5-1-2005

Spatial Implications of Urban Functional Classification: A Study of Small Urban Places in the North-Central United States

Tyler A. Van Meeteren
University of Nebraska at Omaha

Spatial Implications of Urban Functional Classification: A Study of Small Urban Places in the North-Central United States

A Thesis

Presented to the

Department of Geography/Geology

and the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

University of Nebraska at Omaha

by

Tyler A. Van Meeteren

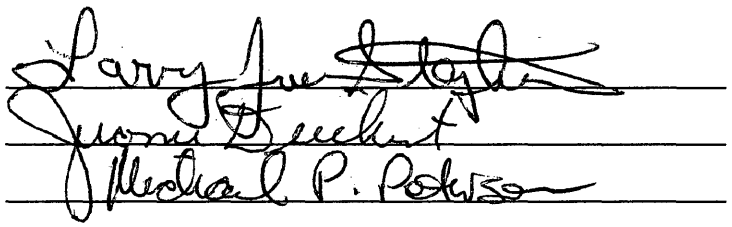
May 2005

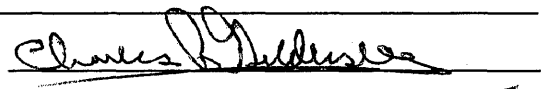
ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

THESIS ACCEPTANCE

Acceptance for the faculty of the Graduate College,
University of Nebraska, in partial fulfillment of the
Requirements for the degree Master of Arts,
University of Nebraska at Omaha.

Committee



Chairperson 

Date April 19, 2005

Spatial Implications of Urban Functional Classification: A Study of Small Urban Places in the North-Central United States

ABSTRACT

Tyler A. Van Meeteren, M.A.

University of Nebraska, 2005

Advisor: Dr. Charles R. Gildersleeve

The idea that cities have diverse economic structures and social characteristics is commonly understood. Many times these differences can be traced to historical regional growth or resource availability. Recognition and better understanding of these different types of cities requires their classification. Classification is way to organize complex and diverse information in order to create a better understanding of processes and relationships. One of the ways in which geographers have classified cities, in terms of describing the external relations, is called functional town classification. The simplest way of classifying cites is to identify the distinctive role they play in the city system.

The purpose of this thesis is to examine the spatial distribution of economic functions for the small urban places in the study area using a standard classification method for urban geography, and by utilizing nearest neighbor analysis. This study should produce spatial patterns of distribution based on the site and situation of the place. There may also be a strong influence of function

based upon proximity to a larger urban area. The creation of a contemporary taxonomy of the small urban places in the study area, and subsequent understanding of the spatial distribution of dominant economic features should provide the base for future investigation into small urban center relationships and classification.

ACKNOWLEDGEMENTS

The completion of my Masters Degree in Geography would not have been successful without the support from numerous people at the University of Nebraska at Omaha. I would like to thank Dr. Charles Gildersleeve for introducing me to the realm of urban geography. As the chair of my thesis committee, Dr. Gildersleeve did a fantastic job molding the theoretical and methodological foundations for my research. Dr. Gildersleeve's enthusiasm for geography was contagious. I would also like to thank Dr. Michael Peterson for introducing me to cartography and geographic information systems (GIS). Jerry Deichert from the Center for Public Affairs Research was instrumental in organizing my census data for the thesis. Dr. Larry Stephens from the Math Department offered suggestions for statistical analysis. I thank each of these four gentlemen for their leadership and guidance.

Last but certainly not least, I thank my family for their support both emotionally and financially as I completed my thesis. My parents Sheila and Alan have provided unwavering support in my pursuit of a Masters degree. I cannot forget to thank my brother, Bryant, and sister, Alissa, for being exceptional siblings, even though I am not sure they thought I would ever get done! Well, I did!

CONTENTS

LIST OF ILLUSTRATIONS

Figure Page

LIST OF TABLES

Chapter 1

Introduction

The study of urban geography brings several overlapping disciplines including economics, political science, sociology, and history together to examine the complex system of cities. To best understand the nature of urban geography, two important approaches should be outlined. The first is to study the relationships in the spatial distribution and dynamic movement of goods within the cities, or a city system approach. The examination of interaction and distribution patterns, or internal relations, within cities are looking into the city as a system. The second approach, and the one this study employs, is the study of spatial distribution of cities and the complex patterns of movement, and linkages, or external relations that tie them together. (Yeates and Garner 1980) Urban geography can merely be described as the study of cities as systems within the framework of cities (Berry, 1964).

The relationships not only exist amongst other urban areas, but also between cities and the people living in that area. These complex interactions are of significant interest to the urban geographer. Figure 1 illustrates the possible relationships of importance in urban geography. The first possibility of investigation

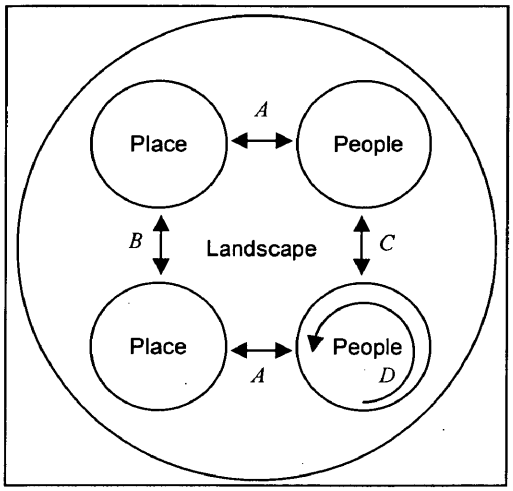


Figure 1: Network of interactions in urban geography adapted from Ray Northam., *Urban Geography*. (New York: Wiley & Sons, 1975), 3.

(A) involves the associations between a place and its population. Another (B) area of inquiry deals with the relationships linking different places. The relationships (C) between people in more than one location can also be researched. The final channel of study (D) includes the associations within one place. (Northam 1976) Each of these interactions occur within the confines of the landscape of the earth.

The study of city patterns began to pick up steam in the first half of the 20th century as N.S.B Gras (1922), Christaller (1933), Losch (1937), and Harris and Ullman (1945) described the nature and origin of systematic variations in the characteristics of urban places. These geographers set the framework for more advanced statistical analysis that future generations could build upon.

The notion that cities have diverse economic structures and social characteristics is commonly understood. Many times these differences can be traced to historical regional growth or resource availability. Recognition and better understanding of these different types of cities require their classification. Classification is a way to organize complex and diverse information in order to create a better understanding of processes and relationships. The relevance and usefulness of classifications in geography is wide-spread throughout the discipline. In urban geography, "generalizations can be made concerning a single group comprised of like items, or one group can be compared and contrasted with one or more other groups" (Northam 1975, 13). The idea that cities differ in terms of economic functions and social characteristics has long

been known. Classification in geography is undertaken in an attempt to "search reality for hypotheses...[and]...to structure reality to test specific hypotheses that have already been formulated" (Yeates and Garner 1980, 95).

One of the ways in which geographers have classified cities, in terms of describing the external relations, is called functional town classification. The simplest way of classifying cities is to identify the distinctive role they play in the city system. These schemes are qualitative in nature and are often highly intuitive. Of the many classifications of this sort, a good example is that undertaken by Aurousseau in 1921. Based on general observations, he identified six types of cities based on the dominant economic functions they perform: administration, defense, culture, production, communications, and recreation. (Aurousseau 1921) Although it was noted that cities may perform a combination of these general functions, it was common to find that one of them dominated to indicate the major role a city plays in the organization of space.

A similar type of general classification was that proposed in 1945 by Harris and Ullman, who recognized three general types of cities: (1) central places performing a wide range of services for local hinterlands; (2) transportation cities performing break-of-point and allied activities for larger regions; and (3) specialized-function cities dominated by one activity, such as manufacturing, or recreation, and serving a wider national market. (Harris and Ullman 1945)

The results of these classifications, when mapped, provide some useful information about the patterns of functional specialization within the city system.

However, there is little gained from a simple organization of facts. There must be a purpose in the classification system because spatial recognition cannot be the only basis for scientific analysis. Other statistical procedures should be undertaken to shed light on possible patterns that may be unseen on a two-dimensional representation of the data.

Nature of Problem

We as humans are continually classifying everything from the rocks beneath our feet to the stars beyond our reach. These taxonomic models are continually being examined and studied with appropriate changes being made. Almost all, however, have dealt with larger cities and not urban places with fewer than 10,000 persons. By classifying these urban centers we may be able to see patterns at a micro-scale that could possibly be used to address problems in larger cities.

The nature of functional classification has evolved in the past century, beginning with a qualitative approach by Aurousseau where general observations were the basis. The majority of the functional classifications developed by geographers across the United States were based on cities with more than 10,000 people. Only a small number of classified small cities and towns under 10,000 people, because of the apparent difficulty of processing the grouped employment data for small cities. Now, with the availability of electronic data and

faster computers, it is plausible to work with the data as presented by the U.S. Census Bureau.

Over time, many geographers made attempts to be more objective, and this led to several different methods including multivariate statistics being developed. However, no one method has proven to be completely accurate, as all are trying to rationalize an extremely complex and dynamic system.

Research Objectives

There are two principal objectives for this thesis: 1) To create a contemporary taxonomy of the small urban places (population 2,500-10,000) in the study area using a standard classification method for urban geography. 2) To discover and understand the spatial distribution of the dominant economic functions of small cities in the study area.

Hypotheses & Rationale

The five states of Iowa, Nebraska, South Dakota, North Dakota and Minnesota should allow for a broad enough study area containing many discernable spatial patterns of functionality. Based on previous studies, there should be solid evidence supporting the three types of cities by support: central places (a study by Brush in Wisconsin in 1953), special functions, and transport cities. Based on results from other studies, retail centers and manufacturing should be the most common functional class (Freestone *et al.* 2003; Harris 1943;

Nelson 1955). Mining, Transportation and Public Administration would likely be some of, if not the least occurring functions due to the specialization and necessity for resources or other special site requirements. The creation of the taxonomy should result in finding many location specific examples, and more than likely follow typical functional patterns. It is expected that solid evidence will be found supporting the three types of cities by support: central places, special functions, and transport cities. Research on the small urban places of the Great Plains region in the late 1960's by Charles Gildersleeve indicated that North and South Dakota were primarily retail trade dominant. Nebraska was more diversified, and not as trade oriented. Manufacturing has a greater influence in the area east of the Missouri River including Iowa and portions of Minnesota. (Gildersleeve 1969)

Using nearest neighbor analysis, spatial patterns should be found to assist in understanding the distribution of functions throughout the region. When attempting to understand spatial distributions and relationships, geographers must realize that "the classification procedure that is adapted should produce groups of towns about which the greatest number, most precise, and most important statements can be made for the differentiating and accessory characteristics" (Cline 1949, 82). This means that one cannot simply say that group 'X' is located in area 'Z'; we should be able to associate other characteristics of towns in that group. With this in mind, classifications of towns

by function may possibly lead to generalizations about the location patterns and the relationships with particular functions and their hinterlands.

The lack of significant data and interest has primarily been the reason for the dearth of research on cities with less than 10,000 in population. With census data more available today, it is possible to successfully complete this research. Studies have occurred since the 1950's on classifying the economic functions of cities – at higher population centers (i.e., above 10,000). These study areas also need to be readdressed since much has changed over the past half century, and geographers ought to study the changes in city functionality over time. The opportunity for a comparative temporal analysis of functionality will be achieved through this research.

There must be a concentrated effort to not just report the results, but be more scientific. "There is nothing inherently wrong with functional classifications per se, yet without reference to the accessory characteristics, they have precious little geographical relevance" (Smith 1965, 548). "The service classifications of urban areas have often proved to be ends in themselves rather than points of departure for further research" (Wilson 1962, 125). With this in mind, the overall purpose of functional classifications in urban geography should be geared towards gaining better understanding of the diverse and dynamic relationships both vertical (function) and horizontal (countryside relationships) that make up the true functionality of a city.

While analyzing the small urban center of Minnesota in 1959, John W. Webb claimed that data are difficult to use for small urban centers. He concluded the research by saying "work on a broad canvas should be undertaken, despite the difficulties. Only in this way will the description of the particular be clarified and general principles evolved" (Webb 1959, 72).

Significance of Research

Many studies conducted on classifying the economic functions of cities were done several decades ago. These study areas should be readdressed since much has changed over that time period. Freestone, Murphy and Jenner recently updated a classic city classification of Australian towns, and many new patterns and employment distributions were discovered. (Freestone *et al.* 2003)

Geographers also need to examine and re-evaluate the functional changes in towns over time. Perhaps planners and city administrators can use the results found in this study to assist them in planning the future economy in their cities. This research will create a contemporary classification of small urban places in the upper central United States. "This line of study might be likened to one studying the human heart without regard for its role as a part of the physiological system of the entire body. To study a single city without regard for the whole urban system of which it is part is equally limited and short-sighted" (Northam 1975, 99). There is a need to understand the small cities and towns, in order to truly understand the larger, more complex system. This study is original

in the sense that it is a hybrid of the various studies done on functional city classifications. The framework will be established for further research into understanding the dynamic economic functionality of small urban centers.

Study Area

The area under investigation is a five state area making up the north-central portion of the United States: Nebraska, Iowa, South Dakota, North Dakota and Minnesota. These five states should allow for a broad enough study area containing many discernable spatial patterns of functionality. The small urban centers are also quite prominent in this region, which will assist in the overall analysis of the character and nature of functional distribution (see Figure 2).

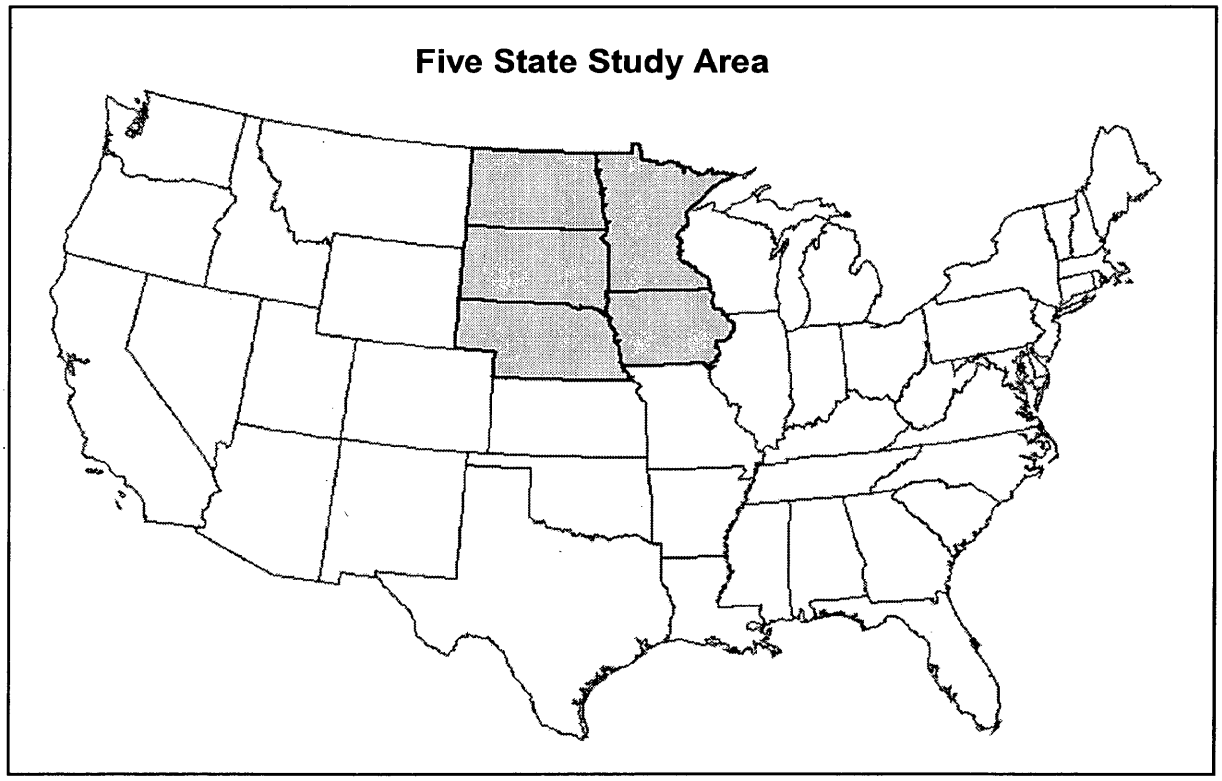


Figure 2: Five state study area location map.

Table 1 shows the 2000 population, land area (square miles), and population density (persons per square mile) for each state in the study area. When compared to the United States as a whole, the study area constitutes a small percentage of the overall population and is generally quite rural.

State	2000 Population	Area (sq mi mi)	Pop. Density
Iowa	2,926,324	55,869	52.4
Minnesota	4,919,479	79,610	61.8
Nebraska	1,711,263	76,872	22.3
North Dakota	642,200	68,976	9.3
South Dakota	754,844	75,885	9.9
United States	281,421,906	3,537,438	79.6

Table 1: Population Figures for the five state study area.
Source: United States Census Bureau. "http://factfinder.census.gov"

Definition of Terms

Geographic Information System (GIS): A System of computer software, hardware and data. A GIS is used to help manipulate, analyze and present information that is tied to a spatial location

Metropolitan Statistical Area: A city of 50,000 or more population or a U.S. Census Bureau defined urbanized areas of 50,000 or more population and smaller urban clusters of 10,000 to 49,999 population within a county or adjacent counties.

Shapefile: A name for a layer in ArcGIS that contains location descriptions and attribute information for the spatial features in a data set.

Site & Situation: Site is the physical location of a city, and a situation is the influence of the surrounding area.

Small Urban Place: A city with a population of 2,500 to 10,000 inhabitants

Chapter Summary

The purpose of this thesis is to examine the spatial distribution of economic functions for the small urban places in the study area using a standard classification method for urban geography, and to discover and understand the spatial distribution of the dominant economic functions of these places utilizing nearest neighbor analysis.

This study should produce spatial patterns of distribution based on the site and situation of the place. There may also be a strong influence of function based upon proximity to a larger urban area. The creation of a contemporary taxonomy of the small urban places in the study area, and subsequent understanding of the spatial distribution of dominant economic features should provide the base for future investigation into small urban center relationships and classification.

Chapter 2 follows with a review of the literature on urban geography that specifically addresses varying methods and theories of functional classification. Chapter 3 discusses the methodological design, data collection, and analyses performed in the research study, while chapters 4 and 5 provide an extensive discussion of the results and conclusions of the research study.

Chapter 2

Literature Review

With respect to the discipline of geography as a whole, urban geography is a relatively new field of study, and this has an impact on the quantity of literature available for functional classification. The purpose behind each of these studies is to find relationships in the spatial distribution of economic functions in an attempt to better understand the incredibly complex urban structure. The nature of functional classifications has changed throughout the course of the last 100 years, with ever more concentrated efforts made to produce more objective results. This had led to the application of various statistical methods including multivariate statistical analysis in an attempt to discover relationships within the dynamic urban system.

The literature on functional classification in urban geography presented in this chapter follows this progression described above, with a focus on the importance of understanding the roots of functional classification theory. The chapter is divided into three sections: (1) traditional functional classifications, (2) a guideline for functional classification analysis, and (3) multivariate statistical analysis. The first part examines the foundation of functional classification through the original architects of the discipline. The second section sets the framework for a more scientific and replicable methodological design in city classification. The final portion of the chapter discusses more recent

classifications accomplished with the application of multivariate statistical analysis approaches including regression, factor analysis, and cluster analysis.

Traditional Functional Classifications

The idea that cities differ in function has long been understood, dating back to the earliest time of city development Chauncy Harris' (1943) *A Functional Classification of Cities in the United States* was the first to classify cities in the U.S. by economic functions. This classification started a whole new wave of urban geography in the mid 20th century. Many geographers used his model as a base for future attempts at classifying and discovering spatial distribution. Harris studied 1930 census data, including occupation and employment figures. His classification included 984 cities of 25,000 or more people and was based upon the activity of greatest importance in each city (see Figure 3). Harris used the employment figures as the principal basis for classification chart, while the occupation figures were used to supplement the interpretation. Arbitrary class breaks of 74%, 60%, 50%, and 25% were used. Harris then mapped the location of the cities based on the category he calculated. He concluded that the central-location theory was exemplified by wholesale centers, and retail centers. Mining and resort centers are based heavily on materials or climate. Industrial cities

Manufacturing Cities M' Subtype
Manufacturing Cities M Subtype
Retail Centers (R)
Diversified Cities (D)
Wholesale Centers (W)
Transportation Centers (T)
Mining Towns (S)
University Towns (E)
Resort and Retirement Towns (X)

Figure 3: Functional Classes used by Chauncy Harris (1943)

have both location factors related to markets and raw materials. The manufacturing belt was shown by the influence of power and labor supply. (Harris 1943) The lasting impact of this article was that Harris attempted to create a quantitative model that could be replicated in the future. He was able to show a spatial pattern existed with his results, which led to further studies by other geographers.

Howard Nelson published *A Service Classification of American Cities*, in 1955. Nelson used employment data in 24 industry groups for 897 urban concentrations of 10,000 or more people. The data were then arbitrarily grouped into nine major categories of service functions. For each industry group, the average proportion of the labor force engaged in that activity was determined. Most cities didn't have average employment in a given industry; therefore, a variation from the mean existed. This was done because Nelson wanted to create a classification based on clearly stated statistical procedures. Nelson used a more statistical method than his predecessors – standard deviation. He used standard deviation to establish degrees of functional specialization in a given industry group. Nelson calculated three standard deviations above the mean of each industry group, since he was specifically concerned with higher levels of employment. This would allow for a degree of emphasis inside the overall functional specialization in a city. This research discovered many instances of geographical patterns. Manufacturing was the most common of all functions, with more than 1/5 of the 897 cities, and was located in the traditional

manufacturing belt of the country. (Nelson 1955) Retail trade tended to be located more in the central portion of the country, and wasn't present in the region dominated by manufacturing. Nelson's method was a multi-functional approach, which is a stronger method of measuring economic levels than a simple dominant classification.

