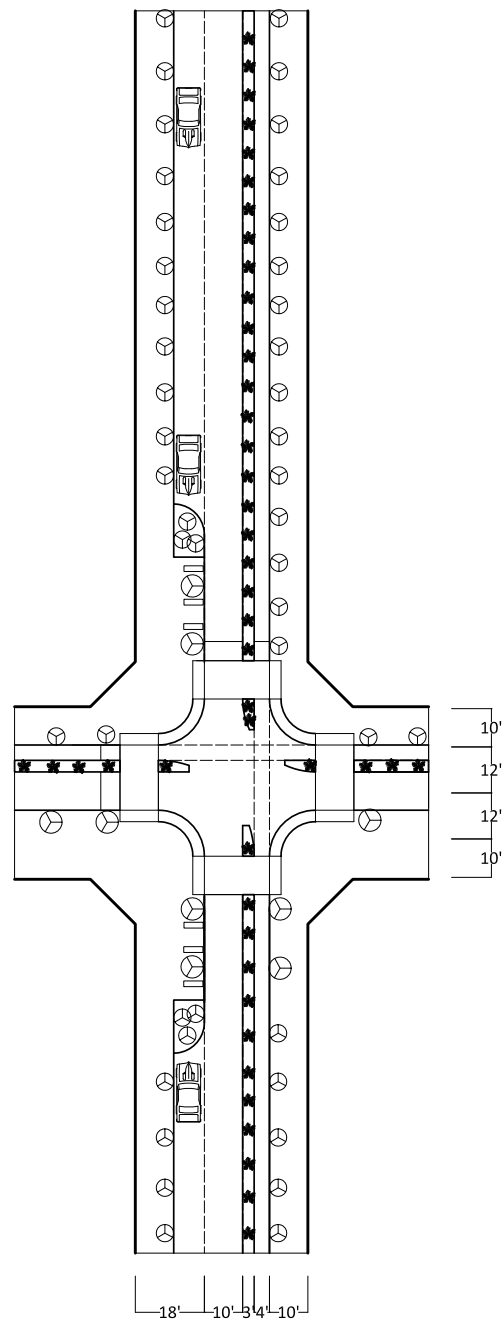
## "B" Streets



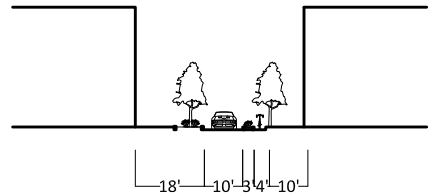
Before Plan



Before Section



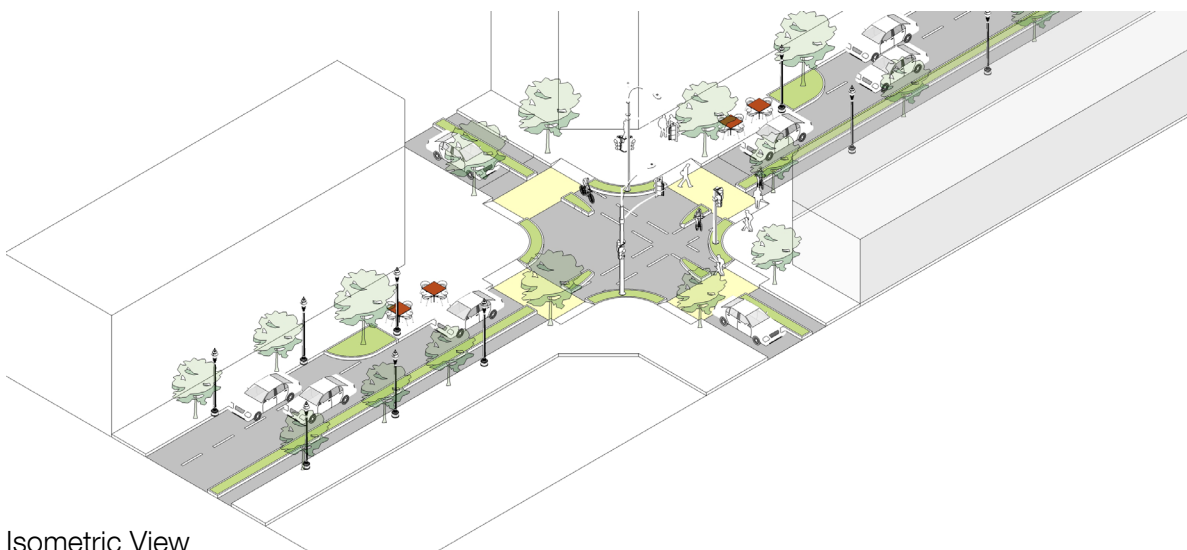
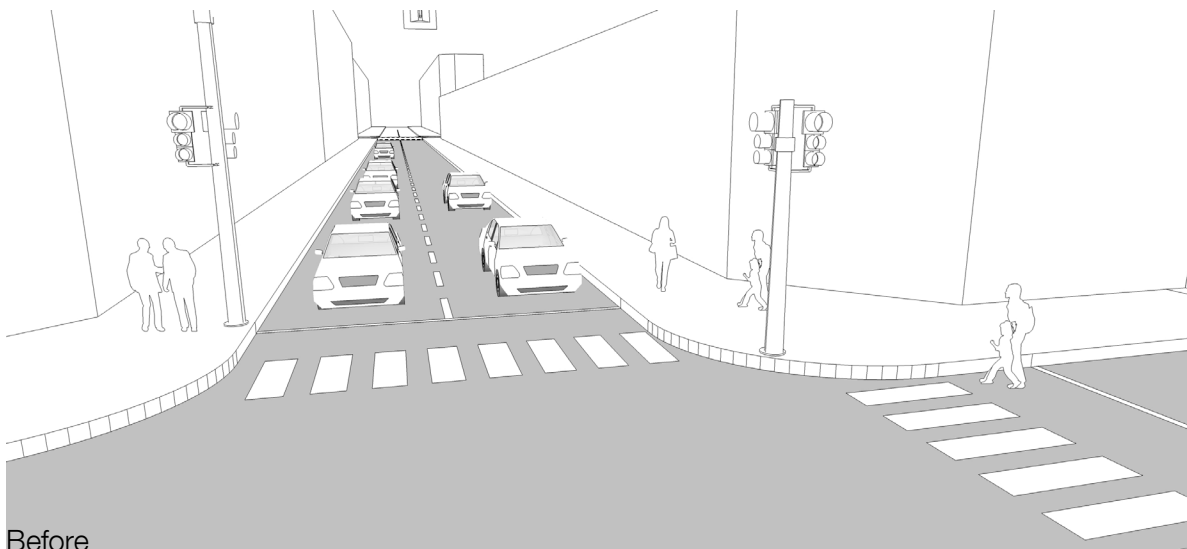
After Plan



After Section

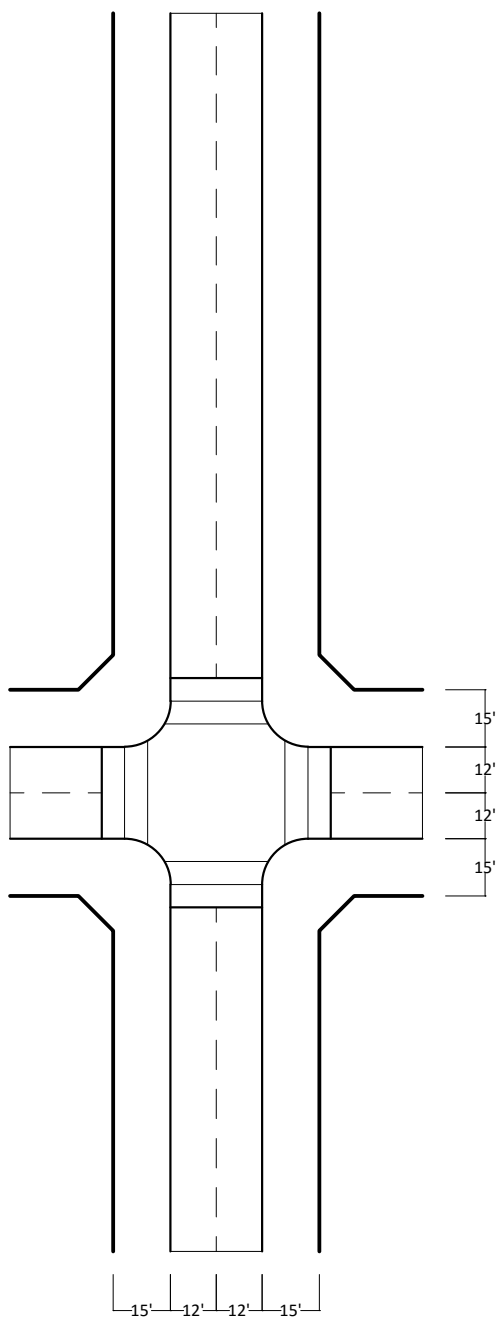
# Private AV Scenario

## "B" Streets

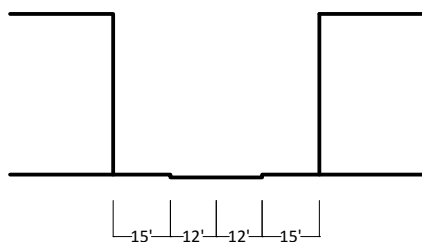


# Private AV Scenario

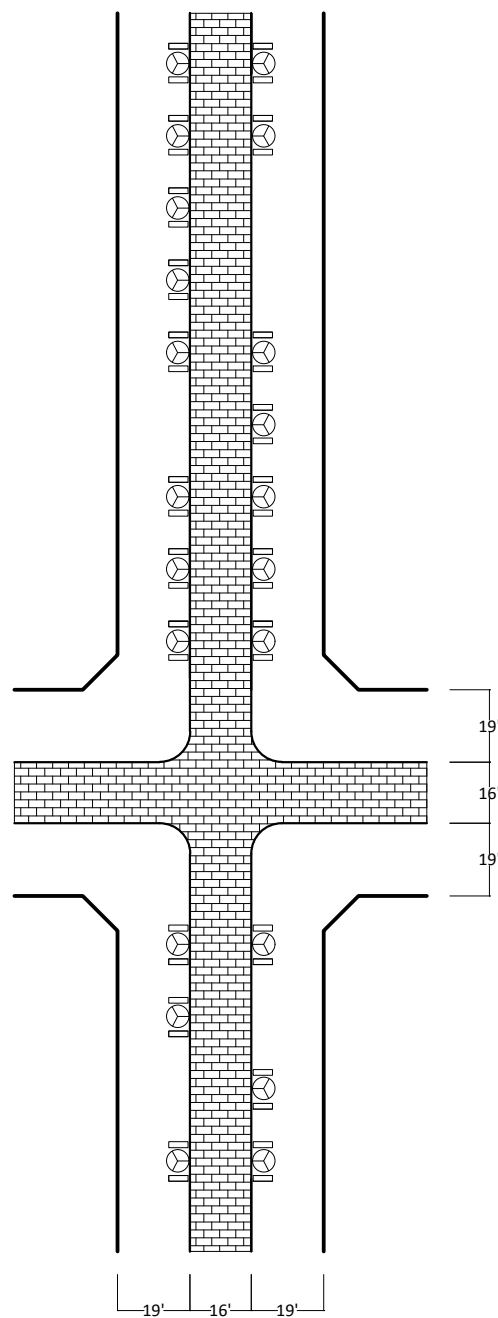
## "C" Streets



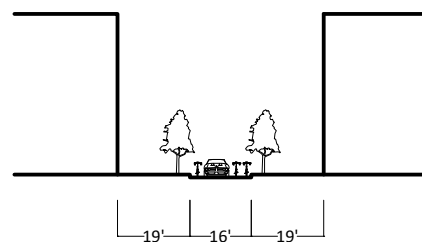
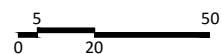
Before Plan



