serene senescence
modular aging in place in fargo, north dakota
How can modular accessory dwelling units facilitate aging in place in Fargo, North Dakota?
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Based on needs, smaller, intimate, more personalized living space
How can modular accessory dwelling units facilitate aging in place in Fargo, North Dakota?

needs based smaller, intimate, more personalized living space

people prefer to age in their own homes for as long as they possibly can
How can modular accessory dwelling units facilitate aging in place in Fargo, North Dakota?

- needs based smaller, intimate, more personalized living space
- people prefer to age in their own homes for as long as they possibly can
- Fargo currently does not mention ADUs in the land development code
“A secondary, usually smaller unit on a property with a primary house. It is self-contained with its own bathroom and kitchen. ADUs come in all shapes and sizes and can include stand-alone one-story and two-story units as well as those above garages.”

-Austin, Texas Land Development Code

**what is an accessory dwelling unit?**
**System of inquiry**
- emancipatory

**Strategies**
- interpretive
- qualitative
- simulation

**Tactics**
- literature review
- case studies
- logical iterations

**Philosophy**

- New urbanism: 20%
- Postmodernism: 60%
- Neo-pragmatism: 20%

**Role of design**
- Responsive to spatial needs of residents
- Modularity makes it easy to design, reduces costs, and shortens construction time
- Incorporates the use of universal design principles so that it is accessible for everyone
- Aesthetically pleasing to fit with existing structures
- Addresses the living needs of the community

