Incorporating Universal Design into Street Design

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About

Snotrac

The Snohomish County Transportation Coalition (Snotrac) advocates for connecting people and communities in Snohomish County and beyond with safe, equitable, and accessible transportation. We focus especially on the needs of people with disabilities, older adults, youth, low income individuals, people of color, immigrants & refugees, veterans, rural communities, and tribal nations.

Founded in 1999, Snotrac serves as Snohomish County's mobility management coalition to identify mobility gaps for priority populations and coordinate specialized transportation by convening transportation and human service providers.

Snotrac program priorities include:

1. Creating and coordinating mobility services
2. Education, outreach, and engagement
3. Planning and design of livable communities
4. Securing public support and funding
5. Emergency response coordination

For more information, visit GoSnotrac.org.

Author

- Ed Engel serves as Snotrac's Mobility Justice Advocate through the AmeriCorps VISTA Program for 2022-2023.

Editor

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Snotrac's Universal Design Forum

This report incorporates the lessons learned from the Snohomish County Universal Design Forum hosted by Snotrac online, April 19-20, 2023. The Universal Design Forum was co-hosted with the Snohomish County Human Services Department, Disability Rights Washington, and Homage Senior Services.

Universal Design Forum speakers:

- **Keynote,** *Anna Zivarts*, Director of Disability Mobility Initiative.
- **Transportation Planning & Universal Design**, *Jonathan White* (M.Arch., AIA), Director of Design Consulting, Center for Inclusive Design and Environmental Access at the State University of New York at Buffalo.
- **Housing Choice & Universal Design**, *Cathy MacCaul*, Advocacy Director at AARP Washington.
- **Introduction to ADA Compliance**, *Sabine Rear*, Northwest ADA Center.
- **ADA & Mobility Justice**, *Michelle Abunaja*, Associate Transportation Planner at Seattle Department of Transportation and Affiliate Instructor at UW College of Built Environments, and *Thomas Hewitt Jr.* (AICP), ADA Coordinator at Seattle Department of Transportation with 13 years of experience in ADA accessibility compliance.
- **ADA Transition Plan Round Robin**: staff and consultants for the cities of Bothell, Edmonds, Everett, Lake Stevens, Mountlake Terrace, and Monroe and Puget Sound Regional Council.

Watch a Recording of the Universal Design Forum on Youtube

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Introduction

What is Universal Design and why is it Important?

The Centre Excellence in Universal Design defines Universal Design as, "the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability."

By adopting Universal Design practices, built environments are made to be used by everyone, fostering usability and enjoyment without the need for costly modifications or retrofits at a later stage. Embracing inclusivity through Universal Design promotes equity by eliminating barriers to ensure that individuals of diverse abilities can fully participate and engage in society.

7 Principles of Universal Design

Universal Design adheres to the following seven principles:

1. Equitable Use

Strive to offer the same set of features to all users whenever feasible. When identical features are not possible, ensure that equivalent alternatives are provided to maintain fairness and inclusivity.

Create a design that caters to the needs of all users, considering accessibility and usability. Make the interface intuitive, visually appealing, and customizable to accommodate diverse preferences and abilities.

2. Flexibility in Use

Offer users a variety of options for how they can interact with and use the product or service. Provide flexibility in input methods, navigation styles, and preferences to accommodate different user preferences and needs.

3. Simple and Intuitive Use

Streamline the user experience by removing unnecessary complexity and simplifying processes. Keep interactions straightforward and intuitive to prevent confusion and enhance usability.

Accommodate users with varying levels of literacy and language skills. Use clear and concise language, avoid jargon or technical terms when possible, and provide support for multiple languages to ensure accessibility and understanding for a diverse user base.

Provide effective prompts and feedback throughout the user's journey, both during and after task completion. Guide users through each step of a process with clear instructions and cues, and provide timely feedback to confirm successful actions or offer assistance in case of errors or uncertainties.

4. Perceptible Information

Communicate necessary information effectively, regardless of regardless of ambient conditions or the user's ability

Use different modes of communication for a redundant presentation of information

5. Tolerance for Error

Arrange elements to minimize hazards and errors by eliminating, isolating, or shielding them.