Before Section



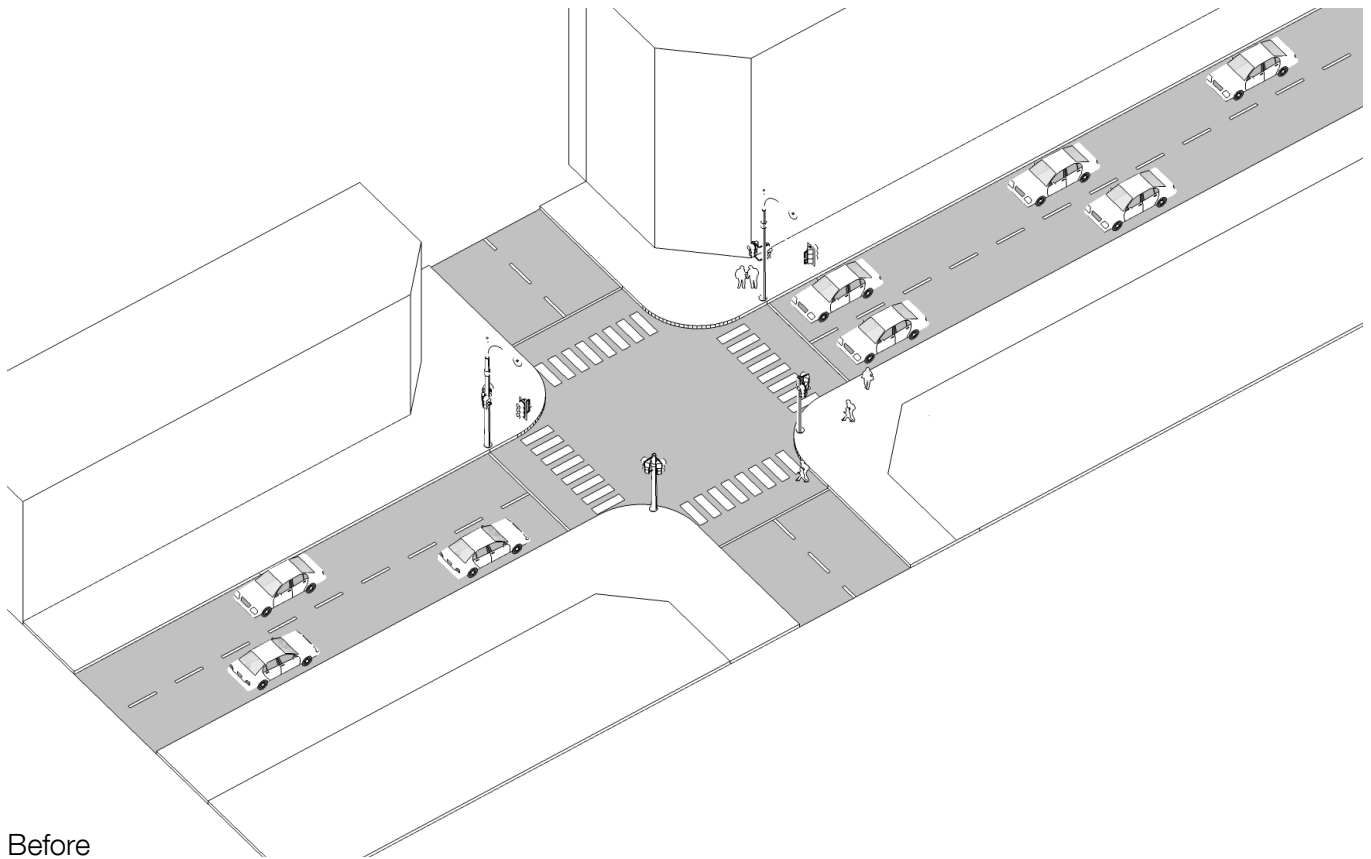
After Plan



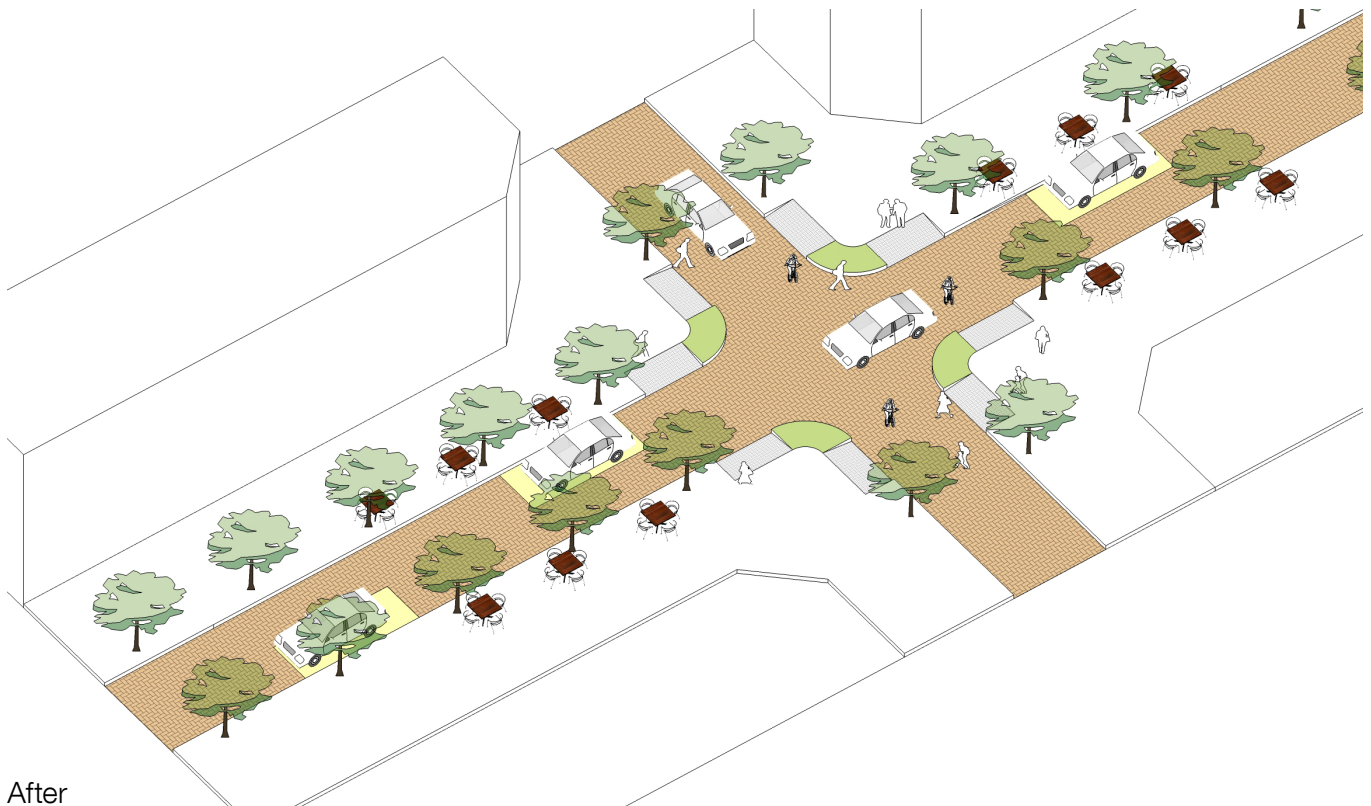
After Section

# Private AV Scenario

## "C" Streets

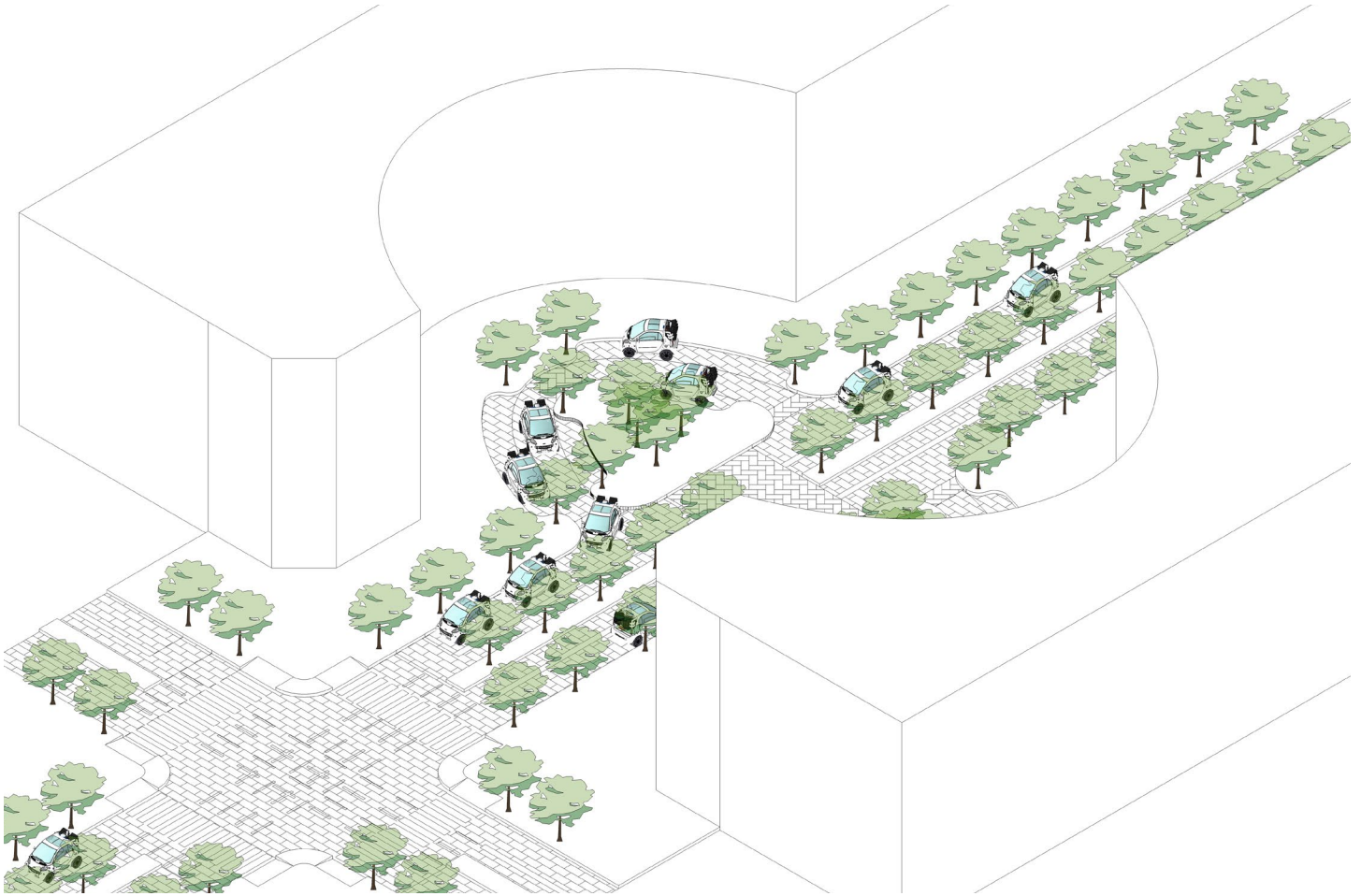


Before



After

# Robotaxi Scenario



## INTRODUCTION:

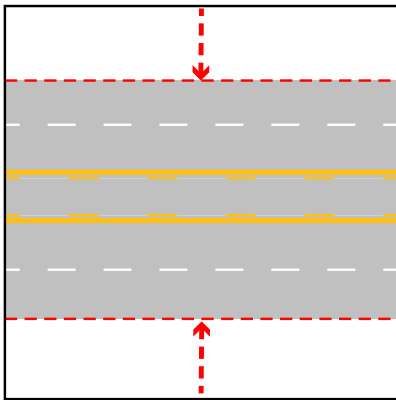
Robotaxi scenario is a future proposal, in which all the private-owned cars will be replaced by driverless car. Similar to a car pool, the robotaxi will be shared by residents who have the same destination or routine. By doing so, it assumes, in terms of urban design, that the width and numbers of lane will both shrink, due to the computer-controlled program embedded in the driverless car and the sharing program. Certainly, it will generate a challenge for how to create a pleasant pickup & drop off place in our city to serve for the shared driverless car. But this is an opportunity to transform the present car-oriented urban street to more friendly to pedestrian, cyclist one for revitalizing the vivid urban life.

In general, the following designs fall into two categories: one is 5-lanes A street to 4 or 2 lanes; one is 2-lanes B street to 2 or 0 lanes. Based on the location of pickup & drop off place, there will be future subcategories to illustrate.

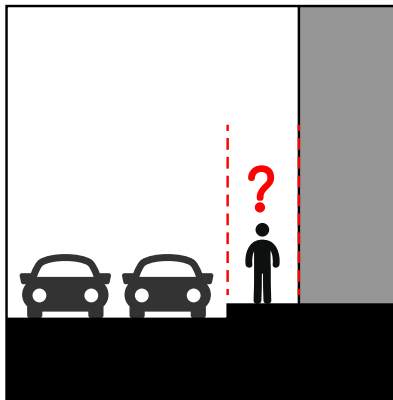
By: Shijia Huang

# Robotaxi Scenario

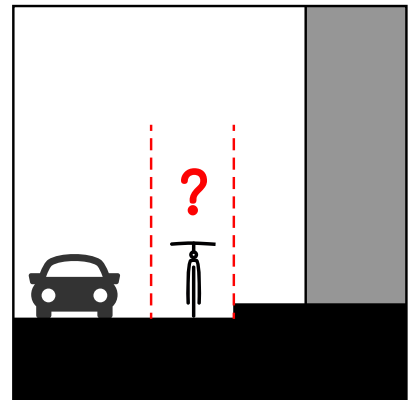
## Problems



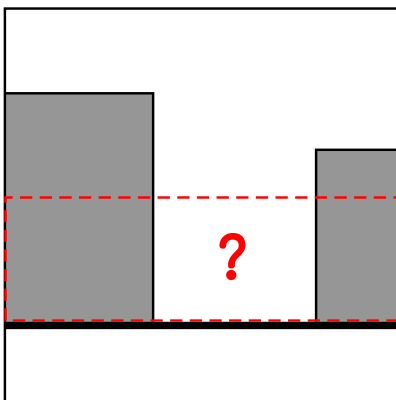
Excessive Lanes



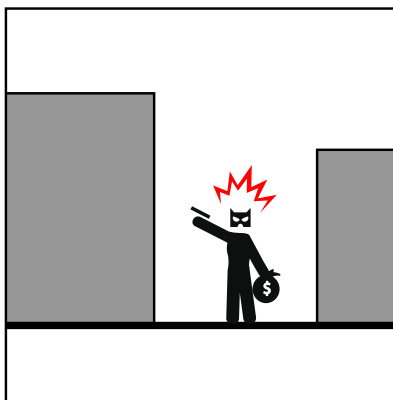
Unfriendly to Pedestrians



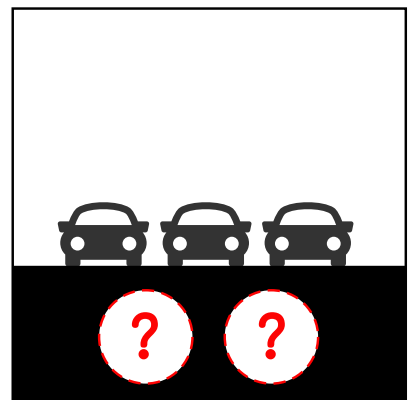
Absent Bike Lane



Blank Wall



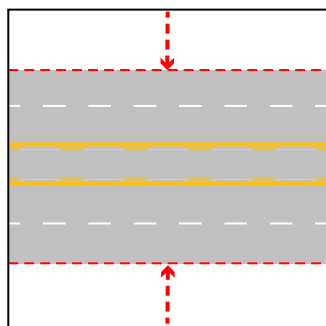
Insecurity



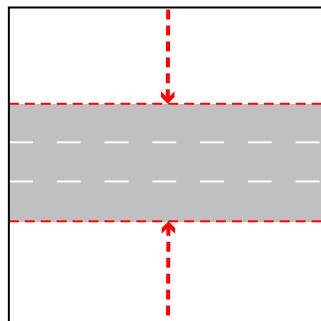
Unsustainable Street

# Robotaxi Scenario

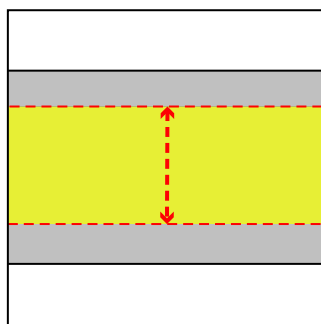
## Possibilities



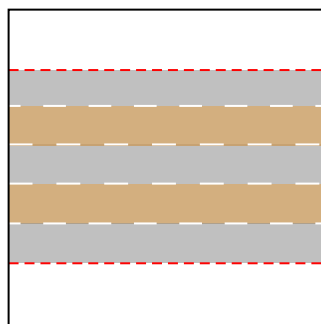
Excessive Lanes



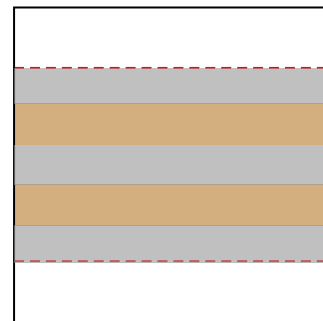
Road Diet



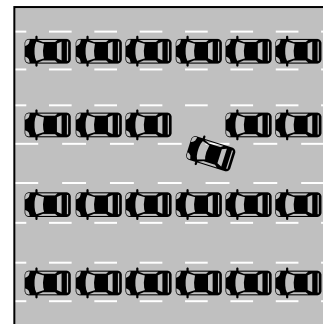
Infill Green Median



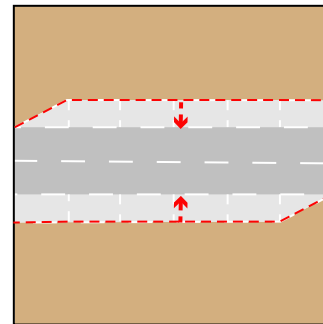
Pavement Replacement



Signal Elimination



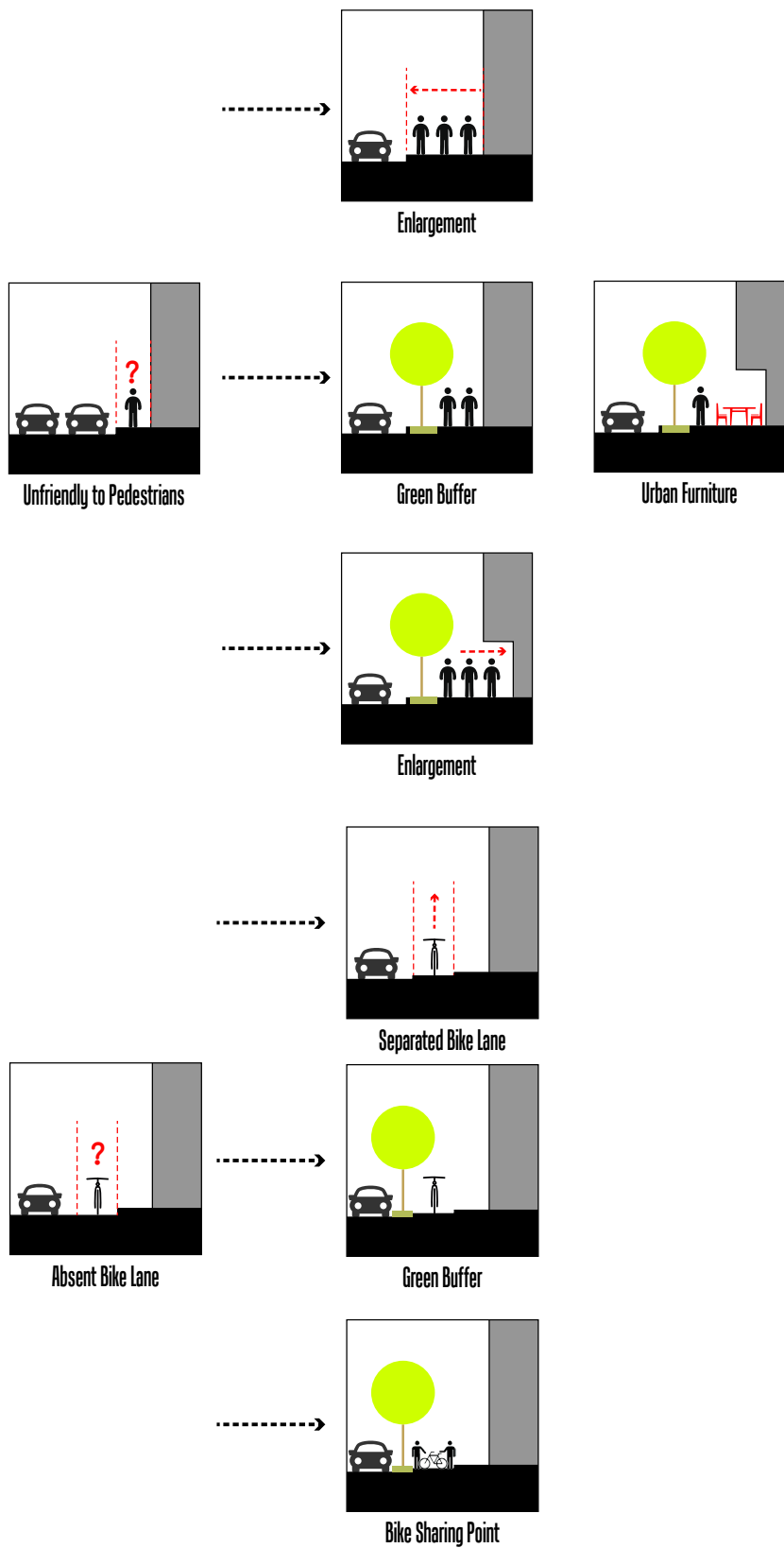
Highway Parking  
(After Rush Hour)