A landmark article was written by Chauncy Harris and Edward Ullman in 1945 titled *The Nature of Cities*. The focus is on the support and internal structure of cities. The concept emphasizing that the services the city provides are based upon its hinterland. The service by which the city earns its livelihood depends on the nature of the economy of the surrounding area. The land must produce a surplus in order to support cities. This does not necessarily mean that every city needs to be encompassed by a productive land, since a strategic location may be more important. Three categories of support are discussed by Harris & Ullman: (1) cities as central places, (2) transport cities, and (3) specialized function cities. The first category describes cities as central places performing comprehensive services for a surrounding area. Such cities tend to have an even spatial distribution throughout a productive area (Figure 4a). This is a common occurrence in the study area for this thesis, particularly in the state of Iowa. Transport cities tend to perform break of bulk and other services along major transportation routes including rail lines, roads, and seaways (Figure 4b). These cities are often found in linear patterns because other smaller cities play a supporting role along the transportation route. Specialized function cities perform

one service such as mining, manufacturing, or recreation for large areas, and include several smaller cities in the immediate surrounding area that support the dominant function (Figure 4c). Commonly, cities are a combination (see Figure 4d) of the above mentioned factors with the relative importance varying from location to location. (Harris and Ullman 1945)

Also discussed with detail were the internal structures of cities including the concentric zone theory, sector theory, and the multiple nuclei concept. The importance of this article is that Harris and Ullman are providing a strong base for further research in urban geography, within a theoretical framework prescribed in their research. (Harris and Ullman 1945)

A look into small towns was conducted by John Brush in 1953 with *The Hierarchy of Central Places in Southwestern Wisconsin*. This article examines the importance of population on the ability to develop larger trade areas. The influence and character of central places were examined. Locational patterns developed by C.J Galpin (1915), J.H Kolb (1946), and Christaller (1933) are examined. Also, the traffic flow as an

Cities by Support

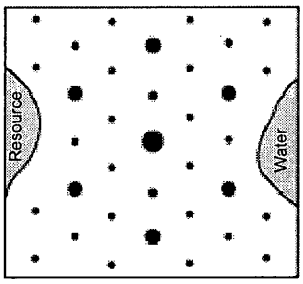


Figure 4a: Central Places

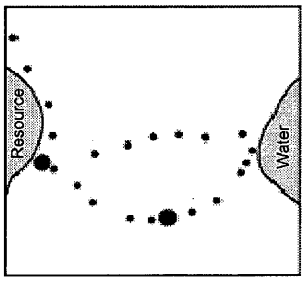


Figure 4b: Transport Cities

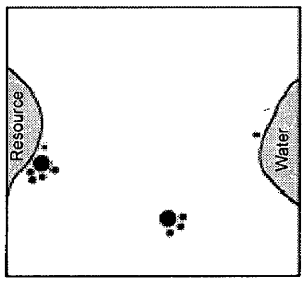


Figure 4c: Specialized Function Cities

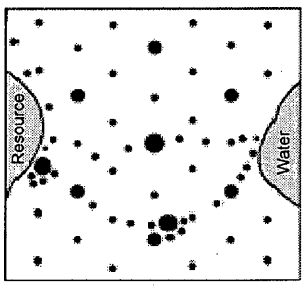


Figure 4d: Comprehensive functional cities

influencing factor was mapped. Brush presents a solid application of central place theory on small towns in Wisconsin. (Brush 1953)

Basic Concepts in the Analysis of Small Urban Centers of Minnesota in 1959 by John W. Webb examined the functional characteristics of cities using a different methodology than previous geographers. Webb endorsed the standard deviation method use by Howard Nelson (1955), L.L Powell (1953), and Steigenga (1955) as a valid method of measuring specialization of service functions. (Webb 1959)

Webb created a method that would account for a function's importance to a city relative to other cities. "The functional index," where the percentage of the employed population in a function is divided by the mean employment in all the towns. Using the U.S. Census data of 1950, Webb created seven categories of functions and calculated the functional index for each category of towns with population 2,500-10,000, and also for populations 10,000-50,000. Webb also attempted to create a system of measuring a town's level of specialization or the "specialization index." Webb concluded by calling for more research on smaller towns to be embarked upon in the future. (Webb 1959)

Functions and Occupational Structure of Cities of the American South, by John Fraser Hart in 1955 is a functional classification system based upon Harris' design of 1943. The purpose of the study was threefold: (1) to discover cities whose function has changed since 1930, (2) to classify cities which have passed the 10,000 population mark since 1930, and (3) analyze the distribution, size,

and occupational structure of cities within each functional category. The geographic area examined is the U.S. Census' definition of the South. (Hart 1955)

Hart's study was based primarily on occupational data for the cities over 10,000 in population. This method leads to a mutually exclusive classification based on the function of the city in terms of the people who live there and what they do (similar to what is pursued in this thesis). Hart calculated the industry data for the cities and determine the minimal, quartile, median, and upper decile percentage for each age group. Manufacturing, retail trade, and personal services were found to be the dominant functional service of cities in the south. (Hart 1955)

An examination of small towns was undertaken in an article by Howard Stafford in 1963 titled *The Functional Bases of Small Towns*. Stafford claims that theories developed for central places should hold true for the whole spectrum of city size, from the largest to the smallest. The purpose of Stafford's study was to determine the functional bases for small towns in southern Illinois and compare the results with similar studies throughout the region. His research was based on Thomas' Iowa study where data are attained for each town and values are calculated for (1) total number of establishments, (2) total number of functions, and (3) total number of functional units. (Thomas 1960) Stafford confirmed what was generally understood that a relationship existed between population and the three indices by applying simple correlation and regression analysis. The final

results of this study found that most towns were service centers. This was consistent to what Berry and Garrison (Berry and Garrison 1958) discovered since small towns simply do not have sufficient threshold populations or large enough trade areas to support a specialized function. Stafford concludes that a whole possible realm of research could be investigated by comparing the results from many regions around the country in an attempt to create generalizations with regards to economic functions in small towns. (Stafford 1963)

Howard Nelson followed up his classification of cities in the United States in 1955 with an article titled *Some Characteristics of the Population of Cities in Similar Service Classifications* in 1957. With regards to concerns over the relevance of classifications as simply a reference tool, Nelson claimed that classifications should be utilized for further and more in-depth analysis of the urban configuration. Analyses have been made of population change, education, age, and labor force, but the main focus of Nelson's research is to investigate possible relationships amongst different functions. Nelson simply used the classifications of U.S. cities as a basis for the study. (Nelson 1957)

It was evident through the research that variations in economic and social qualities of American cities are related to the function or service classes to which a city belongs. Nelson found that variations in the rate of change in population in the 1940 to 1950 decade were strongly affected by a city's leading function. One example of this is that the population in cities classified under personal service and professional service are increasing by more than twice the typical rate.

Contrast that with the population change in manufacturing where little to no growth had occurred. (Nelson 1957)

Nelson also addressed the effects of regional location on social and economic characteristics. The regional averages of population increase, education, female labor force, male labor force, age, unemployment, and average earnings were examined for the geographic regions of the Northeast, North Central, South, and West. Nelson concluded that this research indicated a relationship between the service class and regional location on the characteristics of a city. According to the research, the characteristics of a region generally affected people of all classes, ages, and gender. (Nelson 1957)

A Guideline for Functional Classification Analysis

The purpose of functional classifications is to identify the spatial regularities in the distribution and structure or urban functions. Unfortunately, according to Roberts H. T. Smith's Method *and Purpose in Functional Town Classification,* most studies lack a clear and specific objective. Most classifications created ended up being ends to themselves instead of a springboard for future research. Geographers also seem to be satisfied to simply report their findings in broad geographic terms. The overwhelming majority of classifications were be created by urban geographers in order to develop a new methodology and simply display their results, rather than conducting a more detailed analysis of the data. The primary purpose of Smith's article is to review

several classification methods developed in the mid 20th century and point out flaws and offer a blueprint on how to effectively conduct scientific research. (Smith 1965)

The classification procedure that is used should produce groups of towns about which the greatest number, most precise, and most important statements can be made concerning differentiating and accessory characteristics. Furthermore, to be justified on other than pedagogic grounds, any classification should be relevant to a well defined problem. As a result, when towns are classified according to function (the differentiating characteristic), we not only want to say something about the function or combination of functions typical of that group; knowledge of membership in any one group should automatically carry with it knowledge of additional characteristics of the towns in that group. Smith claims it is not difficult to deduce that there are at least two spatial characteristics associated with town functions. First, since there is some spatial order to the distribution of economic activities in general, we can then expect to find distributional characteristics of towns in similar functional classes that are abnormal to those classes. Second, given the notion that function implies a relationship between a town and its hinterland, different functional classes should be connected with different forms of hinterland areas. (Smith 1965) With this thought process, classification of towns by function may lead to the formalization of generalizations about location patterns of towns and the relationships between

towns with particular functions and their hinterlands, which is the essence of this thesis.

Multivariate Statistical Analysis

Hart and Salisbury's (1965) *Population Change in Middle Western Villages: A Statistical Approach* analyzed population trends in *villages* (places with incorporated status and populations less than 1,000 persons outside large urban areas) in 1960 for a nine state area of the Midwest. It discusses the process of regression analysis and the manipulation of data to obtain a linear relationship between the dependent (percentage of population change) and independent variables and the need for each variable to have a normal distribution. Scattergrams are used to help identify linear or non-linear relationships between variables. Data that do not conform to a normal distribution should be normalized by use of logarithms or square roots. Upon completion of the regression analysis, the residuals of regression (villages lying outside the standard error band of the line of regression) were then mapped and eventually analyzed by their distance from major population centers, which became another independent variable in the analysis. (Hart and Salisbury 1965)

Hart and Salisbury's research supports the idea that patterns of village growth are too complex to be satisfactorily explained by any simple set of statistical variables. Hart and Salisbury provide a strong argument for the

implementation of multivariate statistical analysis in urban geography, particularly when examining population change.

Another article discussing the statistical approach was *What is a Central City in the United States? Applying a Statistical Technique for Developing Taxonomies* in 1998 by Edward Hill, John Brennan and Harold Wolman. This article included a detailed outline of the methodological design using cluster analysis to group cities in the United States. The purpose of the article was to create and discuss a methodological design using cluster analysis to group U.S. central cities, and then employ discriminant analysis to ascertain a statistical based validity for the groups. Overall, the article provides a solid framework by discussing a highly technical step-by-step application of multivariate statistical analysis including several charts and graphs describing the results. (Hill *et al.* 1998)

The most recent study on functional classifications was conducted by Robert Freestone, Peter Murphy, and Alan Jenner in 2003 titled *The Functions of Australian Towns, Revisited.* This inter-temporal research aimed to create a contemporary classification of towns in Australia using principal components analysis and cluster analysis. This article argued for continued classification of urban areas because functionality does change over time, and through their research, several changes had occurred since the last classification in 1965. This article will be used as justification for this thesis project. (Freestone *et al.* 2003)

Factor analysis using varimax rotation has been commonly used in classification research because of the ability to identify the underlying structure of complex data sets. However, in the study conducted by Freestone *et al.*, a clear-cut principal components analysis (PCA) with varimax rotation was selected. PCA has the ability to "provide an informative, low dimensional representation of the data" (Boloton and Krzanowski, 1999). PCA was primarily used in their study as an intermediate step towards cluster analysis. (Freestone *et al.* 2003)

Cluster analysis techniques have become more prominent in taxonomic studies. Freestone, *et al,* chose Ward's Method because it had been used in other comparable studies. An advantage of using Ward's Method is not having fixed entries where cases cannot be removed from a cluster even though the cluster structure may change with each new case being introduced. (Freestone *et al.* 2003).

The data used were inclusive of all recognized urban centers using the 1996 census data from the Australian Bureau of Statistics (ABS). The data contained twelve 1-digit Australian and New Zealand Standard Industry Classification codes for all 741 cities with a minimum population of 1,000 people. The results of the research led to an updated economic classification of Australian urban places. (Freestone *et al.* 2003).

Through cluster analysis, there were found to be thirteen distinct groupings of urban places in Australia based on economic factors. A comparison to Smith's (1965) classification showed many notable differences including the

increase in overall population, the increase in the number of cities, and the increased functional diversification of cities, among others. It was noted that comparisons could indeed be made even though variations in methodologies existed between the classifications conducted by Smith and Freestone, *et al.* (Freestone *et al.* 2003)

Summary of Literature

Although the time-scale of urban geography is relatively short, the development of methodological techniques and conceptual blueprints as regards to how to generalize and understand the geographic relationships cities have with one another is quite astonishing. Harris, Ullman, Nelson, and Hart set the framework of functional classification as the original architects of the discipline. Smith developed a methodological outline for a more scientific and replicable methodological design in city classifications for the future. More recent applications of multivariate statistical analysis created other avenues for scientific inquiry to be obtained.

Over time, many geographers made attempts to be more objective, and this led to several different methods being developed. However, no one method has proven to be completely satisfactory, as all are trying to rationalize an extremely complex and dynamic system. With this in mind, an attempt to better understand the dynamic relationships both vertical (function) and horizontal (countryside relationships) that make up the true functionality of a city is

exceptionally challenging. Therefore, the necessity of understanding the foundation of functional classification theory and methodology is critical to the urban geographer when undertaking the complex and diverse project of creating a taxonomy and attempting to find subsequent relationships. .With these thoughts in mind, this study continues with a discussion of the methodology developed and utilized to answer the questions posed by this thesis

Chapter 3

Methodology

In discussing the role of geography within the scope of academic research, Haring, Lounsbury, and Frazier state that "geography is the branch largely concerned with the attainment of spatial knowledge, and is also concerned with the identification, analysis, and interpretation of spatial distributions of phenomena and their locational relationships as they occur on the planet" (Haring *et al.* 1992, 5). The purpose of functional classifications is to identify the spatial regularities in the distribution and structure or urban functions, and this is consistent with the accepted role of geography in academia. The steps explained in this chapter are in line with the two primary objectives for this thesis: 1) To create a contemporary taxonomy of the small urban places (population 2,500-10,000) in the study area using a standard classification method for urban geography. 2) To discover and explain the spatial distribution of the dominant economic functions of small cities in the study area.

The chapter follows the steps shown in the methodological model as seen in Figure 5. These stages include the acquisition of data, database organization, and evaluation of the data by creating a modern taxonomy and applying nearest neighbor analysis in order to establish spatial distribution patterns. The process was partially adapted from previous functional classifications in urban geography with minor alterations in classes.

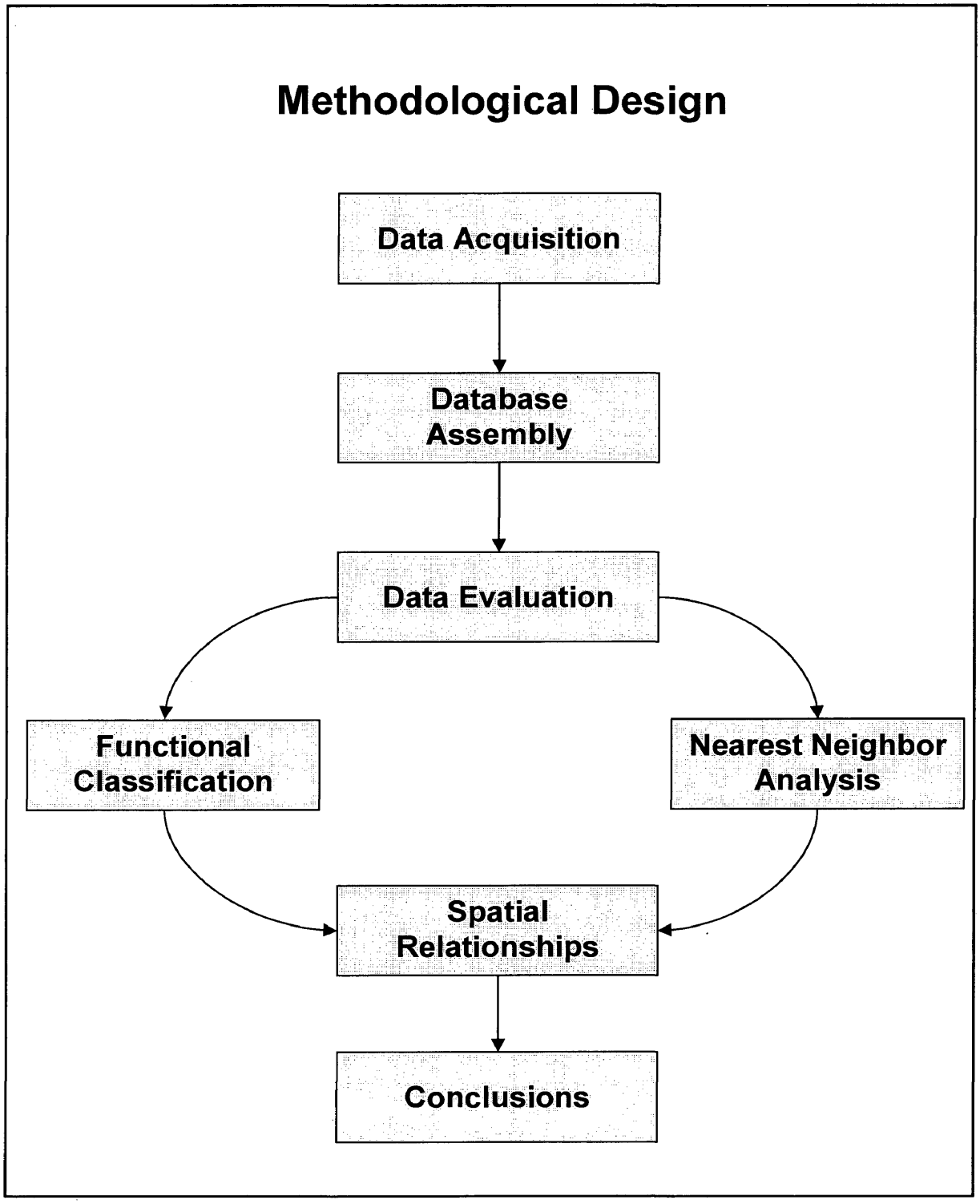


Figure 5: Methodological model applied to the study.

Data Characteristics and Acquisition

Industry data obtained from the 2000 U.S. Census was used for this thesis project. "A common assumption in functional town classification is that the city's labor force is the best single indicator of the structure of the urban economy" (Yeates and Garner 1980, 97). Going with tradition, the data used will be based on the industry of working population in each small urban place in the study area. Other geographical classification studies have also used the industrial census data (Harris, 1943; Webb, 1959; Nelson, 1955, Hart, 1955, Freestone *et al.*, 2003). The data set was obtained in electronic form via the U.S. Census Bureau online at http://www.census.gov. Information was only collected for cities with populations between 2,500 and 10,000 were collected. The data contained the number of employed persons in each urban place, and are divided into 13 major categories. The data were then broken down into more specific industries on several occasions (see Table 2).

	INDUSTRY EMPLOYED	Ackley, Iowa	Ackworth, Iowa	Adair, Iowa
2	Total:	793	48	393
3	Male:	430	21	196
4	Agriculture, forestry, fishing and hunting, and mining:	38	3	20
5	Agriculture, forestry, fishing and hunting	38	3	20
6	Mining	0	0	0
7	Construction	42	2	36
8	Manufacturing	112	7	34
9	Wholesale trade	31	0	22
10	Retail trade	51	6	13
11	Transportation and warehousing, and utilities:	28	0	8
12	Transportation and warehousing	23	0	6
13	Utilities	5	0	2
14	Information	8	0	4
15	Finance, insurance, real estate and rental and leasing:	9	0	7
16	Finance and insurance	9	0	2
17	Real estate and rental and leasing	0	0	5
18	Professional, scientific, management, administrative, and waste management services:	20	0	5
19	Professional, scientific, and technical services	15	0	4
20	Management of companies and enterprises	0	0	0
21	Administrative and support and waste management services	5	0	1
22	Educational, health and social services:	48	3	24
23	Educational services	33	0	21
24	Health care and social assistance	15	3	3
25	Arts, entertainment, recreation, accommodation and food services:	16	0	10
26	Arts, entertainment, and recreation	2	0	0
27	Accommodation and food services	14	0	10
28	Other services (except public administration)	13	0	7
29	Public administration	14	0	6
30				

Sheet1 / Sheet2 / Sheet3 /

Table 2: The census data acquired breaks into 13 main categories, as are the sub-categories. The data included both male and female employment figures listed separately. Only the male data are shown here.

Database Organization

A vital and often times overlooked component of a thesis is the organization of data so an effective and accurate assessment can be completed. The initial step taken to accomplish the first objective was to group the 13 industrial categories into services classes for the new taxonomy. Using previous models (Harris 1943 and Nelson 1955) and with consultation of the thesis committee, eleven classes were chosen for this study (see Table 3). The employment by industry data from the census is by place of residence, not place of work. It is important to note the omission of agriculture, forestry, fishing and hunting in this classification since these people are most likely performing activities in the countryside, and this would not be considered an economic function of the city. Also, the combination of educational, health and social services with professional scientific, management, administrative and waste management services was done because these occupations are considered to be "professional" in nature.

Census Classification by Industry Groups	Thesis Taxonomy	Symbol
Agriculture, forestry, fishing and hunting	Omitted	
Mining	Mining	Mi
Construction	Construction	C
Manufacturing	Manufacturing	Mf
Wholesale trade	Wholesale	W
Retail trade	Retail	R
Transportation and warehousing, and utilities	Transportation	T
Information	Information Technology	I
Finance, insurance, real estate and rental and leasing	Finance	F
Professional, scientific, management, administrative & waste management	Professional Service	Pf
Educational, health and social services:	Professional Service	Pf
Arts, entertainment, recreation, accommodation and food services	Personal Service	Ps
Other services (except public administration)	Personal Service	Ps
Public administration	Public Administration	Pa

Table 3: The service classes for the taxonomy are shown on the right and the U.S census industry groups from which the data were collected are on the left.

Of the 280 cities in the study area, many were in close proximity of Metropolitan Statistical Areas (MSAs). Within the study area there were 18 MSAs including Omaha, Sioux City, Waterloo-Cedar Falls, Dubuque, Cedar Rapids, Davenport, Iowa City, Des Moines, Duluth-Superior, St. Cloud, Minneapolis-St. Paul, Rochester, Fargo-Moorhead, Grand Forks, Lincoln, Bismarck, Sioux Falls and Rapid City. (see Figure 7) To alleviate the influence of these larger cities, all cities within the 2,500 to 10,000 population range that were contained within contiguous urbanized area of the MSA cities were excluded from the study. This led to a subtraction of 49 cities mostly in the Minneapolis-St. Paul metropolitan area (see Figure 8). The remaining 231 cities were then organized by the number of employed persons for each of the eleven classes (see APPENDIX A for cities sorted by population, and APPENDIX B for cities sorted alphabetically).

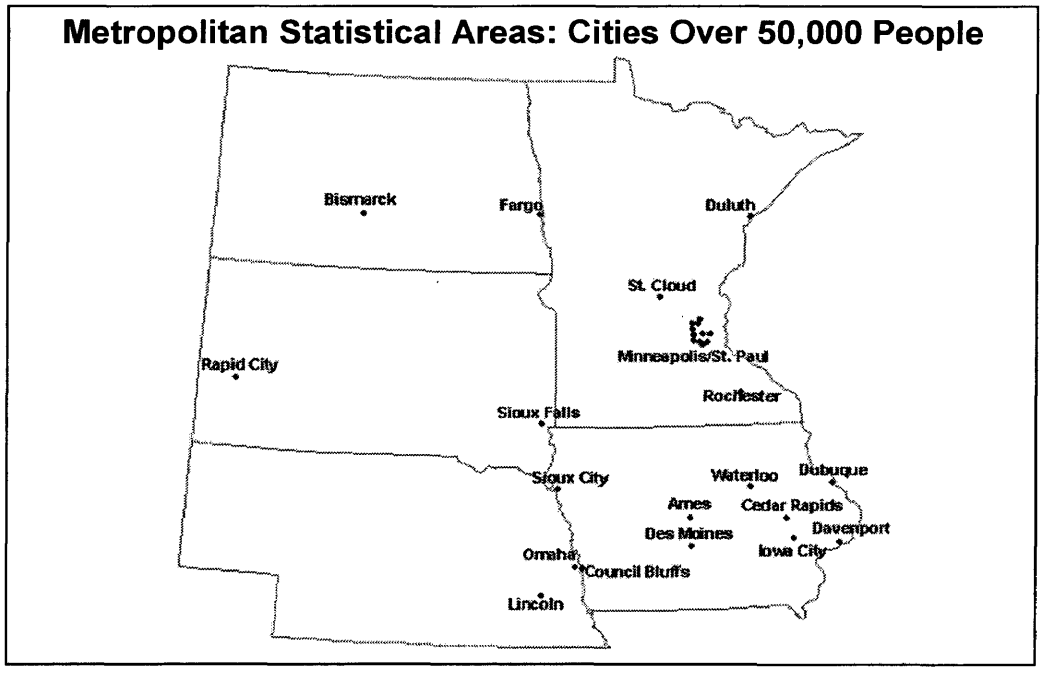


Figure 7: The MSA cities within the thesis study area.

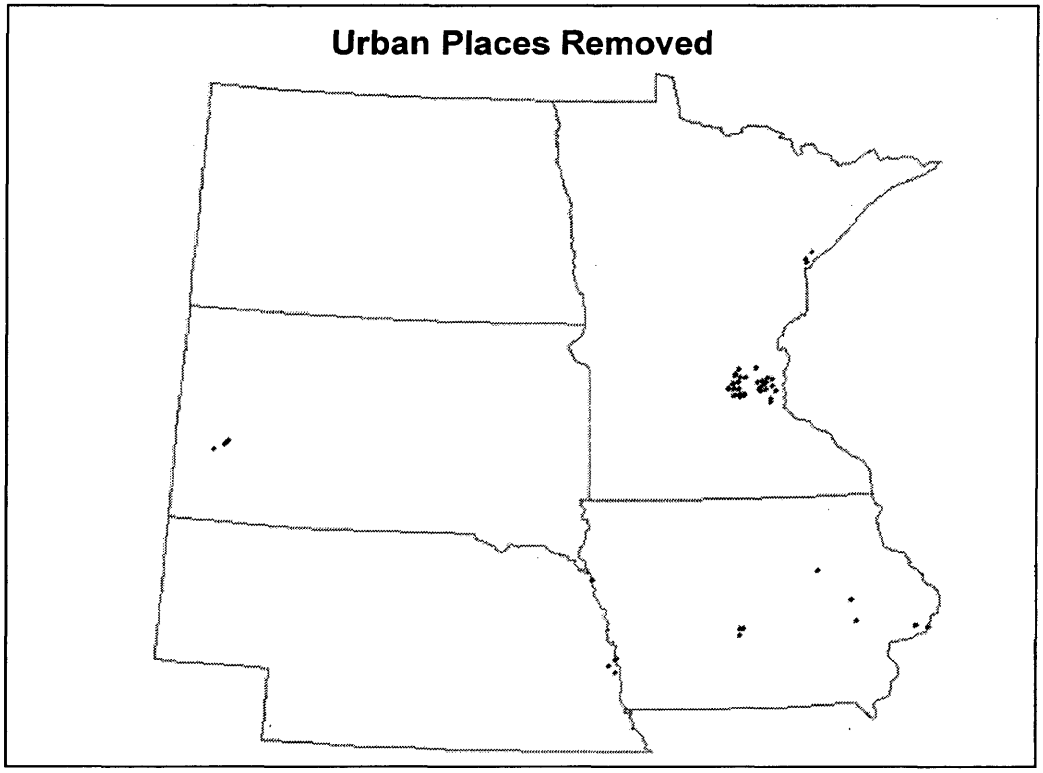


Figure 8: The 49 cities removed from the study because of their location inside of the contiguous area of a MSA city. (34 in MN, 10 in IA, 3 in SD, 2 in NE, 0 in ND)

Creating the Taxonomy

Various methods have been developed and tested throughout the past century, and no single method has been determined to be the best. When determining a method to use for this thesis, it is important to consider the overall objectives of the study. The purpose of this classification is to compare the economic functions of towns within the specified population range in one particular geographic region. With this in mind, the standard deviation method developed by Howard Nelson provides an approach that works well for this study because the degrees of variation lead to a classification of multi-functionality and gives a solid relative comparison of these cities. Furthermore, for the purpose of

creating a classification that is both understandable and replicable, the standard deviation method works well.

