Networks of Opportunity: A Citywide Vision for Pedestrian and Bicycle Pathways in Chicopee, Massachusetts

Stephanie Carlisle
Ambica Chadha
Daniel Fontaine
Sammi Gay
Justin Gilmore

See next page for additional authors

Follow this and additional works at: https://scholarworks.umass.edu/larp_grad_research

Part of the Environmental Design Commons, Landscape Architecture Commons, and the Urban, Community and Regional Planning Commons

Carlisle, Stephanie; Chadha, Ambica; Fontaine, Daniel; Gay, Sammi; Gilmore, Justin; Hulten, GianPaula; Krevat, Derek; Li, Shuo; Smialek, Alexandra 'Ola'; and Tapia, Melody, "Networks of Opportunity: A Citywide Vision for Pedestrian and Bicycle Pathways in Chicopee, Massachusetts" (2016). Landscape Architecture & Regional Planning Studio and Student Research and Creative Activity. 51. Retrieved from https://scholarworks.umass.edu/larp_grad_research/51

This Article is brought to you for free and open access by the Landscape Architecture & Regional Planning at ScholarWorks@UMass Amherst. It has been accepted for inclusion in Landscape Architecture & Regional Planning Studio and Student Research and Creative Activity by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.
Networks of Opportunity
A Citywide Vision for Pedestrian and Bicycle Pathways in Chicopee, Massachusetts

Stephanie Carlisle | Ambica Chadha | Daniel Fontaine | Sammi Gay
Justin Gilmore | GianPaula Hulten | Derek Krevat | Shuo Li
Alexandra ‘Ola’ Smialek | Melody Tapia
ACKNOWLEDGEMENTS

Pacer Planning would like to thank everyone who assisted us with this project. First and foremost, we wish to express our grateful appreciation to Lee Poulion, Director of Planning for the City of Chicopee, and Jack Benjamin, Assistant Planner for the City of Chicopee. Your vision, support, and guidance made this project possible. Thank you to the Chicopee Police Department for helping us distribute our community survey, and to the Chicopee School Department for helping to develop this project’s goals and for working with us to achieve them. We also wish to thank the Chicopee school principals, PTO members, and government employees who participated in interviews for our project. Thank you to Michelle Santerre, Director of GIS for the City of Chicopee, for providing data that was instrumental in the completion of our project.

We wish to give special thanks to Richard Fries, Executive Director of MassBike, for your incredible insight and creativity. We would like to thank Jana Linhart from the Massachusetts Department of Transportation’s Safe Routes to School Program for working with us. We also wish to thank Michelle Chase, Town Engineer of Agawam, for meeting with us and sharing your experiences. Thank you to the Pioneer Valley Planning Commission (PVPC) for providing insightful feedback on our work. Thank you to Steve McGinty, UMass Amherst Social Sciences Research Services Librarian and to Teaching Assistant, Alicia Coleman. We would also like to thank Jen Stromsten, of Jen Stromsten Consulting, for all of your guidance and advice.

We would also like to thank all the staff and faculty from the Landscape Architecture & Regional Planning Department, for their valuable expertise and assistance. Specifically, thank you to all of those who shared prior work with us or met with us about this project:

- Michael DiPasquale, Extension Assistant Professor of Regional Planning
- Frank Sleegers, Associate Professor of Landscape Architecture
- Dr. Mark Hamin, Senior Lecturer of Regional Planning & Graduate Program Director
- Dr. John Mullin, Emeritus Professor of Regional Planning
- Dr. Flavia Montenegro-Menezes, Assistant Professor of Regional Planning

Thank you to Dr. Robert Ryan, who worked with us extensively, and last but not least, we would like to thank our professor, Dr. Darrel Ramsey-Musolf, for guiding us through this challenging, but rewarding process.
# TABLE OF CONTENTS

Acknowledgements ......................................................................................... ii
List of Figures ........................................................................................................ x
List of Tables .......................................................................................................... xi
List of Maps ........................................................................................................... xii
List of Images ......................................................................................................... xiii
Table of Acronyms .................................................................................................. xv
Table of Locations ................................................................................................ xvii

**Executive Summary** ....................................................................................... xviii
Purpose ................................................................................................................... xviii
Overview ................................................................................................................. xix
Findings .................................................................................................................... xx
Recommendations ................................................................................................... xxi
  Proposed Citywide Pedestrian and Bicycle Path Network ...................... xxi
  Recommendations for the Northeast Sector of Chicopee ......................... xxii
  Recommendations for the Northwest Sector of Chicopee ......................... xxiii
  Recommendations for the South Sector of Chicopee ................................. xxiii
  Programming Recommendations ................................................................. xxiv
Policy Recommendations ..................................................................................... xxiv
Infrastructural Design Recommendations ...................................................... xxiv
About Pacer Planning ............................................................................................ xxvi
Format of This Report .......................................................................................... xxvii

**Chapter 1: Introduction** ............................................................................... 1
Client ....................................................................................................................... 1
Problem ................................................................................................................... 3
History & Notable Persons ................................................................................... 5
Demographics ......................................................................................................... 9
  Age & Population Trends ................................................................................... 10
  Race and Ethnicity .............................................................................................. 13
  Median Household Income ............................................................................... 16
  Housing Density ................................................................................................ 19
  Median Home Value .......................................................................................... 22
Educational Attainment ........................................................................................................ 24

Chapter 2: Existing Conditions in Chicopee ....................................................................... 26
  Land-use ........................................................................................................................... 26
  Zoning .............................................................................................................................. 27
  Natural Resources in Chicopee ......................................................................................... 30
  Parks in Chicopee ............................................................................................................ 30
  Transportation .................................................................................................................. 32
  Highways .......................................................................................................................... 33
  Transit ................................................................................................................................. 35
  Pedestrian and Bicycle Paths ......................................................................................... 37
  Prior Planning Projects .................................................................................................... 40
    Chicopee’s Open Space and Recreation Plan ............................................................... 40
    Open Space & Food Access in the City of Chicopee ..................................................... 40
    Chicopee’s Memorial Drive Revitalization Plan .......................................................... 40

Chapter 3: Literature Review on Walkability, Bicycle Networks, and Student Walker Safety... 41
  Walkability ....................................................................................................................... 42
    Elements of Walkability ............................................................................................... 42
    Strategies to Enhance Walkability .............................................................................. 44
  Bicycle Networks .......................................................................................................... 47
    Factors that Influence Successful Bicycle Networks ................................................. 47
  Student Walker Safety .................................................................................................... 53
    Strategies to Increase Student Walker Safety ............................................................ 56
  Summary .......................................................................................................................... 58

Chapter 4: Client Directive ................................................................................................ 60
  Sectors .............................................................................................................................. 60
  Destinations ..................................................................................................................... 61
  Paths ................................................................................................................................ 64
  Project Lens ..................................................................................................................... 65
  Linkages to Schools ......................................................................................................... 65
  MassBike and Safe Routes to School ............................................................................ 65

Chapter 5: Public Engagement ........................................................................................... 66
  Methodology ..................................................................................................................... 66
Chapter 8: Northwest Sector of Chicopee ...................................................... 100

Introduction ........................................................................................................ 100
Description of Sector .......................................................................................... 101
Lynch Analysis ..................................................................................................... 102
Destinations ......................................................................................................... 103
  Bellamy Middle School ...................................................................................... 103
Paths .................................................................................................................... 104
Public Engagement ............................................................................................... 105
Identification of Priority Paths in Northwest Sector of Chicopee .................... 107
Precedent Study .................................................................................................. 108
  Utility Path Corridor – San Jose, California ..................................................... 108
Recommendations for the Northwest Sector of Chicopee ............................... 109
Implementation .................................................................................................... 115
  6 Months .......................................................................................................... 115
  1 – 2 Years ....................................................................................................... 115
  3 – 5 Years ....................................................................................................... 116
Summary .............................................................................................................. 116

Chapter 9: South Sector of Chicopee ................................................................. 118

Introduction ........................................................................................................ 118
Description of Sector .......................................................................................... 119
Lynch Analysis ..................................................................................................... 121
Destinations ......................................................................................................... 123
  Front Street Corridor ......................................................................................... 123
Paths .................................................................................................................... 124
Public Engagement ............................................................................................... 125
Identification of Priority Paths in the South Sector of Chicopee .................... 127
Precedent Study .................................................................................................. 129
  Lewiston Levee Parkway, Lewiston, Idaho ....................................................... 129
Recommendations for South Sector of Chicopee ............................................. 129
Implementation Schedule ................................................................................... 138
Chapter 12: Citywide Infrastructural and Regional Bike Share

Glow

Additional Planning tools: Master Sidewalk and Pavement Management plans

Precedent Studies

Arlington, Massachusetts

Waltham, Massachusetts

Safe Routes to School Implementation Strategies

6 Months

1 – 2 Years

3 – 5 Years

Pavement Management Implementation Strategies

6 Months

1 – 2 Years

3 – 5 Years

Chapter 12: Citywide Infrastructural and Design Recommendations

Glow-In-The-Dark Bike Paths

Precedent Study

Lidzbark Warmiński, Poland

Glow-in-the-Dark Bike Path Implementation Strategies

6 Months

1 – 2 Years

3 – 5 Years

Regional Bike Share

Precedent Studies

Greater Boston, Massachusetts

Pioneer Valley, Massachusetts

Regional Bike Share Implementation Strategies

6 Months

1 – 2 Years
LIST OF FIGURES

Figure 1. Age Distribution in Chicopee, Hampden County, and Massachusetts (1980 - 2030) ........................................... 11

Figure 2. Age Distribution in Chicopee ......................................................................................................................... 12

Figure 3. Race Distribution of Chicopee (1980 - 2010) .............................................................................................. 14

Figure 4. Percentage of Specified Language Speakers in Chicopee (2010) ................................................................. 16

Figure 5. Median Household Income (Constant Dollars) in Chicopee and Surrounding Communities (1980 - 2010) ......................................................................................................................................................... 17

Figure 6. Percent Change: Median Household Income (Constant Dollars) in Chicopee and Surrounding Communities (1980 - 2010) ......................................................................................................................................................... 18

Figure 7. Housing Density in Chicopee and Surrounding Communities (1980 - 2010) .............................................. 21

Figure 8. Median Home Value (Constant Dollars) in Chicopee and Surrounding Communities (1980 – 2010) ...... 23

Figure 9. Educational Attainment in Chicopee, Hampden County, and Massachusetts ................................................. 25

Figure 10. Land-use in Chicopee (In Acres) .................................................................................................................... 26

Figure 11. Public Engagement Survey Findings ............................................................................................................ 70

Figure 12. Northeast Sector of Public Engagement Survey Findings ............................................................................. 87

Figure 13. Northwest Sector of Chicopee Public Engagement Survey Findings ............................................................. 106

Figure 14. South Sector of Chicopee Public Engagement Survey Findings ........................................................................ 126
LIST OF TABLES
Table 1. Population of Chicopee, Hampden County, and Massachusetts (1980 - 2010) ............................................ 13
Table 2. Housing Density in Chicopee by Census Tract (2014) ................................................................................. 21
Table 3. District Regulations in the City of Chicopee ................................................................................................. 28
Table 4. Top High-Crash Intersections in Chicopee (2011 – 2013) .......................................................................... 178
Table 5. Age Distribution in Chicopee, Hampden County, and Massachusetts (1980 - 2010) .............................. 179
Table 6. Race and Ethnicities in Chicopee .................................................................................................................. 180
Table 7. Median Household Income in Chicopee and Surrounding Communities .................................................... 181
Table 8. Housing Density in Chicopee and Surrounding Communities (In Housing Units Per Square Mile) ...... 182
Table 9. Land Use in Chicopee ................................................................................................................................. 182
Table 10. Median Home Value in Chicopee and Surrounding Communities ......................................................... 183
Table 11. Educational Attainment in Chicopee and Surrounding Communities .................................................... 184
<table>
<thead>
<tr>
<th>LIST OF MAPS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map 1. Proposed Citywide Pedestrian &amp; Bicycle Path Network</td>
<td>xxi</td>
</tr>
<tr>
<td>Map 2. Sectors in Chicopee</td>
<td>xxii</td>
</tr>
<tr>
<td>Map 3. Location of Chicopee in Massachusetts</td>
<td>1</td>
</tr>
<tr>
<td>Map 4. Chicopee Neighborhoods</td>
<td>2</td>
</tr>
<tr>
<td>Map 5. Top High Crash Sites in Chicopee (2011 – 2013)</td>
<td>4</td>
</tr>
<tr>
<td>Map 6. Zoning in Chicopee</td>
<td>27</td>
</tr>
<tr>
<td>Map 7. Parks in Chicopee</td>
<td>31</td>
</tr>
<tr>
<td>Map 8. Existing Conditions of Chicopee's Transportation Network</td>
<td>32</td>
</tr>
<tr>
<td>Map 9. PVTA Bus Routes</td>
<td>36</td>
</tr>
<tr>
<td>Map 10. Proposed Chicopee Canal and RiverWalk Phase II</td>
<td>38</td>
</tr>
<tr>
<td>Map 11. Connecticut River Walk and Bikeway</td>
<td>39</td>
</tr>
<tr>
<td>Map 12. Sectors of Chicopee</td>
<td>61</td>
</tr>
<tr>
<td>Map 13. Public School Walking Zones in Chicopee</td>
<td>67</td>
</tr>
<tr>
<td>Map 14. Citywide Bicycle and Pedestrian Network</td>
<td>73</td>
</tr>
<tr>
<td>Map 15. Northeast Sector of Chicopee</td>
<td>78</td>
</tr>
<tr>
<td>Map 16. Lynch Analysis of the Northeast Sector of Chicopee</td>
<td>80</td>
</tr>
<tr>
<td>Map 17. Proposed Bicycle and Pedestrian Path Network for the Northeast Sector of Chicopee</td>
<td>88</td>
</tr>
<tr>
<td>Map 18. Proposed Additional Entrances and Paths to Chicopee Memorial State Park</td>
<td>94</td>
</tr>
<tr>
<td>Map 19. Northwest Sector of Chicopee</td>
<td>100</td>
</tr>
<tr>
<td>Map 20. Lynch Analysis of the Northwest Sector of Chicopee</td>
<td>102</td>
</tr>
<tr>
<td>Map 21. Proposed Bicycle and Pedestrian Path Network for the Northwest Sector of Chicopee</td>
<td>107</td>
</tr>
<tr>
<td>Map 22. South Sector of Chicopee</td>
<td>118</td>
</tr>
<tr>
<td>Map 23. Lynch Analysis of the South Sector of Chicopee</td>
<td>121</td>
</tr>
<tr>
<td>Map 24. Proposed Bicycle and Pedestrian Path Network for the South Sector of Chicopee</td>
<td>128</td>
</tr>
<tr>
<td>Map 25. Proposed Paths and Infrastructure along the Front Street Corridor</td>
<td>131</td>
</tr>
<tr>
<td>Map 26. Towns, Cities, and Sub-Regions within the Pioneer Valley</td>
<td>170</td>
</tr>
</tbody>
</table>
LIST OF IMAGES

Image 1: Chicopee High School Mascot: The Pacer ........................................xxvi
Image 2: Chicopee High School ........................................................................xxvi
Image 3: Bicyclist on Memorial Drive (Left); Bicyclist on Front Street (Right) ..................3
Image 4. Historical Photo of the Chicopee River .........................................................5
Image 5. RiverMills Senior Center ........................................................................7
Image 6: Edward Bellamy (left); Image 7: Joe Jackson (above) ..................................8
Image 8. RiverMills Senior Center ........................................................................10
Image 9. Pulaski Hall ..............................................................................................15
Image 10. Polish Center of Discovery and Learning .................................................15
Image 11. Single Family Housing in Chicopee, Massachusetts .................................19
Image 12. Multi-Family Housing in Chicopee, Massachusetts .................................19
Image 13. Chicopee Comprehensive High School .....................................................24
Image 14. Chicopee River .........................................................................................30
Image 15. Chicopee Memorial State Park .................................................................30
Image 16. Massachusetts Turnpike On Ramp ............................................................33
Image 17. Route 33 (Memorial Drive) .....................................................................34
Image 18. PVTA Bus Stop in Downtown Chicopee .....................................................35
Image 19. Chicopee River Canal Walk ......................................................................37
Image 20. Chicopee Memorial Elementary School .....................................................62
Image 21. Chicopee Memorial State Park .................................................................62
Image 22. Front Street Corridor ...............................................................................63
Image 23. Bellamy Middle School ............................................................................63
Image 24. Pendleton Avenue ...................................................................................64
Image 25. Westover Air Force Base Entrance ...........................................................79
Image 26. Chicopee Memorial State Park .................................................................82
Image 27. Bowie Memorial Elementary School .......................................................83
Image 28. Westover Road .........................................................................................84
Image 29. Rendering of Burnett Road Traffic Calming ............................................90
Image 30. Rendering of Entrance to Chicopee Memorial State Park ..........................92
Image 31. Rendering of Proposed Second Entrance to Chicopee Memorial State Park ....95
Image 32. Rendering for Improved Safety of James Street and Memorial Drive Intersection ....97
Image 33. Proposed Path Networks Surrounding Bellamy Middle School ...............111
Image 34. Rendering of Improved Pedestrian and Bicyclist Accessibility on Pendleton Avenue ......112
Image 35. Rendering of Improved Bicycle Accessibility on the Willimansett Bridge ........114
Image 36. Front Street Corridor ........................................................................................................123
Image 37. Rendering of Proposed Pedestrian and Bicycle Infrastructure on Front Street ...............133
Image 38. Plan View of Proposed Street Design Improvements for Front Street..........................134
Image 39. Rendering of Riverfront Levee Pathway behind the RiverMill Senior Center ....................137
Image 40. Walk [Your City] in Mount Hope, West Virginia ................................................................142
Image 41. Proposed Crosswalk Signal in Amherst, Massachusetts ..................................................148
Image 42. Better Block event in Norfolk, Virginia ............................................................................150
Image 43. Design for Bike Lanes on Massachusetts Avenue in Arlington, Massachusetts ...............153
Image 44. Safe Routes to School Program in California ..................................................................157
Image 45. Image of Glow-In-The-Dark Bike Path in Lidzbark Warmiński, Poland .........................166
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
</tr>
<tr>
<td>CED</td>
<td>Center for Economic Development (at UMass Amherst)</td>
</tr>
<tr>
<td>CMS Park</td>
<td>Chicopee Memorial State Park</td>
</tr>
<tr>
<td>DCR</td>
<td>Department of Conservation &amp; Recreation</td>
</tr>
<tr>
<td>LARP</td>
<td>Landscape Architecture &amp; Regional Planning</td>
</tr>
<tr>
<td>LAND</td>
<td>Massachusetts Local Acquisitions for Natural Diversity Program Grant</td>
</tr>
<tr>
<td>MADAR</td>
<td>Massachusetts Department of Agricultural Resources</td>
</tr>
<tr>
<td>MAPC</td>
<td>Metropolitan Area Planning Commission</td>
</tr>
<tr>
<td>MassDOT</td>
<td>Massachusetts Department of Transportation</td>
</tr>
<tr>
<td>PARC</td>
<td>Massachusetts Parkland Acquisitions and Renovations for Communities Program</td>
</tr>
<tr>
<td>OSRP</td>
<td>City of Chicopee Open Space &amp; Recreation Plan</td>
</tr>
<tr>
<td>PCI</td>
<td>Pavement Condition Index</td>
</tr>
<tr>
<td>PMP</td>
<td>Pedestrian Master Plan</td>
</tr>
<tr>
<td>PTO</td>
<td>Parent Teacher Organization</td>
</tr>
<tr>
<td>PVTA</td>
<td>Pioneer Valley Transit Authority</td>
</tr>
<tr>
<td>SRF</td>
<td>State Revolving Fund</td>
</tr>
<tr>
<td>SRTS</td>
<td>Safe Routes to School</td>
</tr>
</tbody>
</table>
## TABLE OF LOCATIONS

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anna E. Barry Elementary School</td>
<td>44 Connell St., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Belcher Elementary School</td>
<td>125 Montgomery St., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Bellamy Middle School</td>
<td>314 Pendleton Ave., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Bowie Memorial Elementary School</td>
<td>80 Dare Way, Chicopee, MA 01022</td>
</tr>
<tr>
<td>Chicopee Academy at Selser</td>
<td>12 Dare Way, Chicopee, MA 01022</td>
</tr>
<tr>
<td>Chicopee Memorial State Park</td>
<td>570 Burnett Rd., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Chicopee Comprehensive High School</td>
<td>617 Montgomery St., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Chicopee High School</td>
<td>820 Front St, Chicopee, MA 01020</td>
</tr>
<tr>
<td>Chicopee Public Library</td>
<td>449 Front St., Chicopee, MA 01013</td>
</tr>
<tr>
<td>Chicopee Canal RiverWalk</td>
<td>Front &amp; Grape St. to Main &amp; Broadway St.,</td>
</tr>
<tr>
<td></td>
<td>Chicopee, MA 01013</td>
</tr>
<tr>
<td>Dupont Middle School</td>
<td>650 Front St, Chicopee, MA 01013</td>
</tr>
<tr>
<td>Fairview Elementary School</td>
<td>26 Memorial Ave., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Hampden Charter School of Science</td>
<td>20 Johnson Rd., Chicopee, MA 01022</td>
</tr>
<tr>
<td>Helen A. O’Connell School Administration Building</td>
<td>180 Broadway St., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Lambert-Lavoie Memorial Elementary School</td>
<td>99 Kendall St., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Patrick E. Bowe Elementary School</td>
<td>115 Hampden St., Chicopee, MA 01013</td>
</tr>
<tr>
<td>Robert Litwin Elementary School</td>
<td>135 Litwin Lane, Chicopee, MA 01020</td>
</tr>
<tr>
<td>St. Stanislaus School</td>
<td>534 Front St., Chicopee, MA 01013</td>
</tr>
<tr>
<td>Stefanik Memorial Elementary School</td>
<td>720 Meadow St., Chicopee, MA 01013</td>
</tr>
<tr>
<td>Streiber Memorial Elementary School</td>
<td>40 Streiber Dr., Chicopee, MA 01020</td>
</tr>
<tr>
<td>Szetela Early Childhood School</td>
<td>66 Macek Dr., Chicopee, MA 01013</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

Purpose

This report provides a vision plan for the City of Chicopee, Massachusetts that aims to increase local and regional connections between the City’s assets for pedestrians and bicyclists. This goal stems from the Chicopee Planning Department’s observation that data on pedestrian access in the City portrays a highly inconsistent and incomplete sidewalk network. Such conditions have resulted in pedestrian access challenges to major local destinations including schools, recreational facilities, commercial areas, services, and surrounding communities. Against this backdrop, the City of Chicopee’s Planning Director, Lee Pouliot, has tasked Pacer Planning with preparing a vision plan that focuses on improving Chicopee’s pedestrian and bicycle networks.

Additional goals of this project include increasing the number of users of pedestrian and bicycle paths within the City, proposing feasible options that will lead to safer walking paths to school for school-age children living within non-bus service areas, and connecting these paths to existing and proposed green spaces throughout the community. To achieve these goals, after describing the demographics and existing conditions in Chicopee, we will provide the following deliverables as stated in our client directive:

1. A delineation of sectors, or cohesive spatial sub-units, that will divide the City and serve as the backbone of a vision for pedestrian and bicycle networks.
2. The definition of key destinations within each of these sectors, which will serve as nodes to connect the districts.
3. The creation of proposed paths, which will function as connections between destination points.
4. Public engagement centered on soliciting input from community members and stakeholder groups impacted by safe walking and bicycling routes to school.

Specifically, with regard to public engagement, Pacer Planning has decided to focus on school administration officials, public safety officials, and other groups that have a stake in maintaining safety for student walkers and bicyclists. During our study period, Pacer Planning distributed an electronic survey called the Chicopee Student Walker Safety Survey to parents of K-12 students in Chicopee, which received 106 responses, and held 7 in-person and phone interviews with school administration officials and city employees.
Overview

The City of Chicopee is located in the western region of Massachusetts, directly north of Springfield, in Hampden County. Trailing only Springfield, the City has the second highest population in Massachusetts, west of Worcester. Chicopee considers itself “the Crossroads of New England” because four major interstate highways, Interstates 90, 391, 291 and 91, run through the City. Chicopee is also located at the confluence of the Chicopee and Connecticut Rivers.

Chicopee gained prominence in the early twentieth century when multiple large-scale factories and mills located there, including the Facemate Corporation, Uniroyal, Ames Manufacturing Company, and the Dwight Manufacturing Company, among others. Although most of these factories have since closed, Chicopee is currently home to the Westover Air Reserve Base, the nation’s largest Air Force Reserve base, which employs more than 5,500 military and civilian workers (Westover Air Reserve Base, 2016).

Historically, rather than forming as a central core, the City formed as separate villages with distinct cultural and industrial identities (Plourde-Barker, 1998, p. 7). Due largely to this lack of a central core and the major roads that divided Chicopee, residents have become highly reliant on the automobile as the primary mode of transportation. As such, the City does not possess a great deal of walkability or bikeability. Thus, Chicopee is now attempting to make the City more pedestrian and bicyclist friendly with a special focus on safer paths to school for the City’s school-aged children.
Findings

Throughout the course of our 16-week project, Pacer Planning has observed several general findings related to Chicopee’s walkability and bikeability. Through numerous site visits, Pacer Planning observed that Chicopee’s long, auto-centric streets (where cars often speed) inhibit pedestrian and bicyclist safety and limit the connectivity between destinations.

Additionally, Pacer Planning has found that Chicopee is home to a variety of naturally beautiful places that we believe should be made more accessible for pedestrians and bicyclists, namely the Connecticut and Chicopee Rivers and the Chicopee Memorial State Park. Although many built environment features such as the Westover Air Force Base and the three interstates divide the City, Pacer Planning believes that the City of Chicopee would benefit immensely through enhancing accessibility to its recreational, educational, and cultural resources.

Through our public engagement survey and interview responses, Pacer Planning gained a wealth of information related to parents’ and school administration officials’ perceptions on student walker safety in Chicopee. Specifically, 80% of parent respondents of the Chicopee Student Walker Safety Survey noted that the speed of traffic along walking routes influenced their decision to allow or not allow their child to walk to school. This figure was higher in some areas than others, particularly in the Burnett Road neighborhood, where 95% of respondents indicated that the speed of traffic was a concern.

Given these findings, we believe that if the City of Chicopee were to make infrastructural and/or design changes to calm traffic and improve pedestrian and bicyclist safety, then parents may be more likely to allow their child to walk or ride their bicycle to school. In turn, through making roads safer for the City’s K-12 students, the City of Chicopee would make roads safer for all users, including community residents seeking better access to recreational and cultural opportunities. Pacer Planning hopes that the recommendations below will support the City’s efforts to make Chicopee more pedestrian and bicyclist safety.
Recommendations

Based on our analysis using Geographic Information Systems (GIS), site visits, and public engagement responses, Pacer Planning makes a variety of recommendations for the City of Chicopee to consider in order to enhance connections between key destinations and pathways in the City.

Proposed Citywide Pedestrian and Bicycle Path Network

The recommendation most pertinent to our client directive is a proposed citywide pedestrian and bicycle path network, displayed in Map 1 below. Using existing sidewalks and topography as guides, Pacer Planning created paths using GIS to identify where the City of Chicopee could create better connections between key destinations. As Map 1 also shows, the four locations that Pacer Planning is using as key destinations are the Bowie Memorial Elementary School, Chicopee Memorial State Park, the Bellamy Middle School, and the Front Street Corridor.
Since our client directive required Pacer Planning to divide Chicopee into sectors, we have made recommendations by sector. As Map 2 shows, the three sectors that Pacer Planning has identified are the Northeast Sector, the Northwest Sector, and the South Sector. In addition to zooming in on the proposed pedestrian and bicycle path network displayed in Map 1, Pacer Planning makes a series of recommendations within each sector.

**Map 2.** Sectors in Chicopee

---

**Recommendations for the Northeast Sector of Chicopee**

For the Northeast Sector of Chicopee, Pacer Planning recommends that the City of Chicopee take the following actions:

1.) Undertake traffic calming measures on Burnett Road with a focus on the safety of student walkers.
2.) Improve pedestrian access to Chicopee Memorial State Park at the Burnett Road entrance.

3.) Create more points of entry for the Chicopee Memorial State Park and incorporate the Chicopee Memorial State Park’s trail system into the existing path network.

4.) Investigate improvements for the intersection of Memorial Drive (Route 33) and James Street.

**Recommendations for the Northwest Sector of Chicopee**

For the Northwest Sector of Chicopee, Pacer Planning recommends that the City of Chicopee take the following actions:

1.) Work with the owner of the utility corridor that runs adjacent to the Bellamy Middle School and across Pendleton Avenue to create a path for the City’s residents and visitors.

2.) Construct a raised crosswalk, bike lanes, and sidewalks along Pendleton Avenue to connect nearby neighborhoods to the Bellamy Middle School.

3.) Improve bicycle accessibility on the Willimansett Bridge by designating the shoulder of Route 116 as a bike lane and merging the lane onto a shared-use path on the bridge.

**Recommendations for the South Sector of Chicopee**

For the South Sector of Chicopee, Pacer Planning recommends that the City of Chicopee take the following actions:

1.) Improve Front Street’s pedestrian and bicycle connectivity to surrounding assets and residences.

