AUTISM PLANNING AND DESIGN GUIDELINES 1.0

KNOWLTON SCHOOL OF ARCHITECTURE
CITY AND REGIONAL PLANNING PROGRAM

Supported By:

THE OHIO STATE UNIVERSITY
KNOWLTON SCHOOL OF ARCHITECTURE
AUTISM LIVING

ATTEMPT 1.0 AUGUST 2017 - JUNE 2018
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.
ii. CONTRIBUTORS

AUTISM PLANNING AND DESIGN GUIDELINES 1.0
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23 parents of adults with autism, 19 adults with autism (Names of participants were required to be kept confidential per IRB.)

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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 \( \frac{1}{4} \) 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” ft\(^2\). 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.

L. LIVING WITH RETIREEES
(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.

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.
two

CONTEXT SPECIFIC

1. DOWNTOWN 21
2. URBAN 28
3. SUBURBAN 34
4. MULTI-MODAL HUB 38
5. RETAIL 41
6. CAMPUS 45
7. PARK ACCESS 49
two

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 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, 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.
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.
II. Context-Specific

1. DOWNTOWN

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.
two

CONTEXT SPECIFIC

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
A. SIDEWALKS

(from 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.
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

A. SIDEWALKS
B. STREETS
C. PARKING LOTS

5. RETAIL
A. SIDEWALKS

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

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

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, reflective lines from the drive lanes.

Drive lanes shall be no more than 10’0” wide.
II. Context-Specific
5. RETAIL

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

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.
7. PARK ACCESS

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

7. PARK ACCESS

A. SIDEWALKS

(from feeling free, feeling calm, feeling clear, feeling 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

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

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
(feeling 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.
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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-impoverished 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 6 Of adults with autism between the age of 21 to 25, less than 17% have ever lived independently.7 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\(^\text{20}\), 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.\(^\text{21}\) Dementia patients who spent time in traditional Japanese gardens exhibited reduced heart rates, improved short- and long-term memory recall, and improved behavioral symptoms.\(^\text{22}\) 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.\(^\text{23}\) 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.\(^\text{24}\)

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.\(^\text{25}\) Architects and interior designers have proposed guidelines for designing homes for those with autism.\(^\text{26,27}\) 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.\(^\text{28}\) 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.\textsuperscript{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.\textsuperscript{30} They can enable a middle ground whereby those needing care can be in proximity to care while still gaining a measure of independence.\textsuperscript{31} Studies show that zoning is a current barrier preventing wider implementation of such units.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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\textsuperscript{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\textsuperscript{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.”\textsuperscript{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.\textsuperscript{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).

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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.
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. 12
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
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.
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
three
APPENDIX

CHARRETTE

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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
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
  - It’s 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
III. Appendix

8. CHARRETTE POSTERS

1. “I Need Assistance” Symbol
2. Wayfinding/ Navigation
3. Accessory Dwelling Units (ADUs)
4. Bus Rides
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7. Living Space Development Checklist
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28. ADA Policy
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 exterior of stores, schools, in parks, and many other places and situations) may be helpful to keep provided places to see if people who are experiencing sensory overload to find a quiet space. Wayfinding (including site plan and building plan information) could be located near this symbol to assist with navigation. Phone numbers (such as in a park or a bus stop) could be provided or perhaps a help button (may be in store or a bus terminal) would be available for assistance.

Help Us Conceive

- Share/generate design
- Color or colors
- Text or no text
- Mounting/display ideas for peak effectiveness
- Any specific ideas for implementation
- Any foreseeable drawbacks to this idea
- Any new ideas that may be better than this proposal

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 places are particularly desired. This may be in relation to specific sites, parks, grocery stores, and around town. 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.

Help Us Conceive

- Technology (phones, watches, apps, etc.) can be incorporated into simpler using/navigation/navigation for adults with autism
- Street layouts that can be designed to assist in easier navigation/navigating for adults with autism
- Public buildings and/or residential buildings that can be designed to ease navigation/navigating for adults with autism
- Existing landmarks can be utilized for better navigation/navigation for adults with autism
- Multisensory wayfinding/navigation for adults with autism and a vision for a new landmarking system design 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/navigating 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 indicate the scope of what must be considered when designing places.

- Declarative memory
- Social behavior
- Communication
- Everyday tasks
- Mobility
- Sensory processing

Help Us Conceive

- Share/generate design
- Color or colors
- Text or no text
- Mounting/display ideas for peak effectiveness
- Any specific ideas for implementation
- Any foreseeable drawbacks to this idea
- Any new ideas that may be better than this proposal

Autism Planning and Design Guidelines 1.0

APPENDIX | 97
Accessory Dwelling Units (ADUs)

Accessory Dwelling Units (ADUs) otherwise known as "granny flats," in-law suites, detached garages, top-floorers, or backyard 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 want an additional level of independence can live in the back or on the basement in a self-contained unit. They can be close enough to parents or caregivers, but have their own place. The logic also extends to offering increased affordability, though the cost of converting old structures into usable homes or constructing new units can often 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 move a quick fix, instead of a long-term solution. The Parents suggested that doctors, but there may offer better solutions especially if the second unit across the block from the adult with ASD might enjoy becoming a working neighbor. ADUs were not at all possible to The Parents as intentional living with people of mixed ages, adults, or military families, and others.

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.

Help Us Conceive

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

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, disposable ear plugs, and special seating (such as for those with physical disabilities). In addition to improving the interior of the bus, we suggest that more clear announcements are made on the bus when they announce stops, and clear directions are given throughout the bus experience on what to do and how to do it. These instructions could include how to pay, what to do if you begin feeling overwhelmed, how to select your bus stop, and any other important steps to take when using the bus.

Background

The Parents and The Adults mentioned that adults with ASD often have overwhelmed on the bus due to noise and crowds, and unknown people asking them. Due to these experiences, the bus can often be a very overwhelming experience, especially for more frequently used routes. In addition to those sensory experiences, participants of the focus group articulated having a difficult time identifying which stop was next. In addition to finding generally overwhelming, The Adults mentioned discomfort in using transfers (crowd, and not understanding public transportation). We also discussed this issue, we identified ASD focused directions as an important addition to public transportation. Having clear, frequent instructions on the bus and finding alternative routes to travel veterans with ASD.