Standard deviations from the mean of each function were calculated for each of the eleven categories. There are three degrees of variation from the average following the standard deviation breaks. Subjective selection of class breaks has been eliminated by the implementation of an accepted statistical tool such as standard deviation. With regards to the taxonomy, any city over +1 SD from the mean value in manufacturing will be given a Mf1 rating. Over +2 SD's receives a Mf2 rating and + 3 SD or more gets a Mf3 rating. This approach delivers a simple rating that is easily understood. The biased formula for standard deviation was used for this study:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}}$$

Where: $\bar{X}$ = Sample arithmetic mean

n = Sample size

X_i = i^{th} Observation of the variable X

$\sum_{i=1}^{n} X_i$ = Summation of all X_i values in the sample

When applied to the 231 remaining cities in the study area, the method described is not mutually exclusive because there is a possibility that a city can exceed the requirements (i.e., + 1SD or more) in more than one service category.

There is also a possibility that some cities will not rank high enough in any of the eleven service categories. These cities are placed into a "diversified" group in the taxonomy, thus the classification has a total of twelve categories.

Creating the Classification Maps

In order to visualize the spatial distribution within a two-dimensional framework, the results of the classification needed to be mapped. There were multiple methods for compiling city location data to be implemented into a GIS mapping program. Since the cities were located within a five state area, it was most logical to use a dataset that included all the states for consistency. ESRI, a leading distributor of GIS software and data, provides a dataset that includes all cities in the United States. The 231 cities in the survey were selected from the ESRI data set using a query search in ArcGIS 9. A new shapefile was created to be used for adding standard deviation values for mapping purposes. In order to create the maps of economic functionality, an operation called a "join" was completed. A join simply combines the data from two databases through a specified field name, in this case, the city name. However, when dealing with multiple states, often times a city name was found more than once. These duplicate names such as Glenwood (Iowa and Minnesota) created an invalid join because the data were combined due to the lack of a unique value for each city. An alternate naming method was established where city names were sorted

alphabetically and an "ID" number was established for each city. This eliminated any problems with duplicate city names.

Once the city location and standard deviation classification datasets were joined together, the mapping of the twelve functions was completed. Each of the twelve economic functions was mapped by using the query search in ArcGIS. A query search allows for the selection of values (cities) based up the attribute data. In this case, each city was given a value of 0, 1, 2, or 3 for each economic function in the classification. The 0 was a null value, and the 1, 2, and 3 indicated the amount of standard deviations above the mean. A visual representation of this process is show below in Figure 9.

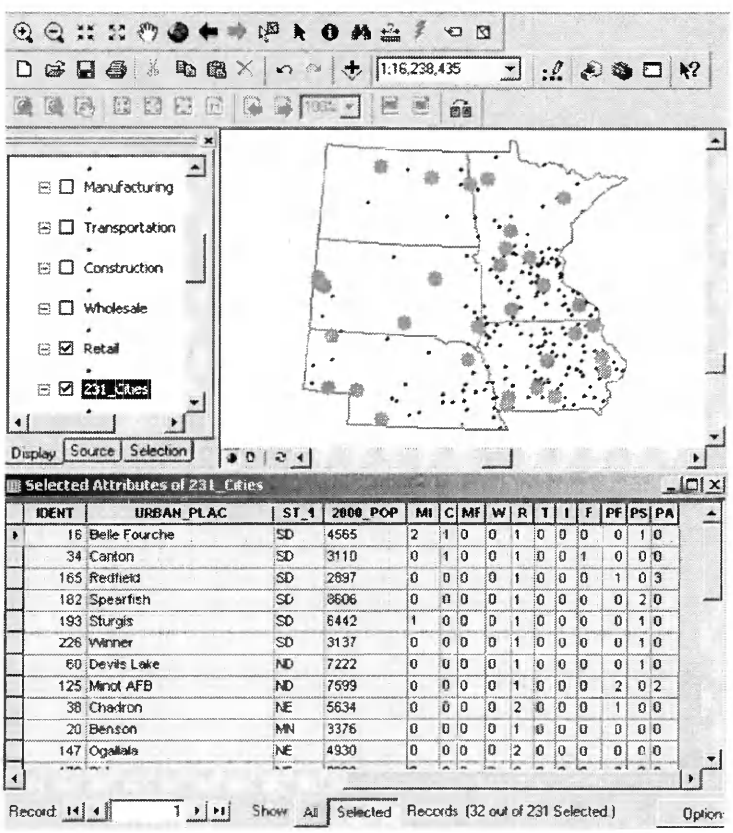


Figure 9: Example of selecting cities in ArcGIS 9 based on Standard Deviation values in Retail Trade.

Nearest Neighbor Analysis

Essentially geography is concerned with distributions in space and one the most important distributions the geographer has to consider is that of human settlement. A primary objective of many geographic studies that begin with locations of a variable on a dot map is to determine the form of the pattern of points. The nature of the point pattern can reveal information about the process that produced the geographic results. (McGrew and Monroe 1993) General descriptions have been used in previous functional classifications that include described patterns as "dense" or "sparse." Devising a more precise mathematical description of areal distributions is needed to produce objective results. (Hammond and McCullagh 1975)

Urban geographers are interested in using a method of analysis that discerns objectively between clustered and dispersed spatial distributions, and also distinguishes between degrees of clustering or dispersal. (Yeates 1974) Nearest Neighbor Analysis is a common procedure for determining the spatial arrangement of a pattern of points within a study area. The distance of each point to its closest neighbor is measured, and the average nearest neighbor distance for all points is determined. This method quantitatively defines a scale which measures the degree of departure of an observed spatial distribution from a theoretical random distribution. (Silk 1979) The maximum departure at one end of the scale is absolute clustering, where all points are at the same place. The other end is absolute uniformity, where all points are equidistant from other

points. Basically, there are three benchmarks: absolute clustering, absolute randomness, and absolute dispersal. The index ranges from 0, indicating clustering, to 2.15, indicating maximum dispersion. The index value, normally written as *R*, is calculated by dividing the measured mean distance between nearest neighbor points in a given area, by the mean distance to be expected from a similar number of points randomly distributed in the same area. (Hammond & McCullagh 1975)

Nearest Neighbor Analysis was performed on each economic function of the classification using a Visual Basic application in ArcGIS. (Sawada 2002) The program performed basic Nearest Neighbor Analysis (Clark and Evans 1954) and provided summary statistics of the point distribution for each function. An example output of the application for construction is shown below in Figure 10.

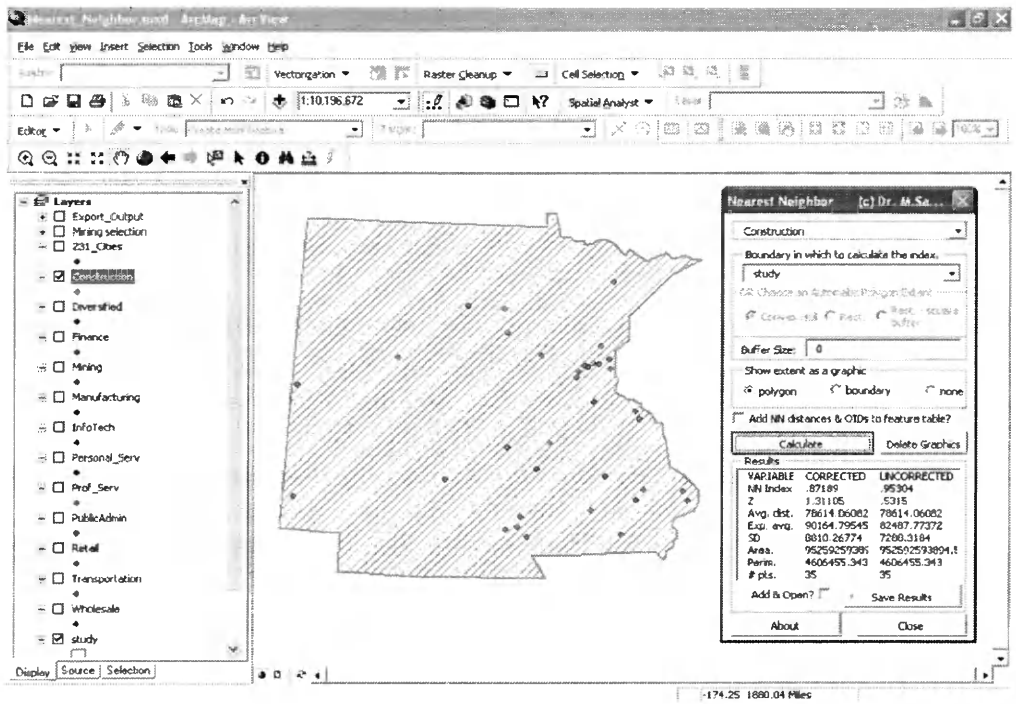


Figure 10: Example output of the Nearest Neighbor Application in ArcGIS 9.

Chapter Summary

Once again, the primary focus of creating a functional classification is to identify the spatial relationships and the distribution of specific urban functions. This chapter followed the methodological model formulated around the two objectives of the thesis. The process was adapted from previous functional classifications within the accepted framework of urban geography.

Staying consistent with previous studies concerning functional classifications, the occupational data obtained from the 2000 U.S. Census was used. Only cities with populations between 2,500 and 10,000, and not contained within the contiguous urbanized area of a MSA city, were collected.

When determining a method to use for this thesis, it is important to consider the overall objectives of the study. The purpose of this classification is to compare the economic functions of towns within the specified population range in one particular geographic region and to discover spatial relationships. The standard deviation method developed provides an approach that allows a multi-functional classification, and provides a firm relative assessment of these cities. The mapping of the classification by economic functions provides a unique insight of the spatial distribution of the cities. Nearest Neighbor analysis is a valid statistical tool for determining spatial distribution in a two-dimensional space.

Chapter 4

Analysis of Results

In this chapter an explanation is given for the results of the functional classification. The first step is to present details of the descriptive statistics for this study and make comparisons with previous studies. The second section includes a detailed discussion of the spatial distribution of each service class within the new functional classification. The final segment is dedicated to the exploration of nearest neighbor analysis results.

Descriptive Statistics

The purpose of this classification is to compare the economic functions of towns within the specified population range in one particular geographic region. Keeping this in mind, the standard deviation method provides an approach that works well for this study because the degrees of variation lead to a classification of multi-functionality and gives a solid relative comparison of these cities.

Standard deviations from the mean of each function were calculated for each of the eleven categories. There are three degrees of variation from the average following the standard deviation breaks. With regards to the new taxonomy, any city over +1 SD from the mean value in mining will be given a Mi1 rating, +2 SD's receives a Mi2 rating, and + 3 SD or more gets a Mi3 rating. This approach delivers a simple rating that is easily understood.

The five state study area provided 231 cities of population 2,500 to 10,000 that were not contained within the contiguous area of city with a population of at least 50,000. There were 91 cities in Minnesota, 84 in Iowa, 31 in Nebraska, 17 in South Dakota, and 8 in North Dakota. The average population for the cities in the study area was 4,829.6, and the average employment per city was 2,334.8. Standard deviations from the mean were calculated for each of the eleven categories as discussed in detail in chapter 3. The results are shown below in Table 4. When examining the averages per function, several numbers stick out including the rather high portion of people engaged in professional service industries and manufacturing, and to some extent personal service. The importance of services that provide for the needs of the surrounding countryside is quite evident when reviewing the results.

Several intriguing similarities and differences can be found while comparing the average employment per function in this classification with previous studies conducted by Nelson (1955), Atchley (1967), and Webb (1959).

Function	Symbol	Mean (%)	SD (%)	+1 SD (%)	+2 SD (%)	+3 SD (%)
Mining	Mi	0.54	2.01	2.55	4.56	6.57
Construction	C	6.41	2.20	8.61	10.81	13.01
Manufacturing	Mf	17.49	8.32	25.81	34.13	42.45
Wholesale	W	3.14	1.73	4.87	6.6	8.33
Retail	R	12.76	2.84	15.6	18.44	21.28
Transportation	T	4.81	2.78	7.59	10.37	13.15
Information Technology	I	2.20	1.18	3.38	4.56	5.74
Finance	F	5.17	2.87	8.04	10.91	13.78
Professional Service	Pf	28.76	5.57	34.33	39.9	45.47
Personal Service	Ps	12.25	4.0	16.25	20.25	24.25
Public Administration	Pa	4.11	2.85	6.96	9.81	12.66

Table 4: Mean and Standard Deviation values for each function.

Most of the functions were relatively consistent, especially public administration, which was between four and five percent in each of the four studies. Manufacturing in this study was similar to Webb, but much less than the national studies by Nelson and Atchley. Professional Service industries made up an average of almost 29 percent in this study, compared to 11 percent (Nelson), 14.7 percent (Atchley), and 16.9 percent (Webb).

Functional Classification

The creation of a modern functional classification of small towns is the primary objective of the thesis. The cities were classified using the standard deviation results for the eleven economic classes. Of the 231 cities, 45 did not meet the criteria established to be +1 SD in any of the eleven functions. These 45 cities are grouped together in the diversified group, meaning that they are not unusually high in any single function. There were 107 cities that qualified with only one function, 63 cities had two functions at least +1 SD, 14 cities reached three functions, and two cities actually had four functions of at least +1 SD or above (Belle Fourche, SD and Elkhorn, NE). Cities located in North and South Dakota had a high degree of multi-functionality. In fact, 22 of the 25 (88%) cities within those two states had at least two functions with a minimum of +1 SD. The opposite was true in Iowa, where only 23 of the 84 (27%) cities had multi-functionality. The complete results of the taxonomy are located in APPENDIX C.

City Classification Spatial Distribution

With the second objective in mind, the following section includes a detailed discussion of the spatial distribution for each of the eleven service functions, plus diversified cities. Focus will be placed on the explanation of site and situation, and other possible factors that could explain the reasoning for inclusion within a particular function. The location of the 231 cities in the study area is shown below in Figure 11. Notice the relatively even dispersion within the corn belt of Iowa and Minnesota and the general bareness in the Dakotas and the sand hills of Nebraska.

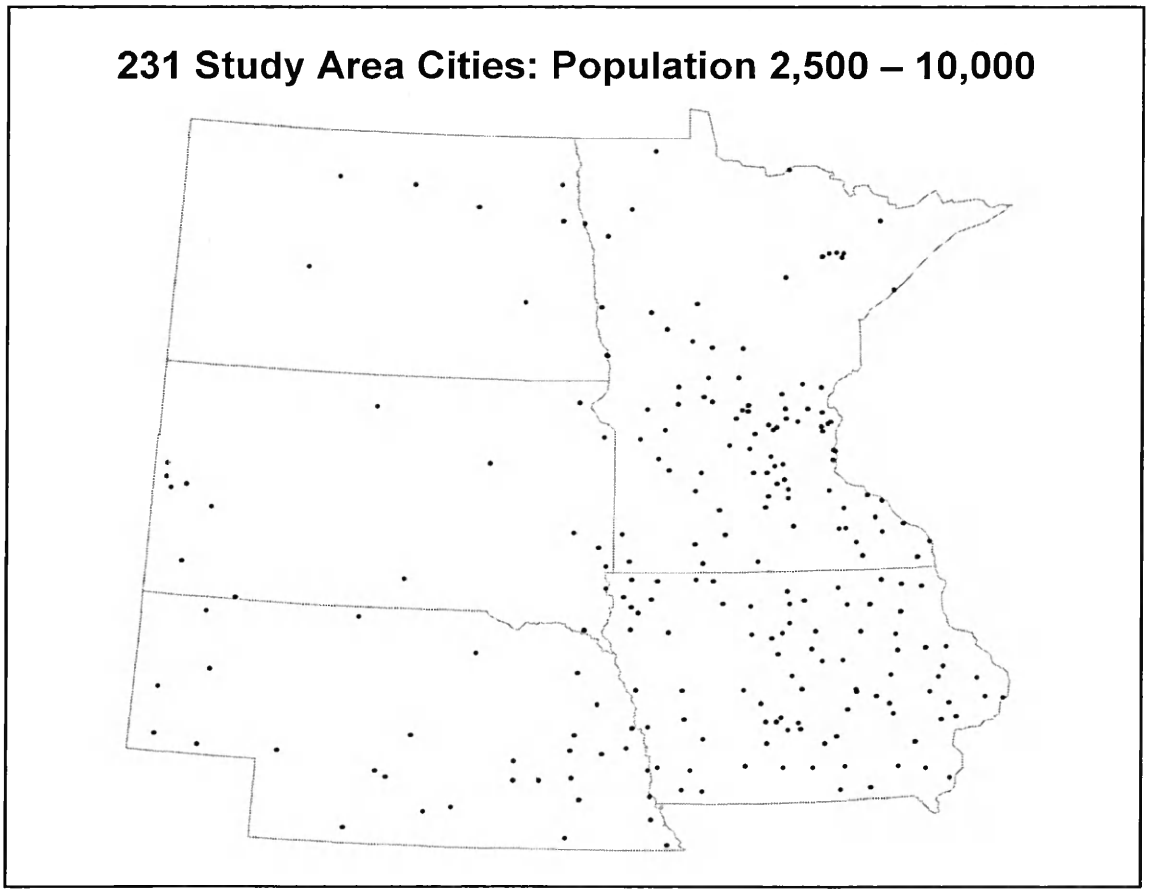


Figure 11: 231 cities in the study area not contained within the contiguous are of a MSA city.

Mining Cities

There are few cities in the study area where mining is considered a significant economic function. (see Table 5) Mining can be viewed as an optimal example of site and situation because this activity only exists where the presence of highly localized natural resources are found. The two distinct clusters of mining activities are located in the iron ore region of northeast Minnesota, and in the Black Hills of South Dakota (see Figure 12). There are however, a few isolated locations in Beulah, North Dakota, Milbank, South Dakota, and Kimball, Nebraska. Mining is the only economic activity that is not reported in every city. Mining activities include sand and gravel pits, coal and metal mining, oil and gas extraction, and limestone quarries. Interestingly, the areas with high levels of mining also tend to have significant levels of personal service activities. Such can be understood because of the location of these cities in more of a comparative wilderness with rugged topography, and timber where vacationers and sportsmen would also be found in elevated quantities.

City	State	Function %	+ SD
Sturgis	SD	2.98	+ 1 SD
Milbank	SD	3.53	+ 1 SD
Two Harbors	MN	3.57	+ 1 SD
Kimball	NE	3.79	+ 1 SD
Belle Fourche	SD	6.02	+ 2 SD
Ely	MN	7.44	+ 3 SD
Eveleth	MN	10.05	+ 3 SD
Lead	SD	10.92	+ 3 SD
Virginia	MN	11.38	+ 3 SD
Beulah	ND	12.34	+ 3 SD
Mountain Iron	MN	12.66	+ 3 SD
Chisholm	MN	13.56	+ 3 SD

Table 5: Cities above 1, 2, and 3 SD from the mean in mining.

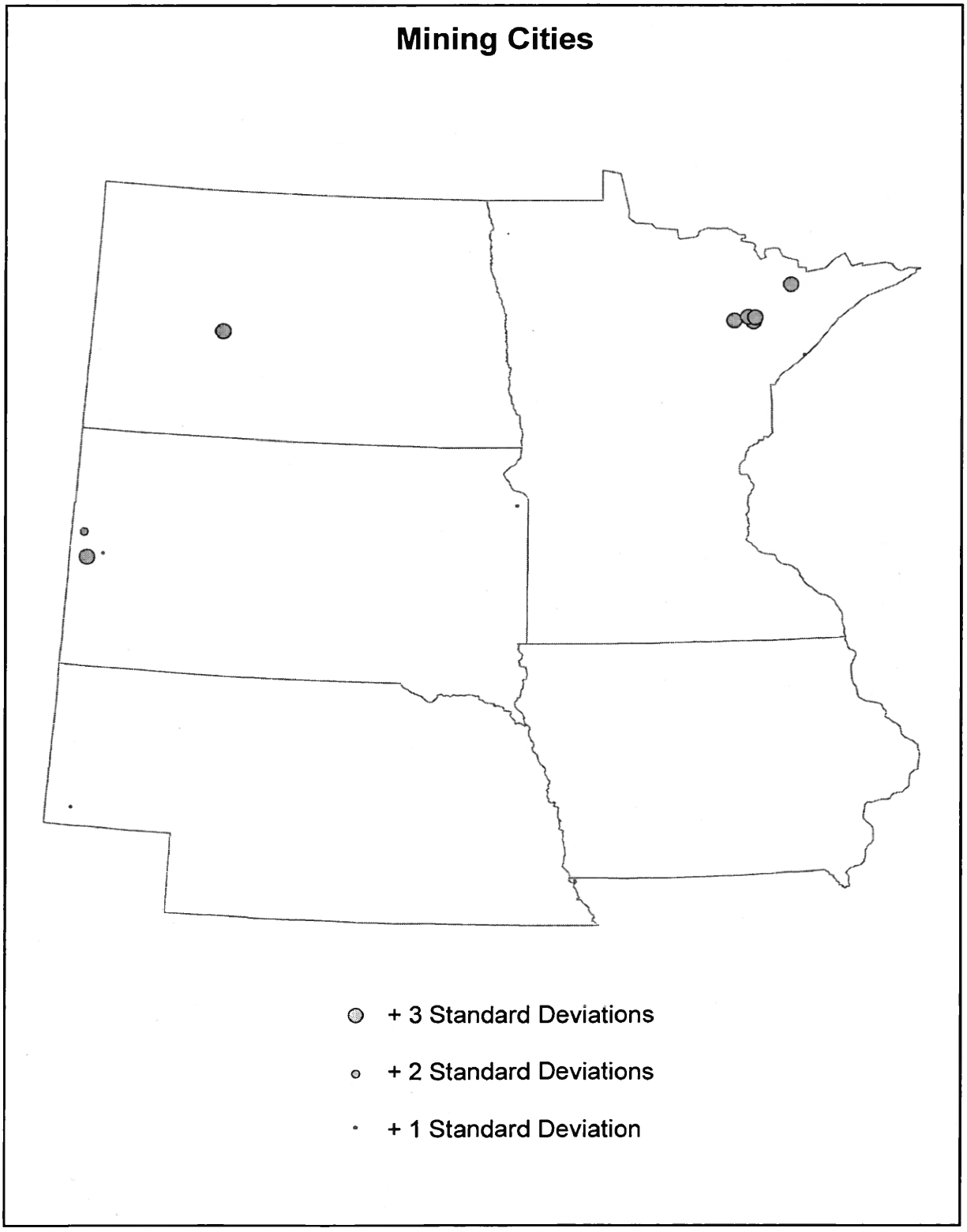


Figure 12: Mining cities above 1, 2, and 3 SD from the mean.

Construction Cities

In terms of the number of cities in a particular function, the 35 cities classified in the construction category are second only to manufacturing (see Table 6). The average employment of 6.4 percent is not especially high, but is higher than six other classes. Construction cities are found to be located near larger cities, transportation routes, or manufacturing cities (see Figure 13). There are 16 cities in Minnesota, nine in Iowa, six in Nebraska, three in South Dakota, and only one in North Dakota. By examining the map, there are two clusters of construction cities around Minneapolis/St. Paul and Omaha where heavy expansion of suburbia is occurring. There are relatively few cities in this class in North and South Dakota, and west of the Omaha area. In Iowa there is a reasonably even distribution of construction cities throughout the state.

City	State	Function %	+ SD	City	State	Function %	+ SD
Valley City	ND	8.56	+ 1 SD	Wahoo	NE	9.70	+ 1 SD
Gering	NE	8.71	+ 1 SD	St. Charles	MN	9.73	+ 1 SD
Grimes	IA	8.84	+ 1 SD	Blair	NE	9.73	+ 1 SD
Spirit Lake	IA	8.89	+ 1 SD	Iowa Falls	IA	9.85	+ 1 SD
Elkhorn	NE	8.89	+ 2 SD	Vinton	IA	10.18	+ 1 SD
Montgomery	MN	8.90	+ 3 SD	North Branch	MN	10.29	+ 1 SD
Forest Lake	MN	8.90	+ 3 SD	Mora	MN	10.35	+ 1 SD
De Witt	IA	8.97	+ 3 SD	Belle Fourche	SD	10.35	+ 1 SD
Plainview	MN	9.07	+ 3 SD	Albia	IA	10.65	+ 1 SD
Mobridge	SD	9.07	+ 3 SD	Grant	MN	10.68	+ 1 SD
Dilworth	MN	9.17	+ 3 SD	Belle Plaine	MN	11.08	+ 2 SD
Maquoketa	IA	9.25	+ 3 SD	Breckenridge	MN	11.19	+ 2 SD
O'Neil	NE	9.31	+ 1 SD	Annandale	MN	11.48	+ 2 SD
Big Lake	MN	9.36	+ 1 SD	Zimmerman	MN	11.74	+ 2 SD
Glenwood	IA	9.43	+ 1 SD	Plattsmouth	NE	13.01	+ 3 SD
Cokato	MN	9.51	+ 1 SD	Becker	MN	13.23	+ 3 SD
Cherokee	IA	9.52	+ 1 SD	St. Francis	MN	15.34	+ 3 SD
Canton	SD	9.69	+ 1 SD				

Table 6: Cities above 1, 2, and 3 SD from the mean in construction.