2.) Add street trees, signage, and bike lanes along both sides of the Front Street Corridor to enhance pedestrian and bicyclist safety.

3.) Create more points of entry to the Chicopee River and incorporate these paths into the existing path network to enhance access to the river for recreational purposes.

4.) Develop a safe, accessible multi-use riverfront pathway behind the Chicopee Senior Center.
Programming Recommendations

In addition to the proposed pedestrian and bicycle path network and sector-specific recommendations, Pacer Planning recommends that the City of Chicopee consider three programming recommendations. The purpose of these programming recommendations is to establish community support and awareness for the enhanced walkability in Chicopee. We recommend that the City of Chicopee:

1.) Utilize the Walk [Your City] online toolkit and resources to install signage related to walking distances between Chicopee’s cultural and recreational assets.

2.) Consult with the Better Block Foundation to support temporary infrastructural changes using creative placemaking and tactical urbanism on priority paths.

3.) Consider holding a citywide Walk and Bike to School Day to spread awareness of student walker and bicyclist safety.

Policy Recommendations

Additionally, Pacer Planning recommends that the City of Chicopee consider three policy-related items. The purpose of these recommendations is to fund, build support for, and raise awareness of the proposed bicycle and pedestrian path network. We recommend that the City of Chicopee:

1.) Continue to work with MassDOT to implement a Complete Streets policy.

2.) Collaborate with each of the City’s schools to assess support for the Safe Routes to School program in order to receive funding for projects related to student walker safety.

3.) Update citywide planning documents to standardize pedestrian and bicyclist infrastructure implementation strategies.

Infrastructural Design Recommendations

Finally, Pacer Planning recommends that the City of Chicopee consider the following more specific infrastructural design changes:

1.) Consider the creation of a glow-in-the-dark bike path using either synthetic materials or glow-in-the-dark paint to build place attachment, attract tourism, and increase safety for bicyclists.
2.) Work with the Pioneer Valley Planning Commission to join discussions on the regional bike share program.
About Pacer Planning

Pacer Planning is comprised of 10 graduate students within the University of Massachusetts, Amherst’s Regional Planning and Landscape Architecture Department. This project is part of a Studio course co-taught by Dr. Darrel Ramsey-Musolf (Regional Planning) and Dr. Robert Ryan (Landscape Architecture). Pacer Planning’s name derives from Chicopee High School’s mascot. Since this project involves working with the school system, we had an interest in making our team name reflective of Chicopee’s school spirit.

Image 1: Chicopee High School Mascot: The Pacer

*Source: Chicopee High School webs*

Image 2: Chicopee High School
Format of This Report

Pacer Planning has structured this report in accordance with the client’s deliverables. First, we describe Chicopee’s demographics and historical roots. It is important to keep in mind that Chicopee developed as a collection of separate villages, which have been unified to form present-day Chicopee. Many of these villages, however, retain a strong neighborhood identity. Thus, we reference these neighborhoods frequently in this report.

After laying out the roots of this report and the City’s history, we describe key demographic information. Any planning effort must take into account features such as population trends, age distribution, race distribution, median household income, housing density, median home value, and educational attainment among residents. Therefore, using U.S. Census Bureau data, we describe these demographic variables since 1980 and compare them against Hampden County and Massachusetts.

In addition to demographics, it is important to account for existing conditions in the City of Chicopee as they relate to this project. Thus, we describe not only current land-use and zoning in the City of Chicopee, but also include descriptions of the City’s natural resources, parks, transportation patterns, and relevant prior planning projects. Since a large part of our goal is to propose future paths that connect the City’s physical assets, we must account for existing paths, assets, and transportation patterns.

After describing these existing conditions, we provide a literature review in Chapter 3. We have broken the literature relevant to our goals into three topics: walkability, bicycle networks, and student walker safety. We believe these themes are highly relevant to our overarching goal of improving bicycle and pedestrian networks in Chicopee with an emphasis on walking conditions for the City’s elementary and secondary school students.

Chapter 4 describes our client directive. In this chapter we describe Pacer Planning’s request from the City of Chicopee, including a description of sectors, key destinations, paths, and public engagement.

In Chapter 5, we discuss both methods and findings of our public engagement. Using an approach comprised of both in-person and electronic surveys, we sought public input specifically pertaining to the safety of student walkers and bicyclists in the City of Chicopee. Those who travel to the City’s schools on a regular basis are the persons who know from experience which areas are dangerous and why, where traffic moves too quickly, and which infrastructural changes
are most likely to improve walking conditions. Throughout our public engagement study period, Pacer Planning received 106 responses to our electronic survey, which was distributed mainly to parents of school-aged children, and held seven interviews with school administration officials. We find that overall, the speed of traffic and amount of traffic are the most highly cited factors in parents’ decision to allow their children to walk to school, particularly in the Burnett Road neighborhood.

Chapter 6 provides Pacer Planning’s proposed comprehensive citywide bicycle and pedestrian path network for the City of Chicopee to consider. Due to time and resource constraints, Pacer Planning was unable to assess each of the proposed paths. However, we provide recommendations for key short-term changes that the City of Chicopee can make in subsequent chapters. For the remaining paths, we recommend that the City assess each of the proposed paths based on their respective levels of connectivity, cost, whether the City has the right-of-way, as well as their impact on safety and vulnerability.

The next 3 chapters of the report (Chapters 7, 8, and 9) are organized by Chicopee’s geography. Using our client directive, we have organized the City into three sectors (Northeast Sector of Chicopee, Northwest Sector of Chicopee, and South Sector of Chicopee) in order to better analyze and present our findings. Each of these three chapters include the following:

1. **Descriptions**: We provide background on each of the sectors from a transportation perspective, including problems that are unique to each of them.

2. **Lynch Analysis**: We include a Lynch analysis for each sector, based on the work of Kevin Lynch. These analyses will be visual representations of each sectors’ edges, nodes, landmarks, paths, and districts.

3. **Destinations**: Per our client directive, we will describe the key destination points in each sector. These locations are the destinations that are most critical to provide access to in order to maximize connectivity within the City.

4. **Existing Paths**: We provide a description of the current major roads in each sector. Such descriptions will serve to paint a more complete picture of the sector.

5. **Identification of Proposed Bicycle and Pedestrian Paths**: Based on the overall proposed citywide bicycle and pedestrian paths, Pacer Planning will identify priority paths that the City of Chicopee should explore.
6. **Recommendations**: Based on this assessment, we will recommend sector-specific infrastructural changes to both on-road and off-road paths for the City of Chicopee to consider. We will also provide recommendations related to enhancing accessibility to the identified key destination points.

7. **Implementation Strategies**: We will propose strategies to implement these recommendations in three stages: short-term (6 months), mid-term (1 - 2 years), and long-term (3 - 5 years).

8. **Summary**: Finally, for each sector we will provide a summary of the sections described above.

Chapters 10, 11, and 12 provide programming, policy, and infrastructural design recommendations, respectively. Programming recommendations are related to wayfinding initiatives and special events for the City of Chicopee to hold that would increase social capital and knowledge surrounding alternative modes of transportation. Our policy recommendations are suggestions for the City of Chicopee to consider related to specific policy options, including Complete Streets, Safe Routes to School, and updating planning documents, among other related policies. Infrastructural design recommendations are related to design and/or infrastructure changes that would improve walkability and bikability. For programming, policy, and infrastructural design recommendations, Pacer Planning provides phased implementation strategies. These implementation strategies are changes the City of Chicopee can undertake within 6 months (short-term), 1 – 2 years (mid-term), and 3 – 5 years (long-term).
CHAPTER 1: INTRODUCTION

Client

The City of Chicopee is located in the western region of Massachusetts, directly north of Springfield, in Hampden County. Trailing only Springfield, the City has the second highest population in Massachusetts west of Worcester. Chicopee considers itself “the Crossroads of New England” because four major interstate highways (Interstates 90, 391, 291 and 91) divide the City. Chicopee is also located at the confluence of the Chicopee and Connecticut Rivers.

Map 3. Location of Chicopee in Massachusetts

Below is a map of the neighborhood delineations in Chicopee, Massachusetts. The image also depicts bodies of water in the City of Chicopee.
Map 4. Chicopee Neighborhoods
Problem

The highly concentrated industrial manufacturing facilities that acted as the economic backbone of the City have given way to segregated land-use designations and car-dependent lifestyles. Chicopee’s amalgamation from three independent villages coupled with its highly industrial past and its lack of any comprehensive plan has made for an inordinately fragmented city layout.

This fragmentation has wide-ranging implications. It affects the value of the City’s most unique assets, compromises the safety of commuting students and workers, and influences the City’s sustainability. Moreover, recent crash data from the Pioneer Valley Planning Commission (PVPC) show that the City of Chicopee has twelve high crash intersections, which can be seen on Map 5 (see Table 5 in appendices for additional details). This makes the City of Chicopee the third highest crash count in the region, trailing only Springfield and Holyoke. Such a high number of dangerous intersections has only exacerbated the City’s level of walkability.
Map 5. Top High Crash Sites in Chicopee (2011 – 2013)

Source: PVPC crash data
The PVPC data also indicates that Chicopee had the eighth highest number of total non-motorized crashes between 2010 and 2013, with 430 total crashes (including six that were fatal). Although Chicopee has the second highest population in the region, the data reveals that Chicopee is in the top five communities in the region with the highest number of crashes per 1,000 people, along with Holyoke, Northampton, Hadley, and Westfield (19 – 20).

Despite this high number of non-motorized crashes, during site visits Pacer Planning observed a high number of bicyclists actively using Chicopee’s roads to travel around the City. Data from the Strava Heat Map, an online resource that documents bicyclists using GPS systems, supports this observation. As Image 3 shows, bicyclists use roads in the City despite the lack of bicycle facilities.

Against this backdrop, the City of Chicopee has requested Pacer Planning to develop a vision plan focused on upgrading the City’s pedestrian and bicycle networks. This vision plan will identify current conditions, opportunities, and challenges, and will provide the foundation for developing citywide pedestrian and bicycle networks. Additionally, this vision plan will also involve improving accessibility to the Connecticut and Chicopee River waterfronts and encouraging greater connectivity to the City’s historic and cultural sites.

**History & Notable Persons**

![Image 4. Historical Photo of the Chicopee River](image)
Chicopee’s topography has largely shaped its history, attracting industries primarily related to farming and manufacturing. The City’s plains, steep hills, limited areas of fertile soil, and location between the Chicopee and Connecticut Rivers discouraged the city from growing out from a central core. Instead, the city formed as separate villages with distinct cultural and industrial identities (Plourde-Barker, 1998, p. 7). Chicopee was incorporated as a city in 1848, though it was settled approximately two hundred years prior in 1648. Nipmuck Indians occupied the area years before English settlement and both communities used the two rivers for travel, food, and industry (p. 8).
Throughout its history, Chicopee has possessed a strong industrial community. The City was home to multiple large-scale factories and mills which included: Facemate Corporation, Chicopee Manufacturing Company, Dwight Manufacturing Company, United States Rubber Company, Uniroyal Incorporated, Stevens-Duryea, Johnson and Johnson, Overman Wheel Company, Lamb Knitting Machine Company, Westinghouse, Ames Manufacturing Company, and J. Stevens Arms & Tools Company, now more commonly known as Savage Arms (Chicopee Department of Planning and Development, 2015). Though there are currently no working mills in the City. In April 2010, Chicopee successfully gained ownership of both the Uniroyal and Facemate properties. The sites were designated as part of the Brownfields Support Team Initiative, which offered aid in the demolition and cleanup of the area in 2010. The RiverMills site is now the RiverMills Senior Center, a state-of-the-art older community center, which has been well received in the City (Chicopee Department of Planning and Development, 2015).

Chicopee is also the location of the Westover Air Reserve Base, the nation’s largest Air Force Reserve base because of its employment of more than 5,500 military and civilian workers (Westover Air Reserve Base, 2016). The Westover Base is a critical military asset to the nation and has become a part of the City’s cultural and historic fabric. Through its unconventional

**Image 5. RiverMills Senior Center**
development, strong industrial heritage, and ongoing military importance, Chicopee has developed a unique identity.

The City is also home to many notable persons who are recognized and honored throughout Chicopee. Bowie Memorial Elementary School was named after Sergeant Herbert Bowie, who is an active community member. The Selser School was named for Major General James C. Selser, who was a Deputy Commander at Westover Air Base (Chicopee Department of Planning and Development, 2015). Additionally, the Bellamy School was named after Edward Bellamy, an author of the famous utopian novel *Looking Backwards* (“A Biography of Edward Bellamy,” 2012). Another notable person born in Chicopee, Joe Jackson, was a former linebacker for the Miami Dolphins in 1975 for the National Football League (National Football League, 2016). Together, many of the City’s notable citizens provide a glimpse into Chicopee’s past while also creating its story for the future.

Image 6: Edward Bellamy (left); Image 7: Joe Jackson (above)

*Source: (Image 6) The City of Chicopee by Collins G. Burnham (1898).  
Source: (Image 7) 99 Days of 99 Jersey Numbers: #88 (2014)*
Demographics

To fully understand the composition of Chicopee’s population, selected demographic variables are discussed. The information contained in these sections provides context for the City’s social composition and shows how Chicopee has changed over time and may change in the future. The documentation and analyses of Chicopee’s demographics are fundamental to this project and will be highly influential in the development of a sidewalk and bike path network vision. Identifying demographic changes will help to inform the types of amenities, access points, landscape features, signage, and other design elements that will be included in our recommendations. The following section presents information on racial and ethnic composition, median household income, housing density, and median home value. Information on the City’s educational attainment will conclude the discussion of Chicopee’s demographics.
Age & Population Trends

Image 8. RiverMills Senior Center

Age distribution and population change are the first two pieces of information presented in this section. Tracking population change and age distribution reveal which segments of the population appear to be growing or shrinking.
Figure 1. Age Distribution in Chicopee, Hampden County, and Massachusetts (1980 - 2030)
The age distribution in Chicopee is reflective of the trends seen throughout Hampden County and Massachusetts over the past forty years (Figure 1). According to the 1980 U.S. Census data, the 0-24 age group comprised the largest portion of the population; however, in 1990, the 25-54 age group surpassed that group and continues to be the largest age group in Chicopee. The 25-54 age group is of particular interest because these people are more likely to have families, and thus, continue to keep the population growth steady. Additionally, as Figure 2 shows more clearly, the amount of residents aged 65 years and older has increased slightly since the 1980s, indicating a relatively aging population in the City.

**Figure 2. Age Distribution in Chicopee**

Since the 1980s, the population of Chicopee has remained relatively constant. From 1980-2010, Chicopee’s population grew by less than 1% whereas Massachusetts population saw an increase of almost 15%. Although a 1% increase appears to be low, Hampden County (in which Chicopee resides) grew by under 5% over those decades. This suggests that Chicopee’s growth pattern is relatively consistent within the regional context. Table 1 further supports this assertion by displaying the percent change in Chicopee’s population growth from 1980 - 2010.
Table 1. Population of Chicopee, Hampden County, and Massachusetts (1980 - 2010)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicopee</td>
<td>55,112</td>
<td>56,632</td>
<td>54,653</td>
<td>55,165</td>
<td>0.096%</td>
</tr>
<tr>
<td>Hampden County</td>
<td>443,018</td>
<td>456,940</td>
<td>456,573</td>
<td>464,005</td>
<td>4.737%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>5,737,000</td>
<td>6,023,000</td>
<td>6,361,000</td>
<td>6,557,000</td>
<td>14.293%</td>
</tr>
</tbody>
</table>

The City of Chicopee is the twenty-second most populated municipality in Massachusetts and the second most populated city west of Worcester, trailing only Springfield. Throughout the past four decades, Chicopee’s population has remained stable. According to the 2010 U.S. Census Bureau data, Chicopee has 55,165 residents, which demonstrates a net increase of only 53 residents since 1980. Hampden County, which includes the City of Chicopee, has experienced mild growth throughout the past forty years. Indeed, as Table 1 shows, the county has grown by approximately 21,000 residents since 1980. Over the past forty years, Massachusetts’ population has increased by almost 1 million people, with most of the State’s population concentrated in the eastern part of the State.

The population growth in Chicopee indicates the current conditions are attracting very few new residents. Despite the stagnant population growth, Pacer Planning intends to develop an integrated and attractive pedestrian network that will serve current residents and also help to attract new residents. Attracting new residents, and particularly young residents, will likely stimulate the City’s local economy, bringing greater financial security to its residents.

**Race and Ethnicity**

Historically, Chicopee’s population has been primarily Caucasian, though the proportion of Caucasians to other racial groups has gradually decreased by about 4% each decade. Furthermore, despite the racial homogeneity, ethnic diversity does exist within the City. Many current residents have ancestral origins from Poland, Russia, and other parts of Eastern Europe. At present, just over 10% of the population speaks an ‘Indo-European’ language at home.
According to the U.S. Census Bureau, ‘Indo-European’ languages include most languages spoken in Europe as well as the Indic languages of India. These include, but are not limited to, German, Dutch, Swedish, Polish, Russian, French, Portuguese, Italian, Hindu, Greek, and other Baltic languages.

Figure 3. Race Distribution of Chicopee (1980 - 2010)

Many of Chicopee’s cultural institutions reflect the large Polish population residing in the City. Chicopee is home to a prominent Polish American Citizens Club. Additionally, the Polish Center for Discovery and Learning housed at Elms College is a museum and event center that focuses on the history and cultural traditions of the Polish people in Europe and the United States. Pulaski Hall was established in 1927 to house a Polish civic group. Pulaski Hall has since expanded to include two banquet halls, a restaurant, and a large bar.
**Image 9.** Pulaski Hall

**Image 10.** Polish Center of Discovery and Learning
As of 2010, about 87% of Chicopee’s population is white, followed by 3.7% black, 0.4% Native Indian or Alaskan, 0.1% Asian or Pacific Islander, and 5.5% as “Other.” Since 1990, racial and ethnic diversity in Chicopee has increased somewhat significantly while the overall population has decreased significantly. Despite the fact that the vast majority of Chicopee’s population is white, around 21% speaks a language other than English (U.S. Census Bureau, 2014), demonstrating much cultural diversity through its historical French-Canadian, Polish, and Irish immigrant populations.

**Figure 4.** Percentage of Specified Language Speakers in Chicopee (2010)

**Median Household Income**

In order to understand the rate of change over time with respect to household income, it is important to contextualize Chicopee within its surrounding cities, towns, and counties. In Figure 5, Chicopee’s median household income is represented by the first, dark blue bar within every decade bracket. Tracking the changes beyond Chicopee allows for a more complete understanding of the types of trends occurring in the region as a whole.
In 2010, the median household income in Chicopee was $47,276. This is considerably higher than the state poverty line for a family of four at $24,300 (MassHealth, 2016). Over the last few decades, the median household income in Chicopee has steadily risen. From 1980-2010, Chicopee’s median household income increased by about 16%. During the same period, Hampden County’s household income shrank by 45% and Massachusetts’ household income shrank by 26%.

However, Chicopee appears to be just average relative to its surrounding towns and cities. Indeed, as Figure 5 shows, Hampden County as a region saw a significant decline after the 1980’s. Being an aggregated statistic, median household income at the county level reacts to the ebbs and flows of city/town level economics. As key manufacturing industries began closing around the 1970’s, employment opportunities that had always provided livelihoods to those living in Chicopee, Springfield, and Holyoke were no longer available. As one of the primary sources of economic generation, once manufacturing went, median incomes declined. As
illustrated in Figure 6, economic recovery, which greatly influences median household income levels, have been slow to recover.

During the 1970s and 1980s, Chicopee and other surrounding cities and towns experienced a sharp decline in manufacturing industries resulting in an overall drop in the percent change in household income from 1980-2000. However, recent data suggests that Chicopee is currently at the front of the pack in relation to its neighbors in terms of percent change in median household income from 2000-2010. The key difference that distinguishes Chicopee from its neighbors, and may explain why the City has been able to rebound, relates to the location of the Westover Air Reserve Base. Officially established in 1940, the base is currently the largest Air Force Reserve Base in the nation, employing approximately 5,500 military and civilian workers (Westover Air Reserve Base, 2016).

**Figure 6.** Percent Change: Median Household Income (Constant Dollars) in Chicopee and Surrounding Communities (1980 - 2010)

Source: U.S. Census Bureau
As Figure 6 shows, median household income in Chicopee and its neighboring communities experienced a much higher surge between 1980 and 1990 than the rest of Hampden County and Massachusetts.

**Housing Density**

![Image 11. Single Family Housing in Chicopee, Massachusetts](Image 11)

Chicopee has the second highest housing density in Hampden County, trailing only Springfield. Housing density is measured as the number of housing units divided by the square
mile of land area. Chicopee’s housing density has been increasing steadily since 1980, and in 2010, housing density was recorded at 1,052 housing units per square mile of land area. Although the average housing density is relatively high, it is important to note that density varies across the different neighborhoods of the City (Image 11 and 12). The highest housing densities occur in the older neighborhoods of the city where multi-family housing is common, including Chicopee Center, Chicopee Falls, Willimansett, and Aldenville. These neighborhoods have both the highest housing densities and the most multi-family housing units in the City.

Table 2 shows that the highest housing density occurs in Census Tract 8109.01, which includes most of Chicopee Center and contains 2,997 housing units per square mile. This contrasts with the census tracts containing the two lowest housing densities in the City, which include Westover Air Reserve Base and Burnett Road, with 454.6 and 265.6 housing units per square mile, respectively. Although most of Chicopee’s residents live in single-family housing, denser areas include more multi-family housing.
Figure 7. Housing Density in Chicopee and Surrounding Communities (1980 - 2010)

Table 2. Housing Density in Chicopee by Census Tract (2014)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Census Tract</th>
<th>Most Prominent Neighborhood</th>
<th>Housing Units</th>
<th>Land Area (in square miles)</th>
<th>Housing Density (housing units / square miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>810901</td>
<td>Chicopee Center</td>
<td>1,019</td>
<td>0.34</td>
<td>2,997.10</td>
</tr>
<tr>
<td>2nd</td>
<td>811101</td>
<td>Willimansett</td>
<td>2,053</td>
<td>0.88</td>
<td>2,332.90</td>
</tr>
<tr>
<td>3rd</td>
<td>810700</td>
<td>Chicopee Falls</td>
<td>2,734</td>
<td>1.3</td>
<td>2,103.01</td>
</tr>
<tr>
<td>4th</td>
<td>810800</td>
<td>Sandy Hill</td>
<td>1,896</td>
<td>0.95</td>
<td>1,995.78</td>
</tr>
<tr>
<td>5th</td>
<td>810902</td>
<td>Chicopee Center</td>
<td>1,870</td>
<td>1</td>
<td>1,870</td>
</tr>
<tr>
<td>6th</td>
<td>811102</td>
<td>Willimansett</td>
<td>2,540</td>
<td>1.48</td>
<td>1,716.20</td>
</tr>
<tr>
<td>Rank</td>
<td>Census Tract</td>
<td>Most Prominent Neighborhood</td>
<td>Housing Units</td>
<td>Land Area (in square miles)</td>
<td>Housing Density (housing units / square miles)</td>
</tr>
<tr>
<td>------</td>
<td>--------------</td>
<td>-----------------------------</td>
<td>---------------</td>
<td>-----------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>7th</td>
<td>811301</td>
<td>Fairview</td>
<td>2,594</td>
<td>1.71</td>
<td>1,516.90</td>
</tr>
<tr>
<td>8th</td>
<td>811200</td>
<td>Willimansett</td>
<td>2,187</td>
<td>1.46</td>
<td>1,497.90</td>
</tr>
<tr>
<td>9th</td>
<td>811000</td>
<td>Aldenville</td>
<td>2,106</td>
<td>1.81</td>
<td>1,163.50</td>
</tr>
<tr>
<td>10th</td>
<td>810601</td>
<td>Westover</td>
<td>2,154</td>
<td>2.31</td>
<td>932.46</td>
</tr>
<tr>
<td>11th</td>
<td>811302</td>
<td>Westover Air Force Base</td>
<td>2,555</td>
<td>5.62</td>
<td>454.6</td>
</tr>
<tr>
<td>12th</td>
<td>810602</td>
<td>Burnett Road</td>
<td>1,052</td>
<td>3.96</td>
<td>265.65</td>
</tr>
</tbody>
</table>

**Median Home Value**

In 2010, the median value of a home with a mortgage in Chicopee was approximately $181,900. This is a large increase overall since 1980, when the median home value was $91,033 in Chicopee. Chicopee’s median home value, along with surrounding cities and towns is displayed constant dollars in Figure 8.
Figure 8. Median Home Value (Constant Dollars) in Chicopee and Surrounding Communities (1980 – 2010)

Nonetheless, the median home value in Chicopee generally follows statewide and regional trends. Chicopee’s median home value is far lower than the Massachusetts state average of $333,600 and the second lowest of Chicopee’s neighbors. This may be due in part to the aging housing stock that exists in the City.
Educational Attainment

Around 83% of the population has either graduated high school or graduated high school and pursued some form of higher education. However, educational attainment levels in Chicopee vary. In 2010, approximately 40% of the population having some college experience and a similar fraction having received graduate and professional degrees.
With respect to the immediate surrounding towns, Chicopee is currently fourth in terms of its percentage of the population that has graduated from high school (U.S. Census Bureau, 2010 - 2014).
CHAPTER 2: EXISTING CONDITIONS IN CHICOPEE

Land-use

Chicopee currently encompasses a total of 22.91 square miles of land (15,260 acres) and 1.13 square miles of water (670 acres). The primary use of Chicopee’s land is residential, occupying 5,011 acres within seven neighborhoods: Fairview, Chicopee Falls, Willimansett, Aldenville, Chicopee Center, Sandy Hill, and Burnett Road. The second most common land-use is undeveloped land at 4,257 acres. This is followed by transportation at 2,347 acres, which demonstrates Chicopee’s heavy dependence on automobiles. Commercial and industrial land in Chicopee account for approximately 1,200 acres (Chicopee Department of Planning and Development, 2015).

Figure 10. Land-use in Chicopee (In Acres)

Source: Chicopee Planning Department
Zoning

Due to the lack of an adopted comprehensive plan, Chicopee’s zoning plan serves as its primary master plan. Chicopee has sixteen classes of districts that include the following: four residential zones, two commercial zones, four business zones, three industrial zones, one mixed-use zone, and four overlay zones.

Map 6. Zoning in Chicopee

As seen in Map 6, the City is predominantly zoned as a Residential A district, which is largely comprised of single-family detached housing. The Willimansett neighborhood has the highest concentration of Residential B and C zoning, which permits the use of two-family dwellings, three-family dwellings, and multi-family dwellings. There is minimal commercial zoning within the City of Chicopee’s neighborhoods. The lack of commercial zoning within
proximity of the neighborhoods inhibits local residents’ access to necessary goods, making the choice to walk or ride a bicycle more challenging.

Areas zoned as “Businesses A, B, and C” are concentrated around Memorial Drive (Route 33); however, there are areas zoned as “Business A, B and C” in Chicopee Center, Willimansett, and Chicopee Falls. Notably, areas zoned as “Business C” are “intended for business development in the vicinity of highway interchanges where it is desirable to encourage interstate-highway-created business” (City of Chicopee, MA District regulations: 275-60 Business C Districts). In its current state, the City of Chicopee’s zoning code favors vehicular travel due to its lack of commercial zones within the neighborhoods as well as its concentration of business zoning along the Route 33 corridor. Details of the zoning codes in Chicopee are listed in the table below.

