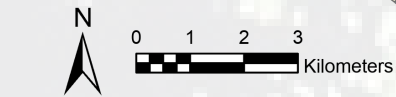
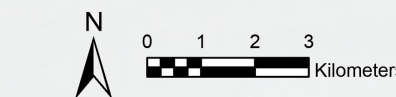
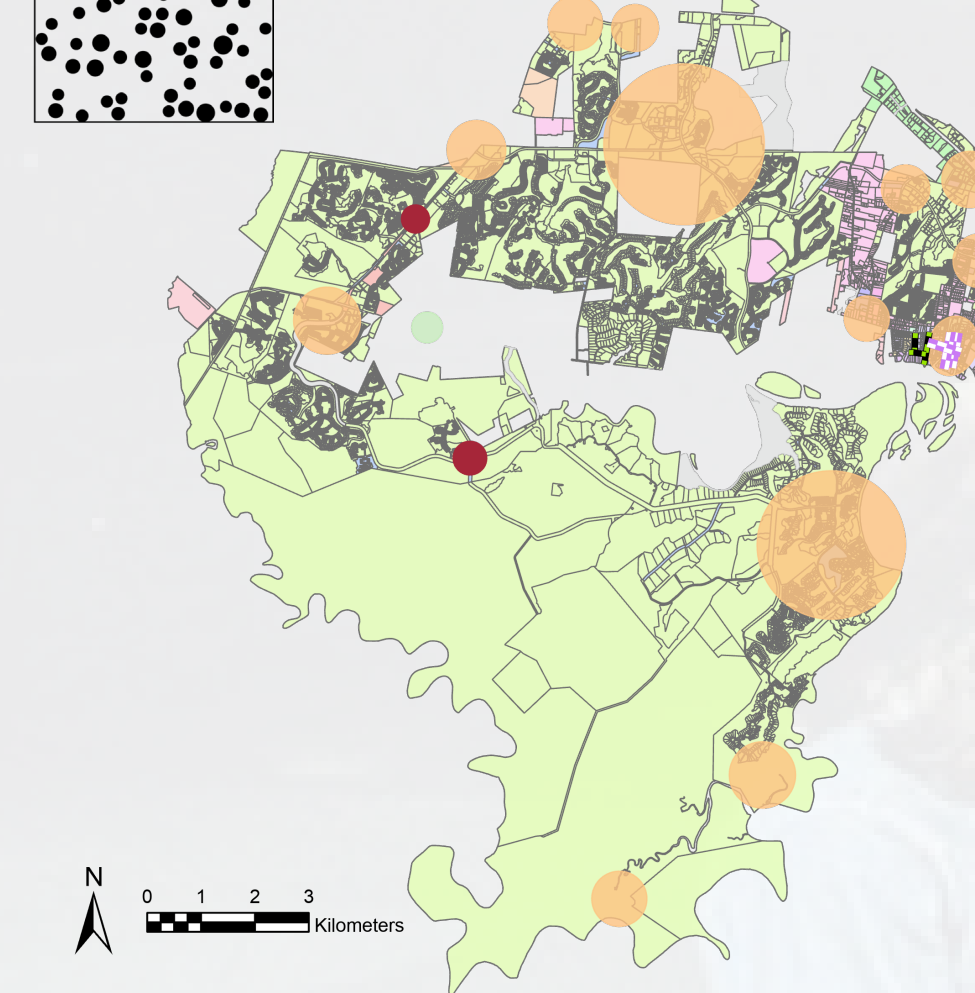




