i. SUMMARY

AUTISM PLANNING AND DESIGN GUIDELINES 1.0
THE SIX FEELINGS FRAMEWORK

Our research culminated in the creation of a planning and design strategy: The Six Feelings Framework. These six feelings combine to promote feelings of being included. When considering their needs, planning and design implementations in the public realm (in a public space or when using infrastructure) should make adults with autism:

1. **Feel connected** - because they are easily reached, entered, and/or lead to destinations.
2. **Feel free** - because they offer relative autonomy and the desired spectrum of independence.
3. **Feel clear** - because they make sense and do not confuse.
4. **Feel private** - because they offer boundaries and provides retreat.
5. **Feel safe** - because they diminish the risk of being injured.
6. **Feel calm** - because they mitigate physical sensory issues associated with autism.

Although these feelings are also desirable for neurotypical people they are especially crucial for people with autism.

Understanding that it may not seem useful to plan for one group of people, planning through the lens of autism can benefit everyone. The Six Feelings Framework helps planners create spaces and infrastructure that are more usable, comfortable, and beneficial to all constituents (but particularly adults with autism) who feel more connected, free, clear safe, private (when needed), calm, and ultimately, included.
PURPOSE

Adults with autism have particular needs that most city planners haven’t yet considered, even as autism has become increasingly prevalent in our society. Autism Spectrum Disorder (ASD) affects millions in the United States, including families and friends of people with ASD.

Many adults with autism “fall off the cliff,” as they age out of childhood support programs while continuing to lack the skills for independent living. This abrupt life change affects adults with autism and significantly impacts their caregivers. We do not assume that independence, a culturally-prescriptive concept, is what adults with high-functioning autism want or need. It is clear, however, that many of adults with autism and their families face daily challenges concerning housing, transportation, and the overall built environment, all of which are major topics that fall within the planning profession’s domain.

Adults with autism are more prone to stress, anxiety, and sensory overload as a result of intense cognitive processing of sound stimuli. They suffer from higher rates of sleep problems related to these auditory issues. Light intensity and noise were shown to disproportionately adversely affect the learning of children with autism. There are other psychological issues associated with the disorder: social anxiety, agoraphobia, attention deficits, obsessive behaviors, forgetting consequential tasks, and depression.

Our research provides a planning and design framework backed up by research that can create effective policies for professionals who are interested in improving the built environment so adults with autism can thrive.

GOAL

To create environments where adults with autism can thrive. The typology will vary (local scale project, mixed-development or redevelopment, neighborhood, transit system, and others), but this goal remains the same. Creating environments where autistic adults can thrive depends on improving the knowledge and tools for city and regional planners to make this happen.

BACKGROUND

In Summer, 2016, several board members from Autism Living, a Columbus, Ohio 501c3 non-profit corporation, met with Professor of Practice Kyle Ezell to plan a City and Regional Planning study on planning for autistic adults. During Autumn 2017 and Spring 2018 terms, graduate and undergraduate students in City and Regional Planning Junior Studio, City and Regional Planning Senior Studio, and City and Regional Planning Graduate Planning Innovations Workshop investigated the everyday needs of high-functioning adults with autism and whether or how professional planners, policymakers, and designers can improve their lives. Students then passed a training course for the ethical treatment of human subjects in research from Ohio State’s Institutional Review Board, designed a focus group to encourage input from adults with autism and their caregiver parents, planned and implemented a design and policy charrette with professionals in mental health, neuroscience, architecture, planning, engineering, landscape architecture, public health and other allied fields. The students then designed infrastructure and program ideas to produce this final deliverable planning toolkit publication. [See the Appendix for more details on the academic process.]
SCOPE

Our research employed a semester-long review of the literature, two focus groups (adults with autism and parents of adults with autism) and a design and policy charrette over an academic year.

While we believe that our work contributes to the planning profession, there were significant limitations to creating this planning practice toolkit. Most obviously, time was a factor as this study comprised an academic year. 33 graduate and undergraduate students, 37 professionals in allied fields, 30 adults with autism, and 23 parents of adults with autism worked on this project and almost everyone involved was based in Columbus, Ohio. Concerns, views, and experiences of our Ohio subjects may not represent the views and experiences of the rest of the U.S. and the world. Planners who wish to involve adults with autism in their public involvement processes may not have access to a professional psychologist and his/her team. Additionally, as people with ASD fall on a spectrum, only the opinions of high-functioning adults with autism are represented in our findings. Finally, though city planners, planning professors, and our professional advisory group (Autism Living) were directly involved in continuous reviews, the planning and design framework that emerged from our research was tested/designed by students—not planning professionals. Professional planners, landscape architects, civil engineers and urban designers are encouraged to refine the work provided in this document. We hope that our initial ideas in this toolkit are challenged and improved upon by professionals in allied fields.
TESTING

Students interpreted the Six Feelings Framework and redesigned common infrastructure and provided ideas, some in specific geographies. This is a first attempt.

AUTISM PLANNING AND DESIGN STANDARDS “1.0”

Professional planners are encouraged to refine this work and engage in further study from our start. Challenge and improve these ideas. See more about this invitation to improve and expand this study in the July/August 2018 American Planning Association Planning Advisory Service Memo.

RECOMMENDATIONS

WE RECOMMEND THAT:

♦ City and regional planners activity accommodates people with autism in their public involvement process.

♦ City and regional planners implement autism standards building on this 1.0 attempt into their zoning and design guidelines, and consider policy changes.

♦ Professionals in affiliated fields who have concern over the public realm test, retest, and improve the ideas in this toolkit.

♦ Civil engineers retrofit infrastructure around the Six Feelings Framework.

♦ Real estate developers who are designing master planned communities consider the Six Feelings Framework in their plans.

♦ For more information on what we learned about public participation for people with autism see the October 2018 edition of Planning.
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Parents of adults with autism

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COMMON INFRASTRUCTURE
A. Bus Rides
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F. Modified ADA Parking Space
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M. Intentional Neighboring
A. BUS RIDES

(feeling connected, feeling safe, feeling private, feeling clear, feeling free)

FROM THE RESEARCH

Bus route and announcements as buses approach a stop will alleviate stress for adults with autism. Indicating a bus route and direction for passengers boarding the bus will reassure passengers that they are getting on the correct bus and will be traveling in the correct direction. Implementing a visual sign on the outside of the bus that clearly indicates the route and direction of the bus will provide clarity for transit users. Providing seats close to the front and near the bus driver is important to make it easier for adults with ASD to ask for assistance. ASD adults are often highly sensitive to bright lights, so the interior light design should be soft.

GUIDELINES

Each bus exterior shall be clearly identify its route and indicate which direction the bus will be traveling.
Buses shall announce the bus route and direction.
There shall be a visual and auditory alert for passengers to be aware of a stop.
Buses shall utilize the “I Need Assistance Symbol” on the exterior and interior in compliance with the Bus Checklist guideline.
Buses shall have seating near the front of the bus wider than 17"0", not including armrests. Buses shall be outfitted with maps that update in real time located at the front and the middle.
Maps shall reference points of interest in a 3-D format. Maps shall show a “you are here” symbol and highlight the upcoming stop.

B. BUS ROUTES

(feeling safe, feeling clear, feeling private, feeling free)

FROM THE RESEARCH

Many adults with autism hesitate to use a bus system due to lack of access and/or ease of travel to final destinations. The majority of bus routes are generally inefficient and require extra travel time away from the intended destination. Many bus route networks resemble a “hub and spoke” system. “Hub and spoke” routes start on the outskirts of a city and work towards the middle of the city then back out, creating long, linear lines. Shifting to a model that resembles an atom shape creates shorter, looping, intersecting, and overlapping routes. These routes can create more potential transfer points, increasing connectivity throughout the city.

GUIDELINES

Bus routes shall be oblong/circular to allow more intersection to provide more coverage to areas/amenities and offer increased transfer opportunities.
C. BUS STOPS
(feeling safe, feeling clear, feeling connected, feeling calm, feeling private)

FROM THE RESEARCH
The research indicates that confusion and anxiety associated with transportation can be alleviated by a more humane design for bus stops. Comfort and safety are important.

GUIDELINES
Shelters shall be a minimum of 8' 0" wide and have a maximum depth of between 6'0" and 12'0". Bus stops shall feature shelters and provide adequate, comfortable seating. Bus stops shall be equipped with an interactive digital help and route display board. The interactive help and route display board shall feature a function that indicates that a passenger is waiting on a particular approaching bus. All bus stops shall provide the same amenities for passengers that busier routes or larger bus stations may have.

D. PARKING GARAGES
(feeling safe, feeling clear, feeling private, feeling calm, feeling connected)

FROM THE RESEARCH
Concerns over safety and wayfinding in parking areas including parking garages were prominent. Creating designated clearly-marked walking areas helps to make garages safer for the people walking through it, and safer for the drivers through. Concerns over memory and "drifting off" were shown in the research, so creating a more visual way to remember where the car is parked is important. Adding color to in addition to each parking level number can make it easier to remember. Adding speed bumps and signage to crosswalks creates extra precautions for drivers to create a safer walking environment. Adding sidewalks provides an extra layer of safe space for pedestrians.

GUIDELINES
Parking garages shall have clearly-marked sidewalks along garage walls that direct pedestrians to elevators and stairs. Crosswalks shall be present on each level of the parking garage with visible directional signage. There shall be speed bumps on either side of the crosswalk. Each level shall have a color along with a level number.

E. PARKING LOTS
(Feeling safe, feeling clear, feeling private, feeling free)

FROM THE RESEARCH
Concerns about safety and wayfinding in parking lots are widely shared. Creating a color/symbol coded system that shows exactly where cars will be driving and where it is safe to walk will help adults with autism more easily navigate a parking lot. The idea for a circular pick-up/drop-off zone was gleaned from the need for safety and clarity. (See Appendix Page 142.) The minimum of 25’0” radius dimension idea was based on the average length of a car so that a car can be parked along the sidewalk to allow other cars to pass.

GUIDELINES
Parking lots shall connect parking spaces to a destination using sidewalks. The crosswalk shall further protect pedestrians from automobiles with speed bumps and signs for yielding or stopping. Parking spaces shall be separated into clearly-identifiable, marked sections. Wayfinding from the destination shall include visual directions on the sidewalk to parking sections. If a pick-off/drop-off location is needed, its radius shall be 25’0” minimum. The width of the street shall be 24’0” divided into 12’0” lanes.
F. MODIFIED ADA PARKING SPACE  
(Feeling private, feeling safe, feeling free, feeling clear, feeling connected)

FROM THE RESEARCH
Adults with ASD are prone to sensory overload in crowded spaces. An increase of 2’ 0” – 3’ 0” allows for extra room on both the driver and passenger side of the car.

GUIDELINES
Standards for ADA-compliant parking spaces shall be 11’ 0” for cars and 13’ 0” for vans/trucks. 5’ 0” access aisles shall be maintained for both designs.

G. CROSSWALKS  
(Feeling safe, feeling calm, feeling private, feeling clear, feeling free)

FROM THE RESEARCH
As crossing streets can be especially stressful for adults with autism, concern for pedestrian safety was widely shared. Ideas for improved standards for crosswalks included a new standard color because color has a major psychological impact on the perception of space. Magenta, used for the “I Need Assistance Symbol,” (see page 19) now extends to ASD accessible crosswalks, denoting safety and comfort. The research indicates that assistive wayfinding including soft directional lighting and implementing an instructive digital voice can also offer comfort, clarity, and safety. The research also suggests that adults with ASD feel more comfortable and less prone to sensory overload when the walking lanes accommodate at least three people comfortably walking side by side.

GUIDELINES
Crosswalks shall be a minimum of 10’0”
Crosswalk color shall be magenta. (Hex Triplet: #FF00FF)
Crosswalks shall include assistive wayfinding on the pavement.
Crosswalks shall utilize digital voices to provide instructions and (soft) signaling lights for navigation.

H. LIGHTS  
(Feeling safe, feeling calm)

FROM THE RESEARCH
Flashing, flickering, and excessively bright lights impact the wellbeing of many adults with autism. The research suggested that purple, blue, or yellow colors are calming for adults with autism. LED or incandescent light bulbs eliminates the flickering or buzzing affect that fluorescent lights possess and provides a more comfortable environment. 1000 lumens are necessary to have full coverage of light throughout the entire outdoor plane.
H. LIGHTS
(Feeling safe, feeling calm)

GUIDELINES
LED or incandescent light bulbs shall be a low-noise, low-glare, light yellow color, and be designed in fixtures that properly filter light.

I. I NEED ASSISTANCE SYMBOL
(Feeling private, feeling safe, feeling free, feeling clear, feeling connected)

FROM THE RESEARCH
Adults with autism sometimes feel discomfort, anxiety, and/or confusion in (especially unknown) public places. Universally-recognized symbols implemented in public can lessen anxiety, confusion, and stress. Spotting the magenta dot signifies to an adult with autism that someone who is trained/aware of their needs are available to assist them. These dots can also provide assistive printed information in areas where people are not available.

GUIDELINES
The symbol shall be a magenta dot visible from the public right of way.

J. TINY HOMES
(Feeling safe, feeling clear, feeling free, feeling private, feeling calm)

FROM THE RESEARCH
For many adults with autism, (much) smaller living space is desirable (and more affordable). While tiny homes have become a trendy concept, they are worth considering. It is quite difficult to integrate tiny homes into high-density development, so an alternative was conceived that could be better incorporated that are similar to micro/studio apartments that are becoming popular in urban areas. A common challenge is access to transportation. It is recommended that tiny dwellings be no more than a ¼ mile or 5-minute walk from transportation, green space, and medical services for this concept to be most effective. This takes into account limited mobility and the need for quick access in case of emergencies.

GUIDELINES
High-rise building space shall be allocated for “tiny” dwelling units between 300’00” and 400’0” ft². Space in high-rise buildings shall be allocated for residential use, resembling a hostel with individual living spaces with common areas that provide various functions, including shared kitchens and bathrooms. Tiny homes in lower density areas can provide affordable housing opportunities.
K. MULTI-USE TRAILS  
(feeling safe, feeling free, feeling clear, feeling calm)

FROM THE RESEARCH  
There is a great need to lessen confusion, anxiety, and stress in the public realm. Wider multi-use trails with separated uses will make it easier for adults with autism because it lessens conflicts and potential collisions.

GUIDELINES  
Trails shall be 22’0” wide.  
Trails shall be divided into a 10’0” bike lane, 2’0” buffer, and a 10’0” pedestrian lane.  
The bike lane shall be divided into two 5’0” sections traveling in opposite directions.  
The pedestrian lane shall be divided into two 5’0” sections, one for running, one for walking.  
Sections shall be divided using a magenta line.

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L. LIVING WITH RETIREES  
(feeling safe, feeling free, feeling clear, feeling private, feeling calm)

FROM THE RESEARCH  
Living with other individuals increases the feasibility of more independent living for citizens with ASD. A retired person who chooses to assist another person can take many forms including sharing a dwelling unit or living nearby. The research indicated that adults with autism face significant challenges associated with transportation, so if the “buddy” and the adult with autism do not live together, it is recommended that they live no more than a ¼ mile or 5-minute walk away. Access to transportation and other ASD services should also be within this proximity for a greater sense of privacy, and independence and quick access in case of emergencies.

GUIDELINES  
Placement / training / incentive programs shall be established.

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M. INTENTIONAL NEIGHBORING  
(feeling safe, feeling free, feeling clear, feeling calm, feeling connected)

FROM THE RESEARCH  
Intentional neighboring is inviting people to live in a developed community or an integrated network to share their lives. As part of living “intentionally,” many neurotypical adults can become mentors/ambassadors for adults with autism and other vulnerable neighbors.

GUIDELINES  
Intentional living communities shall follow the standards set forth in this document.
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CONTEXT SPECIFIC

1. DOWNTOWN

A. SIDEWALKS
B. STREETS
C. PARKING LOTS
D. PICK UP / DROP OFF
E. WAYFINDING
F. ACCESSORY DWELLING UNITS
G. DUPLEX LIVING
H. INTENTIONAL NEIGHBORING
II. Context-Specific

1. DOWNTOWN

A. SIDEWALKS

(from the research)

Crowded sidewalks can cause anxiety for adults with autism. Depending on the physical context, downtown sidewalks can be as wide as 50'0", but standard sidewalks are typically 5'0"-wide. Accommodating three people (instead of two) who can comfortably walk side-by-side can decrease sensory overload caused by over-crowding on standard sidewalks. The resulting sidewalk design includes a marking in the middle of the sidewalk designating two sections to increase comfort. Research also shows a mid-body height barrier between the walkable path and the road would help adults with autism feel less overwhelmed by cars and other activity taking place in the road.

GUIDELINES

Sidewalks shall be 13' 0" wide.
The walking section shall be 8' 0".
There shall be a magenta thermoplastic strip down the center of the walking section.
There shall be a barrier between the walkable path and the road 3'0" high maximum and 1'0" wide maximum.
There shall be a 4'0" wide planting strip between the barrier and the street curb.
B. STREETS

(from feeling calm, feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Many adults with autism have concerns about accessibility. Downtown street design directly impacts their ability to move around. Multi-modal street design on campuses can increase accessibility and safety, especially those who are unable or unwilling to drive. The research shows that narrower travel lanes typically lead to slower traveling speeds which in turn lowers pedestrian anxiety. Suggested design includes separated bike lanes and (soft) glow-in-the-dark green paint to increase visibility, and landscaped buffers which satisfy the Six Feelings Framework that resulted from the research.

GUIDELINES
Streets through downtowns shall be multi-modal in design.
Drive lanes shall be 10’0” wide.
Streets shall include a 5’0” (minimum width) bike lanes traveling in each direction separated by a 2’0”-3’0” wide buffer.
Bike lanes shall be painted green using (soft) glow-in-the-dark paint.
II. Context-Specific

1. DOWNTOWN

C. PARKING LOTS
(feeling safe, feeling calm, feeling clear, feeling connected)

FROM THE RESEARCH
Downtown parking lots can be challenging for drivers and pedestrians. Creating a color/symbol coded system that shows exactly where cars will be driving and where is safe to walk will help adults with autism navigate a downtown parking lot. The idea for a circular pick-up/drop-off zone was gleaned from the need for safety and clarity. (See Appendix Page 142.) The minimum of 25’0” radius design idea was based on the average length of a car so that a car can be parked along the sidewalk to allow other cars to pass.

GUIDELINES
Parking lots shall connect parking spots to a destination using sidewalks.
The crosswalk shall further protect pedestrians from automobiles with speed bumps and signs for yielding or stopping.
Parking spaces shall be separated into clearly-identifiable, marked sections.
Wayfinding from the destination shall include visual directions on the sidewalk to parking sections.
If a pick-off/drop-off location is needed, its radius shall be 25’0” minimum.
The width of the street shall be 24’0” divided into 12’0” lanes.

D. PICK UP / DROP OFF
(feeling free, feeling safe, feeling clear, feeling calm, feeling connected)

FROM THE RESEARCH
Many adults with autism do not drive to or within downtowns and many rely on others to offer automobile rides to and from destinations. Downtown blocks often have bus stops and on-street parking, but an idea for a designated area for passenger pick up/drop off was gleaned from research. Since adults with autism often have difficulty navigating through overwhelming or crowded spaces, areas for picking passengers up and dropping passengers off can lessen anxiety. Public-private implementation ideas included companies sponsoring pick up / drop off areas, working with transit agencies to prohibit bus stops in the zones and syncing bus stops to take advantage of limited space, surveying businesses within the proximity of the area for input on the percentage of space that would be appropriate for the area. The suggested design includes selected areas on selected city blocks could be designated pick up /drop off areas.

GUIDELINES
A minimum of 20% of the street front on selected blocks shall be designated for pick-up and drop-off purposes.
II. Context-Specific

1. DOWNTOWN

E. WAYFINDING

(Feeling connected, feeling safe, feeling clear, feeling free)

FROM THE RESEARCH

Adults with autism are prone to becoming overwhelmed when trying to navigate busy areas such as downtown areas. The research expressed a desire for a specially-designed wayfinding system to provide clear directions on the sidewalks.

GUIDELINES

There shall be directions, including directional symbols, place names/destinations/landmarks, and instructional copy on all types of walking infrastructure indicating upcoming roads, nearby attractions, bus stops, and bike lanes. Vertical signs shall use interactive maps to accompany the sidewalk wayfinding system.

F. ACCESSORY DWELLING UNITS (ADUs)

(Feeling private, feeling free, feeling connected)

FROM THE RESEARCH

There was support for accessory dwelling units to enhance the relative autonomy of citizens with high-functioning autism. Affordability is important. ADUs can increase the local housing supply and provide more affordable housing options. The research also points to a desire for direct control of the sound and temperature of living environments.

GUIDELINES

Interior accessory dwelling units (ADUs) shall be legal in downtown zones. Downtown ADUs are appropriate in the attic, basement, or other inward facing room of the existing building. Occupants of accessory dwelling units shall have direct access to heating and cooling systems. All new walls, floors, or ceilings constructed to separate units shall comply with sound insulation requirements for unit separations in new buildings.
G. DUPLEX LIVING
(feeling free, feeling private, feeling calm, feeling safe, feeling connected)

FROM THE RESEARCH
Caretaking/mentoring adults with autism is a possibility in duplex homes, matching adults with autism to neurotypical adults. Ideas for programs included “neighbor pairing” where subsidized rent would be available for the caretaker/mentor to incentivize people to take specific training. As adults with autism are sensitive to noise, it was determined that downtown duplex living would work best in top residential units since they are less likely affected by street noise and other residents. Higher units also provide a separation from the outside world giving it a sense of safety, important to adults with autism. Visible access to the road from the safety of home can familiarize the tenant with the streetscape and make them more comfortable with the area.

GUIDELINES
An organized pairing system program shall link adults with autism to veterans who are looking for housing. Soundproof walls shall divide the home into two separate units. The residential unit shall include a variety of high and low lights outside to allow for the appropriate visibility. Lights must not give off sound. Native, low maintenance plants shall be incorporated around the building, and will help minimize outdoor sound. Mailboxes shall be located as close together as possible to allow both residents to interact regularly.

H. INTENTIONAL NEIGHBORING
(feeling safe, feeling free, feeling clear, feeling calm, feeling connected)

FROM THE RESEARCH
Downtown intentional neighboring is inviting people to live in a developed community or an integrated network to share their lives. As part of living “intentionally,” many neurotypical adults can become mentors/ambassadors for adults with autism and other vulnerable neighbors.

GUIDELINES
Intentional living communities shall follow the design standards set forth in this document.
2. URBAN

A. SIDEWALKS
B. STREETS
C. PARKING LOTS
D. PICK UP / DROP OFF
E. WAYFINDING
F. ACCESSORY DWELLING UNITS
G. DUPLEX LIVING
H. INTENTIONAL NEIGHBORING
II. Context-Specific

2. URBAN

A. SIDEWALKS

(feeling calm, feeling clear, feeling safe, feeling free, feeling connected)

FROM THE RESEARCH
Crowded sidewalks can cause anxiety for adults with autism. Depending on the physical context, sidewalks in urban neighborhoods can be 20+ feet-wide, but standard sidewalks are typically 5’0” wide. Accommodating three people (instead of two) who can comfortably walk side-by-side can decrease sensory overload caused by over-crowding on standard sidewalks. The resulting sidewalk design includes a marking in the middle of the sidewalk designating two sections to increase comfort. Research also shows a mid-body height barrier between the walkable path and the road would help adults with autism feel less overwhelmed by cars and other activity taking place in the road.

GUIDELINES
Sidewalks shall be 13’ 0” wide.
The walking section shall be 8’ 0”.
There shall be a magenta thermoplastic strip down the center of the walking section.
There shall be a barrier between the walkable path and the road 3’0” high maximum and 1’0” wide maximum.
There shall be a 4’0” wide planting strip between the barrier and the street curb.
II. Context-Specific

2. URBAN

B. STREETS
(Feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Many adults with autism have concerns about accessibility. Urban street design directly impacts their ability to move around. Multi-modal street design on campuses can increase accessibility and safety, especially those who are unable or unwilling to drive. The research shows that narrower travel lanes typically lead to slower traveling speeds which in turn lowers pedestrian anxiety. Suggested design includes separated bike lanes and (soft) glow-in-the-dark green paint which will increase visibility, and landscaped buffers to satisfy the Six Feelings Framework that resulted from the research.

GUIDELINES
Streets shall be multi-modal.
Drive lanes shall be 10’0” wide.
Streets shall include a 5’0” (minimum width) bike lanes traveling in each direction separated by a 2’0”-3’0” wide buffer.
Bike lanes shall be painted green using (soft) glow-in-the-dark paint.
C. PARKING LOTS
(feeling safe, feeling calm, feeling clear, feeling connected)

FROM THE RESEARCH
Parking lots in urban neighborhoods can be challenging for drivers and pedestrians. Creating a color/symbol coded system that shows exactly where cars will be driving and where is safe to walk will help adults with autism navigate a downtown parking lot. The idea for a circular pick-up/drop-off zone was gleaned from the need for safety and clarity. (See Appendix Page 142.) The minimum of 25’0” radius design idea was based on the average length of a car so that a car can be parked along the sidewalk to allow other cars to pass.