Table 3. District Regulations in the City of Chicopee

<table>
<thead>
<tr>
<th>Zoning Code</th>
<th>Permitted Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business A District</td>
<td>General businesses located in areas of high traffic volume that are intended to serve an area-wide population</td>
</tr>
<tr>
<td>Business B District</td>
<td>Heavy businesses that generate high volumes of traffic and are incompatible with residential and many general business users</td>
</tr>
<tr>
<td>Business C District</td>
<td>Business development in the vicinity of highway interchanges where it is desirable to encourage interstate-highway created business</td>
</tr>
<tr>
<td>Central Business District</td>
<td>Designed for mixed use of pedestrian-oriented commercial districts found in the center of the established neighborhoods</td>
</tr>
<tr>
<td>Commercial A District</td>
<td>Designed for business uses that serve a neighborhood and are compatible with residential areas</td>
</tr>
<tr>
<td>Commercial A-1 District</td>
<td>Designed for businesses that enhance a neighborhood’s cultural, historic and aesthetic environment while retaining commercial activity compatible with residential areas</td>
</tr>
<tr>
<td>Mixed Use District</td>
<td>Provide for large-scale developments with flexibility and high standards which are master-planned within the bounds of a district and which require a minimum of three land uses situated in locations favorable to the accommodations of such projects.</td>
</tr>
<tr>
<td>Residential A District</td>
<td>Single-Family detached dwellings; churches and other places of worship; cemeteries; private schools and colleges; greenhouse accessory to a farm or private residence; governmental service; farms, nurseries and truck gardens; utilities transmission facilities and rights-of-way; golf courses, accessory uses</td>
</tr>
<tr>
<td>Zoning Code</td>
<td>Permitted Uses</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Residential B District</td>
<td>Single-family detached dwellings; tow-family residences; churches and other places of worship; cemeteries; private schools and colleges; greenhouse accessory to a farm or private residence; governmental services; farms, nurseries, and truck gardens; utilities transmission facilities and rights-of-way; golf courses, accessory uses</td>
</tr>
<tr>
<td>Residential C District</td>
<td>Single-family dwellings; two-family dwellings; three-family dwellings; multifamily dwellings (four or more units); governmental services; accessory uses</td>
</tr>
<tr>
<td>Residential D District</td>
<td>Mobile homes; accessory buildings</td>
</tr>
<tr>
<td>Industrial District</td>
<td>Industrial uses and any use allowed as a permitted use in Business A and B Districts and accessory uses</td>
</tr>
<tr>
<td>Industrial Garden Planned Unit Development Type 1</td>
<td>An area of land served by sanitary sewer and public water, which is to be developed as a single entity for one or more industrial buildings</td>
</tr>
<tr>
<td>Industrial Garden Planned Unit Development Type 2</td>
<td>An area of land served by sanitary sewer and public water, which is to be developed as a single entity for one or more industrial buildings, in which a mixture of industrial uses has been determined to be compatible both within the proposed development and with the adjacent land uses</td>
</tr>
<tr>
<td>Floodplain Overlay District</td>
<td>The purpose of the Floodplain District is to promote sound management and appropriate use of land subject to periodic flooding; to protect the public health and safety of persons and property against the hazards of flooding; and to ensure the City's compliance with the rules and regulations of the Federal Insurance Administration so as to assure the City's continued eligibility for participation in the National Flood Insurance Program. All development projects, including public and private utilities and facilities, drainage, and infrastructure, must be designed to minimize and reduce exposure to flood damage.</td>
</tr>
<tr>
<td>Mill Conversion and Commercial Center Overlay District</td>
<td>The purpose of the Mill Conversion and Commercial Center Overlay District is to promote the economic health and vitality of the City by encouraging the preservation, reuse and renovation of underutilized or abandoned industrial properties and commercial centers through mixed-use development that includes compatible industrial, commercial, municipal, and residential uses.</td>
</tr>
</tbody>
</table>

Source: City of Chicopee Zoning Ordinances
Chicopee’s natural resources are found primarily within its larger tracts of undeveloped land, or open space. The City characterizes 22% of its total land as open space (City of Chicopee, 2015: 66), which exists as parcels dispersed throughout the City. For this report, open space is considered through two different landscape functions. The first consists of floodplain forests, farmland, old-growth forests, meadows and wetlands. The second consists of ball fields, bike paths, lakes and ponds. Among these open space parcels, 93 parcels (covering about 1,453 acres) have a degree of protection in Chicopee, as compared to 1,015 parcels (covering about 3,362 acres) that are currently undeveloped but not currently protected. Chicopee’s most notable natural resources include the Chicopee River and Connecticut River, which run perpendicular to one another and converge in Chicopee Center. Chicopee has minimal cropland, pastureland, or
brushland, and except for forestland within Chicopee Memorial State Park. Forested areas within Chicopee are not planned or managed (City of Chicopee, 2015: 52).

Increasing access to these natural resources through the development of a well-connected network of paths is a major goal of the City. Since less than 10% of open space in Chicopee has some level of protection, the City’s 2015 OSRP prioritized the open spaces that were most qualified to serve the City’s recreational and conservation goals. The City determined that the small isolated lands were least important, that larger tracts of farmland were moderately important, and that the parcels located on or adjacent to the Connecticut and Chicopee Rivers were critically important.

Chicopee’s unique access to these rivers provides a total of 19 miles of riverfront land. There is widespread community support to provide entry points to these areas to increase the rivers’ physical and visual accessibility. To address these concerns, Chicopee’s OSRP outlined two public Riverwalk projects in the process of design and construction: The Chicopee Canal RiverWalk Phase I & II and the Connecticut Riverwalk and Bikeway. Connecting these sites by incorporating active transportation infrastructure will increase access to valuable natural resources and enhance the community’s interaction with these resources.
Parks in Chicopee

Image 15. Chicopee Memorial State Park

The Chicopee Department of Parks and Recreation manages 29 parks in addition to the land beneath the Massachusetts Turnpike and three City cemeteries (City of Chicopee, 2015). These parks vary in size, users, and the types of amenities offered. Nine of Chicopee’s schools are also located in recreational parks. Five of these schools’ parks, Bowie Elementary School, Bellamy Middle School, Szetela Early Childhood School, and Stefanik Elementary School, are maintained by the Department of Parks and Recreation. As such, the schools’ recreational facilities become public parks after school hours, which has created a strong relationship between schools and parks in the City (City of Chicopee: 79).

The largest park in Chicopee is the Chicopee Memorial State Park, a 574-acre area with a 24-acre pond. Owned by the Commonwealth of Massachusetts, this park is accessible year round. The park’s natural features, including the pond, hilly terrain, and marshland headwaters, allow for picnicking, bicycling, swimming, hiking, ice skating, and sunbathing. However, the park is only accessible by one formal entrance on Burnett Road off of Interstate 291. The OSRP notes that “improved bicycle and hiking access from Memorial Drive would facilitate use, but would be difficult to monitor” (City of Chicopee: 71). Alternatives options for improving Chicopee Memorial State Park’s accessibility can be found later in this report.
Map 7. Parks in Chicopee
Transportation

The existing conditions of Chicopee’s transportation network challenges the creation of a connected and cohesive system that accommodates multiple modes of transit. In its current state, the majority of transportation infrastructure within Chicopee supports vehicular travel, and thus, the dominant mode of transportation in Chicopee is the car. The complexity of this network can be seen in Map 8. The different modes of transportation are identified and discussed in the following subsections.

Map 8. Existing Conditions of Chicopee’s Transportation Network
As noted earlier in this report, the City of Chicopee refers to itself as “the crossroads of New England” in part because major interstate highways converge within its borders. Although these interstate highways make vehicular travel to surrounding cities and states more accessible, this infrastructure inhibits travel by alternative modes of transportation within the City.

Interstate highway I-90, otherwise known as the Massachusetts Turnpike, divides the City along the Chicopee Falls neighborhood, Sandy Hill neighborhood, Chicopee Center, as well as through the southern section of the Willimansett neighborhood. Interstate highway 91 also enters Chicopee in the southwestern section of Chicopee Center. These interstates cater to vehicular travel; however, they also act as barriers that limit accessibility for pedestrian and bicyclists. In its current state, the only way for a pedestrian or bicyclist to navigate around these interstates is through a series of bridges and underpasses, which may not be a safe or enjoyable experience for these users.

Interstate Highways 291 and 391 also divide the City of Chicopee. Interstate Highway 391 enters Chicopee in the northwestern section of the Willimansett neighborhood and through Chicopee Center. Interstate Highway 291 enters in the Chicopee Falls neighborhood, where it then merges onto I-90. As with I-90 and I-91, these highways accommodate vehicular travel; however, they bisect the community and act as barriers for pedestrian and bicycle travel.

In addition to interstate highways, three state highways cross Chicopee: are Routes 33, 116, and 141. Route 33, otherwise known as Memorial Drive, bisects the Fairview neighborhood, separates the Aldenville neighborhood from the Westover neighborhood, and divides the Chicopee Falls neighborhood. Route 116 enters Chicopee in the Willimansett neighborhood and in Chicopee Center. Route 141 also runs through Willimansett, Aldenville, and Chicopee Falls.
Determining whether these routes are assets to the community or barriers depends on the mode of transportation being utilized. For example, the routes are significant pathways for vehicular travel across the community. However, from the pedestrian and bicyclist perspectives, these routes are challenging obstacles to navigate. Unlike the interstate highways, pedestrians and bicyclists are permitted to use these routes. Yet, in the present condition, there are minimal accommodations for pedestrians and bicyclists to use or cross the routes safely and comfortably, as seen in Map 8. Furthermore, Image 17 provides evidence on how walkers and bicyclists create their own paths on center medians in order to safely travel on Memorial Drive.
Chicopee is serviced by the Pioneer Valley Transit Authority (PVTA), which provides busing options for residents. There are five bus routes serving the City of Chicopee: Line G1 (Chicopee Center- Chicopee Big Y- Summer Allen), G2 (Belmont-Dwight Road/Carew-East Springfield), G3 (King-Westford-Hancock/Springfield Plaza), P21 (Holyoke/Springfield via Chicopee), and X90 (Inner Crosstown). The PVTA provides travel services to residents who may not have access to personal modes of transit; however, it was highlighted in the Open Space and Recreation Plan that “there is a need for a map of bus stops within the City to provide easy access to all community members” (Chicopee Department of Planning and Development, 2015, p. 31). Map 9 was created with data provided by the PVTA; however, the data is limited since it does not include locations of individual bus stops.

The PVTA system presents an opportunity for the City to enhance its multi-modal transportation network. For example, PVTA bus stops could serve as intermediate destinations for multi-modal walkers and bicyclists traveling longer distances within the City and the greater region.
Map 9. PVTA Bus Routes
Currently in Chicopee, there is 1/8 of a mile of designated bicycle path. The path is located along the Chicopee River across from the City Hall. However, there are plans to expand this network further up the Chicopee River (Map 10). In past years, efforts were made to improve the grade along the river behind residential and public buildings such as the Chicopee Public Library. In its current condition, it is a gravel road and may not be ADA accessible. Yet, people in Chicopee are using the trail.

Plans to expand the Connecticut River Walk through Chicopee are also under consideration. As seen in Map 11, the trail through Chicopee would help connectivity to surrounding communities such as Agawam, Springfield, and Holyoke.
Map 10. Proposed Chicopee Canal and RiverWalk Phase II
Map 11. Connecticut River Walk and Bikeway

Connecticut River Walk and Bikeway
- Construction Completed, Open to Public
- Design Plans Completed
- Design Plans Underway
- Proposed Linkages

Legend:
- Red: Construction Completed, Open to Public
- Green: Design Plans Completed
- Yellow: Design Plans Underway
- Orange: Proposed Linkages
Prior Planning Projects

In the absence of a comprehensive plan, the City of Chicopee has authored and commissioned a variety of plans that highlight the City’s planning priorities. For our project, Pacer Planning has analyzed three recent plans related to our goals of increasing pedestrian and bicycle connectivity. These include Chicopee’s Open Space and Recreation Plan (2015), Open Space & Food Access in the City of Chicopee (2015), and Chicopee’s Memorial Drive Revitalization Plan (2014).

Chicopee’s Open Space and Recreation Plan

In 2015, the Office of Planning and Development alongside the Parks & Recreation Department prepared Chicopee’s Open Space and Recreation Plan (OSRP), which builds on the City’s 2007 OSRP. The City identifies the lack of connectivity between the built, natural, and social environments as a major problem. The plan outlines goals to create equitable bicycle and pedestrian connectivity, to increase food security and recreation through ecological protection, and to enhance public facilities and community awareness. Recommendations in Chicopee’s OSRP consist of action steps to create an urban landscape characterized by accessible greenways, parks, recreational facilities, and river entrances.

Open Space & Food Access in the City of Chicopee

In 2015’s Regional Planning Studio addressed Chicopee’s food security concerns. Within the 2015 Open Space and Food Access Plan, PEACE Planners created a vision plan outlining a sustainable model of economic development through the creation of open space, recreational areas, and food accessibility destinations. The PEACE Planners identifies three sites for adaptive reuse in the city: The Baskin Property, River Mills South, and Delta Park.

Chicopee’s Memorial Drive Revitalization Plan

Prior to the Open Space and Food Plan, the fall 2014 Studio published the Memorial Drive Revitalization plan. The intention of this plan was to re-envision the Memorial Drive corridor in Chicopee. The Hills House Planners, in the fall of 2014, delivered a plan that connected concerns of land-use and planning, commercial development, vacant parcels/infill, transit conditions, and environmental sustainability. Combined, these plans present a jumpstart to Pacer Planning, as we will be carefully analyzing each plan’s intentions/outcomes that align with our current project.
Pacer Planning’s goal is to propose improvements to the City of Chicopee’s pedestrian and bicyclist networks. Ultimately, these improvements will involve the ability for community residents to access goods (such as housing, offices, and retail) and services (such as transportation, schools, and libraries) on a regular basis through an easy and safe walk or bicycle ride (Urban Land Institute, 2010: 64). In addition to health benefits, walkability and bikeability contribute to communities’ well-being because they allow residents to interact with their surroundings and feel more connected to and responsible for their physical community (River City Company, 2014). Although most communities recognize the benefits of walkability and bikeability, these characteristics are often difficult for local officials to implement because many existing streets were designed specifically for automobiles.

The lack of investment in pedestrian and bicycle networks due to auto-centric planning and design has the potential to limit community character. Less walkability often leads to residents leaving their own community for recreational and entertainment experiences, thus limiting the connection they feel to their community. On the other hand, those who feel a greater “sense of place,” often because of walkability and bikeability, are more likely to shop locally and stimulate the local economy. Therefore, encouraging better pedestrian and bicycle networks can have a positive and sustainable impact on both community character and local business.

This literature review explores the elements of effective pedestrian and bicycle networks and describes steps that local officials can take to encourage better connected communities. Using a variety of academic databases, we explore the following three themes in turn: walkability, bikeability, and safe commutes to school for student walkers and bicyclists. Through weaving together these themes, this literature review seeks to provide the City of Chicopee with new knowledge that will allow local officials to improve the City’s pedestrian and bicycle networks.

Following this brief introduction, the next section explores two components of walkability: (1) the elements of walkability and (2) strategies planners can take that research has shown increases walking rates in communities. The next section examines the importance of bicycle networks in order to paint a more complete picture of better connected communities. The following section focuses exclusively on research that describes the conditions and infrastructure
that maximize student walker and bicyclist safety. Lastly, we shall conclude with topics for future research.

**Walkability**

**Elements of Walkability**

In this section, Pacer Planning describes the various elements that contribute to a more connected community specifically for pedestrians. Dill (2004) examines the role that neighborhood design can play in sidewalk connectivity. Brownson et al. (2001) discuss the high importance of sidewalk presence in motivating residents to walk. Cerin et al. (2006) build on Brownson et al.’s findings to specifically understand what kinds of linkages between places increase pedestrian walking rates. Finally, Southworth (2005) describes other criteria that contribute to walkability in addition to sidewalk presence and neighborhood design, such as safety, the quality of paths, and land-use patterns.

Dill (2004) argues that street connectivity contributes to good neighborhood design. Through undertaking a rigorous literature review as well as an application of connectivity measures in Portland, Oregon, Dill shows that features such as dead ends and cul-de-sacs can limit connectivity. Indeed, since dead ends and cul-de-sacs often increase the distance between destinations, they have the potential to discourage walking and bicycling. On the other hand, greater connections between these neighborhoods allows for greater access to the goods and services that may exist near them.

Dill’s work sheds light on the elements of sidewalk and street connectivity. It stands alone as one of the few academic pieces that has developed a model for this concept. However, she offers only preliminary evidence of the application of her models (to Portland, Oregon). Nonetheless, Dill’s work demonstrates the importance of grid patterns and pedestrian route directness when assessing walkability.

Brownson et al. (2001), public health researchers, examine policy strategies that are aimed at changing people’s inclination to walk in their communities. Using a cross-sectional study design among US adults (with an oversample of lower income levels), Brownson et al. find that the majority of respondents noted the presence of sidewalks as the characteristic most likely to make them walk more. Although this finding sounds simplistic and intuitive, the presence of
sidewalks ranked far higher than other characteristics, such as parks, neighborhood jogging trails, and shopping malls.

Although Brownson et al.’s work is a seminal study on the determinants of walking in communities, it is very broad. Rather than focusing specifically on one characteristic of walkable communities, like many other studies, the authors test for a variety of different characteristics. Nonetheless, this study demonstrates the importance of sidewalk connectivity, especially relative to other factors.

Cerin et al. (2006), building on Brownson et al.’s research, seek to test the validity of the Neighborhood Environment Walkability Scale (NEWS) survey, which was established in 2002. More specifically, using a stratified two-stage cluster sample design and recruiting over 1,000 adults from both walkable and unwalkable areas, they test why there are differences in walking rates between different types of neighborhoods using the NEWS survey. Ultimately, they find that aesthetics, mixed destinations, and residential density are associated with walking for recreation for most communities. However, they find that in almost all communities in their sample, street and sidewalk connectivity is associated with higher rates of walking.

Cerin et al.’s study differs from past studies because it tests the validity of the NEWS survey. Past studies have used a questionnaire, which asks respondents to rank the factors most associated with their inclination to walk, without confirming its validity. Through comparing responses on the survey by “ground truthing” and having respondents self-report their survey responses, Cerin et al. find that the NEWS survey possesses an adequate level of validity. This confirmation provides an extra layer of strength for the study’s findings on street and sidewalk connectivity, aesthetics, and mixed destinations.

Southworth (2005) uses field analysis of pedestrian friendliness, a questionnaire, travel diaries, and observation of walking behavior to understand the criteria that contribute to the walkability of communities. Ultimately, Southworth finds that there are six criteria that contribute most to walkability: (1) connectivity; (2) linkage with other modes; (3) fine grained land-use patterns; (4) safety; (5) quality of path; and (6) path context. More specifically, one major observation that Southworth makes is that the most walkable communities have shops, cafes, banks, laundries, grocery stores, day care centers, fitness centers, elementary schools, libraries, and parks all within a half-mile from each other.
Many of Southworth’s findings are common in the literature on walkability. That said, unlike other transportation analyses, Southworth addresses the quality of the environment and user perceptions through survey analysis and fieldwork. In that vein, he argues that rather than ignoring features like streetscapes and street furniture because there is inadequate data on their outcomes, planners should embrace them. Because pedestrians see, hear, smell, and feel much of the surrounding environment, these elements are likely to play a greater role in the choice to walk.

From the literature on the elements of walkable communities, it is clear that a variety of factors are at play when attempting to assess or enhance walkability. We have learned that street and sidewalk connectivity is a crucial component. However, such connectivity merely serves as a prerequisite. To fully foster an environment where pedestrians feel safe, comfortable, and interested in their surroundings it is essential for planners and other local officials to also a cluster diverse goods and services with increased residential density. It is also important to work with other municipal departments to promote other important determinants of walkability, namely safety. These aims are more easily said than done; as such, the following section touches on specific tools planners can use to enhance walkability.

**Strategies to Enhance Walkability**

In this section on walkability, Pacer Planning specifically focuses on research related to the tools and strategies that planners and other local officials can take to maximize walkability. Chriqui et al. (2016) explore pedestrian-oriented zoning as a facilitator of active pedestrian commuting. Jones et al. (2010) describe and analyze the most effective components of Pedestrian Master Plans (PMPs). Mooney et al. (2016) examine the types of infrastructure that is most highly correlated with pedestrian injury. Finally, Boarnet et al. (2011) offer design and policy recommendations to increase walkability.

Chriqui et. al. (2016) explore whether a relationship exists between pedestrian-oriented zoning codes and adult active travel to work via walking, biking, or using public transit. The authors collect data from municipal governments and the Census Bureau’s ACS 2010–2014 5-year estimates and perform both a t-test and multivariate linear regression to show that pedestrian overlay zoning has a significant positive relationship with increased walking rates.
Chriqui et. al.’s research is the first and largest study on how zoning for active living affects active transport. Their findings validate widely held convictions in planning literature and studies on the benefits of pedestrian-oriented developments: namely, zoning provisions such as sidewalks, crosswalks, connectivity, and bike lanes alone are not associated with a higher percent of workers engaging in active travel. Instead aspects such as bike-parking, bike-pedestrian trails/paths, walkability, and mixed-use areas are most significantly correlated with active transport. This study supports the theory that new urbanist zoning and zoning for active living are associated with a higher rate of active travel.

An increasing concern for pedestrian safety has led policymakers to find strategies that will reduce pedestrian fatalities and injuries; therefore, Jones et al. (2010) ask whether and how Pedestrian Master Plans (PMPs) in North Carolina are designed to improve pedestrian safety. The authors collected data from the North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation plan library, in addition to internet searches, emails to the North Carolina planner listserv, a survey, and phone calls. When the PMPs were collected, Jones et al. created a coding protocol to analyze six elements of each plan (e.g., vision; goals; public participation and creation process; analysis of current conditions; proposals of policies and programs; and implementation guidelines).

Jones et al. find that approximately 91% of the studied plans provide an inventory or assessment of pedestrian facilities such as sidewalks, intersections, crosswalks, trails, greenways, and footpaths, and approximately 85% of the plans discuss existing barriers to pedestrian travel like cul-de-sacs, disconnected development, and high traffic speeds. However, the authors also find that only 50% of the plans identified a person, organization, or agency that would be accountable for implementation of the proposed programs.

The findings presented by Jones, et al. are useful when creating comprehensive vision plans for pedestrian and bike networks. Additionally, Jones et al. attempt to lay a foundation for PMP evaluation that prioritizes plan implementation and impact. While there is currently no universal criteria for bike and pedestrian plan evaluation, the study provides data that can be used as a framework for assessment. Jones, et al. work with more qualitative data in this report, which is less common when analyzing pedestrian safety. The authors prove that qualitative data collection and analysis provides different insight into the problem and is just as critical as more quantitative methods, especially when identifying themes and patterns.
The number of pedestrians injured or killed by motor vehicles has increased in recent years on local and national scales and this has led to growing safety concerns. Mooney et al. (2016) ask how New York City’s environmental contributions impact pedestrian injuries resulting from traffic accidents. Mooney, et al. use collision data from public-use databases, in addition to population density counts and commercial zoning district data from the U.S. Census Bureau. After drawing a sample of New York City 532 intersections, Google Street View was used to assess the following intersection characteristics: presence of crosswalks; curb cuts; visible billboards; sidewalks; signals; refuge; traffic calming systems; bus stops; and the condition of sidewalks and roads as they related to the collision, pedestrian and zoning data.

Mooney et al. find that the presence of crosswalks (Kappa Score .83), visible billboards (Kappa Score .75), pedestrian signals (Kappa Score 1.00) and bus stops (Kappa Score .70) were most related (or in strong agreement) with pedestrian fatalities (p. 466). With varying confidence intervals, Mooney, et al. found that, in general, the number of pedestrian injuries at intersections increased with the presence of crosswalks, signals, billboards, and bus stops. Specifically, the most incidents were concentrated in the Manhattan’s Times Square. As a caveat, it is important to recognize that New York City has increased traffic volumes due to its popular tourist destinations and higher population densities.

Mooney, et al. present findings that may seem atypical to what is to be expected when considering built infrastructure and pedestrian safety—infrastructure is associated with pedestrian injuries when it is designed to reduce injuries. Infrastructure like crosswalks might have a positive correlation with pedestrian industries because if it were not for these infrastructural items then there would be no pedestrians in the first place.

However, this perspective is important to consider, as the perspective identifies potential problems and concerns when planning pedestrian and bicycling infrastructure. Recent studies have suggested that improving lighting, adding speed bumps, and maintaining pavement markings can improve pedestrian safety; however, these studies have not been replicated because of methodological challenges (p. 462). Mooney et al. provide a different method of data collection and analysis surrounding the topic of pedestrian safety and as a result have provided different and unexpected results.

Boarnet et. al. (2011) seek to understand how the character of the built environment can influence travel mode choice. It analyzes results through a t-test and regression from a detailed
travel diary survey of 2,125 residents in four areas of the South Bay area of Los Angeles County—a mature, auto-oriented suburban region. Results show substantial variation in the amount of walking across study areas and suggest that individuals choose travel mode based on distance and concentration of local shopping and service destinations in a commercial core. However, the amount of business concentration associated with highly pedestrian-oriented neighborhoods is three to four times as large as what the local resident population can support, suggesting that pedestrian-oriented neighborhoods import shopping trips, like driving trips, from larger surrounding catchment areas.

Boarnet et al.’s findings align with other studies. For example, other studies also show that the effect of land use on trip generation is typically statistically significant, and that land use effects are usually larger for trip distance. What is still unclear is whether connections between land use and travel mode choice display a causal effect of the built environment, or whether individuals choose residences based on their desired mode of travel.

In sum, from the literature on the elements of walkability, we have learned that connectivity, highly dense mixed-use development, and safety are all crucial elements of walkability. In addition to working collaboratively with other municipal departments, a variety of tools and techniques exist for planners to enhance walkability. These tools include pedestrian master plans, pedestrian-oriented zoning codes, and infrastructural changes such as crosswalks, pedestrian waiting areas, and signals.

**Bicycle Networks**

**Factors that Influence Successful Bicycle Networks**

In this section, Pacer Planning describes the various elements that contribute to an effective bicycle network. Kim and Ulfarsson (2008) discuss the factors associated with mode of travel choices for short home-based trips. Handy, Xing and Buehler (2010) discuss the factors associated with bicycle ownership and use. Pedroso, Angriman, Bellows, and Taylor (2016) examine the influence of bicycle infrastructure on bicycle use. Lastly, Schoner and Levinson (2010) provide a framework for transportation planners to evaluate their local bicycle facility networks and set priorities that support bicycling travel. Kim and Ulfarsson (2008) discuss several factors that influence people’s decision to choose one mode of transportation over
another for short home-based trips. Short home-based trips are defined as “a unit of home-based (originating at home) travel that involves the use of a single transportation mode for a single purpose” (p. 726).

Kim and Ulfarsson used the 1999 Household Activity Survey for the Puget Sound Regional Council (PSRC) to gather personal and household characteristics as well as data on transportation choices. They also used the 1999 PSRC data on employment, and the U.S Census data from 2000 (p. 726). They focused on adults, 18 years or older, and they collected data from 12,900 trips. They determined 1.4 miles as the maximum distance for a short-trip (p. 726). The researchers used discrete choice modeling, a multinomial logit model, to determine the probability that an individual would choose a particular mode of transportation out of the four possible choices (p. 729). The four modes of transportation as they pertain to their study include: walking, bicycling, taking a bus or driving a car.

Kim and Ulfarsson discussed several personal and household factors that influence a person’s choice of transportation. They found that age is negatively associated with walking and biking, but age has a stronger negative association on biking. New residents (regardless of age) are positively associated with walking. Having a college or graduate degree had a positive association with walking. Having a driver’s license is negatively associated with walking and bus trips, but is neutral for driving and biking. Having a bus pass is positively associated with bus and bicycle trips. Owning a vehicle is negatively associated with walking, biking, or riding the bus, and there is a strong preference for driving (p. 731). Persons who are married have a negative association with walking or taking the bus, and married persons with children have less aversion to taking the bus and more aversion to walking. Homes that are multigenerational are more averse to walking than single-person households. Furthermore, as household income increases, short trips made by car also increases and trips made by walking or taking the bus decreases (p. 731).

The purpose of the trip also influences the mode of travel a person will take. For example, traveling to school, going out to eat, and participating in social or recreational activities are positively linked walking, biking or taking the bus. However, shopping was negatively associated with walking, and was neutral for riding the bus, riding a bicycle or driving. According to Kim and Ulfarsson, shopping may be negatively associated with walking because it may be burdensome to carry goods even for a short distance (p. 731). Other factors such as the
trip distance was negatively associated with walking and positively associated with the bus. The
time of day influenced people’s choice as well. People prefer to walk or take the bus during the
daytime; however, these results were neutral in regards to driving or bicycling. Kim and
Ulfarsson (2008) noted that longer travel times were associated with walking and biking.
Furthermore, the urban index was positively linked to walking and busing since there are more
frequent opportunities to use alternative modes of transportation to travel short distances (p.
731).

The results from Kim and Ulfarsson’s study highlights the various reasons why people
may choose a particular mode of travel over another. Therefore, if a city intends on increasing
the number of walkers, bicyclists or multimodal transit use, the city should consider making
social, recreational, and school-related spaces more pedestrian and bicycle friendly as a first
phase of encouraging walkability. Although Kim and Ulfarsson analyze the factors that influence
whether people will choose to travel by car, by bus, by bicycle or by walking, the study by
Handy, Xing, and Buehler (2010) address the factors specifically associated with bicycle
ownership and use.

Handy, Xing and Buehler collected data through an online survey in 2006 which
examined (1) individual factors such as age, race, gender, bicycling preference, and bicycling
comfort, (2) social-environmental factors such as other bicyclists and other drivers, and (3)
physical-environmental factors such as bicycle infrastructure and land use (p. 969). Furthermore,
they employ a cross-sectional research design to determine the relative influence of these three
categorical factors. 9,000 residents were sampled from six small U.S. cities, however, only 965
of the residents participated in the study making a non-response bias a concern (p. 972). Davis,
CA was chosen for their notable high bicycle culture. Woodland, CA has a relatively high level
of bicycle infrastructure, and Chico, CA was selected for its supportive bicycle culture.
According to Handy, Xing, and Buehler, Turlock, CA has neither a supportive bicycle culture
nor a high level of bicycle culture and was selected based on these factors. Eugene, OR and
Boulder, CO both have a reputation for having a strong bicycle culture with supportive
infrastructure.

According to their survey responses, 71% of respondents owned or have regular access to
a bicycle. Of these respondents, 56.2% of them ride their bicycle regularly (at least once in the
past 7 days). Furthermore, respondents were categorized into groups called “transportation-
oriented bicyclists” or “non-transportation-oriented bicyclists.” If respondents answered that either all or most of their bike rides were for transportation needs, they were considered “transportation-oriented bicyclists” (p. 973). Defining whether bicyclists were “transportation-oriented bicyclists” or “non-transportation bicyclists” was important to this study since they were influenced by different externalities.