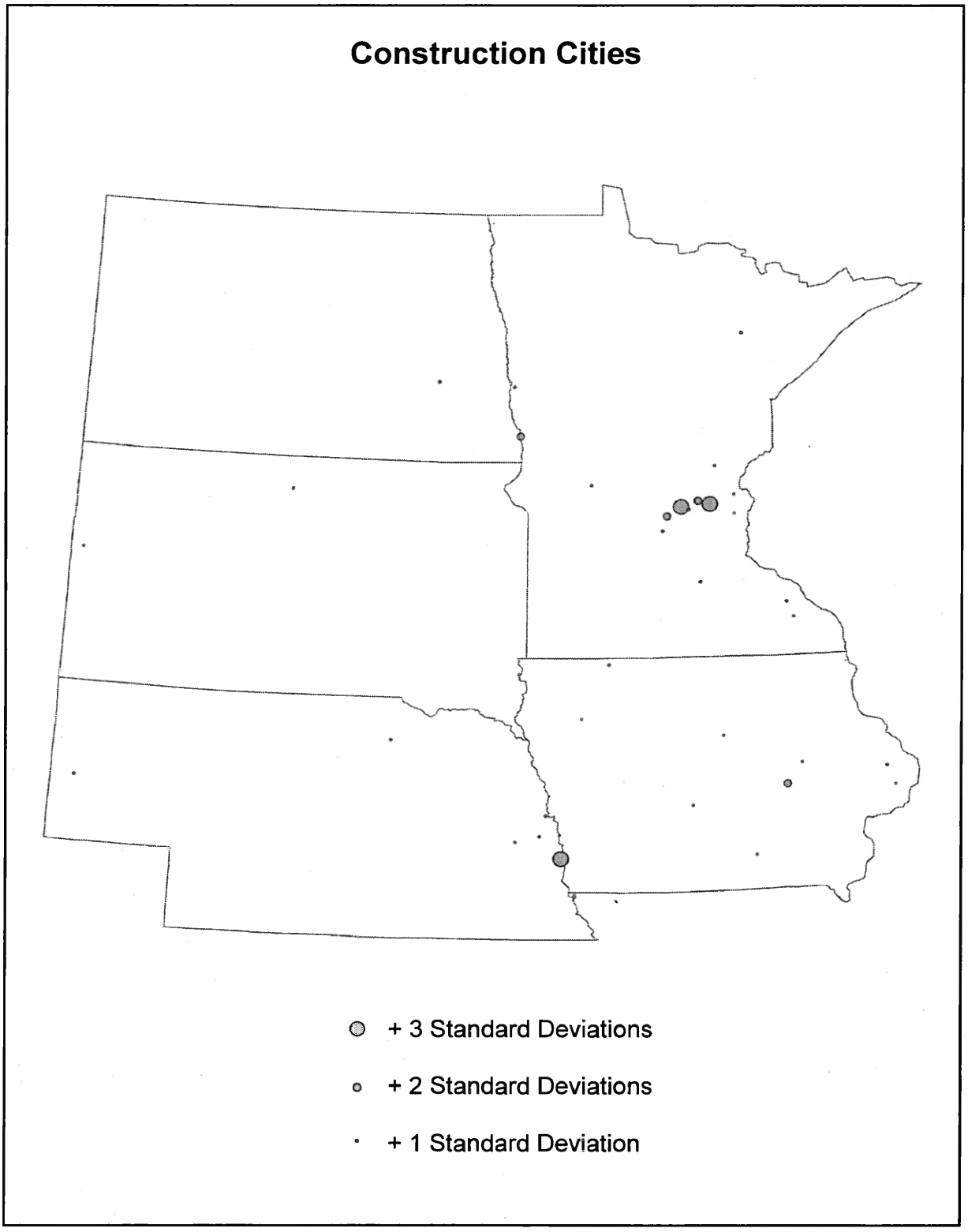


Figure 13: Construction cities above 1, 2, and 3 SD from the mean.

Manufacturing Cities

The number of cities with significant amounts (+1 SD or more) of manufacturing is higher than any other category. Manufacturing tends to be an important part of the economic structure in these urban places where an average of 17.5 percent work in the industry (see Table 7). Most of the 38 classified cities are part of the traditional manufacturing belt that spans from the northeast coast of the United States to roughly the middle of Minnesota and Iowa (see Figure 14). The location of manufacturing cites also has a tendency to follow major routes of transportation such as Interstate 35 through central Iowa and Minnesota. Schuyler, Nebraska was the only city to receive a rating of + 3 SD in manufacturing. North and South Dakota failed to register a single city in the category. Of the 38 cities, 24 (63%) were specialized, meaning no other economic function was significant.

City	State	Function %	+ SD	City	State	Function %	+ SD
Cokato	MN	26.04	+ 1 SD	Crete	NE	30.13	+ 1 SD
West Point	NE	26.14	+ 1 SD	Norwood Young	MN	30.24	+ 1 SD
Mount Pleasant	IA	26.25	+ 1 SD	Pella	IA	30.29	+ 1 SD
Melrose	MN	26.37	+ 1 SD	Sibley	IA	30.31	+ 1 SD
Belmond	IA	26.61	+ 2 SD	Litchfield	MN	30.46	+ 1 SD
Osage	IA	26.68	+ 3 SD	Marengo	IA	30.51	+ 1 SD
Humboldt	IA	26.80	+ 3 SD	Montgomery	MN	30.66	+ 1 SD
Cold Spring	MN	26.92	+ 3 SD	Princeton	MN	30.77	+ 1 SD
Big Lake	MN	27.32	+ 3 SD	Glencoe	MN	31.80	+ 1 SD
Long Prairie	MN	28.01	+ 3 SD	Denison	IA	32.28	+ 1 SD
Fairbury	NE	28.19	+ 3 SD	Goodview	MN	33.13	+ 1 SD
Centerville	IA	28.24	+ 3 SD	Cozad	NE	34.02	+ 1 SD
Wilton	IA	28.61	+ 1 SD	Waseca	MN	34.03	+ 1 SD
Belle Plaine	IA	29.28	+ 1 SD	St. James	MN	34.95	+ 2 SD
Camanche	IA	29.37	+ 1 SD	Forest City	IA	35.16	+ 2 SD
Lake City	MN	29.64	+ 1 SD	Le Sueur	MN	35.32	+ 2 SD
Garner	IA	29.78	+ 1 SD	Roseau	MN	36.41	+ 2 SD
Webster City	IA	29.92	+ 1 SD	West Liberty	IA	41.66	+ 2 SD
Zimmerman	MN	30.01	+ 1 SD	Schuyler	NE	46.10	+ 3 SD

Table 7: Cities above 1, 2, and 3 SD from the mean in manufacturing.

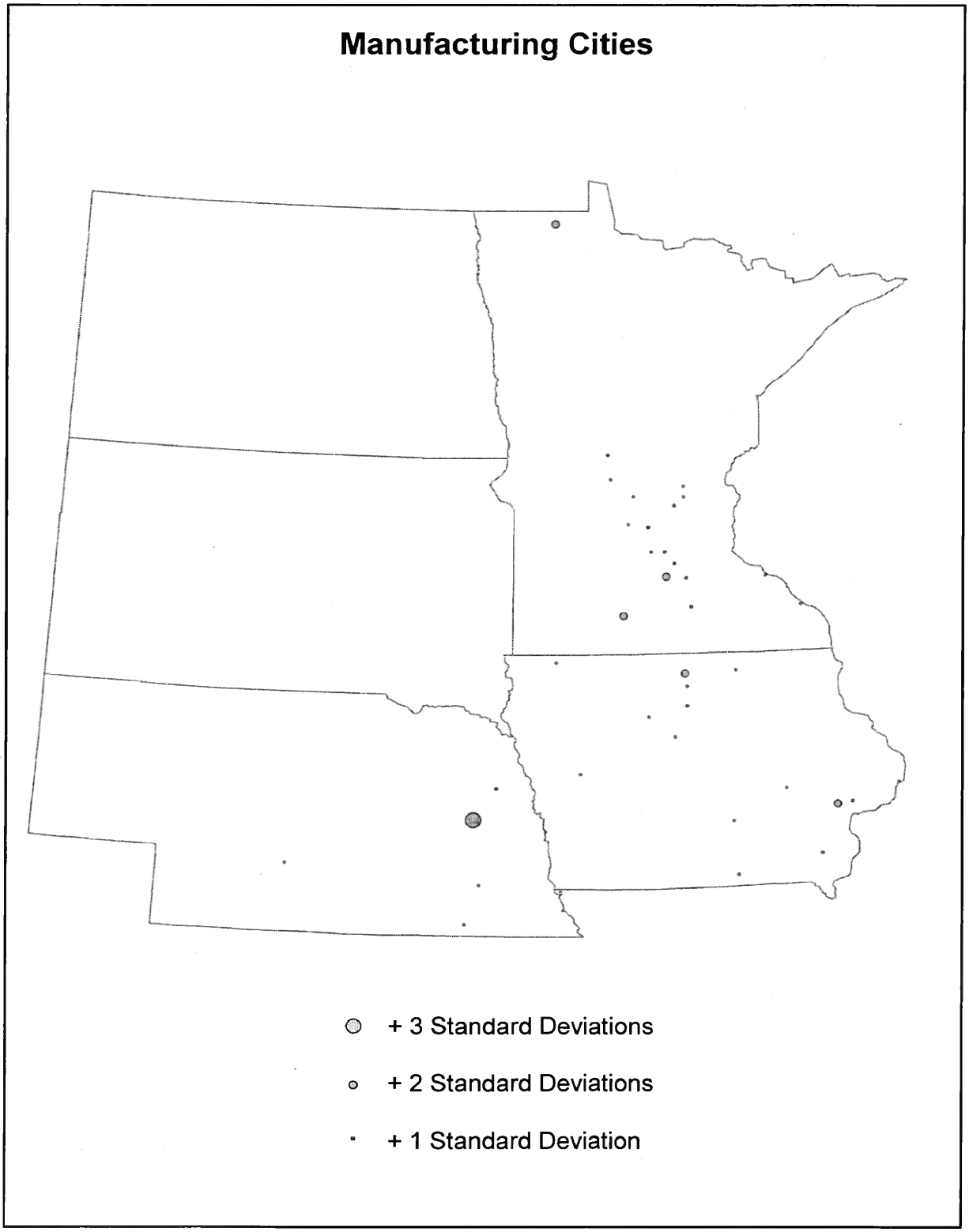


Figure 14: Manufacturing cities above 1, 2, and 3 SD from the mean.

Wholesale Trade Cities

The distribution of wholesale cities follows conventional central place theory where the most significant places (+3 SD) are evenly spaced with smaller, supportive cities found in between (see Figure 15). Wholesaling activities include the sale of commodities in large quantities for retailers and the assembly and sale of merchandise. In this region, farm equipment sales are a significant industry of wholesale trade. These cities are generally located where specialized forms of agricultural produce must be assembled, packaged, and marketed. (Hart 1955) Access to transportation is also a high priority for wholesaling. Also, there are no cities with +3 SD located within 30 miles of MSA cities. The average amount of people working in wholesale trade is relatively small at only 3.1 percent. Even cities with a substantial amount (see Table 8) within the function are typically multifunctional in this region.

City	State	Function %	+ SD	City	State	Function %	+ SD
Park Rapids	MN	4.99	+ 1 SD	Monticello	IA	5.91	+ 1 SD
La Crescent	MN	4.99	+ 1 SD	Waconia	MN	5.95	+ 1 SD
Dyersville	IA	5.09	+ 1 SD	Goodview	MN	5.96	+ 1 SD
Elkhorn	NE	5.12	+ 1 SD	Glenwood	MN	6.40	+ 1 SD
Waukee	IA	5.15	+ 1 SD	Sheldon	IA	6.51	+ 1 SD
Adel	IA	5.28	+ 1 SD	Chisago City	MN	6.75	+ 2 SD
Wyoming	MN	5.37	+ 1 SD	Mountain Iron	MN	7.07	+ 2 SD
Madison	SD	5.40	+ 1 SD	West Union	IA	7.25	+ 2 SD
Rugby	ND	5.52	+ 1 SD	Iowa Falls	IA	8.37	+ 3 SD
Pleasant Hill	IA	5.55	+ 1 SD	Milbank	SD	8.40	+ 3 SD
Wadena	MN	5.62	+ 1 SD	O'Neil	NE	8.80	+ 3 SD
Dilworth	MN	5.69	+ 1 SD	Harlan	IA	10.24	+ 3 SD
Cannon Falls	MN	5.69	+ 1 SD	Chariton	IA	14.20	+ 3 SD
Victoria	MN	5.90	+ 1 SD				

Table 8: Cities above 1, 2, and 3 SD from the mean in wholesale trade.

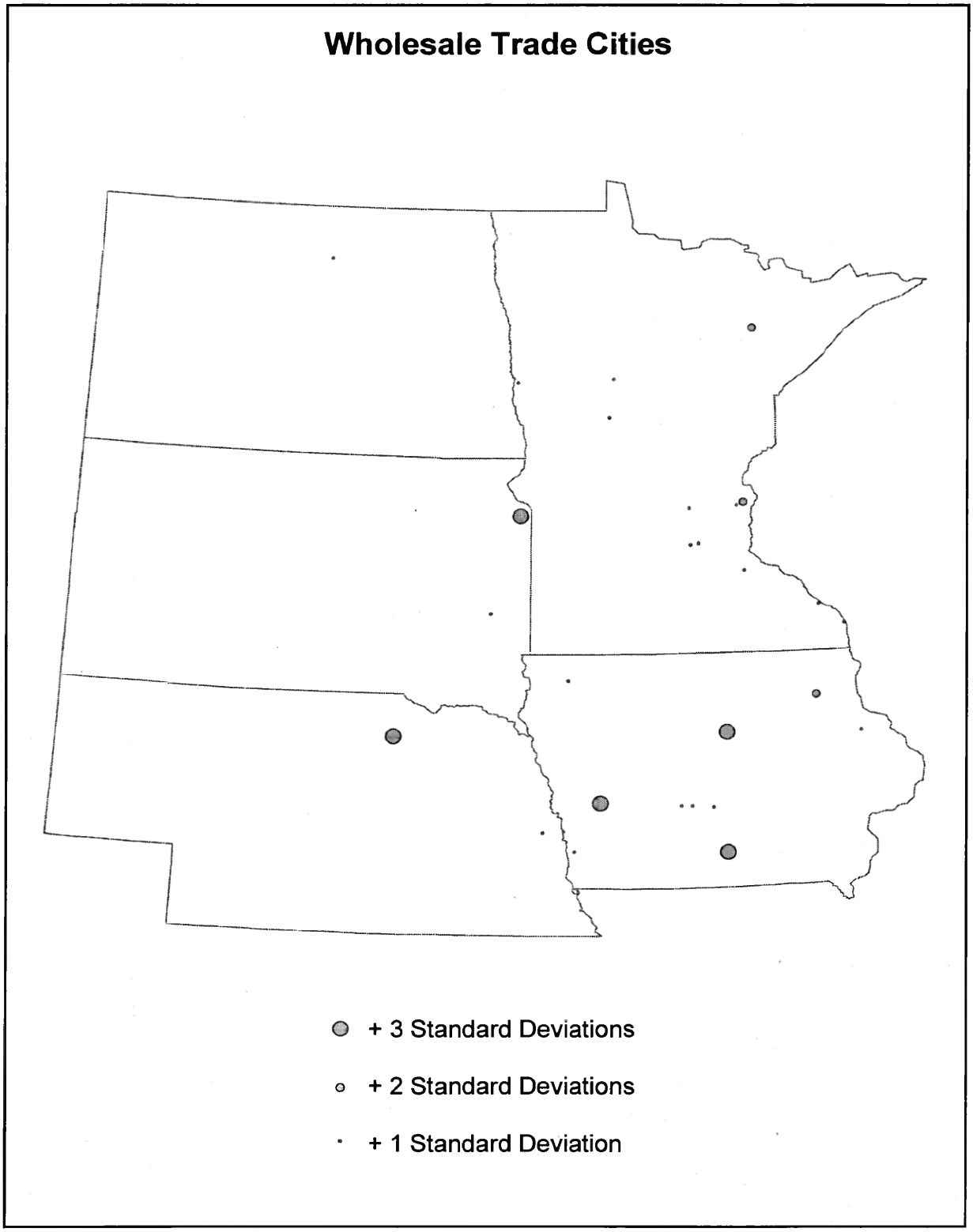


Figure 15: Wholesale Trade cities above 1, 2, and 3 SD from the mean.

Retail Trade Centers

One of the most dispersed functions in the classification are the retail trade cities. These small urban places are responsible for providing goods to the surrounding agricultural population. It could be said that these cities are the backbone of rural America, particularly in this particular region of the country. Cities average 12.76 percent of the workforces in this category. Within the study area, half of the retail cities are specialized due to the high level of employment in this function. (see Table 8). In the Black Hills region, cities are providing merchandise targeting the tourist flow (see Figure 16). Waite Park, Minnesota, just west of Minneapolis is a large shopping area. Sidney Nebraska, with an incredible 29.06 percent engaged in retail trade, is home to sportsmen's superstore Cabela's. Other locations are more dispersed and far away from larger cities, signifying their role in supplying the hinterland.

City	State	Function %	+ SD	City	State	Function %	+ SD
Eveleth	MN	15.63	+ 1 SD	McCook	NE	16.61	+ 1 SD
Monticello	MN	15.74	+ 1 SD	Thief River Falls	MN	16.69	+ 1 SD
Tipton	IA	15.75	+ 1 SD	Winner	SD	16.96	+ 1 SD
Spearfish	SD	15.76	+ 1 SD	New Hampton	IA	17.00	+ 1 SD
Jordan	MN	15.88	+ 2 SD	Red Oak	IA	17.04	+ 1 SD
Wadena	MN	15.99	+ 3 SD	Alexandria	MN	17.11	+ 1 SD
Minot AFB	ND	16.06	+ 3 SD	Windom	MN	17.13	+ 1 SD
St. Charles	MN	16.08	+ 3 SD	Chariton	IA	17.85	+ 1 SD
Redfield	SD	16.11	+ 3 SD	Sturgis	SD	18.02	+ 1 SD
Story City	IA	16.18	+ 3 SD	Devils Lake	ND	18.03	+ 1 SD
Wayne	NE	16.21	+ 3 SD	Benson	MN	18.32	+ 1 SD
East Grand Forks	MN	16.23	+ 3 SD	Chadron	NE	18.45	+ 2 SD
Canton	SD	16.26	+ 1 SD	Ogallala	NE	18.83	+ 2 SD
Winterset	IA	16.26	+ 1 SD	Shenandoah	IA	19.23	+ 2 SD
Belle Fourche	SD	16.32	+ 1 SD	Waite Park	MN	21.35	+ 3 SD
Waukon	IA	16.54	+ 1 SD	Sidney	NE	29.06	+ 3 SD

Table 9: Cities above 1, 2, and 3 SD from the mean in retail trade.

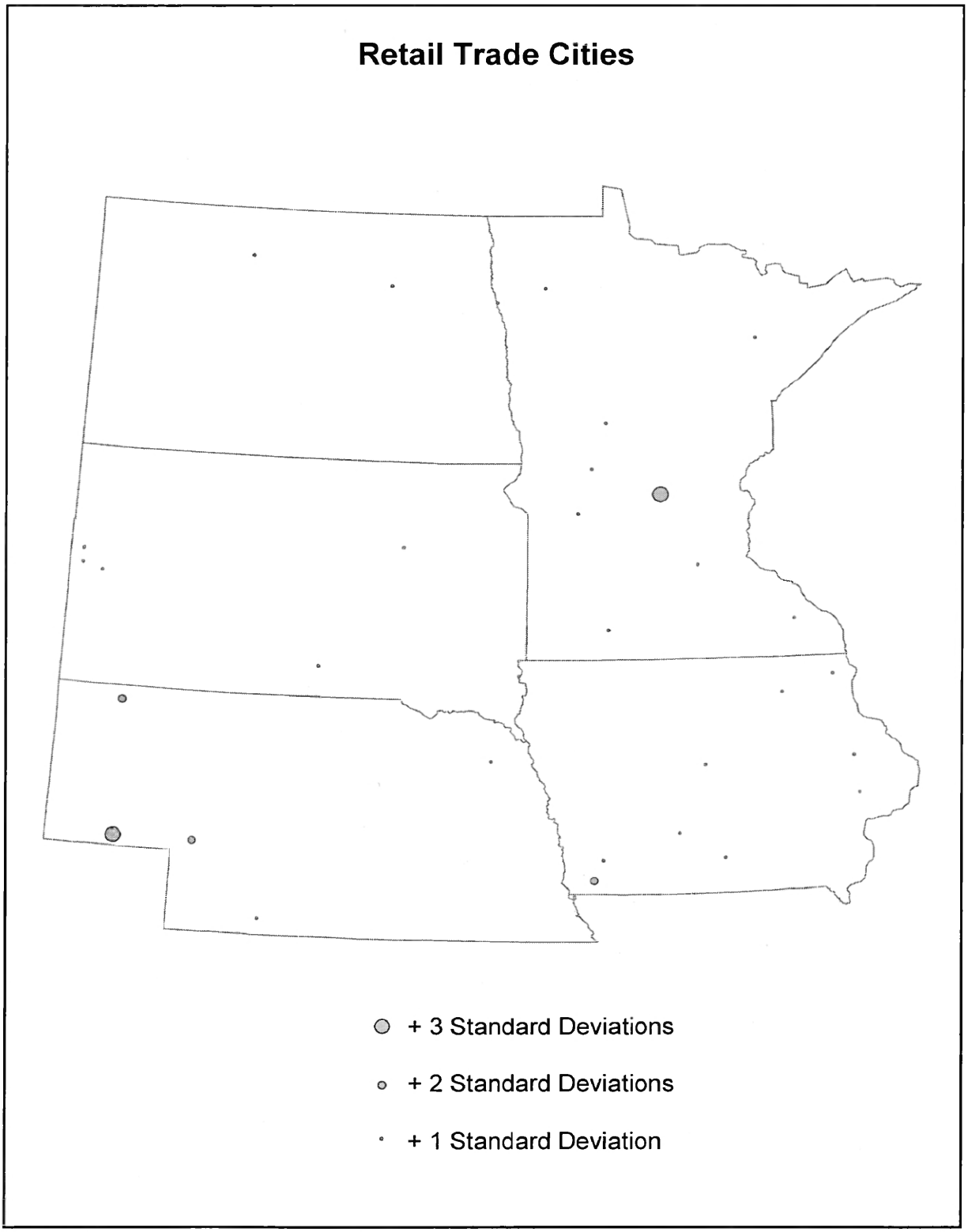


Figure 16: Retail Trade cities above 1, 2, and 3 SD from the mean.

Transportation Cities

Another example of site and situation, to a lesser degree than mining, is that of transportation. Access to large scale routes of transportation such as interstates, railways, or waterways is of critical importance. Only 16 cities reached at least +1 SD from the mean, similar to mining (see Table 10). Typically these cities are found in linear patterns or in groups because the smaller cities play a supporting role along a transportation route. This sort of pattern can be seen in western and extreme southeastern Nebraska (see Figure 17). Oftentimes, cities classified as transportation area also found in another category such as manufacturing, construction, or mining. This category also includes utility based industries like the nuclear power plant in Auburn, and the coal factories associated with Beulah and Nebraska City. The importance of transporting materials across the region from the east to west by railroad and interstate highway is quite evident when examining the amount of transportation cities in Nebraska. In fact, there just as many cities in this category from Minnesota, Iowa, South Dakota, and North Dakota combined as there are in Nebraska.

City	State	Function %	+ SD	City	State	Function %	+ SD
Valentine	NE	7.65	+ 1 SD	Clarion	IA	9.73	+ 1 SD
Sibley	IA	7.71	+ 1 SD	Kimball	NE	10.13	+ 1 SD
Hot Springs	SD	7.90	+ 1 SD	Gering	NE	10.46	+ 2 SD
Brandon	SD	7.96	+ 1 SD	Eagle Grove	IA	10.59	+ 2 SD
Nebraska City	NE	8.04	+ 1 SD	Falls City	NE	10.95	+ 2 SD
David City	NE	8.19	+ 1 SD	Beulah	ND	19.26	+ 3 SD
Chisholm	MN	8.22	+ 1 SD	Auburn	NE	22.17	+ 3 SD
Becker	MN	8.28	+ 1 SD	Alliance	NE	27.15	+ 3 SD

Table 10: Cities above 1, 2, and 3 SD from the mean in transportation.

