1. Transferable Framework

A transferable planning approach was developed to advance People-Centered Mobility (PCM) at the University of Michigan-Dearborn (UM-Dearborn) and on other existing university campuses.

This framework begins with the following vision:

> **"An equitable, vibrant, and connected campus mobility network that enables diverse people to thrive in places that are safe, inviting, and open doors to opportunities everywhere."**

Aligning with the vision, the framework is built around **three core objectives:**

1. **Equity.** Achieving better access to opportunities to acknowledge universities as diverse communities. This considers factors affecting accessibility for all users, no matter their age, ability, or background.
2. **Placemaking.** Establishing a safe, comfortable, vibrant, and inviting community that reflects the identity of its community. This considers factors affecting the comfort, safety, and quality of the users' experience of an area, with greater emphasis on the pedestrian experience.
3. **Connectivity.** Improving connections both within campus and between campus and the greater community. This considers factors affecting the directness, safety, and continuity of routes.

Moreover, to advance safe, comfortable, and people-centered mobility, this framework advances the pedestrian-first approach:

> **"On all university campus streets and paths, pedestrians and people come first. Vehicle movement is supported only where necessary, and vehicle speeds are managed to keep people safe and comfortable."**

The framework was inspired by the movement-and-place methodology of the Orange County Complete Streets Initiative Design Handbook [1]. The methodology was adapted to address the land uses and student service destinations present in a campus context, the reality that many campuses are surrounded by public roadways, and the need for accessibility between campuses separated by non-campus roads.

To address these issues, the framework focuses more directly on destinations and the journeys they generate. It recognizes travel as a derived demand, seeing that transportation networks and travel ultimately derive their demand from the activities generated at the trip's origin and destination [2]. The framework therefore aims to answer the following: "What key destinations does this street have the potential to allow people to access?" This creates a practical, context-sensitive classification while still drawing on the useful ideas of balancing movement and place.

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[1] Orange County Council of Governments, CA, USA. *Complete Streets Initiative Design Handbook,* 1st ed. (2016). [Online]. Available: https://bicycleinfrastructuremanuals.com/manuals3/OC_Complete_Streets_Design_Handbook.pdf

[2] M. Garrett, Ed., "Derived Demand", in *Encyclopedia of Transportation: Social Science and Policy,* vol. 4, Sep. 2014. [Online]. Available: https://doi.org/10.4135/9781483346526

Methodology

The framework methodology is as follows:

1. Determine future destinations and land use context on and around campus using long-term campus planning documents.
2. Classify streets into one of five types based on future context (see *Figure 1. Classifying Streets*).
3. Complete an existing-condition review of the street network by evaluating accessibility at subsections of the network for each mode (see Figure 2. Example Modal Accessibility Scorecard and Figure 3. Street Design Guidelines). The final output of this step should be a **campus roadway context map.**
4. Design an ideal mobility network. The final output of this step should be an **ideal mobility network map.**

This methodology was designed to be easily adapted for consultation purposes; the methodology outlined can be performed in a series of stakeholder mapping sessions to provide a practical diagnosis of a campus' current mobility network. **The campus roadway context and ideal mobility network maps should clearly show which streets have priority gaps to guide proposed interventions.**

1. Future Campus Destinations and Land Use Context

University campuses are dynamic environments shaped by long-term planning documents such as campus master plans, strategic plans, and capital development frameworks. These plans outline the future distribution of land uses, including academic buildings, student housing, mobility hubs, recreation areas, and connections to surrounding communities. For example, UM-Dearborn's recently published Strategic Master Plan identifies future development areas, mobility priorities, and evolving campus edges.

To ensure that this PCM is forward-looking rather than reactive, this framework begins by grounding mobility decisions in planned and anticipated destinations detailed in long-term campus planning documents, not just existing conditions. This includes the following land uses: planned academic, residential, and mixed-use developments; future transit hubs or mobility nodes; anticipated growth areas or redevelopment zones; and strengthened connections to surrounding communities (e.g., downtowns, trails).