First, Handy, Xing, and Buehler found that attitude was an important factor determining whether a respondent owns or does not own a bicycle. Handy, Xing, and Buehler stated, “the more people liked riding a bike… the more likely they are to own a bike” (p. 977). Attitude also influences regular use among bicycle owners. Furthermore, physical or social environmental factors did not influence bicycle ownership; however, this finding may be limited to respondents of this geographical area. Conversely, in terms of regular users, social and environmental factors can influence whether people use their bicycles on a regular basis. For example, Handy, Xing, and Buehler state “the perception that ‘most bicyclists look like they are too poor to own a car’ positively correlates with non-regular bicycling. Negative perceptions of other bicyclists are a deterrent to regular bicycling, even for those who won a bicycle” (p. 978)

According to Handy, Xing, and Buehler, there are several factors that influence those who are considered regular transportation-oriented bicyclists. First, older age is associated with lower likelihood of regular transportation-oriented bicycling, while education level is positively associated with transportation-oriented bicyclists. The findings support the conclusions made by Kim and Ulfarsson (2008). Additionally, if bicyclists have a higher level of comfort, they are more likely to bicycle regularly as a means of transportation. Notably, those who report higher levels of environmental concerns are also more likely to bicycle regularly for transportation (p. 978). Conversely, participants who responded “I need my car to do many of the things I like to do,” have a decreased likelihood of using a bicycle for regular transportation. Another social-environmental factor that influences regular bicycle use is the noted preference to live in a bicycle friendly community (p. 978).

Physical-environmental factors also influence regular transportation-oriented bicyclists according to Handy, Xing and Buehler. For example, longer distance to destinations discourage transportation-oriented bicyclists. Kim and Ulfarsson (2008) also note that distance was a deterrent to using a bicycle as a mode of travel. Lastly, the presence of bicycle infrastructure such as off road paths and separated bicycle lanes was positively associated with transportation-
oriented bicycling (p. 978). According to Handy, Xing and Buehler, respondents who reported they are healthy were more likely to be non-transportation-oriented bicyclists. Handy, Xing and Buehler note that this may highlight the difference between transportation-oriented bicyclists and recreational bicyclists. Regardless of this difference, they state that a network of separated bicycle paths is important to both non-transportation-oriented and transportation-oriented bicycling. The importance of bicycle infrastructure, specifically separated paths designated for bicyclists, have been noted in other studies including the study by Pedroso, Angriman, Bellows, and Taylor (2016).

Pedroso, Angriman, Bellows, and Taylor studied Boston, MA’s expansion of its bicycle network from 60 yards of designated bike lanes to 92 miles of designated bike lane during the period of 2009-2012 (p. 2175). As Boston increased its bicycle lanes, the City also improved bicycle signage, bicycle parking, and bicyclist awareness, as well as implemented a bike share program (p. 2171). Pedroso et al. evaluated the change in bicyclist safety as the City implemented new bicycle infrastructure using this integrated approach to bicycle infrastructure. According to Pedroso et al., bike lanes were defined as part of the road that were marked off for the explicit use of bicyclists (p 2171).

Pedroso et al. measured bicycle lane mileage and used the American Factfinder survey question that collects data on workers 16 years or older and how they get to work. They also used data from the Boston Police Department and the Boston Emergency Medical services to collect data on (1) bicycle accidents with cars and (2) bicycle accidents that result in injury. They used a multivariable logistic regression model to evaluate factors associated with being injured on a bicycle (p. 2172).

Pedroso et al. found an increase in bicycle ridership as a result of the increased bicycle lane mileage. However, the significant increase was in male ridership rather than female ridership. Furthermore, they found an improvement in bicyclist safety resulting from the increase mileage of designated bike lane (p. 2175). The multivariable model showed a 14% reduction in the odds of being injured in a bicycle accident over each succeeding year (from 2009-2012) (p.2176). Ultimately, the findings made by Pedroso et al. demonstrate that an integrated approach to improving bicycle infrastructure was associated with a significant increase in commuting by bicycle and an improvement in overall bicyclist safety (p. 2175).

Schoner and Levinson (2010) also explored the importance of bicycle infrastructure in
promoting bicycle ridership. Schoner and Levinson collected U.S Census data and city-produced bicycling data from 74 mid-sized and large U.S. cities. Moreover, they used regression models to test the relationship between the five network factors (size, connectivity, density, fragmentation, and directness) and bicycle commuters per 10,000 workers (p. 1187, 1197). Notably, Schoner and Levinson controlled for city population, land area, median income, household structure, college enrollment and vehicle ownership, which were named as factors that influence bicycle ownership and use by Kim and Ulfarsson (2008) and Handy, Xing, and Buehler (2010).

Schoner and Levinson found that the directness and connectedness of bike paths are the two most important factors in predicting levels of bicycle ridership. They emphasize that “planning for isolated infrastructure segments without considering how these pieces of infrastructure connect to the broader street network undermines the potential utility of this infrastructure” (p. 1191). Therefore, to put this finding into practice, the authors recommend that planners design bicycle routes to have as few detours as possible and suggest that planners anticipate bicyclists’ destinations to maximize connectedness.

Past research on bicycle ridership levels has been mostly done in European cities and studies on this topic in the U.S. have focused almost exclusively on very large cities. Schoner and Levinson not only use large U.S. cities in their sample, but also include mid-sized cities such as Lowell, MA (population of 108,861) and Richmond, CA (population of 107,571). This wider dataset makes their findings more applicable to all city sizes. Furthermore, their research highlights the negative implications of fragmented bicycle networks on overall bicycle use and ridership.

In summary, from the literature on the factors that influence successful bicycle networks, we have learned that personal and household characteristics, social and environmental factors, supportive bicycle infrastructure, and culture can have strong impacts on whether or not people will choose to ride a bicycle. Furthermore, these factors differ if people are using bicycles for transportation or for recreation. However, we have learned that using an integrated approach that incorporates bicycle signage, supportive bicycle facilities, and separated bike lanes can increase bicycle use. Planning departments should aim to create a connected bicycle network that incorporate these elements.
In this section, Pacer Planning addresses the literature surrounding safety issues directly related to students walking to and from school, as well as best practices on social and infrastructural changes that may maximize safety. Zhu et al. (2008) use measurable social and demographic factors to assess school walkability as it relates to public health and environmental justice. The Centers for Disease Control and Prevention (2002) also analyze factors that influence parents’ decision to allow their children to walk to and from school. Zhou et al. (2016) investigate the factors that influence student walking and biking rates. Ermagun (2016) study the factors that impact how children are accompanied to school. Finally, Timperio et al. (2006) examine how active commuting to and from school is influenced by both the physical and social environments. Collectively, these studies report a variety of safety concerns about both the social and built environments surrounding a student’s commute to school.

Zhu et al. discuss the potential use of environmental support for walking around elementary schools related to traffic, crime, economic status, and/or ethnicity. The authors utilized Geographic Information Systems and field audits to produce a statistical model that highlights variations between race, income, traffic, crime, and location for student walkers from 73 public elementary schools in the Austin, TX. The authors find that schools with higher poverty or Hispanic student rates had greater neighborhood-level walkability in their attendance areas (Zhu and Lee, 2008, p. 285). Additionally, these areas had more students living near school, more complete sidewalk networks, and higher residential density (p. 285). However, though students were more likely to walk in these neighborhoods, street-level walkability included higher crash and crime rates along with lower levels of maintenance and perceived safety, which highlighted economic and racial disparities in access and security for students commuting to and from school (p. 282).

Comparatively, this research offers a different perspective on walkability due to the inclusion of factors like crime and traffic. Such thorough additions not only contribute greatly to the results of the research, but are supported by the field-audits methodology. Furthermore, Zhu et al. introduce the concept of “captive walkers,” defined as low-income, often minority, students that have no alternative means of transportation. Zhu et al. consider the implications their findings may have on policy; finding that the improvement of unsafe and run-down areas in the
city is necessary in order for low-income and minority neighborhoods to effectively use those spaces.

The Centers for Disease Control and Prevention (CDC) (2002) analyze data collected by the HealthStyles Survey addressing the barriers that prevent school children in the U.S. from walking or biking to school. The HealthStyles Survey is a joint collaboration between the CDC and partners Porter/Novelli (Washington, D.C.) and is a simple paper survey mailed out to a sample of the American population to gage health-related attitudes and behaviors. In 1999, 3,550 American households were solicited to participate in this survey. This sample was considered representative of the American population based upon eight demographic variables considered essential requirements that are representative of the whole. These variable include age, sex, marital status, race (ethnicity), income, region, household size, and population density.

The CDC asked two specific research questions. First, what are the primary barriers facing school children that hinder the ability or attractiveness of walking/biking to school? Second, which barriers contribute to an overall sense that walking or biking to school would be highly unsafe? The CDC found that long distances and perceptions of being unsafe as a result of passing motor vehicles were among the most common barriers that prevent more school children from walking or biking to school. This further diminishes opportunities for American school children to exercise and adopt healthier lifestyles. Based on the 611 responses collected during the survey, the CDC found the two biggest factors influencing walking and/or biking to school were the perceptions of danger due to motor vehicle traffic and long distances that must traversed on bike or foot. The CDC recommends that any and all future endeavors undertaken by public health and community-based efforts that aim to encourage walking and biking to school must address these concerns.

Zhou et al. (2016) examine the factors that affect student walking and biking rates for students in the city of Pinella, Florida through a survey that was distributed to 644 classrooms. The students and parents surveyed lived between less than a quarter mile from the school and up to two miles from the school. Results of their analysis indicated that the top four factors affecting their choice to allow their child to walk or bike to school were distance, traffic volume, traffic speed, and violence/crime (p.19). A cause-effect analysis revealed that as distance from the school increased children were less likely to walk, and children enrolled in higher grades were more likely to walk or bike to school. The authors also identified similarities among students
using similar travel modes, finding that distance, the presence of sidewalks and pathways, crossing guards and intersection safety were of high concern for the parents (p. 25).

Ermagun et al. (2016) assess the variables that contribute to how children are accompanied to school in Tehran. The authors ask, "What are the behavioral aspects of escorting children to and from school?" Using multiple logit models, based on site observation and surveys, the authors aimed to show the potentially dangerous effect that using "inappropriate study models" could have on policy. Ermagun et al. found that a growing number of parents are accompanying their children to and from school to "make sure they travel with the best care and minimum stress" (2006). Though not an intentional outcome of the research, the authors found that access to a driver's license and proximity to other school-aged children allow for additional aide in accompaniment en route to school.

This research differs from other studies not only due to its unique location of study, but also because of the detail-oriented variables of the study. Ermagun et al. examined attributes of distance, gender, age, number of siblings, income, vehicle ownership, parental education and work status. The aforementioned variables were also paired with parental observations on safety, convenience, reliability and finally the cost of the trip. As noted, this research approach is based on interactive variables, in which, the authors claim, are hardly used in previous studies. This statement is supported by an implicit assumption that each of the aforementioned variables act independently from other variables. The utilized logit model of the study is also unique to other research regarding student walker safety, in which Ermagun et al. conducted a two-stage regression method to avoid any potential biases.

Timperio, et al. (2006) address how personal, family, social, and environmental factors impact the likelihood of children actively commuting to school. Active commuting means that a student uses non-motorized methods of transport like walking or bicycling to school instead of more passive and motorized methods of transport like taking the bus or driving in a car. The authors used a parent survey that asked several questions about the student’s health, family life, economic status, and perceived independence. The responses indicated factors that negatively impacted active commuting to be parental observations of few other children in the neighborhood, no lights or crossings, and the presence of busy roads and steep inclines (p.45). Furthermore, good connectivity to school was negatively associated with active commuting among older children (p. 45). The authors also found statistically significant negative
relationships between active commuting and the child’s dislike of physical activity (decreased by 6.5%), if the mother worked full-time (decreased by 22.6%), if the parents had a strong concern about strangers (decreased by 81.7%) or road safety (decreased by 78.0%), as well as, the parents’ individual perception about the number of lights or street crossings they believed to be present (decreased by 47.4%) (p. 48).

Timperio, et al.’s report offers a complex data collection and analysis approach. The authors stated that even though there is interest in providing safer routes to school, there have been few studies that comprehensively examine the factors that influence traveling behaviors (Timperio, et al., 2006, p. 50). As a comprehensive study, the evidence encourages municipalities to create more child friendly communities and to provide skills that aid children safety when they commute through the environment (p. 50). Due to the relationships and factors studied, this report presents very specific findings. The authors also mention that studies like this must be done in rural communities in order to prioritize the safety of all school children regardless of their location (Timperio, et al., 2006, p. 50).

From the examination of these studies surrounding social and built environmental factors that influence student walker safety, the research demonstrates that concerns are most often related to street design and distance to and from school. Pacer Planning has also learned that the families of student walkers carry their own perceptions surrounding safety and walkability that must be considered when offering recommendations for improvement. Furthermore, walking or bicycling to and from school is influenced by the social environment and the culture surrounding such commuting methods. These considerations likely shape the success of improving student walker safety in cities and towns across the nation.

**Strategies to Increase Student Walker Safety**

This section focuses on the strategies and implementation processes that increase the safety of students walking to and from school. Everett and Sliwa (2016) determine strategies and recommendations that encourage safe walking routes to school. McKee et al. (2007) study design elements that make pedestrian walkways and bike paths desirable, thereby promoting healthier lifestyles and leading to more children walking or biking to school. McDonald et al. (2014) assess the impacts of the Safe Routes to School Programs (STRS) on the locations that implemented the program. Collectively, these studies reveal that the safety of student walkers is
of primary concern and that many cities and towns are creating initiatives to provide that necessary level of security.

Everett and Sliwa, on behalf of the U.S. Centers for Disease Control and Prevention, use data from the 2014 School Health Policies and Practices Study to test which types of infrastructure and design changes increase walking and bicycling rates among secondary school students. Through a multivariate logistic regression, they find that crossing guards, bicycle racks, and promotional materials all have positive impacts on walking rates. However, they also identify strategies that were not associated with increased walking, including lower speed limits, increased law enforcement presence, and walking school buses.

Compared with other studies, Everett and Sliwa’s research has several limitations. First, the data Everett and Sliwa use are cross-sectional, which makes it difficult to determine causality. Often, over time, active commuting can have a positive feedback loop so it is important to account for time as a variable. Additionally, the authors do not account for students’ distance from school. Nonetheless, the study is very useful for understanding which strategies have proven to be effective and which have not.

McKee et al. (2007) assess the impact of active travel in school curriculums on school children’s travel behavior to and from school. After conducting a study that looked at mode of transportation behaviors among school children attending two different schools in West Dunbartonshire, Scotland, the authors found that reducing the amount of time it takes to walk or bike to school increased the number of students who chose these modes of transportation (2007). Specifically, the authors adopted a ‘quasi-experimental’ trial that examined pre- and post-intervention mapping of routes to school relating to active and inactive modes of travel (McKee, 2007).

Based on 60 questionnaires and observational analyses, the authors found a statistical difference between the mean distance traveled among the experimental group and the control group. The findings reinforce the point that pedestrian paths that take in excess of 25 minutes, or around 800 meters, to get a desired destination are considered less desirable (2007). However, it was also found that through the incorporation of active travel into school curriculums and discussions at home, the distance a student would be willing to walk increased (2007). This report differs to other literature because of its focus on distance and school curriculum
interventions. The fact that school and home interventions related to active travel can have a positive impact on walking to and from school is promising.

McDonald et al. (2014) examined the national policy goal of increasing the numbers of students walking or biking to school since the creation of Safe Routes to School (SRTS) program in 2005. In order to determine the impact of the SRTS program, the authors studied 801 schools, with and without the SRTS program, in Oregon, Texas, Florida, and the District of Columbia to see if the proportion of students walking or biking to school changed after the introduction of SRTS. The authors found that schools with the SRTS program had 18% of their students walk or biking prior to the start of the program (p. 159). Schools with one year of the SRTS program had an average walking/biking rate of 20%, while schools with four or more years in the program had walking/biking rates greater than 30%. Demonstrating that the implementation of the SRTS program increased walking and biking rates to and from school (p. 159).

Additionally, the authors assessed factors that impact a student’s decision to walk or bike to school. McDonald et al. found that engineering improvements were associated with an 18% relative increase in walking or biking to school (p. 161). Furthermore, it was found that over the course of five years, education and encouragement programs could lead to a 25% relative increase in walking or biking to school (p. 161). This research differs from other studies because it highlights the direct impacts of the Safe Routes to School program. The study also highlights that infrastructural improvements and community support heavily influence the success and application of SRTS which must be considered when adopting the program.

From the examination of these studies surrounding strategies and implementation programs that improve student walker safety, the research demonstrates that poor infrastructure and traffic safety discourage students from walking or biking to school. Pacer Planning has also learned that community support and education aids in the implementation of safety programs like Safe Routes to School. Such programs also encourage students and their families to walk or bike to school on a daily basis. These findings help address how better to improve student walker safety on both a local and national scale.

Summary
Overall, from the literature on walkability, Pacer Planning has learned that sidewalk connectivity, high density mixed-use development, and safety are all elements that peer-
reviewed literature has found to increase walking rates. Thus, in developing the pedestrian and bicycle path network proposed in this report, the City of Chicopee should factor in these elements when prioritizing paths further. Additionally, literature on walkability recommends the use of strategies such as pedestrian master plans pedestrian overlay zoning as effective long-term strategies to enhance walkability.

From the literature on bicycle networks, Pacer Planning has learned that the most effective bicycle routes planned for traversing a City are highly connected. Furthermore, there are several personal, household, social and physical-environmental characteristics that should be considered when creating a bicycle network. Moreover, the City should be conscious of the different types of uses of these paths, whether the paths should be catered towards recreational or transit-oriented use. Thus, for the City of Chicopee to effectively implement a bicycle network, they should consider using an integrated approach which would enable residents to efficiently and safely use a bicycle as a mode of transportation and for recreation.

From the literature on student walker safety, Pacer Planning has learned that most concerns are related to street design and distance to and from school. Additionally, community support and education aids in the implementation of engineering changes. One takeaway for the City of Chicopee to consider from this literature is that if parents of K-12 school children feel that factors other than distance impact their decision to allow their children to walk to school, then design changes may aid in increasing walking rates. That said, any infrastructural or design change must be complemented by programming changes such as a walk or bike to school week or walking school bus program. Pacer Planning uses these findings from the literature to inform our recommendations.
CHAPTER 4: CLIENT DIRECTIVE

To achieve our goal of enhancing Chicopee’s pedestrian and bicycle networks, the City of Chicopee has requested Pacer Planning to undertake four overarching client directives:

1. Divide the City into sectors, or cohesive spatial sub-units, which provide an aerial lens through which the City can be understood;
2. Identify key destination points within these spatial sub-units,
3. Propose improvements to existing paths and identify new potential paths that connect the City’s sectors and destinations, and
4. Use public engagement to inform recommendations related to improvements to pedestrian and bicyclist networks.

This chapter delineates how we divided Chicopee into sectors, defines destinations, and describes our project lens.

Sectors

The City of Chicopee measures 23.9 square miles. Thus, the purpose of developing sectors is to take an aerial view of the City to understand it as a collection of cohesive spatial sub-units. Although our initial client directive noted different ways for Pacer Planning to delineate sectors, such as demographic clusters, land-use patterns, or development characteristics, Pacer Planning decided that using the built environment to delineate sectors aligned most closely to our goal.

To that end, Pacer Planning divided Chicopee into three sectors (Northeast Sector of Chicopee, Northwest Sector of Chicopee, and South Sector of Chicopee) based on the built environment, Interstate 90 (running east to west), and Memorial Drive (running north to south). These divisions allow us to focus more intensively on the proposed bicycle and pedestrian network in each part of the City. Map 12 displays the three sectors of Chicopee. It is important to note that generally, these divisions each encompass an equal amount of the City’s neighborhoods (with the exception of Fairview, which is split between the Northwest and Northeast Sectors).
The client requested Pacer Planning to connect residents and visitors to major destinations throughout the City. Thus, Pacer Planning used four key destinations identified by the Chicopee Planning Department to inform our proposed bicycle and pedestrian path network. As the Map 12 shows, these destinations are the Bellamy Middle school, the Bowie Memorial Elementary School, the Chicopee Memorial State Park, and the Front Street Corridor. The City of Chicopee designated these four destinations not only because they are frequently visited by residents and visitors, but also because multiple publics use them. For example, because many of the City’s schools are designated city parks after school hours, both students and community residents use these destinations frequently. Pacer Planning describes each of these destinations more thoroughly in the chapters on the individual sectors below.
Image 21. Chicopee Memorial State Park

Image 20. Chicopee Memorial Elementary School
Image 23. Bellamy Middle School

Image 22. Front Street Corridor
The third client directive was to create routes that connect the destinations. Initially, Pacer Planning’s client directive requested Pacer Planning to identify both major paths, to serve as “trunk lines” between key destinations, and minor paths, which were to serve as paths radiating from the destinations and major paths. Additionally, our client directive further defined minor paths to include “minor destination paths,” which connected minor paths to the destinations in an effort to connect surrounding neighborhoods, as well as “minor network paths,” which connected smaller paths to more major paths.

During our study, Pacer Planning made the decision to reframe this client directive. As opposed to dividing paths into major paths, minor destination paths, and minor network paths, Pacer Planning decided to create pedestrian and bicycle paths all under one umbrella and define which paths within this larger network should take priority in the short-term. In other words, we have chosen to create a citywide bicycle and pedestrian path network with priority paths indicating where it is feasible for Chicopee to begin making pedestrian and bicycle related
improvements. Pendleton Avenue (Image 24), is one such priority path. The paths are discussed in more detail in the following chapters.

**Project Lens**

**Linkages to Schools**

An important lens for Pacer Planning throughout this project is to create linkages to the City’s schools. Our client directive notes that a major impetus for developing a bicycle and pedestrian path network is to create safer walking routes for children to travel to school. In Chicopee, no bus services are provided to children who live within 1 mile of an elementary school, 1.5 miles of a middle school, and 2 miles of a high school. This impetus was instrumental in crafting our public engagement (described in Chapter 5).

**MassBike and Safe Routes to School**

Additionally, Pacer Planning worked extensively with Richard Fries, the Executive Director of the Massachusetts Bicycling Coalition (MassBike) throughout this project. After an initial lecture in October 2016, Pacer Planning held bi-weekly conference calls and conducted site visits with Richard Fries to enhance the development of our bicycle and pedestrian path network. Through working with Richard Fries, Pacer Planning learned a great deal about the Massachusetts Complete Streets program and the National Safe Routes to School Partnership.

Pacer Planning also met with the Michelle Chase, Town Engineer of Agawam, to review the Agawam’s implementation of applying Complete Streets strategies to a suburban Western Massachusetts. Through this meeting, Pacer Planning gained a variety of insights into best practices related to Complete Streets, which was important in the development of our recommendations.

Finally, it is important to note that during this project, Pacer Planning connected the City of Chicopee with MassDOT’s Safe Routes to School Outreach Coordinator for western Massachusetts. Through this connection, Pacer Planning hopes to facilitate the City’s process for applying to and receiving services and funding through MassDOT’s Safe Routes to School program. These services and funding opportunities are described in more detail in our citywide policy recommendations below.
CHAPTER 5: PUBLIC ENGAGEMENT

The Project for Public Spaces notes, “People who use a public space are the ones who know, from experience, which areas are dangerous and why, which spaces are comfortable, where traffic moves too quickly and how certain aspects of a space could be improved” (2011, p. 13). Therefore, public engagement was a core part of our project.

As previously stated, one major objective of this project is to propose safer paths to school for students. This objective stems from the fact that no bus services are provided to children who live within 1 mile of an elementary school, 1.5 miles of a middle school, and 2 miles of a high school (Map 13). Since Pacer Planning could not directly access students’ input for this project, we targeted stakeholders that can act as proxies for the student population. The targeted stakeholders included: The City’s Parent Teacher Organizations (PTOs), public safety officials, and school administration officials. In a similar vein, the target population includes students’ parents. Gaining these individuals’ input on where problem areas exist provided invaluable insight when formulating our recommendations.

Methodology

To reach both our target stakeholders (namely school administration officials) and our target population (namely parents of school-aged children), Pacer Planning determined that a two-pronged public engagement strategy would be most effective. To reach our target stakeholders, we conducted in-person and phone interviews with school administration officials at several of Chicopee’s public schools. The survey and interview period ran from October 11, 2016 to November 18, 2016.
Map 13. Public School Walking Zones in Chicopee
**In-Person and Phone Interviews**

Throughout the six-week public engagement period, Pacer Planning conducted seven interviews with school administration officials in Chicopee. These interviews were with four principals, two vice principals, and one representative from the City Engineer’s office. In each of these interviews, Pacer Planning asked the following prompts:

1. How safe is it for children to walk to school in the City?
2. What types of infrastructural or design changes would make streets leading to schools safer?
3. Which specific streets could be better designed for student walkers?
4. How would enhanced walkability affect students’ ability to report to school regularly and in a timely manner?
5. Which streets are made less accessible by snow build-up, storage, and icy conditions for students walking to school during the months?

After each interview, Pacer Planning transcribed interviewees’ responses to these prompts.

**Electronic Survey**

Additionally, Pacer Planning distributed an electronic survey using the Google Forms platform to our target population of parents of school children in Chicopee entitled the “Chicopee Student Walker Safety Survey.” We received 106 responses to our survey over the study period. In addition to containing the same five open-ended questions we used for the interviews (listed above), the electronic survey asked respondents a series of background questions related to which of the City’s schools they were familiar with, as well as a question asking them to select the factors that were involved in their decision to allow or not allow their child to walk to school. The full survey questionnaire can be found in the Appendix.

The electronic format of the survey allowed for greater access to the public. Additionally, the survey contained an option for participants to provide their email for future contact. To ensure that survey respondents are kept informed of this report’s overall findings, Pacer Planning committed to sending personal invitations to all interviewees and survey respondents to our final presentation, held on December 15, 2016 at Chicopee Comprehensive High School, via email.
Public Engagement Findings

Interview Findings

Pacer Planning received a great deal of feedback during the interview process. Although many school administration officials stated they had experienced no major incidents related to pedestrian safety, there was a significant amount of enthusiasm for the conversation surrounding safer paths to schools for student walkers and bicyclists. We believe that this enthusiasm stems from the finding that most students in Chicopee do not currently walk to school, but would if there were safer walking conditions.

Pacer Planning notes specific findings related to each school in Chapters 7, 8, and 9, which outline each of the sectors of Chicopee. Each of these chapters includes a public engagement subheading. In these sections, we highlight quotes from interviewees related to areas of concern and suggestions for improving the walkability of these areas.

Electronic Survey Findings

Pacer Planning has determined that a full analysis of the open-ended survey responses would be best saved for future analysis. That said, for this report we are able to present findings for the question related to the factors involved in parents’ decision to allow or not allow their child to walk or ride their bike to school. Figure 11 displays the results from this question.
Figure 11. Public Engagement Survey Findings

Issues Affecting Parents' Decision to Allow or Not Allow Children to Walk to School

<table>
<thead>
<tr>
<th>Issue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of Traffic</td>
<td>80%</td>
</tr>
<tr>
<td>Sidewalk Accessibility</td>
<td>76%</td>
</tr>
<tr>
<td>Amount of Traffic</td>
<td>74%</td>
</tr>
<tr>
<td>Distance</td>
<td>67%</td>
</tr>
<tr>
<td>Safety of Intersections</td>
<td>59%</td>
</tr>
<tr>
<td>Crossing Guards</td>
<td>50%</td>
</tr>
<tr>
<td>Violence or Crime</td>
<td>44%</td>
</tr>
<tr>
<td>Time</td>
<td>23%</td>
</tr>
<tr>
<td>Convenience of Driving</td>
<td>11%</td>
</tr>
</tbody>
</table>

N = 106 Total Respondents
As evident by the survey results, the speed of traffic is the most highly ranked issue related to parents’ decision to allow or not allow their child to walk to school in Chicopee. Figure 11 shows that 80% of the 106 total survey respondents indicated that the speed of traffic was an issue. This finding shows that parents perceive the speed of traffic as a major safety concern. Additionally, this finding aligns with Pacer Planning’s site visit observation that the speed of traffic was very high in school zones, particularly in areas near interstate highways.

According to these survey results, there are many parents of K-12 students in Chicopee who feel that the speed of traffic and sidewalk accessibility are more important factors than distance, time, or convenience of driving when determining whether to allow their child to walk to school. This finding suggests that if the City of Chicopee could effectively calm traffic and enhance sidewalk accessibility, perhaps through design changes, students may be more likely to walk or ride their bike to school.

Parents also ranked sidewalk accessibility and the amount of traffic along walking routes as major safety issues related to walking to school. Additionally, although 59% of respondents noted that the “safety of intersections” was a concern, this finding varied by neighborhood. Chapters 7, 8, and 9 include graphs showing the findings for this question broken down by neighborhood.
CHAPTER 6: CITYWIDE BICYCLE AND PEDESTRIAN PATH NETWORK

Introduction

To better connect key destinations in Chicopee, Pacer Planning is proposing new connections to expand Chicopee’s bicycle and pedestrian path network. The goal of this proposed path network is to better connect places of employment, schools, recreational destinations, and historic sites within Chicopee. Through this proposal, Pacer Planning hopes to make the City of Chicopee more pedestrian and bicyclist friendly.

This chapter displays the Pacer Planning’s proposed citywide bicycle and pedestrian path network, discusses its important features, articulates Pacer Planning’s vision, describes the criteria for paths selection, and recommends future City of Chicopee path analysis.