Help Us Conceive

- An autism-friendly bus ride.
- Block out noise on the bus.
- An ear plug program and implementation.
- Best ways to annunciote the next stop while on the bus (Audio of visual cues or both? How and where should directions be added on the bus).
- Better and new ideas we haven't conceived.
- Observations to this proposal.

Facts from Research and Literature

Research shows that all these children grow into adulthood, they are often unable to live independently. Their invariable stay at their parents’ home creates a financial burden and causes prolonged stress. Research has also shown that the parents of ASD children are more prone to mental health issues as a result of caregiving and the burdens that entails. Parents report significant needs, and the caregiving burden is associated with a psychiatric disorder in mothers. We do not assume that correspondence, a culturally descriptive concept, is what adults with ASD want or need. A preliminary investigation makes it clear, however, that many of them and their families’ daily challenges center on housing, transportation, and the general built environment that fall within the urban planning domain. Our mission may allow us to formulate recommendations for use by planning professionals, elected officials, real estate developers, and others who wish to better accommodate those ASD clients.


Facts from Research and Literature

We are glad to share some more insights about planning and design that might be useful. The principles of good planning and design are not yet to be explored in detail, but in part in these interests might provide useful insights.

- Block out noise on the bus.
- An ear plug program and implementation.
- Best ways to annunciote the next stop while on the bus (Audio of visual cues or both? How and where should directions be added on the bus).
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- An ear plug program and implementation.
- Best ways to annunciote the next stop while on the bus (Audio of visual cues or both? How and where should directions be added on the bus).
- Better and new ideas we haven't conceived.
- Observations to this proposal.

Autism-Friendly Drop-Off & Pick-up

The Adults want reliable transportation that offers the least amount of frustration and stress. Along with the 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 drop-off areas would provide comfort and reassurance to the Adults, as well as the person bringing them up.

The Parents mentioned the need for a specific area to pick-up their child from college every day. Currently, when the Parents arrived at campus, they would need to wait for the Adult to come and pick them up. Some of the Parents discussed a drop-off area that was in an area where there was no need to worry about the Adult arriving late or being confused about directions. The drop-off area would be specifically designated for individuals with autism, and others who need this type of transportation assistance.

Help Us Conceive

- Drop-off areas that can be informally utilized near amenities that do not require pick-up services.
- Design specific areas that can be used for pick-up services.
- Any new ideas that may be better than this proposal.

Autism-Friendly Rides

The Adults and the Parents feel strongly about having access to 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. Transferring 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 dropoff in ASD-friendly ridesharing and transportation service experiences are similar during drop-off discussions on the part of the Adults and the Parents. Alternative methods of transportation are necessary due to some adults with autism have in driving, accessing, and using public transportation, as well as limited availability to resources, and limitations with responding to family members due to transportation needs.

Currently, rideshares and transportation services both have significant limitations and are difficult to use efficiently and effectively. However, there are different drivers who choose different rides for each trip. This predictability is to the Adults due to increased predictability, less confusion, and better coordination when choosing an available ride. During conversations about transportation, the Adults shared that they prefer to have people who are familiar with them, and it is difficult to get in and out of a multiple ride in a timely manner. Transportation services often paid for by public or nonprofit agencies are often unreliable, making it difficult.

"Use the longest list first, that I'm thinking of, it has to do with it, and the second is if it's a carpool or a group," says the people involved.

Help Us Conceive

- An autism-friendly Uber/Lyft.
- Improved scheduled transportation services.
- Any new ideas that may be better than this proposal.

Facts from Research and Literature

Pick-up lanes allow separation between continuous traffic and stopped traffic to prevent traffic to stop. Pick-up lanes provide timeliness for service and ensure that the Adult is taken to the main entrance of the building. The structure of a pickup lane can include the following:

- Timeliness
- Increased access for children with special needs
- Increased efficiency
- Increased accessibility

Help Us Conceive

- Pick-up lanes that can be informally utilized near amenities that do not require pick-up services.
- Design specific areas that can be used for pick-up services.
- Any new ideas that may be better than this proposal.
Living Space Development Checklist

The 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 23 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's really possible. Different development designs and living situations such as group homes or group housing 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.

Autism-Friendly Duplex Living

Housing options are a big topic of discussion for everyone when they think about moving away from their parent's 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.”

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

Preclinical investigations with Dr. Emily Amend, clinical psychologist at Autism Family Counseling, LLC have indicated that many with ASD "set of the stage" in the social and emotional development of children who are emerging in independent living. Only 10% of adults with ASD live independently. 10% of adults with ASD turn out to be independent.

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.

Background

Housing opportunities for adults on the spectrum has been a very thought-provoking subject to many a discussion, and involved around a common theme—living alone. "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 increased level furthering society between individuals, duplex housing seemed to be a way to achieve full independence yet still have a support system present if the need arose. The Parents were skeptical of letting their children live all alone. One expressed:

"It's kind of need it be like this and it's always been like this. So we've thought about the duplex living with our kids being where one side and having the other half of the duplex be both of us but one set of parents and the other set of parents with the idea that one out of the year and the other parents be there the other six months out of the year."

This notion brought excitement and sparked great 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 Duplex is necessary where living on the backyard can maintain their new homes for adults with ASD in a popular area in the same location. In this idea, although zoning and other restrictions make it difficult for people to build a duplex housing space on their property.

Duplex living can allow for a caretaker other than the parents to help as well. This could be a family member retired neighbor or even a vet who is looking to positively influence society. Parents could still occupy the other side of the house if they wanted to be done by. Regardless of the neighborhood selection, the style of living could revitalize the idea of independence for adults with ASD and anyone who wishes to live alone but may not have the ability to be completely by themselves. A well-implemented duplex housing system for disabled citizens could help develop a more community and society that fosters on the well-being of all, not just those who can afford it.