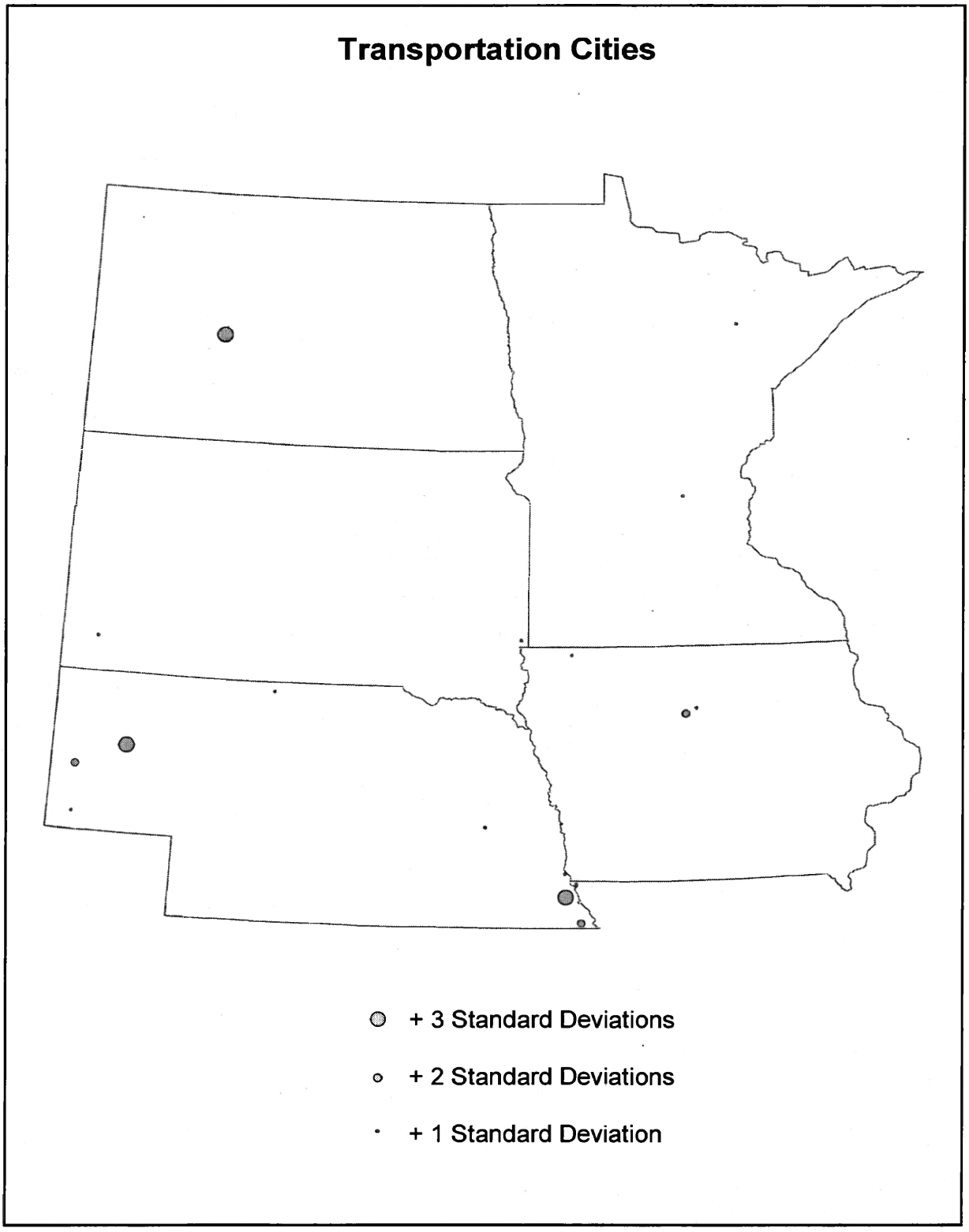


Figure 17: Transportation cities above 1, 2, and 3 SD from the mean.

Information Technology Cities

A new category to the classification is that of information technology. Most of the previous functional studies on cities in the United States either occurred before the computer age or simply grouped communications and transportation together in one class. Industries in this category include newspaper publishing, radio and television broadcasting, libraries, data processing services, software publishing, and other telecommunication services. The average of 2.7 percent is second lowest only to mining, but there were 29 cities with at least +1 SD from the mean (see Table 11). The most intriguing discovery in this service class was the distribution of cities. It is generally thought that information technology jobs are only located in or around a larger city, but this is not the case. A wide spatial distribution of cities, both close and far from larger cities, are found (see Figure 18). There are no information technology cities in North and South Dakota or west of the 98th meridian in Nebraska.

City	State	Function %	+ SD	City	State	Function %	+ SD
Grand Rapids	MN	3.46	+ 1 SD	Jackson	MN	4.28	+ 1 SD
Williamsburg	IA	3.49	+ 1 SD	Norwalk	IA	4.40	+ 1 SD
Afton	MN	3.54	+ 1 SD	Falls City	NE	4.56	+ 2 SD
Appleton	MN	3.57	+ 1 SD	Sauk Centre	MN	4.70	+ 2 SD
Waconia	MN	3.57	+ 1 SD	Winterset	IA	4.74	+ 2 SD
Montevideo	MN	3.68	+ 1 SD	Wayne	NE	4.83	+ 2 SD
Long Prairie	MN	3.74	+ 1 SD	Belmond	IA	4.89	+ 2 SD
Carlisle	IA	3.79	+ 1 SD	Vinton	IA	5.03	+ 2 SD
Vermillion	SD	3.79	+ 1 SD	Elkhorn	NE	5.08	+ 2 SD
Onawa	IA	3.89	+ 1 SD	Grinnell	IA	5.11	+ 2 SD
Monticello	IA	3.90	+ 1 SD	Perham	MN	5.26	+ 2 SD
Pleasant Hill	IA	4.13	+ 1 SD	Waseca	MN	5.86	+ 2 SD
Grimes	IA	4.13	+ 1 SD	Blair	NE	7.23	+ 2 SD
Cambridge	MN	4.14	+ 1 SD	Fairfield	IA	7.72	+ 3 SD
Fairbury	NE	4.27	+ 1 SD				

Table 11: Cities above 1, 2, and 3 SD from the mean in information technology.

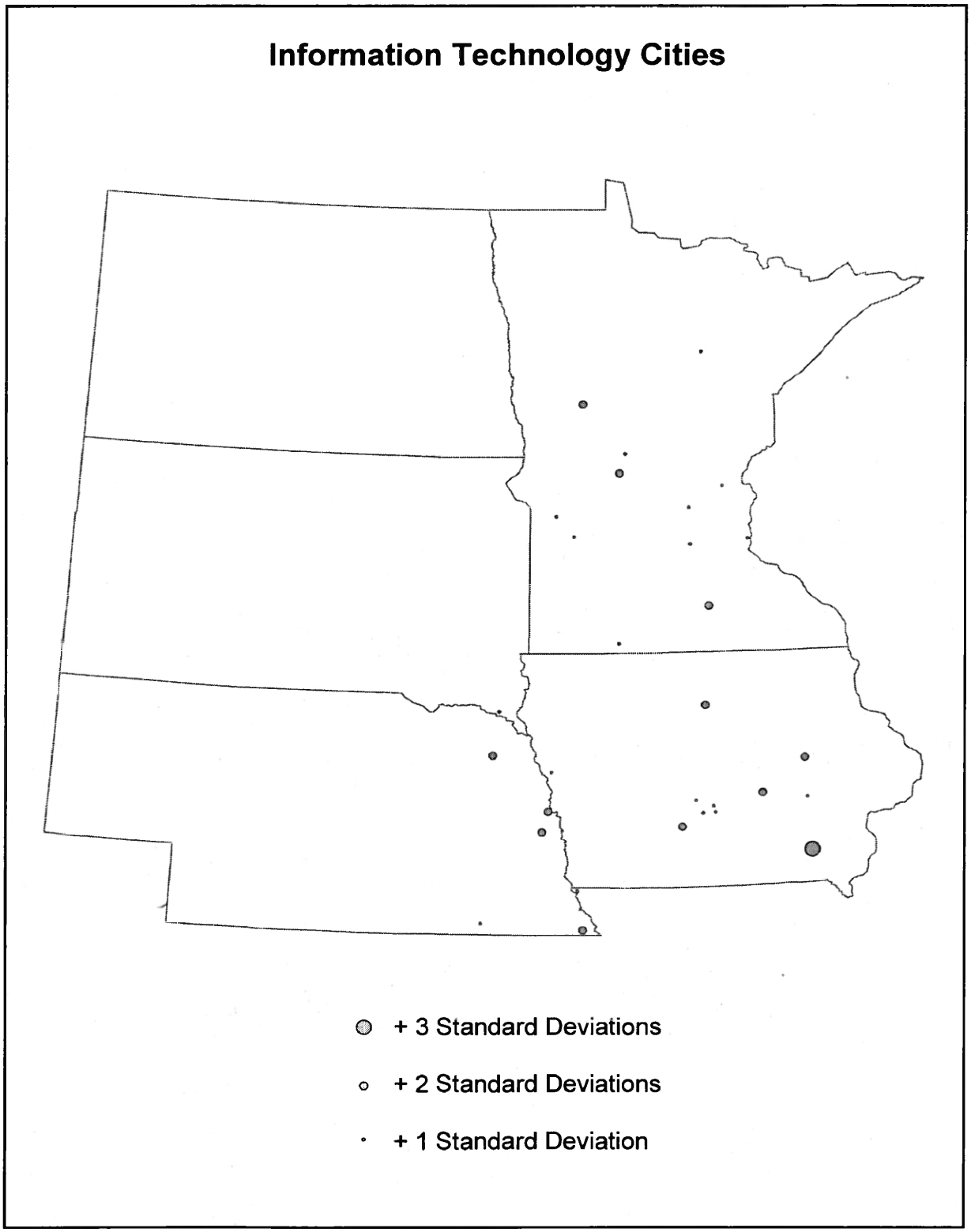


Figure 18: Information technology cities above 1, 2, and 3 SD from the mean.

Finance Cities

Cities included within this category are related to finance, insurance, real estate, and rental and leasing. Only 5.17 percent of the total employment is in the finance class. Previous studies conducted in the United States have found that a considerable amount of the largest cities in the country boast high levels of banking and finance. Typically, this function is not going to be found in excessive amounts in smaller cities. Within the study area, the city of Des Moines, Iowa, is considered an insurance and financial center. A majority of the cities in this category are from the state of Iowa. In fact, eight of the nine highest averages come from the Hawkeye state (see Table 12). The spatial distribution of these cities tends to be clustered around the Des Moines metropolitan area (see Figure 19). Proximity to a larger city can be seen as the rule with cities of this class found around Sioux Falls, Minneapolis/St. Paul, Rapid City, and Omaha. One obvious exception is that of International Falls, Minnesota, located along the border with Canada.

City	State	Function %	+ SD	City	State	Function %	+ SD
Cold Spring	MN	8.18	+ 1 SD	Waverly	IA	10.30	+ 1 SD
Ellsworth AFB	SD	8.33	+ 1 SD	Dell Rapids	SD	10.53	+ 1 SD
Gering	NE	8.37	+ 1 SD	Elkhorn	NE	11.10	+ 2 SD
Victoria	MN	8.40	+ 1 SD	Adel	IA	12.53	+ 2 SD
Wyoming	MN	8.52	+ 1 SD	Winterset	IA	13.08	+ 2 SD
International Falls	MN	8.80	+ 1 SD	Missouri Valley	IA	14.60	+ 3 SD
Waconia	MN	8.83	+ 1 SD	Carlisle	IA	14.72	+ 3 SD
Canton	SD	9.13	+ 1 SD	Pleasant Hill	IA	14.86	+ 3 SD
Forest Lake	MN	9.24	+ 1 SD	Brandon	SD	17.12	+ 3 SD
Luverne	MN	9.26	+ 1 SD	Norwalk	IA	17.26	+ 3 SD
Milbank	SD	9.93	+ 1 SD	Grimes	IA	19.25	+ 3 SD
De Witt	IA	10.21	+ 1 SD	Waukee	IA	19.99	+ 3 SD

Table 12: Cities above 1, 2, and 3 SD from the mean in finance.

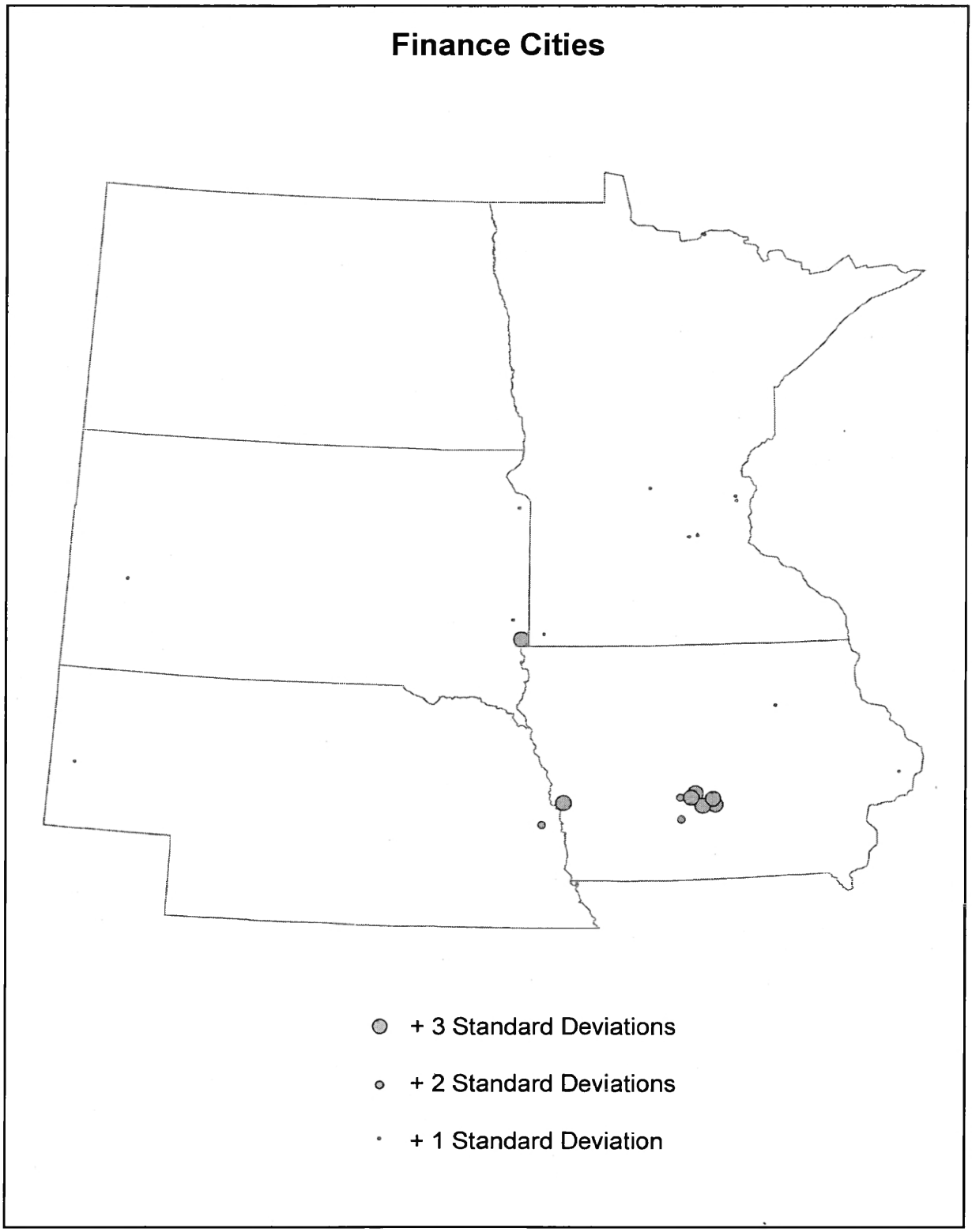


Figure 19: Finance cities above 1, 2, and 3 SD from the mean.

Professional Service Cities

The category of professional services comprises the highest average of any class by a considerable amount. Included in the professional service group are accountants, payroll services, legal services, scientific and technical management, advertising, consulting, educational services, and health care services. The 30 cities in this class all exhibit a substantial amount of average employment ranging from 34 percent to almost 48 percent (see Table 13). Many of these cities are college towns like Grinnell, Orange City, Sioux Center, Chadron, Mount Vernon, Vermillion, and Decorah. The distribution of these cities is widespread and occurs in every state, providing the fundamental educational and health services for the immediate surrounding region (see Figure 20). North and South Dakota have a particularly high proportion of cities in this class. Five of the eight cities in North Dakota, and five of seventeen in South Dakota are classified as professional service cities. Also, all ten cities in the Dakotas are multi-functional.

City	State	Function %	+ SD	City	State	Function %	+ SD
Plainview	MN	34.67	+ 1 SD	Stewartville	MN	38.56	+ 1 SD
Emmetsburg	IA	35.62	+ 1 SD	Grand Forks AFB	ND	38.61	+ 1 SD
Redfield	SD	35.93	+ 1 SD	Sisseton	SD	38.99	+ 1 SD
Hot Springs	SD	36.22	+ 1 SD	Seward	NE	39.08	+ 1 SD
Crookston	MN	36.28	+ 1 SD	Sioux Center	IA	39.76	+ 1 SD
Grinnell	IA	36.54	+ 1 SD	Glenwood	IA	39.77	+ 1 SD
Orange City	IA	37.04	+ 1 SD	Vermillion	SD	40.57	+ 2 SD
Grafton	ND	37.05	+ 1 SD	Waverly	IA	40.96	+ 2 SD
Valley City	ND	37.45	+ 1 SD	Byron	MN	41.25	+ 2 SD
Rugby	ND	37.47	+ 1 SD	Pine Ridge	SD	42.90	+ 2 SD
Fairfield	IA	37.56	+ 1 SD	Minot AFB	ND	44.27	+ 2 SD
Baxter	MN	37.79	+ 1 SD	Mount Vernon	IA	44.29	+ 2 SD
Chadron	NE	37.89	+ 1 SD	St. Peter	MN	45.94	+ 3 SD
La Crescent	MN	38.42	+ 1 SD	Morris	MN	46.95	+ 3 SD
St. Joseph	MN	38.45	+ 1 SD	Decorah	IA	47.90	+ 3 SD

Table 13: Cities above 1, 2, and 3 SD from the mean in professional services.

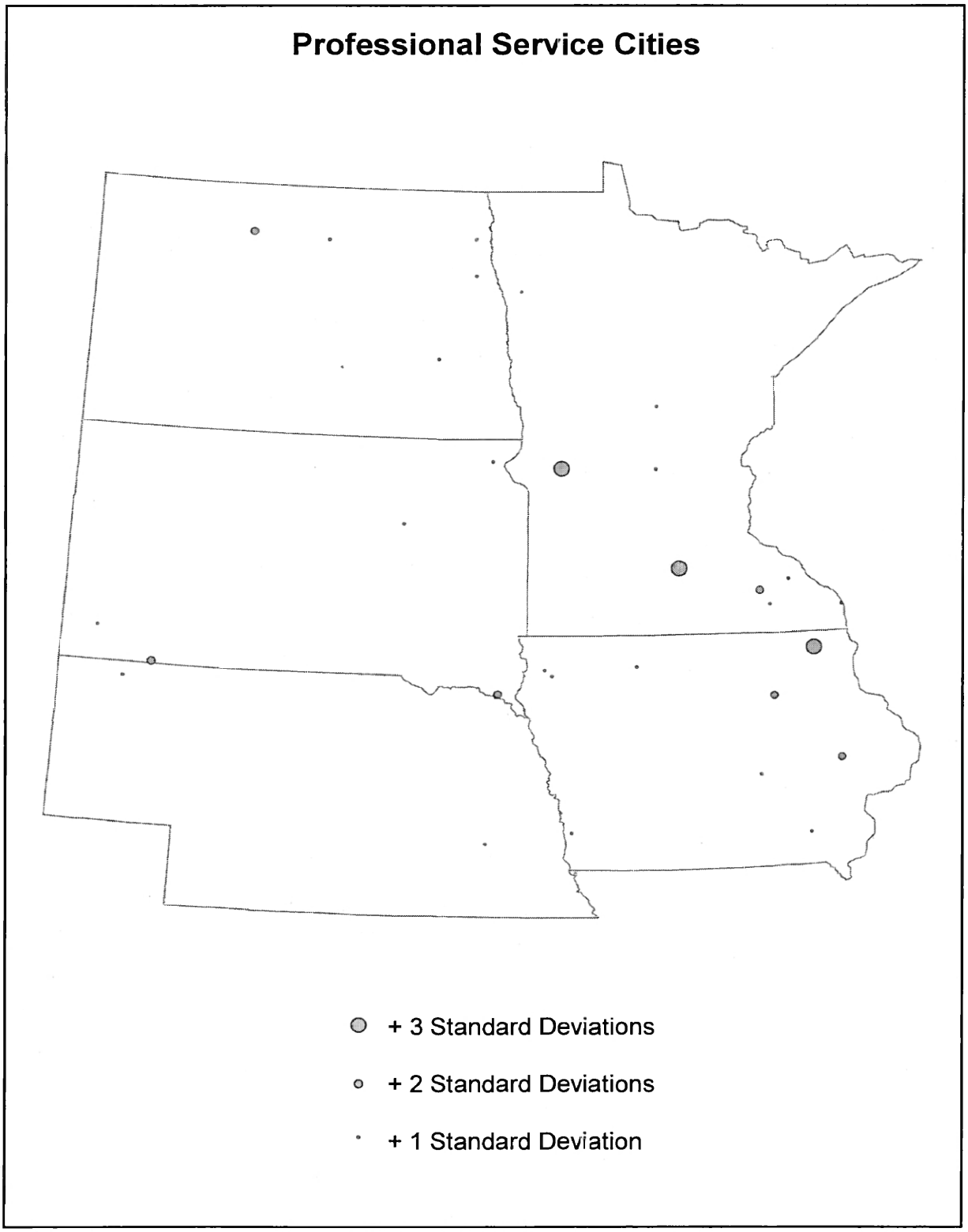


Figure 20: Professional service cities above 1, 2, and 3 SD from the mean.

Personal Service Cities

Personal service is another function that is widely distributed throughout the study area, but each state has a different set of circumstances. The average employment of 12.25 percent is the fourth highest of the eleven functions. Of the 28 cities in this group, ten are in South Dakota, nine in Minnesota, five in Iowa, and only two each in North Dakota and Nebraska (see Table 14). Cities in this category are usually found in areas that attract a large flow of people. The tourist area of the Black Hills is a prime example where five cities, including the largest in the class, Lead, are located (see Figure 21). This region offers a multitude of functions that fit into this class consisting of motels, restaurants, bars, gift shops, sight-seeing, and gambling. The second and third highest cities in personal service, Tama and Toledo, Iowa, are located only a few miles from one another. The Meskwaki Casino and entertainment center provides a substantial amount of employment for these two cities. Many cities in North Dakota are also classified as professional service cities. There is no overlap of classes in any other state.

City	State	Function %	+ SD	City	State	Function %	+ SD
Granite Falls	MN	16.34	+ 1 SD	Minden	NE	17.57	+ 1 SD
Ely	MN	16.63	+ 1 SD	Chisholm	MN	17.79	+ 1 SD
Detroit Lakes	MN	16.70	+ 1 SD	Valentine	NE	17.97	+ 1 SD
Belle Fourche	SD	16.79	+ 1 SD	Virginia	MN	18.33	+ 1 SD
Devils Lake	ND	16.80	+ 1 SD	Winner	SD	18.37	+ 1 SD
Onawa	IA	16.82	+ 1 SD	Sisseton	SD	19.86	+ 1 SD
Spirit Lake	IA	16.85	+ 1 SD	Mobridge	SD	20.33	+ 2 SD
Osceola	IA	16.90	+ 1 SD	Mora	MN	20.84	+ 2 SD
Grand Forks AFB	ND	17.36	+ 1 SD	Pine City	MN	21.28	+ 2 SD
Ellsworth AFB	SD	17.37	+ 1 SD	Spearfish	SD	23.28	+ 2 SD
Sturgis	SD	17.39	+ 1 SD	Pine Ridge	SD	23.89	+ 2 SD
Vermillion	SD	17.40	+ 1 SD	Tama	IA	25.82	+ 3 SD
Redwood Falls	MN	17.50	+ 1 SD	Toledo	IA	29.85	+ 3 SD
Grand Rapids	MN	17.52	+ 1 SD	Lead	SD	39.31	+ 3 SD

Table 14: Cities above 1, 2, and 3 SD from the mean in personal services.