**Research agenda**
## Research Topics

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<th><strong>Modularity &amp; Assembly</strong></th>
<th><strong>ADUs &amp; Tiny Homes</strong></th>
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<td><strong>Logical Iterations:</strong></td>
<td><strong>Literature Review &amp; Case Studies:</strong></td>
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<tr>
<td>Google SketchUp</td>
<td>In-Laws, Outlaws, and Granny Flats by Michael Litchfield</td>
<td>The Accessible Home: Designing for All Ages and Abilities by Deborah Pierce</td>
<td>Minneapolis, Minnesota</td>
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<tr>
<td>Hand Sketching</td>
<td>Backyard Cottages: A New Choice for Seattle Families by City of Seattle Dept. of Planning and Development</td>
<td>Housing for the Elderly: Privacy and Independence in Environments for the Aging by J. David Hoglund</td>
<td>Austin, Texas</td>
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<tr>
<td>Literature Review:</td>
<td>sips.org Structural Insulated Panel Association</td>
<td></td>
<td>Seattle, Washington</td>
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<tr>
<td>Diamond Pier Footings</td>
<td>Pin Foundations, Inc.</td>
<td>Residential Design for Aging in Place by Drue Lawlor &amp; Michael A. Thomas</td>
<td>In-Laws, Outlaws, and Granny Flats by Michael Litchfield</td>
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<td></td>
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<td>Land Development Code by Fargo, North Dakota</td>
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outcomes
zoning code, process, module design, example solutions
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<tr>
<th></th>
<th>Minneapolis, Minnesota</th>
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<th>Austin, Texas</th>
<th>Common Standards Listed in In-Laws, Outlaws &amp; Granny Flats</th>
<th>Current Fargo Building Code</th>
<th>Proposed Fargo ADU Code</th>
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<tbody>
<tr>
<td><strong>ADU square footage compared to primary dwelling</strong></td>
<td>ADU must be smaller than the primary dwelling</td>
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<tr>
<td><strong>Allowable zones</strong></td>
<td>residence, office, commercial, downtown, industrial living</td>
<td>single family 2, single family 3 lots larger than 5,750 square feet</td>
<td>single family, lowrise</td>
<td></td>
<td></td>
<td>sr-1, sr-2, sr-3, sr-4</td>
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<tr>
<td><strong>Property owner occupancy</strong></td>
<td>property owner must live in either the primary residence or ADU</td>
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<td><strong>Total allowable lot coverage</strong></td>
<td>ADU + parking cannot exceed 676 square feet or 10% of lot area, whichever is greater</td>
<td>impervious cover of the site cannot exceed 45%, building coverage cannot exceed 40%</td>
<td>on lots 1,000-5,000 square feet: 15% on lots larger than 5,000 square feet: 35%</td>
<td>minimum lot size of 5,000 square feet, maximum lot coverage of 30-40%</td>
<td>20-50% depending on zone, most lots in Fargo are sr-2, sr-3 or sr-4 which have maximum coverage of 25-45%</td>
<td>no change to current code</td>
</tr>
<tr>
<td><strong>Setbacks</strong></td>
<td>front: ADU must be in rear side: rear: 3'-5' depending on zone</td>
<td>front: ADU must be in rear side: rear: 5 feet, 10 feet on corner lots</td>
<td>front: 20 feet side: 5 feet rear: 10 feet</td>
<td></td>
<td>front: accessory structure not allowed side: 4-15 feet rear: accessory structures must be at least 3 feet from rear line</td>
<td>no change to current code</td>
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<td><strong>Minimum square footage</strong></td>
<td>300 square feet</td>
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<td><strong>Maximum square footage</strong></td>
<td>1,300 square feet total of habitable and parking area OR 16% of the lot, whichever is greater, but no larger than 1,600 square feet</td>
<td>1,000 square feet or 0.15 FAR, whichever is less; maximum of 550 square feet on the second story</td>
<td>including garage and storage areas: single family: 800 sq. ft. lowrise: 650 sq. ft.</td>
<td>750 square feet or it can be listed as a percent of the footprint of the primary structure</td>
<td>the total square footage of accessory buildings may not exceed the footprint of the house</td>
<td>1,200 square feet OR 12% of the lot, whichever is less</td>
</tr>
<tr>
<td><strong>Distance from primary structure</strong></td>
<td>20 feet from habitable portion of house</td>
<td>at least 10 feet from primary structure</td>
<td>5 feet from primary structure</td>
<td>10 feet, may be closer to non-habitable spaces</td>
<td>none, but an accessory building closer than 6 feet to the primary structure must have additional fire protection</td>
<td>8 feet from habitable portion of primary structure</td>
</tr>
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<td><strong>Maximum height</strong></td>
<td>cannot exceed the height of the primary OR 20 feet, whichever is less; the highest point of ADU roof may not exceed the highest point of the primary</td>
<td>limited to two stories, and may not exceed a height of 30 feet</td>
<td>12-23 feet, depending on lot width</td>
<td>separate ADU: 12 feet above garage: 22 feet</td>
<td>accessory buildings may not exceed 15 feet in height</td>
<td>18 feet or height of primary, whichever is less; the highest point of ADU may not exceed the highest point of primary</td>
</tr>
<tr>
<td><strong>Parking</strong></td>
<td>no additional parking space required</td>
<td>one additional space required if the property is greater than 0.25 miles from an activity corridor served by transit</td>
<td>one additional space except in urban centers and lowrise zones</td>
<td>siding, trim, and roof pitch should match existing house to help unit blend in to surroundings and keep the aesthetic style of the lot</td>
<td>one additional space required unless the property is within 0.25 miles of a transit stop</td>
<td></td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td>exterior materials must be durable</td>
<td>siding, trim, and roof pitch should complement the existing house</td>
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<td>siding, trim, and roof pitch should match existing house to help unit blend in to surroundings and keep the aesthetic style of the lot</td>
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<td><strong>Entrance</strong></td>
<td>entrances encouraged or face public street or alley</td>
<td>entrance must not face side lot line or rear lot line unless there is an alley</td>
<td>both entries cannot face the street unless unit door is screened from view; varies greatly between cities</td>
<td>entrances encouraged or face public street or alley</td>
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module design
universal design principles

- at least 42”-48” path of travel
- ample shelf space next to the bed
- bed has view of the door
- high windows add daylight without compromising privacy
- lights are operable from bed
- lamps for reading
- variety of drawers, shelves, and hanging space in closet
- adequate lighting in closets
- full height mirror
- adequate electrical outlets near bed
- 36” pocket doors where possible

**1: bedroom**

- **1a**
  - king or queen bed
  - 306.50 square feet

- **1b**
  - queen or full bed
  - 247.25 square feet

- **1c**
  - full or twin bed
  - 180.50 square feet

- **1d**
  - full or twin bed
  - 214.50 square feet
universal design principles

- Front loading washer and dryer located side by side for easier access from a seated position
- Laundry located in a central location
- “Wet room” bathroom—no enclosed shower
- 18” high shower seat with slightly angled vertical portion
- Mirror with anti-fog features
- Textured, non-slip flooring
- Adjustable, hand-held shower head
- Skylights add daylight without compromising privacy
- 36” pocket door