Facts from Research and Literature

Our preliminary discussion with Dr. Emily Amend, clinical psychologist at Autism Family Counseling, LLC have indicated that many adults with ASD "set of the stage" in the social and emotional development of children who are emerging in independent living. Only 10% of adults with ASD live independently. This demonstrates a serious lack of attention to housing options for adults who fall on the spectrum. In addition, only 10% of young adults with ASD are employed full-time, according to research by the National Autism Society of Wales. This highlights how important it is to have a Duplex living setting associated with a pre-employment program.

Research has shown that parents or children on the spectrum are more prone to mental health issues due to the lack of support and the stress that comes along with it. Parents involved in pre-employment needs, and the lack of living situation associated with a pre-employment situation. For these reasons it is essential to devise a housing strategy that allows for both parents and young adults with ASD to live more independently and more importantly, thrive.

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 expressed that sidewalks are important for comfortable and responsible movement. Especially in urban environments, the Parents expressed that it is safer for them to walk alone, or with other children, than walking on the sidewalk itself. According to The Parents, sidewalks being closer to the building means more “eyes on the street.” This will create an environment where adults with autism and their parents can feel safe walking alone. It was mentioned several times that there are no sidewalks available to those who live in rural communities. It was also mentioned and confirmed that sidewalks were available near the autistic adult’s home which the parents would feel more comfortable utilizing. Most sidewalks in rural communities are alongside roadways with a variety of high-speed traffic. Building the mentioned ed 4 foot wide walking path will create more space between the street/greenspace and the sidewalk and could help create a noisier barrier to reduce sensory overload. The Parents and The Adult mentioned that lack of sidewalks which forces the adults with ASD to ride bike on the sidewalk. One parent in the focus group mentioned that their adult with autism refuses to walk alone. While he intends to ride alone on bikes or paths, watching the adults to accommodate bikes somehow could help pedestrians in the process.

Autism-Friendly Bus Routes

Due to the low percentage of adults with ASD having driver’s licenses, many are limited to public transportation to reach 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 wheel/spoke 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 service that the responsibilities adults with ASD need to access (including therapy locations, grocery stores, continuing education sites, etc.).

Background

Often when a parent sees an autistic 10 year old or younger, they notice changes from the environment because this is the most time they have been outside together. This effect seems to heighten the sensitivity of adults with ASD as well. The environment is often viewed as a least restrictive option for long ride times, accommodate services, and length of transfers. The Parents and The Adults want their children to be safe and enhance their sense of autonomy. The route that The Parents preferred is confirmed by the identification of routes as well. For your creating a single way to acquire the differences in route selection that can vary across different bus routes.

Facts from Research and Literature

"One study demonstrated that exposure to the street decreases the level of stress in people with autism and reduces their anxiety levels. However, another study showed that exposure to busy streets increases the level of anxiety and stress in people with autism."

Help Us Conceive


Facts from Research and Literature

"The following challenges may not be present in all ASD individuals, but they are a good place of where needed to be considered when making planning decisions. Many people with ASD are more prone to anxiety and sensory overload. The route is the focus to be noted in improving our understanding of adult needs for the larger social environment. Light intensity and noise were shown to disproportionately affect the learning of children with ASD. "There is a host of other psychological issues associated with the disorder: a reduced social engagement, different social skills, obsessive behaviors, targeting, potential cognitive tasks, depression, and epilepsy."

Help Us Conceive

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

-The dimensions of the 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.
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 them feel crowded and uncomfortable. Without clearly labeled directions, these trails can become hazardous. This can be especially true for individuals with autism. What should be a pleasurable and peaceful experience is often a series of conflicts. As a minimum, an autism-friendly multi-use trail has clearly labeled symbols that organize multi-modal traffic flows. Without fear of being involved in a collision.

Background

The Pintos 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 monitored their children regarding the use and safety of current individual shows. To learn how to design a multi-use trail such as a sense of safety, direction, organization, and clarity. These strategies will ensure that multi-use trails are safe and accessible as possible to meet our concerns on its intended directions and function. A parent said, "...my son will walk a lot longer and eventually take his bike everywhere he goes. I wish I could have designed a trail for him." Another parent said, "At a higher city park, we used to walk along the trails, but we have been unable to do so since there are a lot of people, and it is so noisy."..."I don't think this is safe for us..."..."I will now ride on the sidewalk and be thankful for that day...

Autism-Friendly Outdoor and Street Lighting

Our research demonstrates a need for calming and soothing outdoor and street lighting within public spaces such as parks and along sidewalks and streets. Highlighted visual and audio stimuli are a common complaint amongst those on the spectrum along with sensory sensitivity. The outdoor realm is a real place that is keen to sensory overload which can lead to stress and sensory emotional turmoil. The Parents gave insight as to what some of these "episodes" entail. One parent expressed that they had sensory stimulants such as a toddler playing with small toys.

The study's focus was to understand the general public's perception of the visual and auditory environment. 

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

Background

As a result of this research, we are now able to design and implement autism-friendly outdoor and street lighting. The Parents would like to see a system that is clearly labeled symbols that organize multi-modal traffic flows. Without fear of being involved in a collision.

in our study, we reviewed the focus group data and further confirmed our research and discovered that the lighting and color in a room can heavily affect a person's mood and behavior. This is why the need of autism-friendly public trail lighting design. This asset should be implemented in every community and still act as a calming agent for not only those on the spectrum but to all people.

Facts from Research and Literature

Facts gathered from various published articles on the topic of autism and sensory processing. This is an important aspect of trying to understand the experience of those with ASD and what they perceive as stimuli or objects. The goal of this research is to provide guidance on how to create a better environment for those with ASD. We have found that the environment can be improved by designing spaces that are safe, calming, and provide a sense of security.