GUIDELINES
Parking lots shall connect parking spots to a destination using sidewalks.
The crosswalk shall further protect pedestrians from automobiles with speed bumps and signs for yielding or stopping.
Parking spaces shall be separated into clearly-identifiable, marked sections.
Wayfinding from the destination shall include visual directions on the sidewalk to parking sections.
If a pick-off/drop-off location is needed, its radius shall be 25’0” minimum.
The width of the street shall be 24’0” divided into 12’0” lanes.
II. Context-Specific

2. URBAN

D. PICK UP / DROP OFF
(feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Many adults with autism do not drive to or within urban neighborhoods and many rely on people offering automobile rides to and from destinations. Urban neighborhoods blocks often have bus stops and on-street parking, but an idea for a designated area for passenger pick up/drop off was gleaned from research. Since adults with autism often have difficulty navigating through overwhelming or crowded spaces, areas for picking passengers up and dropping passengers off can lessen anxiety. Public-private implementation ideas included companies sponsoring pick up / drop off areas, working with transit agencies to prohibit bus stop in the zones and syncing bus stops to take advantage of limited space, surveying businesses within the proximity of the area for input on the percentage of space that would be appropriate for the area. The suggested design includes selected areas on selected city blocks could be designated pick up /drop off areas.

GUIDELINES
A minimum of 20% of the street front on selected blocks shall be designated for pick-up and drop-off purposes.

E. WAYFINDING
(feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Adults with autism are prone to becoming overwhelmed when trying to navigate busy areas such as urban neighborhoods. The research expressed a desire for a specially-designed wayfinding system to provide clear directions on the sidewalks.

GUIDELINES
There shall be directions, including directional symbols, place names/destinations/landmarks, and instructional copy on all types of walking infrastructure indicating upcoming roads, nearby attractions, bus stops, and bike lanes.
Vertical signs shall use interactive maps to accompany the sidewalk wayfinding system.

F. ACCESSORY DWELLING UNITS
(feeling safe, feeling private, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
There was support for accessory dwelling units to enhance the relative autonomy of citizens with high-functioning autism. Affordability is important. ADUs can increase the local housing supply and provide more affordable housing options. The research also points to a desire for direct control of the sound and temperature of living environments.
II. Context-Specific

2. URBAN

F. ACCESSORY DWELLING UNITS
(feeling safe, feeling private, feeling clear, feeling free, feeling connected)

GUIDELINES
Interior accessory dwelling units (ADUs) shall be legal in urban neighborhoods. Downtown ADUs are appropriate in the attic, basement, or other inward facing room of the existing building. Occupants of accessory dwelling units shall have direct access to heating and cooling systems. All new walls, floors, or ceilings constructed to separate units shall comply with sound insulation requirements for unit separations in new buildings.

G. DUPLEX LIVING
(feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Caretaking/mentoring adults with autism is a possibility in duplex homes, matching adults with autism to neurotypical adults. Ideas for programs included “neighbor pairing” where subsidized rent would be available for the caretaker/mentor to incentivize people to take specific training. As adults with autism are sensitive to noise, it was determined that duplex living in urban neighborhoods would work best in top residential units since they are less likely affected by street noise and other residents. Higher units also provide a separation from the outside world giving it a sense of safety, important to adults with autism. Visible access to the road from the safety of home can familiarize the tenant with the streetscape and make them more comfortable with the area.

GUIDELINES
An organized pairing system program shall link adults with autism to retirees and/or veterans who are looking for housing. Soundproof walls shall divide the home into two separate units. The residential unit shall include a variety of high and low lights outside to allow for the appropriate visibility. Lights must not give off sound.

H. INTENTIONAL NEIGHBORING
(feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Intentional neighboring in urban neighborhoods invites people to live in a developed community or an integrated network to share their lives. As part of living “intentionally,” many neurotypical adults will become mentors/ambassadors for adults with autism and other vulnerable neighbors.

GUIDELINES
Intentional living communities shall follow the design standards set forth in this document.
two
CONTEXT SPECIFIC

3. SUBURBAN

A. STREETS
B. WAYFINDING
C. ACCESSORY DWELLING UNITS
D. DUPLEX LIVING
E. TINY HOMES
A. STREETS

(Feeling safe, feeling clear, feeling calm, feeling connected)

FROM THE RESEARCH

While suburban streets are not ordinarily multi-modal, a new suburban multimodal street design has the potential to increase accessibility and safety, especially for those unable or unwilling to drive. To provide a feeling of safety and to lessen anxiety, narrower travel lanes can encourage slower automobile speeds. Separated bike lanes may encourage more adults with autism to become cyclists. Soft glow-in-the-dark green bike lane paint can increase visibility providing more safety and clarity for adults with adults with autism. Landscaped buffers will also increase safety and improve the aesthetics of the streetscape.

GUIDELINES

Streets shall be multimodal.
Bike lanes shall be on one side of the street, with one lane traveling in each direction.
Bike lanes shall be separated from drive lanes with an 8’0” wide parking lane in between.
Automobile lanes shall be no more than 10’0” wide.
Bike lanes shall be painted green using (soft) glow-in-the-dark paint.
II. Context-Specific

3. SUBURBAN

B. WAYFINDING
(feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Adults with autism are prone to becoming overwhelmed when attempting to navigate suburban communities. The research expressed a desire for a specially-designed wayfinding system to provide clear directions on the sidewalks and other pedestrian paths.

GUIDELINES
There shall be directions, including directional symbols, place names/destinations/landmarks, and instructional copy on all types of walking infrastructure indicating directions to the various transportation options and nearby attractions. Vertical signs shall use interactive maps to accompany the sidewalk wayfinding system.

C. ACCESSORY DWELLING UNITS
(feeling safe, feeling clear, feeling free, feeling connected, feeling private)

FROM THE RESEARCH
There was support for accessory dwelling units to enhance the relative autonomy of citizens with high-functioning autism. Affordability is important. ADUs can increase the local housing supply and provide more affordable housing options. The research also points to a desire for direct control of the sound and temperature of living environments. Suburban communities (with side yards and backyards) are easily suited to accommodate ADUs.

GUIDELINES
There shall be directions, including directional symbols, place names/destinations/landmarks, and instructional copy on all types of walking infrastructure indicating directions to the various transportation options and nearby attractions. Vertical signs shall use interactive maps to accompany the sidewalk wayfinding system.
II. Context-Specific

3. SUBURBAN

D. DUPLEX LIVING

(Feeling safe, feeling clear, feeling free, feeling connected, feeling private)

FROM THE RESEARCH
Caretaking/mentoring adults with autism is a possibility in duplex homes, matching adults with autism to neurotypical adults. Ideas for programs included “neighbor pairing” where subsidized rent would be available for the caretaker/mentor to incentivize people to take specific training. Many suburban communities already accommodate double/connected residential structures.

GUIDELINES
An organized pairing system program shall link adults with autism to veterans who are looking for housing. Soundproof walls shall divide the home into two separate units. Native, low maintenance plants shall be incorporated around the building, and will help minimize outdoor sound.
two

CONTEXT SPECIFIC

4. MULTIMODAL HUB

A. SIDEWALKS
B. WAYFINDING
C. BUS STOPS
II. Context-Specific

4. MULTIMODAL HUB

A. SIDEWALKS

(Feeling calm, feeling clear, feeling safe, feeling free, feeling connected)

FROM THE RESEARCH

Transportation hubs connecting buses or trains, automobiles, and bicycles must properly accommodate pedestrians, including adults with autism. While sidewalk dimensions will vary based on geographic context, standard sidewalks can accommodate two-people with a standard width of 5’0”. The research shows a sidewalk accommodating three people walking side-by-side comfortably will decrease sensory overload caused by over-crowding. Multimodal hubs will require much wider sidewalk widths. Research shows a strip down the middle of the walkable path designating two sections has the potential to increase comfort. Research suggests implementing a mid-body height barrier between the walkable path and the road would help adults with autistic feel less overwhelmed by cars and other activity taking place in the road, as well as vegetative buffers.

GUIDELINES

Multimodal standard sidewalk dimensions shall be 13’ 0” wide. The walkable path shall be 8’ 0”. There shall be a magenta thermoplastic strip down the center of the walkable path. There shall be a barrier between the walkable path and the road 3’0” high maximum and 1’0” wide maximum. There shall be a planting strip between the barrier and the curb 4’0” wide, minimum.
II. Context-Specific

4. MULTIMODAL

B. WAYFINDING
(feeling safe, feeling clear, feeling free, feeling connected)

FROM THE RESEARCH
Adults with autism are prone to becoming overwhelmed when trying to navigate busy areas. Multimodal nodes can be particularly confusing to pedestrians, and especially to adults with autism. The research expressed a desire for a specially-designed wayfinding system to provide clear directions on the sidewalks and other pedestrian paths.

GUIDELINES
There shall be directions, including directional symbols, place names/destinations/landmarks, and instructional copy on all types of walking infrastructure indicating directions to the various transportation options and nearby attractions.
Vertical signs shall use interactive maps to accompany the sidewalk wayfinding system.

C. BUS STOPS
(feeling safe, feeling free, feeling clear, feeling connected, feeling calm)

FROM THE RESEARCH
Multimodal bus stops will likely be particularly crowded and have the potential to cause anxiety and stress. Large bus stop designs are necessary in multimodal hubs to provide ample seating for waiting travelers. Shelters are especially important for adults with autism. Research indicates that confusion and anxiety associated with transportation may be alleviated by providing a digital help and display board in which passengers can see arrival times, route information, and call for assistance if needed.

GUIDELINES
Bus stops shall be 12'0" to provide maximum space for travelers.
Bus stops shall be covered and provide comfortable seating.
Bus stops shall be equipped with an interactive digital help and route display board.
The interactive help and route display board shall feature a function that indicates that a passenger is waiting on a particular approaching bus.
two

CONTEXT SPECIFIC

5. RETAIL

A. SIDEWALKS
B. STREETS
C. PARKING LOTS
A. SIDEWALKS

(from the research)

Retail centers and establishments would benefit from wider sidewalks, but sidewalks there often conform to the standard 5’0” width. The research shows a sidewalk accommodating three people walking side by side comfortably can decrease sensory overload caused by crowding. Research also shows a mid-body height barrier between the walkable path and a street or parking lot would help adults with autism feel less overwhelmed by cars in adjacent parking lot or street. This barrier shall be no wider than 2’0”, so as not to hinder or create a hazard.

GUIDELINES

From the front of the retail building to the back of curb shall be 12’0” in width. The walkable path shall be at least 8’ 0” wide. There shall be a barrier 2’ 0” wide maximum and 3’ 0” tall maximum on either side of the walkable path. This barrier shall be either a bollard or a planter.
II. Context-Specific

5. RETAIL

B. STREETS

(from feeling safe, feeling clear, feeling connected, feeling calm)

FROM THE RESEARCH

Research shows that there are general concerns about accessibility, clarity, and safety on streets. Making all retail streets multi-modal can increase accessibility and safety, especially for adults with autism who do not drive. Narrower travel lanes typically lead to slower speeds which can increase safety and lower anxiety for pedestrians. Bike lanes can offer other options for travel for adults with autism and a (soft) glow-in-the-dark green paint can increase visibility.

GUIDELINES

Streets traveling through commercial land uses shall be multi-modal.

Directly in front of stores shall be bike lanes in each direction, no less than 4'0" wide, each.

Bike lanes shall be painted a (soft) green using glow-in-the-dark paint and shall be separated by 1'0"-wide white, reflective lines from the drive lanes.

Drive lanes shall be no more than 10'0" wide.
C. PARKING LOTS
(from the research)

Parking lots are important in many community’s retail establishments and centers, but parking and dropping off passengers in shopping areas can be challenging for adults with autism whether they are driving or being dropped off. Creating a color/symbol coded system that shows exactly where cars will be driving and where is safe to walk will help adults with autism navigate a retail environment. The idea for a circular pick-up/drop-off zone was gleaned from the need for safety and clarity. (See Appendix Page 118.) The minimum of 25’0” radius design idea was based on the average length of a car so that a car can be parked along the sidewalk to allow other cars to pass.

GUIDELINES
Parking lots shall connect parking spots to a destination using sidewalks. The crosswalk shall further protect pedestrians from automobiles with speed bumps and signs for yielding or stopping. Parking spaces shall be separated into clearly-identifiable, marked sections. Wayfinding from the destination shall include visual directions on the sidewalk to parking sections. If a pick-off/drop-off location is needed, its radius shall be 25’0” minimum. The width of the street shall be 24’0” divided into 12’0” lanes.
two

CONTEXT SPECIFIC

6. CAMPUS

A. PARKING LOTS
B. SIDEWALKS
C. STREETS
D. WAYFINDING
E. PICK UP / DROP OFF
A. PARKING LOTS

(from the research)

FROM THE RESEARCH
Arriving and leaving educational, office, or medical campuses can be challenging. Concerns about safety and wayfinding in parking lots are widely shared. Creating a color/symbol coded system that shows exactly where cars will be driving and where is safe to walk will help adults with autism navigate a parking lot. The idea for a circular pick-up/drop-off zone was gleaned from the need for safety and clarity. (See Appendix Page 142.) The minimum of 25’0" radius dimension idea was based on the average length of a car so that a car can be parked along the sidewalk to allow other cars to pass.

GUIDELINES
Parking lots shall connect parking spots to a destination using sidewalks.
The crosswalk shall further protect pedestrians from automobiles with speed bumps and signs for yielding or stopping.
Parking spaces shall be separated into clearly-identifiable, marked sections.
Wayfinding from the destination shall include visual directions on the sidewalk to parking sections.
If a pick-off/drop-off location is needed, its radius shall be 25’0” minimum.
The width of the street shall be 24’0” divided into 12’0” lanes.
II. Context-Specific

6. CAMPUS

B. SIDEWALKS
(feeling free, feeling calm, feeling safe, feeling clear, feeling connected)

FROM THE RESEARCH
Pedestrian activity on campuses can often be crowded and frenetic. A new standard for sidewalks that accommodate three people walking comfortably side-by-side will decrease sensory overload caused by over-crowding. 5’0” is the usual minimum for a 2-person sidewalk. The research determined a mid-body height barrier between the walkable path and the road will assist adults with autism to feel less overwhelmed by nearby cars and other distractions that occur near streets. Adults with autism often have diverse sets of motor impairments and properly-implemented barriers will benefit.

GUIDELINES
From the front of building to the edge of curb the sidewalk shall be 12’ 0” in width. The walking path shall be 8’ 0” wide. There shall be a barrier 2’ 0” wide maximum and 3’ 0” tall maximum on either side of the walkable path. The barrier shall be either a bollard or a planter.

C. STREETS
(feeling calm, feeling safe, feeling clear, feeling calm, feeling connected)

FROM THE RESEARCH
Adults with autism have concerns about how accessibility and street design directly impacts their ability to move around. Multi-modal street design on campuses can increase accessibility and safety, especially those who are unable or unwilling to drive. The research shows that narrower travel lanes typically lead to slower traveling speeds which in turn lowers pedestrian anxiety. Suggested design includes separated bike lanes and the (soft) glow-in-the-dark green paint will increase visibility, and landscaped buffers which satisfy the Six Feelings Framework that resulted from the research.

GUIDELINES
Streets through educational institutions shall be multi-modal. Drive lanes shall be 10’0” wide. Streets shall include a 5’0” (minimum width) bike lanes traveling in each direction separated by a 2’0”-3’0” wide buffer. Bike lanes shall be painted green using (soft) glow-in-the-dark paint.
D. WAYFINDING  
*(feeling safe, feeling clear, feeling free, feeling calm, feeling connected)*

FROM THE RESEARCH  
Adults with autism are prone to becoming overwhelmed when trying to navigate busy areas such as campuses. The research expressed a desire for a specially-designed wayfinding system to provide clear directions on the sidewalks.

GUIDELINES  
There shall be directions, including directional symbols, place names/destinations/landmarks, and instructional copy on all types of walking infrastructure indicating upcoming roads, nearby attractions, bus stops, and bike lanes. Vertical signs shall use interactive maps to accompany the sidewalk wayfinding system.

E. PICK UP/ DROP OFF LOCATION  
*(feeling safe, feeling clear, feeling calm, feeling free, feeling connected)*

FROM THE RESEARCH  
Many adults with autism do not drive, and many rely on people offering automobile rides to schools, work, and medical campuses. A designated area for designated pick up/drop off areas provides easy access and quick/efficient drop off function can benefit passengers and drivers. Since adults with autism often have difficulty navigating through overwhelming or crowded spaces, particularly on campuses, areas for picking passengers up and dropping passengers off can lessen anxiety. The suggested design pushes people who park away from the designated area around a destination which alleviates crowding. Color-coding auto-waiting areas can simplify communication between drivers and passengers.

GUIDELINES  
The entrance and exit to the designated parking area shall be clearly separated. Drivers dropping off or picking up passengers will be guided toward the building’s entrance. Drivers not picking up or dropping off passengers shall be directed away from the entrance. The design shall have a moving lane and an idling (temporary waiting) lane. The idling lane shall be magenta (green and yellow for additional lanes) and located adjacent to the sidewalk for pick-up and drop-off. Speed bumps must be constructed across both lanes. A shelter near the idling lane, using the bus stop designs shall also be included. A separate space/lot shall allow for cars to park out of the way if they will be there for an extended period time.
two

CONTEXT SPECIFIC

7. PARK ACCESS

A. SIDEWALKS
B. STREETS
C. PARKING LOTS
II. Context-Specific

7. PARK ACCESS

A. SIDEWALKS
(four feelings: free, calm, clear, connected)

FROM THE RESEARCH
Sidewalks in and around parks must consider the needs of adults with autism. A new standard for sidewalks that accommodate three people walking comfortably side-by-side will decrease sensory overload caused by over-crowding and work well in parks. 5’0” is the usual minimum for a 2-person sidewalk. The research determined a mid-body height barrier between the walkable path and the road will assist adults with autism to feel less overwhelmed by nearby cars and other distractions that occur near streets. Adults with autism often have diverse sets of motor impairments and properly-implemented barriers will benefit.

GUIDELINES
From the front of building to the edge of curb the sidewalk shall be 12’ 0” in width. The walking path shall be 8’ 0” wide. There shall be a barrier 2’ 0” wide maximum and 3’ 0” tall maximum on either side of the walkable path. The barrier shall be either a bollard or a planter.

B. STREETS
(four feelings: safe, clear, free, connected)

FROM THE RESEARCH
Research shows that there are concerns about independence in travel, navigable, safe, and accessible infrastructure near parks. Making all roads multi-modal in design increases accessibility and safety for all, especially those unable or unwilling to drive. Narrower travel lanes typically lead to slower traveling speeds, which increases safety and lowers anxiety in the pedestrian experience. Separated bike lanes allow for easy travel, and the (soft) glow-in-the-dark green paint will increase visibility at all times of the day. Landscape buffers increase safety and lower anxiety.

GUIDELINES
Streets traveling through parkland shall be multi-modal, accommodating more than automobiles. Drive lanes shall be no more than 10’0” wide. Bike lanes shall be a minimum of 5’0” wide in both directions. The bike lanes shall be separated from the street by a landscaped buffer at least 3’0” in width. Bike lanes shall accompany adjacent sidewalks that are separated by a 2’0”-wide landscaped buffer. Bike lanes shall be painted with (soft) glow-in-the-dark green paint.
C. PARKING LOTS

(feelimg safe, feeling clear, feeling free, feeling connected, feeling calm)

FROM THE RESEARCH

Parking and dropping off passengers in parks can be challenging for adults with autism whether they are driving or being dropped off. Creating a color/symbol coded system that shows exactly where cars will be driving and where is safe to walk will help adults with autism navigate a downtown parking lot. The idea for a circular pick-up/drop-off zone was gleaned from the need for safety and clarity. (See Appendix Page 142.) The minimum of 25’0” radius design idea was based on the average length of a car so that a car can be parked along the sidewalk to allow other cars to pass.

GUIDELINES

Parking lots shall connect parking spots to a destination using sidewalks.

The crosswalk shall further protect pedestrians from automobiles with speed bumps and signs for yielding or stopping.

Parking spaces shall be separated into clearly-identifiable, marked sections.

Wayfinding from the destination shall include visual directions on the sidewalk to parking sections.

If a pick-off/drop-off location is needed, its radius shall be 25’0” minimum.

The width of the street shall be 24’0” divided into 12’0” lanes.
three

APPENDIX
I. Objectives

People with autism have particular needs that most professionals (such as city planners who plan and design communities) haven’t yet considered, even as autism has become increasingly prevalent in our society. Autism Spectrum Disorder (ASD) affects millions in the United States, including families and friends of people with ASD. Community planners can learn to improve the lives of people with autism by first understanding Autism Spectrum Disorder and why education about ASD is needed to properly serve their needs. This research seeks to broaden required public participation to understand the needs of adults with high-functioning Autism Spectrum Disorder. Our research is specific to city planning and fills a gap between community building and urban design and the rich literature and research found in public health (especially mental health), psychology, and special education.

This research seeks to discover how and what kinds of new planning ideas and tools can create quality living environments for adults with autism.

Beyond existing literature, this research will employ focus groups. Focus group questions for individuals with high-functioning ASD (we will refer to high-functioning ASD as “autism” from this point forward with the understanding that the research is based on meeting the needs of high-functioning adults with autism). We will determine what kind of community they want to live in and how planners can help them thrive in the public realm. The research will also include a design charrette to help discover day-to-day living experiences of adults with autism. Beyond the focus group study, we will examine existing planning tools such as zoning codes, methods such as design guidelines, and civic (and private) infrastructure that might better serve adults with autism.

Our main research question is how adults with autism can inform planners about the issue of inclusive built environments.
II. Background and Rationale

City planners are professionals who attempt to comprehensively shape the built environment. Through a variety of tools, the most central of which is the legally-binding zoning ordinance, planners control where and what kinds of buildings will be built, where nature will be preserved, and what transportation systems will be used. City planning is a vast and multi-disciplinary field.

The 1960s witnessed the beginning of a sustained pushback against what many citizens viewed as heavy-handed urban planning interventions, which had often impacted the most vulnerable segments of the population. Jane Jacobs led a grassroots fight against Robert Moses, a transportation planner who sought to demolish New York City’s then-impooverished SoHo neighborhood to build a freeway.\(^1\) Thousands of low income citizens of St. Louis, MO, were evicted via eminent domain and relocated into the Pruitt-Igoe public housing towers in 1954. The project failed dramatically and the buildings were demolished less than 20 years later.\(^2\) These landmark events marked a broader turn in the profession towards greater inclusion of all members of the public, preferably as early on in the planning process as possible. A branch of the field, advocacy planning, is focused on proactively bringing marginalized groups (often defined in racial, cultural, and economic terms) into the process.\(^3\) The universal design movement of the 1980s, led by architect Ronald Mace, aimed at better accommodating people with mobility impairments and/or people with disabilities (especially the mobility-, hearing-, and vision-impaired) and led to the Americans with Disabilities Act of 1990 and an expansion of the Fair Housing Act of 1968 to include the disabled.\(^4\)

It is in this tradition that we seek, through our focus group and design charrette research, to better understand how young adults with autism spectrum disorder (ASD) experience the built environment in order to inform the planning profession. Our preliminary discussions with Dr. Emilio Amigo, clinical psychologist at Amigo Family Counseling, LLC, have indicated that many adults with autism “fall off the cliff,” as they age out of childhood support programs while continuing to lack the skills for independent living.\(^5\) Of adults with autism between the age of 21 to 25, less than 17% have ever lived independently.\(^6\) Only 16% of young adults with autism are employed full-time, according to research by the National Autistic

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6 Amigo, Dr. Emilio. (2017, October 17). Office meeting with Professor Kyle Ezell.
Society of Wales. Automobile drivers with ASD report lower driving abilities and more accidents and citations. Research has shown that the parents of children with autism are more prone to mental health issues as a result of caregiving and the burdens that entails. Parents report significant unmet needs, and the caregiving burden is associated with a pessimistic outlook in mothers. We do not assume that independence, a culturally-prescriptive concept, is what adults with high-functioning autism want or need. A preliminary investigation from the literature makes it clear, however, that many of them and their families’ daily challenges concern housing, transportation, and the general built environment, all of which are major topics that fall within the urban planning domain. Our research may allow us to formulate recommendations for use by planning professionals, elected officials, real estate developers, and others who wish to better accommodate adults with autism.

The following challenges may not all be present in all individuals with autism, but they indicate the scope of what must be considered when making planning decisions. Studies show that people with autism are more prone to stress, anxiety, and sensory overload. This overload is thought to be rooted, in part, in a more intense cognitive processing of sound stimuli. Individuals with autism suffer from higher rates of sleep problems, related to these auditory issues. Light intensity and noise were shown to disproportionately adversely affect the learning of children with autism. There is a host of other psychological issues associated with the disorder: social anxiety, agoraphobia, attention deficits, obsessive behaviors, forgetting consequential tasks, and depression.

Our questioning may allow us to obtain useful qualitative information regarding, for example, when, where, and how the built environment serves as a provoking nuisance to adults with autism. Our role as planners is to translate and extend such principles into planning policy and offer necessary remedies where possible.