Discourage unconscious actions in tasks that require attention and focus to prevent errors or accidents.

Incorporate fail-safe mechanisms into the system to prevent or mitigate the impact of errors or failures.

6. Low Physical Effort

Design the interface or product to allow users to maintain a comfortable and natural body position during interaction.

Ensure that the required physical effort for operating the system is reasonable and does not strain or exhaust the user.

7. Size and Space for Approach and Use

Ensure that important elements within the system are easily visible and accessible, regardless of whether the user is seated or standing.

Design the system to enable comfortable reach for all users, whether they are seated or standing.

Account for the natural variations in hand grip strength and size among users.

Provide ample space within the system to accommodate the use of assistive devices or personal assistance. This ensures that users who rely on such devices or assistance can utilize them effectively without constraints or inconvenience.

Universal Design Practices for Streets

One of the most crucial areas that Universal Design can help guide is how we design the pedestrian environment. Without design guidelines, sidewalks are often too narrow, utility poles obstruct travel, and steep driveway ramps are impassable to wheelchair users. Users are generally exposed to dangerous street designs that prioritize the movement of cars over pedestrians.

Designing our streets to be universally accessed by every user enables people with disabilities to access employment, school, and social services independently without the need for accommodations. Moreover, by creating universally accessible streets that accommodate for disabilities, other users are able to unlock mobility freedom. Older adults, especially those that want to stay in their communities and age in place, would be able to grow old in their communities as they safely navigate their neighborhoods. Children would be able to learn safely about their built environment. Furthermore, those that may be pushing large suitcases or strollers would be able to safely and with ease.

Sidewalks

According to the Federal Highway Administration, in higher pedestrian areas – near schools, sporting complexes, some parks, and many shopping districts – the minimum width for a sidewalk is 8 feet. They additionally state, the bare minimum of 4 feet for a sidewalk, "often force pedestrians into the roadway in order to talk. Even children walking to school find that a 4.0 foot width is not adequate."

On the other hand, the National Association of City Transportation Officials state that the bare minimum width of a sidewalk, in residential areas, should be 5 feet in accordance with ADA accessibility standards. But in pedestrian travel paths, a clear width of 8–12 feet is preferred in downtown areas.

While these guidelines offer a starting point for creating more accessible sidewalks, they should be considered the minimum of what is to be considered. This is especially the case when the effective widths of sidewalks are shrunk by things like parking meters, poles, and other obstructions.

Curb Ramps

At many intersections there only exists one narrow curb ramp which is often unusable and uncomfortable for those that roll. According to ADA standards – curb ramps should be at a minimum 3 feet wide, with no more than a 1:12 grade. However, many existing curb ramps do not meet these standards.

Other issues that curb ramps face include – obstructions blocking the top portions, slopes that are poorly maintained and crumbling, and simply a lack of them on a large portion of sidewalks. The solution would be to build and maintain curb ramps that adhere to ADA standards. Additionally, creating curb ramps that allow for north-south and east-west access, acting as a natural extension from the sidewalk to the crosswalk are best practices.

Crosswalks and Intersections

The current status quo of intersections prioritize the movements of cars without consideration of the travel time that pedestrians may take. According to the Manual on Uniform Traffic Control Devices, transportation agencies are mandated to utilize a presumed walking speed of 3.5 feet per second when determining signal timing. However, this speed may prove insufficient to adequately accommodate the needs of a significant number of older adults or individuals with disabilities who frequently cross the road. In such cases, certain local signal maintenance agencies opt for a lower walking speed of 2.8 feet per second instead. The longer crossing times allow pedestrians to safely cross without rushing or feeling pressured.

Another aspect of a Universally Designed crosswalk include clear and highly visible markings on the road surface to assist pedestrians in identifying the designated crossing areas. This can include well-defined painted lines, contrasting colors, or even textured surfaces that provide tactile feedback.

Audible crossing signals for low vision individuals ensure safe road crossing. "Guiding sound corridor" emits sound from both ends of the crossing, providing enhanced guidance. Pedestrians can follow the sound for safer and more independent navigation in the right direction.