Help Us Conceive

- The width of an autism-friendly multi-purpose pathway and why
- Additional elements would increase safety and tranquility
- Better ideas than this one

Drawbacks to this idea that aren't currently seen
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 idea for an autism-friendly parking space came from conversations regarding other space and projects. It was not a direct idea in either focus group but more a development from multiple ideas.
- One topic that led to the idea was the disconnect surrounding increased depth width. There is research that shows that individuals with ASD require more space to feel comfortable. This could be applied to parking spaces to help ease some of the anxiety first described by those with the autism spectrum. It grates to some people in this way that a parking space is not just a line on the street but a potentially stressful environment with moving traffic. The idea for a parking space is one that not only suits those with ASD, but those with all types of disabilities.
- Another main topic of discussion during data collection was the need for space, especially in transportation, as it can lead to increased anxiety in public spaces. The Autism spectrum was described in public spaces, especially in transportation, by having to feel safe and as much as possible as comfortable. Asking individuals with ASD to share their stories would be ideal in gathering a wider range of data. This would possibly mean that the data was more of an advantage to those with different needs, especially to those that have ASD.

Combining the data gathered from these discussions and focus groups brought us to the conclusion that there is a need for an autism-friendly parking space. From these we have drawn up plans, with ideas on what we think it might look like as well as the long-term where it could be implemented.

Autism-Friendly Bus Stops

Riding the bus (or any other form of public transit) begins and ends with a stop. Many adults with ASD are away from public transportation. We conceive autism-friendly bus stops and bus stop identification designs. Ideas for bus stop design could begin with improving accessibility 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 direction and destination indicators for adults with ASD.

Background

- Through focus groups and in-person discussions, it was made clear that bus stops are locations not utilized or not often visited by people with social and behavioral disabilities. Being out in public is already an anxiety-inducing experience for many adults with ASD. When adding in the confusion of riding public transit, many adults with ASD may not feel comfortable instead of feeling more anxious in public transit.
- Our research suggests that many adults with ASD are not used to being in public and prefer private settings. When riding at a bus stop, especially in extreme weather, many adults who are not used to this type of weather and are not used to this type of bus stop may be unable to understand the bus stop. These adults may be unable to make sense of the bus stop and will not be able to identify landmarks.

Many bus stops should be identified by landmarks. The Parent mentioned their adult children with ASD sometimes have trouble knowing where to get off the bus, heading to participants that these bus stops are contradictory and can be confusing, which leads the participant to believe that something is wrong with the bus stop. Another idea would be adding landmarks to the bus route maps to help adults with ASD know the location of the bus stop as landmarks.

Help Us Conceive

-Policy to allow for people with ASD to park in handicap parking spaces legally.
-Instilling-friendly parking space design that is easier but not interfering 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?
-Other ideas than what is in the proposal...
-Anything we have overlooked.
-Drawbacks to this proposal.

Help Us Conceive

-Instilling-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?
-Other ideas than what is in the proposal...
-Anything we have overlooked.
-Drawbacks to this proposal.

Help Us Conceive

-Instilling-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?
-Other ideas than what is in the 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 enabling effects and enjoyment of various therapeutic activities were mentioned consistently. Therapy for Therapeutic recreation activities has been incorporated into therapeutic programs to enhance the overall well-being of the individual. Activities mentioned by multiple participants included riding horses, interacting with animals, and participating in arts and crafts activities. Interaction with horses and animals provides a sense of structure, routine, and social interaction, which can be beneficial for individuals with ASD.

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 we missing.
- Drawbacks and issues to this idea.

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 public service. 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 of adults with ASD who do not drive.

Background

It was clear that many of The Adults desired support for walkability and connectivity in their neighborhoods. Most of The Adults expressed that they did not drive due to several reasons including lack of parking, traffic, safety issues with perception, too many rules and signs, the inability to form mental maps, and hope is false. Additionally, many of The Adults discussed how they would prefer to walk places as opposed to relying on a vehicle. However, they would need to feel safe and secure in their environment.

Help Us Conceive

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

Our research suggests that safe and reliable crosswalks can benefit all people when accommodating adults on the spectrum. For example, crosswalks could be wider, and more visible. The implementation of visible crosswalks will motivate adults on the spectrum to integrate themselves into the public and be outside. Crosswalks should be placed near schools, community centers, and other places that are accessible to adults on the spectrum. They provide comfort and avoid complications that tend to fear and neuroses among adults on the spectrum.

"Walking isn’t really an option." – The Parents.

Background

The adults and The Parents discussed the necessity 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 the street due to the lack of visual cues which can often 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 to accessing crosswalks often exist, such as giving the path of pedestrians who use headlights. The Parents discussed how technology is employed by adults with autism and technology has the potential to improve autism-friendly crosswalks. For instance, one conversation with 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

The 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 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 dreamed by The Parents, who then developed a laptop at a seminar where an app was presented that used a personal assistant. The app would ask when, where, and how the person wants to arrive at a destination and then provide step-by-step instructions for how to get there. The app also provides an emergency situation when the owner of the phone needs to communicate with first responders; but this remains a non-responsive app.

The Parents and developers both agreed the idea could bridge the worlds of system and individual users. Eventually, it was integrated as a phone, a system on the phone. However, after the idea was taken too far, it was observed to be on many more platforms, such as small webpages, videos, and podcasts. In this refined process, it appears the app could vary in interactivity between a home or on the street. To get off the street or in less complex places, or objects above the imposing objects.

Augmented reality could impact the effectiveness of wayfinding. To gain a clearer understanding of what augmented reality is, one parent closes their description stating, "It provides an accurate view of the real world. So you're looking at your phone, using the camera and seeing things that's really real... it's augmented reality. It is the merging of the real with the virtual."

Facts from Research and Literature

"The overload thought to be tolerated in part, in more intense cognitive processing of sound stimuli. Individuals with ASD suffer from higher rates of sleep problems, related to these auditory issues." The research indicates that adults on the spectrum are prone to sensory overload such as being overly loud and other sensory input. Several people also describe that autistic adults often follow a daily routine, by implementing a visual and autism-friendly crosswalk plan daily routine will alleviate stress and improve familiarity with public spaces.