2. Classification of Streets

After evaluating modal accessibility, use the three-step process outlined in the table below to classify every street based on their function, planned connected destinations, and planned adjacent land uses. The basis of these decisions should be the long-term planning documents, i.e., the envisioned future of the campus. Users should follow the steps sequentially to arrive at the appropriate classification, first identifying whether a street is intra- or inter-campus, then determining the key destinations it serves, and finally considering surrounding land uses. The resulting classification helps guide which design priorities and interventions are most appropriate for each street.

Moreover, streets that have particular needs that go beyond other similarly functioning streets should be designated as "special corridors." This keeps the framework's application flexible and campus-specific. Special corridors meet at least one of the two criteria: they either (1) serve as a major daily route between key destinations for a considerable number of people, or (2) have high symbolic or functional importance (e.g., Rouge River Trail as the main entry to Downtown Dearborn).

For special corridors, certain interventions should be automatically elevated to High Priority (H) even if they are marked Medium (M) or Low (L) in the Street Design Guidelines Table (see *Figure 3. Street Design Guidelines*). These certain interventions are noted in the table below.

Renick University Center, UM-Dearborn

Step 1: Is the street mainly intra-campus or inter-campus?	**Step 2: What primary destinations will the street connect to?**	**Step 3: What land uses are planned to be directly next to?**	**Classification**	**If Special: Immediately Upgrade These Interventions to High Priority (H)**
Inter-campus / Intra-campus	Major entrances, transit	Mixed uses, river/trail, parking	**Campus Gateway**	Safe, visible pedestrian crossings & midblock crossings; protected bike lanes and micromobility facilities; bus/shuttle stop improvements & priority; inclusive wayfinding; public art & community identity features; plazas, pocket parks, seating, & parklets
Inter-campus	Campus, off-campus housing, downtown core, student services	Mixed uses, residential	**Primary Link**	Safe, visible pedestrian crossings & midblock crossings; wide, accessible paths, curb cuts & tactile paving; protected bike lanes and bicycle parking; bus/shuttle stop improvements
Inter-campus	Campus, off-campus housing, downtown core, student services	Mixed uses, parking	**Secondary Link**	Safe, visible pedestrian crossings & midblock crossings; wide, accessible paths, curb cuts & tactile paving; inclusive wayfinding
Intra-campus	Academic buildings, dining, libraries, recreation, on-campus gathering / recreation, campus housing	Academic or active frontages, quads, on-campus green spaces, on-campus event areas, residential clusters or nearby green space	**Academic Street**	Safe, visible pedestrian crossings & midblock crossings; wide, accessible paths, curb cuts & tactile paving; plazas, pocket parks, seating & parklets; active frontages & outdoor learning / event spaces; benches & resting areas for all ages/abilities
Intra-campus	Maintenance, loading	Back areas or service parking	**Service Access**	(Never special)

Figure 1. Classifying Streets: Three-Step Decision Process

3. Evaluation of Streets

After classifying the street network, assess whether campus users can effectively access each subsection across all modes. Each destination identified in step 1 should be considered as a distinct subsection of the street network. This step ensures that mobility planning is destination-driven and gap-focused, directly linking infrastructure investments to activities that generate user demand.

For each subsection of the street network, evaluate how well the following modes can access the destination: (1) walking; (2) cycling & micromobility; (3) bus & shuttle; and (4) car. Rate how each subsection meets each of the objectives (Equity, Connectivity, and Placemaking) on a score from 0 to 3, scoring 1 point for every objective satisfied. For bus & shuttle accessibility, subsections should be scored on Equity and Connectivity (max of 2 points). For car accessibility, subsections should be scored solely on Connectivity interventions (max of 1 point).

Evaluation of whether a street meets the objective for a certain mode can be done using the street design guidelines (see Figure 3. Street Design Guidelines). The street design guidelines table groups priority interventions by targeted objective, mode, and street classification.