But just the existence and presence of a crosswalk is not Universal Design as it does not make the street inherently safe for all users. Because of this, additional safety measures such as reduced roadways speeds, safety islands, signals, and/or traffic calming would be needed. See the Safe System Approach for more information.

Block Lengths

In conjunction with the previous Universal Design improvements for bettering streets, shortening city blocks to 200ft better the walkability and accessibility of communities. With shorter block lengths, pedestrians have shorter distances to walk or roll to their destinations. This is especially the case since long block lengths force pedestrians to walk or roll long distances in order to cross. Effectively, shorter long lengths allow choice for pedestrians and better accessibility for all users.

Land Use and Housing

Discussions regarding Universal Design and housing are often centered around devices within the home that better livability. However, Universal Design principles can be applied to how we can change land use to create housing choices that allow for a range of different abilities. This discussion is important because of how quickly the population is aging. Building dense and compact housing will allow for more affordability and mobility for everyone.

AARP endorses the following policies as part of their Livable Communities program. While these policies exist within the context of creating Age-Friendly Communities, they adhere to Universal Design principles by creating communities that are livable for all.

Mixed-Used

In many downtowns, commercial spaces are built at ground levels away from residential units. As a result of this, the locations in which people work and live are far from another, creating dependency on private vehicles.

By changing zoning to allow for mixed-used development, residential units can be integrated with commercial spaces such as retail stores, offices, and restaurants. As a result, mixed-used development would reduce private vehicle dependence, and increase mobility options. This is especially important for seniors that want to age in place as it allows them to be better connected with their community – in addition to healthcare, transportation and social service infrastructure.

"Missing Middle Housing"

For much of the history of the United States, downtown and main streets contained a wide variety of housing types that accommodated different needs. However, through zoning codes, many of these choices were eroded – leaving most development to be detached single family homes or large apartment complexes. Because of this, current housing is far from things like employment and social services, requiring the usage of a private vehicle for access. The choices that exist between the continuum of single family homes and apartments is often referred to as "Middle Housing." "Missing" because very few have been built since the 1940s.

Missing Middle covers a wide range of housing types which include duplexes, fourplexes, cottage courts, triplexes, townhomes, and others. By legalizing and allowing for these types of housing, communities can become more compact – improving walkability and enabling family members to live closer together.

ADUs

Like Middle Housing – Accessory Dwelling Units (ADUs) give more choice to people that want to stay within their communities and age in place. ADUs come in all shapes and sizes as they are small houses or apartments that exist on the same property lot as a single-family residence.

Common types of ADUs include:

Detached ADUs

These units are separate structures that are entirely detached from the primary residence. They can be standalone cottages, small houses, or converted garages or sheds.

Attached ADUs

These units are connected to the primary residence, sharing at least one wall. They can be created by converting a portion of an existing house, such as a basement or a garage, or by adding an extension to the main structure.

Basement ADUs

These units are located entirely or partially in the basement of the primary residence. They often have separate entrances and can be accessed from the outside or through the main house.

These are just a few examples of the types of ADUs that exist. The specific regulations, requirements, and terminology may vary depending on the location and local building codes.

What is the difference between the Americans with Disabilities Act and Universal Design?

Both the Americans with Disabilities Act and Universal Design are concepts that aim to better our built environment in a way that is inclusive and accessible to our most vulnerable users – people with disabilities, older adults, children, and other populations that have historically faced design barriers. However, there are distinct differences between the two:

Universal Design is a conceptual design framework that aims to make our built environment usable by people with a wide range of abilities, without the need for adaptation or specialized design. It seeks to go beyond minimum accessibility requirements, so that users of all abilities can use the built environment to their full potential.

The Americans with Disabilities Act on the other hand is a civil rights law in the United States that prohibits discrimination against individuals with disabilities in various areas of public life. It sets standards and requirements for accessibility in public accommodations, employment, transportation, and other areas. The ADA ensures that individuals with disabilities have equal opportunities and access to services, programs, and employment. It mandates reasonable accommodations and modifications to eliminate barriers and ensure equal participation for individuals with disabilities.