There is a century-long precedent of sensory nuisances providing legal and practical justification for zoning restrictions, e.g. requiring that a noisy factory locate hundreds of yards from any residential buildings. This precedent,
especially when taken with the “reasonable accommodation” requirement of the 1973 Rehabilitation Act, points towards the potential drafting of best-practices guidelines for the accommodation of those bearing an atypical sensory sensitivity.

There is an emerging discipline of “therapeutic” environmental design, though it rarely focuses on adults with autism. Dementia patients who spent time in traditional Japanese gardens exhibited reduced heart rates, improved short- and long-term memory recall, and improved behavioral symptoms. We have to carefully consider, however, the extent to which the results of research about other mental impairments carry applicability to autism. The disorder brings with it some memory impairments, for example, but these are known to differ in nature from impairment in those with medial temporal lobe epilepsy disorder. Research has shown that bus stops without sidewalks or unfamiliar stops are stressful to the visually impaired, but blindness differs from the visual sensory issues that can attend autism.

While there is virtually no direct city planning research on the public participation process and tools planners use in the practices that is specific to people with autism, there is ASD-specific work regarding landmarks and individual structures. For instance, permanent landmarks have been found to help adults with the disorder orient themselves. Architects and interior designers have proposed guidelines for designing homes for those with autism. Our role as planners is to translate and extend such principles into city planning policy and practice.

Zoning is the legal mechanism through which land use decisions and community design ideas are implemented. Autism-standard design practices can be made to be compatible with local zoning codes if more is known about the needs of adults with autism. Zoning can, on the one hand, encourage best practices and help a community establish its form and function. For example, the usual suburban home exists within a legally-prescribed geographic one specific to “single-family residential” buildings. It may be illegal to provide alternative housing arrangements that would be more desirable for those with autism if they are deemed prohibited land uses as written and codified in a community zoning code and/or prohibited with the laws of homeowners’ associations. Group homes have been found to produce favorable outcomes for adults with autism as well as for those with other developmental disabilities. There is a fraught history of group homes in many a

community’s zoning framework that fall into a land use category distinct from “single-family residential,” where proposals for new group homes are denied within single-family residential areas. 29 The experience of aging populations who face many of the same issues as adults with autism in terms of reduced functional independence, is instructive. Microhousing, defined as apartments with square footage as low as 200 feet, and accessory dwelling units have increased the supply of affordable housing where implemented. 30 They can enable a middle ground whereby those needing care can be in proximity to care while still gaining a measure of independence. 31 Studies show that zoning is a current barrier preventing wider implementation of such units. 32 In addition to prescribing what housing types may exist where, local zoning policy heavily influences the traffic volumes and amount of green space that will occur in an area. One study demonstrated that occupants of neighborhoods with lower automobile “burdens” and higher concentrations of open green space experienced less stress and reported higher levels of good health. 33

In the field of planning, a robust public participation process is essential, for reasons both ethical (note the 20th century abuses cited above) and practical (the more citizens involved, the better the information collected). There is reason to believe the standard practice of the public meeting may be somewhat exclusionary of adults with autism. Given the neuroatypicality of our research subjects, we have relied on literature to form infer ways that might improve the quality of their involvement.

Our review has shown that participation improves with an early introduction of meeting materials to everyone, regardless of disability, and by allowing someone who knows the person well to help mediate the interview. 34, 35 Adults with autism with an understanding of the content in an upcoming public meeting are more responsive, confident, and able to participate in a public setting. Additionally, the involvement of parents in the participatory process further enhances the quality of the research through the addition of other perspectives on the issues. 36 Contributing factors here include securing transportation arrangements and improved motivation. A focus group study conducted by Cumbria County in the United Kingdom found that phrasing proposals and issues in a literal way can remove confusion in the communication process for many with autism. 37

We anticipate gaining a granular and intimate perspective of how young adults with autism view their built environment. Our questioning will avoid planning terminology such as “zoning,” “accessory dwelling unit,” and “transit corridor.” It will broadly deal with subjects like the respondents’ living arrangements, where they travel on an average day, their ambitions, and their daily frustrations. Only later, in the analysis phase, will we determine the planning relevance, if any, of the responses.

Focus groups and design charrettes are known for eliciting qualitative and personal responses. Planners often deal with the birds-eye view, analyzing a region’s demographics and finances, constructing maps, and other general key aspects. The troubled histories of Robert Moses, Pruitt Igoe, and others demonstrate a hard-won truth in the field: a plan is fatally incomplete without an intimate understanding of how affected residents actually live and what their aspirations actually are. Today’s planning practice already affects adults with autism. We hope to better understand how the planning practice can be enhanced to better serve them.

One of the two main diagnostic criteria for autism spectrum disorder is the presence of “persistent deficits in social communication and social interaction across multiple contexts.”38 This presents a unique and serious challenge in conducting a focus group, a format that involves the eliciting of private viewpoints in a group context. There is a risk of the interview process failing, due to one or more participants becoming anxious or otherwise non-cooperative. The interview will be conducted by Dr. Emilio Amigo, an aforementioned clinical specialist in autism. He will be speaking with a group of young adults with which he has a longstanding professional relationship, in his context as a group therapy leader at Amigo Family Counseling. The interviewees have a prior familiarity with each other. All individuals involved in the process of researching and framing the focus group questions have completed CITI Human Research Subject Certification, although they will not interact with the subjects themselves. This includes training on the precautions that must be taken when interviewing or otherwise studying vulnerable human subjects.

There is research indicating that those with autism perform better in novel social situations, such as our proposed focus group, if they have been briefed in detail beforehand (“pre-taught”) about what to anticipate.39 We have been in continuous communication with Dr. Amigo, and have instructed him on how he might brief the subjects. He will bring his own clinical expertise and personal understanding of each unique test subject to bear in how he ultimately chooses to conduct both this briefing process and the interview itself.

III. Procedures

A. Research Design

Process Summary

Focus Groups

The objective of the focus group process is to fill the gap between existing knowledge of the needs of adults with autism and the practice of city planning. We will do this by creating scenarios representing common challenges or situations in the daily lives of adults with autism. Dr. Emilio Amigo will facilitate and guide the focus group using our process design.

Focus Group 1

To determine the struggles or challenges related to city planning faced by people on the autism spectrum:

A focus group made up of Dr. Amigo’s longstanding clients who are young adults with ASD (all age 18 and older) will answer his questions.

General topics will be provided to Dr. Amigo that will prompt the focus group participants to describe their daily activities in the community.

Topic areas such as transportation, housing, work/school, and recreation will be discussed. Photos of these topics will be provided to stimulate discussion.

Dr. Amigo is a licensed clinical therapist and a facilitator who has earned the trust of his clients, who are accustomed to the focus group setting. Dr. Amigo’s clients visit in groups for years.

Qualitative data will either be recorded by a contracted stenographer. No personal identifiers will be collected, and their privacy will be protected, even though this material is not sensitive.

Dr. Amigo will focus on any challenges that the participants face in their everyday life within the aforementioned categories.

Because Dr. Amigo is a licensed clinical psychologist he will make sure that his patients will be comfortable and not harmed in any way.

Focus Group 2

To determine the struggles or challenges related to city planning faced by people on the autism spectrum from the perspective of parents of adults with autism (critical for completing the adults with autism subject perspectives):

A focus group made up of Dr. Amigo’s longstanding parents of his clients who are young adults with ASD (all age 18 and older) will answer his questions by a CITI-trained/approved facilitator.

General topics will be provided to the CITI trained/approved facilitator that will prompt the parents focus group participants to describe the daily activities of their adult children in their communities.
Topic areas such as transportation, housing, work/school, and recreation will be discussed. Photos of these topics will be provided to stimulate discussion.

Qualitative data will either be recorded on an audio recording device. No personal identifiers will be collected, and their privacy will be protected, even though this material is not sensitive.

[These focus groups were be held on January 18, 2018.]

Planning and Design Charrette

Qualitative data from the two focus groups will inform a three-day long charrette-style public participation session to collect further information from participants about the preferences of adults on the Autism Spectrum and their parents that will help planners and designers create better communities. [A charrette is a planning and architecture term for a meeting intended to create a collaborative atmosphere for a variety of stakeholders who come together to plan for a future vision.] This charrette will be managed and constructed by a Graduate Level Workshop Course (Ohio State’s Knowlton School’s CRPLAN 6010 Planning Innovations) and a Junior Planning Studio (CRPLAN 4900). Participants will include multidisciplinary experts from the fields of public health, counseling, architecture, civil engineering, city and regional planners, landscape architects, OSU planners and designers, volunteers, parents of adults with autism, and community leaders (among other possibilities). [The charrette was held in Knowlton Hall at The Ohio State University on February 21-23.]

B. Sample

FOCUS GROUPS:

The recruitment process will be conducted through Autism Living, a Columbus, Ohio 501c3 non-profit corporation. Autism Living is the agency that is working with students in a City and Regional Planning studio course. Autism Living is an organization made up of parents of adults with autism. Dr. Emilio Amigo is the licensed clinical therapist whose young adult clients are some of the parents in Autism Living. Recruiting for this focus group corresponds with the natural client-doctor relationship. Nineteen adults with autism and twenty-three parents participated. Investigators obtained verbal consent from the adults with autism focus group and from the parent’s focus group. Dr. Amigo asked the participants to follow up with further thoughts or comments related to the focus group discussion. Dr. Amigo will collect this information for us to make sure there are no personal identifiers before sending on the information to investigators.

CHARRETTE:

Clients of Dr. Amigo identified for the charrette will be those who participated in the focus groups. Other appropriate participants will be identified by Autism Living, the advisory organization to the graduate workshop and the undergraduate studio. The Knowlton School of Architecture have established connections with policy makers, infrastructure designers, land use experts, development site planners, and zoning professionals who agreed to participate in the policy, ideas, and design activities. Faculty at Knowlton School have contacts at the Nisonger Center whose focus is mental health and developmental disabilities counselors who will also participate, and Knowlton School faculty have connections to Counseling Education in the College of Human Ecology. Parents of the adults with autism from the focus groups will also be invited through Dr. Amigo.
C. Measurement / Instrumentation

This study attempts to gather the information about the challenges adults with autism experience in the built environment. Through examining the everyday living experiences of people with autism we will explore the phenomena of accessibility of community environments for adults with autism. Focus groups are the primary tool for this research, asking adults with autism to identify transportation, housing, urban environment, and city infrastructure challenges and how they understand the position of adults with disabilities within in relation to city planning outcomes in housing, transportation and recreation all of which influence infrastructure design. Questions are crafted to avoid invoking measurement effect or desirability effects, asking only for respondents to volunteer information about their experiences.

Names will not be recorded. Identifying information will be masked or deleted. Transcripts in the focus groups will be deleted once qualitative data are collected and checked for accuracy. All data will be kept on password protected computers or stored in locked file cabinets in the PI’s office. The PI will scrutinize all transcripts and notes to insure that all identifying information is removed. There are no more than minimal risks.

CHARRETTE

Professionals from a wide variety of related disciplines, adults with autism, and parents of adults with autism will take the ideas from the focus groups and create infrastructure designs, planning policies, and new ideas gleaned from the data. This information will be used to provide a framework for the planning/urban design profession.

Before focus groups and the charrette are conducted, all participants will be notified of their ability to withdraw from the study without repercussion. All participants will be informed of the need to verify consent to participate in the research study. Consent verification will be performed before the focus group is conducted. All focus groups will be recorded or a stenographer will be used to maintain accuracy in data gathering. When a stenographer is used, students will make notes for context that would otherwise be lost without audio or video. All subjects will be notified of the recording or dictation before the focus group is conducted. All participants will be informed that focus groups are projected to last around two hours before the focus group is conducted. If, during the research period, focus groups are observed to last for a significantly longer or shorter duration, participants will be notified of more accurate projections in the focus groups’ duration.

RISKS

While there are no anticipated circumstances where confidentiality would need to be broken, there are always risks involved in focus groups such as the one we are proposing. (For instance, a client of Dr. Amigo’s may decide to put her/himself or others in danger somehow or otherwise break the law during the focus group period. This would be highly improbable, but possible. Confidentiality may also be broken if the participants choose to talk about the focus group content after it is finished.

D. Internal Validity

Focus group processes were crafted to avoid invoking measurement effects of desirability effects, asking only for respondents to volunteer information about their own experience. Additionally, the focus group format allows a drift into interpretive results. This further reduces risks of speculation and false interpretation on the part of the researchers.

E. Data Analysis

This study is concerned with descriptive accounts that provide data on the daily activities of transportation, housing, recreation, and work/education reported in the participants of the focus group and design ideas from the charrette. The results will be evaluated in order to find out how city planners can improve communities through changes in
public participation processes, zoning laws, and other tools that professional planners use. The analysis will start from the transcripts of the focus groups and design ideas from the charrette, then the initial themes and ideas will be identified in order to organize the data. These themes will be grouped into a conceptual framework (transportation, housing, recreation, work/education) and grouped under a smaller number of subcategories.
VI. Bibliography


Amigo, Dr. Emilio. (2017, October 17). Office meeting with Professor Kyle Ezell.


Hadacheck v. Sebastian (December 20, 1915).


FOCUS GROUP

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2. FOCUS GROUP EXPLANATORY NARRATIVE

The first step in collecting ideas from adults with autism and their parents, was hosting two focus groups which discussed planning related issues for adults with autism. The goal of the focus group was to get an idea of what areas concern and matter to adults with autism and their parents. These discussion groups were led by Dr. Emilio Amigo, Kyle Ezell, Rick Stein and Gala Korniyenko. Participants were adults with autism in one focus group and their parents in another focus group. Adults with autism and their parents were split into two groups so that the answers of either group would not influence the other (i.e. parents directing their children’s answers).

Participants were selected through association with a local psychologist. Rick Stein is a representative for Autism Living (the client of this research) and had connections with Dr. Amigo Family Counseling. The participants of the focus groups are volunteers from Dr. Amigo’s clientele who desired to share their ideas and opinions. For convenience and comfort, the focus groups were held at Dr. Amigo’s office.

To begin each focus group, the consent agreement was read aloud to the entire participant group. Each participant verbally agreed to the conditions of participation. It was made sure that participants understood what they were participating in before beginning the focus groups.

Each focus group was presented with three general planning categories (transportation, housing, and recreation) for which to discuss. General and specific questions were asked regarding each of these topics to stimulate conversation amongst the participants.

The focus group with the parents of adults with autism was recorded and later transcribed. The focus group of the adults with autism was transcribed by a stenographer. The reason for this difference was confidentiality concerns with the adults with autism and a potential unwillingness to discuss ideas if their name would be associated with it. So, the focus group for adults with autism was completely anonymous.

In the focus group with adults with autism, each general topic was discussed one at a time. Dr. Amigo lead the discussion because he had an established relationship with the participants. To begin discussion, Dr. Amigo asked broad questions within one of the three main panning categories chosen before the focus group. Depending on responses, Dr. Amigo and Gala Korniyenko asked more specific questions to help steer conversation to remain on topic.

Roughly a week after the focus groups were completed, copies of the transcript were sent to Professor Ezell and analyzed by the students in his undergraduate and graduate level classes.
Welcome!

You are invited to tell city planners how they can improve your lives by building better places. The benefits of this research will provide useful information that will contribute to the city planning profession for adults on the ASD spectrum. Your answers will be recorded to create a transcript. No names will appear on the transcript.

If you agree to participate in this study, you will several questions. I encourage you to bring up other issues if you think there is something I have missed. Some of our questions have to do with how you and your adult children move around town, what kind of house they might prefer, how they play, work, and study.

Because of the open-endedness of the focus-group, the length depends in part on your answers. Based on past experience, I would anticipate that it would take up to 2 hours. Of course, you may end your participation at any point (or speak for longer if you like).

Confidentiality

As mentioned, your answers will be recorded and a transcript of your responses will be created. Your name will not appear anywhere on the transcript. Until the completion of the study, only one file that links names to pseudonyms or numbers, but this will be kept on a separate computer or in a separate location from the transcripts themselves. Quotes your interview in future writings will be treated in manner that makes it impossible to identify you. The transcripts will be retained 5 years (this is a federal requirement) or until the completion of the research, whichever is longer. While we ask other group participants to keep the discussion in the group confidential, we cannot guarantee this.

Your participation is voluntary. If you don’t want to participate, it won’t impact your current or future relationship with the Ohio State University, or have any other consequence. There will be no penalty or loss of benefits to which you are otherwise entitled. Even if you agree to participate, you can stop the interview at any time, and you can, of course, also decline to discuss a particular issue or answer a particular question.

Potential Risks:

The risks may be no greater than those encountered in daily life, but no study is entirely without risks. At minimum, there could be a risk of participant breaching confidentiality even though they will be asked to keep the discussion in the group confidential. Again, while we do not anticipate any circumstances where confidentiality would need to be broken, there are always risks involved in focus groups such as the one we are proposing. Please be responsible, respectful of others, and do not discuss the conversation conducted in this focus group. Do not mention names to ensure confidentiality and privacy.

Contacts and Questions

If you have any additional questions concerning this research or your participation in it, or you feel you have been harmed as a result of participation, please feel free to contact Jonathan Ezell at ezell.5@osu.edu. For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.
TO BE READ ALOUD BY DR. AMIGO (FOCUS GROUP 1) – VERBAL CONSENT FOR PARTICIPATION IN FOCUS GROUP FOR ASD ADULTS

Hello,

You are invited to tell city planners how they can improve your lives by building better places. The benefits of this research will provide useful information that will contribute to the city planning profession for adults on the ASD spectrum. Your answers will be recorded by a professional stenographer who will create a transcript of your responses. No names will appear on the transcript.

If you agree to participate in this study, you will several questions. I encourage you to bring up other issues if you think there is something I have missed. Some of our questions have to do with how you move around town, what kind of house you prefer, how you play, work, and study.

Because of the open-endedness of the focus-group, the length depends in part on your answers. Based on past experience, I would anticipate that it would take up to 2 hours. Of course, you may end your participation at any point (or speak for longer if you like).

Confidentiality

As mentioned, your answers will be recorded by a professional stenographer who will create a transcript of your responses. Your name will not appear anywhere on the transcript. Until the completion of the study, only one file that links names to pseudonyms or numbers, but this will be kept on a separate computer or in a separate location from the transcripts themselves. Quotes your interview in future writings will be treated in manner that makes it impossible to identify you. The transcripts will be retained 5 years (this is a federal requirement) or until the completion of the research, whichever is longer. While we ask other group participants to keep the discussion in the group confidential, we cannot guarantee this.

Your participation is voluntary. If you don't want to participate, it won't impact your current or future relationship with the Ohio State University, or have any other consequence. There will be no penalty or loss of benefits to which you are otherwise entitled. Even if you agree to participate, you can stop the interview at any time, and you can, of course, also decline to discuss a particular issue or answer a particular question.

Potential Risks:

The risks may be no greater than those encountered in daily life, but no study is entirely without risks. At minimum, there could be a risk of participant breaching confidentiality even though they will be asked to keep the discussion in the group confidential. Again, while we do not anticipate any circumstances where confidentiality would need to be broken, there are always risks involved in focus groups such as the one we are proposing. Please be responsible, respectful of others, and do not discuss the conversation conducted in this focus group. Do not mention names to ensure confidentiality and privacy.

Contacts and Questions

If you have any additional questions concerning this research or your participation in it, or you feel you have been harmed as a result of participation, please feel free to contact Jonathan Ezell at ezell.5@osu.edu. For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251. 12
**Verbal Consent Script – Charrette- All Participants**

Hello,

Today you are invited to envision how policy and design can improve autistic adult’s lives by making better places where they can thrive. Your ideas will be used to create a toolkit for professionals who are concerned with making communities better places.

**Confidentiality**

By participating in this charrette, you consent to being photographed. Please understand that Knowlton Hall is a public building filled with students, faculty, staff and visitors who may be taking photos of the event. The Knowlton School of Architecture also would like to take official photographs of this event to publish on the School’s webpage, in presentations, and in our published toolkit book or in any other media format. Please note that your name will not be published with the images.

In addition, it is possible that your ideas may be used in future publications and presentations. Any of your quotes in any future writings will be treated in manner that makes it impossible to identify you. During this event, you will also be creating drawings, written ideas, charts, and other visual material from your teams. This material will be stored for 5 years or until the completion of the research and subsequent published toolkit book, whichever is longer.

Your participation is voluntary. At any time you decide not to participate in this event it won’t impact your current or future relationship with the Ohio State University, Knowlton School, or have any other consequence. There will be no penalty or loss of benefits to which you are otherwise entitled. Even if you agree to participate, you can leave at any time, and you can, of course, also decline to discuss a particular issue or answer a particular question.

**Potential Risks:**

The risks associated with your participation in this charrette may be no greater than those encountered in daily life, but no event is entirely without risks. Please be careful for any slick floors (sometimes students and faculty spill their drinks or don’t dry their hands properly while in the restroom). Also, Knowlton Hall has steep, winding staircases so please be careful if you use them. I strongly recommend using the elevator until you understand the building. As we are in a building filled with designers, please watch out for sharp objects such as cutting utensils. Just be careful and let’s all have fun!

**Contacts and Questions**

If you have any additional questions concerning this design charrette event or your participation in it, or you feel you have been harmed as a result of participation, please feel free to contact Jonathan Ezell at ezell.5@osu.edu. For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.
Appendix

3. FOCUS GROUP PRESENTATION

A Day In The Life
Transportation

Car

Taxi - Ride Share

Bus

Multi-Use Path

Bicycles

Sidewalk
Recreation

Recreational Fields

Gym

Gardening

Neighborhood Park

Courts

Hiking - Outdoors
Housing

Condominiums

Single Family- Ranch

Duplex

Single Family- 2 Story

Apartment Complex

Communal Living
### 4. FOCUS GROUP FINDINGS

#### Focus group findings

The focus group conversation was broadly divided into three topics: Housing, Recreation, and Transportation, with the latter being the most extensively discussed area. A coding system was used to filter out keywords from the conversation, which allowed the planners/researchers to identify distinct challenges and recommendations by The Adults with Autism. The referencing system uses the page numbers of the transcript, followed by the relevant line numbers. Example: (8,25) (9,15); [8 is the page number and 25 is the line number].

#### Transportation

The first section dealt with different modes of transit such as cars, buses, cabs, bikes as well as pedestrian connectivity. While most of The Adults preferred not to drive, a couple did have driving licenses or temporary IDs.¹ The most common reasons cited for this unwillingness to drive included a fear of driving, issues with spatial perception, anxiety, and fear of getting lost.² Many also found it emotionally and physically draining to navigate through the traffic due to confusing signage and overwhelming traffic rules.³ It was eventually determined that although most of The Adults would someday like to drive, current peer and parental pressure wasn’t helping the situation.⁴

How then do The Adults prefer to move around the City/Neighborhood? In most cases, either the parents/siblings or the service providers of The Adults would be responsible for pick-ups and drop-offs.⁵ Apart from this, many also preferred taking the bus over driving. However, most of The Adults did not find this mode of transportation very pleasing. Most of them felt that public buses were very cramped/crowded and found the journeys to be very hectic, stressful, and highly uncomfortable.⁶ In addition to that, new bus routes and stop announcements were very confusing to some, while others felt that transfers were very tedious.⁷ Biking to nearby places was considered as an alternative by some, but many felt it was inconvenient for longer distances due to lack of bike lanes.⁸

Many of The Adults recommended there should be more bus stops near amenities and the outer areas of the City should be accessible by public transit as well.⁹ Some even suggested that the interiors of the buses be modified to make them more comfortable, in addition to increasing the frequency of the buses. It was also noticed that most of The Adults felt at ease when they had complete knowledge of their whereabouts, such as familiar landmarks, friendly/known drivers, clear wayfinding signs, and safe walkable streets.¹⁰ Grid-iron street layouts were generally easier to navigate.¹¹

#### Recreation

When the conversation moved to recreational/public spaces, the most prominent concerns seemed to be the ease of access to nearby amenities and the general reluctance to venture into public spaces due to fear of sensory overloads. Some went on to add that they wouldn’t want to go anywhere that isn’t essential to their daily routine.¹² Some of the public places most frequented by The Adults were libraries, grocery stores, laundromats, playgrounds, movies, and clinics.¹³ Most felt that the outdoors were noisy places, and it would be nice to have quiet places or ’Don’t bother me’ zones for de-stressing.¹⁴

Most of The Adults present seemed to agree on the fact that controlled environments, such as a linear or a circular

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1. (8, 25) (9,3)
2. (10, 9-11) (11,6) (17,9) (19,17)
3. (8, 25) (9,3) (17,19) (18,12) (19, 25) (20,10) (21,15)
4. (11,16)
5. (21,19) (22,9) (22,15) (23,6)
6. (27,17-21) (28,5)
7. (29,4) (29,11)
8. (57,1) (57,4) (59,2)
9. (44,19-26)
10. (45,15) (46,20) (47, 2-5) (47,11) (48,8)
11. (75,18) (76,6)
12. (38,20)
13. (39,23) (40,4) (40,13) (45,2)
walking path with clear wayfinding, would help them feel safe and comfortable outside their homes. Some also insisted that better Wi-Fi connectivity would make them feel secure in public spaces. Others suggested more bike paths, shaded areas, adult playgrounds, gym facilities within walking distances, and pet-friendly spaces.