On-Street Parking  
Elimination

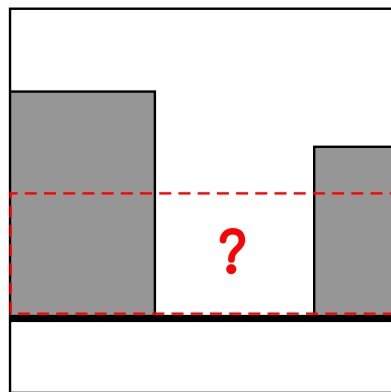
# Robotaxi Scenario

## Possibilities

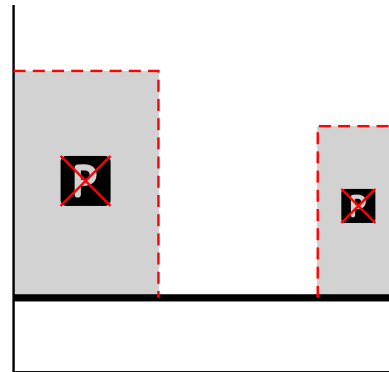


# Robotaxi Scenario

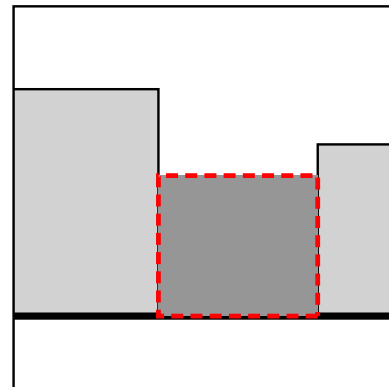
## Possibilities



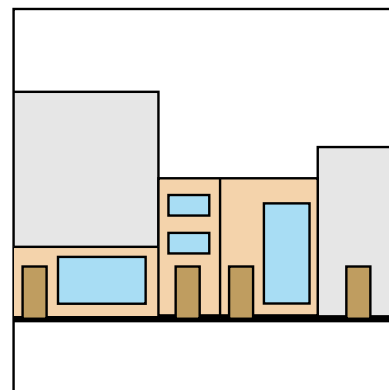
Blank Wall



Parking Replacement



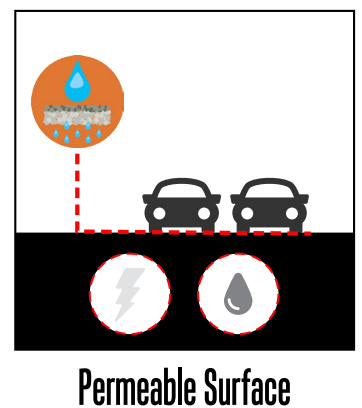
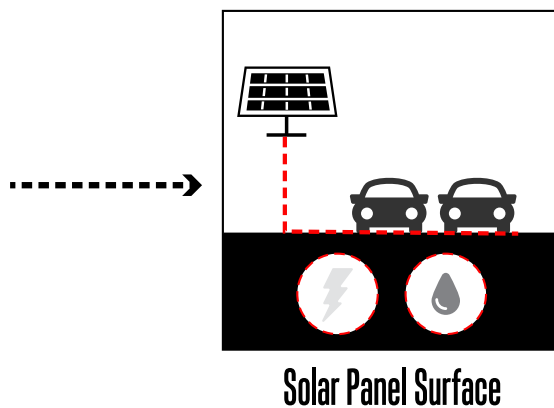
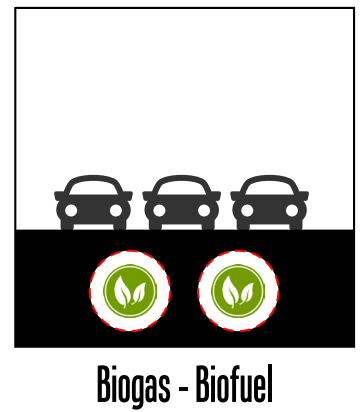
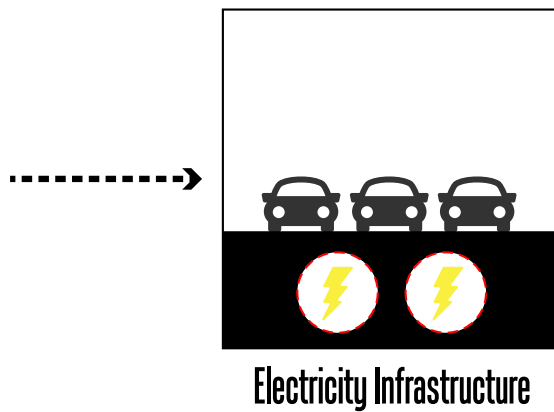
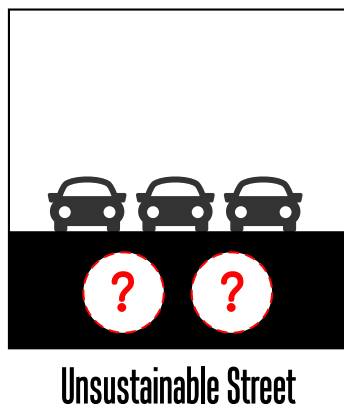
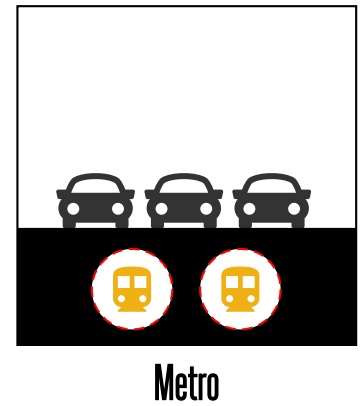
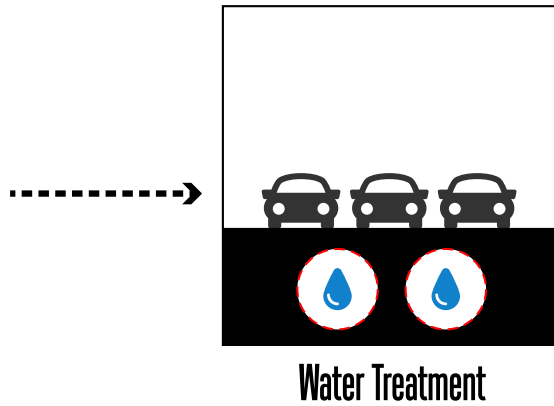
Infill New Development



Active Ground Floor

# Robotaxi Scenario

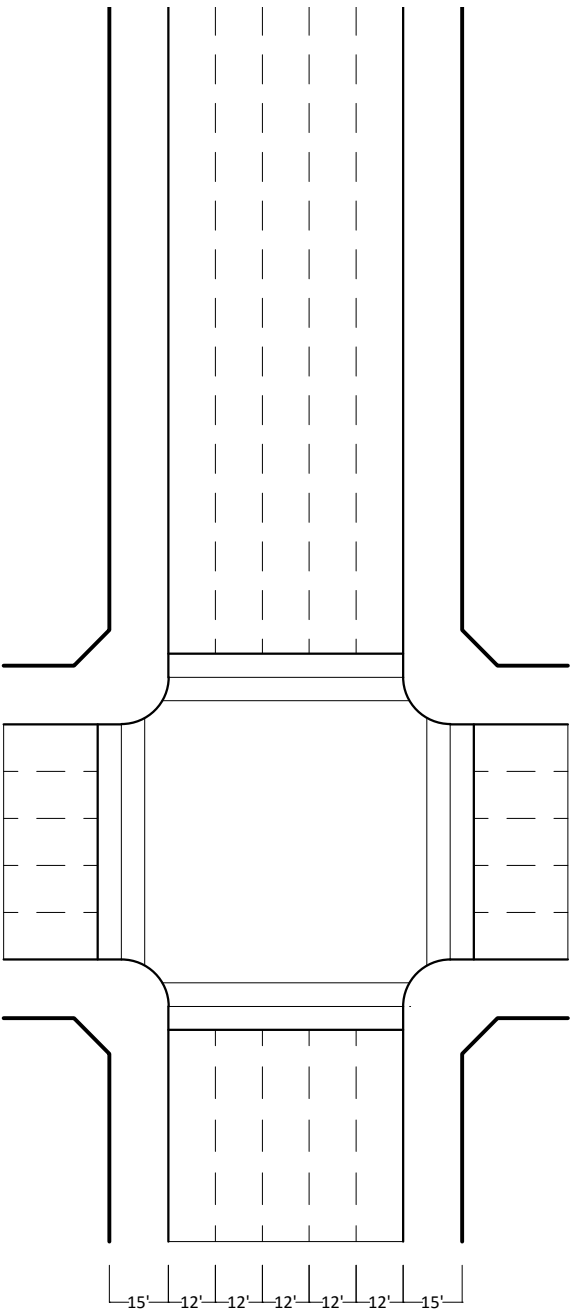
## Possibilities



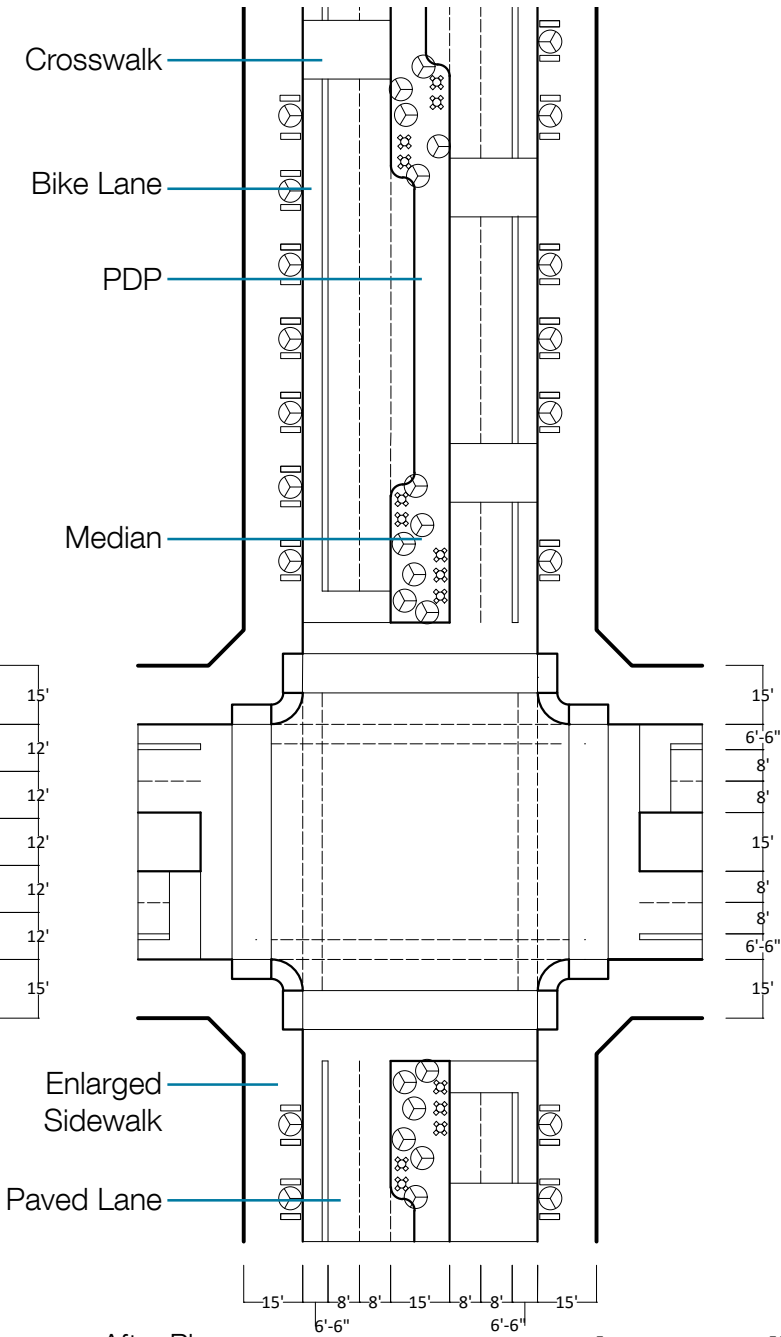
# Robotaxi Scenario

## A Streets

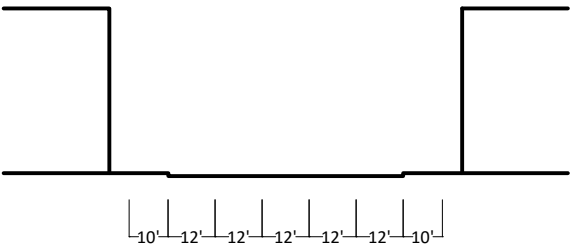
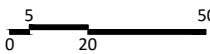
Present 5-lanes Street - Future 4-lanes Street  
Pickup & Drop off Place in the Median



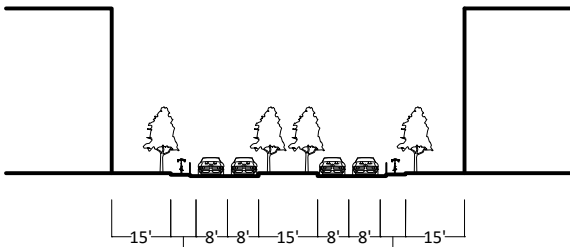
Before Plan



After Plan



Before Section

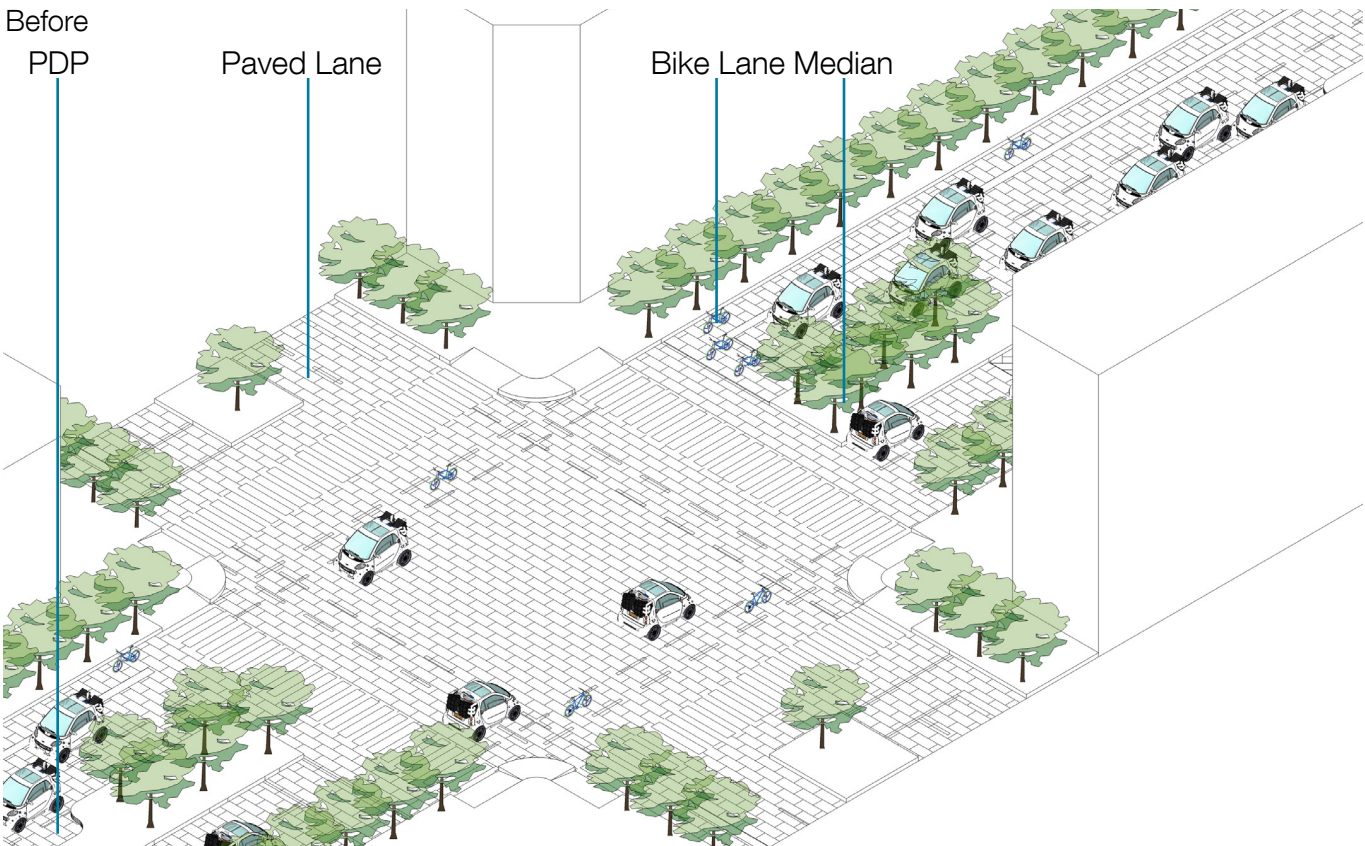
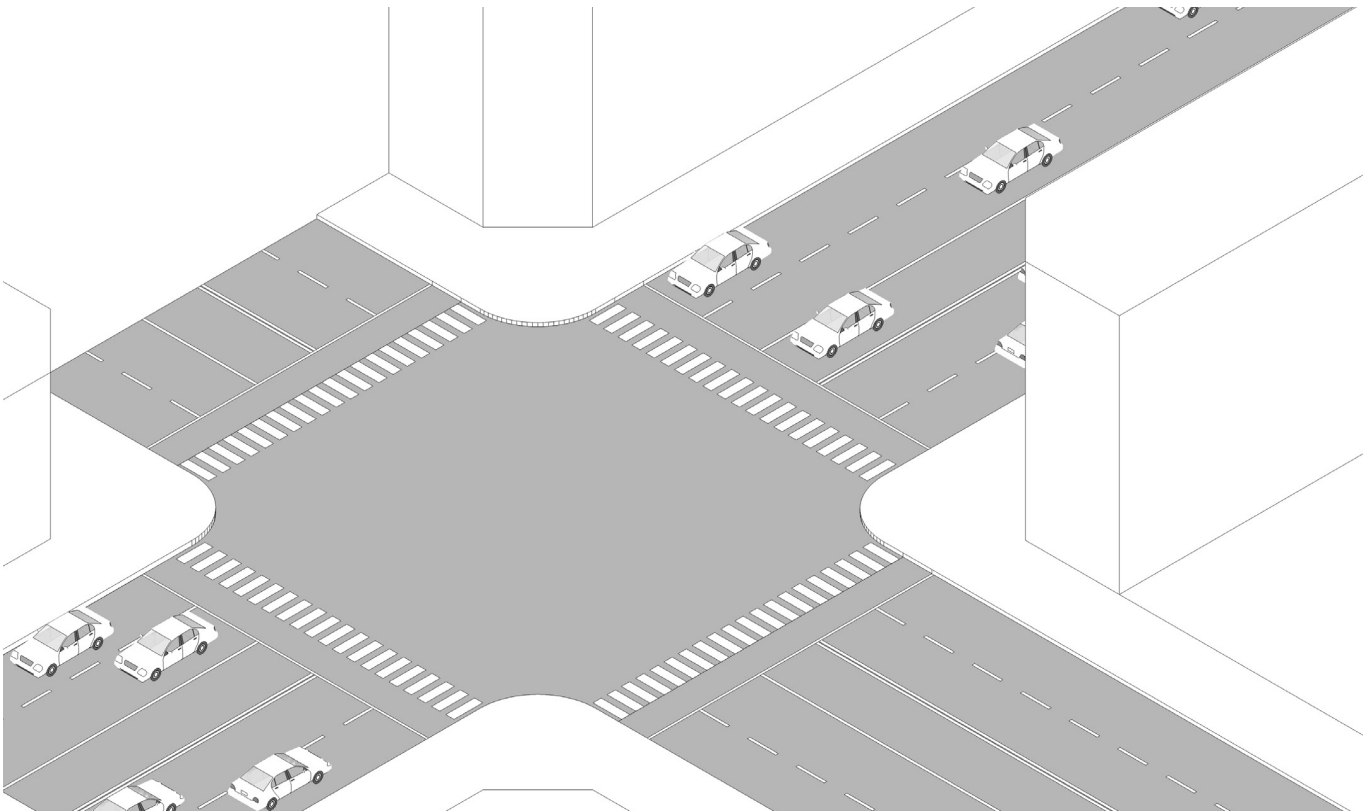


After Section

# Robotaxi Scenario

## A Streets

Present 5-lanes Street - Future 4-lanes Street  
Pickup & Drop off Place in the Median