In addition, there are many challenges that those with ASD face as they are out doors and with the public. A recent study demonstrates that cutting out loud noise only exists, but it also includes acts of trauma. The following challenges may all be present in ASD individuals, but this one expands the scope of what must be considered when meeting planning decisions that involve those along the spectrum. Studies show that people with ASD are prone to stress, anxiety and sometimes elevated.

Help Us Conceive

The design of an autism-friendly crosswalk.

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

Other ideas:

What we haven’t conceived. Issues or problems.

Facts from Research and Literature

When the app is designed, it can provide assistance to the user, allowing for improved technology. Assistive technology is available in children with autism spectrum disorder, prevalence, comorbidity and used in similar contexts in a population-based sample.

Help Us Conceive

The workings of this wayfinding app idea.

Low tech (downloadebly cmyk map that can be used offline) vs high tech? (Reminders on a watch vs augmented reality?)

Best platforms. (Phone vs watch vs glasses)

Other specific recommendations or new ideas.

Implementation.

Autism-Friendly Bike Racks

Some adults with ASD would like to use a bicycle for transport if given the opportunity. Bicycling produces less worry in an individual with autism than driving a car on their own or even learning how to drive their own vehicle. However, there are different sets of strategies for bicycling. Lack of bike lanes or ears not hearing the road appropriately can cause frustration and stress. Approaching a destination without an area to adequately park and secure a bicycle will shift the stress inside the individual. 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.

Facts from Research and Literature

- Cycling is an activity that many adults with autism know how to utilize. This will not be a new skill for them to have to learn.
- Exercise is wanted by The Adults and bicycling provides The Adults a low activity.
- There is an emerging discussion on therapeutic urban environmental design for adults with ASD. This includes bike racks design implemented with "green" environmental design in mind would be helpful. Bike racks deliver small-scale benefits for The Adults.

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 may struggle when they reach a state of living as at that time, 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 also give retirees purpose and a worthwhile way to assist adults with ASD.

Facts from Research and Literature

- When designing for people with autism, it is essential to understand how they might experience the environment and make decisions about what to include in it as well as what to exclude. One finds that adults with autism have a strong desire for control. This is especially true for individuals with autism. Living with another adult with autism was not necessarily their biggest concern, but rather living with someone who could understand them. Also the idea of being able to control their own environment which provides a sense of community and offers services was well received by The Adults.

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.

Background

It was in The Adults that the idea of living independently was a challenge. They expressed a desire to live independently, but fear of losing some sort of a sense of security often prohibits them from achieving this desire. Many of the Adults demonstrated a desire for more control, but wanted to be able to have their own way. It is important to understand that adults with autism, living with another adult with autism was not necessarily their biggest concern, but rather living with someone who could understand them. Also the idea of being able to control their own environment which provides a sense of community and offers services was well received by The Adults.

Just a roommate in general, someone who understands me. I mean, just as long as I can get along with them.

Response of an adult with ASD from focus group when asked what kind of roommate the would like.

This gave our class the chance to have a shared living situation where adults with ASD lived amongst retirees. We believe that this will not only provide adults with ASD comfort or familiarity with individuals who are comfortable with more life experience, but also allow retirees to have companionship and a purpose (possibly causing them to rethink the living situation of their own).

The idea of a community where adults are safe with ASD this could be an option. Housing with people of different ages and backgrounds is the stage to worth exploring further. This would also allow retirees to help with some of the services that adults with ASD are searching for, such as assistance with cooking, laundry, gardening, and exercise.
Public Wifi and Outlets

Research shows that adults with autism depend on the Internet, specifically wifi, for general comfort, and reduced anxiety in public spaces. Wifi provides access to both navigation resources and recreation opportunities. When traveling alone, reliable navigation systems are vital for adults with ASD due to increased difficulties with spatial orientation. Related to this, conveniently located public outlets are helpful for charging devices used for their navigation.

Background

The idea for public wifi and outlets formed during class discussions about the increased need of internet and the need for reliable navigation resources. The ability to access this information is important for adults with ASD. As adults with ASD have limited skills in the use of navigation resources, there are times when they cannot depend on their own capacity to find their way or get to other places. There are times when they may not have the ability to understand the route needed to get to a place. There are times when they may not have the ability to understand the route needed to get to a place.

Help Us Conceive

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

Facts from Research and Literature

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 these.
- Drawbacks and issues.

Tiny Homes

Independence is one of the biggest challenges facing autistic citizens as they age out of child services and mature to adulthood. One topic of particular relevance to this issue is housing. Living alone or in a group is a crucial element of independence, and something autistic adults often struggle with. Seeking a self-sufficient, independent life, the options are few and they must continue living with their parents. Luckily, there are different options available for housing autistic adults in a way that allows them to live independently.

Background

The need for more housing options has been raised by autistic adults at various times throughout our research. The most notable home that the adults told us they desired was the need for a sense of community and integration into society. Autistic citizens need to be able to support themselves, but they also need a sense of safety and the knowledge that help is available to them in case they need it. Tiny homes were only briefly mentioned by The Parents.

You now know an interesting idea, so you imagine, uh, you know its own development. You will ask that nothing less than my response comes... Most of our analysis to them is a derivation from other relevant texts.

Another housing concern that was discussed by The Parents was cost. A frequent concern cited was that of affordability. Yet, the community aspect and self-sufficiency offered were seen to be desirable. Tiny homes could offer the best of both with affordability, yet the versatility to provide the desired community structure.

According to The Parents, one potential obstacle to implementation is zoning codes. The codes were not necessarily designed to accommodate the developmental differences of an autistic adult, yet they may be multiple variations or outright restrictions on development needed to make the adults. Any and all accommodations are welcome in working out these issues. There are many questions yet to be answered pertaining to implementing tiny homes into existing community design, structure, and zoning procedures.

Facts from Research and Literature

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 these.
- Drawbacks and issues.