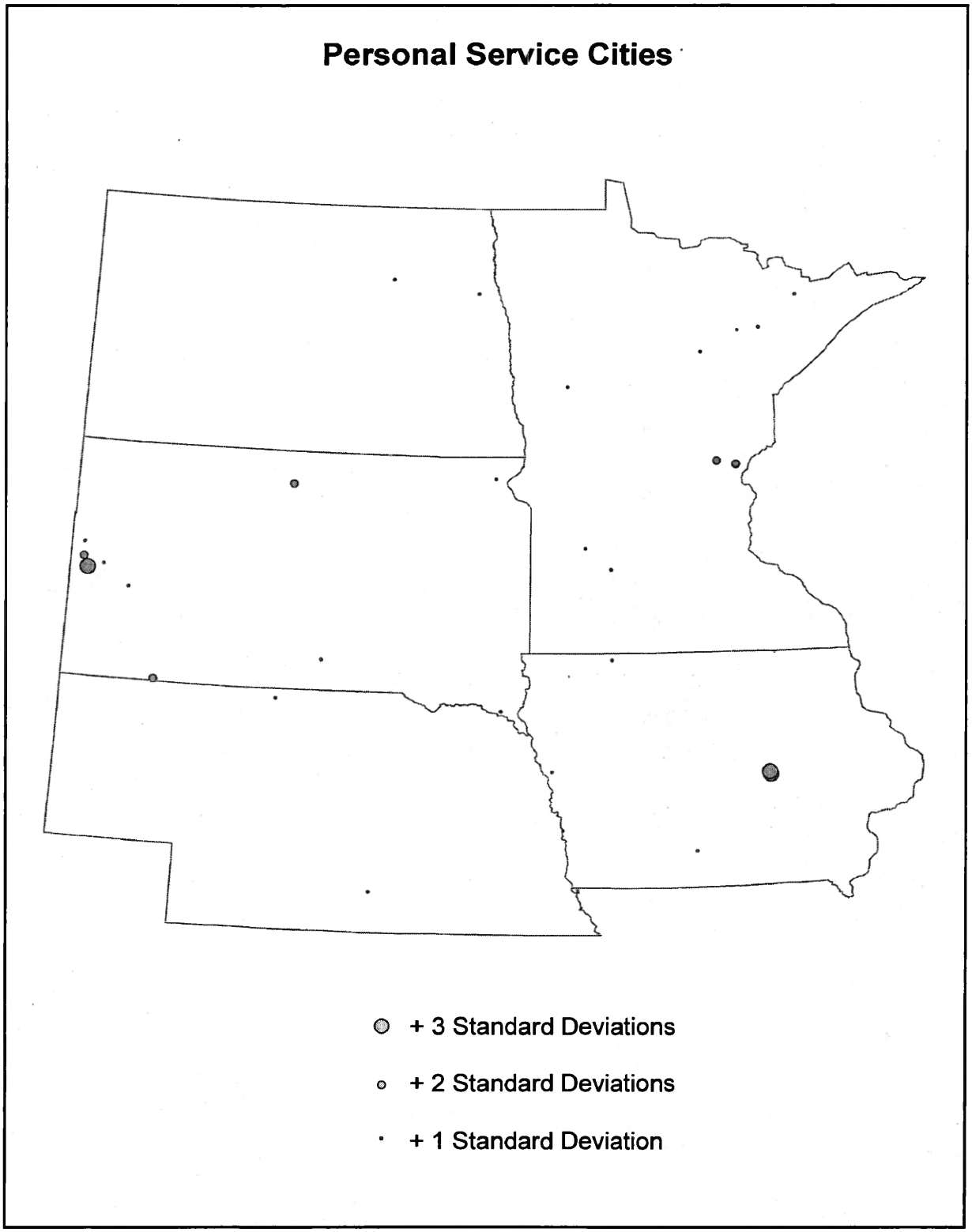


Figure 21: Personal service cities above 1, 2, and 3 SD from the mean.

Public Administration Cities

Cities in this study area providing public administration services are almost always going to be political centers or military installations. The overall average employment in the study area is relatively low at only 4.11 percent, but many cities in this category have significant levels (see Table 15). In other words, much like mining, a city is either fairly low or quite high in public administration. Unlike mining though, the location of these cities is not based on the proximity to a natural resource. The spatial distribution of these cities is quite dispersed (see Figure 22). The three air force bases of Minot, Ellsworth, and Grand Forks are all at least +2 SD from the mean. Pine Ridge, South Dakota, is a significant political center for the Lakota people, and is home to federal government sponsored Bureau of Indian Affairs. Anamosa, Iowa, is home to a state penitentiary. Other cities are local seats of government. All seven cities in North and South Dakota classified as public administration also fall into the professional or personal service class. Only half of the cities in Iowa and Minnesota are multi-functional.

City	State	Function %	+ SD	City	State	Function %	+ SD
Eldora	IA	6.96	+ 1 SD	Toledo	IA	8.25	+ 1 SD
Wahoo	NE	6.99	+ 1 SD	Anamosa	IA	9.75	+ 1 SD
Wabasha	MN	7.05	+ 1 SD	Minot AFB	ND	12.46	+ 2 SD
Sisseton	SD	7.19	+ 1 SD	Redfield	SD	13.52	+ 3 SD
Olivia	MN	7.22	+ 1 SD	Grand Forks AFB	ND	15.23	+ 3 SD
West Union	IA	7.41	+ 1 SD	Appleton	MN	20.50	+ 3 SD
Grafton	ND	7.45	+ 1 SD	Pine Ridge	SD	22.13	+ 3 SD
Clarinda	IA	7.70	+ 1 SD	Ellsworth AFB	SD	23.80	+ 3 SD

Table 15: Cities above 1, 2, and 3 SD from the mean in public administration.

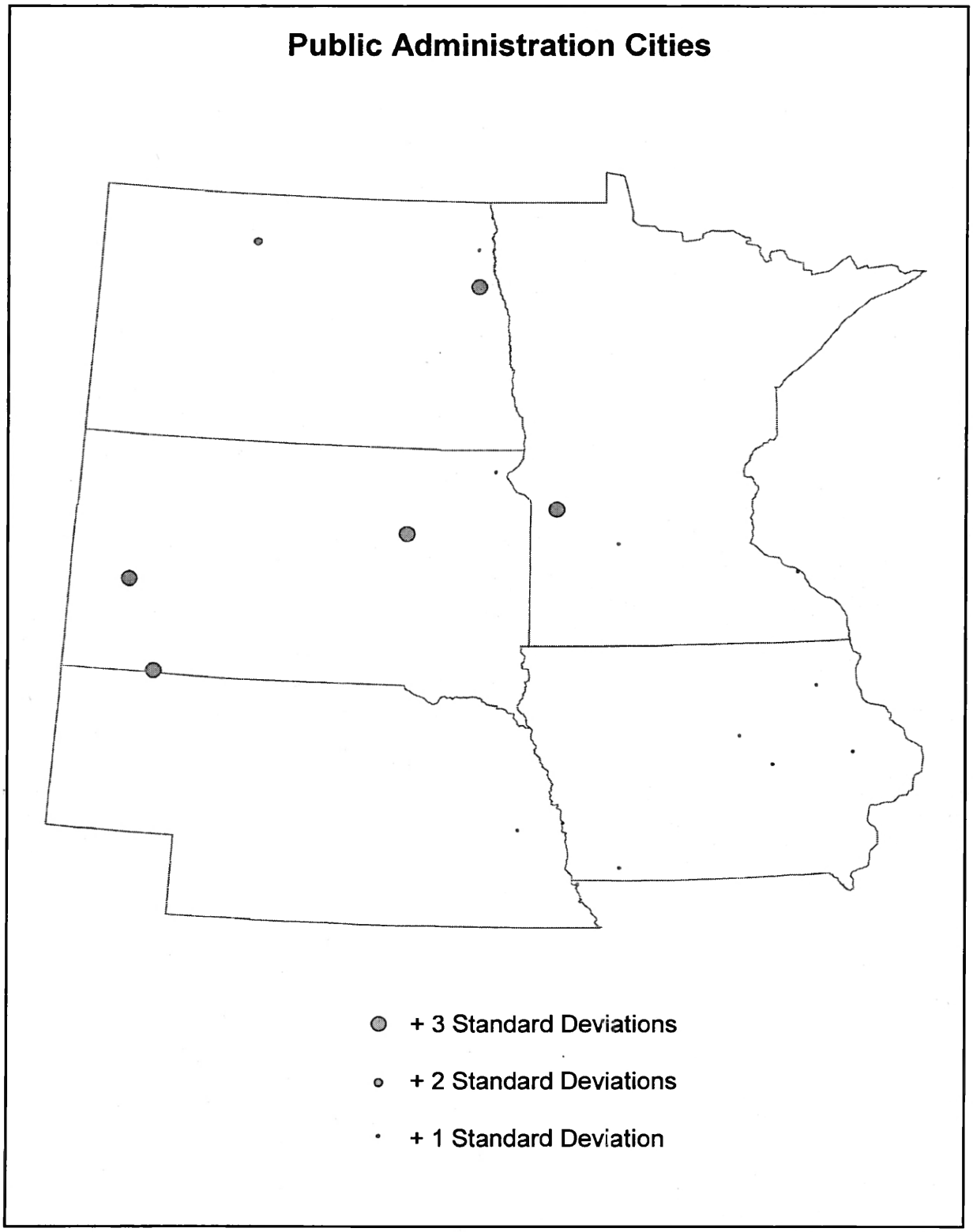


Figure 22: Public administration cities above 1, 2, and 3 SD from the mean.

Diversified Cities

Of the 231 cities within the study area of this functional classification, there are 45 cities that did not reach at least +1 SD in any of the eleven services classes (see Table 16). Iowa alone had 22 of the cities, and Minnesota was second with 16. Nebraska has six cities in the category, North Dakota has one, and South Dakota contains zero. The location of these cities tends to follow the traditional cornbelt throughout Iowa, southern Minnesota, and through south-central Nebraska (see Figure 19). These cities serve important roles in the local economy despite not having a significant amount of employment in one of the eleven classes. The spacing of these cities is quite even in Iowa and southern Minnesota.

City	State	City	State	City	State
Wahpeton	ND	Oak Park Heights	MN	Estherville	IA
Aurora	NE	Pipestone	MN	Grundy Center	IA
Broken Bow	NE	Sartell	MN	Hampton	IA
Central City	NE	Sleepy Eye	MN	Independence	IA
Gothenburg	NE	Spring Valley	MN	Jefferson	IA
Holdrege	NE	Staples	MN	Knoxville	IA
York	NE	Watertown	MN	Le Mars	IA
Bayport	MN	Zumbrota	MN	Manchester	IA
Blue Earth	MN	Algona	IA	Nevada	IA
Caledonia	MN	Atlantic	IA	Oelwein	IA
Kasson	MN	Bloomfield	IA	Perry	IA
Lindstrom	MN	Charles City	IA	Rock Rapids	IA
Little Falls	MN	Clear Lake	IA	Rock Valley	IA
Milaca	MN	Cresco	IA	Washington	IA
New Prague	MN	Creston	IA	West Burlington	IA

Table 16: Diversified cities.

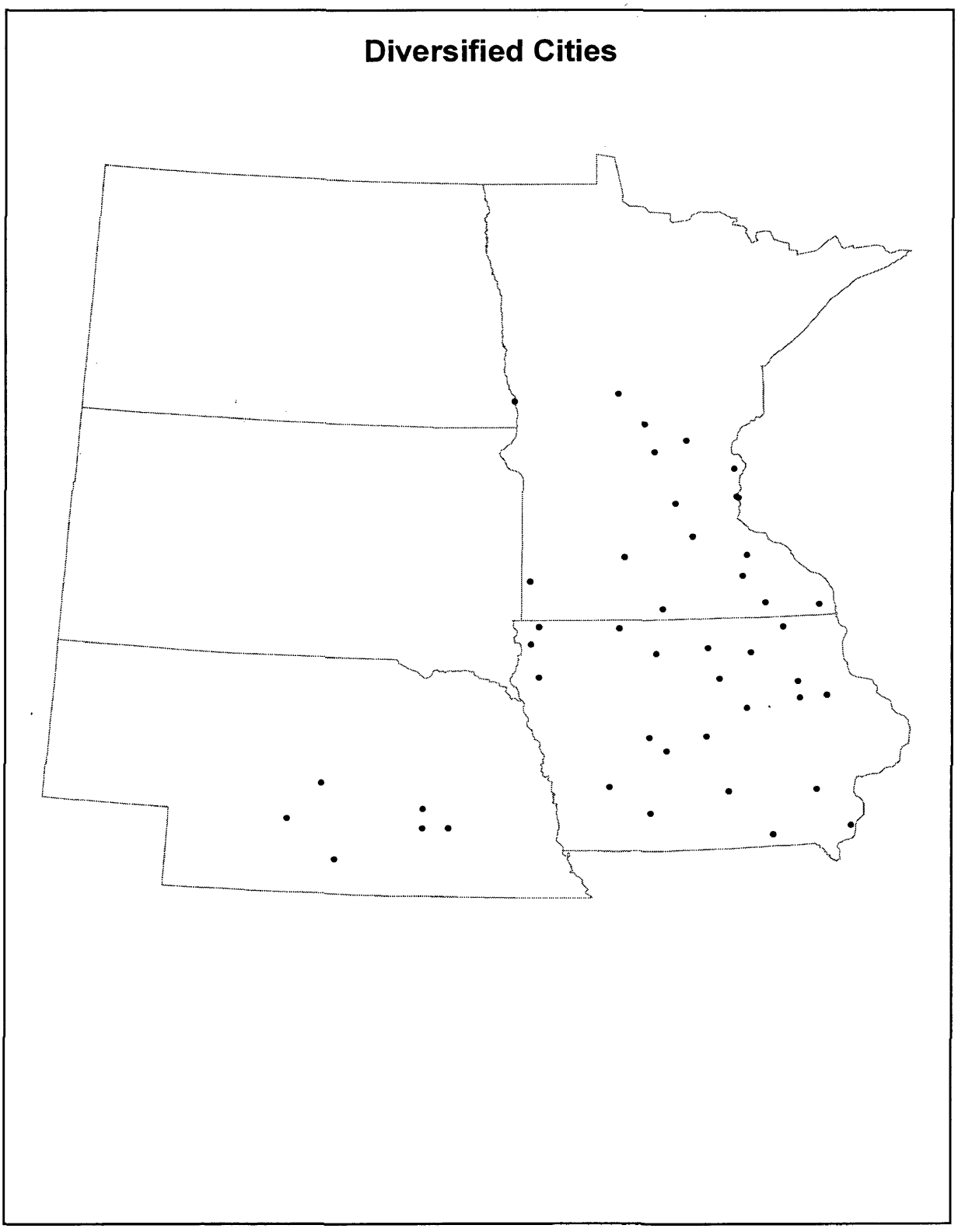


Figure 23: Diversified cities.

Nearest Neighbor Analysis

Many geographers utilize nearest neighbor analysis as a valid statistical tool for determining spatial distribution in a two-dimensional space. The maximum departure at one end of the scale is absolute clustering, where all points are at the same place. The other end is absolute dispersal, where all points are equidistant from other points. The index ranges from 0, indicating clustering, to 2.15, indicating maximum dispersion.

The nearest neighbor results are shown below in Table 17. The columns contain the index value (r value), average distance calculated in miles (Ave. Dist), the expected average distance for the number of points randomly placed in a study area (Exp.Ave.Dist), standard deviation (S.D.), the study area in square miles (Area) and the number of cities per function (# of points). Overall, the point distribution of each function, except retail, was random tending toward clustering.

Function	R Value	Ave. Dist (mi)	Exp.Ave.Dist (mi)	S.D. (mi)	Area (mi^2)	# of Points
All Cities	0.95	19.6	20.6	0.8	367,798	231
Mi	0.67	68.8	102.6	17.6	367,798	12
C	0.87	48.8	56.0	5.5	367,798	35
Mf	0.67	35.8	53.5	5	367,798	38
W	0.77	49.7	64.6	7.2	367,798	27
R	1.02	60.3	58.8	6	367,798	32
T	0.85	74.3	86.8	12.8	367,798	16
I	0.92	38.7	62.1	6.7	367,798	29
F	0.67	46.4	69.0	8.2	367,798	24
Pf	0.78	48.0	61.0	6.5	367,798	30
Ps	0.8	51.0	63.3	7	367,798	28
Pa	0.83	72.0	86.8	12.8	367,798	16
D	0.64	31.3	48.8	4.2	367,798	45

Table 17: Nearest Neighbor Analysis results for each economic function.

Retail was random and slightly leaning towards uniformity. The average distance between cities in the transportation class was the highest at 74.3 miles. Diversified cities were the closest together at an average of 31.3 miles. However, those cities were generally clustered towards the southeastern region of the study area.

Summary of Results

It must be noted again that the purpose of functional classifications is to identify the spatial regularities in the distribution and structure or urban functions. This chapter provided an explanation of the results produced by the creation of the contemporary functional classification of cities in the study area. Compared to previous studies on city classification, many service categories were consistent regarding percent of workers. Examples of this are public administration, wholesaling, transportation, and to a certain extent mining. Other economic classes such as personal and professional services were significantly higher in this study than previous research had found in other geographic areas, and city size. There was a noticeable divide in functions from the agricultural portions of Iowa, Minnesota and eastern Nebraska to the rest of the study area of western Nebraska, North Dakota, and South Dakota.

Urban geographers are interested in describing the pattern of points within a specified study area. With this in mind, the utilization of nearest neighbor analysis, a method of analysis that distinguishes objectively between clustered

and dispersed spatial distributions was used. The results showed that most of the spatial distribution was random, with a tendency towards clustering for every function except retail, which was random tending towards uniformity. The results of the nearest neighbor analysis demonstrate a degree of spatial distribution of a two-dimensional distribution. It is important to reiterate that these cities provide basic connections between the dispersed agricultural populations and the agglomerated urban populations. For the most part, such direct connections as do exist are through the goods and services which are provided in these small towns for the agricultural population surrounding them.

Chapter 5

Conclusion

It is commonly understood that cities have diverse economic structures and social characteristics. Many times these differences can be traced to historical regional growth or resource availability. Recognition and better understanding of these different types of cities results from their classification. Classification is one way to organize complex and diverse information in order to create a better understanding of processes and relationships. The relevance and usefulness of classifications in geography is wide-spread throughout the discipline. In urban geography, "generalizations can be made concerning a single group comprised of like items, or one group can be compared and contrasted with one or more other groups" (Northam 1975, 13).

Location also has been an important dimension in the study of systems of cities. The activities and characteristics of a local community are thought to be influenced not only by its immediate locality, but also by its ecological position with respect to other centers of various sizes. Given the exchange relationships between cities, and the economics of transportation and communication, geographic location is an important aspect of this ecological position. (Fuguitt and Field 1972) The small town is of academic interest because it represents the lower end of the central place continuum. Any generalizations, theories, or laws developed for central places should hold true for larger cities as well as smaller cities. (Stafford 1963)

Harris, Ullman, Nelson, and Hart set the framework of functional classification as the original architects of the discipline. Smith developed a methodological outline for a more scientific and replicable methodological design in city classifications for the future. More recent applications of multivariate statistical analysis created other avenues for scientific inquiry to be obtained. The purpose behind each of these studies is to find relationships in the spatial distribution of economic functions in an attempt to better understand the incredibly complex urban structure.

Within the scope of academic research, "geography is the branch largely concerned with the attainment of spatial knowledge, and is also concerned with the identification, analysis, and interpretation of spatial distributions of phenomena and their locational relationships as they occur on the planet" (Haring *et al.* 1992, 5). The purpose of functional classifications is to identify the spatial regularities in the distribution and structure or urban functions, and this is consistent with the accepted role of geography in academia. There are two primary objectives for this thesis: 1) To create a contemporary taxonomy of the small urban places (population 2,500-10,000) in the study area using a standard classification method for urban geography. 2) To discover and explain the spatial distribution of the dominant economic functions of small cities in the study area.

Any system of classification should provide a vehicle for efficient communication, a set of definitions, and a system of relationships among these definitions. Each label in the classification system should convey the greatest

possible meaning in the fewest possible symbols. The categories should be precisely defined, and overlapping should be eliminated wherever possible. The goals of any such system are to allow the investigator to compare groups of cities by type and allow him to reduce hundreds of cities into some kind of order. (Atchley 1967)

Staying consistent with previous studies concerning functional classifications, the occupational data obtained from the 2000 U.S. Census were used. Only cities with populations between 2,500 and 10,000, and not contained within the contiguous urbanized area of a MSA city were examined.

When determining a method to use for this thesis, it is important to consider the overall objectives of the study. The purpose of this classification is to compare the economic functions of towns within the specified population range in one particular geographic region and to discover spatial relationships. The standard deviation method developed provides an approach that allows a multi-functional classification, and provides a firm, relative assessment of these cities. The mapping of the classification by economic functions provides a unique insight into the spatial distribution of the cities. Nearest neighbor analysis is an applicable statistical tool for determining spatial distribution in a two-dimensional space.

It must be noted again that the purpose of functional classifications is to identify the spatial regularities in the distribution and structure or urban functions. This chapter provided an explanation of the results produced by the creation of

the contemporary functional classification of cities in the study area. Compared to previous studies on city classification, many service categories were consistent regarding the amount of workers. Examples of this are public administration, wholesaling, transportation, and to a certain extent mining. Other economic classes such as personal and professional services were significantly higher in this study than previous research had found in other geographic areas, and city size. A noticeable divide was formed with functions from the agricultural portions of Iowa, Minnesota and eastern Nebraska to the rest of the study area of western Nebraska, North Dakota, and South Dakota.

Urban geographers are interested in describing the pattern of points within a specified study area. The utilization of nearest neighbor analysis provides a method of analysis that distinguishes objectively between clustered and dispersed spatial distributions. (Berry 1958) The results illustrate that most of the spatial distribution was random, with a tendency towards clustering for every function except retail, which was random tending towards uniformity. The results of the nearest neighbor analysis demonstrate a degree of spatial distribution of a two-dimensional distribution. It is important to reiterate that these cities provide basic connections between the dispersed agricultural populations and the agglomerated urban populations. For the most part, such direct connections as do exist are through the goods and services which are provided in these small towns for the agricultural population surrounding them.

The present study, in conjunction with those that have preceded it, lends empirical support to Brush's statement that "small towns and villages in agricultural areas of Anglo-America exist mainly because of their function as central places for the exchange of goods and services, each for its local farm trade area" (Brush 1953, 380). By building one similar study upon another in different areas, progress is made toward valid generalizations concerning the economic functioning of central places, thus making precise prediction more possible. (Stafford 1963)

These small places provide basic connections between the dispersed agricultural populations and the agglomerated urban populations. For the most part, such direct connections that do exist are through the goods and services which are provided in these small towns for the agricultural population surrounding them. Second, even if small towns do not fulfill their role of providing goods and services for a dispersed farm population, the fact remains that these small places exist and that economic activities are performed in them just as they are in larger places. (Thomas 1960)

This thesis establishes the framework for further research into understanding the economic functionality of small urban places. Future research could investigate various issues including temporal studies, because geographers should examine functional changes and spatial distribution as the urban construct evolves. Another aspect that should be carefully examined is the changes in population for cities in a particular region or service class. Other

forms of multivariate statistical analyses, such as cluster analysis or regression analysis, could be used to locate groups of cities with similar economic structures. Many plausible avenues can be utilized in order to discover and understand this diverse and complex system, but it is crucial to employ a method that strictly follows the research objective(s) of a particular study.