In short, Universal Design is a philosophy towards creating spaces that can be used by all to the best of their ability. While the ADA is a law that mandates that those with disabilities will have access to accommodations and modifications, it establishes a baseline for accessibility.

Mobility justice lessons learned from the Universal Design Forum

From Snotrac's Universal Design Forum held on April 19-20, the following lessons learned were observed:

- Mobility justice means creating streets and places that allow for people to live dignified lives regardless of their race, religion, background, or physical ability. This ultimately means creating spaces that allow people to be human and have human interactions.

- When trying to implement mobility justice and Universal Design principles into projects, agencies should view the American with Disabilities Act as the minimum for accessibility. Agencies should build projects within their ADA transition plans, but simultaneously look to better those same projects to better mobility for everyone.
    - Consider the specific context of where projects are located. Is there heavy pedestrian foot traffic here? Should we create wider sidewalks that go beyond ADA standards to allow for comfortable walking and rolling given that heavy foot traffic?
    - The ADA is vague and does not cover every aspect of accessibility for pedestrian tactile wayfinding. Using Universal Design principles becomes a necessary component when creating wayfinding that works for everyone.

- Measuring the success of projects can often be a tricky. While agencies view the number of complaints received as a key metric, often it is the substance of the comments rather than the pure number that matters.
    - There are frequently trade-offs between different users. For example, removing car parking for wider sidewalks comes at the cost of drivers to the benefit of pedestrians and people with disabilities, and will likely generate lots of complaints from drivers. However, keeping the status quo may not generate many complaints, but it nevertheless comes at the cost to pedestrians. As an engineer or planner, use your professional judgment to improve mobility for the most vulnerable within your community, helping it to become a healthier, happier place.
    - Professionals in transportation and public works are not expected to know everything about the problems that face a community. However, having empathy and listening to those that face mobility issues is a necessary skill in creating projects that adhere to mobility justice principles.

- Universal Design and mobility justice policy works doubly as climate policy. Single occupancy vehicles are some of the biggest emitters of greenhouse emissions. By building sidewalks that can be used by everyone and changing land use to allow for denser buildings, policymakers can create walkable and bike-friendly communities that reduce the need for long-distance commuting and reliance on private vehicles. This approach not only reduces emissions but also enhances mobility options and improves quality of life for people of low incomes, people with disabilities, and older adults.
    - To ensure effective implementation, mobility and climate policies should involve collaboration among government agencies, community organizations, transportation providers, and other stakeholders. Engaging with local communities and conducting equity assessments can help identify specific transportation needs and develop targeted strategies.

Case Studies

In many places across the world, cities are implementing projects that embody aspects of Universal Design. This is not to say that these projects are perfect in their implementation of Universal Design principles – what these projects do show is that implementing Universally Designed projects are ongoing processes in order to achieve accessibility for all users of our streets.

Credit: *City of Hoboken, N.J.*

Hoboken, New Jersey

The city of Hoboken has achieved a remarkable record of zero traffic fatalities since 2018. This was achieved in part by implementing traffic safety calming measures, which also include things like curb ramps, highly visible crosswalks, and spacious sidewalks – all of which improve mobility options for all its users.

The image above shows an example of how Hoboken extended a curb and made a crosswalk more visible, a design treatment employed across the city. The sidewalk is wide enough to accommodate multiple users at a time, side-by-side. The curb ramp then acts as a natural extension of the sidewalk, thus allowing users to cross the highly visible crosswalk.

Even though not every pedestrian pathway in Hoboken has been redesigned to Universally Design principles, the fact that the city has effectively achieved zero traffic fatalities. This is a testament that a strong focus on Universal Design on several projects can change driver behavior across the entire city.

Credit: "*Best Complete Streets Initiatives of 2017*," Smart Growth America

South Bend, Indiana

The emphasis on maximizing car speed for many years transformed South Bend's downtown streets into fast-paced corridors that posed risks to all road users. In order to create a downtown environment that promoted the use of all users, the city of South Bend, Indiana, introduced the Smart Streets initiative.