1. Research indicates that people with ASD are more prone to mental health issues than the general population. Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by social and communication difficulties, repetitive behaviors, and restricted interests. People with ASD may experience anxiety, depression, and other mental health challenges.
2. Many individuals with ASD have unique communication styles and may require specific accommodations to feel supported and included in group settings.
3. It is essential to involve families, individuals with ASD, and community members in the planning process to ensure that the needs and preferences of all involved are considered.
Proximity to Recreation

The adults 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 mostly upon others to provide 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 for adults close to residential spaces is important for 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 a familiar concept. Such design increases the density of urban spaces, a component Jane Jacobs argued was key to enhancing vitality, diversity, and safety (the density of urban space is an inherent part of the city’s life). This means residents can drive, walk, and work to the benefit of urban spaces. The New Urbanism Movement has sought to put the idea into practice by designing concentrated, mixed-use developments in towns such as Seaside, Florida. Other examples of towns that prove this to themselves are highly concentrated urban spaces include Celebration, Florida and Reston, Virginia.

The adults had several concerns about the bus system, citing overcrowding, high fare levels, and confusing route changes. White shuttle services are available, the adults consider them generally unreliable. Finding recreational facilities such as pools and libraries close to residential spaces would not only increase pedestrian activity, but also increase the overall density of community spaces. Given the information about the experiences and desires of the adults, their needs do not call for a new strategy of city planning; instead, they provide evidence that further research for more highly concentrated, mixed-use developments of urban spaces is needed.

In conclusion, planning recreational facilities close to residential areas will encourage healthier lifestyles, not only for adults with autism, but also for other residents by increasing the convenience of walking and allowing easier access to parks and recreational areas. For this reason, there is a need for more research into the benefits of dense, mixed-use communities for adults with autism.

You know, I know personally, and I went to avoid making this too personal but personally, I just feel that in adult living, something that’s important is to be able to go out, do things, and have that in close proximity, like a basketball court that you can shoot hoops.

Communal Apartment Complex

Apartment complexes that often integrated 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 involves a voluntary roommate service where adults with autism and non-autistic tenants who are educated on the needs of adults with ASD are willing to share an apartment. Such apartments can also provide for roommates for need-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/deli, laundry ( ideally in unit), restaurants, pharmacies, libraries, recreational areas and other daily needs and services.

Background

Given this discussion, it was expected that many of the adults who put their parents in development work would like to see an apartment that has a kitchen. However, the group toward independence comes when needful instead of being a case of necessity, financial, or dependency needs. Many of the adults and their parents in attendance are concerned regarding this and said they still had to learn to take on more responsibilities. Many also expressed that they would like to be living with someone who provided assisted living and their needs.

Help Us Conceive

-Wide sweeping policies for designing new communities that combine residential and recreational spaces together in an attractive, easy-to-follow format.

-Strategies for different urban areas.

Facts from Research and Literature

Researchers have illustrated the needs of adults with autism and their families. They have identified the importance of building environments that are safe and supportive. For adults with autism, there is a need for environment that is predictable and familiar. Many researchers have also highlighted the benefits of close proximity to residential spaces for adults with autism.

Help Us Conceive

-Scenarios for a new autism-friendly communal living development.

-Strategies for existing residential developments.

-Preliminary designs for building/floor plans.

-Other ideas we haven’t considered.
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 streetscapes should be comfortable and conducive to physical activity and social interaction. These parents also mentioned that improvement to bike lanes, sidewalks, and pedestrian accessibility would enhance the quality of life for both adults on the autism spectrum and their caregivers. The survey also revealed that barriers between residents, businesses, and pedestrians were cited as reasons. Many adults with Autism frequency ride their bikes, while others report that the noise from the bike lane is too loud to walk or talk.

The Adults also mentioned how overstimulation in travel affects most adults on the spectrum. Currently, streets are generally designed for vehicular traffic and built environments, which can be overstimulating for people with ASD. For those dealing with overstimulation issues, navigating streets can be an unpleasant and difficult task. This, and how much traffic vehicular traffic can be dangerous to individuals with ASD. The survey also revealed that residents who lived in neighborhoods with lower levels of overstimulation 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 express a need for temporary shelter/enclosed spaces to feel secure through periods of stress or anxiety.

Background

Recreation is important. Parks and open spaces are places where people go to have fun and unwind. Sometimes parks can be loud, too bright, and overly stimulating. There is a need for adults with ASD to know where to go to take time to relax within parks and outdoor spaces. Knowledge gained through testing and discussions indicates that there should be a clear signpost on or close to the structure and be visible from most locations within the interactional space.

The design should provide a warm and inviting space, perhaps bright spaces with plenty of natural light and subdued colors. It should be a quiet place, too.

Help Us Conceive

- Autism-friendly street cross-sections that incorporate multimodal transportation
- Other better ideas
- Drawbacks and issues

Facts from Research and Literature


Help Us Conceive

- A preliminary design for a space/shelter that can accommodate adults with ASD without isolating them from the standard outdoor recreational areas
- Other better ideas
- Issue or problems with this proposal

Facts from Research and Literature

Soothing Spaces in the Public Realm

Public social interaction, as well as public interaction in general, is a notable challenge for people with autism. Through this problem cannot be easily remedied, it is possible to provide a safe and comfortable environment for these 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 privately accessible, yet allow privacy for whomever chooses to use the room at any given moment. These spaces may be located both indoors (single or multiple rooms with provided items one can purchase in) if they so choose, and with enough room for passing) but we are more concerned here about the outdoors (such as small-sale park shelters, and adult-oriented playground spaces). The ultimate goal of soothing spaces is to allow people with autism to calm themselves in places where safety and comfort are not normally provided.

Background

The concept of “soothing spaces” originated from The Autistic Children’s Project’s “no-noisy” behavior. While soothing space data came from The Autistic Children’s Project, the concept was expanded to suit the needs of the Autistic. The specific concept was brought up for one of the Autistic tasks in the city planner who also attended the meeting.