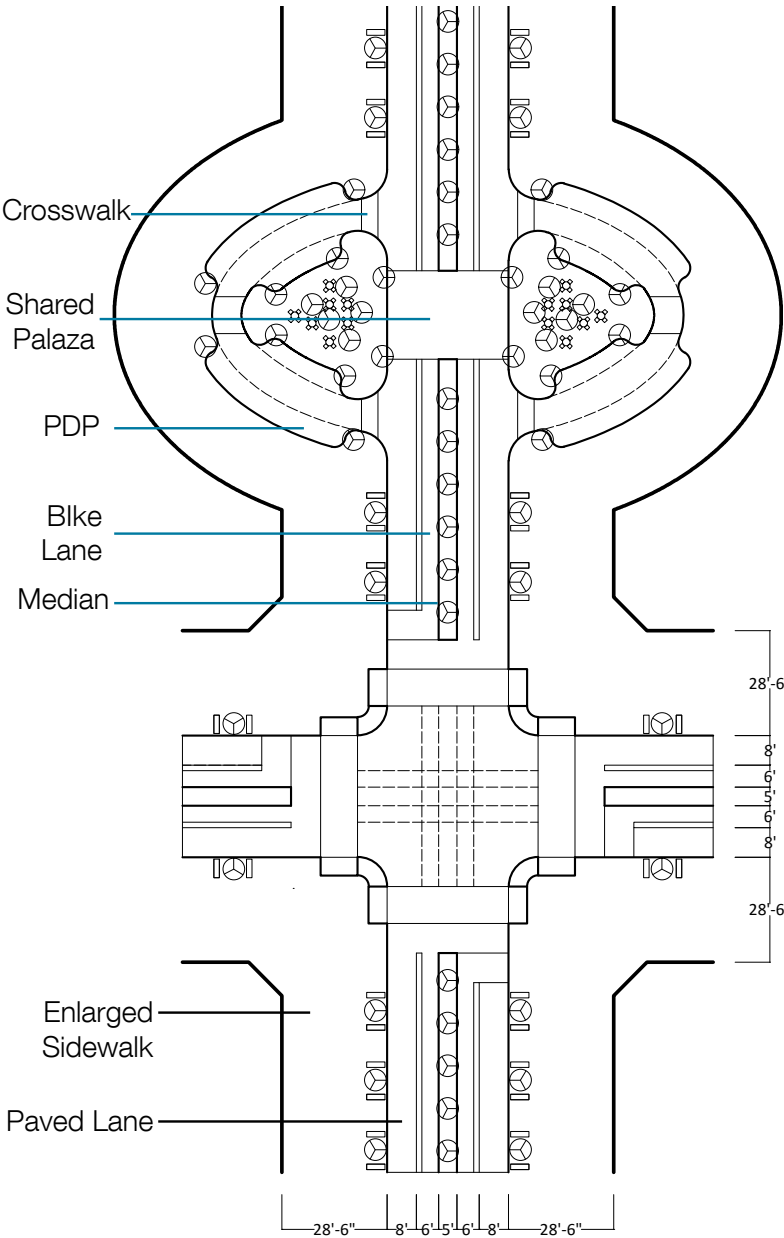


After

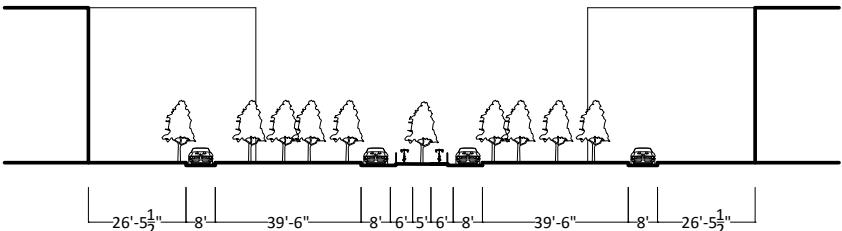
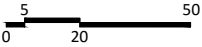
# Robotaxi Scenario

## A Streets

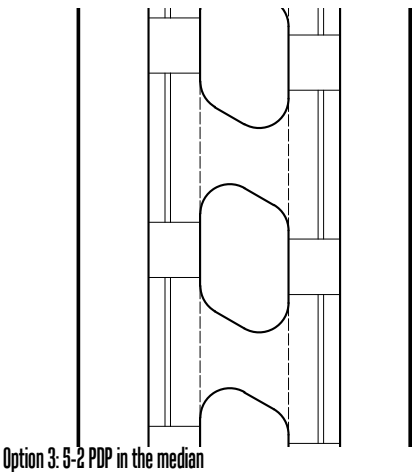
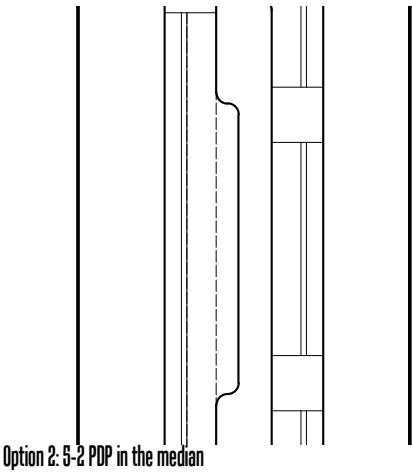
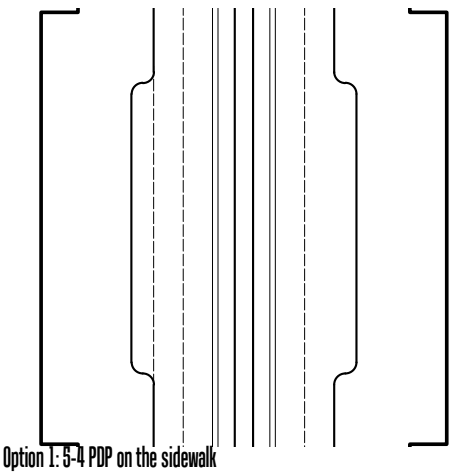
Present 5-lanes Street - Future 2-lanes Street  
Pickup & Drop off Place on the Sidewalk



After Plan



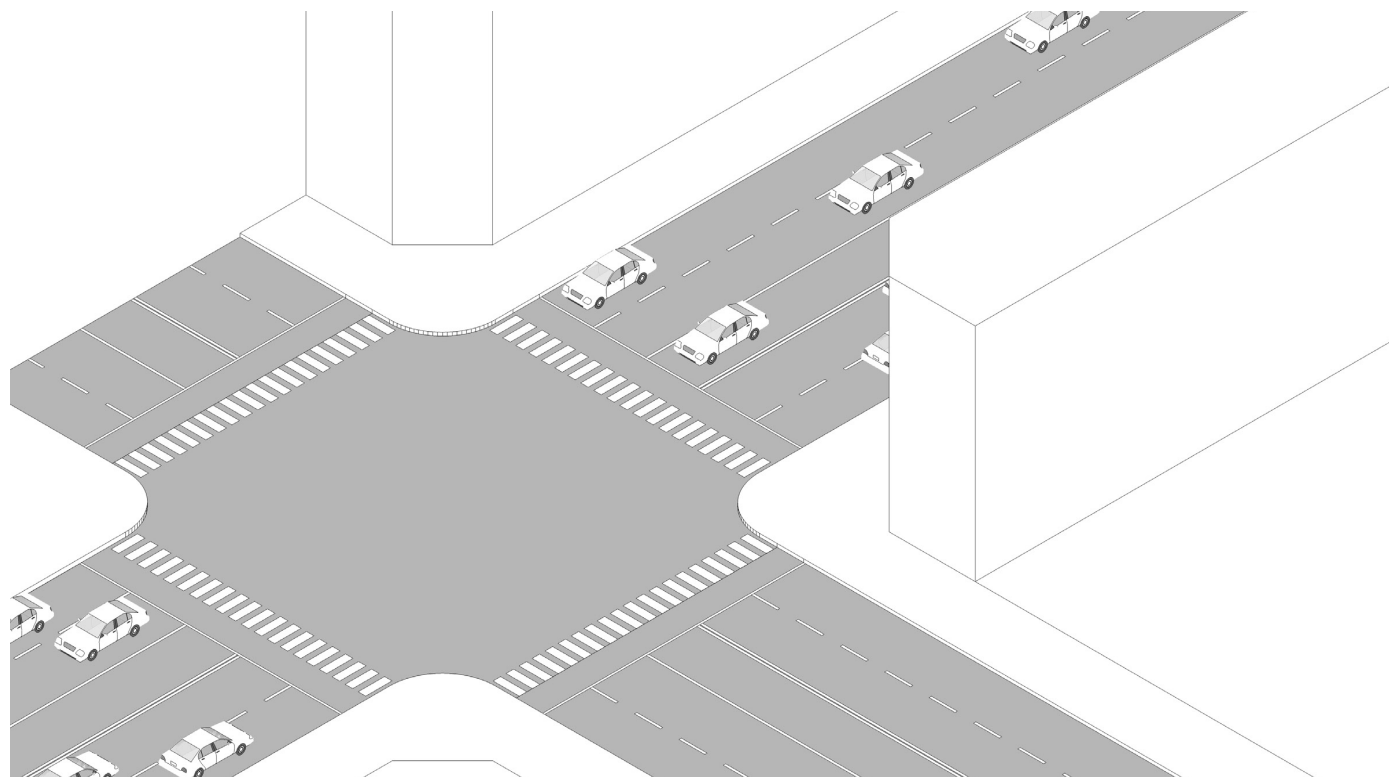
After Section



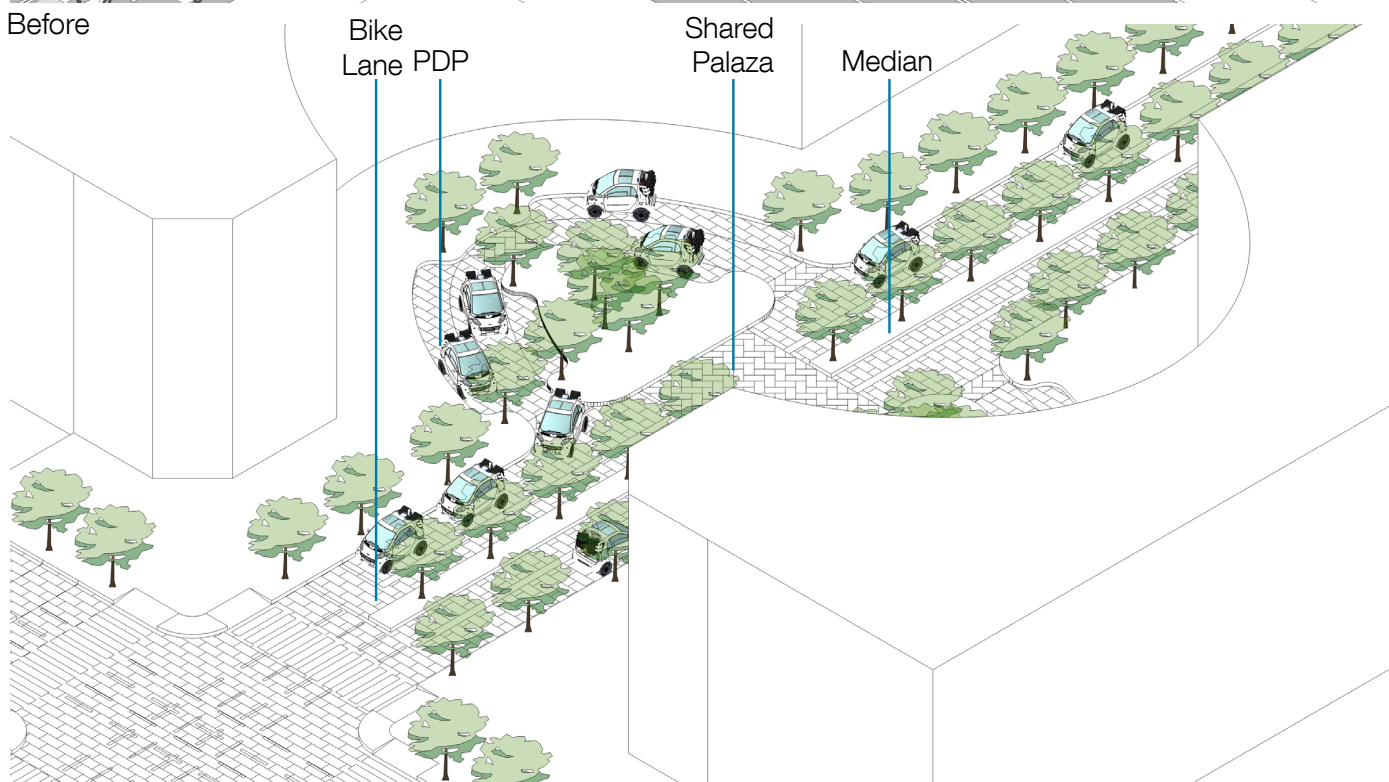
# Robotaxi Scenario

## A Streets

Present 5-lanes Street - Future 2-lanes Street  
Pickup & Drop off Place on the Sidewalk



Before

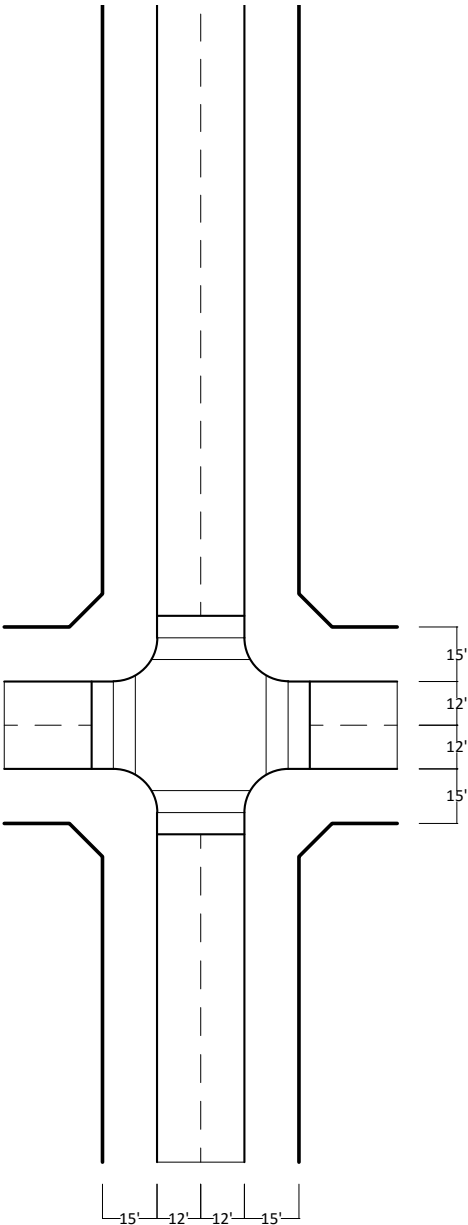


After

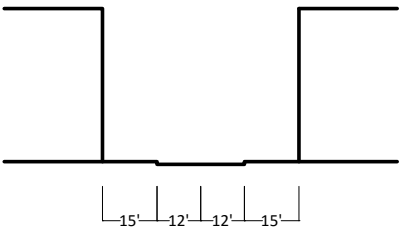
# Robotaxi Scenario

## B Streets

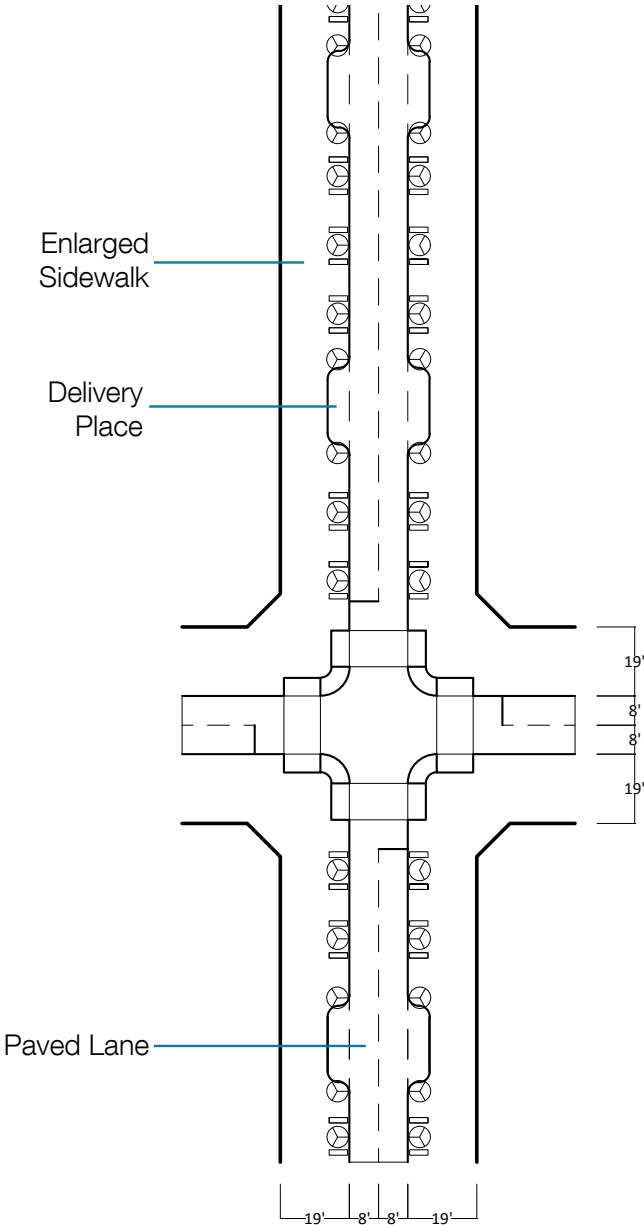
Present 2-lanes Street - Future 2-lanes Street  
Delivery Place on the Sidewalk