Proposed Citywide Bicycle and Pedestrian Path Network

The proposed path network, Map 14, shows Pacer Planning’s Vision Plan for pedestrian and bicycle pathways. The dashed dark green lines represent the entire path network proposal, and the dashed light green lines represent parts of the path network that currently have sidewalks. This map also displays Chicopee’s rivers, four destinations the Chicopee Planning Department identified (Bowie Memorial Elementary School, Bellamy Middle School, Chicopee Memorial State Park, and the Front Street Corridor), and indicates how the proposed network connects these points.

Additionally, the map displays the Pioneer Valley Transit Authority (PVTA) bus route in purple. We display the PVTA bus route to show how the proposed path network complements the existing bus route, thereby encouraging intermodal transportation, or the ability for path users to use more than one mode of transportation during a journey.
Map 14. Citywide Bicycle and Pedestrian Network
Features of the Citywide Path Network

Although Pacer Planning further examines these proposed paths in the subsequent sector-specific chapters, there are two important common features of the citywide path network to note. First, the path network is comprised of both on-road and off-road paths, which allow for diverse use for either recreational or transportation oriented purposes. Furthermore, the off-road paths grant pedestrians and bicyclists the opportunity to safely travel to their destinations without having to interact with vehicular traffic.

Second, many of the proposed bicycle and pedestrian paths are adjacent to the Chicopee and Connecticut Rivers. Pacer Planning proposed these paths to build on the existing river walks described in Chapter 2 of this report. As the City of Chicopee learned in the 2015 Open Space & Recreation Plan, promoting access to the City’s rivers is a priority for residents. Moreover, two of the proposed bicycle and pedestrian paths help to bridge the gaps in the Connecticut River Walk. These proposed connections can be seen in the section of the proposed path network on the northwestern-most corner and the southwestern-most corner of the City. Through this connection, Pacer Planning hopes to connect Chicopee to the greater Pioneer Valley region.

Vision of Citywide Path Network

In the proposed the bicycle and pedestrian path network, Pacer Planning’s long-term vision is to make Chicopee a better connected City. Pacer Planning believes that the proposed path network will contribute toward making pedestrians and bicyclists feel safe traversing the City and will increase their access to residential neighborhoods, recreational areas, cultural and educational resources, places of employment, and public services.

Additionally, Pacer Planning believes that through updating the current bicycle and pedestrian path network, the City of Chicopee will improve the well-being of all of its residents. With increased transportation options, residents and visitors will have more opportunities to engage in their community without having to travel to surrounding communities for recreational, entertainment, or educational experiences.

Criteria for Selecting Proposed Paths

Pacer Planning used the following criteria for determining where to add proposed path connections to the existing network: the presence of existing sidewalks, topography, and the
extent to which the paths increase connectivity to places of employment, schools, parks, and historical and cultural sites throughout the City.

In Map 14, many proposed paths overlay existing sidewalks. Pacer Planning believes that such paths are important for the City of Chicopee to consider since the existing sidewalk will allow the City to expand the existing path network without the costs and time of constructing a new sidewalk. Improvements to the proposed paths that overlap with the existing sidewalk network may include the addition of pedestrian and bicyclist facilities such as bike lanes, improved pavement surface conditions, crosswalks, flashing pedestrian lights, and pedestrian wait areas. Specific proposals for areas on the proposed path network that Pacer Planning has determined are priority areas are discussed in more detail in the sector-specific chapters below.

For the proposed paths outside of the existing sidewalk network, Pacer Planning factored in topography and the extent to which the proposed path would increase connectivity to the existing path network. Accounting for topography was important because the City of Chicopee includes several steep areas, which would not be ideal or feasible for pedestrian and bicycle infrastructure.

Finally, in designing the proposed bicycle and pedestrian path network, Pacer Planning accounted for the extent to which the path proposals increase connectivity to places of employment, schools, parks and historical and cultural sites within the City. Such increased connectivity enhances the network’s convenience for pedestrians and bicyclists, ultimately allowing for shorter travel times between key destinations.

**Recommendations for Future Path Network Analysis**

Although the criteria discussed above allowed Pacer Planning to develop this proposal, a more thorough analysis of each proposed path was outside the scope of this project. To that end, Pacer Planning recommends that the City of Chicopee assess these proposed paths using an expanded set of criteria, including but not limited to: the path’s connectivity, cost, right-of-way, and the paths’ respective impact on users’ safety and vulnerability. These criteria were informed both by our literature review and Bedford, Massachusetts’ 2015 Bicycle and Pedestrian Plan. The criteria will be described below.
**Connectivity**

This criterion reflects the extent to which each recommendation would complete gaps in sidewalk networks. For an area to be ranked highly on connectivity, it should connect to major points of interest in the City or areas with already high demand.

**Right-Of-Way**

This criterion reflects the level of difficulty it would be for the City of Chicopee to obtain the right-of-way for the identified areas. It requires an analysis of City-owned vis-a-vis privately owned parcels. Those that the City can easily change will rank high on this criterion.

**Safety**

As noted in the literature review, safety is a key consideration when pedestrians are deciding to walk or ride their bicycle. Thus, Pacer Planning recommends that the City of Chicopee include an assessment of safety for each proposed recommendation. This assessment should rate each recommendation’s impact on the overall safety of walking and biking conditions.

**Vulnerability**

As the Town of Bedford’s plan notes, assessments “in this category reflect each recommendation’s impact on vulnerable or choice-limited users” (2015: 36). In other words, this assessment will measure the extent to which each proposed recommendation would help children, seniors, and disabled individuals and other choice-limited users. This rating will also measure how well each proposed recommendation would assist lower-income individuals and, particularly those living in environmental justice zones.

**Cost**

The City of Chicopee should also include a measure of each path’s implementation costs, and where appropriate, its maintenance costs.

**Summary**

The bicycle and pedestrian path network proposed in this chapter (Map 14) aims to build off of Chicopee’s existing sidewalk network to increase access to the key destinations identified for this report. In doing so, the proposed bicycle and pedestrian path network will also serve to connect places of employment, schools, recreational destinations, and historic sites within
Chicopee. Additional features of the path network proposed in this chapter include enhanced access to the Chicopee and Connecticut Rivers and to neighboring communities.

Pacer Planning has developed this proposed bicycle and pedestrian path network by accounting for existing sidewalks, topography, and the level of connectivity of proposed paths. However, a more thorough analysis of the proposals presented in this chapter must involve more robust measures of connectivity, right-of-way analysis, and cost, as well as measures of the paths’ impact on the safety and vulnerability of path users.

The following three chapters explicate the proposed bicycle and pedestrian path network for each sector of Chicopee. These chapters also recommend actions the City of Chicopee to undertake in order to implement infrastructural changes and make the proposed bicycle and pedestrian path network a reality.
CHAPTER 7: NORTHEAST SECTOR OF CHICOPEE

Introduction

This chapter describes and analyzes the Northeast Sector of Chicopee, and includes a Lynch analysis of the sector. This technique, as described by Kevin Lynch in the “Image of the City,” identifies five elements that are key in defining places. Additionally, we identify key destinations and existing major roads. We provide an analysis of the proposed bicycle and pedestrian and path network described above specifically for the Northeast Sector of Chicopee as well as the public engagement findings specific to this sector. We conclude with additional recommendations that are specific to the Northeast Sector of Chicopee as well as implementation strategies.

Map 15. Northeast Sector of Chicopee
The Northeast Sector of Chicopee is comprised of the area north of Route 90 and east of Memorial Drive (Route 33). It contains the Burnett Road and Westover neighborhoods as well as the Westover Air Force Base. This area is home to two destinations that we have identified for this report: The Chicopee Memorial State Park and the Bowie Elementary School. Other major points of interest include Chicopee Academy (the City’s alternative middle and high school), the Hampden Charter School of Science, and the Litwin Elementary School. In addition to the state park, Northeast Chicopee is home to seven other parks: Williams Park, Westover Industrial Gate Park, Mandalay Road Park, Preston Park, Bowie Park, Selser/Bowie Field of Dreams, and Litwin Field.

The Westover Air Force Base is the largest parcel of land in Northeast Chicopee, comprising approximately 2,500 acres. Given this large size, the base divides many key points of interest contained in this sector, namely its parks and schools. Indeed, although the Chicopee Memorial State Park and Bowie Elementary School are located only a few miles apart, the base, which is unsafe to walk through, runs directly between these points. An online search for directions using Google Maps notes that the fastest walking route between the Bowie Elementary School and the Chicopee Memorial State Park circles the Westover Air Force Base, taking pedestrians on a 7.5-mile trip that takes an estimated 2.5 hours.
Lynch Analysis

A Lynch analysis is a technique for analyzing places to determine the degree to which they are legible. In turn, the legibility of any place is determined by how well people can recognize and process elements of a place in a coherent pattern to find their way around. A Lynch analysis consists of five components, “(1) paths: routes along which people move throughout the city; (2) edges: boundaries and breaks in continuity; (3) districts: areas characterized by common characteristics; (4) nodes: strategic focus points for orientation like squares and junctions; and (5) landmarks: external points of orientation, usually an easily identifiable physical object in the urban landscape.”

The Northeast Sector of Chicopee is confined by two edges: Route 90 to the south and Memorial Drive to the west. Major paths in the Northeast Sector of Chicopee (described in more
detail below) include James Street, Westover Road, Burnett Road, New Lombard Road, and Ludlow Road. Most of these roads are one-lane two-way arterials containing a mix of land zoned for residential and business uses.

The Westover Air Force Base, which divides the sector in half, could also be considered an edge as well as a district. Since it is highly industrial and therefore unsafe and inaccessible for pedestrians, walkers and bicyclists neither use nor travel across the base’s 2,500 acres of land. At the same time, the base is a district in that it is a clearly defined geographic area where everything inside shares the common characteristic of being part of a military base.

The most prominent landmark in the Northeast Sector of Chicopee is the Chicopee Memorial State Park, which also could serve as a district. The park serves as a clear point of orientation for residents and visitors, especially given its prominent location directly off of Route 90. Nodes in the Northeast Sector of Chicopee include the intersection of Route 90 and Memorial Drive, the intersection of Westover Road and Sheridan Street, and the intersection of Burnett Road and New Lombard Road. These intersections are important junctions for anyone entering or traversing this sector of the City.
Destinations

Chicopee Memorial State Park

Pacer Planning considers the Chicopee Memorial State Park (CMS Park) as a key destination point because it is the largest park in the City. As a state park under the management of the Massachusetts Department of Conservation and Recreation (DCR), the CMS Park contains a swimming pond and beach area, and becomes a highly popular destination during the warmer months. Additionally, the CMS Park is the only place that has ample hiking and running trails within the city. In fact, the High School track teams use the CMS Park for practice. Despite its wide recreational usage, the CMS Park is largely inaccessible for visitors to arrive by means other than a vehicle. For residents living outside the Burnett Road neighborhood, it is dangerous to get to the park by walking or bicycling. This is largely due to the major connection from Interstate 90 to Interstate 291, where vehicular traffic is very high.
Three schools in Northeast Sector of Chicopee are located on the same access road (D.A.R.E. Way): Chicopee Academy, which recently moved to what was formerly the Selser School, the Bowie Memorial Elementary School, and the Hampden Charter School of Science. The Chicopee Child Development Center is also located in very close proximity to these schools.

Pacer Planning has chosen the Bowie Elementary School as a destination because of our focus on creating safer walking routes to school, specifically for the City’s K-8 students.
In addition to being bordered by Interstate 90 and Memorial Drive, Northeast Sector of Chicopee is home to four major roads, as defined by MassDOT. These roads (from north to south) include the following:

1. **New Ludlow Road**: Located directly off Memorial Drive in the northernmost area of Chicopee, and directly south of South Hadley, New Ludlow Road is a two-lane arterial. With a mix of land zoned residential and business, it leads to the Sons of Zion Cemetery. The road’s area in Chicopee is about 1-mile long, and contains about one-tenth of a mile of sidewalk.

2. **James Street**: James Street is also located directly off Memorial Drive. Three schools (Chicopee Academy at Selser, Bowie Elementary School, and the Hampden Charter School of Science) are located adjacent to this street. At the schools, James Street is a four-lane arterial with turn lanes. Most of this street has sidewalks and contains a mix of residential and business zoning.

3. **Westover Road**: Located off a rotary on the southern end of Memorial Drive near the commercial district, Westover Road is the primary access road to the Westover Air Force
Base. The road is a two-way arterial and contains a mix of residential and business zoning. Almost all of Westover Road contains a sidewalk on one side.

4. **Burnett Road:** Burnett Road is also a two-way arterial. The only access road for the Chicopee Memorial State Park is directly off Burnett Road. The Litwin Elementary School is located in close proximity to the road, with much of the school’s students living in the residential areas north of Burnett Road.

Burnett Road is located directly off Interstate 90 at a relatively dangerous intersection. In fact, the Federal Highway Safety Administration performed a road safety audit of this intersection in 2013 since the Pioneer Valley Planning Commission (PVPC) identified it as a high crash area. The audit identified several concerns, including speeding, congestion, signal visibility, and red light violations, among others (BETA Group, Inc., 2013).

**Public Engagement**

Pacer Planning held two stakeholder interviews with school administration officials from the Northeast Sector of Chicopee, from the Litwin Elementary School and Chicopee Academy. The interviewee from Chicopee Academy noted that the school currently has only two student walkers, but that they both work after school at the McDonald’s on Memorial Drive. This interviewee noted that the intersection of James Street and Memorial Drive was a problem area for these walkers.

One highlight from the interview with Litwin Elementary School was the concern that traffic on Burnett Road was far too fast. The interviewee noted, “I would not let my child walk across Burnett Road.” The interviewee also stated that this was a particular concern because much of the school’s service area covers the neighborhoods located on the both sides of Burnett Road.

The results from the electronic survey align with the interviewees’ comments. As the graph below shows, of the survey respondents selecting Burnett Road as an area with which they were familiar, about 95% stated that the speed of traffic was an issue affecting their decision to allow or not allow their children to walk to school. This statistic is well above the average of all neighborhoods, which is about 80%, and the highest of all neighborhoods surveyed. This high statistic indicates that traffic in the Burnett Road neighborhood is a major concern for parents.
At the same time, respondents familiar with Burnett Road ranked the accessibility of sidewalks lower than the average for all neighborhoods. Paired with the finding regarding the high speed of traffic, the perception that sidewalks are relatively accessible in this neighborhood indicates that traffic calming measures may increase the likelihood of students to walk to school.
Figure 12. Northeast Sector of Public Engagement Survey Findings
Identification of Priority Paths in the Northeast Sector of Chicopee

The map below depicts the proposed paths that we have determined as well the priority paths (Burnett Road and Sheridan Street) within the larger citywide bicycle and pedestrian path network. We have identified these locations as paths that the City of Chicopee can begin to change to connect parks and schools in this sector of Chicopee.

Map 17. Proposed Bicycle and Pedestrian Path Network for the Northeast Sector of Chicopee
In the bike and pedestrian path network above, the proposed paths already containing sidewalks are highlighted in bright green while those with no sidewalks are highlighted in the darker shade of green. It is important to note that many of the paths without existing sidewalks are off-road paths, such as those running through the Chicopee Memorial State Park.

**Recommendations for the Northeast Sector of Chicopee**

Based on this bike and pedestrian path network, Pacer Planning recommends a number of specific actions for the City of Chicopee to consider related to improving the walkability of the Northeast Sector of Chicopee and accessibility of this sector’s assets.

**Recommendation 1: The City of Chicopee should undertake traffic calming measures on Burnett Road with a focus on the safety of student walkers.**

As our public engagement has shown, Burnett Road is a major cause for concern among school administrators and parents alike. Therefore, Pacer Planning proposes that the City of Chicopee implement traffic calming measures on Burnett Road. As the rendering below shows, we believe that bicycle lanes will both slow traffic and enhance bicyclist access to the Chicopee Memorial State Park. The addition of crosswalks, particularly connecting to the sidewalk on the opposite side of the Chicopee Memorial State Park, would also be instrumental in calming traffic on Burnett Road. Additional signage notifying drivers that there is a crosswalk leading to the Chicopee Memorial State Park will also assist in reducing traffic speed. Finally, the addition of street trees along both sides of Burnett Road will help with traffic calming.

With regard to traffic calming for students walking across Burnett Road to get to and from the Litwin Elementary School, Pacer Planning recommends that the City of Chicopee investigate the feasibility of flashing pedestrian lights on Burnett Road.
Image 29. Rendering of Burnett Road Traffic Calming
Recommendation 2: Improve pedestrian access to Chicopee Memorial State Park at the Burnett Road entrance.

Currently, the Burnett Road entrance to Chicopee Memorial State Park has no sidewalks, bike lanes, or any other pedestrian or bicyclist facilities. Moreover, although there are sidewalks on the side of Burnett Road that is opposite to the Chicopee Memorial State Park entrance, there are no sidewalks on the same side as the park entrance. There are also no crosswalks that connect the side of the street with sidewalks to the park entrance. Image 30 shows how the City could add an additional pedestrian and bicyclist entrance on the right side of the current entrance.
Image 30. Rendering of Entrance to Chicopee Memorial State Park
Recommendation 3: Create more points of entry for the Chicopee Memorial State Park and incorporate the Chicopee Memorial State Park’s trail system into the existing path network.

Currently, the Chicopee Memorial State Park has only one major point of entry on Burnett Road. This lack of entrances makes the park inaccessible to community residents wishing to use alternative modes of transportation (e.g. walking or biking) to access the park from different areas. For example, residents living directly to the west of the park are unable to easily access it currently.

The map below shows proposals for two new formal entrances to Chicopee Memorial State Park, both on Sheridan Street. As Map 18 shows, both new entrances are proposed to be on privately owned land. The two parcels that the northernmost entrance (directly below Westover Air Reserve Base) would run through are owned by the BDF Realty Company and the Westover Metropolitan Development Corporation, respectively. The proposed entrance to the south would require a path running through land that is owned by residents.

Image 31 depicts how the proposed entrance would appear. The addition of bicycle paths on both sides of the road would aid in connectivity. Furthermore, the addition of street trees would assist in traffic calming. New signage would notify the public of this alternative entrance specifically catered to pedestrians and bicyclists. Finally, Pacer Planning proposes adding a separated sidewalk so pedestrians can feel protected from traffic.
Map 18. Proposed Additional Entrances and Paths to Chicopee Memorial State Park
Image 31. Rendering of Proposed Second Entrance to Chicopee Memorial State Park
Recommendation 4: Investigate improvements for the intersection of Memorial Drive (Route 33) and James Street.

As Table 1 shows, PVPC crash data reveals that the intersection at Memorial Drive and James Street had 33 auto crashes between 2011 and 2013 ranking 72nd of the highest-crash intersections in the entire region. During site visits, Pacer Planning also observed the difficulty of crossing this intersection by foot. However, the PVPC data also show that there are currently no planned improvements to this intersection. To that end, Pacer Planning recommends that the City of Chicopee work to improve the safety of this intersection through the addition of a raised crosswalk, a traffic island, and increased signage.
Image 32. Rendering for Improved Safety of James Street and Memorial Drive Intersection
Implementation

6 Months

Chicopee Memorial State Park

- Work with the Massachusetts Department of Conservation and Recreation to discuss the feasibility of adding both new access points and a new paved pedestrian and bicycle path to the existing access road off of Burnett Road.
- Work with property owners in the areas directly adjacent to the proposed entrances, including BDF Realty, the Westover Metropolitan Development Corporation, and residents and do outreach to these owners.

Burnett Road

- Conduct public engagement and outreach with community residents living on Burnett Road to understand their perspectives on traffic calming measures such as flashing pedestrian lights and bicycle lanes.

James Street and Memorial Drive Intersection

- Conduct a road safety audit at the intersection of James Street and Memorial Drive to determine whether the changes proposed here would enhance pedestrian safety.

1 – 2 Years

Chicopee Memorial State Park

- Assess the path network proposed here and apply for funding through the Massachusetts Department of Conservation and Recreation’s Recreational Trails Program. This program generally provides grants for project costs ranging from $2,000 to $50,000 for projects related to both motorized and non-motorized trail construction. More information about this program can be found on the Massachusetts Department of Conservation and Recreation’s website.
- Coordinate with the Public Works Department to assess the existing Burnett Road entrance and discuss painting two crosswalks to connect the park entrance to the opposite side of Burnett Road.

Burnett Road

- Work with the Engineering Department and Department of Public Works to measure lane widths and create realistic sectional designs for pedestrian friendly improvements.
• Paint bike lanes on both sides of Burnett Road and monitor bicycling levels.

**James Street and Memorial Drive Intersection**

• Begin to make improvements found during the road safety audit.

**3 – 5 Years**

**Chicopee Memorial State Park**

• Construct new paths throughout the park, proposed entrances, and sidewalks at the existing park entrance with secured funding based on the assessment recommended above.

**Summary**

The Westover Air Force Base makes the Northeast Sector of Chicopee highly difficult for pedestrians and bicyclists to traverse. Moreover, 95% of the parents responding to the Chicopee Student Walker Safety Survey who were familiar with Burnett Road reported that the speed of traffic in the Burnett Road neighborhood influenced their decision to allow or not allow their child to walk to school. To address these challenges, Pacer Planning has proposed a bicycle and pedestrian path network that aims to better connect the sector’s schools and parks.

Within this bicycle and pedestrian path network, Pacer Planning recommends that the Chicopee Planning Department prioritize Burnett Road and Sheridan Street as areas for short-term action. This is because there is concern surrounding the speed of traffic as well as the fact that these roads are in such close proximity to the Chicopee Memorial State Park. Changes that we recommend for Burnett Road include the addition of traffic calming measures such as bicycle lanes and increased pedestrian crosswalks, particularly to connect the areas directly across from the Chicopee Memorial State Park and the Litwin Elementary School. Additionally, we recommend that the Chicopee Planning Department add two additional entrances to the Chicopee Memorial State Park on Sheridan Street to increase its accessibility for both residents and visitors.

To implement these changes, Pacer Planning recommends that the Chicopee Planning Department meet with stakeholders in the short-term, begin to work with MassDOT, the Engineering Department, and the Department of Public Works within 1 – 2 years, and fully implement infrastructural changes within 3 – 5 years.
CHAPTER 8: NORTHWEST SECTOR OF CHICOPEE

Introduction

This chapter describes and analyzes the Northwest Sector of Chicopee. We include a Lynch analysis of the sector. This technique, as described by Kevin Lynch in the “Image of the City,” identifies five elements that are key in defining places. Additionally, we identify key destinations and existing major roads. We provide an analysis of the proposed bicycle and pedestrian and path network described above specifically for the Northwest Sector of Chicopee. We conclude with additional recommendations that are specific to the Northwest Sector of Chicopee as well as implementation strategies.

Map 19. Northwest Sector of Chicopee
**Description of Sector**

The Northwest Sector of Chicopee contains recognized transportation issues. This sector, as a whole, lacks connection due to the presence of eight major roads that divide the area and limit access. Furthermore, the presence of the I-391 interstate creates a large barrier to potential path and bicycle network connections. This is important to consider because there are seven schools in Northwest Chicopee to which Pacer Planning aims to provide safer and more direct routes.

Additional concerns for the Northwest Sector of Chicopee include identified environmental justice areas within the Willimansett neighborhood. An environmental justice area is any census tract in which twenty percent or more individuals live in poverty and/or thirty percent or more of the population is a racial or ethnic minority. Due to the citywide lack of pedestrian and bicycle networks, Chicopee’s existing infrastructure does not provide equal access to low-income residents of the City who do not own a car. Creating a path network that allows all individuals to traverse the City regardless of their age, ability, or socioeconomic status is the primary goal of Pacer Planning. To provide this type of access at a citywide scale, the streets and sidewalk networks within all sectors require significant improvement.

The Northwest Sector of Chicopee is located in the area north of I-90 (Massachusetts Turnpike), west of Memorial Drive, and east of the Connecticut River. This sector includes the Aldenville, Fairview, and Willimansett neighborhoods. This sector is also home to one identified destination, the Bellamy Middle School, but also contains six other schools which include the Streiber Memorial, Fairview Elementary, St. Joan of Arc, Lambert-Lavoie, Stefanik, and Chicopee Comprehensive High School. In addition to the many educational resources in the area, the Northwest Sector of Chicopee has natural and recreational resources that include Nash Field, Rivers Park, Ray Ash Park, Sarah Jane Park, and the Mountain Lake. An additional recreational resource is the Connecticut River; however, there is only one main access point at Nash Field.
Lynch Analysis

**Map 20. Lynch Analysis of the Northwest Sector of Chicopee**
Pacer Planning applied the Lynch Analysis approach to the Northwest Sector of Chicopee. Edges within the Northwest Sector of Chicopee include Route 391, Interstate 90 (Massachusetts Turnpike), and Memorial Drive as they act as boundaries and impact the connectivity of roads, sidewalks, and other pathways. Major paths include James Street, Prospect Street, Yelle Street, Chicopee Street, Meadow Street, Grattan Street, Granby Road, and Montgomery Street. These paths offer direct access to several of the area’s schools and parks, as well as, the residential and commercial areas within the sector.

The utility corridor can be defined as a district as well as an edge due to its prominence in the Northwest Sector. The utility corridors are privately owned, but have the potential to be incorporated into the path network through negotiated easements. Additionally, there are several nodes, or points of orientation, within the area that include the Bellamy Middle School, as well as, the Streiber Memorial, Fairview Elementary, St. Joan of Arc, Lambert-Lavoie, Stefanik, and Chicopee Comprehensive High School.

A landmark within the Northwest Sector is the Connecticut River waterfront, which also extends through the South Sector of Chicopee. The Connecticut River is nationally recognized and serves as a flagship natural resource in New England. The river is 410 miles long and runs from the Canadian border (north) to the Long Island Sound (south). The Connecticut River watershed is spread over an area of 11,260 square miles (www.connecticutriver.us). Additional landmarks include the Bellamy Middle School that is also a park and the Mountain Lake.

**Destinations**

**Bellamy Middle School**

The Bellamy Middle School is located in the Fairview neighborhood. Its service area includes areas on the western and eastern sides of Memorial Drive, a major traffic-heavy road in the City. Students living within the school’s service area, especially on the eastern side of Memorial Drive are unable to take the bus because they are in the school-designated “walk zone.” As a result, they must either be driven by car or take an unsafe walking route to school. Memorial Drive acts as a barrier for school children due to its high traffic volumes and traffic speeds. Additional barriers (high traffic speeds and other safety concerns) include Pendleton Avenue. Pendleton provides a direct access point to the school but lacks sidewalk infrastructure.
and pedestrian scale design. Improving accessibility to the school is important to its multi-use sports field that turns into a park after school hours.

**Paths**

Northwest Chicopee is divided by Interstate 391, which runs north-to-south near the center of the sector. The area also has eight major roads as defined by the MassDOT.

1. **James Street** - James Street is a two-lane, two-way street. It passes through Memorial Drive from Northwest Chicopee and continues into Northeast Chicopee. James Street provides access to the Fairview neighborhood.

2. **Prospect Street** - Prospect Street is a two-lane, two-way street. Prospect runs through a predominantly residential area in the Fairview neighborhood.

3. **Yelle Street** - Yelle Street is a two-lane, two-way street. Yelle connects to Montgomery Street and provides access to the Fairview and Willimansett neighborhoods.

4. **Chicopee Street** - Chicopee Street, also known as Route 116, is a two-lane, two-way street. Chicopee Street runs directly through the Willimansett neighborhood in residential and commercial areas, continues south beyond the I-90, and provides direct access to Sarah Jane Park.

5. **Meadow Street** - Meadow Street is a two-lane, two-way street that runs parallel to Chicopee Street and connects to Chicopee Street right before the I-391. The Callaway Golf and several other service businesses are located on this major road.

6. **Grattan Street** - Grattan Street is a two-lane, two-way street that transforms into a four-lane, two-way street (Route 141). Grattan connects residential and commercial districts, runs through the Aldenville neighborhood, and travels under the I-90 into South Chicopee.

7. **Granby Road** - Granby Road is a two-lane two-way road. Granby runs through the Aldenville neighborhood and connects to Memorial Drive and into South Chicopee.

8. **Montgomery Street** - Montgomery Street is a two-lane, two-way street. Montgomery provides direct access to Chicopee Comprehensive High School as well as the St. Stanislaus Cemetery. Montgomery Street run beyond 1-90 overpass and into South Chicopee.
Public Engagement

Pacer Planning conducted one stakeholder interview with a school administration official in the Northwest Sector of Chicopee. The interviewee, a faculty member at Bellamy Middle School, identified Memorial and Pendleton Avenue as sites in need of safety upgrades. “Make it [Memorial and Pendleton Ave.] safer; it’s a busy intersection…” The interviewee noted that busy traffic conditions result in unsafe conditions for pedestrians. The interviewee went on to state that providing easier access to the entrance of Bellamy would create safer walking conditions for students, and Pacer Planning contends, will reduce traffic congestion.