**Housing**

Most of The Adults in the focus group lived with their parents, siblings, friends, or roommates. While living with friends or siblings was easy and comfortable, continued residence with parents was considered socially limiting. Some felt it wasn’t always easy to get along with their parents, while others thought that they could be intrusive at times. Some of The Adults also felt that parents often had high expectations and didn’t really understand what The Adults were going through. Contrary to these opinions a few of The Adults felt extremely comfortable in their parents’ home and would not like to leave.

On living with roommates, most of The Adults would prefer someone who is easy to get along with and who understands their needs. While living alone was an option they would like to explore, most of The Adults felt they would still require some assistance with access to amenities, and financial/organizational skills. Many also felt that living alone would come with a lot of managerial responsibilities, which they would like to avoid. In such a scenario, assisted living seemed to be a good option to help the Adults transition into their independence. Many of The Adults also suggested that amenities such as laundry, recycling, trash, mail, and part/full-time care-givers should be easily accessible in any type of independent living situation.

In addition to these suggestions, some of The Adults also mentioned that they would prefer smaller apartments or communal living, which offered a balance of social life, retreat, and assistance. Pet-friendly living units were preferred. Some of the other challenges included underemployment, where The Adults felt that they did not have equal job opportunities as compared to neurotypicals.
iii. Appendix

5. FOCUS GROUP DATA ASSESSMENT

TRANSPORTATION

Driver’s Licenses:
- 2 participants have their licenses

Driving Experience:
- “Pretty Scary” due to dealing with repair fees
- Parking on campus is a “big pain”
- One person said they were too nervous to learn at 16 years old

Would you like to drive in the Future?
- 11 people say “yes” they would like to drive in the future

Who drives you?
- Most frequent answer was parents, family, or service providers (providers is not elucidated upon)
- Community apparently falls under “service providers” per what some said in focus group but not sure that’s true.
- Falls under service providers?
- Friends included as well
- Two people said Uber.

Obstacles to getting a driver’s license:
- Peer pressure to get license
- Spatial issues
- The rules of driving is an obstacle.
- More peer/social pressure (this time from parents, however)
- Driver’s instructor prevented a person in the focus group from hitting someone while they were driving
- Road rage

Obstacles to getting a driver’s license continued:
- Eye-sight (visual impairment)
- Can likely be recorded as a throwaway comment, but potentially obstacles stem from video games (or other entertainment).
- Crashing of a vehicle (albeit a golf cart not a car)
- Fine motor skills and instructors not good at their job
- Another crash, but an actual car crash
- Turning the car
- Fear in general
- Driving is draining (lack of “endurance”).
- The rules of the road and having to envision where one’s going
- Lack of a car to practice on as well
- Car noises (any of them)
- Focusing on the lights for the car and what is happening on the car’s dashboard
- Another visual impairment
- No incentive to drive. No benefit
- Busy schedule, can’t find time to practice
How many ride the bus, and are there any comments on riding the bus?

- Uses a service bus 3 times a week; not COTA
- Riding can be hectic, and “a bit cramped” due to amount of other riders.
- Other people talking makes the person uncomfortable. Other people can be inappropriate as well.
- Uses [unknown university] campus busing
- Another bus rider, this time COTA
- A “little” uncomfortable when riding the bus, but convenience was more an issue — and that convenience went away after COTA split up routes
- COTA is good when you need to go downtown, but not so much everywhere else in Columbus.
- Bus routes are not always clear, so a rider may get on the wrong bus or be on the wrong side of the street for their bus.
- Confusion with transferring tickets when getting on wrong bus, resulting in having to pay more — adding to stress
- Bus used for vacation (obviously not COTA)
- Buses for vacation, and occasionally COTA for Ohio State football games
- Lack of understanding in how to use the bus
- Went through a training on how to use COTA buses, but has not tried to ride the bus yet
- Routes can be confusing.
- Person’s perception is that COTA only services “bad” neighborhoods
- Announcements for locations are inconsistent.

Potential Destinations:

- Grocery store; Shops for things they want/need
- Grocery Store again
- Drug store, for grocery shopping, by way of biking or walking
- 10 in the focus group state they pick out, or buy, their own food at grocery store.
- One participant wants to learn how to drive to explore more places.
- Second participant wants to learn how to drive to explore more places.
- Transportation access/availability boils down to “essential” places for participants.
- Majority of participants react negatively to question about visiting places of faith if they had better transportation access.
- Some participants say they would be more involved in places of faith with better transportation access.
- Recreation activity (card game with their father)
- Library is another place a person in the focus group visits.
- A participant would like to go to a casino (and put earplugs in while there)
- Person in focus group would go to the zoo, a park, or grandad’s house if they had easier transportation.
- Special events (Art Festival as they mention below) and movies
- Pool or library
- Movies (with friends - does not state how they get there however)

How could [the focus group's] transportation situations be improved?

- Having public transportation close by (where they live)
- Buses in community scene - residential area (clarified below by Professor Ezell)
- At least 3 participants believe having a bus system in their residential areas (neighborhoods a better term?).
- Avoiding downtown altogether when getting to “outer area of town”
- More bus shelters to wait inside
- Vehicle comfortability a must
- Quick transportation as not to be late
- The vehicle (& vehicle’s driver) and person(s) being picked up, and making sure they know what time to get picked up/do the picking up
- Trust is important between the driver and this participant.
- Making sure the driver knows where they are going is important. No guessing about directions.
- Bus numbers changed and are more difficult to distinguish where they are going or which route they are for.
- Cars and other people walking can cause worryment or are distractions.
Walking Hazards:
- Lack of cell-phone can hinder finding one's way around.
- Distance an issue for walking to places.
- Spatial issues when walking to places (especially when one's phone is dead)
- Not related to sub-topic but: support for “easy accessible” public transportation, or more providers to do it
- “Grid-based” plan (sidewalks and streets?) at Miami University makes it easier to navigate

Bike Riding:
- Roughly half of the participants ride a bike.
- Lost interest in
- Rode to the market district
- Gamestop
- One participant rides in the bike lanes (newer additions around Columbus)
- Lack of bike lane an issue
- Places to securely lock up bike is an obstacle.
- Biking would be “more distracting”
- “hindrance for me to ride a bike”

Path/Trails
- Used for School
- Used for fun. And exercise
- Exercise and fun
- Helps discover new places, things, or people.
- “Hiking around” – in California, however
- Greenways allow participant to get to places (in this example a house) quicker

Uber/Taxis (Driving Services):
- Recreational purposes
- Used when first option (here parents) is not available; but still for a recreational purpose.
- Uber used again as a backup when first option (here parents) is not available.
- Taxi used to go to church
- Used a taxi to get to work, but was apprehensive to use it due to the price
- Taxis (or taxi-esque services from providers) take “a long time” to pick up participant.
- One participant had to wait an hour and a half for a driving service.
HOUSING

Residence (where you live?)
- House. Lives with brother and brother’s friends.
- Lives with parents. Wants to move out.
- Parents have a difficult time adapting to participant’s unique situation.
- Wants to move out from parents, but live with other people. “A social thing”
- Live with parents
- Parents ask too many questions.
- Independence would be important.
- Lives at home and does not want to leave.
- Two-story house
- Currently: Two-story apartment with parent

What sort of building would you like to live in?
- Would want to live with people that have “the same issues.”
- Small apartment on their own
- Apartment with roommate
- Apartment complex or communal living
- Living with group of people
- A place that allows pets
- A place with bunk-beds
- Condo or townhome, where landscaping, lawn, etc. is taken care of for them
- Caregiver involved as well
- A place that allows service dogs
- Currently in apartment on their own
- Would like to be able to do more things without having to leave the apartment complex (ex: laundry, dropping off recycling)
- Apartment with roommates
- Apartment with reasonable walking distances to amenities
- Duplex, but having roommates is important
RECREATION

Note: This will be predominantly a mix of activities the focus group likes to do, wants to do, or needs to accomplish their recreational needs.

- Exercise
- Biking or playing basketball.
- Being outside more and play basketball.
- Library, park (21-101), mall (24-101)
- Playing video games, need a reliable internet connection.
- Outdoor activities (specifically horse riding)
- Open space (for recreation)
- Adequate parks and paths throughout the year.
- Open space to walk or run.
- Walking path (oval shaped)
- Somewhere to roller blade.
- Gym
- Internet connection. (3x)
- Place inside for smaller toys (like LEGO)
- Area outside for walks.
- Area nearby for available transportation to go to other recreational activities
- Place to walk around, open space.
- Basketball court.
- Place to express anger.
- Adult Playgrounds

What do you do currently that’s recreational?
- Basketball (x2)
- Go to the park
- Go for walks.
- Gardening
- Basketball
- Running (3x)
- Walks on trails
### APPENDIX

#### CHARRETTE

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III. Appendix

6. CHARRETTE EXPLANATORY NARRATIVE

The Hazel Morrow-Jones Charrette, was named for Professor Emerita, Hazel Morrow-Jones, a mentor to many in The Ohio State University City and Regional Planning Program. The charrette was held in the City and Regional Planning Studio in Knowlton Hall, at The Ohio State University. The charrette occurred over a period of three days, February 21-23, 2018. The event was planned and executed by a graduate workshop course (CRPLAN 6010: Innovative City) and an undergraduate junior planning studio (CRPLAN 4900). The goal was that participants’ contributions would assist policymakers, city planners, and community designers in improving lives by creating better places for people on the autism spectrum so they can thrive.

Invited participants included multidisciplinary experts from the fields of public health, counseling, architecture, civil engineering, city and regional planners, landscape architects, OSU planners and designers, ASD volunteers, autistic adults, parents of autistic people, and other community leaders.

With data collected from autistic adult and parents of autistic adults focus groups, the charrette suggested 28 design topics related to ideal housing, transportation, and recreation specific to the needs of autistic adults.

The 28 topics were:

1. “I Need Assistance” Symbol
2. Wayfinding/ Navigation
3. Accessory Dwelling Units (ADUs)
4. Bus Rides
5. Drop-off/Pick-up
6. Ride Share
7. Living Space Development Checklist
8. Duplex Living
9. Sidewalks
10. Bus Routes
11. Multi-use Trails
12. Outdoor and Street Lighting
13. Parking Space
14. Bus Stops
15. Therapeutic Recreation
16. Walkability
17. Crosswalks
18. Assistive Technology
19. Bike Racks
20. Shared Living with Retirees
21. Public Wifi and Outlets
22. Tiny Homes
23. Proximity to Recreation
24. Communal Apartment Complex
25. Streets
26. Technology
27. Soothing spaces
28. ADA Policy
The first day of the charrette included participation from the professionals. Each of the 28 topics was presented on large poster along a wall in the studio space that included relevant background information, which created an educational foundation for the professionals about that topic and how it relates to the wants and needs of adults with autism. Throughout the day small groups of professionals chose a topic to brainstorm and design their ideas. Space and materials were provided for the professional participants to discuss, draw, and write about their ideas. Graduate and undergraduate students oversaw and facilitated this process throughout the day, providing insight as needed. As groups concluded their brainstorming on a topic, a student summarized the solutions.

The second day of the charrette was dedicated to adults with autism and parents of adults with autism. Two group sessions were held on day two, comprising of mostly two different groups of participants. The adults with autism and their parents were led in guided discussion by a few facilitators. The facilitators led the group through the topics and solutions proposed by the professionals on the previous day in order to get feedback on their viability and/or effectiveness. There was an open and interactive discussion on each topic; ideas were further expanded on and recorded through drawings and writings on a large paper canvas. Students also took notes of feedback and summarized the findings after the conclusion of each focus group.

The third day of the charrette culminated in the creation and execution of a presentation about the most important initial findings from the previous two days. A top ten list of the findings was presented in the afternoon to students and participants able to attend. The ideas generated by the charrette informed and will continue to inform more refined policies, ideas, and designs that will help autistic adults thrive. Additionally, the ideas were immediately utilized post-charrette by the students to create best practice suggestions of development plans, zoning codes, and design guidelines.
7. CHARRETTE NOTES

Shared Living with Retirees (20)
Mentioned in this topic: Duplex Living (08)

**FOR:**
- Shared with retirees
  - Dorm-like
  - Shared living spaces
  - Help with care and schedule
  - Helping each other
- Mentor relationship
  - Learning life skills
  - eg, learning to cook from your mentor and then being able to cook for your mentor
  - getting advice from them
- Duplex idea
  - Soundproof wall separates
  - Privacy
  - How about parents on the other side?

**AGAINST:**
- Apt building with similar-aged adults
- Parents might not be a good idea as it may affect the parents’ relationship, cause anxiety.

**UNRELATED**
- Hotel-like with meals provided

**‘I need assistance’ symbol (01)**
- How about a big green dot?, do you think it’s a good idea?
  - Maybe use a big yellow dot – for caution – or I need help
  - QR codes might be helpful
  - Most adults think it’s a good idea
- Fears:
  - Afraid of getting lost
  - What does the ADA symbol mean to you?
  - Makes the space accessible
- Type of help the symbol can provide:
  - Directions
  - Money
  - Charging stations
  - Wayfinding
- What if a Starbucks had the symbol? How would it be different from other coffee shops?
  - Better ambience
  - Softer lighting
  - Better sound quality
  - People should be friendly
  - Better understanding of Autism
  - They should be able to redirect the adults to a quiet room
  - Spaced out tables to avoid over-crowding
  - Job opportunities
Safe spaces - “Soothing Spaces” (27)

- Far away, shaded, quiet space in park (away from playgrounds)
- Maybe a rocking chair or a swinging chair like a cocoon
- An overhang type building
- Plexiglas walls – should be see through
- Something to reduce the outside noise
- Privacy (like a public bathroom)
- Maybe have a trampoline? See-saw? Or a yoga trapeze?
- Playground equipment for all ages?
- May not be a good idea as adults might not be welcome where kids play

Against:
- With a pod like shelter, we don’t want the adults to stick out
- They should blend in
- Don’t want the shelter to look like a sad spot

Sidewalks (09)

- Wall separating road from sidewalk
  - Tall enough to recognize (“mid-body”)
  - Taller to prevent ____?
  - Use of plants on wall
- Safety rails (in middle of sidewalk)
- Three people wide sidewalk, with some space in between
- Wider if there’s a bike path on it
- Directions given on sidewalks to show where people should walk

Bus Stops (14)

- Problems with current bus stops:
  - Lack of sidewalk and/or crosswalk; having to run cross street at light change
  - Uneven terrain at stop
  - Lack of shelters (to provide shade) or benches at the stops
  - No setbacks for many of the stops
  - Signs are not large enough (not including CMax stops)
- Suggestions for future bus stops:
  - Crosswalk buttons near bus stops
  - Bus stops situated at distance from street
  - “Intuitive” bus stop apps
  - Touch screen at bus stops that allow people to click where they need to go to show which bus route they should take (inclusion of voice recognition if person does not know exact location)
- Multiple brochures for different bus routes, organization of route and time may result in missing the bus you’re trying to take, chance of no phone available
  - Physical consolidation of bus routes and times into single brochure?

Bus Rides (06)

- Possible solutions for inside (specialty seats would blend in with regular seats):
  - Private seating?
  - Seating close to driver for ease of requesting assistance?
  - Softer seats as seats are “uncomfortable”
- Similar concept to white noise machine for dealing with loud noises on bus (i.e., crying babies)
• Video guides showing how to board and leave buses (precedent: similar guides for boarding and exiting airplanes)
• Problems with traffic outside bus; cars in front of bus forcing it to go slower than what passengers would like
• Friendlier bus drivers? To act as support for those with autism
• Implementation of “I Need Assistance” symbol
• Identification of ASD on COTA pass or bracelet
• Possibility of bus crash may make passengers nervous
• “Should buses have seatbelts?”
• Notification of next stop; to alert passengers who may be distracted
  - Announcement, beeping for alert
  - If wearing headphones? Bright lights
  - Signal sent to phone upon approach of/arrival at stop
  - Message (through an app) lets one know to look out window and see where they are
• Confrontational passengers are also problem
  - Training on “crisis intervention”

**Bus Routes (10)**
• Bus does not go to desired location
• COTA takes forever to get to places; ex: hour-plus trip to spend 15 minutes shopping
  - Busses not on time
• Uber-like tool of going to same/multiple places?

**Pick-Up Lot (I.e. drop-off & pick-up lane) (05)**
Mentioned in this topic: Parking Spaces (13)
• Example: Like from school
• What it would look like:
  - Indoor (due to adverse weather)
  - Quiet
  - Benches
• 1 space or 2 spaces?
  - If 1 space: wait & pickup in same spot
  - If 2 spaces: wait in spot then call person you’re picking up & go get them

**Crosswalks (17)**
Mentioned in this topic: Parking Spaces (13)
• White paint blends in with other markings; bright/fluorescent yellow instead?
  - Implement reflectors; “retroreflective”
• More bridges over roads, especially really busy ones
  - “Are we making roads too wide?”
  - “Barnes Dance”; all pedestrians cross street at once
  - Underpasses? (Subway-esque)
• Not enough time to cross when walk signal is flashing
• Bothersome sounds from crossing signals; make them nicer, reduce number
  - Voice instead of repetitive beeping
• Crosswalk use training
• Walking in parking lots:
  - Moving between parking spaces to get from point A to point B
• More opportunities to cross roads, hence more mid-intersection crossings
• Rapidly flashing beacons, bright flags to carry across?
Accessory Dwellings (03)
- Importance of living on own
- Camper vs. Tiny House
- Garage conversion to home
  - Living in a more permanent building

Technology (18)
Mentioned in this topic: Public Wifi (21)
- Apps
  - GPS
    - more interactive
    - insides of buildings
  - augmented reality
    - “the virtual reality of Columbus, Ohio”
- Access to the internet
  - Internet cafes
  - Wifi hotspots

Apartments (8)
- Simple designs that include
  - Open concepts (Living room/kitchen)
  - Soft lighting-no fluorescent bulbs
  - Sound-proof walls
  - Recreation room
  - Storage Space
  - Appliances within unit
- Choice of smaller personal room or larger shared living room (with people of similar age)
- Pet Friendly
- Fenced-in recreation areas
- Security system
  - Fingerprint
  - Facial recognition
- Accessibility to amenities
  - Laundry, mailboxes, etc
  - Shared or individual?
  - Computer room/lab
  - Library/ “room where you can read books”
  - “Room for art and music”
- Could be shared amenities or an extra room in the individual apartment for the tenant/ adult with ASD to individualize according to their own personal interests
  - Clear preference for special spaces that cater to personal interests
- Microwave for easy use
2018 Hazel Morrow-Jones Charrette
Planning and Design For and With Adults with ASD
Adults with ASD and Parents of Adults with ASD Evening Session
February 22, 2018

Outdoor/Street Lighting
• Concerns from participants:
  - Vehicle LED headlights too intense
  - Instances where lights suddenly switch on while walking
• Ideas from participants:
  - Enough light to see where you’re going and stuff on the ground (i.e., glass shards)
  - Color preference; not too strong a color to be disorienting
  - Less bright LEDs
  - Lights closer together, more consistent

Parking Lots
• Walking maneuverability in parking lot
  - At an angle, to avoid cars and center of street
  - “Making it up as [I] go”
• Problems
  - Danger in navigating parking lots
• Suggested improvements:
  - Better identification of where you are in parking lot/garage; i.e., labeling of rows/spots
  - Grass medians (designated path)
  - Parking spaces closer to buildings; out of need to feel safer in parking lots
  - Coloring parking spaces to alert drivers to use of area
  - Parking spaces large enough for those who are parking-challenged
  - Color-coded posts similar to ADA signs

Pick up lots/Cell phone lot
• Having indoor waiting areas for rides but having complete visibility of the parking/waiting area.
• Separate ‘loading area’
• Much like the airport
• Near a bus stop so easy accessibility from ride drop off to bus stop
• Time limit of how long someone will sit and wait for rider/no one is parked and you would have to rotate out if your time exceeds
• Protected waiting space if it is outside
  - Shade/shield from weather elements
  - Almost like a complete bus stop with at least three walls and a ceiling

Symbol/Placard
• Different symbol or use existing (handicapped symbol)?
• Symbol applies to beyond those with ASD; i.e., schizophrenics
• Problem: people yelled at for using handicapped spots while lacking physical handicap
• Parking permit for people with ASD
• Cell phone lot/waiting area like at airport for vehicles to wait for passenger pick-up
• Severity of Disability determines type of placard
• Optional Placard?—concern that it would lead to an association with more extreme versions of autism and those who are on the higher end of the spectrum who still need assistance would be more reluctant to use the placard.
• Difference in symbol between mental and physical disabilities—why not just use the universal handicap symbol?
• A different symbol is preferable to stray away from lumping ASD with all disabilities.
• Controversy between combining symbols and making an “asd only” symbol

**Bus Stops:**
• Not knowing which bus stop to wait at if there are two separate stops on different sides of the same street
• Information kiosks are very helpful
• Training for public on how to use the bus and how the routes work
• More robust route system
• Traveling to medical appointments that bus routes do not access
  - “Medi-cabs”
  - Uber-health insurance offers vouchers to people that use ride share for medical purposes to pay for uber
  - Flexibility with this amenity
    • Time slots
    • Emergency appointments

**Bus Ride Experience:**
• Crowding of bus during certain times
  - Having no space for yourself or your items
  - Rightsizing the appropriate bus for certain times of day to fit demand
• Seats
  - Cleanliness is a major issue
  - Being so close to strangers invading personal space
    • Wider seats
    • More spaced out seats
• Being boxed in between the window and the person next to you
• A lot of the information the bus gives on screens gives unnecessary information
  - Give relevant information to the bus ride itself
  - Verbal announcements of the bus stop and points of interest (grocery store, etc.)
• Noise
  - Its difficult to hear the announcement of upcoming stop from back of bus
• Visuals for when bus stop is nearing
• Bus driver number always visible to maximize comfort of who is driving
• An person on the bus to help give information and help to those on the bus who may have questions

**Biking**
• Bike paths that are safe enough would make people in general want to bike more

**Bike Racks**
• Lack of bike racks makes them not want to bike. Being uncertain of if there will be a bike rack

**Tiny Houses**
• Easier to manage
• Not right for everyone, but a significant sub-group could benefit
• Simple, basic necessities only
**Duplex**
- Soundproofing is critical
- Supportive relationships with the neighbor is beneficial and preferred (Parent/Guardian)
- Non-family supportive member is crucial to permanence of duplex living situation

**Housing**
- On site amenities are preferred
  - Laundry
  - Yard or nearby to nature/park
  - Accessible to caretaker or support
- Dorm/hotel living is an attractive idea, but could seem institutional
  - Maid service/on-site support could be beneficial option for many
### 8. CHARRETTE POSTERS

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Welcome to the 2018 Hazel Morrow-Jones Charrette
PLANNING AND DESIGN FOR AND WITH ADULTS WITH ASD
"I Need Assistance" Symbol

The research demonstrates a clear need for a universal symbol that can be placed in the public realm where people with autism can find assistance when they need it. Many places can be chaotic. Finding this proposed symbol (for instance, on the interior of doors, schools, in parks, and many other places and situations) may be helpful in such crowded places to let people who are experiencing sensory overload find a quiet space. Wayfinding (including site plan and building plan information) could be located near this symbol to assist with orientation or dissemination. Phone numbers (such as in a park or a bus stop) could be provided or perhaps a help button (may be in or a store or a pedestrian terminal) would be available to call someone for assistance.

Help Us Conceive

- Share ideas.
- Be open.
- Have a goal.
- Meet needs.
- Know the process.
- Be on the same page.
- Make others understand.
- Help us understand.

Help Us Conceive

Technology (phones, watches, apps, etc.) can be incorporated into simpler wayfinding/navigation for adults with autism.

- Street layouts that can be designed to assist in easier navigation for adults with autism.
- Public buildings and/or residential buildings that can be designed to ease navigation for adults with autism.
- Existing landmarks can be utilized for better navigation for adults with autism.
- Multisensory navigation/navigation for adults with a vision for a new landmark system designed for the public realm.
- Existing maps, color-coding, and sign design to make wayfinding/navigation easier for adults with autism.
- Other ideas related to navigation/wayfinding are we missing, issues, or drawbacks to this idea.

Facts from Research and Literature

The following challenges may not be present in all ASD individuals, but they illustrate the scope of what must be considered when making planning decisions. Studies show that people with ASD are more prone to stress, anxiety, and sensory overload. This is likely due to a number of factors, including the heightened sensitivity to sensory stimuli, which can be overwhelming for individuals on the autism spectrum.

1. Increased Sensitivity to Sensory Stimulation
2. Sensory Processing Differences
3. Stress and Anxiety

AUTISM PLANNING AND DESIGN GUIDELINES 1.0

Appendix 97

Autism-Friendly Wayfinding/Navigation

Wayfinding and navigation are important design aspects for the built environment. The research shows that adults with ASD especially rely on the assistance of wayfinding and navigation design. Wayfinding and navigation in public spaces are particularly desired. This may be in relation to specific sites, parks, grocery stores, and other public areas. Wayfinding and navigation tools tailored to the needs of adults with ASD will increase the rate of successful travel, execution of necessary and optional activities, and independence, while reducing anxiety, confusion, and becoming lost.

