**Input Criteria Used**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Transportation Network** | | | **Population** | | **Built Environment** | | | | | |
|  | Transit Stops | Bike  infrastructure | Low car usage/  ownership | Population/  Housing Density | Demographics | University/  Student  Housing/  Schools | Jobs/  Employment  Density | Retail/  Malls/  CBD | Restaurants/  Bars/ Bakeries/ Cafes | Park/Trailhead/  Water | Museum/Theatre  /Cinema/Memorial/  Hotels/Event Centers |
| **Input Criteria Modeled Impact** | | | | | | | | | | | |
| Croci and Rossi (2014) | + |  |  |  |  | + |  |  |  |  | + |
| Duran-Rodas et al (2019) |  | + |  | + |  |  | + | + | + | + |  |
| Wang et al (2015) |  | + |  |  | + | + | + | - | + | - |  |
| **Propensity Analysis Criteria Weights** | | | | | | | | | | | |
| Washington DC  Capital Bikeshare (2020) | + | + | + | + | +  (disadvantaged) |  | + | + | + | + | + |
| Minneapolis Mobility Hubs (2021) | + | + | + | + | + | + | + | + |  | + | + |
| **Optimization Approaches** | | | | | | | | | | | |
| Cetinkaya (2017) | + | + |  | + | +  (young) | + | + | + |  | + | + |
| Wuerzer et al (2012) | + | + | + | + |  | + | + | + | + | + |  |
| Qian et al (2022) |  | + |  | + | +  (disadvantaged) |  | + |  |  | + |  |
| Eren et al (2022) | + | + |  | + |  | + |  | + | + | + | + |
| Kabak et al (2018) | + | + |  | + |  | + |  | + | + | + | + |
| Conrow et al (2018) |  | + |  | + |  |  |  |  |  |  |  |
| Garcia-Palomares et al (2012) |  |  |  | + |  |  | + |  |  |  |  |
| Mix et al (2022) | + | + |  |  |  |  | + | + |  | + |  |
| Liu et al (2015) | + | + |  | + |  | + |  |  | + |  | + |
| **Proposed Paper** | | | | | | | | | | | |
| Proposed Paper | + | + | + | + | + (disadvantaged) | + | + | + | + | + | + |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Paper** | **Candidate Locations** | **Input Criteria Considered** | **Weighting Method** | **Station Selection Method** | **Constraints** |
| **Ranking of Candidates** | | | | | |
| Cetinkaya (2017) | Candidate stations | Demand indicators with proximity | Fuzzy AHP | TOPSIS ranking | NA |
| Eren et al (2022) | Existing station locations | Demand indicators with fuzzy buffer | AHP for two categories: transportation and recreation | VIKOR method and new Psychometric-VIKOR method for ranking | NA |
| Kabak et al (2018) | Candidate locations | Demand indicators proximity | AHP | MOORA ranking | NA |
| Salih-Elamin and Al-Deek (2020) | Existing station locations | Closeness, Degree, Betweenness centrality metrics between station pairs in service distance | AHP for three measures | TOPSIS ranking | Maximum service distance for CC, DC, BC (multiple considered) |
| Wuerzer et al (2012) | Continuous service area considered | Demand indicators with buffer | Arbitrarily selected (Los Angeles’ method) | Hand-selected locations, optimized # of stations/bikes | Maximum budget |
| **Maximizing Demand Coverage (O/D Trip Demand Known)** | | | | | |
| Frade and Ribeiro (2015) | Zones | O/D demand between zones | NA | Maximize coverage of trips demanded | Maximum budget, revenue >= operating costs |
| Garcia-Palomares et al (2012) | Existing train stations, candidate locations within zones | O/D demand between zones, scaled to building level with population/job data | NA | Minimize impedance between stations  Maximize demand coverage | Maximum # stations (multiple considered) |
| Caggiani et al (2020) | Zones, candidate locations within zones | O/D demand between zones | NA | Minimize inequalities in bicycle-public transport mobility among population groups | Minimum average accessibility  Minimum total coverage  Maximum budget |
| Celebi et al (2018) | Candidate stations | O/D demand between stations from direct survey about demand points | NA | Minimize total unsatisfied demand | Maximum # stations  Maximum # bicycles |
| **Maximizing Demand Coverage (O/D Trip Demand Modeled/Approximated from Demand Indicators)** | | | | | |
| Mix et al (2022) | Equilateral triangle zones with station at center | O/D demand from existing system data modeled with demand indicators (Regression) | NA | Maximize generated trips for local generation, accessibility-based generation | Maximum # stations (multiple considered) |
| Liu et al (2015) | Voronoi Regions with stations at center | O/D demand from existing system data modeled with demand indicators (Neural Network) | NA | Maximize demand from chosen stations while minimizing unbalanced stations | Maximum # stations  Minimum distance apart |
| Qian et al (2022) | Candidate locations (randomly selected from set of intersections) | Trip demand generated from previous research on demand indicators | NA | Maximize accessibility  Maximize revenue  Pareto frontier comparison | Maximum # stations |
| Conrow et al (2018) | Continuous bike network considered | Census block population, bike network segments | Importance weight for bike network coverage vs population coverage | Biobjective coverage optimization model for bike network and population | Maximum # stations |
| **Minimize Cost** | | | | | |
| Garcia-Gutierrez et al (2014) | Zones, candidate locations within zones | Mobility survey O/D information used with utility (mode choice) model | NA | Bi-Level optimization (planner minimizes total transportation system cost, users minimize travel time) | Maximum budget |
| Ghandehari et al (2013) | Candidate locations | Demand indicator proximity | AHP with simple additive weighting | Combinative model minimizing deviation from goal (maximizing station utility, minimizing cost) | Minimum distance between stations  Maximum # stations |