For example, three points for walking accessibility would be given to subsections that meet all categories (Equity, Connectivity, and Placemaking) of interventions in serving pedestrians. For a Campus Gateway to gain three points for walking accessibility, the following high-priority interventions would need to be present at minimum, with medium-priority interventions being included if context allows:

- Equity: Wide accessible paths, curb cuts & tactile paving; Inclusive wayfinding
- Placemaking: Plazas, pocket parks, seating & parklets
- Connectivity: Traffic calming (bulbouts, raised crossings, chicanes); Safe, visible pedestrian crossings & midblock crossings

This evaluation identifies weak mobility connections based on the three framework objectives and specific mode. This helps prioritize the types of new infrastructure needed to service these destinations targeted by mode.

Destination	Walking				Cycling & Micromobility				Bus & Shuttle			Car	
	Equity	Placemaking	Connectivity	**Total Score**	Equity	Placemaking	Connectivity	**Total Score**	Equity	Connectivity	**Total Score**	Connectivity	**Total Score**
Subsection A	0	0	1	**1**	0	0	1	**1**	1	0	**1**	0.5	**0.5**
Subsection B	0	0.5	1	**1.5**	0	0	0	**0**	1	1	**2**	1	**1**

Figure 2. Example Modal Accessibility Scorecard

In the following street design guidelines, "H" means High Priority (implement extensively where feasible), "M" means Medium Priority (include if space and context allows), and "L" means Low Priority (consider only if needed).

Targeted Objective	Targeted Mode	Interventions	Campus Gateway	Primary Link	Secondary Link	Academic Street	Service Access
Equity	Walking	Wide accessible paths, curb cuts & tactile paving	H	H	H	H	H
	Walking; Cycling & Micromobility; Bus & Shuttle	Inclusive wayfinding	H	H	H	H	M
	Cycling & Micromobility	Protected bike lanes and micromobility facilities	H	H	H	H	L
	Walking	Benches & resting areas for all ages/ abilities	M	M	H	H	L
Placemaking	Walking; Cycling & Micromobility	Plazas, pocket parks, seating & parklets	H	L	H	H	L
	Walking; Cycling & Micromobility	Active frontages & outdoor learning / event spaces	M	L	M	H	L
	Walking; Cycling & Micromobility	Public art & community identity features	M	L	H	H	L
	Walking; Cycling & Micromobility	Parking lot revitalization	M	L	H	M	L
	Walking; Cycling & Micromobility	Shared spaces & open streets for events	L	L	H	H	L
Connectivity	Walking; Cycling & Micromobility; Car	Traffic calming (bulbouts, raised crossings, chicanes)	H	L	H	H	M
	Walking	Safe, visible pedestrian crossings & midblock crossings	H	M	H	H	M
	Bus & Shuttle	Bus/shuttle stop improvements & priority	H	H	H	M	L
	Walking; Cycling & Micromobility	Limited vehicle priority	M	M	H	H	L

Figure 3. Street Design Guidelines

4. Ideal Mobility Network

Using the map of future destinations, land use context, and street classifications, plan out an ideal mobility network. Aside from noting interventions to existing streets, new pathways can be created to enhance journeys where multimodal connectivity is limited. Every new pathway should then be evaluated according to the street design guidelines (see Figure 3. Street Design Guidelines) to identify priority interventions for each mode and street classification.

2. UM-Dearborn

Introduction to UM-Dearborn's Campus

The University of Michigan-Dearborn (UM-Dearborn) is a major post-secondary institution located within the Detroit Metropolitan Area. With ~8000 total students between its undergraduate and graduate programs as well as ~500 academic staff, the campus serves as an important destination for those who learn, work, and play on it [3]. Since its founding in 1959, UM-Dearborn has become a pivotal part of its local community. Built on Henry Ford's historic estate, UM-Dearborn holds significant cultural and heritage value for the city of Dearborn. Additionally, UM-Dearborn organizes numerous community programs that benefit the significant number of people living under the poverty line in Dearborn county [4], [5].