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1. Increased Sensitivity to Sensory Stimulation
2. Sensory Processing Differences
3. Stress and Anxiety
Accessory Dwelling Units (ADUs)

Accessory Dwelling Units (ADUs) otherwise known as "granny flats," in-law suites, detached garages, top-floorers, or background tiny homes are gaining popularity. The reason for this is because they present solutions to several housing-related issues such as affordability, sustainability, and availability. Some examples of this include reduced energy costs due to smaller size, and increased density to meet the increased housing demand within existing communities. For that reason, we believe that some variation of ADUs can be implemented to address the concern of independent living in ASD households in an affordable way. ADUs provide housing alternatives that can create opportunity within this community.

Background

Conversations in the city planning and design world on ways to improve independence for adults with autism have been increasing. The logic seems straightforward—adults who have an additional level of independence within the built environment are not necessarily out of reach for the average family. Our research suggests that The Parents are generally not enthusiastic about the idea of providing ADUs for their adult children. They consider this more of a quack fad, instead of a long-term solution. The Parents suggested that doctors, nurses, and caregivers may offer better solutions. It is noted that if the second unit across the walk from the adult with ASD might enjoy being more active, ADUs are not just possible. The Parents are intentional living along with people with mixed ages, friends, family, and sometimes colleagues. It was noted by one parent that ADUs are illegal in most communities, and even if they weren't, most subdivisions have rules that restrict ADUs, superseding the local zoning laws.

Autism-Friendly Bus Rides

Persons with ASD are more sensitive to sensory input including noise and crowds. Buses are often crowded and noisy. We suggest that improvements be made to the bus ride to improve the experience of adults with ASD. These improvements could include familiar and ASD-friendly bus drivers, accessible stops, and special seating (such as for those with physical disabilities). In addition to improving the interior of the bus, we suggest that more frequent announcements are made on the bus even when they are not necessary. We also suggest that the bus drivers be trained to be more familiar with ASD.

Background

The Parents and The Adults mentioned that adults with ASD often have overheard about the bus due to noise crowds, and unknown people standing on them. Due to these constraints, the bus can often be a very overwhelming experience. Especially for some more frequently used routes. In our interview, participants of the focus group mentioned having a difficult time experiencing which stop was next. In addition to finding generally overwhelming, The Adults mentioned confusion in using transfers (p.s. and others), and the mechanics of public transportation. As we discussed this issue in class, we identified ASD toward directions as an important addition to public transportation. Having clear directions is imperative for people who are less familiar with using public transportation.

Help Us Conceive

-Facts from Research and Literature

-Long-term solutions for ADUs.
-Variances on the idea of ADUs in the context of intentional neighboring (as opposed to neighboring near caregivers).
-Foreseeable drawbacks to this idea.
-Any new ideas that may be better.

Help Us Conceive

-An autism-friendly bus ride.
-Block out noise on the bus.
-An ear plug program and implementation.
-Best ways to arm your next stop while on the bus (Audio of visual cues or both? How and where should directions be added on the bus).
**Autism-Friendly Drop-Off & Pick-up**

The Adults want reliable transportation that offers the least amount of frustration and stress. Along with reliable transportation, the Adults need reliable locations to be picked up or dropped off by car.

**Background**

The Adults should not have to wait for their transportation to arrive due to confusion with directions or the driver not being able to find parking. Specific pick-up areas would provide comfort and reassurance to the Adults, as well as the person(s) picking them up.

The Parents mentioned the need for a specific area to pick up their child from college every day. Currently, the parent has to “move along” for circuits until they could meet the student child to pick them up. Some of the Parents discussed a report cell-phone area as an example of what could be used for adults with ASD.

There were various discussions on implementing drop-off/pick-up lanes near major landmarks to lessen confusion and increase familiarity. Cell-phone style pick-ups could be located anywhere and closer could be made for a multi-modal location. Any pick-up lane would be used specifically for drivers transporting adults with autism, and others who need the type of transportation assistance.

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**Facts from Research and Literature**

Pick-up lanes allow separation between continuos traffic and stopped traffic to prevent traffic to splitter. Pick-up lanes provide familiarity and less confusion. The infrastructure would provide more social with sensory overload. This could also be used in post, in a more intense cognitive processing of sound and touch. The Adults indicate that they have aspects of their lives including being picked up as formalized as possible to prevent frustration.

**Help Us Conceive**

- Pick-up lanes that can be informally utilized near amenities that do not have pick-up lanes.
- Structures – if any – that might be included near well-utilized pick-up lanes to add a layer of comfort to persons with autism.
- Pick-up lanes designed to lessen sensory overload.
- Design and systems for pick-up (cell-phone style) area.
- Any foreseeable drawbacks to this idea.
- Any new ideas that may be better than this proposal.

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**Autism-Friendly Rides**

The Adults and the Parents feel strongly about having access to safe and reliable forms of transportation for adults with autism. Although not always the preferred form of transportation, rideshare services (Uber, Lyft) and car services (private) are used by adults with autism for important transportation needs when more preferred forms of transportation are unavailable. Transforming the rideshare experience to be more reliable and predictable could increase the level of comfort when using these services, resulting in adults with autism feeling more confident to use them for travel and becoming more connected with their communities.

**Background**

The center in ASD-friendly rides and transportation services experiences some during class discussion and the Parents’ response. Alternative methods of transportation are necessary due to concerns that adults with autism have in driving, accessing, and using public transportation, as well as accessibility by the resource, and limitations with responding on busy roads.

Currently, ridesharing and transportation services both have significant limitations and are difficult to use efficiently and comfortably. Rideshare services such as their current are often driven without differences in routes or pickup. This exacerbates the situation for the adults due to increased anxiety, lack of control for the driver, and limited control when traveling along an unfamiliar route. During conversations about transportation, the Adults shared that they prefer to know people who are driving them, and it is difficult to get assurance on many services. Transportation services often prefer to be driven rather than public transport agencies are often unreliable, taking hours to arrive.

"Use the longest I want, that I am willing to wait, it is on hour and half.”

One of the Adults

When asked about their preferences, the Adults mentioned that it took too long for the car service to arrive and that the event they were trying to attend. Some of the Adults were more likely to use the available pick up service than it did before such as Uber due to increased predictability and trustworthiness (of the company and driver, but the long wait times and unpredictable service are often known). The Adult commented that the ability to plan and get to places on time is important.

Although not currently a preferred option for transportation for adults with autism, ASD-friendly rideshare and transportation agency services have the potential to increase the freedom and connectedness of adults with autism. Connecting the transportation needs of adults with autism to the accessibility and convenience of rideshare can begin to help adults with autism become more confident to use this mode of travel and increase their social interactions and inclusion within their communities.

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**Facts from Research and Literature**

Adults with ASD report lower driving abilities and more accidents and collisions. Studies show that people with ASD are more prone to drive in unsafe and sensory commitments. Navigating the physical and social environment can be challenging for people with ASD. Transportation is an issue that affects all areas of the lives of adults with ASD. Going deeper into this topic may help to see a situation which enables adults to use more effective transportation options more ASD-friendly.

**Help Us Conceive**

- An autism-friendly Uber/Lyft.
- Improved scheduled transportation services.
- Any foreseeable drawbacks to this idea.
- Any new ideas that may be better than this proposal.
Living Space Development Checklist

This research suggests that there has been a continuing push for adults with autism to become more independent and live on their own or with others that are not their parents. One parent said:

My son is 33 who’s still living at home has aspirations for being independent and my wife and I think it’s possible, but we don’t know if it is really possible. Different development designs and living situations such as work environments or treatment centers can offer varying accommodations for adults with autism. We can use this information to create a grading scale where living spaces can be ranked based on how accommodating they are to adults with autism. These checklists could be used to help current developments to learn exactly what needs that adults with autism have and improve their living spaces based on those needs.

Background

The parents of the adults with autism would like to have their children move out eventually. They are not completely comfortable with the living conditions that exist, but they are providing for their children mostly because they do not want them in foster care. This type of living situation is more realistic kinds of developments that are either in a mass of selectivity, but for adults with autism, they are not ready for independence. The problem is creating enough developmental programs that are safe, secure, and socializable with their peers in a safe, social setting where they can keep on the goal of retaining new skills and creating a widespread program for living environments that accommodate all on the autism spectrum.

Autism-Friendly Duplex Living

Housing options are a big topic for discussion for everyone when they think about moving away from their parents or guardian(s). The process of moving out, although possibly desired, is much more difficult for adults with ASD. As affordability and availability of housing options becomes more limited for everybody, the challenges have not been made any easier. An effective option for people with ASD may be a duplex home. One half of the house could be occupied by a person who is high on the spectrum and the other side would be used by either a parent or intentional neighbor who could keep an eye on them, yet allow for them to live “alone.”

Background

Housing opportunities for adults on the spectrum have been a major topic of discussion, and there remains a common theme: independence. The term is loosely defined and thought of differently by all people. The level of independence desired by some is much different than others, and the same is true for adults with ASD. With the dependence level fluctuating severely between individuals, duplex housing seems to be a way to achieve full independence yet still have a support system present if the need arises.

The Parents were skeptical of letting their children live alone. One expressed:

Also kind of need a place... (and) just to be there. So we thought about the duplex setting for our kids being lower on the spectrum and having the other half of the duplex be both of us but one of us will take the other two months out of the year and the other parent will take the other six months out of the year.

This notion brought excitement and sparkled conversation with the rest of The Parents. Cost of living and transportation issues seemed to be the main issues, although there were also worries about maintaining daily routines. The idea for the ASD friendly housing model: a stationary group of people in a group of people in a group of people that are new to the area for adults with ASD. This has been a popular topic since the idea of group living has been in the news recently. The idea of having various common spaces makes it easier for people to build and maintain friendships and their support network.

Duplex living could allow for a caretaker or other than the parents to help as well. This could be a family friend, a neighbor, or even a relative looking to positively influence someone. Parents could potentially volunteer or come to the house if they desired to help. Regardless of the neighbor selection, the style of living should revolutionize the idea of independence for adults with ASD and everyone who wishes to live alone but may not have the skills to be completely independent. A well-implemented duplex housing system for disabled citizens could help develop a more community-engaged society that focuses on the well-being of all, not just those who can afford it.

Help Us Conceive

-Categories that should be on this checklist.
-Incentives for developments that decide they want to be autism-friendly.

Facts from Research and Literature

Dr. James P. Anderson, a clinical psychologist at the Autism Research Institute, has conducted research on the effects of social skills training and social support programs for adults with autism. His findings have been published in several peer-reviewed journals.

Help Us Conceive

-A plan design (idea) to implement this housing style including location (proximity to services), policy (subsidies, building initiatives, government funding)

-Ideas for a tenant pairing process. (Who might assist the adult with ASD & occupy other side of duplex? (Veterans, retired citizens of the community, family friend: parent/guardian))

-Better ideas.

-Foreseeable drawbacks to this idea.

Autism-Friendly Sidewalks

Research shows that people with autism are prone to sensory overload from colors, noise, and visual design. Based upon this research, it is obvious that there is a need for a shift in design to produce a more autism-friendly sidewalk. Sidewalks in urban and suburban neighborhoods generally do not take autism into consideration. In rural communities there is a lack of sidewalks. Because of the close proximity of potential sidewalks and high-speed oncoming traffic, a significant barrier between the sidewalk and the road needs to be established. Widening and special markings, modular expansion options that keep pedestrians safe, vegetation barriers and green space are opportunities for autism-friendly sidewalks. In addition, constructing sidewalks that are neutral in color, implementing planting strips or vegetation to potentially decrease noise pollution, and producing a straightforward and usable design is crucial.

Background

The Parents recognized the importance of walking for transportation and recreational purposes. The Parents claimed that they felt safer if their child was walking in a neighborhood where sidewalks were available. The Parents and The Adults also asserted that sidewalks are important for comfortable and confident movement. Especially in urban environments, the Parents expressed that adults with ASD would feel safer, and they would feel better, when walking on sidewalks that are closer to the line of buildings. According to The Parents, sidewalks being closer to the building line means more “eyes on the street.” This will create an environment where adults with autism and their parents can feel safer walking. It was mentioned several times that there are no sidewalks available to those who live in rural environments. It was also mentioned and confirmed that sidewalks were available neither in the autistic adult’s present nor in their planned future environments. Most sidewalks in rural communities are alongside roads with a high-speed traffic. Utilizing the environment cd 4 foot walking space between the driving lane and the sidewalk could help create a safer and more accessible environment. The Parents and The Adult mentioned that sidewalks such as these, which allow the adults with ASD to ride bikes on the sidewalk, could improve conditions for children with this idea.

Autism-Friendly Bus Routes

Due to a low percentage of adults with ASD having driver’s licenses, many are limited to public transportation to meet their transportation needs. Shortened ride times would help adults with ASD be able to use public transportation more frequently. Most importantly, The Adults noted the inconvenience of routes going downtown as inconvenient and adding unnecessary time to trips. (Discussion and in-class research show that many adults have a wheelchair or a route system.) Adding more cross-town routes that do not require transfers downtown would make COTA more usable for many adults with ASD. In addition to lessening the number of routes that require transfers downtown, an increase in stops that service the responsive adults with ASD need to access (including therapy locations, grocery stores, continuing education sites, etc.).

Background

Often we forget how important it is for us to go out and experience the world. When we consider this, we are reminded of the importance of providing opportunities for young adults with ASD to experience the world. The Parents and The Adults want to create an environment where young adults with ASD can experience the world in the safest and most comfortable way possible. Public transportation, when possible, should be provided to the residents, and the environment should be safe and accessible. The Parents and The Adults want to provide a safe and accessible environment for young adults with ASD.

Help Us Conceive

"The color, shape, and materials of an autism-friendly sidewalk.

"The look and dimensions of landscaping and planting strips that accompany the sidewalk.

"What kind of sidewalk to implement in different environments.

"Other ideas we missed.

"Issue or problems associated with this idea.


Help Us Conceive

An Autism-friendly bus routes.

An Autism-friendly bus route identifier system.

Better ideas we haven’t conceived.

Drawbacks to this proposal.
Autism-Friendly Multi-use Trails

According to our research, there is a need for recreation infrastructure such as multi-use trails that accommodate some of the specific needs of the autistic community. Multi-use trails incorporate cyclists and pedestrians whereas typical trails can be narrow with lots of activity, making users feel crowded and uncomfortable. Without clearly labeled directions, these trails can be hazardous. This can be especially true for individuals with autism. What should be a pleasant and peaceful experience is often a series of conflicts. At a minimum, an autism-friendly multi-use trail has clearly labeled symbols that organize multi-modal traffic flow without fear of possibly being involved in a collision.

Background

The Parents expressed that their children with autism used biking and walking as a common recreational activity, as well as a primary mode of independent transportation. Family members mentioned that sometimes regarding the road and streets, current multi-modal stalls are less than ideal. There are extra steps taken into consideration for the design of this multi-use trail such as a sense of safety; control, organization, and clarity. These attributes will ensure that the multi-use trail operates smoothly and safely as possible with integration to surrounding areas or in intended directions and function. A parent said:

My son will walk a lot of places. And actually, they’re great in it and especially he won’t take it everywhere he goes. Some places, he’s not interested or knows where he wants to go. So they have put in a lot of sidewalks, and I think you’re supposed to be riding on sidewalks.”

Autism-Friendly Outdoor and Street Lighting

Our research demonstrates a need for calming and aesthetically pleasing autism-friendly lighting within public spaces such as parks and along sidewalks and streets. Heightened visual and audio stimuli are a common problem amongst those on the spectrum along with sensory overload. The public realm is a place that is seen by sensory overload which can lead to stress and even emotional turmoil. The Parents gave insight as to what some of these ‘episodes’ entail. One parent expressed that certain stimuli, such as busy city traffic, can cause anxiety.

He recently was up in the dark and at that point he was becoming verbs and possibly aggressive.

With something as simple as proper light fixtures, brightness, color, and controlling the flicker and buzzing sound, fluorescent lights have been found to be a calming agent for those with ASD or any sensory disorder.

Background

The idea for custom lighting for those on the spectrum came from both the Adults, The Parents, and in-depth interviews. The Parents were concerned for their child venturing into the public realm alone and potentially having an emotional breakdown or panic attack due to sensory overload. Seeing that people on the spectrum are very prone to stress and anxiety, it becomes apparent that something in the public realm needed to act as a calming agent.

In our study, we reviewed the focus group data and furthered our research and discovered that the lighting and color in a room can heavily affect a person’s mood and behavior. This is where the idea of a calming outdoor public space came from. This asset should be implemented almost everywhere and still act as a calming agent for not only those on the spectrum, but for all people.

Facts from Research and Literature

Focus groups are useful for collecting qualitative and personal experiences. Parents often deal with the trial and error when introducing a region's demographics and features, contrasting maps, etc. The used materials are Robert Moses. Physical, etc., and sometimes a design element that in the least a plan is fairly incorporate without an intimate understanding of how affected residents actively use and what they visually experience actively are today's planning practices always address those with ASD. We hope to better understand how and practices can be made to better serve them.

The Olembury Trail meets the passage dimensions of multi-use paths at roughly 10 feet wide. According to ABD Guide for the Development of Bay Area Projects (Design a Guide of Sharrow Path Lines), 11-14 feet are recommended in high pedestrian areas.

Help Us Conceive

- The width of an autism-friendly multi-purpose path and why
- Additional elements would increase safety and tranquility
- Better ideas than this one
- Drawbacks to this idea that aren’t currently seen

Facts from Research and Literature

According to the Scientific Data Sheet on Emerging and Rapidly Growing Health Risks: There is a generalized notion of increasing the use of fluorescent lamp planning and independent lighting. However, manyставLS are looking for another lighting solution that utilizes fluorescent lighting, with a more modern design and lighting, that includes advanced technology and added features. A white light source is generally good for reading, tasks, and relaxing.

Help Us Conceive

- Non-fluorescent light design including:
  - Color or colors
  - Direction of light rays
  - Bulb type
  - Environmental considerations
  - Added features to lighting structure
  - Implementation
  - Perceptible drawbacks
  - New ideas that may be better than this proposal

Sources:
Autism-Friendly Parking Space

People on the autism spectrum have a need for different considerations when it comes to parking spaces. Much of the data gained through The Parent demonstrated that a limited number of autistic people drive, however, those that do face similar challenges while on the road. These individuals can benefit from changes in policies and the built environment that relieve the stress of driving. In order to help individuals on the autism spectrum, there should be a policy shift to allow those that have any type of handicap that would necessitate a closer proximity to park in handicap spaces, whether this disability is physical or mental. There is also data that suggests that those with autism could benefit from wider spaces. This could also be applied to parking spaces to provide more space and alleviate anxiety when parking and entering or exiting the vehicle.

Background

The data for an autism-friendly parking space comes from conversations regarding other spaces and projects. There was a direct link to other focus groups, but more a breakdown from multiple tables.

One topic that led to the idea was the discriminatory parking increased عبدالله. There is a research trend showing that individuals with ASD require more space to feel comfortable in an area. This theory could be applied to parking spaces to help ease some of the anxiety that people with autism feel when they go out. This would also allow for easier access to the car when it is parked and get in and out of the vehicle, increasing at least some of the potential stress associated with driving. The idea for a better parking space is one that not only helps those with ASD, but those with all types of disabilities.

Another main focus of discussion during data collection from The Adults and The Parents was the notion of parking, whether it was a fixed transportation device or area to get the attention of people with autism. The idea is to make people feel safe as well as providing comfort. While adults with ASD have issues with anxiety while driving, parking lots can be disorienting for everyone, making sense provide guaranteed spaces for cars that are generally located close to entrances and have accessible built to accommodate people with disabilities. 

Background

Riding the bus (or any other form of public transit) begins and ends with a stop. Due to elevated anxiety and sensory sensitivity, the bus stop can turn adults with ASD away from using public transportation. We conceive autism-friendly bus stops and bus stop identification designs. Ideas for bus stop design could begin with weather-friendly construction and technology in mind. Improving the identification of bus stops should be based on the bus’s destination rather than by common street intersections commonly identified as such. Since landmarks are often used as directional and destination indicators for adults with ASD.

Help Us Conceive

- Policy to allow for people with ASD to park in handicapped parking spaces legally.
- Autism-friendly parking space design that is wider but not interfere with the flow of traffic in order to create a more accommodating parking space for those with ASD as well as other handicaps.
- Any other ideas beyond ours.
- Drawbacks and issues.

Help Us Conceive

- Autism-friendly bus stop placement decisions.
- [Along certain routes? / Along all routes as a system? / Spaced out randomly?]
- How? (Where to make landmarks to bus stops / How to identify landmarks as bus stop identifiers?)
- Better ideas than what is in this proposal.
- Anything we have overlooked.
- Drawbacks to this proposal.
Therapeutic Recreation

The research suggests that recreation is an important aspect of the lives of adults with ASD. Preferred recreational activities vary by individual, however, a desire for access to therapeutic recreation exists. All forms of recreation may serve a therapeutic purpose, yet certain activities seem to specifically hold more therapeutic characteristics. Access to therapeutic recreation is expected to be important to build confidence, responsibility, independence, and relieve anxiety.

Background

The need for therapeutic recreation comes from The Adults. When discussing recreation, the overall planning, effects, and engagement of various recreational activities were mentioned similarly. Many for Therapists, recreational activities last one-time or for one-time events were mentioned by multiple participants. One activity that was mentioned was the impact and benefit of therapeutic recreation include:

- "I usually like to go to the park and relax like horse riding, like I used to ride, independent and organized ASD, supporting.
- "One of the Adults mentioned and discussed past the facilitator-based. And how many of you feel like you want to have opportunities for your pets or animals to be a part of your lifestyle until a particular recreation we believe to have pets or animals being added to brunson-oriented.

While Therapeutic recreation was not always specifically mentioned by participants, a desire to feel more confident, independent, responsible, and less anxious and confused was prevalent. These options were related to nearly all aspects of life, including considerations for the overall well-being of many.

A desire to escape recreation is other public spaces was also mentioned, especially for adults with ASD to provide a more organized space for therapeutic recreation as being handled. The topic of "Therapeutic Recreation" was a focus for recreation that is a necessary strategy in nearly every recreation being temporarily avoided.

Walkability with Autism in Mind

Adults with autism are often unable to access different services or amenities because they are not within walking distance. Increasing the number of safe, clean, and walkable streets and trails could allow adults with ASD to access a wider variety of services and amenities by foot as opposed to relying on a vehicle or ride shares. Walkability is something that planners often discuss because people generally enjoy walkable communities; however, creating a walkable community for adults with ASD could be considered even more essential because of the large number adults with ASD who do not drive.

Background

It was noted that many of the Adults desired access to walkable and accessible neighborhoods in their neighborhood. Most of the Adults expressed that they did not drive because they had problems including: their homes were far, driving, parking issues, with perception, too many rules and signs, the inability to control mental issues or behaviors. Therefore, if the Adults continue to walk to different neighborhoods, walkable communities should be a goal. While people like to have the option to either drive or walk places, adults with ASD often do not have that choice, and if they cannot walk somewhere, they often cannot go.

Therefore, it is critical to account for the services and amenities that adults with ASD require and create more walkable neighborhoods for them to live in the surrounding area.

Facts from Research and Literature

The following challenges may not all be present in all ASD individuals, but they outline the scope of what must be considered when making planning decisions. Adults who are treated with ASD show a variety of symptoms and symptoms can vary. ASD, however, has a range of symptoms for adults, and adults with ASD are often prescribed medications to control their symptoms. Medications can lead to side effects, and adults with ASD often experience social isolation because of their symptoms. Medications can lead to side effects, and adults with ASD often experience social isolation because of their symptoms. Medications can lead to side effects, and adults with ASD often experience social isolation because of their symptoms.

Help Us Conceive

- Therapeutic recreation activities that can be incorporated into neighborhood design or public programming.
- Therapeutic recreation activities that are easily accessible in the public realm.
- Therapeutic recreation activities that can be incorporated into residential complexes.
- Other ideas related to therapeutic recreation are being missed.

Drawbacks and issues to this idea:

Facts from Research and Literature

The following challenges may not all be present in all ASD individuals, but they outline the scope of what must be considered when making planning decisions. Adults who are treated with ASD show a variety of symptoms and symptoms can vary. ASD, however, has a range of symptoms for adults, and adults with ASD are often prescribed medications to control their symptoms. Medications can lead to side effects, and adults with ASD often experience social isolation because of their symptoms. Medications can lead to side effects, and adults with ASD often experience social isolation because of their symptoms.

Help Us Conceive

- Autism-friendly walkable communities.
- Infrastructure and policies that can be put in place to create autism-friendly walkable communities.
- Any other or better ideas.
- Drawbacks and issues.
Background

The Adults and The Parents discussed the issues of providing safe and reliable crosswalks as well as easy-to-understand traffic signs. The Parents stated that the autistic adults tend to have trouble crossing streets due to the lack of instructional signs which can then lead to anxiety and stress within the public realm.

When adults on the spectrum try to use crosswalks to get to destinations such as bus stops, crosswalks are often non-existent or dangerous. In addition, requirements for accessing crosswalks (if they exist) may require blocking the path of pedestrians who use wheelchairs. The Parent discussed how technology is employed by adults with autism, and technology has the potential to improve autism-friendly crosswalks. For example, one conversation by The Parents included a goal of implementing technology in crosswalks to offer consistency and security.