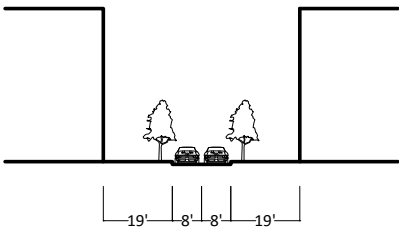
Before Plan



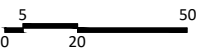
Before Section



After Plan



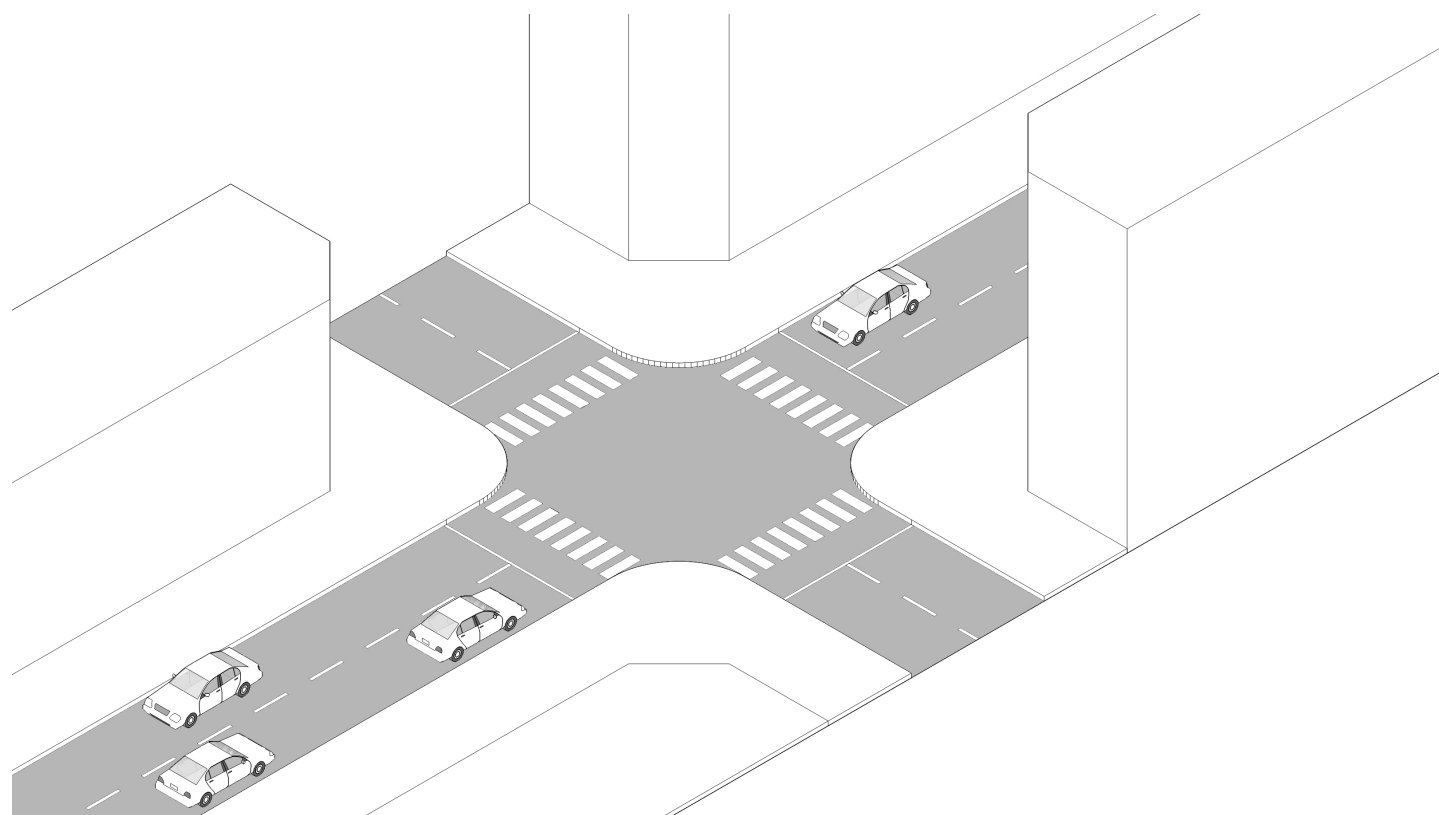
After Section



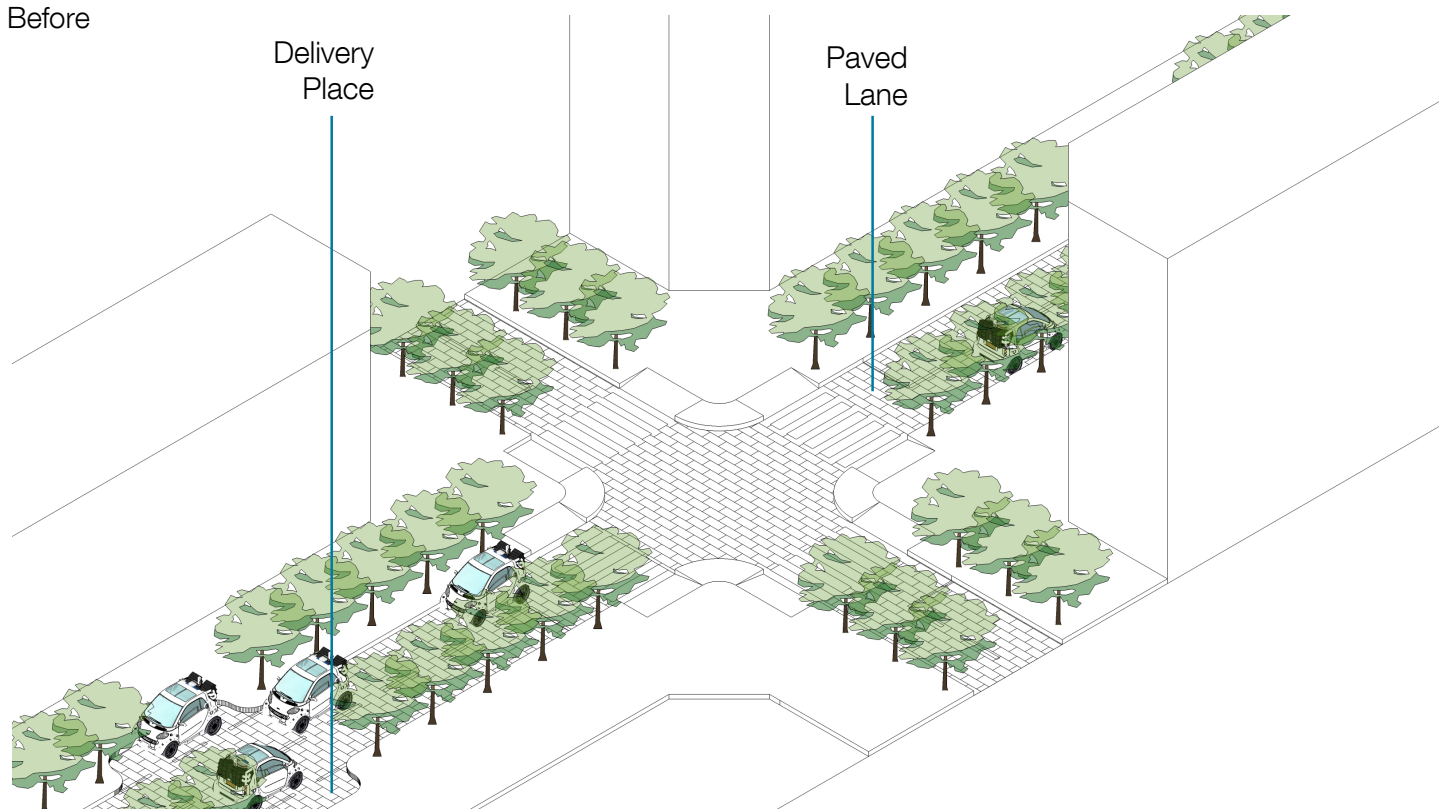
# Robotaxi Scenario

## B Streets

Present 2-lanes Street - Future 2-lanes Street  
Delivery Place on the Sidewalk



Before

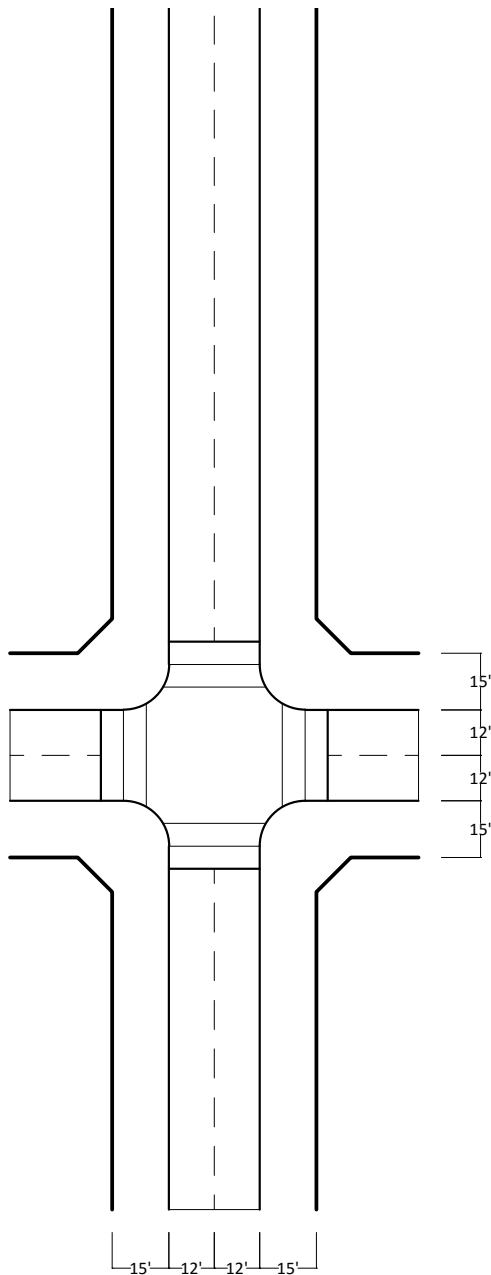


After

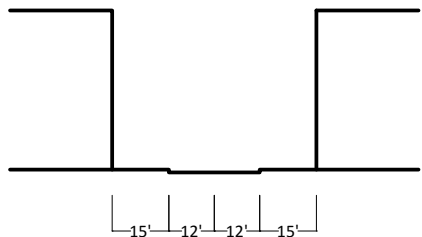
# Robotaxi Scenario

## B Streets

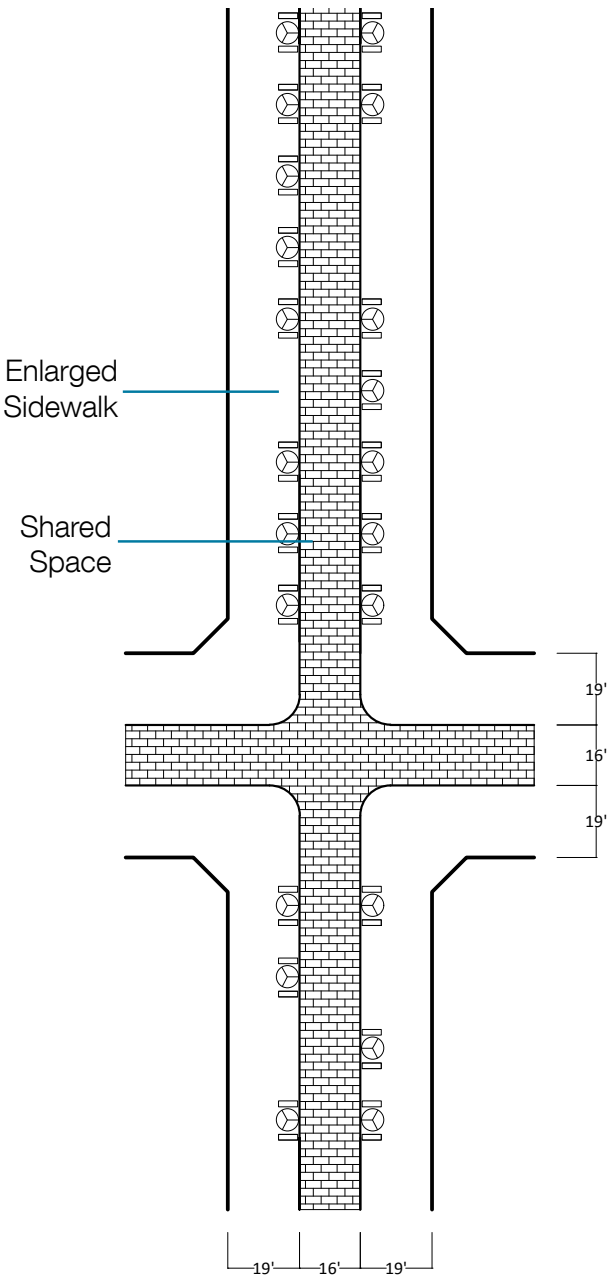
Present 2-lanes Street - Future 2-lanes Street  
Total Shared Space



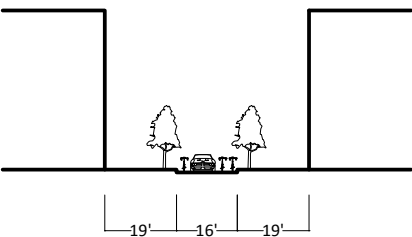
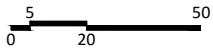
Before Plan