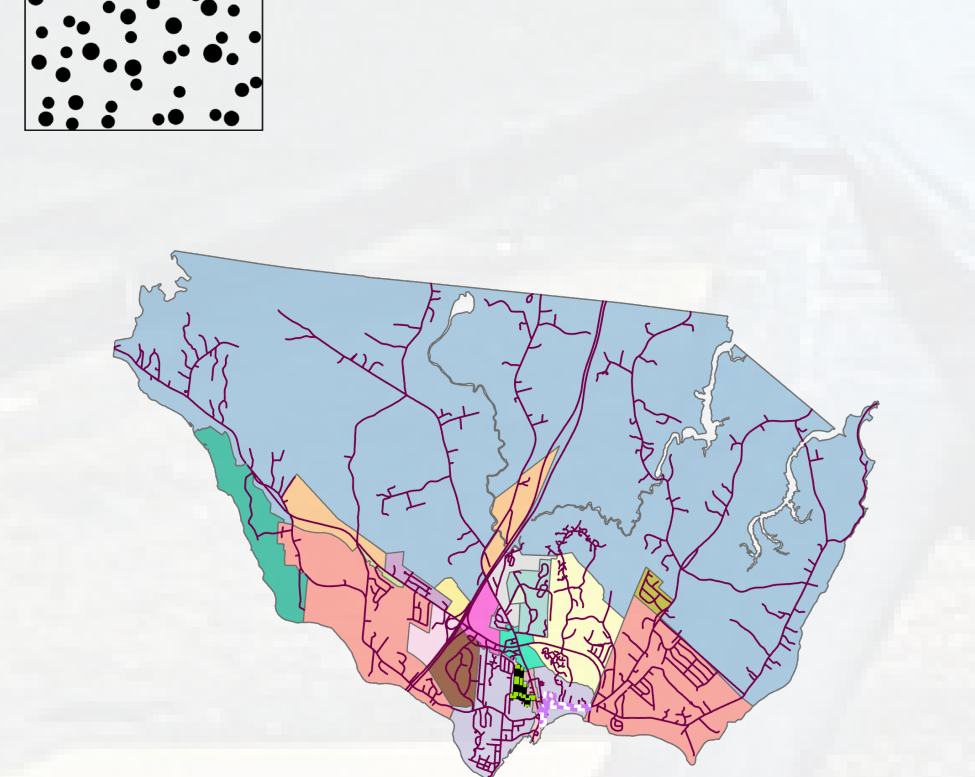
Hammonton, New Jersey (2011) 137 people/km<sup>2</sup>



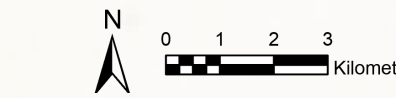
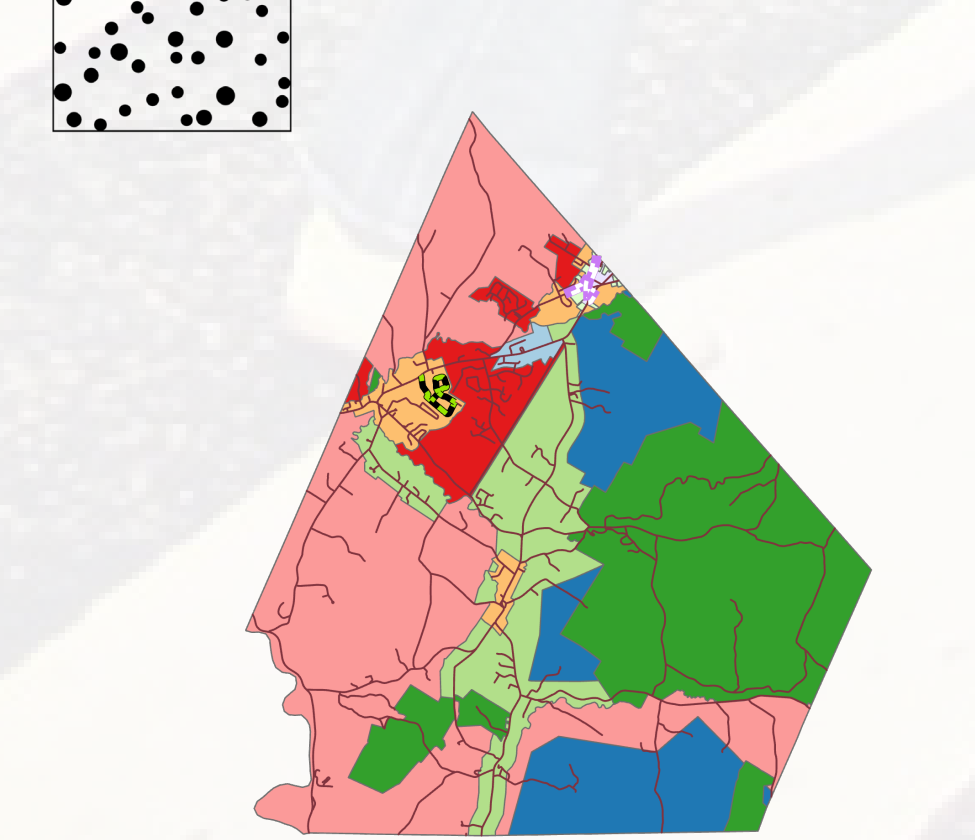
Bluffton, South Carolina (2012) 94 people/km<sup>2</sup>