Creating autism-friendly crosswalks will offer better amenities such as safety, familiarly crosswalk.

Assistive Technology

This research acknowledges a desire to incorporate assistive technology into everyday life. As our lives become more hectic and busy, our reliance on technology grows. The city can be a confusing place, especially managing public transit and wayfinding. All of this can be easier if you have a watch, phone, or glasses to help guide you. An app on any one of these devices can provide a multitude of services including but not limited to, navigating public transit, and providing effective wayfinding through augmented reality.

Background

This original idea for the app was described by The Parents and that of whose was presented that used as a prototype application. The app would ask what route, and how the person wants to arrive at a destination and then provide step-by-step instructions, how to get there. The app was also used in an emergency situations when the driver of the phone needs to communicate with first responders, but has become non-responsive.

The Parents and parents both agreed the idea could bridge the worlds of system and real-world individuals. Initially, it was integrated on a phone, a smartwatch, or on both. However, after the idea was taken on, it was observed to be on many more platforms such as mobile websites, tablets, and digital devices. In the testing phase, it is apparent the app could vary in its ability to translate information on a walk to get off all the rest bus stops as it complex as possible, or guides every imposing object.

Augmented reality could request upon the effectiveness of wayfinding. To gain a better understanding of the augmented reality, the photo could be the description stating...

Facts from Research and Literature

"This area is thought to be related, in part, in more intense cognitive processing of sound in a hulk. Individuals with ASB suffer from higher rates of deaf problems, related to these auditory issues. The research indicated that individuals on the spectrum are prone to sensory overload such as eying baby and even other individuals. It also indicates that adults often follow a daily routine by implementing a visual and auditory-friendly crosswalk in daily routine with attention to their own needs and feelings.

In addition, there are many challenges that those with ASB face as they are out door with the public. Parents demonstrated that listening is not only essential, but it is also a

Help Us Conceive

The design of an autism-friendly crosswalk.

-Twenty-two of technology that could improve crosswalk-related signage that is autism-friendly.

-Other ideas.

-What we haven't conceived.

-Issues or problems.
Autism-Friendly Bike Racks

Some of The Adults would use a bicycle for transport if given the opportunity. Bicycling produces less worry with an individual with autism than driving a car on their own or even learning how to drive. However, there are different sets of stressors for bicycling. Lack of bike lanes or cars not sharing the road appropriately can cause frustration and stress. Approaching a destination without an area to adequately park and secure a bicycle will ratchet the stress even higher. By placing bike racks in suitable and near known amenities, The Adults would have a new avenue of independence with riding a bicycle to a local park or convenience store.

Help Us Conceive

-Bike racks that are autism friendly.
-Technological innovations could be included with or within the bike racks.
-Methods to make the bike racks properly utilized.
-Methodically placed bike racks instead of afterthoughts in the built environment.
-Any foreseeable drawbacks to this idea.
-Any new ideas that may be better than this proposal.

Shared Living with Retirees

"Adults with ASD can struggle when they reach what is often referred to as the "crisis." The ‘crisis’ represents what happens to an adult with ASD when they reach the age of 18 and stop receiving critical services. Often, many adults struggle to live on their own and would prefer either a roommate or someone to assist them with services. By providing a housing option which allows adults with ASD to live with retirees, this could not only provide adults with safe and service-enriched housing, but it also could give retirees purpose and a worthwhile way to assist adults with ASD.

Help Us Conceive

-If the idea of housing for retirees/adults with autism is feasible.
-Challenges associated with this idea.
-The market for this type of housing.
-Which ways retirees could provide help and services to adults with autism neighbors or roommates.
-Foreseeable drawbacks to this idea.
-Other ideas that might work better than this proposal.

Facts from Research and Literature

Bicycling can add a new skill for them to have to learn; exercise is wanted by The Adults and bicycling provides The Adults a new activity. There is an emerging discipline of "therapeutic environmental design" through it many issues on those with ASD. The bike rack design implemented with "therapeutic" environmental design in mind would be helpful. Bike racks deliver small scale, big benefits for The Adults.

Facts from Research and Literature

When designing for people with autism, it is essential to understand how they might experience the environment and define places (and objects in it) as well as what barriers exist. One barrier that planners can aim to overcome is zoning regulations which may limit the type of living arrangements that would be more desirable for those with ASD in some cases. The environment in which adults with autism live can have a profound impact on their health and well-being. Providing the right setting can help to enhance performance, confidence and self-esteem. Although this type of building arrangement may not be suitable for every adult with autism, it is an idea that should be analyzed further and highlights some large barriers in which planners have had direct influence.
Public Wifi and Outlets

Background

The idea for public wifi and outlets formed during class discussion about the limited mobility and options that autistic children often experience. The idea was well-received and has been subsequently implemented in many local schools, libraries, and coffee shops.

Currently, public wifi and the need for accessible outlets in public spaces pose many challenges, particularly for autism. The Autism Society and others have called for improved accessibility in public spaces for all, and every attempt should be made to address these needs. Public wifi and outlets can be a significant component of public infrastructure needed when children depend on other means of transportation and navigation.

The importance of access to public spaces and the need for consistent access to public services and amenities through the Autism spectrum is increasingly recognized, especially by those who support children and adults with ASD.

The benefits of public wifi and outlets can be significant for people with autism. It provides access to information and resources that may be otherwise inaccessible.

However, there are also concerns that need to be addressed, such as the need to ensure that public spaces and services are accessible to all, including those with autism.

Help Us Conceive

- Public wifi that can make communities more accessible for adults with ASD.
- Effective locations for public charging outlets.
- Any reasonable drawbacks to this idea.
- Any new ideas that may better suit this proposal.

Facts from Research and Literature

Studies show that people with ASD have a stronger need for public wifi and outlets. This has been associated with the need for more opportunities for social interaction and access to information.

Help Us Conceive

- Whether tiny homes are a viable idea for affordable housing for adults with autism.
- Location for tiny homes.
- Any other ideas beyond that.
- Drawbacks and issues.

Facts from Research and Literature

Caring for autistic children in adult homes is an option that is often considered by families. The cost of this type of care can be high, but it is often necessary for the well-being of the children. The success of these homes can be measured by the level of independence and social skills of the children.

Help Us Conceive

- Whether tiny homes are a viable idea for affordable housing for adults with autism.
- Location for tiny homes.
- Any other ideas beyond that.
- Drawbacks and issues.

Facts from Research and Literature

Caring for autistic children in adult homes is a significant burden on parents and is associated with higher rates of depression and anxiety. The cost of this type of care can be high, but it is often necessary for the well-being of the children. The success of these homes can be measured by the level of independence and social skills of the children.

Help Us Conceive

- Whether tiny homes are a viable idea for affordable housing for adults with autism.
- Location for tiny homes.
- Any other ideas beyond that.
- Drawbacks and issues.
Proximity to Recreation

The authors mentioned several forms of recreation, including swimming pools, the zoo, Dungeons and Dragons games, outdoor parks and playgrounds, movies, libraries, malls, gyms, and restaurants. However, few had a driver's license, relying mainly upon parents to provide their necessary transportation. For many, public transportation is often overcrowded and confusing to use, and the adults expressed a preference for walking and biking to get places. For these reasons, planning public recreational facilities in various kinds close to residential areas is important to fulfilling the needs of people with autism. Close proximity to residential areas will also ease users' navigation of public space throughout their community in addition to enhancing the community's overall walkability.

Background

Within planning strategies today, placing residential and recreational areas in close proximity to one another is hardly a new concept. Such design increases the density of urban spaces; a concept that was Jacobson's guiding principle when he envisioned the diversity, density, and accessible use of an urban space (his book, *The Death and Life of Great American Cities*, 1961). Concentrated, mixed-use development further Jacobson's concept of "eyes on the street," the necessity of people being aware of each other, the design of the space to be lived and work in to strive for the survival of urban spaces. The New Urbanism Movement has sought to include such places into practice by designing concentrated, mixed-use developments in towns as seen in Streetscape Plans. Such examples of towns that pride themselves on highly concentrated urban spaces include Channelside, Florida and Reston, Virginia.

The authors had several concerns about the bus system, citing overcrowding, high-side levels, and confusing route changes. While shuttle services are available, the adults consider them generally unreliable. Finding recreational facilities such as pools and beaches close to residential spaces that would not only increase routes with closer access to these forms of entertainment, but also increase the overall utilization of community spaces. Given the information about the experiences and desires of the adults, while their needs do call for a new strategy of city planning altogether, they provide evidence to further bolster the need for more highly concentrated, mixed-use developments of urban spaces.

In addition, planning recreational facilities in close proximity to residential areas can encourage healthier lifestyles not only for adults with autism, but also for other residents by increasing the convenience of walking and getting to places as well as reducing air pollution by decreasing the need for cars. Increasing accessibility of urban spaces will also increase the sense of independence many adults with autism want as a decreased need for driving as a means of transportation will decrease the need for gas to provide. As one parent explained:

"You know, I know personally and I went to avoid making this too personal, but personally, I've noticed something that I think as a basketball court, that one can shoot hoops.

Communal Apartment Complex

Apartment complexes that often integrate living for adults with autism could be a viable housing option. This idea includes incorporating units for adults with autism within new and existing developments. One idea includes a voluntary roommates' system where adults with autism and neurotypical tenants who are educated on the needs of adults with ASD are willing to share an apartment. Such apartments can also provide more flexibility for room-based caretakers, for instance a person to help the adult with monthly expenses or bills. These dwelling units also need to be designed sensitively, with respect to lighting and noise cancellation. Integrated living also implies that such dwelling units should be in close proximity of basic amenities such as corner stores/delis, laundry (ideally in unit), recreation center, pharmacies, libraries, recreational areas and other daily needs and services.

Background

"Swing class discussions, I was shocked that many of the adults who participated in the focus group had never been to - which is really unexpected. However, the group coordinated independence with occupational therapy being valued among many living arrangements, another one mentioned was the matter, and said they would not enjoy taking on many responsibilities. Many also expressed that they would like to bring someone with ASD and a different level of support and their needs.

"It would be something like a lifestyle or a social group, or something like that. It's also a lot of the time people don't want to have that.

...the idea of living in a community where people have similar interests...is a lot of the time people don't want to have that.

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...the idea of living in a community where people have similar interests...is a lot of the time people don't want to have that.

Help Us Conceive

-Scenarios for a new autism-friendly communal living development.
-Scenarios for existing communal developments.
-Scenario development for floor plans.
-Other ideas we haven't considered.
-Scenes or drawings to this proposal.

Help Us Conceive

-Scenarios for a new autism-friendly communal living development.
-Scenarios for existing communal developments.
-Scenario development for floor plans.
-Other ideas we haven't considered.
-Scenes or drawings to this proposal.
Autism-Friendly Streets

The research demonstrates a clear need for streets that are safe, walkable and conducive to multimodal transit. Streets can be overwhelming and unsafe for not only those on the spectrum but for all people. This forces many to depend on driving or require assistance in getting around, even when their destination is within walking distance. Streets should be designed in an inclusive manner for people who are unable or unwilling to drive.

Background

The Parents and the Adults mentioned that they want streets that are safe, walkable, and bicycle-friendly. Many parents expressed that sidewalks should be comfortable and conducive to physical activity and social interaction. These parents also mentioned that improvement for bike lanes, sidewalks and pervasive accessibility would enhance the quality of life for both adults on the autism spectrum and their caregivers. The typical street design encourages contact between motorists, bicyclists and pedestrians. This can be overwhelming for the adults who frequently ride their bike, mostly walked or ridden but not walked. When asked how many of the adults frequency ride their bike, most raised their hands. However, the Parents emphasized their concerns about safety and mentioned that they prefer biking and walking rather than taking on too safe to walk due to the traffic.

The Parents also mentioned how overwrought feelings negatively affect most adults on the spectrum. Currently, streets are generally designed in a way that creates a lack of curb and landscaping unfriendly to pedestrians and bicyclists. For those dealing with overstimulation issues, navigating streets can be unpleasant and difficult. This, and conflict involving vehicle traffic, can be dangerous. However, research suggests that reducing the impact of noise and light stimulation can greatly improve adults with ASD's ability to be independently mobile.

Secure Spaces in Parks

The Adults generally react differently than neurotypical park users with sudden changes in the environment, such as unexpected rain or bright sunlight. The Adults suggest that there is a need for safe spaces in parks that address the needs of people with ASD. Adults on the spectrum sometimes feel overwhelmed in a standard playground and expressed a need for temporary shelter in outdoor spaces to feel secure through periods of stress or anxiety.

Background

Recreation in important. Parks and open spaces are places where people go to have fun and unwind. Sometimes parks are crowded with people. Some parks can be loud, too bright, and overly stimulating. There is a need for adults with autism to know where to go to have time to socialize within parks and other spaces. Knowledge gained through talking and discussions indicates that there should be clear signage on or close to the structure and be visible from most locations within the recreational space.

The design should provide a warm and inviting space, perhaps bright spaces with plenty of natural light and vibrant colors. It should be a quiet space, too.
Soothing Spaces in the Public Realm

Public social interaction, as well as public interaction in general, is a notable challenge for people with autism. Though this problem cannot be easily remedied, it is possible to provide a safe and comfortable environment for those individuals in a public setting. These environments, known as “soothing spaces,” are individual public spaces designed to provide those with autism the time and space needed to calm down if they feel stressed or uncomfortable in situations involving social interaction or other anxiety-inducing activities in public settings. Soothing spaces would be publicly accessible, yet allow privacy for whomever chooses to use the room at any given moment. These spaces may be located in buildings, parks, or community centers. The ultimate goal of soothing spaces is to allow people with autism to calm themselves in a safe and comfortable environment.

Help Us Conceive

- The ideal appearance of the space for both indoor and outdoor environments
- Ways to ensure people with ASD have primary use of the space
- How can it be conveyed that the site is for specified use by those with ASD?
- Potential signage
- Any foreseeable drawbacks to the idea
- Any additions or/and changes that can be made to this proposal

Facts from Research and Literature

1. Researchers have found that people with ASD are more prone to stress and anxiety. The suggested toys or objects should be placed in a quiet, low-stimulation environment.
2. There is a need for more research into the behavioral and emotional responses of individuals with ASD in response to environmental stimuli, such as noise, light, and movement.
3. The research also highlights the importance of providing a quiet, low-stimulation environment, such as a sensory room, for children and adults with ASD.

 ADA for Autism

In 1999 The Americans With Disabilities Act (ADA) became law to ensure that people with disabilities have the same opportunities and rights and non-disabled people. While physical disabilities are extensively covered, surprisingly, there is currently no accommodation in housing or ADA policy to benefit adults with autism. They have a particular set of needs in the built environment that can be effectively addressed with a few key changes.

"It would be better if I was more independent and for me, in my case, living on my own and have more freedom.”

Help Us Conceive

- State and/or federal building codes to fit the needs of those on the ASD spectrum.

Facts from Research and Literature


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9. CHARRETTE PROCESS PHOTOS
III. Appendix

10. CHARRETTE DAY 1 OUTPUT

CHARRETTE_Day 1ADA_Incentives7.jpg

CHARRETTE_Day 1ASDRideshare3.jpg
11. CHARRETTE DAY 2 OUTPUT

TRENDS
- Amenities
  - Recreation, Apartment, Walkway, Gym
  - Laundry, Hotel, Keycard
- Can be alone or involved as you want
- "Concrete Chic"
- "In shape" & fit
- Ways to do this close by
- Wellness program
- More rides?

HOUSING
- Tiny houses
- "No small spaces"
- Claustrophobia
- "Lack utterance"
- Ability to keep in motion
- "Stemming"
- "May be good for some people"
- Depends, maybe how much space of my current home
- "Needs to be straight forward if so"
- "Easy to understand, navigate"
- "Simpler is the idea"
- Customized housing
- "Affordable"
- "Don't want to be 'segregated' apart"

Duplex
- "Soundproofing"
- Like idea of living close to family, friend, while maintaining independence

Love the idea of independence & own private space.

"I need Assistance Symbol"
- Yellow (caution), maybe other colors
- "Call for help"
- What type of help
- "Directions (lost)
- "Money"
- "Chargers"
- "Wayfinding in buildings"

- Could indicate a building/place
- "ASD accessible"
- "Friendly"
- What does this mean?
- "Softer colors/lighting"
- "Sound (not so loud)"
- "Friendly people"
- "Redirect people w/ASD"
- "Quiet Room"
- "More spaced out (ie. tables)"
**Bus Stop**

- Design 'perfect bus stop'
- Label in other ways other than intersection names
- Direction of bus & which side of street to wait on
- Time tables
- App to notify

**Transit App**

- Non-intuitive
- Shuts off
- Different app
- More intuitive experience

- Everything has to go downtown
- More cross-town routes?
- Helpful to run later?

---

**Bus Stops**

- Protection from weather
- Shelter
- Sit-back
- Bench
- Crosswalk button to cross
- What bus is where??
- Touch screen @ stops
  - I'm here, adjust to go there
- Voice recognition?
  - Siri on big screen @ bus stop
- Don't know address all the time
  - Which bus to get on?
  - Parked
  - Can click which one

---

**Pick-up area**

- Safety, time
- Waiting inside but able to see the 'pick-up zone'
- Separate, 'loading area' like airport
- Car line
  - Branch off/pull off
- Cell phone lot
  - Shuttle lot
- Protected from elements
  - Ceiling & walls
  - Shaded, heat, & to see phone

---

**Check List Ideas**

- On-site laundry
- Windows
- Near access to nature
- Caretaker near by/accessible

**Living w/ a mentor (ex-officio)**

- Someone who could help if something happened
- Hard to communicate without everyday support
- Ideally support person will be helpful
- Still able to bring friend/partner
1. Label rows/spots more (identification like a garage!)
2. Traffic calming
3. Colors to identify what space is being used for
4. Grass median
5. Designated path between parked cars
6. Barriers between sidewalk & street
Recreation

Thick walls
- Playground for all ages
- Playground for adults and/or special needs
- Arcade (video games)
- Library/learning center
- Uber/Lyft
- Pool

Bus Rides
- Keep constant display of bus stop
- More visible bus driver because it helps identify who is driving
- Someone on bus (staff or volunteer) that you can ask questions to express concerns to ("Bus Monitor")

Bikes
- For work
- More bike racks as reason for not riding bikes
- Lack of bike racks as reason for not riding bikes
- Training system built into bike rack
- Pathways for bikes so you don’t have to use sidewalk or road
- Public training for adults

Recreation
- Closer to home
- Expand creativity
- More desire to get out of home

Shade
Swing
Chair
Proof
outdoor/ street lights

- enough to see, not just where you are going. But also if stuff is on the ground (e.g. glass)
- light color preference?
  - not too strongly colored
  - LED headlights too intense
  - too bright
- closer together / consistency
- parking spaces
  - trying to avoid cars
  - have to make up paths
  - designated spots
  - closer to building
  - can see, first floor, accessible
- navigation
- parking lots:
  - dangerous
  - bigger spaces
- sidewalks
- green space

CHARRETTE_Day 2_StreetLights1.jpg

CHARRETTE_Day 2_indoorParking12.jpg
Next Stop

- Announce what you are approaching
- Reminder: seat assignment over intercom
- LED bold / bright yellow indicator
- App that gives notifications when on board
- "Transit App"

Cross Walks

- White paint blends in - bright yellow instead
- @night too (rereflective)
- More bridges over roads (less transfer, less need to pass underpass or cyclopath)
- Cross all at once
- Longer time to cross
- Sound of crossing: Thudin means to walk to
- Quiet, not as many
- Voice instead of repetitive beeping

Navigating parking areas - wayfinding between parking spaces

Pick-up lot (like from school)

- Indoors?
- Quiet
- "Recharge"
- Weather

1 space or 2 spaces?

- Wake up, pick up in same spot
- Wait in spot, have cell phone in hand, talking to kid

- Sidewalks: directions given on sidewalk
- Increased width → 3 people wide of a little space between
- Bike lane on sidewalk; it wider
- Safety rails or something to prevent them from hitting people
- Transplanted small wall between sidewalk & bike path
III. Appendix

12. STUDENT SYNTHESIS
12. STUDENT SYNTHESIS

III. Appendix

AUTISM PLANNING AND DESIGN GUIDELINES 1.0

APPENDIX | 139
Parking Garages

One of the key concerns for parking lots and garages that we learned from the focus groups and charrette were that there was a major need to improve safety, wayfinding, and connection to the location desired. Some solutions that were brought up were having different colors in parking spaces to identify exactly where you should be walking and an easier way to identify what floor or spot you are in. Using these ideas, we can create unique floors of parking garages using different colors. Instead of having floor numbers, creating color levels to help more easily identify what floor you are on, and make the actual spaces and crossing sections the same color so the floor is overwhelmingly one color. If this was included on the stairs as well it could create a way to remember what floor you were parked on by remembering what colors were passed on the way down. Another way that safety can be improved in parking garages would be to make a sidewalk around the interior and exterior walls to prevent people from walking in the way of cars and create a situation where you would have to cross cars just one time if you wanted to get out of the garage.
Parking Lot

Parking safety was an important part of the design process. It was critical that the parking lot be well-organized and user-friendly. The layout of the parking lot was designed to accommodate the specific needs of individuals with autism. The parking spaces were wide enough to allow for easy navigation, and the paths were clearly marked with visible signage. The design of the parking lot was intended to minimize confusion and maximize safety.

Tree Trunk

The tree trunk was placed near the parking lot to provide shade and a focal point for the visitors. The trunk was decorated with simple, symbolic imagery that was familiar to individuals with autism. This helped to create a sense of familiarity and comfort for the users of the lot.

The 220/240 V Space

The 220/240 V space was designed to accommodate electric vehicles and was equipped with charging stations. This was an important feature for individuals who relied on electric vehicles for transportation.

Finding Ourselves

Finding Ourselves was a mural created by a local artist. The mural was designed to be a focal point for the visitors of the parking lot. The artwork was intended to inspire and encourage individuals to explore their own sense of identity and self-expression.

Conclusion

In conclusion, the design of the parking lot was intended to create a safe, welcoming, and accessible environment for individuals with autism. The layout of the parking lot was designed to accommodate the specific needs of this population, and the design was intended to maximize safety and minimize confusion. The tree trunk and mural were added to create a sense of familiarity and inspiration for the visitors of the lot.
### Autism Friendly Checklist

**Business**
- Location (not area)
  - Accessible Space (not specific)
- Access to Transportation
  - Special Needs Access (not specific)
- Unique Assurances - 5 Steps of Consistency
  - Use of Consistency (not specific)
- Unique Features of Site (not specific)
- Information on Unique Features (not specific)
- Unique Features of Different Sites
- Unique Uses of Different Sites

**Parking**
- Built-In Parking (not specific)
- Other Parking (not specific)
- Street Parking (not specific)
- Unique Parking Features (not specific)
- Unique Parking Locations (not specific)
- Unique Parking Sites (not specific)

**Public**
- Accessibility
  - Specific Access
- Visibility
  - Specific Visibility
- Security
  - Specific Security
- Competency
  - Specific Competency
- Confidentiality
  - Specific Confidentiality

**Environment**
- Reducing Stress (not specific)
  - Specific Reducing Stress
- Sensory
  - Specific Sensory
- Safety
  - Specific Safety
- Specific Safety (not specific)
- Overall Safety
  - Specific Overall Safety
- Overall Safety Features (not specific)

**Paratransit**
- Wheelchair
  - Specific Wheelchair
- Lifts
  - Specific Lifts
- Ramps
  - Specific Ramps
- Accessibility Features (not specific)

**Furnishings**
- Built-In Furnishings (not specific)
- Other Furnishings (not specific)
- Specific Furnishings (not specific)

**Amenities**
- Specific Amenities (not specific)
**Suggestions**

- **Require consistency from drivers**: LE. Stop announcements are helpful but are not always used.
- **Impact**: on bus drivers - having this happen can help and passengers as well.
- **Real-time Map/Monitor showing our route & “you are here” with upcoming stop announcement**.
  - Ideally 3D map similar to Google Earth View (e.g., campus map). Map/monitor may be:
    - Collect data on what the public thinks the best route looks like.

**Considerations**:
- Monitors such as this may take up space previously used for ads.
- Real-time visual (e.g., map) may be an issue of funding.
- Possible community input to just the automated announcement.
- Add on suggestion: in that same space (usually dedicated to ads) have scrolling text similar to "just" the automated announcement.

**Additional info to include**:
- Real-time monitor of bus route showing "you are here".
- Visual map with pictures of scenery along the way & drop-off destinations.
- 2 kinds of line? Bus amenities map, maps are unobtrusive.
- Include 3D tour (e.g., campus) or also example of OSU campus map.
CONCEPTUAL

STANDARD "WHEEL & SPACE"

PROPOSED "ATOM" MODEL

LINEAR ROUTE

CIRCULAR ROUTES

PARKING SPACE

CURRENT STANDARDS

CAR

VAN

PARKING SPACE

NEW STANDARDS

CAR

VAN

ASL Parking Space

Description

The ASL Parking Space provides an accessible parking space for individuals who use American Sign Language (ASL). The space is designed to accommodate individuals who use ASL, allowing them to communicate effectively while parking. The space includes an area designated for ASL interpretation, along with signage and seating for interpreters. This provides a comfortable environment for individuals who need assistance with ASL interpretation while parked.