The planner’s suggestion was as follows:

“Now another question about that park. Would you like to have [a] place in the park, if you have this social interaction, that whatever you can do it in, whatever you want to do, and whatever you want to do is going to be safe and nice there? Is it something you would like to have a place like that?”

Several of The Autistic agreed that such a space would make them feel better and more comfortable in the park. While many individuals lack surrounding environments that allow them to express their emotions while still feeling safe in the park. The idea for a place similar to this concept was brought up by the city planner who also attended the meeting.

Recommendations include: Specific public observations, training on the initial topic covered, an awareness of “soothing spaces,” and increased awareness of “soothing spaces” as a concept. The city planner who also attended the meeting.

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 could be better if it was more independent and for me, in my case, living on my own and have more freedom."

Background

There are requirements in the Fair Housing Act and Americans with Disabilities Act to help people with mobility, sensory, and other impairments such as Alzheimer’s, hearing, and visual impairments. Current policy provides accessible building entrances, accessible common areas, wheelchair accessible elevators, offices of the participant’s preference, halls, and accessibility reinforce: accessibility, bathrooms, grab bars, etc.

"I am currently in an apartment by myself, but I’d like to be able to do more things without having to leave the apartment. I’d like to be able to take the recycling to the recycling bin that’s pretty far away. I have to do it at one of the city recycling bins. Because my apartment doesn’t have recycling."

Facts from Research and Literature

- 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 specific use by those with ASD?
- Potential signage?
- Any foreseeable drawbacks to the idea
- Any additions and/or changes that can be made to this proposal

Help Us Conceive

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

Exceptionally, given that 1% of the population is on the ASD spectrum, perhaps 1% of dwellings应当 be ASD-friendly. What would be the most effective route to achieve this? Can it be incorporated into current standards like the ADA and Fair Housing Act?

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 specific use by those with ASD?
- Potential signage?
- Any foreseeable drawbacks to the idea
- Any additions and/or changes that can be made to this proposal

Facts from Research and Literature

- Adult with ASD struggles with social sensitivity to environmental issues such as sound and light, as well as a strong need for privacy and control within their environment.
- 4% of adults with ASD struggle with environmental issues.
- 20% of adults with ASD struggle with sensory sensitivity.
- 1% of adults with ASD struggle with social sensitivity.
- 10% of adults with ASD struggle with sensory sensitivity.
- 1% of adults with ASD struggle with sensory sensitivity.

Help Us Conceive

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

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III. Appendix

9. CHARRETTE PROCESS PHOTOS
III. Appendix

10. CHARRETTE DAY 1 OUTPUT
CHARRETTE_Day 1Zoning_safeRoutes2.jpg

CHARRETTE_Day 1_UPD AssistancePART1_18.jpg
Assistive Technology
- Equal pay for equal work
- Career opportunities

Living Space: A place to feel safe
- Mental and emotional health
- 75% design / 25% policy rules

Living Space
- Co-Traditional living
- Equal accommodations
- Not dependent on the population
- "Love me like a princess" strategy

# Living Space
- Do we even need new buildings?
- Can we use a voucher system? Similar to housing choice vouchers
Internet
- Why important
  - Social community
  - Games

Public wifi
- Generally would want
  - internet access

Experiments
  - Rooms in houses
  - Share a bigger
    personal room
  - Soundproof walls
  - Soft lights
  - Pet friendly
  - Dog park
  - Security system to
get you in (fingerprint)

Accessibility to needed things
  - Laundry
  - Mailboxes
  - Dumpster close
  - Recycling

"Accessory Dwelling"
- lonely?
  - Live in a camper?
  - Living in a garage
  - Apartment on top of garage
  - Prefer apt building

Technology
- Apps to help move through city
- GPS
- Also for inside buildings
- More interactive

"60s" vs. "70s" location of tech member
- Use of 3D arrow through phone direction
- VR
- Glasses to augment reality
- Lights (color, brightness)

"I don't know what to expect"

Safe place available everywhere
  - Physically, psychologically

What recreation do we want/how do we make it better?
- Music, dancing, tech, failed so lost,
  map not helpful (missed identifiable)

Symbol/Placard for parking spots
- Having a different symbol
- Use already existing handicap spots
- Experience of people getting yelled at when
  using handicap spots with physical handicap
- Parking permit for people with ASD
- Regulation
- Education on what sign means
  - Different symbols
  - Different colors
  - Different sizes
- Gotta start somewhere
- Mobile sharing spots would be best, these
  - Cell phone lot
  - Like airport, to wait until someone is ready to be picked up
III. Appendix

11. CHARRETTE DAY 2 OUTPUT

AUTISM PLANNING AND DESIGN GUIDELINES 1.0
**Bus Stop**

- Design: 'perfect bus stop'
- Labeled in other ways other than intersection names
- Direction of Bus + which Side of Street to wait on
- Time tables
- App to notify
- More training (for general public)
- Non-intuitive, shuts off a different app
- More intuitive experience
- Everything has to go downtown
- More cross-town routes?
- Helpful to run later?

**Pick-up area**

- Safety, time
- Waiting inside but able to see the 'pick-up zone'
- Separate 'loading area'
- 'Like airport' / 'Shuttle' / 'Car line'
- Branch off / pull off
- Cell phone lot / Shuttle / lot
- Protected from elements
- Ceiling & walls
- Shade, hat, etc., to see phone
- Label rows/spots more (like a garage)
- Traffic calming
- Colors to identify what space is being used for
- Grass median
- Designated path between parked cars
- Barriers between sidewalk & street

Vouchers for Ubers/lift
Transportation for APIs
Transportation for social events
Pooled resource w/destination

Public Transit (Bus) Ride Ex.

Packed
- No room to carry stuff
- Facing aisle
- Cleanliness (not clean)
- Not boxed in
- Closer to bus driver?