As stated in the Strategic Comprehensive Campus Plan, UM-Dearborn is slated for major transformation involving the relocation of buildings and increased student enrollment. These changes include the migration of academic and administrative offices from UM-Dearborn's Fairlane Campus to its Main Campus. In place, the university is expecting to redevelop Fairlane Campus into student housing, which is projected to increase student enrollment by 50%. This change brings new challenges in providing safe and sustainable transportation to a new student demographic. The UM-Dearborn's PCM Plan represents the next step in showcasing a framework that promotes place and movement through directed policies and design.

UM-Dearborn Main Campus

Situated between the Rouge River and Evergreen Road, UM-Dearborn's Main Campus is linearly organized north to south along a main pedestrian corridor, Wolverine Walk. Surrounding the campus are Fair Lane, and Richard Drive, and John Monteith Boulevard, which form a ring around the center of campus for vehicular access to campus buildings and surface parking.

To the north is Henry Ford College, which is a public community college consisting of ~12000 students and which has academic partnerships with UM-Dearborn at varying levels [6], [7]. West is the Rouge River, which has a series of recreational trails that provide access to nature and wildlife. East across Evergreen Road is Fairlane Town Center, which remains a high traffic destination not just for students, but for the greater community as well.

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[3] K. Palm and S. Tuxbury, "A look into Fall 2025 enrollment," *University of Michigan-Dearborn,* Sep. 22, 2025. [Online]. Available: https://umdearborn.edu/news/look-fall-2025-enrollment

[4] United States Census Bureau. "U.S. Census Bureau QuickFacts: Dearborn city, Michigan." [Online]. Available: https://www.census.gov/quickfacts/fact/table/dearborncitymichigan/PST045225

[5] University of Michigan-Dearborn. "About UM-Dearborn." [Online]. Available: https://umdearborn.edu/about-um-dearborn

[6] Henry Ford College. "Fast facts." [Online]. Available: https://www.hfcc.edu/fast-facts

[7] University of Michigan-Dearborn. "Henry Ford College." [Online]. Available: https://umdearborn.edu/admissions-aid/undergraduate/ready-apply/transfer-students/transfer-hubs/henry-ford-college

UM–Dearborn Fairlane Campus

UM–Dearborn's Fairlane Campus remains slightly separate from the Main Campus. Being smaller in area, the campus is highly compact with vehicular access through Hubbard, Auto Club, and Fairlane Woods Drive. Fairlane Campus is bordered by low–density housing and Fairlane Town Center to its south and medical buildings to its east and west.

Due to their high functional and symbolic importance to the campus and the broader Dearborn community, the following paths are designated as special corridors: (1) the path from the Campus Gateway in between Main Campus's E4 and E5 parking lots connecting to Fairlane Town Center and the Fairlane Campus through Lone Oak Dr, the northwest portion of Town Center Dr, the entirety of Beechtree Dr and Northwood Dr; (2) the Rouge River Trail; (3) Evergreen Rd between Ford Rd & Michigan Ave; (4) Hubbard Dr from Evergreen Rd until Southfield Rd; (5) Michigan Ave; (6) Ford Rd; and (7) Southfield Fwy. Using our framework, such designation lists multiple high priority interventions for these paths (see Figure 1. Classifying Streets).

Evaluation of Challenges Using the Framework

Figure 4. Campus Roadway Context Map contains the final map generated using steps 1–3 of the transferable framework as outlined in Section 1.

Through driving, the predominant mode of travel in the area [8], both campuses are connected through Evergreen and Hubbard Drive, which are the arterial roads of the area. A major component of this is the absence of a signalized intersection through the design of a Michigan Left for travelers moving westbound from Fairlane Campus. On the other way, there is a slip lane between Evergreen and Hubbard Drive that allows fast vehicular movement. It should also be noted that there is no cycling or pedestrian access through these roads, as those users must go through Fairlane Town Center instead. UM–Dearborn's current road network also comprises multiple Michigan left treatments, which removes left turn vehicle/pedestrian conflicts and thus eliminates left turn pedestrian crashes. Michigan lefts create longer travel paths for cars, thus indirectly promoting active modes for intercampus mobility.