Paradigm

- Communication
- Accessibility

Contribution

- Provides a dedicated space for ASL interpretation
- Enhances accessibility for individuals using ASL

Impact

- Improves communication for individuals using ASL
- Increases accessibility for those who require ASL support

Implementation

- Design considerations
- Detailed specifications

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Implementation

- Design considerations
- Detailed specifications
Multi-Use Trails

**Clarity:** Lanes are marked with bright colors, simple words, and easy-to-understand symbols. Directions are clearly laid-out and made more clear by landmarks like museums.

**Sensibility:** Trees, tree canopy, easy-to-cross with lanes allow for easy and confident use.

**Safety:** Lanes are clearly divided and labeled wide enough to accommodate lots of traffic. Wide enough lanes allow for users to confidently use lanes. Electric calls stations allow people to call for help or assistance—useful for those with no phone.

**Inclusivity:** Trails are made to accommodate all types of users and includes ramps to allow easy access for those who can’t use stairs. Ideally the trails would mostly be flat for ease of use.

Bus Stop (Electric Sign)

**Clarity:** The electric sign updates on a continuous cycle. It lets you know when the next bus arrives and where it is heading. The stops are also identified by landmarks such as museums or hospitals.

**Inclusivity:** The sign can be displayed in other languages. The call box can get you in touch with someone if you have a specific need with navigation.
Bus Stops (inside)

Safety: Well lit, has a call box for directions and safety. Indoor bus stop provides added sense of security.

Sensitivity: Being inside helps reduce stress from the outside. Inside is kept quiet and free of ads to provide peace and tranquility.

Clarity: All parts of need or interest are clearly marked. The station is labeled and identified by nearby landmarks.

Bus Stops (outside)

Sensitivity: The bus shelter is inside, reducing stress from outside traffic.

Safety: Bus shelter is inside, well lit, and equipped with a help and call box.

Privacy: While complete privacy is difficult at a bus stop, being an indoor bus stop reduces stress from outside traffic and stress.

Clarity: The bus stop is labeled by its street location, but also by nearby landmarks like hospitals and museums.

Inclusivity: The bus stations are accessible to everyone, have no stairs, wide doors, and accommodate many needs.
SPECIFIC

• Bus Stops
• Bus Routes
• Living Space Checklist (Autism Friendly Scorecard)
• Sidewalks/Crosswalks
• Streets
• Secure Spaces
• Parks
• Public Realm

GROUP DESIGN

GENERAL

• Lighting
• INAs (Indoor Active Spaces)
• Video Surveillance
• Security
• Parking Spaces/Garages
• Assistive Tech
III. Appendix

13. CHARRETTE PRESENTATION

2018 Hazel Morrow-Jones Charrette Summary of Findings

Planning and Design for and with Adults with ASD
Literature Review

• Graduate and undergraduate students in the 2017 Fall Semester began literature review process
• Students sought information on autism, zoning codes, and cities that had incorporated laws around improving cities for people with autism

Research

• No city planning research on public participation process and tools specific to people with ASD
• There is ASD-specific work being done regarding landmarks and individual structures.
• Autism-friendly design practices can be made to be compatible with local zoning codes
Focus Groups

- Adults with ASD
- Parents of Adults with ASD

Central Topics

- Housing
- Recreation
- Transportation
- 28 sub-topics, including
  - Wayfinding
  - Sidewalks
  - Bus Routes
  - Therapeutic Recreation
  - Assistive Technology
  - Shared Living with Retirees

Review of Process

Day 1

- City planning and design professionals gave input to improve proposals
- Multi-disciplinary professionals created new ideas through discussion
- Professionals sketched their ideas to better elaborate their improvements
- Students recorded notes for each discussion and began synthesis of newly recorded data

Day 2

- Two separate groups of Adults with ASD provided their opinions on the project proposals
- Discussion about improving project proposals took place as a group
- The Adults produced their ideas for improvements through sketches
- Students recorded notes throughout the group discussions
- Synthesis of Day 1 and Day 2 data began immediately after second session with The Adults
Ten Findings

(In no particular order)

Housing Options

Duplex and/or Mixed Communities with Retirees

Well received
- “Ideal village” includes:
  - 50% individuals or families with autism
  - 50% without autism, and empathetic/intelligible (retirees, grad students, individuals with desire to serve)
  - Mixed income/diverse
  - Partner orgs (age-friendly Columbus, universities, major employers, COTA)

ADU’S & Tiny Homes

Not well received
- The idea did not go over as well with Adults with ASD & their parents as it did with the professionals
- A point of contention among Adults with ASD and their parents
- Not as ideal as duplex or mixed communities
Autism Community Scorecard

This is a proposal for a scorecard that communities can use to measure how well they meet the needs of people with autism.

- Many communities now are good in some areas but weak in others and a checklist will bring their weaknesses to their attention.
- Aspects like walkability and digital connectivity are elements that other residents can enjoy as well.

In-Bus Features

- Separate Areas for loud riders versus quieter riders
  - Possible area towards the front in case assistance is needed
  - Literal separation?
- Assistant on the bus to help riders if needed
- Different kinds of alerts to make riders aware of an impending stop
- Use of app with ringer or notification to identify when their bus stop arrives
  - Louder notification or flash of light on the bus to identify when you are at a stop
  - Have ticker say when/what stop is currently at, instead of time
- Wifi on buses
Bus Stops

- Higher visibility of bus stops (landmarks)
- Paths leading up to the bus stop, landmarks
- Enclosed bus stops
  - Weatherproof
  - Safer
  - Sound dampening
  - Soft lighting for night time
- Consistency of bus stop designs
- Crosswalks close to bus stops, safe distance from the road
  - Easy to get to, in more convenient places
- Touch screen computers at stops for wayfinding
  - Routes
  - Which Bus
  - When
- Buses on demand
- Landmarks, signage that lead to bus stops
- Stops by name rather than address

Specialized Recreation Room

- Separate designated spaces for specific recreational activities
- Ability to personalize the space
- Incorporated into individual residential living spaces and multifamily common areas
- Small spaces are often preferred by people living with autism

- Example - video game room
Soothing Spaces

- Separate quiet spaces --> Allow for more privacy in case of stress
- Can be reserved for different uses
- In public buildings and in parks
- Proposed outdoor design
  - Benches
  - Quiet Fountain
  - Surrounding Vegetation
  - Pet Care Space
  - Check-in System

I Need Assistance Symbol

- Universal symbol used to alert people with ASD to places where they can seek assistance
- Needs to be adaptable for various needs and people (ex: higher and lower functioning)
- Icons for sake of simplicity, easy recognition
- Sticker with symbol at info desks with ASD-specialized staff
- Possible inclusion of connection to 211 operator
Designated Walking Spaces

Parking Lots
- Major challenges presented:
  - Safety
  - Where to walk
- Clear paths to walk on in the parking lot
  - Placing a walking path in between parked car

Crosswalks/Sidewalks
- Wider sidewalks
- Separation from sidewalk to street with a short wall
- Clearer marked crosswalks
  - Longer time to cross
  - Gentle voice instead of loud beeping

Pick-up/Drop-off
- Similar to an airport/cell phone lot
- Time Limit
- Protection from outside elements
- Attached to building so that people can wait inside and still see the ‘pick-up zone’
Assistive Technology

- In-Home-Programmed and on-demand settings to reduce overstimulation
  - Whole home lighting and sound
  - IOS/"Alexa" control
  - Window tinting (transition lenses) and automatic blinds
  - Nest
  - System learns preferences
  - Wearable control (ex - apple watch)
- Remote monitoring for caregiver
- Individualized to person
- 24/7 access to remote support
- Non-auditory alarm clock (lights)

Wayfinding

- Apps to connect modes of transportation
- Augmented Reality (AR)
- Mapping app for phone, glasses, etc.
  - When and where to:
    - Walk
    - Cross
    - Get on/off transit

What's Next

1. Master planning
2. Zoning codes
3. Policies and recommendations
   - ADA enhancements
4. APA interest group
5. Autism Living implementation
Questions?
III. Appendix

14. PLANNING GLOSSARY

ACCESS Aisle - An accessible pedestrian space between elements, in this case parking spaces, that provides clearances appropriate for use of the elements.

Accessory Dwelling Unit (ADU) - A secondary dwelling on the same grounds as or attached to an existing residential structure.

Affordable Housing - Housing for occupants that pay no more than 30 percent of their income for overall housing costs, including utilities. This is a relative measure that varies per region.

Americans with Disabilities Act (ADA) Standards - Design guidelines and regulations for businesses and governments to abide by to provide accessibility throughout developments to those with physical disabilities.

Bike Lane - Bicyclist specific corridor next to roadways separated by pavement markings.

Bike Rack - Storage structure for bicycles.

Buffer - A strip of land designed to separate two use areas from one another. Typically characterized by the presence of trees and shrubs planted for screening purposes.

Bump-Out - Used to shorten distances to cross streets and to extend sidewalk into street as a mode of traffic calming.

Central Business District - The commercial and business center of a city. Synonymous with a city’s downtown area, though the two are sometimes separate districts.

Communal Living - A lifestyle where a group of people with similar interests or beliefs live together in one space.

CROSSWALK - Right-of-way that provides access to pedestrians to travel across a thoroughfare.

Design Standards - Set of parameters to be followed in a site or building development.

Downtown - Colloquialism for a city’s central business district or populous urban core.
**DUPLEX** – A single dwelling unit divided into two apartments, with separate entrances for each household.

**DWELLING UNIT** – A structure or portion of a structure used for residential purposes by the household that owns the structure.

**GREENWAY** – Open space conservation area that provides passive recreational opportunities.

**HUB AND SPOKE** – A model commonly used for various transportation uses that aggregates multiple traffic flows at a single hub node where the high volume aggregated traffic flows from one hub to another hub. All hubs are assumed to be interconnected.

**I NEED ASSISTANCE SYMBOL** – Magenta circle representing that a building, structure or park is autism-friendly and can provide basic help to people with autism. Circle size can vary but must be visible from nearest public right-of-way.

**MULTI-MODAL** – Applying to multiple, different modes of transportation.

**MULTI-USE TRAIL** – Path, separated from vehicular traffic, that is used by bicyclists, joggers, pedestrians, and other forms of non-vehicular travelers.

**PARK** – A public open space often displaying natural landscapes with active or passive recreational uses.

**PARKING GARAGE** – Structure where vehicles are stored within. Generally, costs money to store vehicle.

**PARKING LOT** – Designated, open space area for vehicles to be stored.

**PICK-UP/DROP-OFF LOCATION** – Area near building, structure or park where passengers can be dropped-off and later picked-up by a driver. Pick-up and drop-off locations may be in the same location or differing locations in vicinity.

**PLANTING STRIP** – The grassy area between the sidewalk and the street. Also known as a “tree lawn.”

**SETBACK** – The minimum required distance between a building front and the street or sidewalk it is accessible from.

**SIDEWALK** – Walkable path system, typically alongside streets.

**SIDEWALK BARRIER** – A small wall (no taller than 3’) that separates the sidewalk from various thoroughfares.

**SIGNAGE** – A collective term for public display signs.
**SUBURBAN** – An outer area of a city, typically characterized by low population density and low- to medium-intensity development patterns.

**THERMOPLASTIC** - Pliable plastic material.

**TINY HOME** – A residential structure associated with the tiny house movement. They are typically between 100 and 400 square feet in size, though the structures detailed in this document will be between 300 and 600 square feet.

**WALKABLE PATH** – A pedestrian-friendly sidewalk or other path suited for the purpose of walking.

**WAYFINDING** – Knowing where you are in a building or environment, where your desired location is, and how to get there from your present location. Also known as “spatial problem solving”.

**ZONING** - The process of classifying land into areas and districts based on permitted and prohibited uses.
SIX FEELINGS DEFINED

**CONNECTED** – Indicates spaces that can be easily reached, entered, and used by adults with autism.

**FREE** – Indicates spaces where adults with autism can act independently without difficulty.

**CLEAR** – Indicates spaces with elements at ease of being understood by adults with autism.

**PRIVATE** – Indicates spaces where adults with autism can go if they feel stressed or uncomfortable.

**SAFE** – Indicates spaces where adults with autism have little to no risk of being injured.

**CALM** – Indicates spaces that appeal to physical sensory issues associated with adults with autism.

ENVIRONMENTS

1. **DOWNTOWN** – Colloquialism for a city’s central business district or populous urban core

2. **URBAN** – Area represented by political boundaries with three or more dwelling units per acre, commercial development, industrial development, and availability of public services.

3. **SUBURBAN** – An outer area of a city, typically characterized by low population density and low- to medium-intensity development patterns.

4. **MULTIMODAL HUB** – A place where passengers and cargo transfer from one mode of transportation to another. Includes bus stops, airports, train stations, and rapid transit stations.

5. **RETAIL** – Physical area where goods and services are purchased and sold.

6. **CAMPUS** – Adjacent areas making up the grounds of a corporation or university, containing various buildings and structures.

7. **PARK** – A public open space often displaying natural landscapes with active or passive recreational uses.
AUTISM PLANNING AND DESIGN GUIDELINES 1.0

KNOWLTON SCHOOL OF ARCHITECTURE
CITY AND REGIONAL PLANNING PROGRAM

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IMPLEMENTATION
OVERVIEW

PURPOSE

Adults diagnosed with Autism Spectrum Disorder (ASD) are predisposed to overstimulation due to the acute neurological processes associated with the disorder. As a result, people with autism experience higher levels of stress from stimulants in the built environment, such as light and sound. The current pedestrian and transportation infrastructure contributes to this stress (Reference: Research Protocol).

In Spring of 2018, researchers at the Knowlton School of Architecture created the Autism Planning and Design Guidelines 1.0 and the Six Feelings Framework to better accommodate adults with autism in cities nationwide. The Guidelines 1.0 prescribes retrofits for pedestrian and transportation infrastructure that directly affect an adult with autism’s perception of six key feelings: connectedness, freedom, spacial clarity, privacy, safety, and calm. Specific recommendations include changes to bus stops, parking lots, streets, crosswalks, sidewalks, multi-use trails, pick-up/drop-off areas, and calming spaces.

After the publication of Guidelines 1.0, the researchers added this chapter focusing on the implementation of the recommendations through the use of a focus group on Ohio State’s campus. The campus focus group tested four infrastructure elements in Autism Planning and Design Guidelines 1.0. Researchers augmented selected areas of The Ohio State University campus to determine the effects of the design recommendations on adults with autism with regard to their independence and sense of well-being. The framework was then revised as needed.

GOAL

The present research achieved three primary goals. First, researchers at the Knowlton School of Architecture implemented four designs in Autism Planning and Design Guidelines 1.0 to assess the efficacy of its design recommendations for adults with Autism, with regards to the Six Feelings Framework. Adults with autism were invited to experience the four design elements, and the feedback gathered from the campus focus group were used to revise the specific recommendations offered in the Guidelines.

Once the focus group results were analyzed, policy recommendations were devised to inform municipalities across the country on how to plan for adults with Autism. These recommendations contribute to the existing policies associated with the Americans with Disabilities Act and will thereby improve the ease with which people with diverse abilities can maneuver the public environment.

Finally, the campus focus group begins the iterative process for assessing and implementing design elements described in Guidelines 1.0. Planning practitioners are encouraged to test these elements and revise them to accommodate the Adults with Autism in their communities.
THE SIX FEELINGS FRAMEWORK

As mentioned in the summary of these guidelines, The Six Feelings Framework is a means by which the needs of adults with autism can be considered in the design of the public realm. To reiterate, planning and design implementations in the public realm should make adults with autism:

1. **Feel connected** - because they are easily reached, entered, and/or lead to destinations.
2. **Feel free** - because they offer relative autonomy and the desired spectrum of independence.
3. **Feel clear** - because they make sense and do not confuse.
4. **Feel private** - because they offer boundaries and provides retreat.
5. **Feel safe** - because they diminish the risk of being injured.
6. **Feel calm** - because they mitigate physical sensory issues associated with autism.

The Six Feelings Framework helps planners create spaces and infrastructure that are more usable, comfortable, and beneficial to all constituents, but especially adults with autism. The designs presented in Guidelines 1.0 were a theoretical first-step. Implementation of the autism planning design elements was needed to assess the strengths and shortcoming of the designs. Based on the supporting information gathered and presented in Guidelines 1.0, the design elements tested on The Ohio State University campus were expected to perform better than conventional infrastructure in meeting the needs of adults with autism.

In preparation for the focus group, there was extensive discussion about how to test the designs most effectively. The designs needed to remain true to the Guidelines 1.0 while being feasible for research on an active college campus. This is a common challenge for planners trying to translate policy into practice. To mitigate some of these challenges, planning researchers at Knowlton prepared for the campus implementation and focus group in five concurrent ways: participating in a Team Better Block event at Blackburn Recreation Center, completing online video modules about focus group research methods, developing a hypothesis and accompanying research questions, facilitating several practice focus-group scenarios (i.e. role-playing), and creating useful aids for note taking.

In order to begin preparing for the focus group, the Knowlton School research team participated in an event known as the Blackburn Better Block. During this event, an organization known as Team Better Block used tactical urbanism techniques to activate and improve the park. The research team received permission to incorporate the designs elements from Guidelines 1.0 into the Blackburn Better Block project, thereby providing a means for the researchers to practice tactical urbanism techniques prior to the campus focus group. Versions of the designs that would work for the Blackburn Better Block were developed and implemented. Through this, researchers gained valuable insight into how the designs should be best built out during the actual focus group.
In order to prepare for the upcoming focus group, the researchers reviewed various online training courses on how to conduct professional research and take detailed field notes. Following this training, we began preparing to ask questions.

Using the Six Feelings Framework as a guide, a series of research questions were drafted to gauge how focus group participants felt about the implemented designs. It was important to create open-ended questions that were not “leading,” thereby allowing the participants’ true thoughts to be captured. The final list of initial questions and response-based, follow-up questions was compiled and can be viewed in Appendix A.

Role playing proved especially helpful when generating the list of potential follow-up questions. One researcher served as a facilitator, while one or two others practiced field notation and two others acted as focus group participants. When the facilitator asked questions, the focus group participants gave indirect answers, as these responses seemed more probable during the actual focus group. This simulation was challenging, however it proved critical for preparing the facilitators to think on their feet and for allowing notetakers to practice recording unanticipated responses.

The practice simulations highlighted the challenge notetakers could face when recording responses for multiple individuals answering rapidly. Therefore, researchers created note sheets which can be viewed in Appendix B. These were intended to streamline the notes and make it easier to decode responses recorded by multiple notetakers. We also developed a method for conducting the focus group and a guide for coding and analyzing field notes. The schedule for the focus group can be viewed in Appendix A.
RESEARCH DESIGN

GUIDELINES AND BUILD OUT

The objective of this study was to test elements of the Autism Planning and Design Guidelines 1.0. These guidelines were developed with feedback from adults with autism, but they have not been tested by adults with autism. This study seeks to collect their feedback on the guidelines, and will be used to inform future iterations and autism planning guidelines.

Four guidelines were tested on the Ohio State University campus:
- Crosswalks
- Pick-up/Drop-off Zones
- Soothing Spaces
- Multi-use Trails

CROSSWALKS

The Autism Planning and Design Guidelines 1.0 call for wider and easy to navigate crosswalks. Specifically, the guidelines outline the following:
- Crosswalks shall be a minimum of 10’0”
- Crosswalk color shall be magenta. (Hex Triplet: #FF00FF)
- Crosswalks shall include assistive wayfinding on the pavement.
- Crosswalks shall utilize digital voices to provide instructions and (soft) signaling lights for navigation.

The width and color requirements for crosswalks were tested. The digital voices and lights were not feasible to test on Ohio State’s campus due to building requirements and rules against permanently altering physical assets of the university. The crosswalks were widened and colored using magenta tape in order to comply with university rules.

PICK-UP & DROP-OFF

Many adults living with autism do not drive and rely on others to transport them to their destinations. Because of this, pick-up and drop-off zones are included in the design guidelines to ease the transportation strain. The guidelines require the following:
- A minimum of 20% of the street front on selected blocks shall be designated for pick-up and drop-off purposes

This concept was tested near Knowlton Hall using magenta tape. The pick-up and drop-off zones were outlined with the tape and labelled using white chalk.
SOOTHING SPACES
Soothing spaces were not specifically outlined in the guidelines, but they were recommended in the charrette. Thus, a design for soothing spaces was tested to determine whether or not to add it to the next iteration of the guidelines.

Soothing spaces are meant to provide an escape from busy urban areas. Adults with autism can get overwhelmed, so providing quiet and relaxing spaces can ease stress.

- Far away, shaded, quiet space in park (away from playgrounds)
- Maybe a rocking chair or a swinging chair like a cocoon
- An overhang type building
- Plexiglas walls – should be see through
- Something to reduce the outside noise
- Privacy (like a public bathroom)
- Don’t want the adults to stick out
- They should blend in
- Don’t want the shelter to look like a sad spot

MULTI-USE TRAILS
Multi-model trails can be chaotic and stressful for adults with autism. The guidelines propose dividing trails by uses to make them safer and easier to navigate:

- Trails shall be 22’0” wide.
- Trails shall be divided into a 10’0” bike lane, 2’0” buffer, and a 10’0” pedestrian lane.
- The bike lane shall be divided into two 5’0” sections traveling in opposite directions.
- The pedestrian lane shall be divided into two 5’0” sections, one for running, one for walking.
- Sections shall be divided using a magenta line.

This was tested by dividing a portion of a sidewalk on the Ohio State University campus using magenta tape. There were two lanes for pedestrians and two lanes for bikes.
DATA COLLECTION
The researchers worked with Autism Living, a local nonprofit autism advocacy group to find participants for the focus group. When the participants arrived on campus, they were given an overview of the research as a whole and the details of what they should expect during the focus group. After signing a consent form, the seven participants were split into two groups, one of three adults and one of four adults. Each group was accompanied by one-two facilitator(s), and two note takers. One note taker was tasked with recording the verbal responses of the adults, while the second note taker recorded any physical responses that the adults exhibited. The adults were taken to four different locations. Each station tested one of the four chosen designs from Guidelines 1.0 using the designs described above. The participants’ verbal and non-verbal responses were recorded during the focus group and in the following debriefing session. The notes were immediately transcribed and can be found in the Appendix.

DATA ANALYSIS
Following the focus group, the transcribed notes were analyzed for repeated themes and response commonalities: these broader response themes were used to generate a list of recommendations for each of the four designs. First, the verbal and physical responses from participants were recorded. Next, the participants’ reactions to each of the four design elements were summarized. Then, the researchers categorized the reactions in accordance with the Six Feelings Framework. Through the prior analysis, recommendations were written for improvements to Guidelines 1.0. Some of the changes that the adults with autism said they would like to see aligned with existing guidelines that were not realized in the physical build-out. These guidelines were considered confirmed.

The Findings and Recommendations section contains a description of the feedback on each design element, the guidelines that were confirmed, and new guidelines based on the results of the focus group.
FINDINGS AND RECOMMENDATIONS
The crosswalk used for the focus group was adapted from the Guidelines 1.0. It was fashioned in an existing intersection. Strips of magenta tape were placed diagonally to fill in the crosswalk.
**LATEST RESEARCH**

Focus group participants notes that it was easy to perceive the difference between a traditional crosswalk and the crosswalk constructed for the focus group, due to the color and size. The larger crosswalk allowed participants to walk side-by-side with their friends. Several participants felt the magenta was too bright and they suggested that other colors should be used. Nearly all participants disliked the diagonal lines. They appeared to direct walkers to move diagonally, outside of the crosswalk, rather than straight across the street; or they appeared to be no-walk zones. Wayfinding and directional elements were not included in the campus focus-group design. Participants recommended having a crossing guard or an accessible pedestrian signal should be used to direct movement through the crosswalk.

**GUIDELINES**

- Crosswalks shall be a minimum of 10'0".
- Crosswalks shall include assistive wayfinding on the pavement.
- Crosswalks shall utilize digital voices to provide instructions and (soft) signaling lights for navigation.
- *Crosswalks shall be white, yellow, or another color that clearly distinguishes the crosswalk from the road.*
- *Crosswalks shall appear solid or be filled with evenly-spaces straight lines that delineate the walking direction.*

Italicized text denotes guidelines that are new or altered from the original guidelines.
PICK-UP & DROP-OFF

DESIGN

A simplified version of the design in the guidelines was constructed in an area designated on campus already used for a pick-up drop-off area. The zone was marked with pink duct tape and diagonally striped lines. The zone was accompanied by a designated area on the sidewalk for a covered shelter, marked in pink duct tape and enclosed with multicolored planters.
**GUIDELINES**

- A minimum of 20% of the street front on selected blocks shall be designated for pick-up and drop-off purposes.
- *Pick-up & Drop-off zones shall have a sign designating the lane as a pick-up drop-off zone.*
- *Pick-up & Drop-off zones shall have a shelter that follows the bus stop guidelines.*
- *Pick-up & Drop-off zones shall be a solid color that is aligned with the city’s general designations for idling or safety lanes.*

Italicized text denotes guidelines that are new or altered from the original guidelines.