APPENDIX A

City Employment Data and Percentages by Function (population sort)

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Spring Valley	MN	2518	1258	0	0.0%	69	5.5%	166	13.2%	28	2.2%	149	11.8%	79	6.3%	18	1.4%	89	7.1%	382	30.4%	182	14.5%	46	3.7%
Marengo	IA	2535	1321	0	0.0%	67	5.1%	403	30.5%	15	1.1%	169	12.8%	30	2.3%	31	2.3%	35	2.6%	307	23.2%	178	13.5%	49	3.7%
Toledo	IA	2539	1176	0	0.0%	90	7.7%	145	12.3%	15	1.3%	114	9.7%	30	2.6%	24	2.0%	27	2.3%	281	23.9%	351	29.8%	97	8.2%
West Union	IA	2549	1242	0	0.0%	62	5.0%	256	20.6%	90	7.2%	132	10.6%	42	3.4%	8	0.6%	55	4.4%	295	23.8%	149	12.0%	92	7.4%
Kimball	NE	2559	1214	46	3.8%	59	4.9%	141	11.6%	45	3.7%	150	12.4%	123	10.1%	21	1.7%	71	5.8%	267	22.0%	163	13.4%	73	6.0%
Perham	MN	2559	1140	4	0.4%	77	6.8%	283	24.8%	22	1.9%	116	10.2%	56	4.9%	60	5.3%	30	2.6%	324	28.4%	121	10.6%	26	2.3%
Belmond	IA	2560	1308	0	0.0%	79	6.0%	348	26.6%	29	2.2%	158	12.1%	33	2.5%	64	4.9%	44	3.4%	363	27.8%	87	6.7%	15	1.1%
Olivia	MN	2570	1261	0	0.0%	83	6.6%	196	15.5%	35	2.8%	187	14.8%	61	4.8%	11	0.9%	69	5.5%	351	27.8%	103	8.2%	91	7.2%
Sisseton	SD	2572	1113	0	0.0%	66	5.9%	37	3.3%	16	1.4%	131	11.8%	24	2.2%	18	1.6%	57	5.1%	434	39.0%	221	19.9%	80	7.2%
Rock Rapids	IA	2573	1265	0	0.0%	64	5.1%	202	16.0%	35	2.8%	161	12.7%	59	4.7%	38	3.0%	101	8.0%	347	27.4%	150	11.9%	51	4.0%
Milaca	MN	2580	1061	0	0.0%	68	6.4%	198	18.7%	12	1.1%	155	14.6%	36	3.4%	24	2.3%	47	4.4%	335	31.6%	149	14.0%	21	2.0%
Glenwood	MN	2594	1078	0	0.0%	39	3.6%	161	14.9%	69	6.4%	124	11.5%	59	5.5%	34	3.2%	58	5.4%	329	30.5%	145	13.5%	29	2.7%
Grundy Center	IA	2596	1189	0	0.0%	42	3.5%	227	19.1%	41	3.4%	170	14.3%	64	5.4%	21	1.8%	62	5.2%	316	26.6%	135	11.4%	74	6.2%
David City	NE	2597	1160	0	0.0%	63	5.4%	275	23.7%	30	2.6%	115	9.9%	95	8.2%	5	0.4%	34	2.9%	368	31.7%	63	5.4%	59	5.1%
Wabasha	MN	2599	1177	0	0.0%	69	5.9%	239	20.3%	22	1.9%	132	11.2%	54	4.6%	34	2.9%	54	4.6%	333	28.3%	146	12.4%	83	7.1%
Bloomfield	IA	2601	1147	0	0.0%	82	7.1%	248	21.6%	19	1.7%	73	6.4%	70	6.1%	18	1.6%	53	4.6%	359	31.3%	166	14.5%	37	3.2%
Chisago City	MN	2622	1185	0	0.0%	95	8.0%	209	17.6%	80	6.8%	103	8.7%	59	5.0%	34	2.9%	70	5.9%	365	30.8%	114	9.6%	52	4.4%
Williamsburg	IA	2622	1348	0	0.0%	111	8.2%	270	20.0%	49	3.6%	189	14.0%	41	3.0%	47	3.5%	28	2.1%	395	29.3%	85	6.3%	44	3.3%
Becker	MN	2673	1413	0	0.0%	187	13.2%	259	18.3%	37	2.6%	168	11.9%	117	8.3%	12	0.8%	67	4.7%	334	23.6%	130	9.2%	71	5.0%
Annandale	MN	2684	1272	0	0.0%	146	11.5%	223	17.5%	47	3.7%	135	10.6%	59	4.6%	38	3.0%	47	3.7%	355	27.9%	191	15.0%	19	1.5%
Rock Valley	IA	2702	1441	0	0.0%	85	5.9%	315	21.9%	57	4.0%	176	12.2%	42	2.9%	18	1.2%	69	4.8%	473	32.8%	134	9.3%	29	2.0%
Cokato	MN	2727	1294	0	0.0%	123	9.5%	337	26.0%	28	2.2%	150	11.6%	39	3.0%	28	2.2%	54	4.2%	349	27.0%	128	9.9%	35	2.7%
Tama	IA	2731	1224	0	0.0%	84	6.9%	249	20.3%	24	2.0%	110	9.0%	43	3.5%	13	1.1%	43	3.5%	290	23.7%	316	25.8%	38	3.1%
Roseau	MN	2756	1417	0	0.0%	42	3.0%	516	36.4%	8	0.6%	177	12.5%	25	1.8%	37	2.6%	65	4.6%	410	28.9%	76	5.4%	46	3.2%
Zumbrota	MN	2789	1467	0	0.0%	106	7.2%	204	13.9%	64	4.4%	159	10.8%	90	6.1%	29	2.0%	94	6.4%	503	34.3%	165	11.2%	38	2.6%
Montgomery	MN	2794	1360	1	0.1%	121	8.9%	417	30.7%	55	4.0%	173	12.7%	59	4.3%	8	0.6%	40	2.9%	289	21.3%	148	10.9%	24	1.8%
Sibley	IA	2796	1336	0	0.0%	62	4.6%	405	30.3%	38	2.8%	116	8.7%	103	7.7%	30	2.2%	60	4.5%	316	23.7%	93	7.0%	68	5.1%
Valentine	NE	2820	1347	0	0.0%	101	7.5%	36	2.7%	65	4.8%	192	14.3%	103	7.6%	16	1.2%	46	3.4%	435	32.3%	242	18.0%	69	5.1%
Wilton	IA	2829	1482	3	0.2%	43	2.9%	424	28.6%	67	4.5%	178	12.0%	99	6.7%	47	3.2%	54	3.6%	419	28.3%	97	6.5%	47	3.2%
Afton	MN	2839	1552	5	0.3%	94	6.1%	292	18.8%	62	4.0%	125	8.1%	66	4.3%	55	3.5%	86	5.5%	493	31.8%	160	10.3%	97	6.3%
Zimmerman	MN	2851	1516	0	0.0%	178	11.7%	455	30.0%	38	2.5%	179	11.8%	70	4.6%	18	1.2%	73	4.8%	306	20.2%	136	9.0%	38	2.5%
Appleton	MN	2871	644	0	0.0%	30	4.7%	72	11.2%	14	2.2%	71	11.0%	35	5.4%	23	3.6%	40	6.2%	150	23.3%	58	9.0%	132	20.5%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Belle Plaine	IA	2878	1267	0	0.0%	37	2.9%	371	29.3%	36	2.8%	135	10.7%	65	5.1%	9	0.7%	72	5.7%	331	26.1%	156	12.3%	21	1.7%
Redfield	SD	2897	1080	0	0.0%	46	4.3%	33	3.1%	33	3.1%	174	16.1%	41	3.8%	15	1.4%	39	3.6%	387	35.8%	132	12.2%	146	13.5%
Garner	IA	2922	1501	0	0.0%	28	1.9%	447	29.8%	59	3.9%	186	12.4%	75	5.0%	28	1.9%	85	5.7%	396	26.4%	94	6.3%	57	3.8%
Rugby	ND	2939	1249	7	0.6%	64	5.1%	66	5.3%	69	5.5%	151	12.1%	68	5.4%	37	3.0%	66	5.3%	468	37.5%	178	14.3%	39	3.1%
Minden	NE	2964	1514	4	0.3%	112	7.4%	217	14.3%	18	1.2%	200	13.2%	56	3.7%	35	2.3%	82	5.4%	392	25.9%	266	17.6%	43	2.8%
Caledonia	MN	2965	1415	2	0.1%	118	8.3%	227	16.0%	40	2.8%	189	13.4%	58	4.1%	32	2.3%	20	1.4%	481	34.0%	168	11.9%	62	4.4%
Clarion	IA	2968	1439	0	0.0%	80	5.6%	234	16.3%	50	3.5%	115	8.0%	140	9.7%	35	2.4%	67	4.7%	442	30.7%	139	9.7%	31	2.2%
Cold Spring	MN	2975	1382	0	0.0%	82	5.9%	372	26.9%	43	3.1%	191	13.8%	41	3.0%	7	0.5%	113	8.2%	377	27.3%	121	8.8%	22	1.6%
Dell Rapids	SD	2980	1517	12	0.8%	108	7.1%	157	10.3%	69	4.5%	168	11.1%	80	5.3%	49	3.2%	160	10.5%	483	31.8%	159	10.5%	45	3.0%
Missouri Valley	IA	2992	1459	4	0.3%	108	7.4%	144	9.9%	38	2.6%	219	15.0%	88	6.0%	36	2.5%	213	14.6%	388	26.6%	159	10.9%	37	2.5%
Central City	NE	2998	1386	5	0.4%	91	6.6%	211	15.2%	32	2.3%	172	12.4%	72	5.2%	22	1.6%	56	4.0%	419	30.2%	173	12.5%	68	4.9%
Mountain Iron	MN	2999	1556	197	12.7%	95	6.1%	57	3.7%	110	7.1%	205	13.2%	80	5.1%	49	3.1%	78	5.0%	432	27.8%	172	11.1%	72	4.6%
Dilworth	MN	3001	1440	0	0.0%	132	9.2%	189	13.1%	82	5.7%	203	14.1%	91	6.3%	19	1.3%	77	5.3%	349	24.2%	189	13.1%	83	5.8%
Lindstrom	MN	3015	1611	0	0.0%	122	7.6%	302	18.7%	30	1.9%	177	11.0%	40	2.5%	25	1.6%	82	5.1%	543	33.7%	207	12.8%	83	5.2%
Lead	SD	3027	1511	165	10.9%	92	6.1%	25	1.7%	16	1.1%	163	10.8%	28	1.9%	27	1.8%	35	2.3%	293	19.4%	594	39.3%	38	2.5%
Watertown	MN	3029	1634	2	0.1%	123	7.5%	345	21.1%	47	2.9%	217	13.3%	96	5.9%	17	1.0%	94	5.8%	428	26.2%	227	13.9%	29	1.8%
Eldora	IA	3035	1321	0	0.0%	93	7.0%	216	16.4%	29	2.2%	156	11.8%	36	2.7%	36	2.7%	53	4.0%	404	30.6%	144	10.9%	92	7.0%
Long Prairie	MN	3040	1203	0	0.0%	63	5.2%	337	28.0%	6	0.5%	129	10.7%	37	3.1%	45	3.7%	52	4.3%	341	28.3%	137	11.4%	39	3.2%
Pine City	MN	3043	1311	0	0.0%	95	7.2%	246	18.8%	21	1.6%	191	14.6%	59	4.5%	11	0.8%	32	2.4%	294	22.4%	279	21.3%	63	4.8%
Wyoming	MN	3048	1619	0	0.0%	109	6.7%	304	18.8%	87	5.4%	193	11.9%	69	4.3%	48	3.0%	138	8.5%	440	27.2%	154	9.5%	77	4.8%
Granite Falls	MN	3070	1426	0	0.0%	115	8.1%	230	16.1%	48	3.4%	154	10.8%	82	5.8%	4	0.3%	58	4.1%	433	30.4%	233	16.3%	57	4.0%
Melrose	MN	3091	1517	0	0.0%	73	4.8%	400	26.4%	67	4.4%	190	12.5%	81	5.3%	40	2.6%	84	5.5%	349	23.0%	131	8.6%	56	3.7%
Onawa	IA	3091	1492	0	0.0%	113	7.6%	196	13.1%	49	3.3%	179	12.0%	68	4.6%	58	3.9%	28	1.9%	421	28.2%	251	16.8%	79	5.3%
Staples	MN	3104	1311	3	0.2%	63	4.8%	317	24.2%	51	3.9%	201	15.3%	62	4.7%	14	1.1%	44	3.4%	356	27.2%	149	11.4%	28	2.1%
Norwood Young America	MN	3108	1657	5	0.3%	121	7.3%	501	30.2%	55	3.3%	154	9.3%	76	4.6%	20	1.2%	86	5.2%	399	24.1%	201	12.1%	25	1.5%
Canton	SD	3110	1599	0	0.0%	155	9.7%	283	17.7%	63	3.9%	260	16.3%	119	7.4%	37	2.3%	146	9.1%	369	23.1%	90	5.6%	66	4.1%
Winner	SD	3137	1415	0	0.0%	109	7.7%	10	0.7%	66	4.7%	240	17.0%	92	6.5%	23	1.6%	75	5.3%	368	26.0%	260	18.4%	73	5.2%
Beulah	ND	3152	1516	187	12.3%	52	3.4%	99	6.5%	8	0.5%	171	11.3%	292	19.3%	31	2.0%	61	4.0%	388	25.6%	183	12.1%	39	2.6%
Tipton	IA	3155	1556	13	0.8%	128	8.2%	265	17.0%	26	1.7%	245	15.7%	84	5.4%	31	2.0%	43	2.8%	399	25.6%	187	12.0%	86	5.5%
West Burlington	IA	3161	1571	0	0.0%	113	7.2%	396	25.2%	50	3.2%	221	14.1%	110	7.0%	23	1.5%	17	1.1%	392	25.0%	135	8.6%	81	5.2%
Bayport	MN	3162	892	0	0.0%	75	8.4%	183	20.5%	13	1.5%	127	14.2%	43	4.8%	27	3.0%	70	7.8%	199	22.3%	111	12.4%	44	4.9%
Pine Ridge	SD	3171	741	0	0.0%	28	3.8%	0	0.0%	0	0.0%	37	5.0%	6	0.8%	0	0.0%	11	1.5%	318	42.9%	177	23.9%	164	22.1%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Plainview	MN	3190	1621	2	0.1%	147	9.1%	233	14.4%	64	3.9%	219	13.5%	89	5.5%	31	1.9%	84	5.2%	562	34.7%	124	7.6%	27	1.7%
Mora	MN	3193	1430	5	0.3%	148	10.3%	303	21.2%	22	1.5%	189	13.2%	20	1.4%	31	2.2%	50	3.5%	329	23.0%	298	20.8%	34	2.4%
Story City	IA	3228	1533	11	0.7%	120	7.8%	215	14.0%	69	4.5%	248	16.2%	54	3.5%	26	1.7%	99	6.5%	469	30.6%	143	9.3%	79	5.2%
Park Rapids	MN	3276	1263	0	0.0%	93	7.4%	197	15.6%	63	5.0%	150	11.9%	26	2.1%	14	1.1%	66	5.2%	374	29.6%	163	12.9%	72	5.7%
St. Charles	MN	3295	1748	3	0.2%	170	9.7%	286	16.4%	38	2.2%	281	16.1%	82	4.7%	12	0.7%	48	2.7%	545	31.2%	200	11.4%	59	3.4%
West Liberty	IA	3332	1553	0	0.0%	49	3.2%	647	41.7%	24	1.5%	159	10.2%	65	4.2%	29	1.9%	26	1.7%	347	22.3%	165	10.6%	23	1.5%
Auburn	NE	3350	1637	0	0.0%	48	2.9%	160	9.8%	23	1.4%	186	11.4%	363	22.2%	41	2.5%	70	4.3%	411	25.1%	233	14.2%	79	4.8%
Goodview	MN	3373	1947	0	0.0%	104	5.3%	645	33.1%	116	6.0%	139	7.1%	54	2.8%	62	3.2%	91	4.7%	480	24.7%	183	9.4%	57	2.9%
Benson	MN	3376	1616	0	0.0%	90	5.6%	343	21.2%	33	2.0%	296	18.3%	102	6.3%	47	2.9%	71	4.4%	388	24.0%	131	8.1%	66	4.1%
Mount Vernon	IA	3390	1971	0	0.0%	88	4.5%	201	10.2%	50	2.5%	231	11.7%	64	3.2%	51	2.6%	115	5.8%	873	44.3%	186	9.4%	64	3.2%
Adel	IA	3435	1668	8	0.5%	124	7.4%	179	10.7%	88	5.3%	215	12.9%	88	5.3%	47	2.8%	209	12.5%	423	25.4%	141	8.5%	90	5.4%
Osage	IA	3451	1608	0	0.0%	116	7.2%	429	26.7%	40	2.5%	217	13.5%	42	2.6%	15	0.9%	69	4.3%	424	26.4%	173	10.8%	41	2.5%
Broken Bow	NE	3491	1638	0	0.0%	93	5.7%	217	13.2%	42	2.6%	215	13.1%	100	6.1%	8	0.5%	43	2.6%	484	29.5%	221	13.5%	54	3.3%
Carlisle	IA	3497	1794	0	0.0%	141	7.9%	244	13.6%	61	3.4%	198	11.0%	123	6.9%	68	3.8%	264	14.7%	466	26.0%	109	6.1%	120	6.7%
Byron	MN	3500	1976	0	0.0%	142	7.2%	319	16.1%	15	0.8%	292	14.8%	48	2.4%	21	1.1%	71	3.6%	815	41.2%	176	8.9%	64	3.2%
Jackson	MN	3501	1751	0	0.0%	91	5.2%	359	20.5%	46	2.6%	241	13.8%	101	5.8%	75	4.3%	112	6.4%	362	20.7%	230	13.1%	55	3.1%
Sleepy Eye	MN	3515	1645	6	0.4%	126	7.7%	376	22.9%	30	1.8%	156	9.5%	74	4.5%	26	1.6%	60	3.6%	459	27.9%	212	12.9%	18	1.1%
Breckenridge	MN	3559	1707	0	0.0%	191	11.2%	310	18.2%	52	3.0%	146	8.6%	48	2.8%	36	2.1%	47	2.8%	564	33.0%	164	9.6%	60	3.5%
Mobridge	SD	3574	1510	0	0.0%	137	9.1%	20	1.3%	57	3.8%	223	14.8%	83	5.5%	22	1.5%	42	2.8%	466	30.9%	307	20.3%	84	5.6%
Monticello	IA	3607	1692	0	0.0%	97	5.7%	428	25.3%	100	5.9%	195	11.5%	72	4.3%	66	3.9%	48	2.8%	390	23.0%	167	9.9%	91	5.4%
Two Harbors	MN	3613	1682	60	3.6%	86	5.1%	207	12.3%	21	1.2%	204	12.1%	94	5.6%	27	1.6%	101	6.0%	461	27.4%	263	15.6%	105	6.2%
Gothenburg	NE	3619	1781	0	0.0%	142	8.0%	214	12.0%	80	4.5%	217	12.2%	122	6.9%	41	2.3%	90	5.1%	379	21.3%	267	15.0%	59	3.3%
Blue Earth	MN	3621	1772	0	0.0%	75	4.2%	301	17.0%	50	2.8%	265	15.0%	77	4.3%	51	2.9%	100	5.6%	540	30.5%	189	10.7%	94	5.3%
Milbank	SD	3640	1642	58	3.5%	63	3.8%	134	8.2%	138	8.4%	213	13.0%	124	7.6%	29	1.8%	163	9.9%	376	22.9%	232	14.1%	55	3.3%
West Point	NE	3660	1748	16	0.9%	97	5.5%	457	26.1%	82	4.7%	236	13.5%	87	5.0%	36	2.1%	70	4.0%	387	22.1%	203	11.6%	37	2.1%
New Hampton	IA	3692	1729	0	0.0%	122	7.1%	359	20.8%	46	2.7%	294	17.0%	60	3.5%	22	1.3%	57	3.3%	474	27.4%	192	11.1%	63	3.6%
Albia	IA	3706	1578	0	0.0%	168	10.6%	366	23.2%	43	2.7%	216	13.7%	60	3.8%	18	1.1%	57	3.6%	397	25.2%	144	9.1%	62	3.9%
Eagle Grove	IA	3712	1709	0	0.0%	141	8.3%	341	20.0%	80	4.7%	124	7.3%	181	10.6%	33	1.9%	57	3.3%	489	28.6%	182	10.6%	30	1.8%
Ely	MN	3724	1666	124	7.4%	112	6.7%	83	5.0%	21	1.3%	226	13.6%	33	2.0%	53	3.2%	97	5.8%	540	32.4%	277	16.6%	53	3.2%
O'Neill	NE	3733	1762	0	0.0%	164	9.3%	23	1.3%	155	8.8%	269	15.3%	119	6.8%	15	0.9%	110	6.2%	401	22.8%	254	14.4%	97	5.5%
Belle Plaine	MN	3789	1949	0	0.0%	216	11.1%	389	20.0%	48	2.5%	210	10.8%	116	6.0%	39	2.0%	127	6.5%	417	21.4%	303	15.5%	79	4.1%
Cannon Falls	MN	3795	2038	0	0.0%	113	5.5%	500	24.5%	116	5.7%	261	12.8%	81	4.0%	36	1.8%	117	5.7%	469	23.0%	251	12.3%	56	2.7%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Jordan	MN	3833	1958	1	0.1%	151	7.7%	406	20.7%	70	3.6%	311	15.9%	114	5.8%	33	1.7%	94	4.8%	469	24.0%	238	12.2%	57	2.9%
Eveleth	MN	3865	1651	166	10.1%	61	3.7%	155	9.4%	51	3.1%	258	15.6%	121	7.3%	28	1.7%	40	2.4%	427	25.9%	263	15.9%	76	4.6%
Cresco	IA	3905	1882	0	0.0%	138	7.3%	469	24.9%	78	4.1%	197	10.5%	73	3.9%	45	2.4%	104	5.5%	430	22.8%	202	10.7%	63	3.3%
Le Sueur	MN	3922	1993	7	0.4%	107	5.4%	704	35.3%	66	3.3%	154	7.7%	57	2.9%	50	2.5%	95	4.8%	569	28.5%	171	8.6%	13	0.7%
Sauk Centre	MN	3930	2042	0	0.0%	77	3.8%	283	13.9%	77	3.8%	302	14.8%	129	6.3%	96	4.7%	108	5.3%	570	27.9%	273	13.4%	49	2.4%
Princeton	MN	3933	1947	3	0.2%	128	6.6%	599	30.8%	34	1.7%	279	14.3%	97	5.0%	48	2.5%	48	2.5%	473	24.3%	174	8.9%	43	2.2%
Wahoo	NE	3942	1917	0	0.0%	186	9.7%	346	18.0%	79	4.1%	251	13.1%	66	3.4%	24	1.3%	68	3.5%	475	24.8%	264	13.8%	134	7.0%
Oak Park Heights	MN	3957	1820	0	0.0%	110	6.0%	367	20.2%	40	2.2%	203	11.2%	104	5.7%	39	2.1%	93	5.1%	489	26.9%	267	14.7%	100	5.5%
Emmetsburg	IA	3958	1979	0	0.0%	95	4.8%	304	15.4%	39	2.0%	191	9.7%	91	4.6%	61	3.1%	75	3.8%	705	35.6%	289	14.6%	33	1.7%
Victoria	MN	4025	2203	0	0.0%	116	5.3%	389	17.7%	130	5.9%	312	14.2%	72	3.3%	28	1.3%	185	8.4%	751	34.1%	170	7.7%	41	1.9%
Grant	MN	4026	2220	0	0.0%	237	10.7%	433	19.5%	34	1.5%	219	9.9%	58	2.6%	36	1.6%	99	4.5%	747	33.6%	231	10.4%	115	5.2%
Dyersville	IA	4035	2202	0	0.0%	110	5.0%	508	23.1%	112	5.1%	273	12.4%	72	3.3%	40	1.8%	95	4.3%	577	26.2%	311	14.1%	50	2.3%
Hot Springs	SD	4129	1607	14	0.9%	135	8.4%	47	2.9%	34	2.1%	197	12.3%	127	7.9%	38	2.4%	65	4.0%	582	36.2%	222	13.8%	99	6.2%
Waukon	IA	4131	2038	0	0.0%	138	6.8%	372	18.3%	84	4.1%	337	16.5%	65	3.2%	27	1.3%	65	3.2%	664	32.6%	152	7.5%	60	2.9%
Cozad	NE	4163	2081	0	0.0%	120	5.8%	708	34.0%	39	1.9%	224	10.8%	123	5.9%	11	0.5%	72	3.5%	424	20.4%	227	10.9%	49	2.4%
Ellsworth AFB	SD	4165	996	0	0.0%	28	2.8%	33	3.3%	14	1.4%	113	11.3%	23	2.3%	11	1.1%	83	8.3%	268	26.9%	173	17.4%	237	23.8%
Camanche	IA	4215	2193	0	0.0%	153	7.0%	644	29.4%	32	1.5%	207	9.4%	166	7.6%	26	1.2%	63	2.9%	532	24.3%	282	12.9%	70	3.2%
Hampton	IA	4218	2013	6	0.3%	92	4.6%	388	19.3%	77	3.8%	224	11.1%	57	2.8%	36	1.8%	61	3.0%	611	30.4%	253	12.6%	58	2.9%
Aurora	NE	4225	2135	0	0.0%	139	6.5%	289	13.5%	65	3.0%	217	10.2%	145	6.8%	51	2.4%	138	6.5%	680	31.9%	234	11.0%	114	5.3%
Spirit Lake	IA	4261	2149	0	0.0%	191	8.9%	453	21.1%	45	2.1%	300	14.0%	53	2.5%	23	1.1%	67	3.1%	578	26.9%	362	16.8%	55	2.6%