The results from the electronic survey align with the overall sentiment of the interviewee. As Figure 13 shows, the speed of traffic was a persistent prohibitive factor in whether parents felt comfortable allowing their children to walk to and from school. This point is underscored by the data displayed below showing that, on average, 80% of all respondents from the Northwest Sector of Chicopee identified the speed of traffic as being a priority concern. Respondents from Willimansett identified ‘safety of intersection’ as the number one issue, and respondents from Aldenville ranked this as the second most relevant issue impacting this decision.
Figure 13. Northwest Sector of Chicopee Public Engagement Survey Findings

Issues affecting parents' decision to allow or not allow children to walk to and from school in Chicopee:
- Speed of Traffic Along Route
- Accessibility of Sidewalks or Pathways
- Amount of Traffic Along Route
- Distance
- Safety of Intersections
- Crossing Guards
- Violence or Crime
- Time
- Convenience of Driving

Legend

Neighborhoods Surveyed in Northwest Chicopee
Identification of Priority Paths in Northwest Sector of Chicopee

Map 21 depicts the proposed paths as well the priority paths (Utility Corridor and Pendleton Avenue) within the larger citywide bicycle and pedestrian path network. We have identified these locations as paths that the City of Chicopee can begin to improve the connection between this sector’s parks, schools, and environmental resources.

Map 21. Proposed Bicycle and Pedestrian Path Network for the Northwest Sector of Chicopee
The proposed paths also aim to create pedestrian access along the Connecticut River waterfront. This would allow the City to maximize the numerous recreational and natural benefits that the waterfront offers. Furthermore, it is important to note that the eastern part of the sector lacks sidewalks on the majority of the proposed paths. The lack of sidewalks requires that the City look at improving the infrastructure in this area.

Pacer Planning’s first priority path for this sector, as mentioned previously, includes the utility corridor that runs adjacent to the Bellamy Middle School. The utility corridor presents an opportunity to use an already established path network located directly beneath the power lines. The land beneath the power lines is often maintained and accessed by the utility company. Using the utility corridor as a path would use open space effectively and provide an off-road network that the public could use. Furthermore, the utility corridors travel through the majority of the Northwest Sector, which would improve path network connectivity and accessibility.

Pendleton Avenue is our second priority path because it provides direct access to the Bellamy Middle School. The current speed limit for the road is 35 miles per hour; however, it can be conducive to higher speeds because it is a straight road, has few trees, and lacks of traffic calming interventions. Pendleton Avenue has a sidewalk on only one side of the road and a limited number of crosswalks. This road is a priority for Pacer Planning due to its location near the middle school and the need to improve safety conditions for students who walk or bike to school.

**Precedent Study**

**Utility Path Corridor – San Jose, California**

The city of San Jose, California is much larger than Chicopee in terms of population and land area. Despite the lack of similarities between the two cities, San Jose and Chicopee have shown interest in using their utility corridors for pedestrian and bicycle networks. Most utility corridors are privately owned which may make it more difficult for the City to negotiate access to the available open space. Chicopee, Massachusetts should examine the utility corridor near the Bellamy Middle School. As a result, Pacer Planning has chosen to look into the Albertson Parkway in San Jose as a precedent study for how to incorporate path networks in the privately owned utility corridors.

The Albertson Parkway opened in 2009 and currently includes 0.5 miles of paved trails. The trail had replaced a blighted path filled with trash. The parkway uses the open space located
under PG&E’s electric lines. In order for San Jose to be granted access to that open space, negotiations between the City and PG&E concluded that the trail could be constructed with respect to the maintenance and safety needs of PG&E (Rails-To-Trails Conservancy, 2016). The Albertson Parkway proves that negotiations related to accessing utility corridors can be successful and meet the needs of both the City and the privately owned company.

**Recommendations for the Northwest Sector of Chicopee**

Based on the case study described above, our public engagement data, and an analysis of priority paths, Pacer Planning will has created a set of recommendations for the Northwest Sector of Chicopee. The recommendations are primarily focused on our priority paths that include the utility corridor and Pendleton Avenue; however, a recommendation for the Willimansett Bridge will also be provided. The goal of these recommendations will be to improve and expand upon existing path networks.

**Recommendation 1: Create a bike lane and pedestrian footpath under the utility corridors adjacent to Bellamy Middle School.**

Pacer Planning recommends that City of Chicopee contact the owners of the utility corridors in order to begin negotiations for a pedestrian and bicycle-accessible path under the existing powerlines. This path will likely require an easement, as well as, a written agreement outlining the conditions for shared-use. The City must be considerate of the safety and maintenance needs of the utility company. The City may use packed gravel or pavement for the construction of the pathway; however, the path can also remain as “off-road” to better enhance to the surrounding open space and environment.

**Recommendation 2: Improve pedestrian and bicycle access on Pendleton Avenue and Bellamy Middle School.**

Pacer Planning recommends that the City of Chicopee improve pedestrian and bicycle accessibility on Pendleton Avenue. During our public engagement, survey respondents voiced safety concerns related to the area. In order to address these concerns, the City should provide bike lanes, with rumble strips, on either side of Pendleton Avenue. Furthermore, there should also be a designated foot path connecting the existing sidewalk to the utility corridor. A raised crosswalk closer to the entrance of Bellamy Middle School is also recommend to provide access for students and their families while also providing a traffic calming intervention. Adding plants, shrubs, and trees will also aid in making the area more pedestrian-scale.
Images 33 and 34 outline the proposed path network that run through the Utility Corridor as well as Pendleton Avenue. The paths aim to connect residential and open space areas to the Bellamy Middle School and Pendleton Avenue. This network would improve accessibility in the area and making walking to or from school more efficient.
Image 33. Proposed Path Networks Surrounding Bellamy Middle School
Image 34. Rendering of Improved Pedestrian and Bicyclist Accessibility on Pendleton Avenue
Recommendation 3. The City of Chicopee provide a shared-use path on the Willimansett Bridge.

The bridge connects Chicopee and Holyoke over the Connecticut River and carries both Route 116 and Route 141. Currently, if a bicyclist were to approach the Willimansett Bridge, they would find that the shoulder narrows significantly once on the bridge. Due to the raised curb, bicyclists are forced to stop before the bridge, get off their bike, and move to the sidewalk which can cause safety concerns.

The City should designate the shoulder of Route 116 as a bike lane, as per Image 35. The sidewalk should also become designated as a shared-use path near the bridge. It is also recommended that the City remove the raised curb to ease the transition from the bike lane onto the sidewalk. Furthermore, the addition of street trees and shrubs will enhance the visual landscape. With this recommendation, access to the Willimansett Bridge and Holyoke will be improved.
Image 35. Rendering of Improved Bicycle Accessibility on the Willimansett Bridge
Implementation

6 Months
Utility Corridor:
- The City of Chicopee should contact the utility company to negotiate a shared-use path.
- Continue discussions with the utility company and other interested parties to create a written agreement on the conditions for a shared path.
- Designate a committee or commission to monitor and protect the path.

Pendleton Avenue:
- Gather public input on specific design recommendations, such as street trees, raised crosswalks, and rumble strips that could be implemented on Pendleton Avenue.
- The City should connect Bellamy Middle School with the Safe Routes to School program in order to identify infrastructural improvements directly related to the safety of students walking or biking to school.

Willimansett Bridge:
- Engage the public on how they would like to see bicycle accessibility improved on the Willimansett Bridge.
- Contact the City of Holyoke propose that the shared-use path continues beyond the Willimansett Bridge to increase connectivity of path networks.

1 – 2 Years
Utility Corridor:
- For any shared path, the City of Chicopee should provide signage and wayfinding elements on the path.
- The City of Chicopee should identify at least three or four access points for pedestrian and bicyclists to enter and exit the path.

Pendleton Avenue:
- Designate a bike lane on the north side of the avenue. This north side has existing sidewalks and a bike lane should improve accessibility.
- The City of Chicopee should also add rumble strips to the side of the bike lanes in order to alert cars if they are crossing over the shoulder.
• Add native plants, trees, and shrubs to provide pedestrian-scale design elements to the streetscape.
• Add pedestrian signals and raised crosswalks close to the Bellamy Middle School entrance.

**Willimansett Bridge:**
• Designate the shoulder of Route 116 as a bike lane.
• Add signage that identifies the bike lane, as well as, the shared-used path.
• Remove the raised curb prior to the Willimansett Bridge to help bicyclists transition from the bike lane onto the shared-used sidewalk.

**3 – 5 Years**

**Utility Corridor:**
• Enhance security and nighttime visibility by adding solar-charged lights or glow-in-the dark materials onto the path.
• Add additional path access points.

**Pendleton Avenue:**
• Designate another bike lane (with a rumble strip) on the south side of the avenue.
• Discuss the potential of lowering the speed-limit in the area if traffic continues to move fast.

**Summary**

The Northwest Sector of Chicopee is home to seven schools and several parks. This sector also has access to the Connecticut River and Mountain Lake making the area rich in educational, recreational, and natural resources. Pacer Planning has proposed a path network and identified priority paths (Utility Corridor and Pendleton Avenue) within the larger citywide bicycle and pedestrian path network. Furthermore, through our public outreach, it was identified that 80% of all respondents from the Northwest Sector of Chicopee identified the speed of traffic as being a priority concern.

In order to resolving high traffic speed, as well as other identified concerns, Pacer Planning provided several recommendations. The first set of recommendations includes those for the Utility Corridor which encourage the City and utility company to negotiate a shared path under the power lines. Recommendations for Pendleton Avenue included the application of
traffic calming interventions, implementing a bike lane, and designating a footpath. Finally, the recommendations for the Willimansett Bridge work to improve bicyclist accessibility my removing the curb, directing a bike lane onto the sidewalk, and offer a safe bicycle route into Holyoke.

To implement these changes, Pacer Planning recommends that the Chicopee Planning Department meet with community members and stakeholders in the short-term, begin to implement low-cost infrastructural changes within 1 – 2 years, and fully implement and maintain infrastructural changes within 3 – 5 years.
CHAPTER 9: SOUTH SECTOR OF CHICOPEE

Introduction

This chapter describes and analyzes the South Sector of Chicopee. We include a Lynch analysis of the sector. This technique, as described by Kevin Lynch in the “Image of the City,” identifies five elements that are key in defining places. Additionally, we identify key destinations and existing major roads. We provide an analysis of the proposed bicycle and pedestrian and path network described above specifically for the South Sector of Chicopee. We conclude with additional recommendations that are specific to the South Sector of Chicopee as well as implementation strategies.

Map 22. South Sector of Chicopee
Description of Sector

The South Sector of Chicopee is full of culture, history, commerce, and residential communities. Within the South Sector of Chicopee there is Elms College, historic mills like Dwight Manufacturing, as well as downtown Chicopee. Together these establishments pay homage to the City’s rich cultural history. This sector is also home to local public services, like the library and City hall. These offerings contribute to the character of the bordering residential neighborhoods, which has more urban characteristics than other sectors of the City.

Due to the diverse range of activities and sites located within the South Sector of Chicopee, this sector attracts many members of the community and should only continue to grow in a positive direction. Despite its name, the position of Chicopee’s downtown is not centered within the City’s boundaries. On many occasions, the client has voiced strong desires to revitalize the downtown corridor. Due to its non-central location, the downtown is underutilized by Chicopee residents and potential business owners. However, the City has begun implementing changes to revitalize the downtown.

The City of Chicopee has an existing revitalization project for one of its oldest industrial communities, The West End Plan, in which the purpose is to create a downtown neighborhood that is “affordable, attractive, distinctive, healthy, hip, and safe” (2012). The goals of the West End Plan align with the goals of this report and Chicopee’s Open Space Plan, abetting the creation of a cohesive downtown identity. Furthermore, the recent addition of the Canal Walk has demonstrated the City’s dedication to sector improvements and will act as a connector to the Chicopee’s other sectors. By combining the City’s desires, both tangible and envisioned, with the outcome of this report, the South Sector of Chicopee has the unique potential to be established as Chicopee’s lively and active downtown destination.

The South Sector of Chicopee includes four neighborhoods: Sandy Hill is in the north; Chicopee Falls occupies the eastern half; the southern tip of Willimansett sits above the Chicopee River in the far northwest, and Chicopee Center is bordered by the Chicopee and Connecticut Rivers lies. Some of Chicopee’s most prominent natural, historic, and cultural features are located in Chicopee Center. These features include the historic West End, the Cabotville Mill Complex, Delta Park, the downtown commercial center, and the Chicopee and Connecticut Rivers riverfronts. Other notable features include Atwater Park, the Calvary and Fairview Cemeteries, Elms College, and the Chicopee Public Library on Front Street. Though
much of the downtown area itself is easily traversed by foot, bike provisions are minimal and
bicycle and pedestrian provisions that connect to other areas of Chicopee are nonexistent.

Directly to the east of Chicopee Center lies Chicopee Falls, which is divided into
Northern and Southern Chicopee Falls by the Chicopee River. Front Street serves as the primary
connecting road from the Chicopee Center to Chicopee Falls. Both Chicopee High School and
Dupont Middle School are along Front Street, and moving further eastward lies Szot Park,
Lincoln Park, and Chicopee Academy. In the east is the Delta Hills Conservation Area, which is
bound by the Chicopee River on the north and Interstate 291 on the east.

In Northern Chicopee Falls directly above the Chicopee River and south of Interstate 90,
long auto-centric corridors characterize the landscape. In the center, Grattan Street, Montgomery
Street, Memorial Drive, and Sheridan Street radiate out of the convergence of Church Street and
Broadway Street just below in Southern Chicopee Falls. Belcher Elementary School and Anna E.
Barry Elementary School, as well as Garity Playground, lie within the vertical boundaries of
Grattan and Montgomery Streets. Northern Chicopee Falls is connected to Chicopee Center by
Granby Road on the west and to Springfield by Fuller Road on the east.

The Chicopee River cradles the circular Sandy Hill district, isolating the neighborhood
from Chicopee Center and Southern Chicopee Falls. Granby Road divides this district from the
southwest to the northeast, with small clusters of residencies stemming from the main road.
Interstate 391 and Interstate 90 create barriers of connectivity on Sandy Hill’s west and north
boundaries respectively.

The presence of two rivers in addition to four major highways (Interstate 90, 291, 391,
and 91) pose challenges to creating more intra-sectoral and regional connectivity within Southern
Chicopee. However, the rivers, schools, and historic and cultural features within this sector also
provide unique attractions that deserve prioritization.
Lynch Analysis

Map 23. Lynch Analysis of the South Sector of Chicopee
Pacer Planning applied the Lynch Analysis approach to the South Sector of Chicopee. Within the South Sector of Chicopee, Interstate 391, Interstate 90 (Massachusetts Turnpike), Interstate 291, and the Chicopee River act as barriers that inhibit connectivity of pathways, roads, and areas of interest. These barriers, both natural and built, prevent connectivity due to safety concerns. Paths within the sector include Front Street, Granby Road, Grattan Street, Montgomery Drive, Memorial Drive, Sheridan Street, and Fuller Road, which connect many of the sector’s points of interest effectively, but only via a motor vehicle. Districts within the sector include a historic West End in the upper left-hand corner, a school district along Front Street, a downtown commercial district southwest of Front Street, a residential district in the center, and an open space district in the east. The junction between Grattan Street, Montgomery Drive, Memorial Drive, and Sheridan Street north of the Chicopee River constitutes a major node within the sector. Front Street acts as another important node, connecting many of the sector’s resources and linking the western and eastern halves of the sector. Lastly, landmarks within the sector include the RiverMills Senior Center, the Chicopee Public Library, Chicopee City Hall, Elms College, historic mill sites, and other places within Chicopee’s downtown center.
Destinations

Front Street Corridor

As noted in the Client Directive, one of the destinations is the lively Front Street. The zoning allows of a variety of uses on Front Street, ranging from single-family residential, multi-family residential, commercial, public services and educational sites. There are quite a few public attractions situated on this strip such as the Chicopee Public Library, Department of Parks and Recreation, several auto-repair shops, and diverse hosts of other small business (i.e. diners and salons). Also located on Front Street are three schools, the Dupont Middle School, the newly opened Chicopee High School, and the Saint Stanislaus School. With the addition of the new high school and designation of the Dupont School as a middle school, Front Street now has vastly increased traffic volume and volatile traffic patterns during the morning and evening.
commutes. Pacer Planning recognizes Front Street as a site of major congregation for a diverse range of Chicopee residents and visitors.

**Paths**

The South Sector of Chicopee includes Routes 116, 141, 33 and Interstates 90, 91, and 391. In accordance to the Mass DOT definitions, Pacer Planning additionally recognizes the following streets as major roads within this sector. These roads (from east to west) include the following:

1. **Fuller Road**: Fuller Road is a two-lane two-way road that runs horizontally between Interstate 90 and the Chicopee River. Fuller is bordered mainly by commercial sites and open space, with few residential areas as Fuller nears Memorial Drive.

2. **Sheridan Street**: Sheridan Street is a narrow two-lane, two-way street that runs through the Northeast Sector and connecting to Memorial Drive in the South Sector. There are some sidewalks adjacent to the road.

3. **Broadway Street**: Broadway Street is a two-lane, two-way street that connects Chicopee with the city of Springfield. Broadway is predominantly hosts single and multi-family residences, with some commercial uses. This street has some on-street parking and a PVTA route. The entire street has at least one sidewalk and a break-down lane. The street connects a cemetery, parks, and a baseball field.

4. **Memorial Drive**: Memorial Drive is a multi-lane arterial street that connects the South Sector of Chicopee to the Northeast and Northwest Sectors of Chicopee. The South Sector section of Memorial Drive is mostly lined with open green space and a few commercial uses. When traveling north on Memorial Drive from the South Sector to the Northeast Sector of Chicopee, there is a notable transition from open space to a large commercial hub bordered by plentiful shopping plazas.

5. **Montgomery Drive**: Montgomery Street is a two-lane, two-way street. In the South Sector of Chicopee, Montgomery is predominantly multi-family residential with some commercial zones. Montgomery provides direct access to Belcher Elementary School.

6. **Grattan Street**: Grattan Street is a two-lane, two-way street that transforms into a four-lane, two-way street (Route 141). The street connects residential and commercial areas. Grattan runs through the Aldenville neighborhood and beyond the 1-90 into the South Sector of Chicopee.
7. **Front Street:** Front Street is a two-lane, two-way street that has on-street parking and PVTA bus routes. Front Street runs parallel to the Chicopee River. This street hosts mixed-use residencies, multi-family homes, commercial businesses, educational uses, and public services.

8. **Granby Road:** Granby Road is a two-lane two-way road that runs through a predominately residential neighborhood and connects to the Interstate 391 and the Northeast Sector of Chicopee. Granby has some sidewalks, but they are fragmented. Granby has wide breakdown lanes adjacent to both sides of the street.

**Public Engagement**

Although the South Sector hosts many of Chicopee’s schools, Pacer Planning was unable to coordinate one-on-one meetings with any of this sector’s school officials. The results of our online survey approach supports the following recommendations for the South Sector. Responses pertaining to the South Sector were targeted to the neighborhoods of Chicopee Center and Chicopee Falls. The most notable highlights of these results show that speed of traffic, safety of intersections, and accessibility of sidewalks/pathways are the most prominent concerns influencing the decision of parents allowing their children to walk to and from school.
Figure 14. South Sector of Chicopee Public Engagement Survey Findings
When compared to the average response of all neighborhoods, the safety of intersections is ranked much higher in the South Sector of Chicopee. The comparison also highlights that the amount of traffic along the route is a greater concern for the average of all neighborhoods than specifically within the South Sector of Chicopee. Since four schools are proximate to Front Street, Pacer Planning designate Front Street as a priority path within the South Sector of Chicopee

**Identification of Priority Paths in the South Sector of Chicopee**

Map 24 depicts the proposed bicycle and pedestrian path network for the South Sector of Chicopee. The proposed on- and off-road paths are represented by the dark green dashed line. The bright green dashed line indicates paths within our proposed network that already have existing sidewalks. The red star indicates the Front Street Corridor, one of four destinations provided by our Client. This destination also serves as the identified priority path for the sector.

Within this sector, the Front Street corridor is a major community connector. The corridor connects the Dupont Memorial School, Chicopee High School, residential neighborhoods located south and east of Front Street, and incoming traffic from the junction between Grattan Street, Montgomery Drive, Memorial Drive, and Sheridan Street. Moving westward, Front Street leads to attractions such as the Chicopee Public Library, Elms College, Chicopee City Hall, the Chicopee Canal RiverWalk, the historic West End, Chicopee’s downtown commercial center, and the various parks. Prioritizing this corridor for improvement will significantly increase accessibility to these attractions and encourage transport via walking and biking laterally across the sector.
Map 24. Proposed Bicycle and Pedestrian Path Network for the South Sector of Chicopee
Precedent Study

**Lewiston Levee Parkway, Lewiston, Idaho**

Lewiston, Idaho has a population of approximately 32,554 persons making it smaller than the City of Chicopee which has about 56,741 persons (United States Census Bureau, 2016). Though the population size of these cities differs, their land area is comparable with Lewiston having 17.2 square miles of land area and Chicopee having 22.8 square miles (2016). Furthermore, the cities have similar median household incomes centering around $47,000 (2016). Though there are differences between the two cities, both Lewiston and Chicopee have levees owned and operated by the Army Corps of Engineers present in their localities. Lewiston, however, has used the levee to create a successful recreational trail called the Lewiston Levee Parkway.

The Lewiston Levee Parkway is part of the greater Clearwater and Snake River National Recreation Trail (Rails-To-Trails Conservancy, 2016). The parkway runs 12.3 miles using a predominately asphalt surface. Other parkway amenities include wheelchair accessibility, a marina for fishing and boating, cross-country trails, and access to the park (2016). To tie into the area’s history, the parkway includes plaques that describe the journey of Lewis and Clark as they traveled through Lewiston on their way to the Pacific coast (2016). The City of Chicopee can follow Lewiston’s example due to Chicopee’s history and environmental assets.

**Recommendations for South Sector of Chicopee**

Pacer Planning recommends several measures that Chicopee can adapt in order to increase pedestrian and bicycle accessibility to the many historic, cultural, and natural resources of the South Sector while also improving their overall connectivity.

**Recommendation 1: Improve Front Street’s pedestrian and bicycle connectivity to surrounding assets and residences.**

Front Street’s location amidst several of the City’s most valuable assets provides an opportunity to improve walking and biking accessibility to many attractions simply by improving the path. Pacer Planning recommends delineating paths to these locations while creating a greater sense of connectivity to adjacent attractions. Map 25 depicts proposed paths connecting Front
Street to a nearby cemetery, the Bemis Pond Upper Reservoir, Szot Park, and the Chicopee River. In addition, these paths will inadvertently increase connectivity to the residential neighborhood south of Front Street, as well as St. Stanislaus School, Dupont Memorial Middle School, and Chicopee High School.
Map 25. Proposed Paths and Infrastructure along the Front Street Corridor
**Recommendation 2: Make Front Street more accessible and safe for pedestrians, bicyclists, and student walkers through infrastructure improvements.**

Survey results from Pacer Planning’s public engagement initiative show that 80% of the survey respondents (n=106) believed that the speed of traffic to be a major safety concern in a parents’ decision to allow or not allow their child to walk to school in Chicopee. Site visits to Front Street, support these findings, as Pacer Planning found it surprisingly difficult and dangerous to cross the street, despite the presence of a sidewalk and the short crossing distance.

With these results in mind, Pacer Planning recommends Chicopee prioritize implementing traffic calming measures on Front Street. These measures may include raised intersections, flashing pedestrian lights, increased presence of stop signs, speed humps, and vegetation. Pacer planning also recommends increasing pedestrian and bicycle infrastructure, which may also calm traffic. Image 32 below shows how Front Street could look after the implementation of recommended measures.
Image 37. Rendering of Proposed Pedestrian and Bicycle Infrastructure on Front Street
As shown in Image 33 (Front Street), few pedestrian-scale features exist, making the roadway appear as if it was created solely for vehicular travel. A straight, flat corridor with few signs of pedestrian activity provides no incentive for cars to slow down; Instead, the barreness of Front Street promote high speeds. Slight design changes may create a greater sense of safety at the pedestrian and bicyclist scale, discouraging the speed of traffic and encouraging active transportation.

As shown in the rendering of proposed recommendations (Image 38), Pacer Planning recommends the addition of bike lanes on either side of Front Street that will connect to bike paths within the overall path network. Native shrubs and a significant increase of trees provide co-benefits including calming traffic, improving aesthetics, and providing a greater sense of safety for pedestrians and bicyclists. Signs and wayfinding tools create a sense of place while catering to pedestrian and bicyclist needs, such as contextualizing one’s location and informing one of proximity to nearby assets. Pacer Planning also recommends implementing sidewalks at a higher frequency along Front Street, especially where schools are located.

**Image 38.** Plan View of Proposed Street Design Improvements for Front Street
Recommendation 3: Prioritize funding and improvement of pedestrian access for the Chicopee Canal RiverWalk.

The Chicopee River is a noteworthy natural and recreational asset for the City of Chicopee. Similar to Front Street, the Canal RiverWalk has the potential to connect many points of interest across the South Sector. Pacer Planning’s experience interacting with the public through formal public engagement endeavors and informal discussions during site visits and public presentations show a distinct desire on behalf of the public for greater accessibility to this resource. Chicopee’s OSRP also supports the Canal RiverWalk, stating, “residents expressed frustration about the very limited access to these rivers and were agitated about delays in the design and construction of the Connecticut Riverwalk and Bikeway and the continuance of the Chicopee Canal and RiverWalk beyond Grape Street” (Chicopee Planning Department, 2015). Furthermore, when asked where multi-use paths should be located, 51.2% said along the Chicopee River, which was the second highest ranked location behind existing neighborhoods (Chicopee Planning Department, 2015).

Although the City’s planned construction of the Chicopee Canal and RiverWalk depends on non-local funding, Pacer Planning recommends prioritizing the Chicopee Canal and RiverWalk’s revitalization with a special focus on pedestrian and bicycle access due to a strong desire on behalf of the public. Access points should coincide with paths of the proposed path network vision. Map 25 displays river access and proposed paths that intersect Front Street while connecting to other points of interest.

Pacer Planning also recommends that the City explore other potential funding sources to expedite the Chicopee Canal and RiverWalk’s construction. To supplement this in the short-term, the City could take immediate low-cost measures improve the Chicopee Canal and RiverWalk’s appeal and access, such as a community trash clean-up, increased signage, and addition of picnic tables and benches.

Recommendation 4: Develop a multi-use riverfront pathway accessible to the elderly behind the Chicopee Senior Center.

The Chicopee Senior Center, also known as the RiverMills Senior Center, opened in the fall of 2014 and provides a state of the art resource for the elderly population of Chicopee. Located on Valley View Drive north of Front Street, the center offers amenities such as exercise
classes, art rooms, and counseling. The Chicopee River is located behind the building; however, the river is visually and physically inaccessible to the RiverMills Senior Center visitors. The inaccessibility is due to the levee, which creates a barrier to the Chicopee River. Although able-bodied individuals may access the existing levee easily, its steep slope inhibits access by much of the elderly, youth, and those with physical disabilities.

Pacer Planning recommends prioritizing the development of a multi-use levee path behind the Senior Center that enables riverfront accessibility. The proximity of the river to the Senior Center creates a major opportunity to capitalize on this natural resource and serve the elderly populations of Chicopee, who may not have access to other resources within the City.
Image 39. Rendering of Riverfront Levee Pathway behind the RiverMill Senior Center
Implementation Schedule

6 Months

Front Street Connectivity
- Examine and assess the path network proposed around Front Street. Work with the Department of Public Works to discuss the feasibility and interest regarding constructing the proposed paths to connect Front Street to nearby resources.

Front Street Bicycle and Pedestrian Access
- Enroll the schools to the Safe Routes to School Program to optimize safety-related infrastructural improvements conducive to student walking.
- Implement low-cost, temporary traffic calming measures to address pedestrian access across and along Front Street, such as pavement markings, stop signs, and flashing lights.
- Identify potential funding sources for the redevelopment of Front Street.

Chicopee Canal and RiverWalk
- Take measures to improve existing condition of the Chicopee Canal and RiverWalk.
- Consider reaching out to local service organizations to clean up waste and debris along the river.
- Investigate low-cost options like implementing picnic tables and/or benches along the riverfront
- Improve wayfinding of the existing multi-use paved path through signage.
- Explore supplemental funding through grants and fundraising options to expedite construction process.
- Designate a committee to manage and spearhead the Chicopee Canal and RiverWalk design, construction and maintenance.

RiverMill Senior Center Levee Path
- Reach out to the Army Corps of Engineers to discuss the possibility of implementing a multi-use path along the levee.
- Investigate ownership, easements, maintenance access, permits and other potential legal issues related to the proposed infrastructure.
- Conduct a public engagement workshop with visitors of the RiverMills Senior Center to gauge desire for this type of pedestrian activity.
1 – 2 Years

Front Street Connectivity
- Reach out to property owners in the area who own land within the proposed paths to discuss the possibility of an easement.
- Consider applying for funding through the Massachusetts Department of Conservation and Recreation’s Recreational Trails Program.
- Develop a detailed visual plan for pathway entrances and exits with a focus on wayfinding and creating a sense of arrival.

Front Street Bicycle and Pedestrian Access
- Gather public input on specific design recommendations and needs along Front Street, specifically targeting frequent users of Front Street amenities.
- Introduce traffic mitigation to slow speed by adding features such as vegetative plantings, rumble strips, and raised crosswalks.
- Identify landscape architects and/or civil engineers to design new infrastructure for Front Street.

Chicopee Canal and RiverWalk
- Reach out to the public with updates in ways they can get involved in order to build social capital.
- Commence construction of the next phase of the Chicopee Canal and RiverWalk.
- Design access points to align with Front Street paths that connects to the Chicopee Library, Chicopee Senior Center, Chicopee High School, and Szot Park.
- Prioritize designing accessibility for the elderly, the youth, and those with physical disabilities.