2: bathroom & laundry
universal design principles

- front controls on single row of cooktop burners
- wall mounted oven with side swinging door
- lever, touch, or sensor style faucet
- 32”-34” high countertops with rounded edges
- upper cabinets 12”-15” above base cabinets
- flooring continues under cabinets for future removal if needed
- 9” high, 6” deep baseboards on cabinets to accommodate wheelchairs
- electrical outlets located on front of base cabinets for easy access
- d-shaped cabinet pulls

3: kitchen & entry
universal design principles

- soft furniture and cushions for acoustical dampening
- dining table with trestle or pedestal base so seats of all sizes can fit on all sides
- separate spaces with furniture, not walls
- variety of lighting types
- power operated window openings
- 18”-20” window sill height

4a
large
257.50 square feet

4b
small
174.75 square feet

4: living & dining
tiny house principles

in general:

- the use of large windows gives the feel of a larger space and helps to connect to nature
- open floor plan to create overlapping spaces
- utilize light colors to make the space feel larger
- the addition of a deck adds more space without adding square footage
- having a sloped roof makes the home seem more like a house than an RV trailer
- using a tankless water heater saves space and energy

5a

bed, bath, laundry
306.50 square feet

5b

kitchen, living, dining, entry
257.50 square feet

5: combination
example solutions
site 1: 3750 10th street north
site 2: 1138 28th street north
site 3: 1324 11th avenue south
site 4: 5069 rose creek parkway
site 1:  3750 10th street north

total lot: 5,890 square feet

<table>
<thead>
<tr>
<th>allowance/coverage</th>
<th>area</th>
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<tbody>
<tr>
<td>allowable lot coverage: 45%</td>
<td>(2,650.5 square feet)</td>
</tr>
<tr>
<td>setback coverage: 21.7%</td>
<td>(1,267 square feet)</td>
</tr>
<tr>
<td>other use: 33.3%</td>
<td>(1,972.5 square feet)</td>
</tr>
</tbody>
</table>

existing buildings: 18.5% (1,088 square feet)

ADU allowable: 12% (706.8 sq. ft.)
site 1:  3750 10th street north
proposed solution:

- 1a 1b 1c 1d 2a 2b 3a 3b 4a 4b 5a 5b
- 165.50 sf 174.75 sf 306.50 sf
- = 646.75 square feet

site 1: 3750 10th street north
**site 2: 1138 28th street north**

<table>
<thead>
<tr>
<th></th>
<th>Allowable Lot Coverage: 25%</th>
<th>Setback Coverage: 54.1%</th>
<th>Other Use: 20.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Lot:</strong></td>
<td>7,000 square feet</td>
<td>3,790 square feet</td>
<td>1,460 square feet</td>
</tr>
<tr>
<td><strong>Existing Buildings:</strong></td>
<td>11% (1,239 sq. ft.)</td>
<td></td>
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<tr>
<td><strong>ADU Allowable:</strong></td>
<td>12% (840 sq. ft.)</td>
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</table>
site 2:  1138 28th street north
proposed solution:

site 2: 1138 28th street north

= 809.25 square feet
site 3: 1324 11th avenue south
site 3: 1324 11th avenue south
proposed solution:

1a 1b 1c 1d 2a 2b 3a 3b 4a 4b 5a 5b
180.50 sf 162.75 sf 257.50 sf

= 600.75 square feet

site 3: 1324 11th avenue south
site 4: 5069 rose creek parkway

- total lot: 12,667 square feet
- allowable lot coverage: 25% (3,166.8 square feet)
- setback coverage: 37.5% (4,747 square feet)
- other use: 37.5% (4,753.2 square feet)

- existing buildings: 16.2% (2,064 square feet)
- ADU max.: 8.8% (1,103 sf)

- 52nd avenue south
- 25th street south
site 4: 5069 rose creek parkway
proposed solution:

site 4: 5069 rose creek parkway

rose creek parkway
52nd avenue south

5b
5a
4b
4a
3b
3a
2b
2a
1d
1c
1b
1a

214.50 sf 204.25 sf 165.25 sf 257.50 sf
247.25 sf 214.50 sf 204.25 sf 165.25 sf 257.50 sf

= 1,088.75 square feet
How can modular accessory dwelling units facilitate aging in place in Fargo, North Dakota?

People prefer to age in their own homes for as long as they possibly can. Fargo currently does not mention ADUs in the land development code.

Based on needs, smaller, intimate, more personalized living space is preferred.
thank you