Alternatively, UM–Dearborn offers two weekday shuttle services which connect the Fairlane Campus and Main Campus with some intermediate stops in Fairlane Town Center or local apartment complexes. As of now, there are no public transit connections between the two campuses as routes serviced by the Dearborn's local transit agencies, the Detroit Department of Transportation (DDOT) and the Suburban Mobility Authority for Regional Transportation (SMART), terminate or pass by Fairlane Town Center instead. To its east is a network of recreational trails along the Rouge River. Its main path, the Rouge River Gateway Trail, provides a scenic connection to Downtown Dearborn and other areas along the watershed. These trails remain popular for recreational use, but are not used for commuting due to poor wayfinding and maintenance during the winter [9].

Although pedestrian and cycling access directly on Fairlane Campus and Main Campus are acceptable, there are limited options between off–campus destinations and between campuses. Although it is not impossible to traverse between off–campus destinations, the acute lack of pedestrian and cycling interventions makes it unsafe and inaccessible. When compounded with the limited transit service, particularly during off–peak periods, this prevents other modes of transportation, such as walking, cycling, and transit, from being a competitive choice for students and staff. This raises vehicle dependence in Dearborn, decreases connectivity and network resilience, and poses a major equity barrier for low–income students accessing vital services and opportunities (grocery stores, healthcare facilities, off–campus employment, and UM–Dearborn).

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[8] R. V. Irey. "Mapping UM–D mobility." ArcGIS StoryMaps. [Online]. Available: https://storymaps.arcgis.com/stories/d138fe67631d4a6b8419df79006a32fa

[9] University of Michigan–Dearborn, "Comprehensive Campus Plan," 2024. [Online]. Available: https://umdearborn.edu/sites/default/files/unmanaged/pdf/facilities/comprehensive–campus–plan.pdf

3. Recommendations & Discussion

Figure 5. Ideal Mobility Network Map contains the final map generated using steps 1, 2, and 4 of the transferable framework as outlined in Section 1.

Because of the planned consolidation of two campuses, planned increase in campus housing, and subsequent expected shift in student demographic, there is now an opportunity to improve mode choice and connectivity on and adjacent to campus. In particular, interventions could be leveraged to bridge challenges in pedestrian, cyclist, and transit mobility to accommodate the evolving transportation needs of its commuter and on-campus student and staff populations.

The campus's proximity to an abundance of surface parking, planned housing on Fairlane Campus, and expected increase in student population highlights an opportunity to connect both campuses with a centralized transit hub that is served by frequent and reliable campus-to-campus shuttle service, including a redesigned Blue shuttle route that loops through the campus core. Parking Lots E2, E3, and E4 were identified as most ideal due to the the lower level of usage in these lots; their proximity to the Special Campus Gateway, Fairlane Town Center, Renick University Center, and Mardigan Library; and the Special Campus Gateway's roadway configuration, which allows transit vehicles from the south to directly enter the campus [9], [10]. Commuters would then have the option of parking at a neighbouring parking lot and riding the campus shuttle into the campus core. This new proposed transit hub would need to replace the existing transit hub at Fairlane Town Center and introduce pedestrian and cycling interventions to facilitate more comfortable access into Fairlane Town Center, including at the Evergreen Road & Lone Oak Drive interchange.

This then creates the opportunity to partner with the region's local transit authorities, SMART and DDOT, to improve transit service in this area with the substantial increase in campus-related traffic. It is recommended that UM-Dearborn work with SMART and DDOT to coordinate scheduling, stops, fares, and emergency management.

Because of the constraints of street and land ownership, it is recommended that UM-Dearborn liaise with the City of Dearborn and other adjacent land owners to improve accessibility on and around campus. This should include traffic calming measures (shared streets, road diets, decreased speed limits); pedestrian infrastructure (maintained and lit sidewalks, crosswalks); and cycling and micromobility infrastructure (bike lanes, bike storage).