Before Section



After Plan

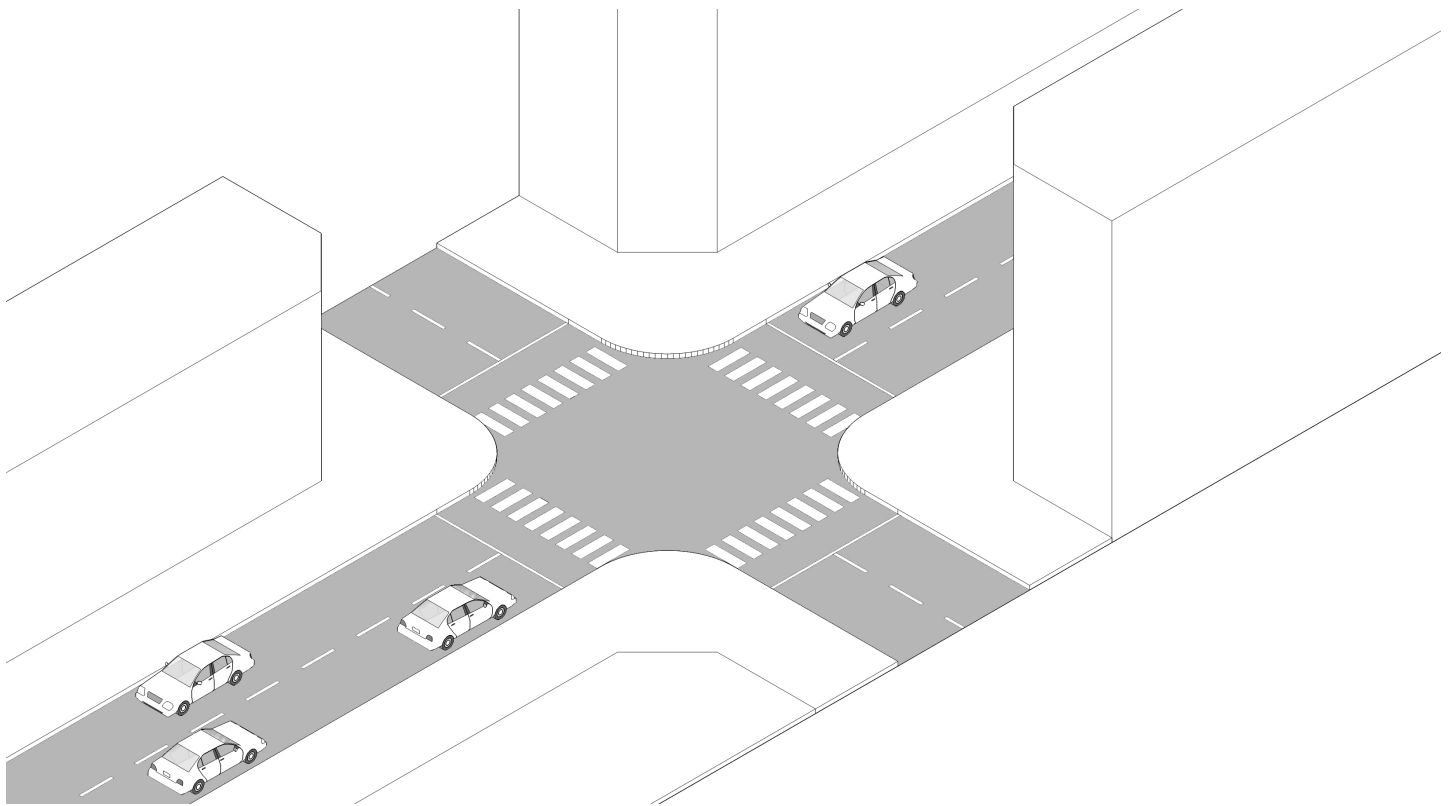


After Section

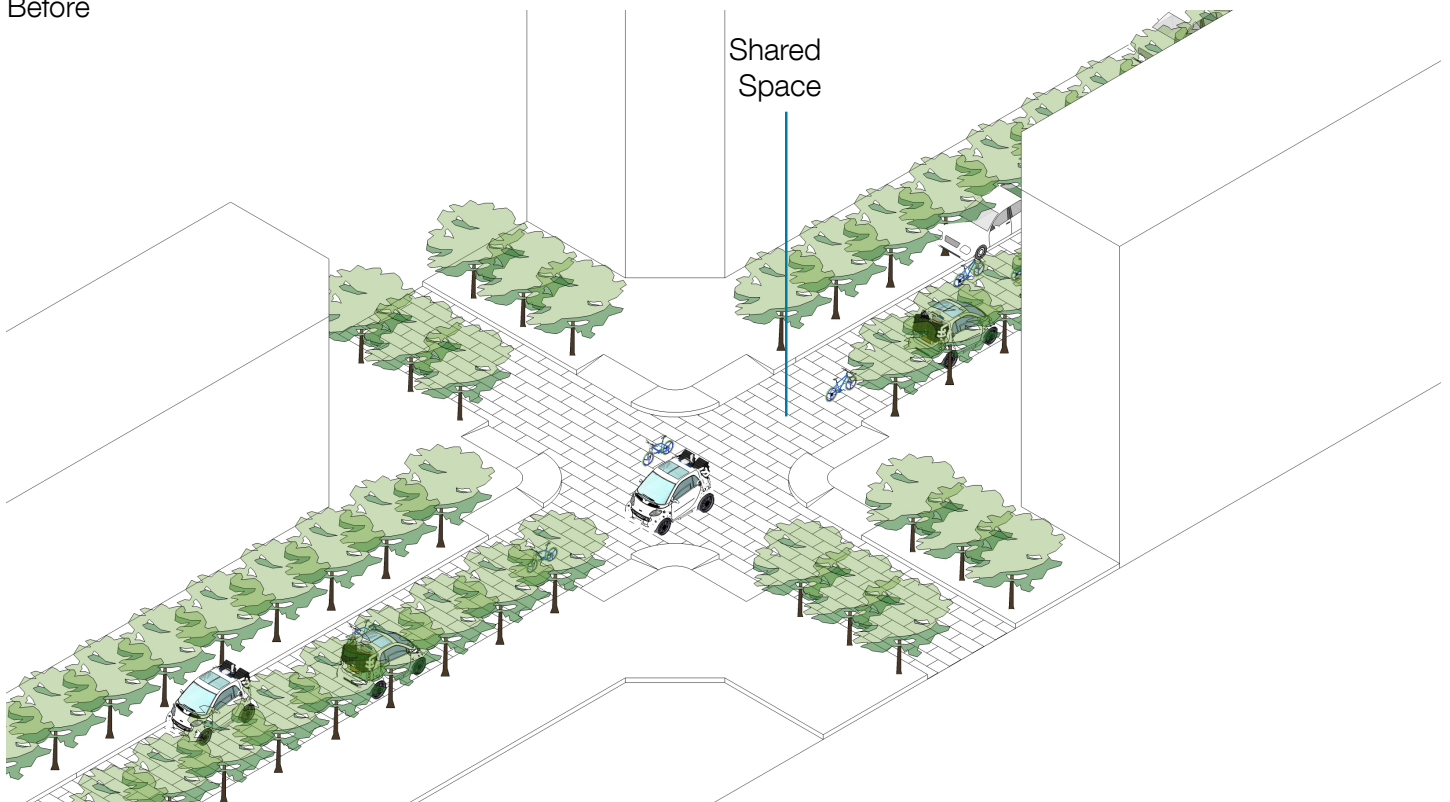
# Robotaxi Scenario

## B Streets

Present 2-lanes Street - Future 2-lanes Street  
Total Shared Space



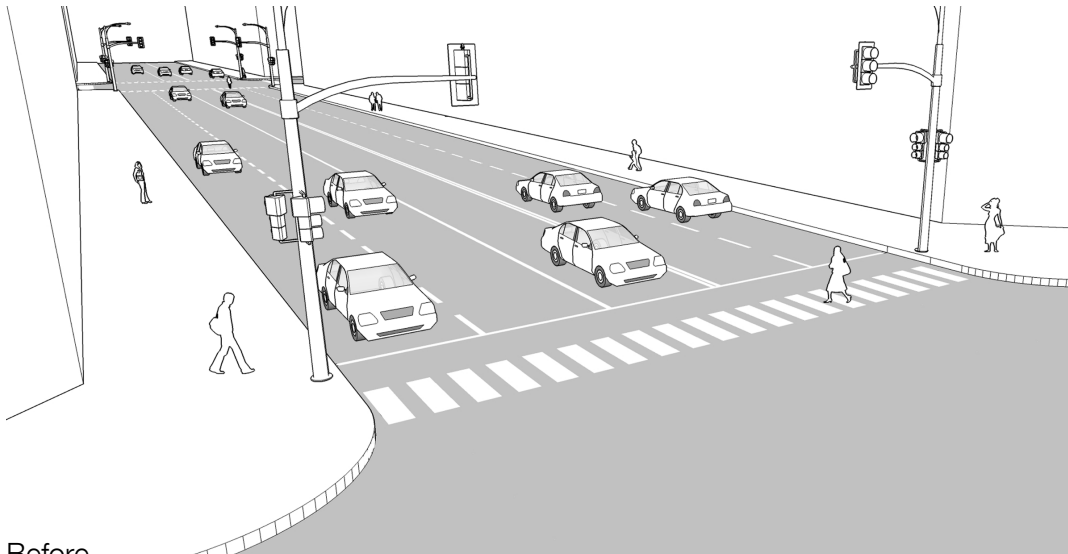
Before



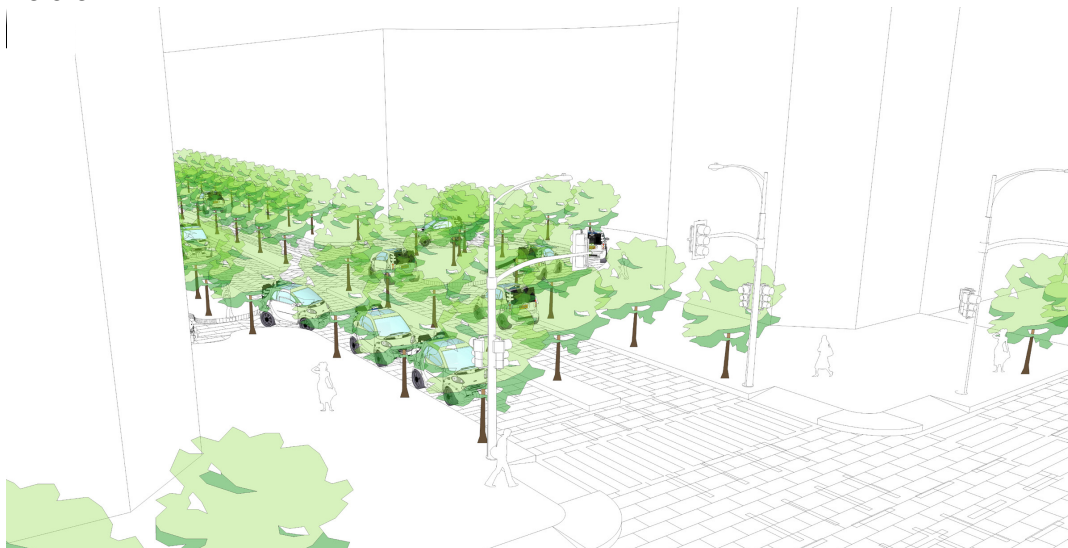
After

# Robotaxi Scenario

## A Streets



Before



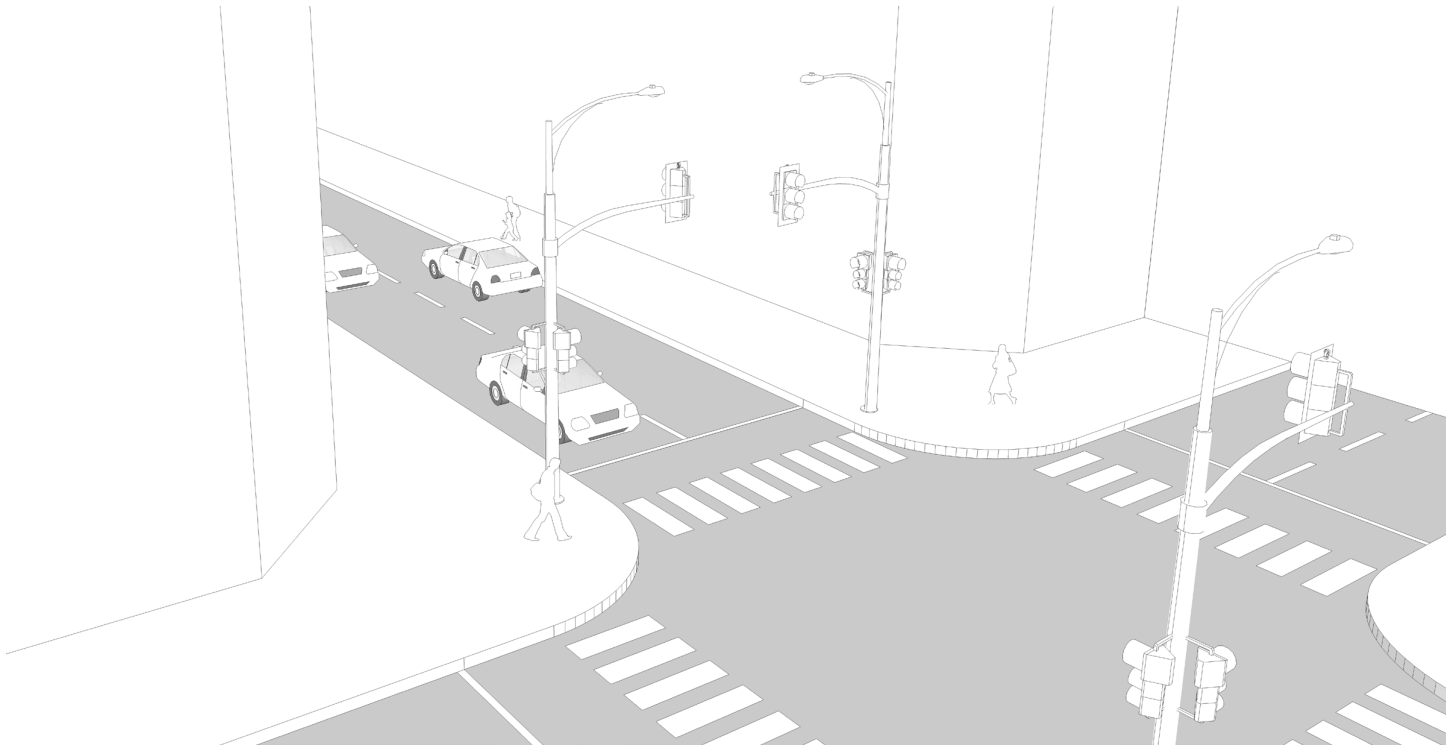
After



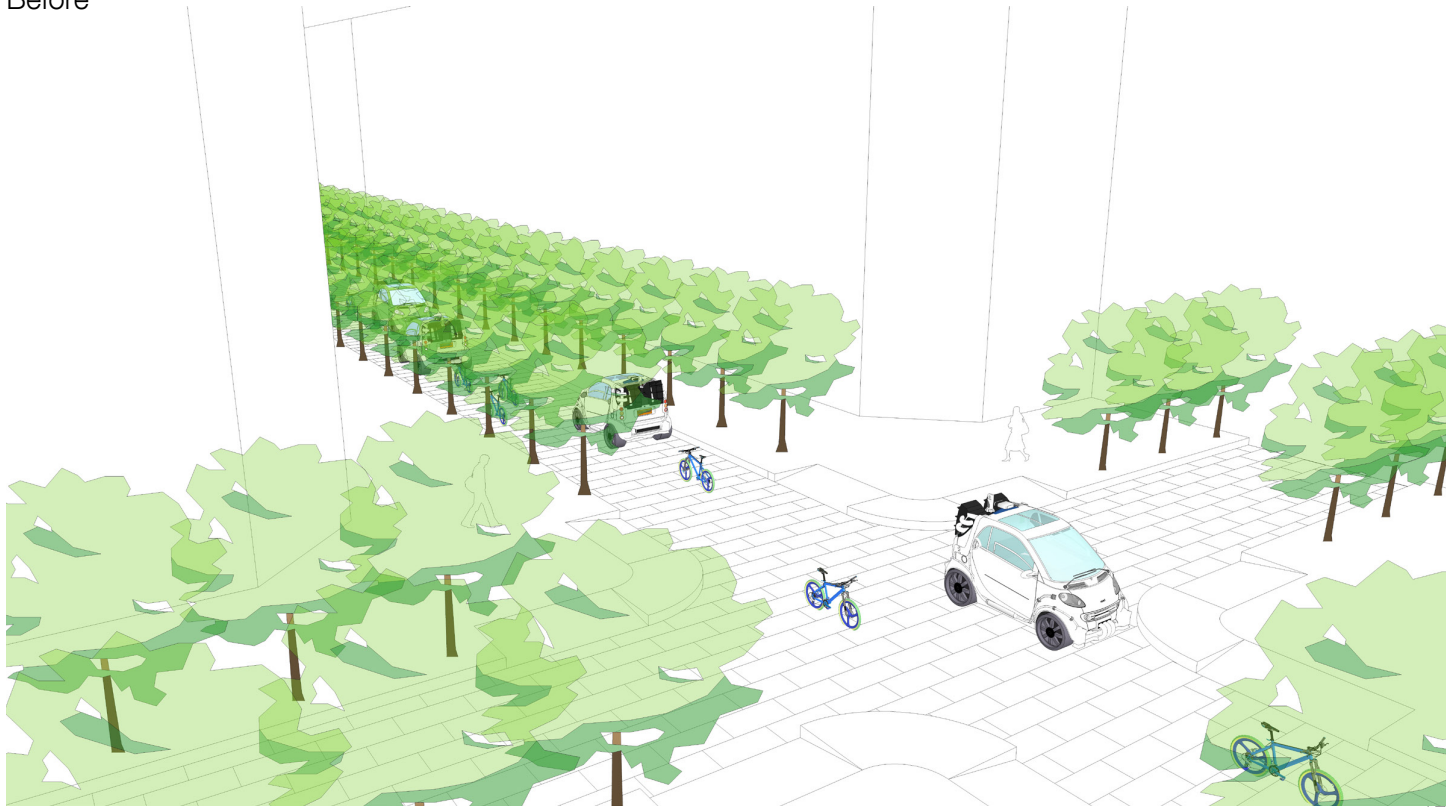
After Rendering

# Robotaxi Scenario

## B Streets



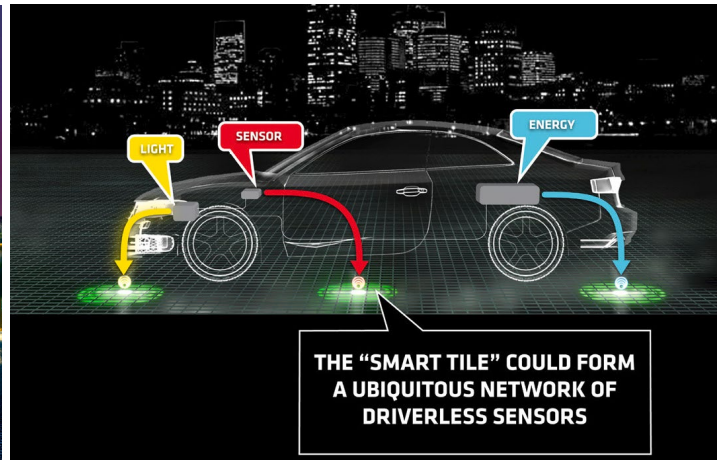
Before



After

# Robotaxi Scenario - Case Studies

## BIG's Proposal for the Audi Urban Future Award



(Source: <http://www.archdaily.com/77103/bigs-proposal-for-the-audi-urban-future-award>)

By adding a thin layer of reprogrammable sensors within the surface of the road, we imagine a future where driverless technology is shared between the vehicle and the tissue of the street. This "Smart Tile" surface is the next upgrade of infrastructure required to coordinate the flows of driverless cars, bicycles, and pedestrians in a completely fluid and adaptable way. This sensor network coordinates traffic flows by communicating with the flux of driverless cars. This vast surface area also has the potential to harvest energy from the sun as well as piezoelectric power of human movement. This collected energy could be transmitted wirelessly (electromagnetic induction) to electric cars and personal mobile devices, making electric power truly mobile for the first time!

# Robotaxi Scenario - Case Studies

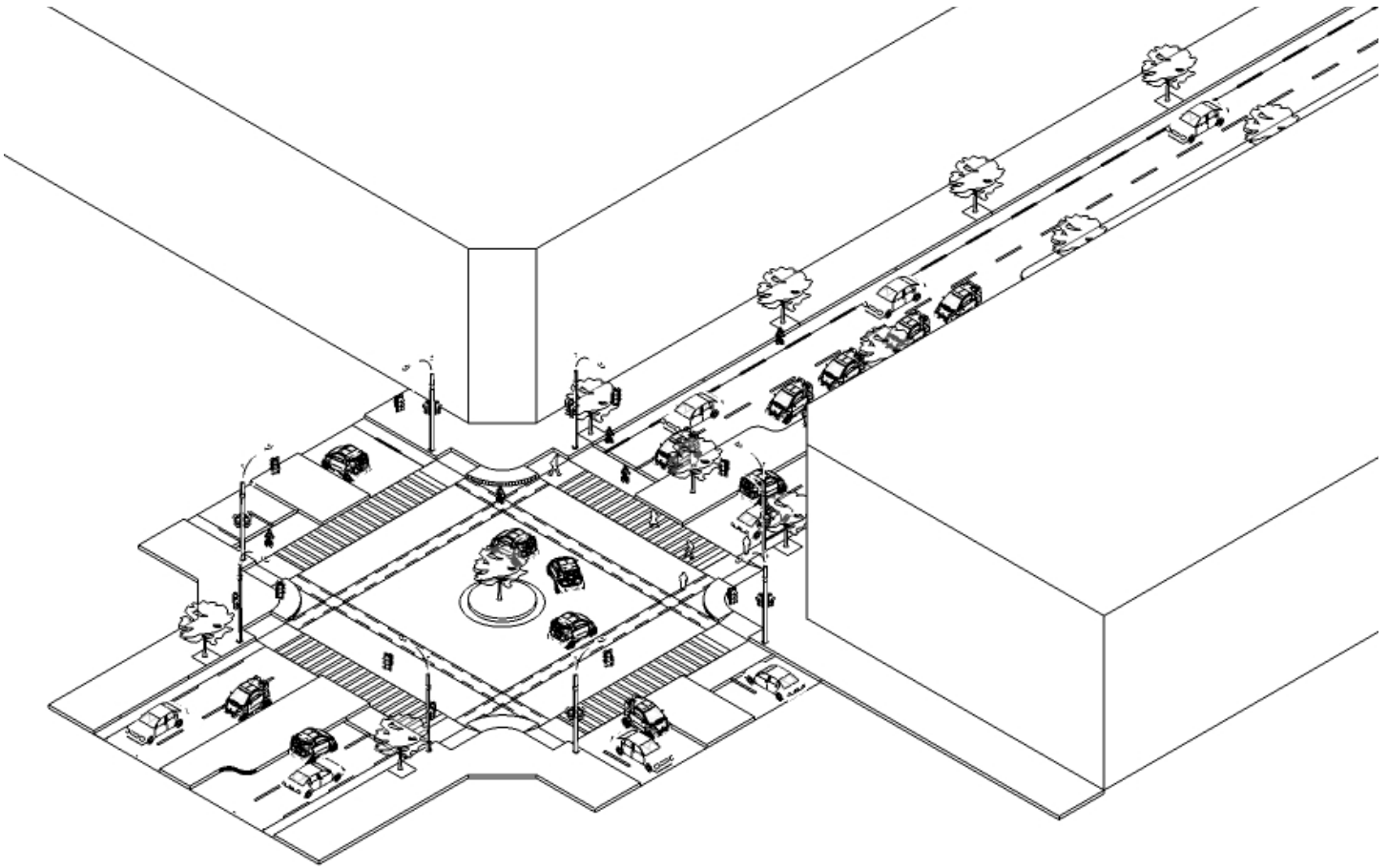
## Audi Urban Future Award 2014: "Flywheel"



(Source: <http://audi-urban-future-initiative.com/blog/seattle-wins-ahead-of-boston-and-san-francisco>)

The Berlin Team proposed a system incorporating pioneering driving technology, powered by self-driving cars and borrowing a concept from the elevator industry known as "destination control." This technology allows an increase in efficiency by having passengers program in their desired floor upon calling the elevator, allowing an algorithm to calculate the most efficient path. By grouping passengers who are travelling to nearby floors, the total travel distance required by the elevator is smaller. Team Berlin's proposal argues that once self-driving cars become a reality, Destination Control could be applied to personal transport, with cars which follow the same route grouping together and the precision of the self-driving systems allowing them to drive bumper-to-bumper, thus taking up less space on the road and easing congestion.