Topsham, Maine (2012) 89 people/km<sup>2</sup>



Jericho, Vermont (2014) 55 people/km<sup>2</sup>



# UTILITARIAN WALKABILITY :

## Differences between Neighbourhoods in Small U.S. Towns with and without Form-Based Codes

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### RESEARCH QUESTIONS

- I. DOES WALKABILITY DIFFER BETWEEN FBC VS. NON-FBC NEIGHBOURHOODS?
- II. WHAT LESSONS CAN FORM-BASED CODES OFFER FOR IMPROVING UTILITARIAN WALKABILITY?

### KEY TERMS

#### FORM-BASED CODES (FBCs)

They are often integrated into zoning by-laws, and may be optional or mandatory. They may also apply only to specific areas or districts.

#### UTILITARIAN

Identified as having an essential purpose.

#### URBAN DESIGN QUALITY (UDQs)

In this capstone refers to *Pedestrian Infrastructure* (see *Research Methods*) within the urban fabric influencing how well-trafficked areas are based on the attributes of imageability, enclosure, human scale, transparency, and complexity.

#### WALKABILITY

The study of how walkable an environment is, based on pedestrian-friendliness and accessibility to destinations.

### RESEARCH METHODS

Four case studies of small towns with less than 15,000 people adopting transect-based form-based codes (FBCs) were selected based on similarities to the criteria below:

Town, State	Code Adoption Year	Town Area Size	Town Population
Hammonton, NJ	2011	107 km <sup>2</sup>	14,706
Bluffton, SC	2012	140.4 km <sup>2</sup>	12,530
Topsham, ME	2012	92.18 km <sup>2</sup>	8,717
Jericho, VT	2014	92.2 km <sup>2</sup>	5,072

Legend: FBC Neighbourhood (pink dashed line), non-FBC Neighbourhood (green dashed line)

#### SPATIAL ANALYSIS *utilizing road GIS data*

##### I. DESTINATION INTENSITY

This calculated how many and what service types are within each interval of the walking maps, including the "destinations": banks, community centre, convenience centre, grocery store, library, medical, open space, restaurant, retail, school.

##### II. INTERSECTION DENSITY

This investigated the density and distribution of street crossings around town, which supports the walking maps and pedestrian environment analyses.

##### III. WALKING DISTANCE MAPS WITH DESTINATION INTENSITY

This studied how many and what type of destinations were within reach of 100m, 300m, 600m, 800m and 1km from specified points in each neighbourhood.

##### IV. WALKING TIME MAPS WITH DESTINATION INTENSITY

This studied how many and what type of destinations at a 5km/hour walking rate were accessible within intervals of 5mins, 10mins, 15mins, 20mins, and 25mins from the same points in each neighbourhood.

#### SPATIAL ANALYSIS & DOCUMENT REVIEW

Visual review with the *use of Google Views: Aerial Maps and Street View* while the plan review relied on *planning and design documents* related to the towns' zoning regulations including FBCs.

#### V. PEDESTRIAN ENVIRONMENT – URBAN DESIGN QUALITIES AND HUMAN-SCALE PROPORTIONS

Specific elements can influence the physical and perceived atmosphere of spaces, including pedestrian infrastructures and human-scale proportions. Pedestrian infrastructure (UDQs) were counted including benches, crosswalks/crossings, signalized or stop sign controlled intersections, sidewalk, streetlamp or lighting, vegetated buffers. Human-scale proportions measured include streets, sidewalks, buildings and building setbacks.