These interventions are particularly conducive towards interventions that target equity and placemaking. For example, creating a shared street on a corridor with high pedestrian traffic would prioritize human-scale design and create opportunities for placemaking elements and third spaces that enhance UM-Dearborn's campus character and social environment. A shared street could be incorporated alongside UM-Dearborn's plan for a "Central Quad" on the open field in the middle of campus.

BSB Green, McMaster University

In line with this, UM-Dearborn could work towards transforming redundant parking lots into community spaces such as parks or outdoor shaded study spaces. Remaining parking lots can also be greened, with the installation of planters and green pavers to better integrate parking lots with parks and green spaces.

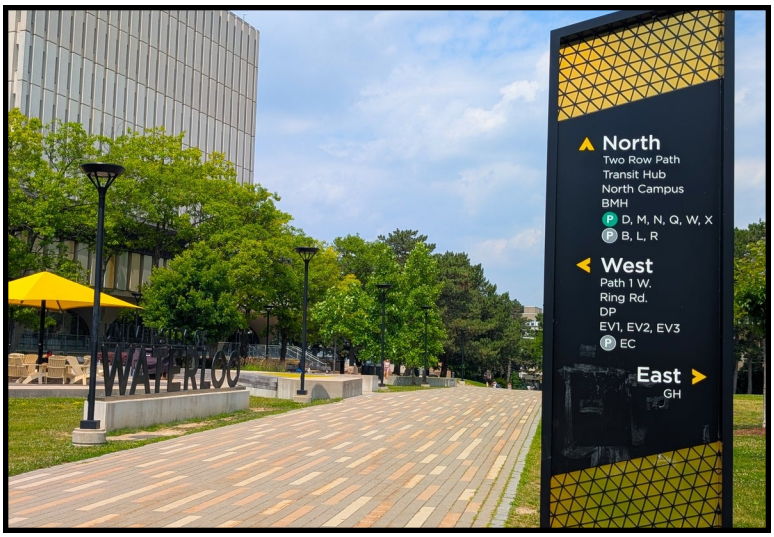
[10] B. Yu et al, "Two-phase optimization approach to transit hub location – the case of Dalian," in *Journal of Transport Geography,* vol. 33, Dec. 2013. [Online]. Available: https://doi.org/10.1016/j.jtrangeo.2013.09.008

Active Frontage, University of British Columbia

Another major intervention to enhance activity on main streets is to front streets with retail and place parking and loading uses behind. Active frontages support community wellbeing, mental health, and stimulate the local economy [11]. Integrating this with other interventions allows mobility and land use to intersect, providing opportunities for services (supermarkets, pharmacies) and shops to engage with existing and future mobility.

These new developments would then provide an opportunity to revisit UM-Dearborn's wayfinding strategy. Clear and inclusive wayfinding can improve access to campus amenities for equity-deserving groups such as students with disabilities, international students, and more broadly students who are unfamiliar with the campus. Beyond navigation, a cohesive wayfinding system strengthens community identity and well-being by reinforcing campus landmarks, highlighting cultural spaces, and creating a recognizable visual language that reflects the institution's values and local context.

Thoughtful wayfinding supports human-scale design by prioritizing pedestrians through clear sightlines, legible signage, and intuitive paths that help people navigate comfortably and safely without relying heavily on vehicles or digital tools. Updates could include the use of plain language, braille, and tactile features to allow everyone to locate classrooms, services, transit stops, and gathering spaces. Additionally, the university could introduce consistent signage standards, install pedestrian-level maps in high-traffic areas, and highlight major campus destinations along primary walking routes.