RiverMill Senior Center Levee Path
- Identify funding sources, potential landscape architects, engineers and/or UMass Amherst LARP to create a feasible design.
- Investigate potential design options that enable access to the levee from the RiverMill Senior Center and promote safety for those with compromised physical abilities.
- Include a public engagement component for the design phase.

3 – 5 Years

Front Street Connectivity
• Coordinate the design and construction of the Chicopee Canal and RiverWalk to planned access points along the Chicopee River to Front Street’s connective paths.

• Construct new pathways connecting Front Street to nearby attractions. Include trees, signage, and other amenities for pedestrians and bicyclists.

**Front Street Bicycle and Pedestrian Access**
• Begin design and construction of new infrastructure including crosswalks in key locations, bike lanes on either side of the street, and other permanent infrastructure.

• Implement wayfinding tools such and signage that connect pedestrians from Front Street to adjacent paths and/or points of interest.

• Add pedestrian-scale features such as street trees, benches, and bike racks.

• Use public engagement initiatives to assess Front Street usage regarding travel mode and areas for future improvement.

**Chicopee Canal and RiverWalk**
• Execute methods to improve wayfinding and continuity within Chicopee’s greater path network.

• Establish Chicopee Canal and RiverWalk management and maintenance protocol.

• Gain public feedback on areas to prioritize for future improvement.

**RiverMill Senior Center Levee Path**
• Begin constructing hard infrastructure of the multi-use levee path.

• Focus on the path’s connections to the overall path network, particularly to Front Street and to the Chicopee Canal and RiverWalk.

**Summary**

The South Sector of Chicopee hosts a diverse opportunities in Chicopee, due to public amenities, like the Chicopee Public Library, City Hall, and the downtown district. This sector is already attractive to many users, for residential, social, recreational, and/or commercial purposes. Pacer Planning proposes recommendations that enhances the existing uses and conditions of the South Sector of Chicopee, allowing for a more accessible and appealing experience for visitors and residents alike. The proposed bicycle network within the South Sector of Chicopee connects such amenities with existing major roads, allowing for utmost pedestrian and bicyclist accessibility throughout the sectors boundaries. This proposal is supported by the public engagement outreach, in which participants named speed of traffic, accessibility of sidewalks,
and safety of intersections as their main concerns limiting the walkability of school children within the sector.

The additional South Sector recommendations provided by Pacer Planning aim to alleviate some of the aforementioned traffic concerns while providing greater connections to destination points within the sector. The recommendations are as follows:

1. Improve Front Street’s pedestrian and bicycle connectivity to surrounding assets and residences.
2. Make Front Street more accessible and safe for pedestrians, bicyclists, and student walkers from the three schools on Front Street through infrastructural improvements.
3. Prioritize funding and improvement of pedestrian access for the Chicopee Canal and Riverwalk.
4. Develop a multi-use riverfront pathway accessible to the elderly behind the RiverMill Senior Center.

For successful implementation of these features, Pacer Planning recommends that additional communication, research, and planning is done within the first 6 months, followed by initial design and construction within the 1-2 year range, while lastly conduct assessment and continue construction within the 3-5 year period.
CHAPTER 10: CITYWIDE PROGRAMMING RECOMMENDATIONS

This section provides recommendations for the City of Chicopee to consider related to programming. We also provide precedent studies and implementation strategies to support each recommendation. Programming is an important complement to the proposed bicycle and pedestrian path network described above in order to make residents aware of infrastructural changes.

Walk [Your City]

Image 40. Walk [Your City] in Mount Hope, West Virginia

Pacer Planning’s first programming recommendation relates directly to campaign building and the promotion of cultural, historical, and recreational assets within the City of Chicopee. To begin a conversation with residents on which of these assets and spaces should be promoted, Pacer Planning recommends that the City of Chicopee utilize the Walk [Your City] toolkit.

The Walk [Your City] toolkit, available for free online, provides creative strategies that aim to increase and enhance cities’ and towns’ walkability and bikeability. By identifying points of interest displayed on signage posted throughout the city and identifying the amount of time it
takes to walk to these points, residents can promote local businesses, cultural institutions, and recreational facilities in the City. The implementation of this strategy is meant to initiate a dialog between community members and city officials. Furthermore, the Walk [Your City] toolkit provides residents the opportunity to make decisions on which destinations within Chicopee are valuable to them, can facilitate a sense of community pride, and help further strengthen community relationships between diverse groups.

The Walk [Your City] toolkit has guided different towns and cities across the U.S. in making their downtown areas more enjoyable and pedestrian friendly. One of the more unique characteristics of the toolkit, aside from its cost effectiveness, is that it is easily adaptable to any municipality hoping to promote alternative ways of moving around the city. This is particularly relevant to the City of Chicopee, which as this report has documented, is highly auto-centric. By promoting walking and bicycling, residents of Chicopee can become better acquainted with the many natural beauties and cultural offerings that already exist within the City. There are many beneficial outcomes that have been observed as cities implement this strategy. These outcomes include but are not limited to:

- Encouraging residents and visitors to walk and explore the City’s interior.
- Giving community members and local organizations a voice in expressing the importance of particular spaces in the city.
- Helping to garner public participation an essential component of project implementation success.
- Providing inexpensive signage, which city employees, community residents and volunteers can post over a time frame ranging from a few hours to a few days (depending upon the degree of community engagement).
- Creating effective advertising and promoting local businesses.
- Giving residents a sense of community pride while also increasing greater social cohesion.
Precedent Studies
Mount Hope, West Virginia

Mount Hope is a small town located in West Virginia. With a total population of 15,000 residents, Mount Hope is considerably smaller than Chicopee. However, in this otherwise typical small town, Mount Hope receives around 30,000 tourists each July for an annual event. The influx of this many tourists prompted Mount Hope to adopt the Walk [Your City] toolkit in hopes of increasing the public’s awareness of the downtown corridor. Lacking many of the resources available to larger municipalities, program costs and efficiency were top priorities for Mount Hope. Walk [Your City] satisfied these critical priorities set forth by this small town.

After organizing a small charrette in which goals and opportunities were established, nine community members posted eighty signs around the town’s historical core within a month after project formulation. The town views the implementation of the signs as a constant evolution, with old signs coming down and new ones going up. This process allowed the community to evaluate which signs seem to gain momentum and promote the most desirable spaces among the public. Following the implementation of the signage, the community members posted a video of the implementation process, allowing for public input on the process and the effectiveness of the signage. Undertaking Walk [Your City] has made sites of interest available to Mount Hope pedestrians and has also facilitated a strong sense of town pride and cohesiveness.

Walk [Your City] Implementation Strategies
6 Months

- The City of Chicopee should identify/work with community members and organizations that have interest in helping Chicopee become more pedestrian friendly. It is important that community stakeholders are involved in the initial process of destination promotion, as this can help establish community buy-in.

- The City of Chicopee should with community groups in Chicopee to increase the variety of avenues through which funding for temporary signage can be secured. Communities successfully implementing the Walk [Your City] program in the past have found it effective to garner support from local businesses who might benefit from signage advertisement, leading them to be more likely to contribute funding for destination signage.
• Residents and City officials should decide the best locations to post signage promoting local businesses, recreational facilities, and other cultural assets.

1 – 2 Years
• Within 1 – 2 years, the City of Chicopee should consider exploring options to assess the perceptions from residents on the effectiveness of the new signage. The purpose behind gaining insight into residents’ perceptions is to better understand which signs seem to be effective and which ones are not. The ultimate outcome of identifying effective signs will be to then explore the potential permanence of such signage.

3 – 5 Years
• Between 3 – 5 years, the City of Chicopee should measure the outcomes gained from implementing the Walk [Your City] toolkit as they relate to increasing walkability and destination visitation, public participation in city decision making, and economic stimulation among local businesses.
• Additionally, the City of Chicopee should explore the option of making successful pedestrian signage permanent and aesthetically pleasing, based on community input.
Walk/Bike to School Day

To build walkable culture amongst Chicopee’s students and larger school district, Pacer Planning recommends that the City implements a Walk/Bike to School Event at local schools. This initiative was organized by the Partnership for a Walkable America in 1997, designed as one-day event to generate awareness about walkable communities. The event grew in popularity, gaining widespread notoriety in 2000; thus allowing for the month of October to be claimed “International Walk to School Month.” Over the years, bike culture has grown into a sustainable and affordable option for U.S. students and families. As of May 9, 2012, the first national Bike to School day occurred as a unique event of National Bike Month. Together, these events allow for public togetherness and demonstrate the possibility of accessible communities.

Getting involved with such an initiative is quite simple, as the organization provides many customizable options to implement a Walk/Bike to School Event within a school district. These options cater to the dynamic range of families that live in a school district, including those that may far or have children with disabilities. For example, families could either: walk or bike from home, walk from a (closer) designated starting point, or walk or bike during a school event. The organization thus provides many tools for planning and outreach, including promotional tools and testimonies of success from other schools. Though Walk/Bike to School events occur on an annual basis, the organization encourages participating school districts to “maintain the momentum” to introduce permanent change in community culture and attitude. Participating in a Walk/Bike to School event also offers the unique opportunity of collaboration between local organizations.

Precedent Study

Amherst, Massachusetts

In 2016, about 271 schools across Massachusetts participated in a Walk/Bike to School event, including a few of Chicopee’s local neighbors like Springfield, Holyoke, Northampton, and Amherst. While Walk/Bike to School Day tends to be a purely social and fun event for many, Amherst’s Crocker Farm Elementary School implemented a strategic action to highlight the need for supportive walker infrastructure in town. Crocker Farm participants met in the morning at specific intersection in town to show public officials how many kids use the certain
intersection at once, with hopes to put pressure on the town to fund a proper push-button crosswalk for students (Image 41).
Because many of Chicopee’s schools host a No-Bus-Zone ranging from a one to two-mile radius, a Walk/Bike to School event could be utilized as a strategic tactic to access public support for supportive walker infrastructure around the city. To increase event success, schools should involve community organizations, public officials, law enforcement, PTOs, families, and local businesses.

**Walk/Bike to School Day Implementation Strategies**

6 Months

- The City of Chicopee should host a public meeting for community stakeholders, particularly the local school affiliates, to design the specifics of a City Walk/Bike to School Event in Chicopee and also form a managing committee.
• The City of Chicopee should register the events with the Walk/Bike to School organization for proper recognition and supportive record keeping

• The City of Chicopee should review the existing promotional tools on the Walk/Bike to School website and conduct a public outreach campaign to ensure the success of the event

1 – 2 Years

• The City of Chicopee should host the first annual Walk/Bike to School Day in October of 2017.

• After the event, the initial committee should meet to assess the first annual event and make a plan of action for the next Walk Bike to School Event

3-5 Years

• Continue to host Walk/Bike to School Day annually.

• Access each event and initiate a discussion to implement necessary programming and infrastructure improvement
Better Block

Pacer Planning recommends that the City of Chicopee consult with the Better Block Foundation to support creative placemaking and tactical urbanism in the priority paths identified in the chapters above. Tactical urbanism is an umbrella term used to describe a collection of low-cost, temporary changes to the built environment, usually in cities, intended to improve local neighborhoods and city gathering places.¹ The Better Block Foundation develops open source media to create rapid and temporary prototyping of pedestrian and bicyclist infrastructure. Such infrastructure includes roadway retrofits such as temporary green bike lanes, benches, café sets, pedestrian islands, planters, street signs, and bicycle stencils, among other items.

In almost all cases, municipalities using resources from the Better Block Foundation hold an event where community residents come together to work on specific projects related to traffic calming and the activation of previously underused spaces. There are numerous documented benefits of such a strategy, including the following:

• Municipalities may measure the outcomes of traffic calming and place-making efforts without a high cost.
• Local officials become more eager to work on projects that are popular.
• Better Block projects often lead to more formal measures, such as pedestrian overlay zoning.
• Businesses benefit from increased visitation rates and revenue.
• Better Block projects often excite the advocacy community and establish buy-in for bicycle and pedestrian-related changes.
• Better Block projects often pave the way for future grants for street improvements.

Precedent Study
Norfolk, Virginia

In Massachusetts, cities and towns such as Somerville and North Adams have undertaken Better Block projects (available online). However, the most relevant example with well-documented outcomes is perhaps Norfolk, Virginia. Norfolk has a population of about 247,189 persons. Although the City is much larger in population than Chicopee, due to the City’s large military presence on industrial land, it did not form as a highly pedestrian-friendly place. Only recently has Norfolk begun to invest in more mixed use improvements to encourage walkability.

On April 12 – 13, 2013 Norfolk, Virginia held a Better Block event. The project was a collaboration between the city of Norfolk, two realtor associations, and the Park Place Business Association. After re-claiming the right-of-way for greater use by the neighborhood’s residents, those participating in the Better Block project painted new pedestrian crosswalks, added lighting, gave fresh coats of paint to multiple buildings, and painted a temporary bike lane. Moreover, Norfolk Better Block notes that “prior to the effort, local businesses organized to help spearhead the Better Block project and create a unified vision for the area. Outreach occurred to local residents who were interested in starting new businesses, and city staff was advised on the creation of outdoor cafe seating, pedestrian bulb-outs, and improved landscaping” (2013). In addition, Norfolk cataloged open spaces and gathered baseline metrics to show existing vehicle counts and speeds, and pedestrian use. Code for America’s Streetmix tool was used to profile the existing streetscape.
According to the Better Block Foundation, many businesses participating in Norfolk’s Better Block project reported their best sales day ever. Additionally, the area has also realized an increase in real estate activity, with a nearby 15,000 square foot building being purchased within a week of the Better Block event. Furthermore, the event catalyzed progress for zoning changes. After the event, Norfolk was able to make sweeping zoning changes to allow for temporary businesses and a more pedestrian friendly area.

**Better Block Implementation Strategies**

6 Months

- The City of Chicopee should identify locations that would be best-suited for a Better Block project. Although the priority paths Pacer Planning identified in the chapters above could serve as a starting point, it is important to note that the most successful Better Block projects often occur in downtown locations.
- Additionally, the City of Chicopee should begin to work with stakeholders, including the Chamber of Commerce, local businesses in the identified area, and those interested in starting businesses, to spread awareness and gain partnerships for the Better Block event.

1 – 2 Years

- Within 1 – 2 years, the City of Chicopee should launch at least one Better Block project. After the locations are identified, this phase requires using empty storefronts, creating a detailed plan of action for events (e.g. inviting performing artists, solidifying what kinds of activities will be present, etc.). Additionally, the City should invite local officials to attend. Often, municipalities hold more than one Better Block project to activate more than one space in their community. Thus, between 1- 2 years, the City of Chicopee should consider holding three Better Block events, as well to maximize outcomes.

3 – 5 Years

- Between 3 – 5 years, the City of Chicopee should measure the outcomes gained from the Better Block event(s) as they relate to traffic calming, community involvement, and business creation and make the positive outcomes realized by the Better Block event(s) more permanent.
CHAPTER 11: CITYWIDE POLICY RECOMMENDATIONS

In this chapter, Pacer Planning proposes three related but separate policy options for the City of Chicopee to consider. Although this vision plan is a step toward making Chicopee more pedestrian and bicycle friendly, having policies in place will ensure the sustainability of infrastructural changes and potentially provide dedicated funding streams for such projects. First, we recommend that Chicopee continue to work with MassDOT to further develop and implement its Complete Streets initiative. Secondly, we propose that Chicopee work with the City’s schools to assess levels of support and needs for the Safe Routes to School Program. Third, we recommend that Chicopee make pedestrian and bicycle infrastructure more mainstream in its future planning documents.

Complete Streets Program

Image 43. Design for Bike Lanes on Massachusetts Avenue in Arlington, Massachusetts

Pacer Planning recommends that the City of Chicopee continue to work with MassDOT to implement a Complete Streets policy. According to the National Complete Streets Coalition (2016), “complete streets are those designed and operated to enable safe access and travel for all
users. Pedestrians, bicyclists, motorists, transit users, and travelers of all ages and abilities will be able to move along the street network safely.”

In Massachusetts, the Complete Streets program is divided into three separate tiers. In MassDOT’s Funding Program Guidance document, the agency notes that in Tier 1, municipalities must demonstrate its commitment to Complete Streets principles by passing a Complete Streets policy through its official approval channels. Tier 2 requires municipalities to develop a hierarchy of funding priorities that align with local plans and roadway work. Tier 3 is where a municipality identifies projects from its priority plan for funding, MassDOT determines which projects are to be funded, and then the municipality and MassDOT enter into a contract (MassDOT, 2016).

Currently, the City of Chicopee fulfills the Tier 1 requirements of Complete Streets. This means that the City has had a municipal employee attend a Complete Streets training, and has submitted or intends to submit a Complete Streets policy. However, as the precedent studies below show, simply having a Complete Streets policy does not always lead to the successful implementation of infrastructural changes. Therefore, Pacer Planning recommends that the City of Chicopee continue working with MassDOT to move forward to Tiers 2 and 3.

Precedent Studies

Arlington, Massachusetts

Arlington, Massachusetts is located about six miles northwest of Boston and has a population of about 42,844 persons. In 2015, Arlington successfully implemented a Complete Streets program. Early in the year, the Town Meeting voted to undergo a “road diet” for Mass Ave, which involved condensing four lanes into two lanes (one in each direction), with turn pockets and bike lanes. However, this proposal did not come without opposition.

Phil Goff, the founder of East Arlington Livable Streets summarizes the community’s counterarguments:

To opponents, space was being taken away from cars for the benefit of the “small handful” of bicyclists (i.e. any number less than the number of cars) using Mass Ave. The group spent $80,000-$100,000 to hire a traffic consultant, environmental engineer, an attorney and a public relations firm to perpetuate
misperceptions about the design. They falsely argued that the resulting traffic congestion would block emergency vehicles, long queues would create unacceptable levels of pollution, parking removal would cripple local businesses, and frustrated commuters would cut through neighborhood side streets (2015).

However, after meeting with businesses along Mass Ave, Goff found that business owners were mainly concerned about the impacts of construction, and were cautiously optimistic that the new design would slow traffic and create a more shopping-friendly environment. As noted in the literature review above, this case highlights the importance of communication, clear goals, and objective public participation when it comes to implementing Complete Streets programs.

Agawam, Massachusetts

Agawam is a city located in Hampden County, about eight miles south of Chicopee. With a population of 28,438 persons as of 2010, Agawam is located directly on the banks of the Connecticut River. The city is also home to the Six Flags New England amusement park. Like Chicopee, Agawam has not historically been a walkable community with auto-centric transportation infrastructure. As a result, several departments, namely the Engineering Department, advocated for the City Council to take steps to enhance walkability. Specifically, this department pushed for the City Council to pass a Complete Streets Policy, which is the first step toward obtaining funding through MassDOT’s Complete Streets Program. According to MassDOT, “a Complete Street is one that provides safe and accessible options for all travel modes - walking, biking, transit and vehicles – for people of all ages and abilities” (2016).

In 2016, the Agawam City Council passed “A Resolution Endorsing A Complete Streets Policy Within Agawam.” This policy first outlines the numerous benefits of the Complete Streets Program, such as economic development, improved safety, and enhanced accessibility of the City’s destination points. It then describes the City’s commitment to MassDOT’s Complete Streets guidelines, and dictates that the City make “Complete Streets practices a routine part of everyday operations and shall approach every transportation project and program as an opportunity to improve streets and the transportation network for all users.” The City is now
working with a consultant to prioritize streets for changes in line with the Complete Streets program.

**Complete Streets Implementation Strategies**

**6 Months**
- The City of Chicopee should build off of the bicycle and pedestrian path network proposed in this report to begin to identify priority areas for Complete Streets funding.

**1 – 2 Years**
- The City of Chicopee should request Technical Assistance (up to $50,000) from MassDOT to develop a formal Complete Streets Prioritization Plan in order to fulfill the Tier 2 Complete Streets requirements. At this tier, the City may draw from existing planning documents or work with consultants to generate a master list of Complete Streets project. MassDOT notes that at Tier 2, municipalities often invest in capital investment plans, network gap analyses, pavement management systems, ADA transition plans, and/or safety audits.

**3 – 5 Years**
- At the 3 – 5 year mark, Pacer Planning recommends that the City of Chicopee submit a Tier 3 application and enter a contract with MassDOT for state aid specifically related to the prioritization plan undertaken as part of Tier 2.
Pacer Planning recommends that the City of Chicopee work with MassDOT’s Safe Routes to School Program (SRTS) to implement the program for all City schools. SRTS staff works with schools, parents, community leaders, and all levels of government to improve the wellbeing and health of school children by encouraging them to walk or bike to school. Most SRTS programs assess conditions around schools to better improve walkability, accessibility, and safety by improving traffic conditions and other infrastructure concerns (National Center for Safe Routes to School). The goal is to make walking or biking to school appealing and safe for both students and their families.

Because SRTS is dependent on each individual school’s participation in order to successfully build a city-wide initiative, all schools within the City of Chicopee must be encouraged to apply to the program. Once the schools apply, a multi-tier process begins, which includes community outreach, a parent survey, and funding components. Pacer Planning also recommends that the City of Chicopee continue to work with MassDOT’s SRTS Outreach Coordinator for western Massachusetts, who will offer support during the application process.
Furthermore, as seen in the precedent studies below, in order to create a strong foundation for the program to build upon, the City must identify schools that are most interested in adopting SRTS.

**Precedent Studies**

**Arlington, Massachusetts**

Arlington, Massachusetts has a population of 44,815 as compared to Chicopee with 56,741 persons. Both Arlington and Chicopee both have approximately 21 percent of their population under 18 years old. Arlington’s Median household income, however, is twice the amount of Chicopee, at $92,338 and Arlington is geographically smaller than Chicopee (United States Census Bureau, 2015). Despite demographic differences, Arlington, like Chicopee, wants to increase the number of children walking and bicycling to school. Additionally, both cities want to increase student safety through the Safe Routes to School Program (National Center for Safe Routes to School).

In 2001, Arlington was selected to be one of two cities in the United States to participate in a Safe Routes to School pilot program. Two of the City’s elementary schools and one of their middle schools received $15,000 from the National Highway Traffic Safety Administration to start their programs. The elementary schools used the funds for several pedestrian and bicycle oriented education and encouragement programs. Furthermore, a walkability audit identified issues and concerns around the school. Due to parent and community involvement in program’s events and educational sessions along with constant encouragement, the number of students walking to the two pilot schools increased by 22 percent and the middle school saw a 10 percent increase within their first year of participating (National Center for Safe Routes to School).

**Waltham, Massachusetts**

Waltham, Massachusetts has a population of 63,378 as compared to Chicopee with 56,741 persons. Waltham has approximately 24,000 households, similar to Chicopee which has approximately 23,000 households. Additionally, median household income in Waltham is almost $26,000 greater than Chicopee (Census, 2015). Though there are differences in demographics, both cities have disconnected paths created by gaps in the sidewalks surrounding school areas. Furthermore, both cities have concerns regarding the poor conditions of their sidewalks and roads (National Center for Safe Routes to School).

In 2006, Waltham and the principal and parents of Whittemore Elementary saw the need to improve the safety of their children walking to and from school due to the levels of traffic
congestion. To “kick-off” the program, the school promoted an event called “Walking Wednesdays” with the support of MassRIDES. Together, they organized four Walking School Buses, where groups of parents and students would meet at a designated location and then walk together to school while allowing other students to join along the way. With additional help of a safety patrol (parent volunteers), the city was able to assess walkability and traffic safety. In the spring of 2006, only 21 percent of Whittemore’s students walked to school and by the fall the number had increased to 53 percent (National Center for Safe Routes to School).

Safe Routes to School Implementation Strategies

6 Months

- The City of Chicopee should first gauge community support for the SRTS program. Pacer Planning recommends continuing to work with the stakeholder groups identified in this report, including school administration officials, City employees, and families of school-aged children in Chicopee. As a first step, the City should consider directly contacting the Bowie Memorial Elementary School and the Bellamy Middle School to discuss the potential implementation of SRTS. As described in the chapters above, the Chicopee Planning Department identified these schools as two major destinations in the City for this project.

1 – 2 Years

- In 1-2 years, the City of Chicopee should conduct the SRTS Parent Survey and a Student Travel Tally in order to collect valuable data that provides information on demographics, the walking environment, how children commute to school, travel distance and commute time, and factors that influence a parent’s decision to let their student walk or bike to school.

- After the two surveys are completed, the City and local schools can identify potential solutions in a SRTS plan that include the program’s “education, encouragement, engineering and enforcement” approach (National Highway Traffic Safety Administration).

- Pacer Planning also encourages the City to fund the plan through sources identified by SRTS, including federal programs like the Safe Accountable Flexible Efficient Transportation Equity Act (SAFETEA-LU), the Congestion Mitigation and Air Quality...
Surface Transportation Program, and others. Chicopee can also research funding options available through MassDOT’s SRTS program and local community organizations (National Highway Traffic Safety Administration). This implementation phase would require some grant funding.

3 – 5 Years

- After the SRTS plan has been implemented for the City’s schools, Pacer Planning recommends that Chicopee look into infrastructure changes that may be identified during the SRTS implementation process. These changes, some of which are recommended in our report’s path network and public engagement study, can be prioritized as a first wave of construction. These changes would likely include sidewalk improvements, bike lane construction, and more pedestrian-scale street design. This phase would support the Complete Streets policy, as well.
Additional Planning tools: Master Sidewalk and Pavement Management plans

Pacer Planning recommends the City of Chicopee update future planning documents to reflect priorities outlined in this report under the pedestrian vision plan. To successfully implement citywide policy and programming recommendations that cultivate a walking and biking culture among Chicopee residents, city officials must take proactive planning measures that work toward prioritizing pedestrian mobility. A critical step that will allow Chicopee to secure federal grant money to implement Pacer Planning’s recommendations, includes following the requirements set forth by the ‘Safe Routes to School’ and/or ‘Complete Streets’ initiatives. A fundamental requirement for each initiative includes assessing community input through various outreach strategies with critical stakeholder groups. Pacer Planning has provided Chicopee with community input and represents a solid foundation upon which the City can expand.

In the following precedent studies, Pacer Planning will highlight some of the creative ways other cities in Massachusetts have gone about updating comprehensive planning documents. Specifically, these examples emphasize how city officials have approached mainstreaming pedestrian-focused strategies and have successfully merged these priorities within official planning practices.

Precedent Studies

Framingham, Massachusetts

Framingham, Massachusetts is located in Middlesex County about 23 miles west of Boston. Framingham has a population of about 68,318 persons, making it the 14th most populous municipality in Massachusetts. Like Chicopee, Framingham developed out of several distinct villages and contains several major roads including Interstate-90 and four state highways. In 2012, Framingham updated its Master Plan for the first time in 23 years.

Framingham’s updated Master Plan puts into writing several of the Town’s priorities, many of which reflect similar goals the City of Chicopee has expressed in our client directive for this project. Specifically, the plan prioritizes a network of pedestrian paths and sidewalks as well as ‘road diets’ for streets and ways throughout the Town as a way to increase pedestrian and bicycle access and build in traffic calming features (2012: 18). The plan also requires all new residential projects to incorporate sidewalks and pedestrian features into their site design (20).
In addition to these infrastructural changes, the plan has an entire section called “Healthy Community Priorities.” In this section, the plan makes several programmatic recommendations like promoting the Safe Routes to School Program in addition to generally safer transportation in planning locations of new schools. It also recommends that future development that provide open space for physical activity. Although these are broad sweeping recommendations, their inclusion within this document provides a foundation for future land-use decisions, which case law has determined are more legitimate when preceded by an up-to-date Master Plan.

**Missoula, Montana**

In 2010, Missoula, Montana’s Public Works Department completed a Master Sidewalk Plan (MSP) that provided a strategy for the completion of the city’s sidewalk systems (Missoula Public Works Department, 2010, p. I). Missoula has approximately 68,000 persons with a median age of approximately 33 years old, a median household income of $37,317, and more than 50,000 residents were in the workforce (Missoula Economic Partnership, 2011). Missoula, sits at the convergence of three major rivers, with mountains surrounding the city. There is a designated wilderness area just twenty minutes from the city center, along with an extensive trail system which all provide outdoor recreational opportunities (2011).

The Master Sidewalk Plan’s goals and objectives reflect the need for the Master Sidewalk Plan in the city. The goals included providing a continuous sidewalk system throughout Missoula, installing new sidewalks in prioritized areas, and upgrading existing sidewalks to improve safety and efficiency while also incorporating ADA modifications. Furthermore, the MSP aimed to identify pedestrian corridors to create effective routes for school children, disabled residents, and the elderly. In order to succeed with these goals, the city hoped to garner community support to help achieve the plan in its entirety (Missoula Public Works Department, 2010, p. 3).

In order to implement the Master Sidewalk Plan, Missoula incorporated land use tools and techniques to create a more comprehensive plan. Though the MSP could stand alone, the City of Missoula wanted to ensure that other land-use related plans were included. An overall sidewalk system inventory and assessment was also planned, which requires data collection on the sidewalk type and width, absence or presence of ADA curb ramps, percent of cross slopes, vertical and horizontal displacements of sidewalks, spalling (flaking), and cracking (Missoula Public Works Department, 2010, p. 8). The city gathered additional pedestrian activity data by
examining zoning maps, the city directory, school districts, prior plans, accident reports, city engineering staff input, and site visits (Missoula Public Works Department, 2010, p. 8). This data would enable the city to prioritize which sidewalks should first be improved.