As shown in the above images, a wide street that was primarily used for cars prior to transformation. In addition, the right sidewalk has a pole that acts as an obstruction and it does not have a clear curb ramp or crosswalk. In the after picture, not only has the street been narrowed, a dedicated bike lane has been built alongside the sidewalk — this allows a wide range of users to not only use the pathways but to be protected from cars. The curb ramp acts as a natural extension of the sidewalk.

Credit: Mark Ostrow, @Qagggy

The Woonerf

A woonerf, also known as a "living street" or a "home zone," is a concept in urban design that aims to create a shared space where pedestrians, cyclists, and vehicles coexist harmoniously. The term "woonerf" originates from the Dutch language, meaning "living yard" or "residential courtyard."

In a woonerf, the traditional hierarchy between different modes of transportation is diminished or eliminated altogether. Instead of the typical separation of pedestrians on sidewalks, cyclists in bike lanes, and cars on the road, a woonerf blurs these boundaries, giving priority to the safety and comfort of pedestrians and cyclists.

Woonerfs are characterized by various design elements that encourage slower vehicle speeds, promote social interaction, and enhance the overall livability of the space. These features may include shared surfaces without clear demarcation between sidewalks and roadways, traffic-calming measures like speed bumps and chicanes, greenery, benches, and other amenities that invite people to gather and linger.

From a Universal Design lens, the woonerf is usable by all people regardless of age, disability or other factors without the need for extra accommodations. This is especially done because these streets were made to prioritize pedestrians and their mobility, rather than cars.

Credit: MissingMiddleHousing.com, Opticos

Minneapolis, Minnesota

As part of their new comprehensive plan, Minneapolis 2040, Minneapolis allowed duplexes and triplexes in every neighborhood citywide, most of which were formerly reserved for nothing but single-family houses.

Following the passage of the plan, areas with regular public transportation service will also have the opportunity to increase the height and density of buildings, reaching up to 4 stories in numerous areas and up to 6 stories in proximity to the city center. This expansion will enable these regions to advance to the next level of density and effectively utilize transit investments by allowing a greater number of people to reside within walking distance of public transportation.

From a Universal Design perspective, by allowing more housing choices that are denser and near transportation choices – older adults are able to age in place by shortening the distances to necessary locations. But other populations would universally benefit from the increase in housing choices. Those that have disabilities and face mobility barriers would be better connected to social services and employment.

Arlington, Virginia

In Arlington, residents who reside on land designated for single-family residences are able to construct detached accessory dwelling units (ADUs) on their property without the need for prior county approval. Prior to 2008, homeowners could only build such a unit inside their house or convert an existing outside structure into one.

In addition to the increased density that ADUs provide and thus better mobility to services, ADUs offer a valuable solution for caregiving needs within residential properties. These additional units provide a convenient and accessible space for caregivers to provide assistance and support to family members or individuals in need, while still maintaining privacy and independence for both parties.

Status of ADA Transition Plans in Snohomish County

	ADA Plan Last Updated	# of Existing Curb Ramps	# of ADA Compliant Curb Ramps	# Of Non-Compliant Curb Ramps	Missing Curb Ramps	Existing Sidewalks Evaluated	ADA-Compliant Sidewalks	Non-Compliant Sidewalks	Total Sidewalk Miles	Missing Sidewalks
Snohomish County	2019	10,718	659	7,909	2,150	464 miles		141 obstructions, 766 damaged panels, 62% of sidewalk cross slope measurements exceeded 2%		
Arlington										
Bothell	2018	796	32	764		2,731 blocks	55 blocks	2,316 blocks	66.8	33 miles
Edmonds	2017	1,950	237	1,713						
Everett	2021	3,871	1,623	2,248	3,316	345 miles		4,000 barriers located		
Lake Stevens	2023	3,095	343	2,752		137* miles	8 miles	129 miles		
Lynnwood	2021	1,384	84	1,300		137.5* miles	2.9 miles	134.6 miles		
Marysville	2020	4,120	490	2,601	1,029	388.3 miles				166.8 miles
Mill Creek										
Monroe	2021	1,313	588	725		75 miles	16 miles	59 miles		
Mountlake Terrace	2020	402	48	354		25 miles				
Mukilteo	2023									
Snohomish, City of	In progress									
Stanwood										
Sultan										
Port of Everett	2021	132	40	92						