**LATEST RESEARCH**

Suggestions included marking the curb as yellow to indicate a change in elevation. Other suggestions are reflected in the guidelines below. There is further research needed as to how many drop-off spots are needed in a certain area or given a specific density and if they are needed on both sides.
SOOTHING SPACES

DESIGN
The soothing space was constructed in a courtyard on campus near a busy area. It featured magenta chairs strategically located under a tree and 3-ft planters that sectioned-off the chairs.

Below is a possible design for future trials, incorporating some of the suggestions from the trial.
LATEST RESEARCH

The participants of the study interacted with the designed soothing space, utilizing the chairs and observing the space in a broader context and overall had a positive reaction. One of the participants mentioned that they liked that the chairs have backs unlike the benches nearby, demonstrating the effectiveness of our design for the seating in the soothing spaces. Participants enjoyed the environmental aspects of soothing spaces, but they recommended the addition of seat cushions and technology could improve comfort and provide opportunities for activity. They also noticed a level of noise near the space that made them uneasy and recommended noise cancelling headphones. Recommendations also included changing the color from magenta as it was too bright and drew too much attention raising the concern of being isolated.

GUIDELINES

- Soothing space shall include neutral colors and use magenta only to highlight the area.
- Soothing space may use the autism symbol to designate the space with the intent to make the space identifiable but not exclusive.
- Soothing space shall incorporate technology for activities such as charging stations and headphones.
- Soothing space locations shall be shady and include foliage.

Italicized text denotes guidelines that are new or altered from the original guidelines.
MULTI-USE TRAILS

DESIGN
Researchers built a simplified version of the Multi-Use Trail mentioned in the guidelines. Under the Knowlton Hall overhang, a to-scale mock-up of this trail was constructed using magenta duct tape. The tape was used to denote the separate lanes, while white chalk was used to draw arrows and other wayfinding.
LATEST RESEARCH

During the focus group, the participants mentioned that they liked the lane size and overall width of the multi-use trail design. Participants from both groups recommended a divider in the trail’s two foot buffer to better separate the pedestrian and bike lanes. The participants that recommended a divider both mentioned a railing but also reacted positively upon the suggestion of using shrubs instead. One participant mentioned that utilizing two different kinds of materials for the pedestrian and bike lanes would also help to better delineate between the two lanes. Other participants reacted positively to these suggestions.

GUIDELINES

- Trails shall be 22’0” wide.
- Trails shall be divided into a 10’0” bike lane, 2’0” buffer, and a 10’0” pedestrian lane.
- The bike lane shall be divided into two 5’0” sections traveling in opposite directions.
- The pedestrian lane shall be divided into two 5’0” sections traveling in opposite directions.
- The bike lane shall be paved with asphalt, concrete or another smooth surface for biking. The pedestrian lane may be paved in similar fashion or may be made of crushed limestone, gravel, wood-chips or a similar material usable for walking.
- The 2’0” buffer shall feature a raised divider such as low bushes, bollards, or a railing.
- The specific form that this divider takes will depend upon the context of the area.
- Sections shall be divided using a dashed line.
- Trails shall include arrows to delineate direction, images of bikes or pedestrians to delineate between the pedestrian and bike lanes and posted signs and/or maps as needed to assist in wayfinding.

Italicized text denotes guidelines that are new or altered from the original guidelines.
CONCLUSIONS
TAKEAWAYS

The research conducted for this chapter entailed building four design elements from Guidelines 1.0 and facilitating a focus group of adults interacting with the built design elements. From this research, the following takeaways that were observed in the creation of Guidelines 1.0 were confirmed:

- City spaces should be designed with an awareness of the sensory impact of the space on neurologically atypical members of society.
- Public spaces should provide ample width for people to travel without feeling crowded.
- Public spaces should use wayfinding and signage to clearly communicate where key landmarks are and how to get to them.
- Public spaces should separate pedestrians from other forms of transportation including cars and bicycles.

In addition, the following two takeaways came specifically from this latest research:

- Design features of spaces designed for adults with autism should be consistent with general local design principles and signage when it comes to color and other markings.
- Spaces designed for adults with autism should not be isolating and should blend in with the overall space.
Building upon the Autism Planning and Design Guidelines 1.0 requires an understanding of the limitations that may be encountered. This section details the limitations that were faced during this research so that such matters can be considered when conducting future research.

A major limitation that should be considered when conducting future studies is that Autism Spectrum Disorder (ASD) differs greatly between individuals. Future studies should consider these limitations when analyzing research results, as an individual study’s results may not reflect the desires of the entire ASD community.

Another limitation that should be considered is the time allotted for research. With only four months to test the design guidelines, the present research was limited to the testing of only four elements from the Guidelines 1.0 (crosswalks, pick-up drop-off zones, soothing spaces, and multi-use trails). The analysis of the research was also limited in scope due to time constraints. With more time, a formal coding system could have been utilized in addition to finding key themes and using the Six Feelings Framework. When making additional contributions to this research, be sure to develop a project timeline that produces the most effective results. The concept of an effective time frame may vary depending on the additions you plan to add to the research, but allow time to prepare for the project, conduct research, and analyze research results. Strive for a time frame that both reduces bias and maintains productivity to allow for the most effective results.

The final major limitation to consider is your access to resources when conducting your own research contributions. For example, in the present study we were limited with our ability in testing the concepts that required semi-permanent aspects (i.e. barriers on multi-use trails, bus stop shelters at pick-up drop-off zones, etc.). The focus group was conducted on a university campus, which made it difficult to implement all of the designs from Guidelines 1.0, according to the exact specs prescribed in the document. While future studies may not be on a college campus, they may have similar physical limitations which should be considered when analyzing future results.

These revised guidelines are intended to serve as a beginning for this area of research. As planners continue this field of research, they should be cognizant of any limitations that may be encountered during the practical implementation of their studies.
Prior to the inception of the research that would become Autism Planning and Design Guidelines 1.0, very little research had been done on how to plan city spaces for adults with autism. Their particular needs were often not considered by policy makers, planners, and designers. The publication of Guidelines 1.0 brought the needs of adults with autism into the planning discourse. This trial went one step further and demonstrated how these design elements can be implemented, tested, and adjusted based on that feedback.

This research is intended to be a beginning not a conclusion. It is important to note that the research presented in this chapter, Guidelines 1.1, only applies to the Central Ohio adults who participated in the focus group. However, the impact of this chapter goes beyond the immediate research conclusions. It is intended to help planners begin implementing these design elements and testing their effectiveness in their own regions and cities. Ongoing research by academics and practicing planners is necessary to continue to develop the Autism Planning and Design Guidelines to best serve neurodiverse members of society.

Projects that seek to address neurodiversity in the built environment are qualitative and inherently riddled with confounding variables. The subjective nature of this research should not serve as a deterrent; instead, planners should view it as an opportunity to craft a unique environment that effectively meets the needs of their communities.
APPENDIX
INTRODUCTION

The needs of adults with autism are rarely considered in the planning process. Autism Spectrum Disorder (ASD) affects millions of adults and their families. Adults with autism suffer from stress, anxiety, and sensory overload from intense cognitive processing of sound stimuli; making it difficult to navigate the built environment. ASD is one of the fastest growing developmental disabilities, and the current infrastructure is not accommodating to those living with autism. The following proposal recommends a series of policy changes to ensure that all cities and communities can create environments where adults with autism can thrive (Reference: Research Protocol).

BACKGROUND

In Spring of 2018, researchers at the Knowlton School of Architecture created the Autism Planning and Design Guidelines 1.0 and the “Six Feelings Framework” to better accommodate adults with autism in cities nationwide. Specific recommendations include changes to bus stops, parking lots, streets, crosswalks, sidewalks, multi-use trails, pick-up/drop-off areas, and calming spaces.

After the publication of Guidelines 1.0, the research team conducted a focus group with adults with autism on Ohio State’s campus to gather feedback. The following four aspects of the guidelines were built out on campus and tested to inform this trial:

- Crosswalks
- Multi-use trails
- Calming spaces
- Pick-up and drop-off zones

The study confirmed some elements of the guidelines and contradicted others. For example, the guidelines emphasize the use of magenta because the first focus group said it was a calming color. When testing magenta buildouts, many of the participants expressed that they did not like the bright color, and that natural colors are better. However, the focus group confirmed the need for soothing spaces and pick-up/drop-off zones. Overall, the research group gathered the following key takeaways:

- City spaces should be designed with an awareness of the sensory impact of the space on neurologically atypical members of society.
- Public spaces should provide ample width for people to travel without feeling crowded.
- Public spaces should use wayfinding and signage to clearly communicate where key landmarks are and how to get to them.
- Public spaces should separate pedestrians from other forms of transportation including cars and bicycles.
RECOMMENDATIONS

Based on the above findings, the research group recommends that cities adhere to the following policy proposals:

- All neighborhood planning guidelines incorporate the Six Feelings Framework
- Transportation options must be accessible and easy to use for all disability types
- Interior accessory dwelling units (ADUs) shall be legal in downtown zones. Downtown ADUs are appropriate in the attic, basement, or other inward facing room of the existing building.
- Open spaces should feature “soothing spaces” designed in accordance with the standards outlined in the Autism Design Guidelines 1.0
- Connectivity between development should employ separation of transportation modes including between pedestrian and bicycling.
- Consistent wayfinding shall be installed as needed along pedestrian and cycling infrastructure to assist pedestrians and cyclists in locating and travelling to their destination.
- New development should be designed in accordance with the standards outlined in the Autism Design Guidelines 1.0 to minimize or mitigate impacts, including noise and light, on the adjacent uses, especially residential uses.

The research team urges all cities and communities to consider the needs of adults with autism when crafting their planning policies.
I TRIAL QUESTIONS
First, the researchers briefly explained the research design. Then they used one or two broad questions to begin the conversation. While the conversation flowed naturally, the facilitators had general and specific complementary questions prepared which are below.

Broad Questions:
- What do you think of _____?
- How did _____ make you feel?
- What was your experience with _______?
- Throw out some words that you would use to describe this space.

General complementary questions:
- What made you feel that way?
- What do you like?
- Was this ____ different? How has it changed? Did you like those changes?
- How do you normally feel in _____?
- Which _____ made you feel more safe? How safe do you feel?
- How safe do you feel: not at all, a little bit, mostly, completely?
- In the city, which ______ would you want to see?

Complementary questions for Don’t Bother Me Zones (Soothing Spaces)
- Is it comfortable? Do you like to sit on park benches?
- How many chairs would you like in the park?
- Do you like this spot or that spot?
- In public, where do you go when you want to be alone?

Complementary questions for Multi-Use Trails
- How does this trail compare to other trails you have experienced?
- What would you feel comfortable doing on this trail?
- How do typical trails make you feel?
- If you could change anything about this trail, what would you change? - If anything
- If this trail existed by your house, how often, if at all, would you use it?
I TRIAL QUESTIONS

Complementary questions for Pick-Up/Drop-Off
Where do you get dropped off? Who drops you off?
Do you like the color?
Do you get rained on sometimes? Would a shelter help?
How does your caregiver find you? Would it be easier to find them if there was a designated spot?
How do you feel when you get dropped off normally?

Complementary questions for Crosswalks
How do you normally feel in crosswalks?
Which crosswalk did you like better?
II NOTE-TAKING TEMPLATES

### Group: Crosswalks/Streets - Verbal Notes

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**Shorthand for verbal**
- +t = positive response
- -c = negative response
- /r = neutral response

### Group: Crosswalks/Streets - Physical Notes

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**Shorthand for physical**
- e = positive expression
- n = negative expression
- / = neutral expression
- Y = yes
- N = no
- C = confused
- H = happy
- S = silence
III TRIAL TRANSCRIPTION

Crosswalks:

Physical Observations:

**Group 1**
- C=about color of crosswalks; looks both ways when talking about how he crosses the street; nods to indicate crosswalk hashes are confusing; overall +e /e
- Contemplates with hands when walking through crosswalk: hand to chin; gestures straight line to indicate the path one would walk in crosswalk; gestures at crosswalk while talking about it; gestures with hands to show lines should be solid in crosswalk; C=diagonal lines, tilts head to show direction is confusing; quotation marks hand gesture around “professional” when talking about lines being straight rather than diagonal. IN BIG GROUP: jolts to show she was taken aback by magenta color/ too bright
- Deep breath before walking through crosswalk; nods and gestures that he likes size of crosswalks; gestures and nods often; gestures at crosswalk and nods to say he liked crosswalk.

**Group 2**
- Turned head to side as thinking and answering. Opens and closes hands when saying “wait, wait” about verbal tech for crosswalks. Fiddling with string.
- When crossing normal crosswalk, seemed very focused on cars. Had to get attention, really likes idea of having a crossing guard.
- See overall notes.
- When crossing normal crosswalk, seemed very focused on cars.

Overall: Lot of walking around and looking at surroundings.

Verbal Observations:

**Group 1**
- Thought the color was “noticeable”. Liked how wide the space was, thought the lines across the crosswalk look like a “don’t cross here” section not a crosswalk.
- Likes the color red for a crosswalk. Always looks when walking and the wide space and and color make it very noticeable. Thought the stripes made it hard to know how to walk would rather follow the lines. Thought two straight lines would be nice if they were still wide.
- Thought the idea was nice to widen the crosswalk. Thought the color was really cool. And said it looked nice.

**Group 2**
- Vertical lines v. diagonal to help with wayfinding. Needs to be wider. Color is reflecting light. Likes this v. standard CW. No stop signs or street lights. Wayfinding and using sounds
- Afraid of cross traffic. Would like a light purple instead of pink. Crossing guards
- “Which color is it?” (confusion on the white standard CW and the pink).“Truck just went by and didn’t even stop”
- Wider, makes it easier to see where I am going. “I tend to lose direction sometimes”. Likes this more than standard, likes the pattern
Soothing Spaces (Don't Bother Me Zones)

Physical Observations:

Group 1
- Plops into seat; Taps on chair to say it’s too hard; Y to benches being uncomfortable at parks; tilts head back and forth to think about if parks are too busy, but says no; +e about wanting hammocks; IN BIG-GROUP: +e about name “chillax zone”
- Taps arms of chair to think about chair, crosses legs; shrugs to say DBMZ is rude; gestures with hand to say name should be shortened, indicates change in size with hands; gestures hits fists together to express annoyance at not having charger when phone dies; H-to say she’d probably snooze in a DBMZ; gestures-reclines to demonstrate relaxing in the sun; +e for charger/hammock
- Looks around at chair to consider what would be more comfortable; gestures-laying something down to say it would be nice to have a place to put your things down after class; e+ for hammock

Group 2
- See overall notes
- Kicking around in leaves. Sat down after asking for permission. Waved leaves around while sitting. Smiled and seemed happy. Began crawling around in corner of DBMZ as if playing.
- Tapping hands together while thinking. Squinting throughout. Could be the light.
- See overall notes

Verbal Observations:

Group 1
- Didn’t like how hard the seats were, would’ve prefered cushioning to go along the entire chair to increase comfort. Didn’t like park benches either. Thought OSU colors would be better because we were on campus. Normally goes to the park with family and doesn’t mind sitting with a couple of others at picnic tables. A large group would be unnerving. Liked idea of table w/ outlets and cup holders for drinks. Would use if seen in a park, liked that chair was in the middle of an open park. It looked secluded. Did not care about being able to see people and people being able to see him.
- Did not like the name of the space, thought don’t bother me zone was rude and standoffish. Liked chillax zone better. Wanted more trees around the area, thought it was too in the sun. would’ve liked more shade. Normally goes to the park with family or with friends. Said they would use the space in an actual park. Suggested that a table be by the chair to have a place to set things down while sitting. Wouldn’t mind if it was a hammock that a nap could be taken in. would be aok with sitting at a table if one person came, but if a group came, would not like.
- Likes the idea of a Don’t bother me zone, did not like the chair. Wanted cushions on it to make it more comfortable. Thought it was a nice place to take a break in between classes. Thought a table to set things on would be nice and maybe something to do. Thought a picnic table would be ok with maybe one or two other people came over. Felt nice about the spaces seclusion
Soothing Spaces

Verbal Observations:

**Group 2**
- Less crowded. Not too many people. “When I want to get away there’s nowhere to sit”. “I need a place to escape and relax”. Chairs are low, need cushions. Change color to brown (neutral). Don’t want to draw attention with the colors or be judged. Use the pink to highlight the area, instead of it being so prominent. Incorporate technology, things to do (music, phone chargers, etc.)
- Listening to headphones could help with the noise. Maybe change the color. “Make a pink playhouse” something with a door
- Chair feels good. Likes the trees and plants around. Like the chair better than benches
- Needs better designed dividers. Makes me feel calm. Intended use needs to be explained. Likes “Quiet Zone” v. DBM’s. Use less prominent designs

Pick-Up/Drop-Off

Physical Observations:

**Group 1**
- Thinks (visibly) about where he’d like to be dropped off [visualizing other PUDO places]; nods to say pink marks are helpful in parking spot
- Gestures to indicate collision; gestures with hand to indicate that parking space should be smaller; points to show parking spot should be moved up; makes hand-pushing motion to show there is no designated PUDO spot at another place; gestures to say that there’s a clearly designated spot at Fresh Thyme for PUDO; gestured that shelter should be next to parking zone; puts hand to chin to think about diagonals in parking zone; gestures “maybe” by shrugging with hands up to say curb painted for step-down would be helpful. IN BIG GROUP: slopes hand upward to gesture that an incline would make the curb should be inclined or have ramp to prevent injury and to be more accessible; gestures C= about initially not knowing if zone is for bus or PUDO; nods up to show clarity after looking at zone.
- Uses hand to count how many places he is dropped off at; nods to say a couple of places don’t have specific PUDO zones; gestures to say area at library is big with a shelter; smiles when he says structure at library is nice but it is smaller, indicates that it is smaller with hands; nods to say it’s hard to picture PUDO when you can’t see it; gestures with hand (shakes hand) to say lines could be changed; nods to say parking space should be solid color.

**Group 2**
- Mentioned her ears were cold and said “I could really go for some earmuffs”.
- Grimaced for a while and uncomfortable breathing. May have been from wind. Turned away from wind as this occurred.
- See overall notes.
- See overall notes

Overall: All gathered into the zone automatically. All wandered and looked around after spending a brief period of time within zone.
Pick-Up/Drop-Off

Verbal Observations:

**Group 1**

- Drives to job at Zoo on own. Gets dropped off to job at TopGolf. Thought it would be a good idea to slightly change the layout depending on the season (a/c shelter in summer/ heated shelter in Winter) Gets dropped off at TopGolf main entrance and would like a drop-off zone right there if there needed to be one. Liked idea of curb being yellow to tell where to pick up. Liked the color yellow to mark a curb to help tell where to go.

- The drop-off space needed to be lined up with the car pull space. Thought the space marked for a car to pull up was too big. Liked the place being designated so that pickup/dropoff goes smoother. Thought it was kind of hard to picture. Said the space looked like a no parking zone because of lines across. Liked space at store she goes to sometimes. Thought a colored curb would be nice to help distinguish between street and sidewalk. Liked idea of entire lane being colored.

- Thought that designated pick up space would be really helpful. Uses a pickup location at library in grove city and when they go to JoAnn’s. Thought it was hard to picture a real pick up location at joann’s because it is so chaotic. Uses a painted curb at library to know where to get picked up. Also liked idea of markers on the way to space. And that the entire lane should be colored.

**Group 2**

- Glass walls surrounding benches. Enclosed area to protect from varying weather. Signage for cars and pedestrians. Bigger (enough room for 2 benches). No opinion on pink but thinks yellow means safe. Sound proof. Maybe a PU/DO site at every 2 buildings

- Seating and benches. Find PU/DO helpful. Would be easy to find ride and to be found. Likes the space. Doesn’t interact with bus stops because bus comes to house

- Takes buses but doesn’t use the stops. Uses Uber for emergencies. Thought there were lots of buildings

- Thinks PU/DO’s would be helpful. Doesn’t really use bus stops to relate to the design. Usually uses Uber or Lyft
Multi-Use Trails

Physical Observations:

Group 1
- Gestures to clarify lanes, shows straight line with hands; points to center divider to say it needs railing; hits hand when talking about scooter hitting railing instead of people (laughs); IN BIG-GROUP: +e and nods to agree that current trails allow too much activity in one space
- Points with crutch to express happiness about bike lanes; C=recalling that she can’t remember where she parked when coming from a trail; gestures/C= upset when people speed past you when you don’t know when they’re coming in your lane; points to indicate on map “you are here” mark is helpful on map; frown/smile-looks frustrated when thinking about corn maze; indicates with hand how she curves around pedestrians on bike and walkers get upset, flippant “I tried to tell you!” (arms up); used hand to indicate wanting smooth path the length of path; laughs that it’s okay if people get splinters from wood chips in walking lane; gestures straight lane motion to say sign should be as clear as possible on trail; points at sign in knowlton are helpful; IN BIG-GROUP: gestures at picture on powerpoint and says she understands concept and loves trails
- Laughs at idea of scooter hitting railing; uses hands to indicate a buffer of some sort would be good

Group 2
- Walked up and down median of trail
- See overall notes
- See overall notes
- See overall notes

Overall: Wandered around surrounding area, looked around at surroundings, relatively neutral expressions, downward gazes.

Verbal Observations:

Group 1
- Thought a railing of some sort should be placed in between biking and walking lanes to keep people from crossing over to other side at free will. Thought signs on the road and in the air would help mark directions and location. Brought up idea of map that would show different trails before you get there. A smooth trail for bikes and possibly wood chips for walking would be nice.
- Likes bikes separate from walking. Bikes a lot and is always worried about getting hit by a car or hitting people while biking because they don’t pay attention. Likes the idea of smooth trials because of biking.
- Likes a buffer zone between paths, bushes and shrubs were better. Thinks it is unnerving being around bikes while walking. Thought different pavements should be used because it would be easier to tell where to walk or bike.
Multi-Use Trails

Verbal Observations:

Group 2
- Asked would it be wider and would the middle divide be flat or a wall type of structure. Asked if it was one trail. Signage would be useful (bicycle or running images as well as direction indicators). Thinks the trail would be useful, better than average trails. Needs wayfinding and speed indicators. What about strollers, wheelchairs, and powered scooters?
- Considered people on crutches
- Considered wheelchair accessibility
- Special flooring materials. Doesn’t really bike or use trails. Widen paths. Likes the idea of divider being white
IV TRIAL GROUP DISCUSSION/ANALYSIS

Crosswalks

Reactions
Did’t love the magenta -- felt it was too bright  
  Liked that it was wider  
  “I can walk with my friend”-- can fit multiple people across  
  Did not react well to diagonal lines  
  All liked the idea of voice instruction

Suggestions
White or yellow lines instead of magenta  
  Vertical lines instead of diagonal to help with sense of direction  
  Reflective/glowing material for night  
  One suggested a crossing guard

Confirmations
  10’ width  
  Reflective/glow paint  
  Digital voice instruction

Debunked
Magenta -- not a good color

Don’t Bother Me Zones

Reactions
Frustrated with noise level  
  Liked trees/foliage  
  One student particularly enjoyed sitting in the space  
  Group 2 seemed neutral about it  
  Most didn’t like name “Don’t Bother Me”--felt rude  
  One person said they don’t want to feel isolated  
  One said she “would take a snooze”  
  Seemed to feel nice in the sun  
  Felt secluded in a good way  
  Said they would use if it was in a park/other area

Suggestions
Incorporate something to do  
  Both groups suggested technology -- charging stations, noise cancelling headphones  
  Want a place to set their stuff/drinks  
  Hammock, something more relaxing  
  Rename to quiet/silent/relaxation/chillax zone  
  Some suggested more shade  
  Change color -- more natural, blends in  
  Adding the autism symbol  
  One suggested adding the symbol for autism on a sign/use a color to accent it (identifiable but not exclusive)

CONTINUING QUESTION: Should this be a space for only people with autism or is everyone welcome?
Don’t Bother Me Zones

Confirmations
- Don’t want to stand out (didn’t like color)
- Want to blend in

Debunked
- Add “soothing spaces” into formal guidelines
- (our) Magenta is not a good color

Pick Up/Drop Off Zones

Reactions
- Didn’t like how the stop and the parking space were misaligned
- Felt the parking spot was too small
- Didn’t like stripes on parking space

Suggestions
- Wanted something more weather proof, temperature control
- Bus stops should be wider
- Wanted a sign that cars could see in addition to the signage on the ground
- Yellow mark on curb to increase visibility
- Signs directing people to the pick up/drop off zone

Confirmations
- A pick-up/drop-off area is helpful
- Weather proof structure/shelter
- Solid color for the parking space

Debunked
- Add more specific guidelines to the design
- Further research needed into how frequently/how many are needed and if they should be on both sides

Multi-Use Trails

Reactions
- Liked width and how big it was
- Wanted maps/wayfinding

Suggestions
- Images of bikes, arrows--better wayfinding/signage
- Both groups recommended a divider in the middle--bushes, concrete, rail
- Materials--walking and biking two different materials (crushed limestone/gravel for walking, asphalt for biking)

Confirmations
- Good width

Debunked
- More details about the buffer--low level bushes or median
- “Raised buffer”--depends on context
- Change guidelines to be two different directions for walking lanes instead of walking and running
IMAGES FROM TRIAL