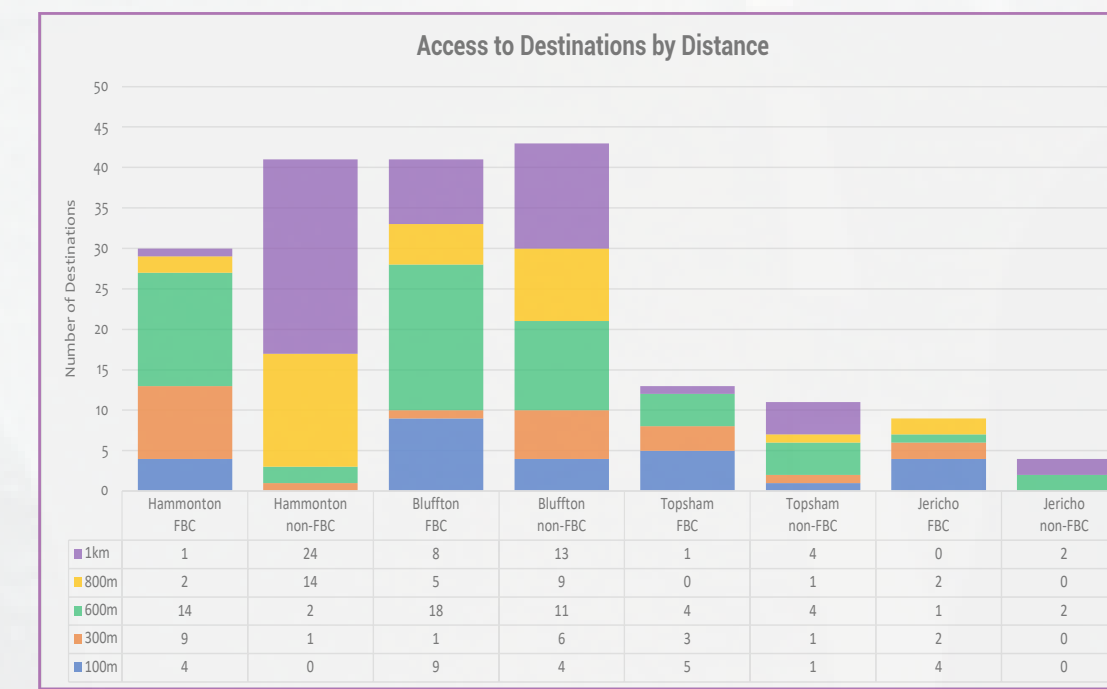
### INTRODUCTION

Walking is one of the most natural ways to move around and reach destinations (Wunderlich, 2008). It was the primary mode of transportation until motorized modes of transport took priority over the streets. As streets began to focus less on foot traffic, the distribution of services slowly got relatively farther away from desirable walking distances of 800m or 10-minute walks to residential homes (Southworth, 1997). Conventional zoning has contributed to this inaccessibility as it tends to homogenize neighbourhoods by segregating homes from other land uses (Talen, 2013). The importance of walkable environments following past urban design exhibiting human-scale environments are increasing in contemporary developments (Baran et al., 2008). As most focus on recreational walking, utilitarian or purposive walking is disregarded. This capstone studies how (FBCs) can influence utilitarian walkability in small U.S. town neighbourhoods. FBCs are an alternative to conventional zoning, which aims to regulate form over use that may allow more flexibility in land use distribution. Utilitarian trips are purposeful with the aim to reach desired destinations. The focus on utilitarian walkability accentuates the importance of accessible foot traffic in residential areas.

### FINDINGS & ANALYSIS

#### WALKABILITY BETWEEN FBC AND NON-FBC NEIGHBOURHOODS THROUGH THE WALKING MAPS

In most cases, the FBC neighbourhoods had a lot of the destinations at reach within the 300m and 600m intervals; unlike the non-FBC neighbourhood mostly at 800m and 1km. The correlation between the time and distance studies yielded that 1km took 15minutes at a 5km/hr walking rate; this was consistent in all neighbourhoods.