Campus Wayfinding, University of Waterloo

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[11] S. Atanackovic-Puzovic, "Measuring social sustainability of the public realm: Design of street frontages as a precondition for social sustainability," M.A.S.A. thesis, University of British Columbia, BC, Canada, 2018. [Online]. Available: https://dx.doi.org/10.14288/1.0365700

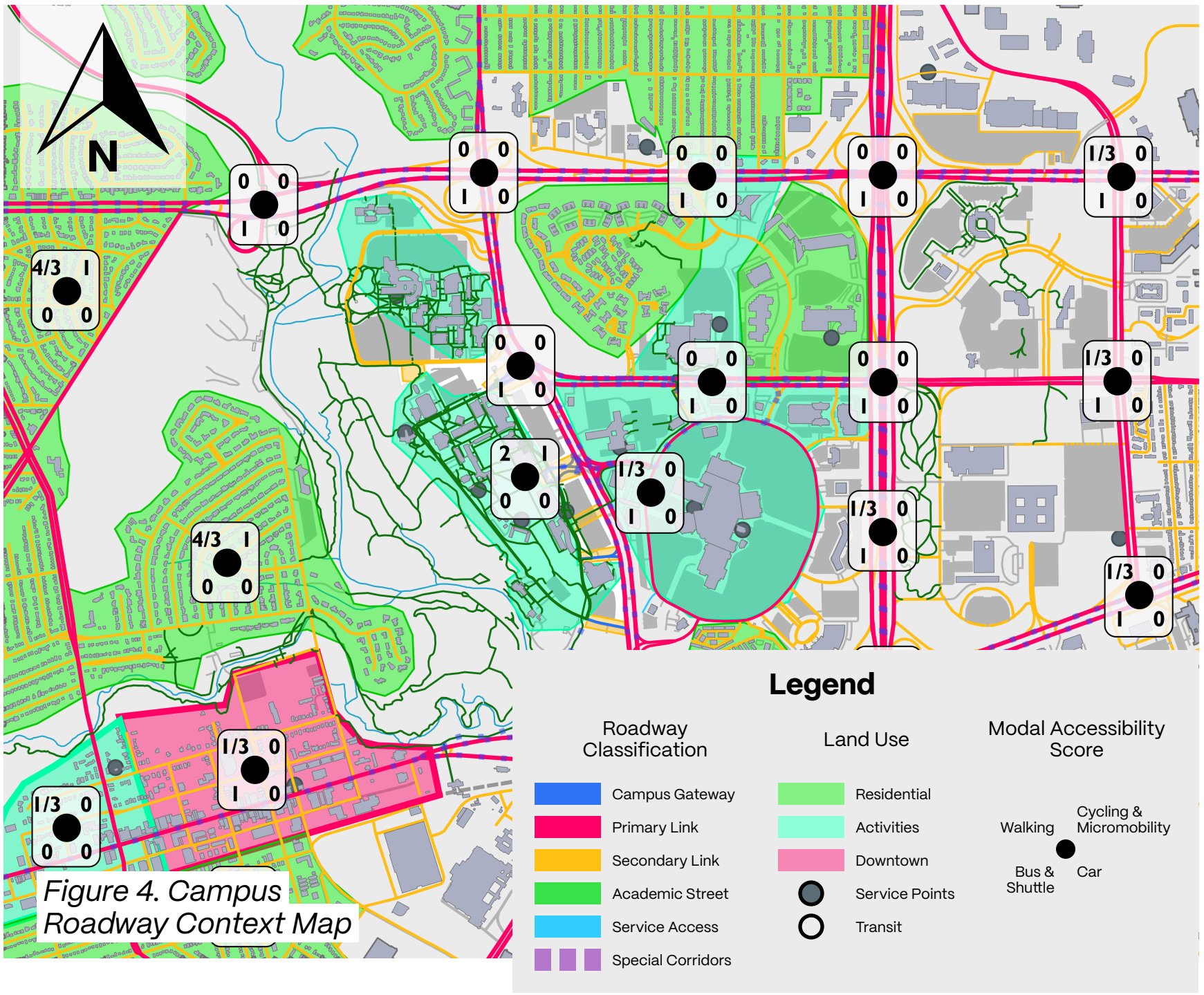

Figure 4. Campus Roadway Context Map

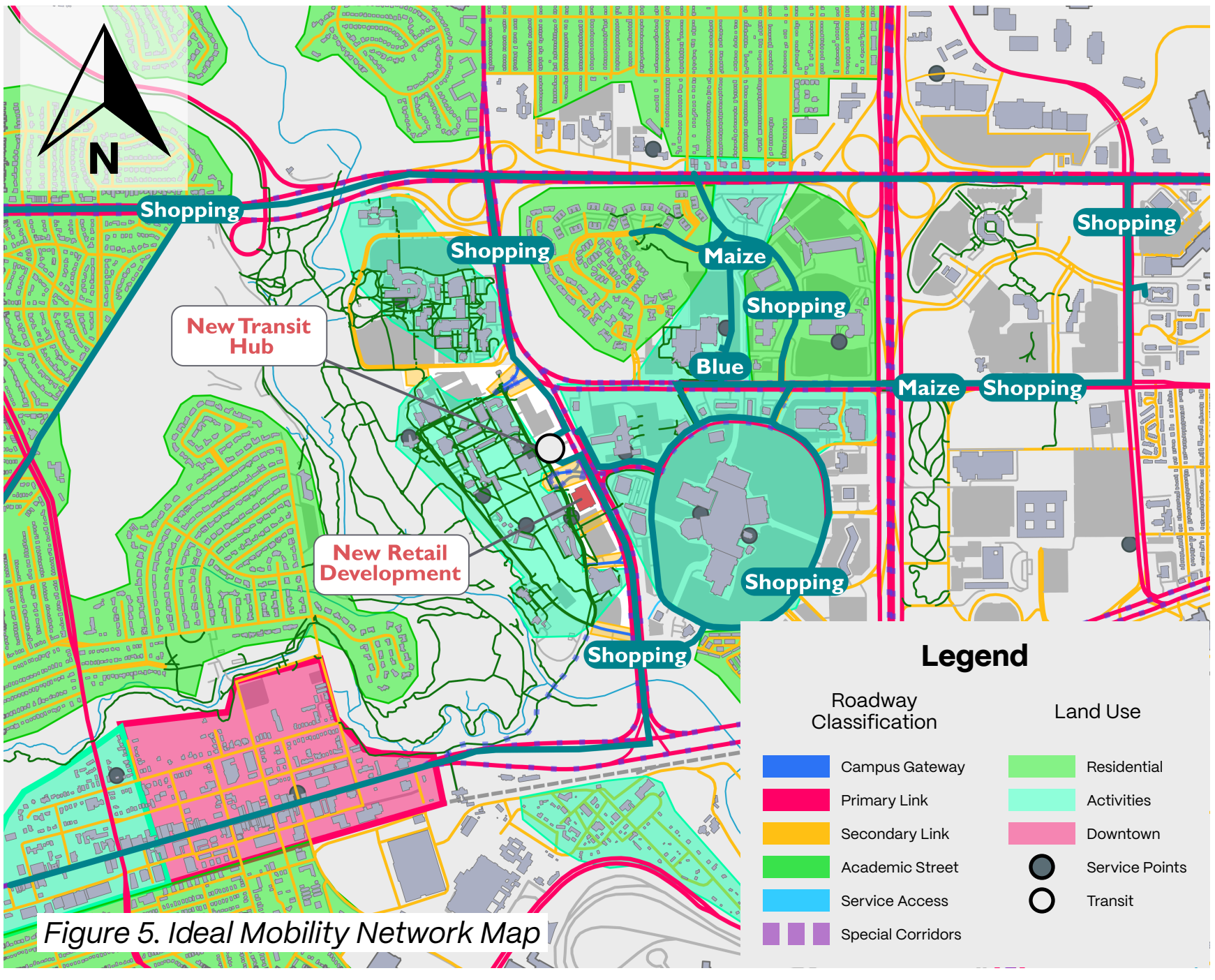

Figure 5. Ideal Mobility Network Map