# Hybrid Scenario

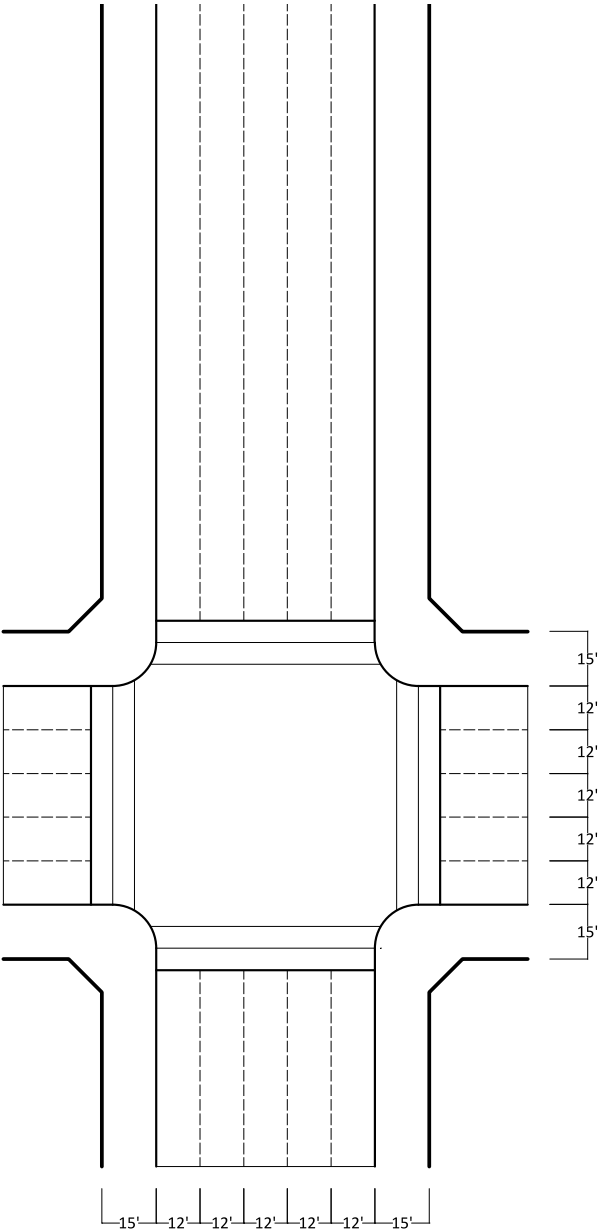


Here is a street under hybrid scenario, which is not just a road to commute. It was designed as a multi-purpose public space.... You can drive your own car by 20 miles per hour as a maximum speed, take a robotaxi or publicly-owned autonomous shuttle bus to save your money, rent an electric bike, or take a walk along green median. While you get on a driverless car, you can have a coffee, recharge a phone, buy a warm sandwich, or even take a shower and do your makeup. It was also designed as a shared and safe street, where pedestrians and cyclists are given first priority. Thus, while taking a cycle, you would not be afraid of cars any more. Variable light adjusts for day and night conditions. Especially at night, driverless car would turn on lights, charge themselves, and monitor everything happening on street, which would ensure a safe and peaceful walkable environment.

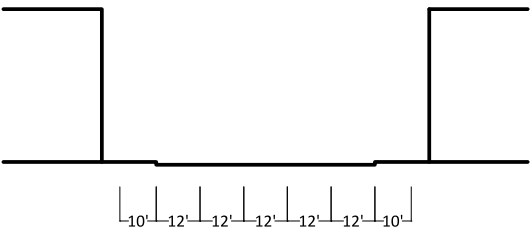
By: Lu Pang

# Hybrid Scenario

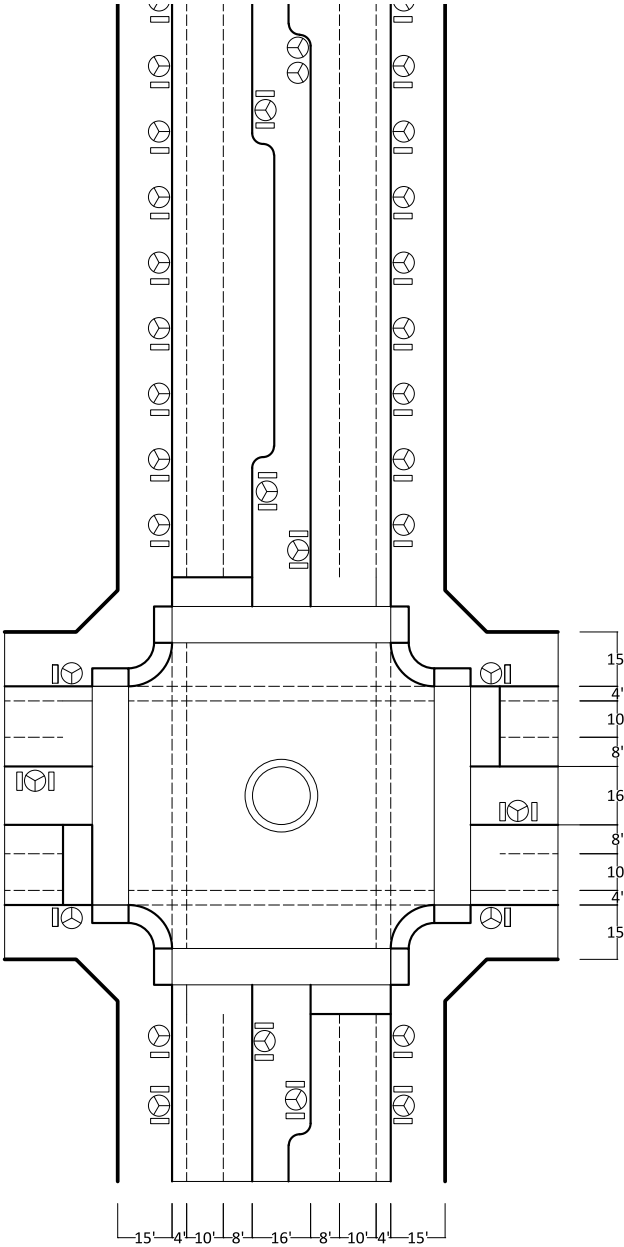
## A Streets



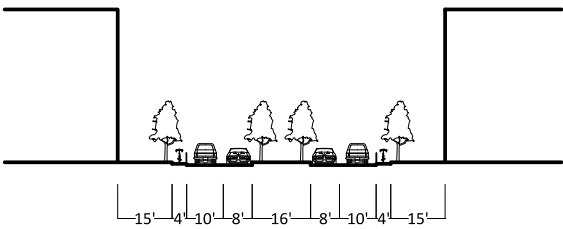
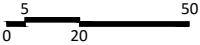
Before Plan