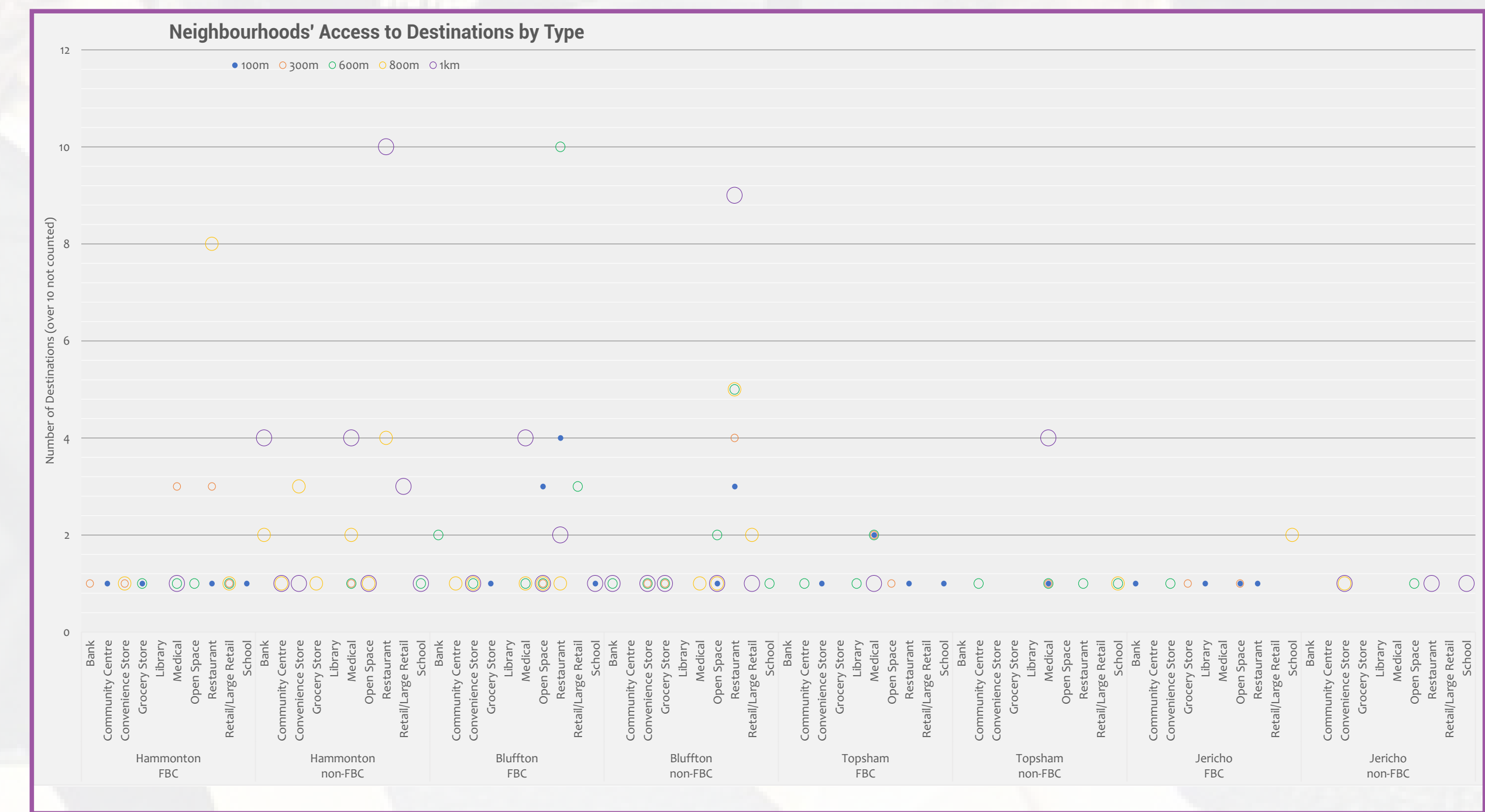
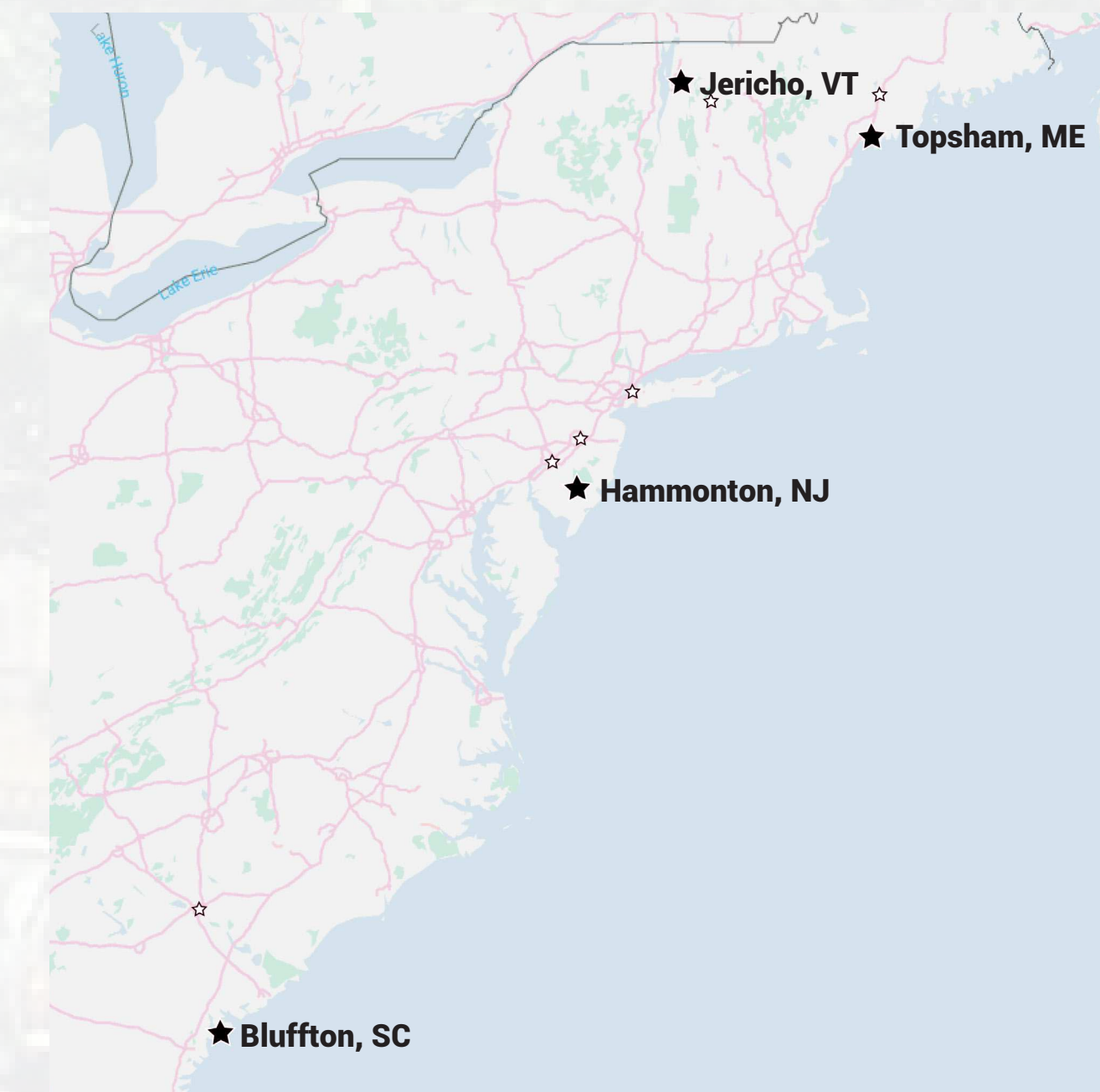