Dedham, Massachusetts

Dedham is a town located southwest of Boston in Norfolk County, Massachusetts. Dedham’s current population of 24,064 persons has declined significantly since the 1950s. Like Chicopee, it now has an aging population with 16.5% of its residents over the age of 65. The number of school-age children, however, has increased by over 14% from 1990 to 2000, making safety and accessibility priorities for Dedham’s transportation infrastructure (Dedham Planning Department, 2009). Dedham’s most updated Master Plan (2009) outlines goals to revitalize commercial centers, embody sustainable practices, increase transportation efficiency, and promote underrated natural, historical, and recreational resources. Its specific transportation objectives are as follows:

1.) Increase the efficiency of Dedham’s roadways through effective advocacy for priority transportation projects.
2.) Discourage traffic on residential streets through the appropriate use of traffic calming measures.
3.) Ensure continued maintenance and improvement of Dedham’s pedestrian infrastructure.
4.) Increase access to and efficiency of public transportation in Dedham, including the JBL and MBTA bus lines.

These transportation objectives support Pacer Planning’s goal to make Chicopee more accessible to pedestrians and bicyclists. Dedham’s Roadway Management System, which has been refined since the 2009 Master Plan is an example of how Chicopee could efficiently maintain the quality of its roads and sidewalks. Dedham defines pavement management as “the practice of planning for pavement maintenance and rehabilitation with the goal of maximizing the value and life of a pavement network” (Dedham Public Works Department, 2007).

Dedham’s management process utilizes software that synthesizes data to produce cost analyses and priority recommendations. This entails keeping a pavement section inventory in GIS with each road’s distress quantification and ranking on the Pavement Condition Index (PCI).

---

The PCI ranges from 0-100, with 40-60 indicating need for base rehabilitation, 60-72 indicating need for structural improvement, 72-86 indicating need for preventative maintenance, 86-92 indicating need for routine maintenance, and 92-100 indicating a “do nothing,” or quality condition. The system also evaluates sidewalks, curbs, and pedestrian ramps, and can project future conditions under various budget scenarios.

Through its pavement management system, Dedham has raised its average PCI from 70 in 2006 to 82 in 2012, and their Chapter 90 funding has gone up from approximately $500,000 for FY09 through FY11 to $675,000 for FY12 & FY13 (Mammone).

**Pavement Management Implementation Strategies**

**6 Months**

- Within the first 6 months, Chicopee should conduct a citywide pavement, curb, and sidewalk evaluation and link findings to an inventory on GIS.

**1 – 2 Years**

- Within 1 – 2 years, Chicopee should contact Dedham acquire pavement management software in order to determine which roads and sidewalks are of highest priority to the City based on high traffic volume, lower repair costs, longer life expectancy, and poor road condition. It also will allocate the annual pavement budget to high benefit roads and analyze the effect on overall citywide conditions.

- In conjunction, Chicopee should identify the level of available funding for pavement maintenance and submit a Chapter 90 Project Request Form for priority roads. Under Chapter 90, the State will provide 100% reimbursement for qualified roadway projects.

**3 – 5 Years**

- Within 3 – 5 years, the Department of Public Works should implement infrastructural improvements. Chicopee should also begin to expand its routine maintenance program to preserve good roads and sidewalks by setting PCI goals and identifying related funding requirements. The pavement deterioration trajectory shows that roadway maintenance costs far less than roadway repair, so routine maintenance will allow Chicopee to spend less while preserving an overall higher quality of roads and sidewalks. Furthermore, with consistent PCI improvement, Chicopee will be qualified to receive greater state funding under Chapter 90.
Pacer Planning recommends that the City of Chicopee adopt a non-traditional bike path design for portions of the path network. Glow-in-the-dark bike paths offer a distinctive design element that visually enhances both the City’s streetscape and its landscape. In doing so, the bike lanes are likely to increase bikeability and walkability due to the excitement surrounding such a unique path design. European models, like those in Lidzbark Warmiński, Poland and the Netherlands prove that the success of such bike paths are dependent on positive public perception and high levels of use. Because traditional, painted-green bike paths are more common, they may not attract the public in the same way as glow-in-the-dark bike paths. Therefore, Pacer Planning recommends adopting this design approach to make the City of Chicopee one-of-a-kind in the Pioneer Valley region.

Furthermore, these bike paths have a potential for several positive outcomes. For example, the paths may increase place-attachment as they become part of the City’s character.
They will likely become an element of the City that residents and visitors are proud of and want to share with others. Additional outcomes include increasing security during the nighttime as these bike planes are solar charged and increase visibility. Ideally, they can be implemented in areas with little to no street lighting. Cost-efficient alternatives, like glow-in-the-dark paint as opposed to traditional lighting.

**Precedent Study**

**Lidzbark Warmiński, Poland**

Lidzbark Warmiński is a small town in the northern part of Poland. The town has recently installed a glow-in-the-dark bike path made up of materials called phosphors that are said to be easier on joints as compared to more traditional materials like asphalt. The lane is solar-charged and can stay lit for about eight to ten hours. The bike lane is about 6 feet wide and 330 feet long and cost approximately $31,000 dollars for installation. With Chicopee’s large connection to Poland and the Polish culture, having a precedent from Poland will help strengthen cultural bonds (Metcalfe, 2016).

**Glow-in-the-Dark Bike Path Implementation Strategies**

**6 Months**

- In the first phase of implementation, Pacer Planning recommends that the City use an online survey to assess the level of support for glow-in-the-dark bike paths and collect input on where residents would support their implementation. To distribute this survey electronically, Pacer Planning recommends that the City use various social media sites. The goal of the survey will be to identify at least one street on which residents would support glow-in-the-dark bike paths.

**1 – 2 Years**

- After the path(s) have been identified, the City should begin the design phase of implementation. This would include choosing the glow-in-the-dark materials, determining the dimensions of the path, and identifying cost.
- The City of Chicopee can then implement a street-specific glow-in-the-dark bike path and collect public input regarding their path experiences and any needed improvements.
- The City may also create or partner with a community group that works on maintaining and advertising the bike path.
3 – 5 Years

- After implementation, the City should consider implementing the design into other areas of Chicopee or expanding the existing path.
- The City should create an annual community event that brings residents and visitors to the glow-in-the-dark bike path for a day of activities. This will likely help maintain a high level of interest around the path for years to come.

**Regional Bike Share**

Pacer Planning recommends that the City of Chicopee join the discussions on the Pioneer Valley Regional Bike Share currently being held by the Pioneer Valley Planning Commission (PVPC). Bike sharing is a piece of transportation infrastructure where stations provide bikes at central locations and can be used for a fee. Most frequently, cities and towns use bike sharing for short distance trips providing users the ability to pick up a bicycle at any self-serve bike-station and return it to any other bike station located within the system's service area (PVPC). The Pioneer Valley is in the process of becoming the second location for a regional bike share in New England, after Boston’s Hubway Program. With PVPC serving as the coordinating advisor, the communities of Northampton, Amherst, Holyoke, South Hadley, and Springfield have been actively working since 2014 to implement ValleyBike Share.

**Precedent Studies**

**Greater Boston, Massachusetts**

The Hubway Bike Share Program serves as the first established regional bike share program in New England. Publicly owned and privately operated, the bike share operates in Boston, Cambridge, Somerville, and the Brookline with each municipality separately owning the required equipment. These municipalities have populations ranging from 59,115 (Brookline) to 655,884 (Boston). Brookline’s population is most comparable to Chicopee’s population of 55,298, however Brookline’s population density is 8,701/square mile, nearly four times higher than Chicopee’s density of 2,313/square mile. Despite notable differences in Greater Boston and Chicopee’s population and development density, Hubway provides an example of how a New England regional bike share program could successfully operate, and can be adjusted to scale.

The Hubway Program launched in July of 2011 with 610 bicycles throughout Boston. The next year, it expanded to Brookline, Cambridge, and Somerville, and by 2015 the program
spanned 25 square miles. The Metropolitan Area Planning Council (MAPC), a regional planning agency like PVPC, serves as the arbiter between the four municipalities, overseeing the interaction and use and coordinating Hubway Advisory Committee meetings. Hubway’s bike share equipment operates under a company called Motivate, which operates the nation’s most successful urban bike shares including New York’s Citi Bike, San Francisco’s Bay Area Bike Share, Chicago’s Divvy Bikes, Washington D.C.’s Capital Bikeshare, and Portland’s BIKETOWN.

Hubway provides 24-hour and 72-hour memberships for $6/day, monthly memberships for $20, and yearly memberships for $84. All memberships allow users unlimited 30-minute rides, and charge fees for overtime use based on membership type. In the first four years of operation, annual memberships increased 413.6% from 3,203 to 13,248, and 1 – 3 day memberships increased 334.2% from 30,655 to 102,445. Hubway’s solar-powered Kiosks are used to purchase passes, find nearby stations, and view real-time bike availability. In the winter months, Hubway suspends service at many of its stations due to inclement weather (Hubway).

Pioneer Valley, Massachusetts

As previously discussed, the Pioneer Valley will become the second location for a regional bike share in New England. Thus far, the communities of Northampton, Amherst, Holyoke, South Hadley, and Springfield have collaborated to implement ValleyBike Share.

Nestled between Holyoke, Springfield, Amherst, Hadley, and Northampton, Chicopee is an important link in this comprehensive regional bike share program. Without contracting into the bike share program, Chicopee would create a disconnection between highly populated cities in the southern Pioneer Valley and towns northern Pioneer Valley. As seen in Map 26, Sub-Regions 1 and 3 of which these existing contracting municipalities are a part comprise over 50% of the population of the entire Pioneer Valley, making them priority areas for a bike share program.
To date and using funds from MAPC’s District Local Technical Assistance (DLTA) program, the contracting towns and cities have completed a detailed feasibility study and analysis, which includes recommendations for equipment models, recommendations for business and operation models, and detailed station location and plans. Furthermore, they have submitted federal grant requests and are in the process of seeking corporate sponsors and collaborating with key stakeholders. The Pioneer Valley Regional Bike Share System Pilot, which can be found on PVPC’s website, details the planned bike share’s business and operation models, system costs and revenues, equipment alternatives, and site planning and phasing strategies.
Regional Bike Share Implementation Strategies

6 Months

- Within the next 6 months, Chicopee should contact key organizers within PVPC to join the regional initiatives for implementing the ValleyBike Share program.
- Chicopee should also seek local stakeholders who would be interested in representing Chicopee and coordinate with ValleyBike stakeholders.

1 – 2 Years

- Within 1 - 2 years, Chicopee should identify at least three local businesses willing to sponsor the ValleyBike Program through an initial donation of $12,000 per year.
- Within the next 2 years, Chicopee should explore additional potential funding sources, identified necessary agreements and permits, and establish a local management structure. Furthermore, Chicopee should develop a pre-launch marketing strategy and creating a detailed plan of initial station locations based on qualitative and quantitative data.

3 – 5 Years

- Within 3 – 5 years, Chicopee should implement ValleyBike stations in key locations.
- Chicopee should establish a data management system for ValleyBike usage in Chicopee and identify factors to track in order to maximize use and minimize cost.
- Chicopee should construct methods to engage the public regarding their ValleyBike experience and consider feedback in routine evaluation and maintenance.
CONCLUSION

Throughout the 16-week study period, Pacer Planning has worked to produce a citywide vision plan for enhanced bicycle and pedestrian networks in Chicopee, Massachusetts. We have defined sectors and major destination points, collected qualitative and quantitative data on proposed routes between these destination points, held meaningful public engagement, and made targeted recommendations. All of these recommendations are based on evidence-based practices.

Overall, we have found that there is a great amount of enthusiasm in the community for making Chicopee more pedestrian and bicycle friendly. Through our work, we hope we have provided a solid foundation that city officials can build upon to ensure that Chicopee’s students, residents, and visitors can safely traverse the city.


U.S. Census Bureau, American Community Survey. 3 & 5 Year Estimates (2010-2014)


## APPENDIX A: DETAILED TABLES AND FIGURES

Table 4. Top High-Crash Intersections in Chicopee (2011 – 2013)

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Total Crashes (2011 -2013)</th>
<th>Injury Crashes</th>
<th>Fatal Crashes</th>
<th>Property Damage Only</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granby Road / McKinstry Avenue / Montgomery Street</td>
<td>93</td>
<td>21</td>
<td>0</td>
<td>72</td>
<td>Planning Study Completed</td>
</tr>
<tr>
<td>Bridge Street / East Main Street / Broadway / Main Street / Church Street</td>
<td>81</td>
<td>25</td>
<td>0</td>
<td>56</td>
<td>Transportation Improvement Project Completed</td>
</tr>
<tr>
<td>Memorial Drive / Grattan Street / Bridge Street / Montgomery Street / Sheridan Street</td>
<td>71</td>
<td>19</td>
<td>0</td>
<td>52</td>
<td>Transportation Improvement Project Completed</td>
</tr>
<tr>
<td>Memorial Drive / Pendleton Avenue</td>
<td>60</td>
<td>19</td>
<td>0</td>
<td>41</td>
<td>Project on Transportation Improvement Program/Proposed Local Project</td>
</tr>
<tr>
<td>Memorial Drive / Lauzier Terrace / Curry Honda Driveway</td>
<td>44</td>
<td>20</td>
<td>0</td>
<td>24</td>
<td>Project on Transportation Improvement Program/Proposed Local Project</td>
</tr>
<tr>
<td>Memorial Drive / Stop and Shop Driveway / Home Depot Driveway</td>
<td>67</td>
<td>14</td>
<td>0</td>
<td>53</td>
<td>Project on Transportation Improvement Program/Proposed Local Project</td>
</tr>
<tr>
<td>Grattan Street / McKinstry Avenue / Dale Street</td>
<td>38</td>
<td>18</td>
<td>0</td>
<td>20</td>
<td>Transportation Improvement Project Completed</td>
</tr>
<tr>
<td>Center Street / West Street / Hampden Street</td>
<td>56</td>
<td>13</td>
<td>0</td>
<td>43</td>
<td>No Planned Improvements</td>
</tr>
<tr>
<td>Memorial Drive / James Street</td>
<td>33</td>
<td>12</td>
<td>0</td>
<td>21</td>
<td>No Planned Improvements</td>
</tr>
<tr>
<td>Chicopee Street / Chester Street / Meadow Street / Wilson Avenue</td>
<td>30</td>
<td>11</td>
<td>0</td>
<td>19</td>
<td>No Planned Improvements</td>
</tr>
<tr>
<td>Chicopee Street / Prospect Street / Erline Street</td>
<td>39</td>
<td>8</td>
<td>0</td>
<td>31</td>
<td>No Planned Improvements</td>
</tr>
<tr>
<td>Memorial Drive / Granby Road / Westover Road</td>
<td>47</td>
<td>5</td>
<td>0</td>
<td>42</td>
<td>No Planned Improvements</td>
</tr>
</tbody>
</table>
Table 5. Age Distribution in Chicopee, Hampden County, and Massachusetts (1980 - 2010)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Chicopee</th>
<th></th>
<th></th>
<th>Hampden County</th>
<th></th>
<th></th>
<th>Massachusetts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5</td>
<td>2,986</td>
<td>2,986</td>
<td>29,745</td>
<td>27,742</td>
<td>397,268</td>
<td>367,087</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 to 9</td>
<td>3,570</td>
<td>3,570</td>
<td>33,784</td>
<td>31,235</td>
<td>430,861</td>
<td>385,687</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 to 14</td>
<td>3,502</td>
<td>3,502</td>
<td>35,009</td>
<td>31,713</td>
<td>431,247</td>
<td>405,613</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 to 19</td>
<td>3,741</td>
<td>3,741</td>
<td>33,878</td>
<td>36,914</td>
<td>415,737</td>
<td>462,756</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 to 24</td>
<td>3,206</td>
<td>3,206</td>
<td>28,210</td>
<td>33,185</td>
<td>404,279</td>
<td>475,668</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 to 29</td>
<td>7,218 (25-34)</td>
<td>7,218 (25-34)</td>
<td>57,705 (25-34)</td>
<td>28,165</td>
<td>926,788 (25-34)</td>
<td>441,525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 to 34</td>
<td></td>
<td></td>
<td>25,986</td>
<td></td>
<td>403,616</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 to 39</td>
<td>8,510 (35-44)</td>
<td>8,510 (35-44)</td>
<td>71,768 (35-44)</td>
<td>27,215</td>
<td>1,062,995 (35-44)</td>
<td>418,195</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 to 44</td>
<td></td>
<td></td>
<td>31,204</td>
<td></td>
<td>468,954</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 to 49</td>
<td>7,276 (45-54)</td>
<td>7,276 (45-54)</td>
<td>61,087 (45-54)</td>
<td>34,758</td>
<td>873,353 (45-54)</td>
<td>515,434</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 to 54</td>
<td></td>
<td></td>
<td>34,837</td>
<td></td>
<td>497,001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55 to 59</td>
<td>2,759</td>
<td>2,759</td>
<td>22,026</td>
<td>30,746</td>
<td>310,002</td>
<td>432,822</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 to 64</td>
<td>2,247</td>
<td>2,247</td>
<td>16,765</td>
<td>26,045</td>
<td>236,405</td>
<td>370,547</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 to 69</td>
<td>4643 (65-74)</td>
<td>4643 (65-74)</td>
<td>31,906 (65-74)</td>
<td>18,616</td>
<td>427,830 (65-74)</td>
<td>264,459</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 to 74</td>
<td></td>
<td></td>
<td>13,406</td>
<td></td>
<td>192,001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75 to 79</td>
<td>3,953 (75-84)</td>
<td>3,953 (75-84)</td>
<td>25,577 (75-84)</td>
<td>11,707</td>
<td>315,640 (75-84)</td>
<td>162,592</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 to 84</td>
<td></td>
<td></td>
<td>10,339</td>
<td></td>
<td>138,473</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85 +</td>
<td>1042</td>
<td>1042</td>
<td>8,768</td>
<td>11,677</td>
<td>116,692</td>
<td>145,199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Population</td>
<td>54,653</td>
<td>54,653</td>
<td>456,228</td>
<td>463,490</td>
<td>6,349,097</td>
<td>6,547,629</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 6. Race and Ethnicities in Chicopee

<table>
<thead>
<tr>
<th>Race</th>
<th>1990</th>
<th></th>
<th>2000</th>
<th></th>
<th>2010</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>White</td>
<td>54,031</td>
<td>95.4</td>
<td>49,089</td>
<td>89.8</td>
<td>47,999</td>
<td>86.8</td>
</tr>
<tr>
<td>Black</td>
<td>1,038</td>
<td>1.8</td>
<td>1,244</td>
<td>2.8</td>
<td>2,053</td>
<td>3.7</td>
</tr>
<tr>
<td>Native Indian or Alaskan</td>
<td>70</td>
<td>0.1</td>
<td>107</td>
<td>0.2</td>
<td>204</td>
<td>0.4</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>321</td>
<td>0.5</td>
<td>531</td>
<td>1.0</td>
<td>36</td>
<td>0.1</td>
</tr>
<tr>
<td>Other</td>
<td>1,166</td>
<td>2.0</td>
<td>3,212</td>
<td>5.9</td>
<td>3,016</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>2,050</td>
<td>3.5</td>
<td>4,790</td>
<td>8.8</td>
<td>8,196</td>
<td>14.8</td>
</tr>
</tbody>
</table>
Table 7. Median Household Income in Chicopee and Surrounding Communities

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicopee</td>
<td>$28,905</td>
<td>$35,672</td>
<td>$47,276</td>
</tr>
<tr>
<td>Ludlow</td>
<td>$36,247</td>
<td>$47,002</td>
<td>$61,410</td>
</tr>
<tr>
<td>Springfield</td>
<td>$25,656</td>
<td>$30,417</td>
<td>$34,731</td>
</tr>
<tr>
<td>South Hadley</td>
<td>$38,694</td>
<td>$47,678</td>
<td>$62,803</td>
</tr>
<tr>
<td>Holyoke</td>
<td>$22,858</td>
<td>$30,441</td>
<td>$35,550</td>
</tr>
<tr>
<td>Granby</td>
<td>$41,277</td>
<td>$54,298</td>
<td>$78,261</td>
</tr>
<tr>
<td>Hampden County</td>
<td>$33,660</td>
<td>$39,718</td>
<td>$50,036</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>$61,717</td>
<td>$65,011</td>
<td>$67,846</td>
</tr>
</tbody>
</table>
**Table 8.** Housing Density in Chicopee and Surrounding Communities (In Housing Units Per Square Mile)

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicopee</td>
<td>851.6</td>
<td>991.2</td>
<td>1,021.9</td>
<td>1,051.9</td>
</tr>
<tr>
<td>Ludlow</td>
<td>211.9</td>
<td>255.0</td>
<td>277.5</td>
<td>297.3</td>
</tr>
<tr>
<td>Springfield</td>
<td>1,661.4</td>
<td>1,847.0</td>
<td>1,842.5</td>
<td>1,858.6</td>
</tr>
<tr>
<td>South Hadley</td>
<td>289.2</td>
<td>338.9</td>
<td>369.2</td>
<td>389.2</td>
</tr>
<tr>
<td>Holyoke</td>
<td>726.4</td>
<td>742.0</td>
<td>711.0</td>
<td>718.6</td>
</tr>
<tr>
<td>Granby</td>
<td>54.5</td>
<td>56.5</td>
<td>58.0</td>
<td>59.2</td>
</tr>
<tr>
<td>Hampden County</td>
<td>248.8</td>
<td>284.0</td>
<td>293.2</td>
<td>303.1</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>192.6</td>
<td>234.3</td>
<td>248.4</td>
<td>266.1</td>
</tr>
</tbody>
</table>

**Table 9.** Land Use in Chicopee

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Area (Acres)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>5,011</td>
<td>32.8</td>
</tr>
<tr>
<td>Commercial</td>
<td>577</td>
<td>3.8</td>
</tr>
<tr>
<td>Industrial</td>
<td>622</td>
<td>4.1</td>
</tr>
<tr>
<td>Transportation</td>
<td>2,347</td>
<td>15.4</td>
</tr>
<tr>
<td>Agriculture</td>
<td>166</td>
<td>1.1</td>
</tr>
<tr>
<td>Urban/Open</td>
<td>1,209</td>
<td>7.9</td>
</tr>
<tr>
<td>Outdoor Recreation</td>
<td>426</td>
<td>2.8</td>
</tr>
<tr>
<td>Water</td>
<td>670</td>
<td>4.4</td>
</tr>
</tbody>
</table>
Table 10. Median Home Value in Chicopee and Surrounding Communities

<table>
<thead>
<tr>
<th>Community</th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicopee</td>
<td>$91,033</td>
<td>$184,034</td>
<td>$129,144</td>
<td>$181,900</td>
</tr>
<tr>
<td>Springfield</td>
<td>$76,743</td>
<td>$170,612</td>
<td>$109,519</td>
<td>$155,500</td>
</tr>
<tr>
<td>Holyoke</td>
<td>$93,415</td>
<td>$188,886</td>
<td>$129,650</td>
<td>$189,100</td>
</tr>
<tr>
<td>Granby</td>
<td>$102,274</td>
<td>$205,543</td>
<td>$173,964</td>
<td>$269,200</td>
</tr>
<tr>
<td>Hampden County</td>
<td>$96,590</td>
<td>$199,236</td>
<td>$143,957</td>
<td>$200,500</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>$128,346</td>
<td>$263,276</td>
<td>$231,445</td>
<td>$352,300</td>
</tr>
</tbody>
</table>

Undeveloped Land | 4,257 | 27.8

**Table 10. Median Home Value in Chicopee and Surrounding Communities**

<table>
<thead>
<tr>
<th>Community</th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicopee</td>
<td>$91,033</td>
<td>$184,034</td>
<td>$129,144</td>
<td>$181,900</td>
</tr>
<tr>
<td>Springfield</td>
<td>$76,743</td>
<td>$170,612</td>
<td>$109,519</td>
<td>$155,500</td>
</tr>
<tr>
<td>Holyoke</td>
<td>$93,415</td>
<td>$188,886</td>
<td>$129,650</td>
<td>$189,100</td>
</tr>
<tr>
<td>Granby</td>
<td>$102,274</td>
<td>$205,543</td>
<td>$173,964</td>
<td>$269,200</td>
</tr>
<tr>
<td>Hampden County</td>
<td>$96,590</td>
<td>$199,236</td>
<td>$143,957</td>
<td>$200,500</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>$128,346</td>
<td>$263,276</td>
<td>$231,445</td>
<td>$352,300</td>
</tr>
</tbody>
</table>
Table 11. Educational Attainment in Chicopee and Surrounding Communities

<table>
<thead>
<tr>
<th></th>
<th>Percentage (%) of population that graduated from high school</th>
<th>Percentage (%) of population that did not graduate from high school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicopee</td>
<td>83.4%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Ludlow</td>
<td>84.6%</td>
<td>15.4%</td>
</tr>
<tr>
<td>South Hadley</td>
<td>92.9%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Granby</td>
<td>92.2%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Holyoke</td>
<td>76.8%</td>
<td>23.2%</td>
</tr>
<tr>
<td>Hampden County</td>
<td>84.1%</td>
<td>15.9%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>89.5%</td>
<td>10.5%</td>
</tr>
</tbody>
</table>
APPENDIX B: FULL PUBLIC ENGAGEMENT ELECTRONIC SURVEY QUESTIONNAIRE

Welcome to the Chicopee Student Walker Safety Survey!

This survey is being distributed by Pacer Planning, a group of graduate students at UMass Amherst’s Department of Landscape Architecture and Regional Planning, on behalf of the City of Chicopee’s Planning Department.

The Problem:
Since no bus services are provided to children who live within 1 mile of an elementary school, 1.5 miles of a middle school, and 2 miles of a high school, the City of Chicopee has requested our team to gather community input regarding pedestrian and bicyclist safety in these areas.

The Purpose of this Survey:
This survey is designed to help Pacer Planning understand walking and bicycling conditions on routes leading to and from the City of Chicopee’s schools. This effort is part of a larger vision plan related to the City’s walkability. We believe that gathering local knowledge is the best way for us to develop recommendations related to safer routes to school.

The Accountability
It is important to note that this survey is the beginning of what will be a longer conversation, and will provide a foundation for future work. To ensure that you, as a survey respondent, are kept informed of our findings, please consider the following:

- If you leave your email address (on the last question of this survey), we will provide you a link containing the final report. The release date is scheduled for mid-January 2017.
- We will also be hosting a community meeting regarding our findings, to be held on Thursday, December 15. The time is to be determined, but if you leave your email address we will send you an invitation.

Depending on the detail of your answers, you may want to reserve 5 - 10 minutes for answering this questionnaire. Please note that the answers for these questions will be used for this specific research, and will be kept confidential and anonymous. If you leave your email address, it will not be shared. Your participation is completely voluntary and you can withdraw at any time.

The survey will remain open until Thursday, November 10, 2016. If you have questions about this project or if you have a research-related problem, you may contact our team by email at pacerplanning@gmail.com.
Which neighborhoods in the City of Chicopee would you say you are familiar with? (Please check all that apply)

- Chicopee Center
- Aldenville
- Fairview
- Ferry Lane
- Westover Air Force Base
- Burnett Road
- Willimansett
- Chicopee Falls
- I am not familiar with any Chicopee neighborhoods
- Other

Please provide your association with the Chicopee schools listed below. If you do not have any association with these schools, you may leave this question blank. (Options include “my child(ren) attend or attended school here;” “I work here;” and “I know the area of this school well”)

- Chicopee High School
- Chicopee Comprehensive High School
- Bellamy Middle School
- Dupont Middle School
- Chicopee Academy at Selser
- Barry Elementary
- Bowe Elementary
- Bowie Elementary
- Lambert-Lavoie Memorial Elementary
- Litwin Elementary
- Fairview Elementary
- Stefanik Memorial Elementary
- Streiber Memorial Elementary
- Szetela Early Childhood School
The questions below are designed for you to think about walking conditions to any of Chicopee’s schools. If you have a specific school in mind, please note this in your responses. You may also feel free to provide feedback on more than one school in your responses.

How safe do you feel it is for children to walk or ride their bike to school in the City of Chicopee? (Again, if you have a specific school in mind, please note this in your response). Which streets could be better designed for students walking or bicycling to school?

What of the following issues do you believe affects parents’ decisions to allow or not allow their children to walk to and from schools in Chicopee? (Please check all that apply)

- Distance
- Convenience of driving
- Time
- Speed of traffic along route
- Amount of traffic along route
- Condition of sidewalks or pathways
- Accessibility or sidewalks or pathways
- Safety of intersections and crossings
- Crossing guards
- Violence or crime
- Other

Do you have any thoughts or suggestions about what would make streets that lead to schools safer (e.g. more crosswalks, improved signage, better lighting)? If you have a specific street or intersection in mind, please note this in your response.

Which streets could be better designed for students walking or bicycling to school?

How might enhanced walkability affect students’ ability to report to school regularly and in a timely manner?
Which streets are made less accessible by snow build-up/storage/icy conditions for students walking to school during the winter months?

OPTIONAL: Please provide your occupation and title below:

OPTIONAL: Please provide your email address below:

If there is anything else this survey has not covered that you would like to share, please do so below:

Thank you for your time! Please press "SUBMIT" below to complete your survey.