Alert stops/destination
- Flashing lights
- Speakers towards bus stop

Bus stops
- Bus seats
- Bus riders
Recreation
- Thick walls
- Playground for all ages
- Both labored
- Playground for adults w/ ASD + NT
- Arcade (video games)
- Library (e-library)
- Uber/Lyft
- Uber-pool with same destination

Bus Stops
- Keep constant display of 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 (e.g., bus monitors)

Bikes
- For work
- Bike racks
- Lack of bike racks as reason for not riding places
- Locking system built into bike rack?
- Public training for adults?
- Bike parks

Recreation
- Closer to home!!
  - Flexible to do more
  - Expand creativity
  - More desire to get out of home

Shade
- Swing
- Chair
- Proof

SAFE OFFICE DESIGN
outdoor street lights

- enough to see not just where you are going but also if stuff is on the ground (eg glass)
- light color preference? Not too strongly colored;
- LED headlights too intense, not too bright
- closer together, consistency

Parking Spaces
- trying to avoid cars
- have to make up path; designated spaces closer to building, safer, easier to navigate
- no designated path
- how improve

CHARRETTE_Day 2_StreetLights1.jpg

CHARRETTE_Day 2_indoorParking12.jpg
Next stop: announce what you are approaching
- Remember near seat announcement over intercom
- Doorbell
- LED Bright light when stop coming towards you
- App that gives notification when on bus

“Transit-App” Crosswalk
- White point blends in - bright yellow inground
- @night too (retrospective)
- More bridges over roads (can really way slow)
- Too wide - underpass?
- Slow down
- Longer time to cross
- Sound of crosswalk thing
- (Making plans for walk to park, not as many voices, instead of repetitive beeping

Navigating parking lots - way more between parking spaces

Pick-up lot (like from school)
- Indoor?
- Quiet?
- Reach 
- Weather
- 1 space or 2 spaces?
- Want to pick up in same spot
- Want in spot more call passenger on phone to pick up
- No street

Side walk directions given on side walk
- Increased width - 3 people wide with a little space between
- Bike lane on side walk wider
- Safety rails or something on side walk to prevent them from hitting people. They also do not have space
Small wall between sidewalk and bike path
III. Appendix

12. STUDENT SYNTHESIS
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 Safety

Parking lot safety was a key part of what was talked about when referencing how parking lots operated. Concerns such as closer parking, designated walking areas, and easier identification on where to walk and where parking is. Using a color method to distinguish parking from walking areas could be easily implemented. Would help to give a way to remember where you parked, and would provide distinct lines where you could see where cars are driving and where it is safe to walk. Since closer parking spaces cannot really work unless there is an implementation with handicap spots, a system where you can reach the door quicker would be a much better option. Using a cul-de-sac design, having a dead-end lane that leads to the front of the desired space would help for easy drop off and pick up and would still help keep the basic fluidity of a parking lot intact. With this method also comes the availability of walking paths on either side of the cul-de-sac, which could provide safer travel by foot directly to the door without needed to walk beside or cross in front of cars as frequently.

Autism-Friendly Development Guide (AFDG)

The developmental checklist has lots of potential for both business and living space situations to make places more accessible and more accommodating for those with Autism. One of the key points of developmental were that they needed to have knowledge of Autism and what can be done to make adults with Autism’s experience as enjoyable as everyone else’s. Looking at how these checklists could be formatted and function, I believe that having three basic categories such as normal, present, and ideal would help to describe exactly what can be found at either public places or potential living spaces. Depending on exactly how many categories end up being on the checklist, the “score” can be based on a percentage of points that are either in the present or ideal category. From this, having a rating scale where these places can be classified as not Autism-friendly, Autism-friendly, or ideal Autism-friendly (working title) would make it easier to separate places where adults with Autism want to go/live by giving them an overview of what amenities exist that can help them to thrive.
Suggestions

- Require consist... drivers. LE. Stop announcement announcements are helpful, but are not always used.

- IMPACT: on bus drivers - having this helps. the ability to navigate... can help blind passengers as well.

- Real-time Map/monitor showing bus route + you are here. Usually 3D map similar to Google Earth with (optional) examples: Oswego campus map. Movement Park map. 

- Materials: Maps, screen/monitors - a way to track things. Expensive to provide each bus with these.

- Considerations: Monitor? Such as this may take up space previously used for ads/line graphics. Which may be an issue of funding/sponsorship.

- Help a user/seat community up by visuals vs. just the automated announcement.

- Add on suggestion: in that same space (usually dedicated to bus) have scrolling text similar to a promo run (not THE runs) along bus routes around town.

BUS RIDES

Considerations: stop announcements audio + visual

- Real-time bus routes' estimated arrival times to show progress in relation to the rest of the route.

- Scrolling visual/monitor plans similar to junctions of stadiums.

- Est. Arrival: context/surroundings map: picture or what the bus stop looks like.

- Label upcoming stop.

- 3D map with pictures of scenery along the route destination. Along the way.

- Kind of like a bus animation, park maps are animated. With 3D.

- Work example of CTD at OSU.

- Also example of OSU campus AP map.

- Additional info to include:
**Multi-Use Trails**

**Clarity** - Trails 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 distance with lanes allow for easy and confident use.

**Safety** - Lanes are clearly divided and labeled, wide enough to accommodate less 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 flat for ease of use.

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**Bus Stop (Electric Sign)**

**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.

**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.

**Safety** - Sign includes a dial box for safety; you can call someone to get help or direction.
### Bus Steps (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 outside. Inside is kept quiet and free of ads to provide peace and tranquility.

### 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.

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

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

**Inclusivity:** The bus stations are accessible to everyone, with no stairs, wide doors, and accommodate many needs.
Specific
- Bus stops
- Bus rides
- Living space checklist
  (Autism-friendly scorecard)
- Sidewalks/crosswalks
  - Streets
- Secure spaces
  - Parks
  - Public realm

General
- Lighting
- INNS (interior, nature,
  interior, signage)
- Duplex living
- 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/informed (retirees, grad students, individuals with desire to serve)
  - Mixed income/diverse
  - Partner orgs (Age-friendly Columbus, anemos, Age-friendly COTA)

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

ADUS & 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
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

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.
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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