Both neighbourhoods were near the town centre, where destinations clustered and more intersections were found, but even with similar street patterns having smaller block sizes the findings still had varying results. This speaks to how street pattern may have minimal to no influence in walkability.

#### WALKABILITY IN THE PEDESTRIAN ENVIRONMENTS OF THE FBC AND NON-FBC NEIGHBOURHOODS IN PLAN & VISUAL REVIEW

Most of the pedestrian infrastructures were present in the study areas except for benches, which was a missed opportunity in providing parking for pedestrians. All other five UDQs were observed, except crosswalks were not in Jericho's study neighbourhoods. Meanwhile, most intersections considered pedestrians as having the right-of-way in the plans, but the street lighting were often taller than human-scale in spatial analysis.

The proportions of streets-to-sidewalks-to-buildings were often regulated wider in the plan than was measured from the visual review, especially for street widths. The building setbacks and heights in the FBC neighbourhood had a minimum average being 0.5 storeys taller than the non-FBC neighbourhood, where the setbacks varied more depending on the established street character.



#### THE DISTRIBUTION OF DESTINATION TYPES ASSOCIATED WITH ZONING

A lot of the destinations were located in the town centre or the alternative commercial corridor, along highways. Most towns had all ten of the identified service types with only some out of the 25km study range away from the town centre. The FBC neighbourhoods were often in better proximity to the town centre, while the non-FBC neighbourhoods were nearer the other commercial centre.

The FBC neighbourhoods had quicker access to more types of destinations, whereas the non-FBC neighbourhoods had more options for the same type of destinations, but were often at the farther distances of 800m and 1km. Therefore, quicker or closer access to destinations was not relative to accessing all service types within certain proximity intervals.

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