Before Section



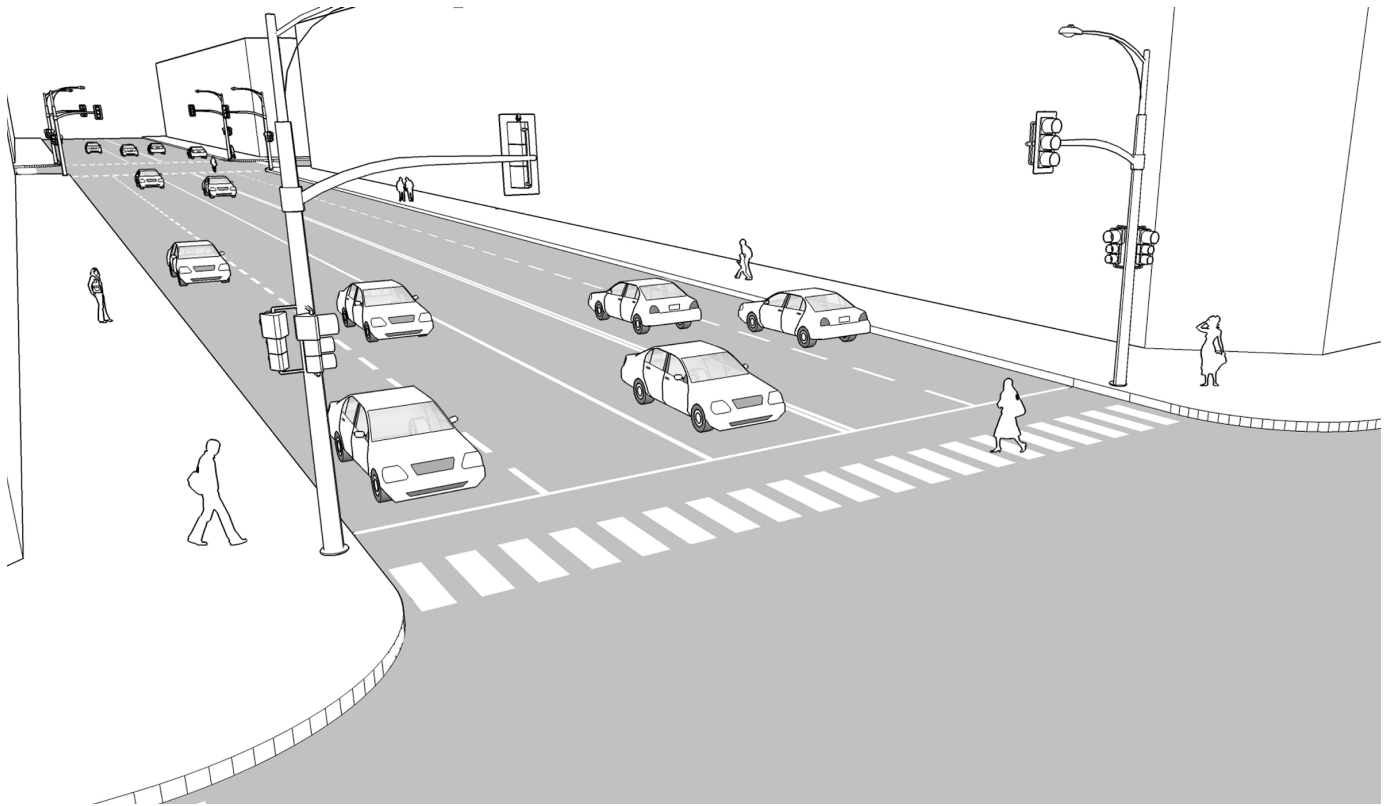
After Plan



After Section

# Hybrid Scenario

## A Streets



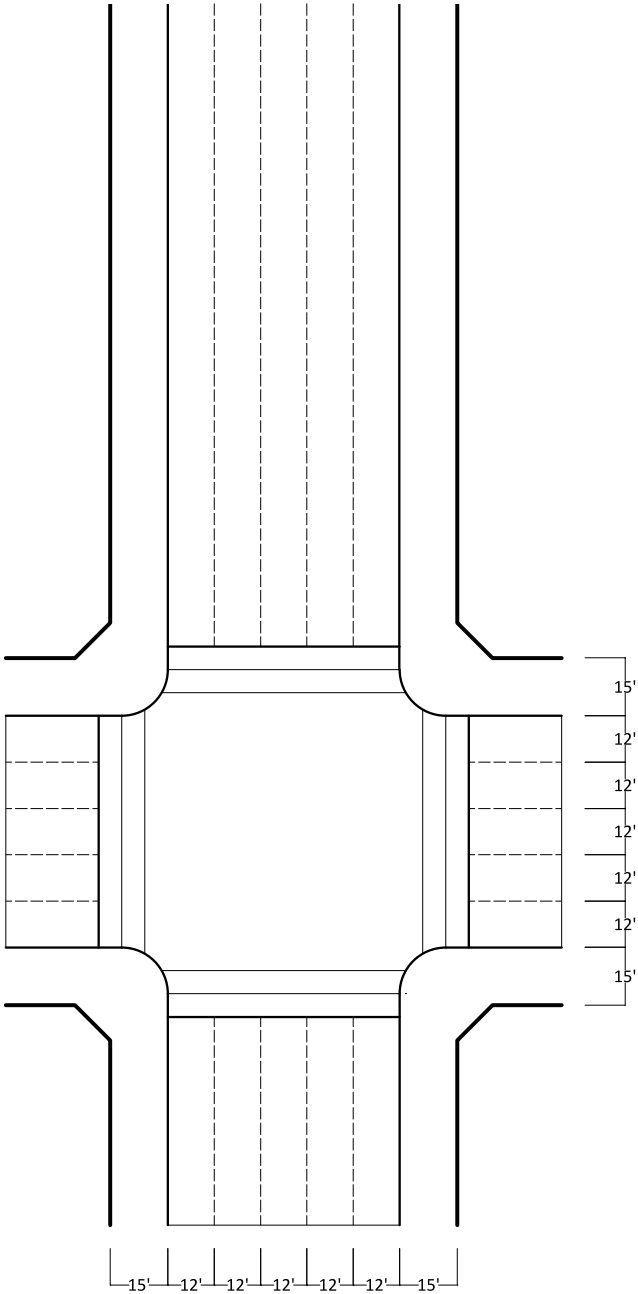
Before



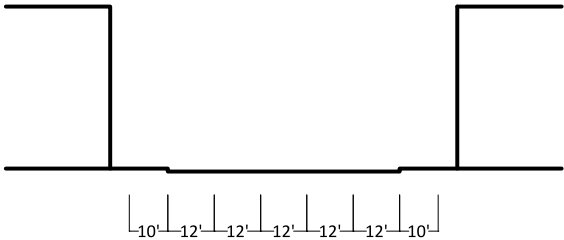
After

# Hybrid Scenario

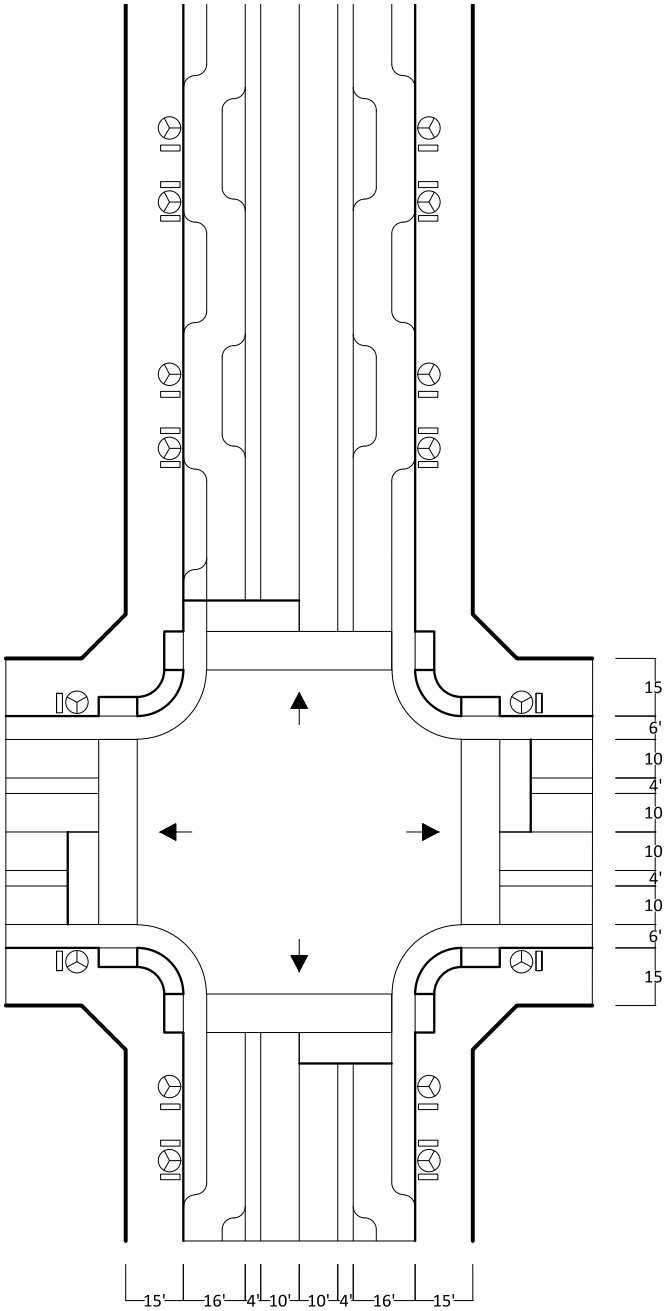
## A Streets



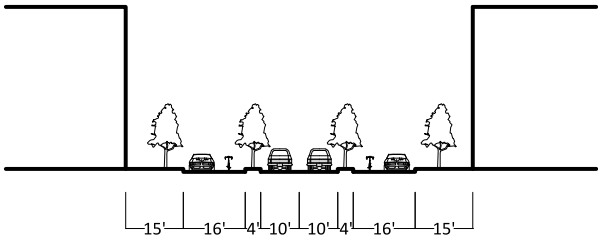
Before Plan



Before Section



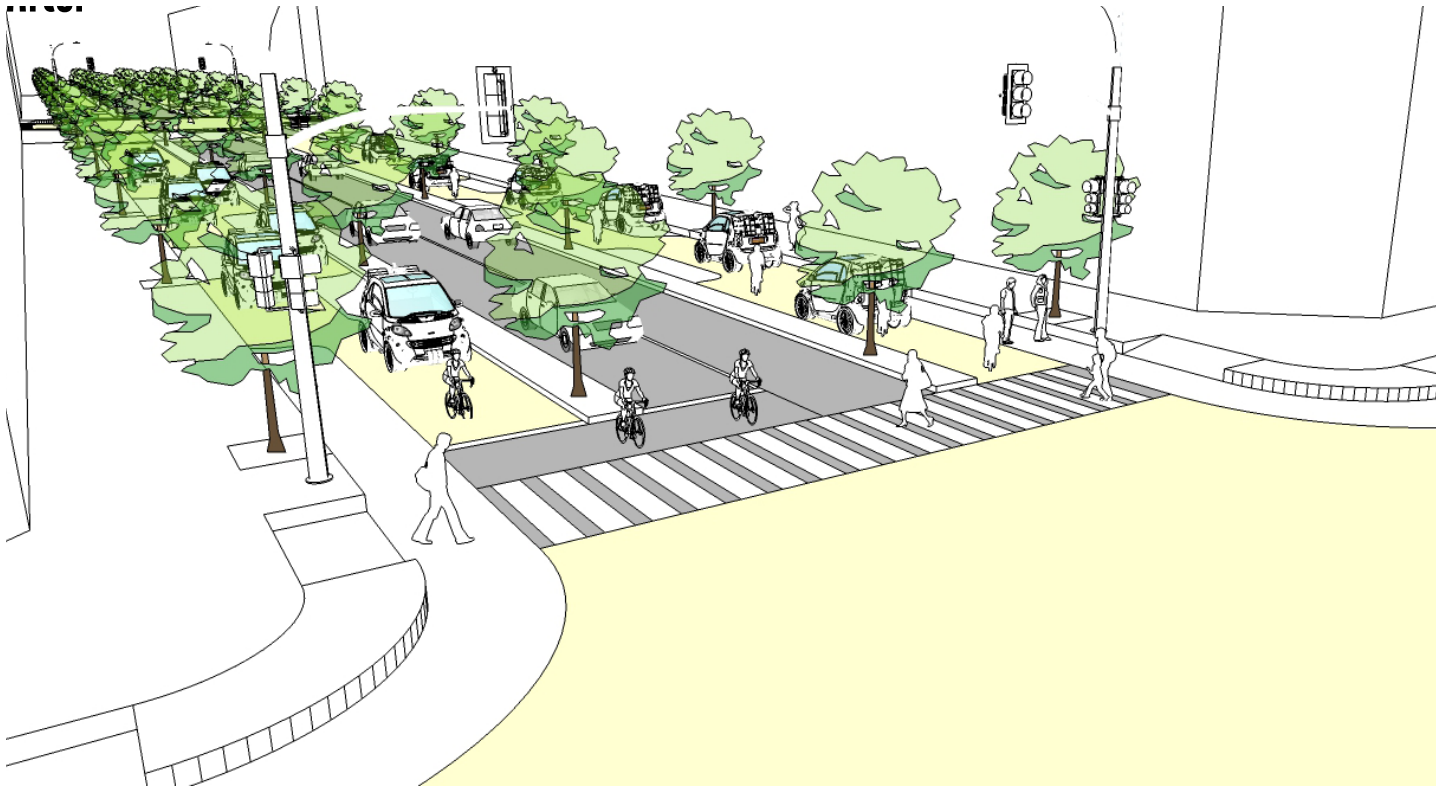
After Plan



After Section

# Hybrid Scenario

## A Streets



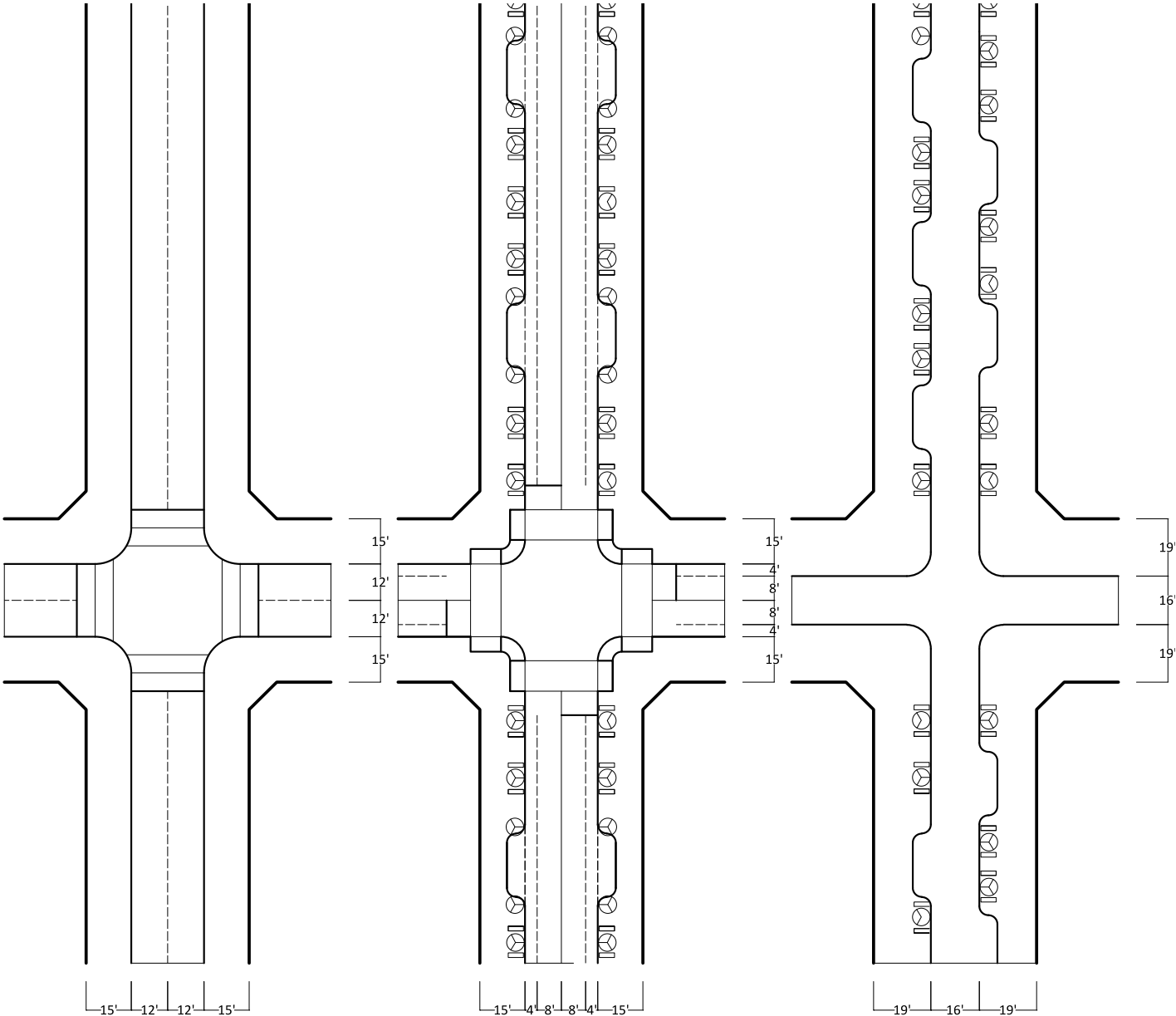
Before



After

# Hybrid Scenario

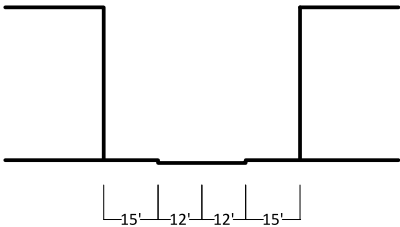
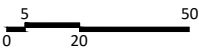
## B Streets



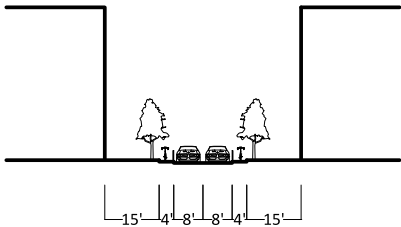
Before Plan

After Plan 1

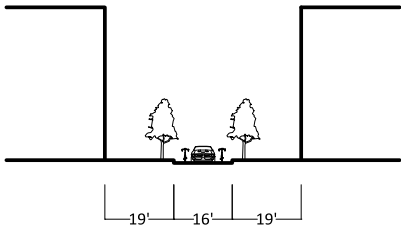
After Plan 2



Before Section



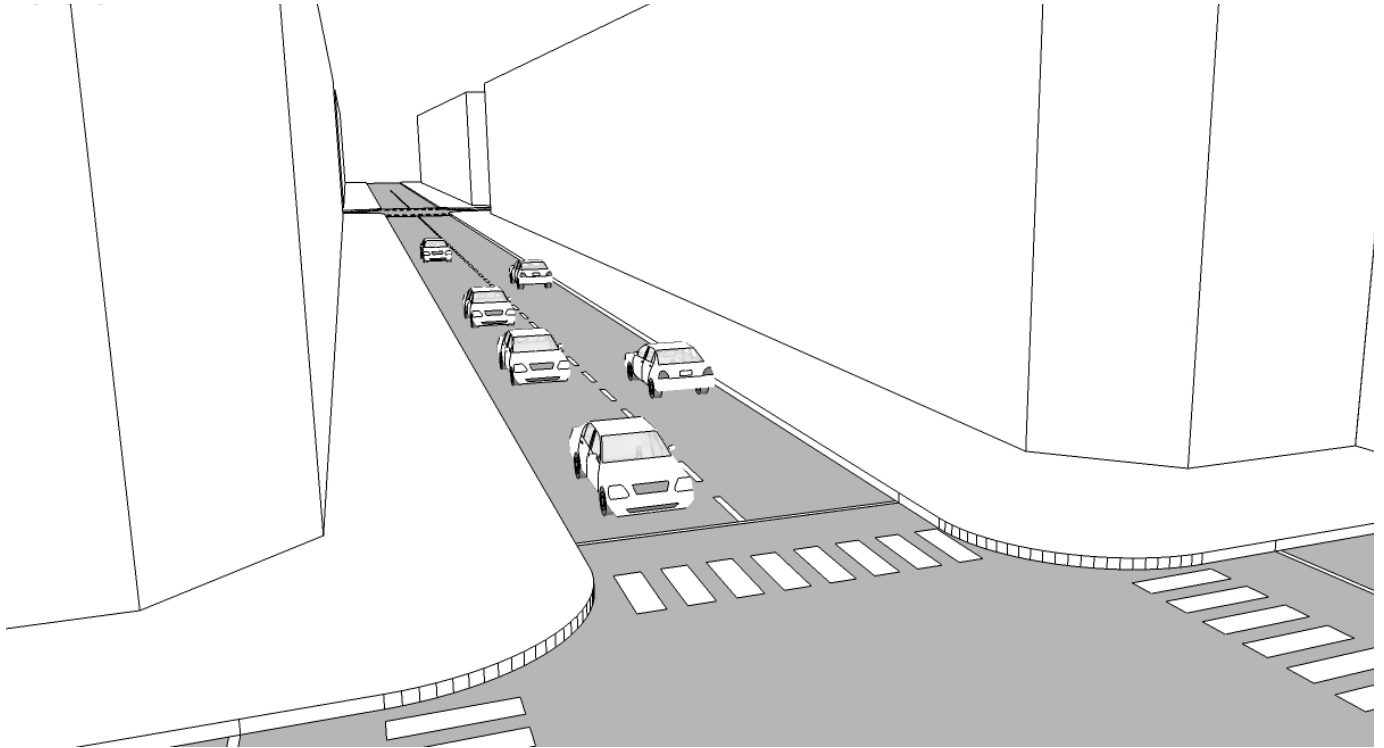
After Section 1



After Section 2

# Hybrid Scenario

## B Streets



Before



After



# Buildings

## Adaptive Reuse



(Source:<http://www.arc-3.com/886/the-office-at-250-piedmont>)



(Source:<http://theofficeapts.com/wp-content/uploads/2015/08/home021.jpg>)

Office High Rise to Residential, The Office Apartments, ARC-3 Architecture



(Source:<http://kronbergwall.com/wp-content/uploads/2014/10/563-Spring-St-4.jpg>)



(Source:<http://kronbergwall.com/portfolio-item/563-spring-st-portfolio/>)

563 Spring Street, Kronberg Wall Architects

Adaptive reuse refers to the process of reusing an old site or building for a purpose other than which it was built or designed for. Along with brownfield reclamation, adaptive reuse is seen by many as a key factor in land conservation and the reduction of urban sprawl. However adaptive reuse can become controversial as there is sometimes a blurred line between renovation, facadism and adaptive reuse. It can be regarded as a compromise between historic preservation and demolition.(Source: Wikipedia)

### Adaptive Reuse Potentials

1. Office High Rise to Residential
2. Office/Warehouse to Education
3. Office/Warehouse to Mixed-Use
4. Warehouse to Office
5. Parking Garage to Public Space?

# Buildings

## Liner Buildings



(Source: [www.mnn.com/your-home/remodeling-design/photos/9-of-the-worlds-thinnest-buildings/skinny-building-pittsburgh-pa#top-desktop](http://www.mnn.com/your-home/remodeling-design/photos/9-of-the-worlds-thinnest-buildings/skinny-building-pittsburgh-pa#top-desktop))



(Source: [www.mnn.com/your-home/remodeling-design/photos/9-of-the-worlds-thinnest-buildings/sam-kee-building-vancouver#top-desktop](http://www.mnn.com/your-home/remodeling-design/photos/9-of-the-worlds-thinnest-buildings/sam-kee-building-vancouver#top-desktop))

Liner buildings are very thin buildings that line the edge of a street, plaza, square, or other public space. They can be as little as 8-10 feet deep for retail uses and 12-14 feet deep if they include residential uses. They may be a single story high, or they may be several stories tall. (Source: <http://www.originalgreen.org/blog/liner-buildings---how-to.html>)

Liner Buildings can be used for:

1. Cover Blank Facades
2. Screen Surface Parking Lots
3. Small Residential, Office, Commercial Buildings

# Buildings

## Future Building Technologies

### **Sustainable, responsive, resilient materials**

The future of construction should be to move away from materials like wood and concrete and incorporate either stronger or safer materials that are lightweight to support grander development or to have reusable or recycled materials like recycled steel.

### **Low-emittance windows and smart glass**

Low-emittance windows are coated with a metallic oxide so that it shields the sun's harsh rays in the summer and retains heat in the winter. Smart glass, or electrochromic glass, uses an electric field of charged ions to reflect sunlight and it can be controlled depending on the time of the day.

### **Storm water management and water reuse**

Storm water management is important at the building level to hold onto water before it goes into the municipal system. This goes hand in hand with the need for water retention and reuse on-site through the building of cisterns because of water shortage.

### **Energy efficiency and net-zero**

Net-zero buildings are becoming a growing trend as the awareness and practice of sustainability has increased. Advanced building performance and being energy efficient is not only a public credit and "newsworthy" but it is an investment in reduced energy costs for the building in the future.

### **Discrete controls**

Having control over a particular area of a building such as a classroom reduces the simultaneous heating and cooling and provides more energy efficient systems. Besides heating and cooling, these controls could be for ventilation, lighting, and humidity.

### **Internal green walls**

On the inside layer of the enclosure of buildings, there is a new system developed to filter the air before entering the building. This can be done by organic materials such as plants and can be done by air-filtration machines along the inside part of the façade.

# Buildings

## Smart Cities

### Transportation Coordination

With a smart system organizing all of the forms of transportation such as bus, train, and automobile, autonomous or not, there can be efficient control of providing public access to these network and of how they operate such as changing lanes and designing the street.

### Driverless Eyes on the Street

With the adoption of autonomous vehicles, there will be a much greater record of the city by the means of the exterior cameras on the vehicles. This will allow for more information about This may also be used in crime prevention and analysis..

### Health Analytics

With interactive systems monitoring microclimate trends in building and on the streets, we can get a better understanding of the health concerns that are applicable to a certain region of the city. Decisions in the construction and design fields may change once they see the trends of health impacts.

### Crime Analytics

In a similar way to health analytics, crime can be monitored and maybe prevented by having a more comprehensive system of interconnectivity in the city. The trends of crime depending both on time and on location may lead to an understanding of how the city can properly address crime.

## Low Impact Development

LID techniques are used to improve water quality and resolve water drainage problems.

### Problems

1. Combined Sewer-Stormwater Overflow
2. Dirty Water Going to Proctor Creek
3. Wooden Water Pipes
4. Water Shortage
5. Lack of District-Level Organization
6. Outdated Systems

### Opportunities

1. Urban Forests and Wetlands
2. Bioswales and Rain Gardens Along the Street Network
3. Roof-Level and Street-Level Cisterns For Water Retention and Storage
4. Pre-treatment and Filtration of Stormwater
5. Green Roofs and Rooftop Water Retention
6. Pervious Paving to mitigate flooding

# Buildings

## Future Transit-Oriented Development (TOD)

### Multi-modal Connectivity

With multiple layers of means of transportation, people can go from riding the train to taking a bus or bicycle or vice versa. The ability to change to a different form of transportation makes commuting more affordable and flexible for workers.

1. Pedestrians
2. Bicycle
3. Bus
4. ART (Autonomous Rapid Transit)
5. AV (Autonomous Vehicle)

ART and AV are important in their ability to solve the "last mile" challenge of bring commuters from rapid transit to the workplace.

### Equitable TOD

By being in the proximity of lower income developments, equitable TOD can provide the necessary transportation commuters in the region to their places of work. The financial successes of the TOD can be use to support the community in the future.

### Property Value Improvement

With TOD, the concentration of commuters can lead to the production of successful retail and office developments. This will increase the property value of the area around the transit allowing the area to develop further becoming a strong place for the public and private. Much like the BeltLine, downtown has the capacity to a very strong TOD, although it is currently hampered by a lack of density.

BELTLINE AFFORDABLE SUPPLY AND DEMAND BALANCE 2012-2021			
	Owner	Renter	Total
<b>Affordable Demand</b>			
2012-2016	3,064	3,578	6,642
2017-2021	3,064	3,578	6,642
<b>Total</b>	<b>6,128</b>	<b>7,156</b>	<b>13,284</b>
<b>Affordable Supply</b>			
2012-2016	322	1,008	1,330
2017-2021	520	960	1,480
<b>Total</b>	<b>842</b>	<b>1,968</b>	<b>2,810</b>
<b>Demand/Supply Balance</b>			
2012-2016	(2,742)	(2,570)	(5,312)
2017-2021	(2,544)	(2,618)	(5,162)
<b>Total</b>	<b>(5,286)</b>	<b>(5,188)</b>	<b>(10,474)</b>

Source: BAG

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