Fairbury	NE	4262	1827	0	0.0%	115	6.3%	515	28.2%	23	1.3%	169	9.3%	85	4.7%	78	4.3%	60	3.3%	431	23.6%	177	9.7%	53	2.9%
Pipestone	MN	4280	2190	0	0.0%	136	6.2%	345	15.8%	49	2.2%	276	12.6%	126	5.8%	51	2.3%	66	3.0%	663	30.3%	342	15.6%	37	1.7%
Wadena	MN	4294	1814	0	0.0%	107	5.9%	307	16.9%	102	5.6%	290	16.0%	48	2.6%	19	1.0%	54	3.0%	584	32.2%	233	12.8%	44	2.4%
Forest City	IA	4362	2298	0	0.0%	117	5.1%	808	35.2%	50	2.2%	202	8.8%	66	2.9%	14	0.6%	73	3.2%	614	26.7%	207	9.0%	47	2.0%
Kasson	MN	4398	2385	5	0.2%	180	7.5%	389	16.3%	59	2.5%	305	12.8%	82	3.4%	40	1.7%	177	7.4%	817	34.3%	181	7.6%	83	3.5%
Humboldt	IA	4452	2086	10	0.5%	98	4.7%	559	26.8%	71	3.4%	282	13.5%	120	5.8%	34	1.6%	107	5.1%	428	20.5%	200	9.6%	121	5.8%
Windom	MN	4490	2324	2	0.1%	116	5.0%	459	19.8%	58	2.5%	398	17.1%	114	4.9%	48	2.1%	100	4.3%	626	26.9%	238	10.2%	113	4.9%
Grafton	ND	4516	2162	0	0.0%	133	6.2%	177	8.2%	47	2.2%	247	11.4%	98	4.5%	27	1.2%	90	4.2%	801	37.0%	201	9.3%	161	7.4%
New Prague	MN	4559	2144	5	0.2%	162	7.6%	510	23.8%	73	3.4%	218	10.2%	64	3.0%	39	1.8%	105	4.9%	567	26.4%	315	14.7%	56	2.6%
Belle Fourche	SD	4565	2126	128	6.0%	220	10.3%	136	6.4%	24	1.1%	347	16.3%	103	4.8%	54	2.5%	71	3.3%	465	21.9%	357	16.8%	116	5.5%
Chariton	IA	4573	2056	0	0.0%	120	5.8%	182	8.9%	292	14.2%	367	17.9%	116	5.6%	22	1.1%	96	4.7%	531	25.8%	201	9.8%	80	3.9%
Luverne	MN	4617	2213	3	0.1%	115	5.2%	295	13.3%	78	3.5%	230	10.4%	97	4.4%	38	1.7%	205	9.3%	644	29.1%	343	15.5%	84	3.8%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Jefferson	IA	4626	1981	0	0.0%	158	8.0%	331	16.7%	69	3.5%	224	11.3%	57	2.9%	34	1.7%	127	6.4%	632	31.9%	243	12.3%	73	3.7%
Osceola	IA	4659	2272	0	0.0%	133	5.9%	529	23.3%	75	3.3%	252	11.1%	115	5.1%	5	0.2%	129	5.7%	561	24.7%	384	16.9%	66	2.9%
Falls City	NE	4671	1972	0	0.0%	116	5.9%	283	14.4%	68	3.4%	203	10.3%	216	11.0%	90	4.6%	114	5.8%	515	26.1%	209	10.6%	116	5.9%
St. Joseph	MN	4681	2585	4	0.2%	133	5.1%	299	11.6%	52	2.0%	397	15.4%	62	2.4%	66	2.6%	75	2.9%	994	38.5%	416	16.1%	66	2.6%
St. James	MN	4695	2086	0	0.0%	135	6.5%	729	34.9%	15	0.7%	240	11.5%	123	5.9%	18	0.9%	50	2.4%	516	24.7%	188	9.0%	30	1.4%
Winterset	IA	4768	2110	7	0.3%	174	8.2%	180	8.5%	75	3.6%	343	16.3%	92	4.4%	100	4.7%	276	13.1%	509	24.1%	183	8.7%	84	4.0%
Grand Forks AFB	ND	4832	847	0	0.0%	2	0.2%	39	4.6%	11	1.3%	118	13.9%	38	4.5%	0	0.0%	31	3.7%	327	38.6%	147	17.4%	129	15.2%
St. Francis	MN	4910	2517	0	0.0%	386	15.3%	577	22.9%	105	4.2%	240	9.5%	160	6.4%	17	0.7%	157	6.2%	644	25.6%	182	7.2%	38	1.5%
Sheldon	IA	4914	2503	0	0.0%	123	4.9%	520	20.8%	163	6.5%	254	10.1%	128	5.1%	72	2.9%	35	1.4%	833	33.3%	181	7.2%	58	2.3%
La Crescent	MN	4923	2465	0	0.0%	91	3.7%	308	12.5%	123	5.0%	380	15.4%	110	4.5%	62	2.5%	142	5.8%	947	38.4%	254	10.3%	33	1.3%
Ogallala	NE	4930	2475	6	0.2%	155	6.3%	199	8.0%	82	3.3%	466	18.8%	174	7.0%	40	1.6%	158	6.4%	588	23.8%	402	16.2%	103	4.2%
Lake City	MN	4950	2608	0	0.0%	117	4.5%	773	29.6%	54	2.1%	211	8.1%	73	2.8%	53	2.0%	67	2.6%	745	28.6%	348	13.3%	95	3.6%
Chisholm	MN	4960	2057	279	13.6%	127	6.2%	290	14.1%	75	3.6%	219	10.6%	169	8.2%	30	1.5%	56	2.7%	415	20.2%	366	17.8%	29	1.4%
De Witt	IA	5049	2585	19	0.7%	232	9.0%	449	17.4%	91	3.5%	310	12.0%	140	5.4%	25	1.0%	264	10.2%	705	27.3%	224	8.7%	85	3.3%
Morris	MN	5068	2692	2	0.1%	122	4.5%	235	8.7%	27	1.0%	290	10.8%	71	2.6%	88	3.3%	97	3.6%	1264	47.0%	313	11.6%	90	3.3%
Pleasant Hill	IA	5070	2954	0	0.0%	148	5.0%	236	8.0%	164	5.6%	275	9.3%	160	5.4%	122	4.1%	439	14.9%	916	31.0%	297	10.1%	197	6.7%
Grimes	IA	5098	2951	0	0.0%	261	8.8%	244	8.3%	104	3.5%	296	10.0%	123	4.2%	122	4.1%	568	19.2%	885	30.0%	248	8.4%	69	2.3%
Vinton	IA	5102	2347	17	0.7%	239	10.2%	234	10.0%	74	3.2%	290	12.4%	137	5.8%	118	5.0%	151	6.4%	779	33.2%	214	9.1%	62	2.6%
Waukee	IA	5126	2876	8	0.3%	245	8.5%	192	6.7%	148	5.1%	335	11.6%	114	4.0%	93	3.2%	575	20.0%	747	26.0%	228	7.9%	174	6.1%
Iowa Falls	IA	5193	2436	16	0.7%	240	9.9%	335	13.8%	204	8.4%	274	11.2%	88	3.6%	32	1.3%	84	3.4%	695	28.5%	263	10.8%	72	3.0%
Manchester	IA	5257	2490	0	0.0%	198	8.0%	526	21.1%	69	2.8%	374	15.0%	49	2.0%	44	1.8%	94	3.8%	714	28.7%	222	8.9%	95	3.8%
Harlan	IA	5282	2587	6	0.2%	202	7.8%	288	11.1%	265	10.2%	370	14.3%	159	6.1%	64	2.5%	129	5.0%	725	28.0%	184	7.1%	93	3.6%
Montevideo	MN	5346	2609	0	0.0%	188	7.2%	559	21.4%	39	1.5%	321	12.3%	145	5.6%	96	3.7%	94	3.6%	680	26.1%	310	11.9%	112	4.3%
Glenwood	IA	5358	2459	0	0.0%	232	9.4%	141	5.7%	75	3.1%	307	12.5%	85	3.5%	64	2.6%	153	6.2%	978	39.8%	269	10.9%	134	5.4%
Cherokee	IA	5369	2606	0	0.0%	248	9.5%	532	20.4%	114	4.4%	372	14.3%	110	4.2%	22	0.8%	79	3.0%	699	26.8%	264	10.1%	115	4.4%
Schuyler	NE	5371	2551	12	0.5%	126	4.9%	1176	46.1%	33	1.3%	204	8.0%	112	4.4%	33	1.3%	75	2.9%	368	14.4%	267	10.5%	38	1.5%
Stewartville	MN	5411	2819	0	0.0%	178	6.3%	385	13.7%	92	3.3%	439	15.6%	129	4.6%	30	1.1%	109	3.9%	1087	38.6%	246	8.7%	86	3.1%
Glencoe	MN	5453	2604	7	0.3%	194	7.5%	828	31.8%	59	2.3%	361	13.9%	67	2.6%	58	2.2%	125	4.8%	611	23.5%	161	6.2%	107	4.1%
Redwood Falls	MN	5459	2789	0	0.0%	189	6.8%	522	18.7%	101	3.6%	418	15.0%	178	6.4%	30	1.1%	133	4.8%	573	20.5%	488	17.5%	114	4.1%
Anamosa	IA	5494	2092	0	0.0%	115	5.5%	315	15.1%	71	3.4%	322	15.4%	120	5.7%	63	3.0%	101	4.8%	537	25.7%	212	10.1%	204	9.8%
Cambridge	MN	5520	2558	0	0.0%	171	6.7%	480	18.8%	41	1.6%	277	10.8%	87	3.4%	106	4.1%	197	7.7%	851	33.3%	242	9.5%	106	4.1%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Shenandoah	IA	5546	2558	0	0.0%	153	6.0%	514	20.1%	56	2.2%	492	19.2%	103	4.0%	82	3.2%	87	3.4%	659	25.8%	311	12.2%	58	2.3%
Baxter	MN	5555	3006	0	0.0%	192	6.4%	273	9.1%	97	3.2%	412	13.7%	89	3.0%	72	2.4%	213	7.1%	1136	37.8%	301	10.0%	196	6.5%
Orange City	IA	5582	2978	0	0.0%	118	4.0%	556	18.7%	54	1.8%	438	14.7%	69	2.3%	62	2.1%	130	4.4%	1103	37.0%	354	11.9%	69	2.3%
Wayne	NE	5583	3189	0	0.0%	164	5.1%	326	10.2%	75	2.4%	517	16.2%	67	2.1%	154	4.8%	251	7.9%	979	30.7%	479	15.0%	67	2.1%
Chadron	NE	5634	3088	4	0.1%	100	3.2%	74	2.4%	62	2.0%	570	18.5%	84	2.7%	73	2.4%	97	3.1%	1170	37.9%	484	15.7%	163	5.3%
Holdrege	NE	5636	2868	0	0.0%	204	7.1%	444	15.5%	97	3.4%	256	8.9%	200	7.0%	63	2.2%	165	5.8%	770	26.8%	379	13.2%	124	4.3%
Clarinda	IA	5690	2143	0	0.0%	57	2.7%	551	25.7%	36	1.7%	248	11.6%	54	2.5%	33	1.5%	59	2.8%	694	32.4%	213	9.9%	165	7.7%
Brandon	SD	5693	3241	0	0.0%	221	6.8%	331	10.2%	78	2.4%	384	11.8%	258	8.0%	30	0.9%	555	17.1%	860	26.5%	344	10.6%	170	5.2%
Algona	IA	5741	2728	0	0.0%	140	5.1%	499	18.3%	84	3.1%	392	14.4%	84	3.1%	34	1.2%	126	4.6%	772	28.3%	358	13.1%	122	4.5%
Centerville	IA	5924	2252	0	0.0%	80	3.6%	636	28.2%	80	3.6%	297	13.2%	108	4.8%	31	1.4%	65	2.9%	509	22.6%	283	12.6%	108	4.8%
Sioux Center	IA	6002	3388	0	0.0%	189	5.6%	515	15.2%	127	3.7%	375	11.1%	115	3.4%	63	1.9%	106	3.1%	1347	39.8%	385	11.4%	20	0.6%
Independence	IA	6014	2820	5	0.2%	143	5.1%	633	22.4%	71	2.5%	364	12.9%	111	3.9%	60	2.1%	124	4.4%	885	31.4%	231	8.2%	153	5.4%
Crete	NE	6028	2987	7	0.2%	103	3.4%	900	30.1%	69	2.3%	272	9.1%	107	3.6%	94	3.1%	77	2.6%	899	30.1%	330	11.0%	69	2.3%
Elkhorn	NE	6062	3127	0	0.0%	278	8.9%	409	13.1%	160	5.1%	422	13.5%	177	5.7%	159	5.1%	347	11.1%	839	26.8%	289	9.2%	47	1.5%
Big Lake	MN	6063	3291	6	0.2%	308	9.4%	899	27.3%	137	4.2%	421	12.8%	209	6.4%	42	1.3%	137	4.2%	674	20.5%	378	11.5%	80	2.4%
Maquoketa	IA	6112	2993	5	0.2%	277	9.3%	704	23.5%	86	2.9%	406	13.6%	99	3.3%	84	2.8%	180	6.0%	773	25.8%	247	8.3%	104	3.5%
Red Oak	IA	6197	2729	12	0.4%	221	8.1%	566	20.7%	90	3.3%	465	17.0%	78	2.9%	61	2.2%	139	5.1%	565	20.7%	322	11.8%	107	3.9%
Sidney	NE	6282	3193	13	0.4%	178	5.6%	240	7.5%	106	3.3%	928	29.1%	223	7.0%	30	0.9%	162	5.1%	667	20.9%	399	12.5%	98	3.1%
Seward	NE	6319	3252	0	0.0%	120	3.7%	372	11.4%	120	3.7%	316	9.7%	165	5.1%	67	2.1%	155	4.8%	1271	39.1%	435	13.4%	172	5.3%
Sturgis	SD	6442	3025	90	3.0%	233	7.7%	158	5.2%	50	1.7%	545	18.0%	59	2.0%	79	2.6%	201	6.6%	840	27.8%	526	17.4%	156	5.2%
Madison	SD	6540	3447	9	0.3%	205	5.9%	624	18.1%	186	5.4%	507	14.7%	132	3.8%	52	1.5%	156	4.5%	991	28.7%	435	12.6%	63	1.8%
Litchfield	MN	6562	3070	0	0.0%	136	4.4%	935	30.5%	56	1.8%	333	10.8%	86	2.8%	74	2.4%	89	2.9%	939	30.6%	260	8.5%	67	2.2%
Waite Park	MN	6568	3752	18	0.5%	227	6.1%	672	17.9%	163	4.3%	801	21.3%	96	2.6%	76	2.0%	185	4.9%	830	22.1%	580	15.5%	76	2.0%
Estherville	IA	6656	3402	12	0.4%	179	5.3%	864	25.4%	83	2.4%	447	13.1%	170	5.0%	54	1.6%	130	3.8%	891	26.2%	373	11.0%	115	3.4%
Nevada	IA	6658	3582	0	0.0%	258	7.2%	564	15.7%	60	1.7%	441	12.3%	140	3.9%	72	2.0%	208	5.8%	1216	33.9%	374	10.4%	224	6.3%
Oelwein	IA	6692	2819	7	0.2%	177	6.3%	516	18.3%	66	2.3%	426	15.1%	121	4.3%	84	3.0%	95	3.4%	851	30.2%	340	12.1%	68	2.4%
International Falls	MN	6703	2864	0	0.0%	94	3.3%	662	23.1%	25	0.9%	373	13.0%	109	3.8%	53	1.9%	252	8.8%	805	28.1%	362	12.6%	115	4.0%
Forest Lake	MN	6798	3539	6	0.2%	315	8.9%	565	16.0%	118	3.3%	447	12.6%	186	5.3%	116	3.3%	327	9.2%	928	26.2%	384	10.9%	140	4.0%
Waconia	MN	6814	3612	0	0.0%	248	6.9%	722	20.0%	215	6.0%	496	13.7%	71	2.0%	129	3.6%	319	8.8%	995	27.5%	319	8.8%	81	2.2%
Valley City	ND	6826	3250	5	0.2%	281	8.6%	268	8.2%	93	2.9%	473	14.6%	93	2.9%	58	1.8%	118	3.6%	1217	37.4%	374	11.5%	171	5.3%
Norwalk	IA	6884	3956	0	0.0%	259	6.5%	261	6.6%	131	3.3%	407	10.3%	281	7.1%	174	4.4%	683	17.3%	1169	29.6%	352	8.9%	221	5.6%
Plattsmouth	NE	6887	3314	7	0.2%	431	13.0%	345	10.4%	104	3.1%	392	11.8%	235	7.1%	71	2.1%	265	8.0%	788	23.8%	456	13.8%	213	6.4%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Washington	IA	7047	3544	6	0.2%	252	7.1%	600	16.9%	141	4.0%	539	15.2%	116	3.3%	93	2.6%	156	4.4%	1021	28.8%	390	11.0%	132	3.7%
Devils Lake	ND	7222	3327	0	0.0%	196	5.9%	177	5.3%	70	2.1%	600	18.0%	82	2.5%	102	3.1%	181	5.4%	1088	32.7%	559	16.8%	221	6.6%
Nebraska City	NE	7228	3468	0	0.0%	282	8.1%	607	17.5%	50	1.4%	522	15.1%	279	8.0%	58	1.7%	146	4.2%	789	22.8%	510	14.7%	111	3.2%
Atlantic	IA	7257	3482	0	0.0%	276	7.9%	733	21.1%	80	2.3%	500	14.4%	85	2.4%	59	1.7%	212	6.1%	935	26.9%	424	12.2%	115	3.3%
Denison	IA	7339	3497	0	0.0%	171	4.9%	1129	32.3%	129	3.7%	337	9.6%	150	4.3%	74	2.1%	104	3.0%	864	24.7%	368	10.5%	117	3.3%
Detroit Lakes	MN	7348	3258	0	0.0%	193	5.9%	380	11.7%	65	2.0%	502	15.4%	173	5.3%	57	1.7%	152	4.7%	920	28.2%	544	16.7%	186	5.7%
East Grand Forks	MN	7501	3659	8	0.2%	304	8.3%	287	7.8%	118	3.2%	594	16.2%	228	6.2%	51	1.4%	139	3.8%	1169	31.9%	555	15.2%	131	3.6%
Blair	NE	7512	4027	0	0.0%	392	9.7%	419	10.4%	72	1.8%	612	15.2%	202	5.0%	291	7.2%	184	4.6%	1201	29.8%	589	14.6%	51	1.3%
Creston	IA	7597	3797	6	0.2%	216	5.7%	716	18.9%	95	2.5%	509	13.4%	198	5.2%	108	2.8%	160	4.2%	1035	27.3%	492	13.0%	161	4.2%
Minot AFB	ND	7599	1308	13	1.0%	17	1.3%	36	2.8%	8	0.6%	210	16.1%	26	2.0%	9	0.7%	57	4.4%	579	44.3%	171	13.1%	163	12.5%
Perry	IA	7633	3664	0	0.0%	167	4.6%	891	24.3%	130	3.5%	440	12.0%	176	4.8%	105	2.9%	204	5.6%	1016	27.7%	328	9.0%	120	3.3%
Little Falls	MN	7719	3291	0	0.0%	179	5.4%	624	19.0%	71	2.2%	477	14.5%	86	2.6%	15	0.5%	75	2.3%	1051	31.9%	480	14.6%	172	5.2%
Knoxville	IA	7731	3412	12	0.4%	119	3.5%	820	24.0%	43	1.3%	444	13.0%	106	3.1%	69	2.0%	243	7.1%	940	27.5%	473	13.9%	104	3.0%
Gering	NE	7751	3776	15	0.4%	329	8.7%	235	6.2%	106	2.8%	455	12.0%	395	10.5%	69	1.8%	316	8.4%	1157	30.6%	527	14.0%	117	3.1%
Grand Rapids	MN	7764	3327	33	1.0%	168	5.0%	411	12.4%	65	2.0%	464	13.9%	184	5.5%	115	3.5%	118	3.5%	1081	32.5%	583	17.5%	86	2.6%
Charles City	IA	7812	3409	17	0.5%	123	3.6%	722	21.2%	144	4.2%	390	11.4%	84	2.5%	65	1.9%	107	3.1%	1130	33.1%	455	13.3%	107	3.1%
Monticello	MN	7868	4359	9	0.2%	325	7.5%	821	18.8%	196	4.5%	686	15.7%	213	4.9%	89	2.0%	294	6.7%	1144	26.2%	482	11.1%	84	1.9%
McCook	NE	7994	3974	26	0.7%	253	6.4%	376	9.5%	109	2.7%	660	16.6%	207	5.2%	91	2.3%	251	6.3%	1133	28.5%	540	13.6%	174	4.4%
North Branch	MN	8023	4169	0	0.0%	429	10.3%	775	18.6%	201	4.8%	553	13.3%	239	5.7%	92	2.2%	199	4.8%	1086	26.0%	404	9.7%	156	3.7%
York	NE	8081	4042	0	0.0%	236	5.8%	596	14.7%	112	2.8%	489	12.1%	301	7.4%	101	2.5%	222	5.5%	1140	28.2%	601	14.9%	175	4.3%
Clear Lake	IA	8161	4341	0	0.0%	266	6.1%	648	14.9%	209	4.8%	575	13.2%	185	4.3%	127	2.9%	221	5.1%	1338	30.8%	609	14.0%	92	2.1%
Decorah	IA	8172	4549	20	0.4%	167	3.7%	495	10.9%	114	2.5%	528	11.6%	67	1.5%	94	2.1%	161	3.5%	2179	47.9%	563	12.4%	122	2.7%
Webster City	IA	8176	4218	0	0.0%	235	5.6%	1262	29.9%	92	2.2%	366	8.7%	223	5.3%	81	1.9%	126	3.0%	1154	27.4%	402	9.5%	163	3.9%
Crookston	MN	8192	3806	5	0.1%	198	5.2%	476	12.5%	100	2.6%	380	10.0%	128	3.4%	84	2.2%	145	3.8%	1381	36.3%	539	14.2%	234	6.1%
Thief River Falls	MN	8410	3978	0	0.0%	183	4.6%	733	18.4%	176	4.4%	664	16.7%	169	4.2%	65	1.6%	115	2.9%	1061	26.7%	583	14.7%	152	3.8%
Waseca	MN	8493	4434	0	0.0%	191	4.3%	1509	34.0%	84	1.9%	474	10.7%	146	3.3%	260	5.9%	229	5.2%	930	21.0%	392	8.8%	172	3.9%
Wahpeton	ND	8586	4277	0	0.0%	282	6.6%	740	17.3%	90	2.1%	436	10.2%	189	4.4%	51	1.2%	149	3.5%	1462	34.2%	510	11.9%	174	4.1%
Spearfish	SD	8606	3814	72	1.9%	201	5.3%	225	5.9%	40	1.0%	601	15.8%	122	3.2%	60	1.6%	225	5.9%	1238	32.5%	888	23.3%	85	2.2%
Mount Pleasant	IA	8751	3772	0	0.0%	121	3.2%	990	26.2%	71	1.9%	569	15.1%	158	4.2%	82	2.2%	87	2.3%	1125	29.8%	363	9.6%	160	4.2%
Alexandria	MN	8820	4296	0	0.0%	264	6.1%	943	22.0%	124	2.9%	735	17.1%	135	3.1%	98	2.3%	191	4.4%	1125	26.2%	550	12.8%	79	1.8%
Alliance	NE	8959	4287	5	0.1%	146	3.4%	384	9.0%	87	2.0%	451	10.5%	1164	27.2%	48	1.1%	156	3.6%	893	20.8%	565	13.2%	166	3.9%
Waverly	IA	8968	4582	0	0.0%	156	3.4%	590	12.9%	104	2.3%	580	12.7%	91	2.0%	108	2.4%	472	10.3%	1877	41.0%	483	10.5%	91	2.0%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Grinnell	UA	9105	4620	0	0.0%	124	2.7%	812	17.6%	113	2.4%	471	10.2%	199	4.3%	236	5.1%	255	5.5%	1688	36.5%	562	12.2%	101	2.2%
Virginia	MN	9157	3830	436	11.4%	200	5.2%	265	6.9%	99	2.6%	558	14.6%	139	3.6%	109	2.8%	102	2.7%	1069	27.9%	702	18.3%	149	3.9%
Le Mars	IA	9237	4560	0	0.0%	299	6.6%	1024	22.5%	164	3.6%	658	14.4%	265	5.8%	106	2.3%	269	5.9%	1003	22.0%	544	11.9%	121	2.7%
Fairfield	IA	9509	4907	7	0.1%	293	6.0%	662	13.5%	129	2.6%	609	12.4%	115	2.3%	379	7.7%	334	6.8%	1843	37.6%	396	8.1%	97	2.0%
Sartell	MN	9641	5223	0	0.0%	310	5.9%	875	16.8%	219	4.2%	805	15.4%	231	4.4%	153	2.9%	281	5.4%	1652	31.6%	530	10.1%	167	3.2%
St. Peter	MN	9747	5224	27	0.5%	184	3.5%	750	14.4%	106	2.0%	330	6.3%	168	3.2%	118	2.3%	140	2.7%	2400	45.9%	722	13.8%	195	3.7%
Vermillion	SD	9765	5122	0	0.0%	175	3.4%	445	8.7%	97	1.9%	681	13.3%	161	3.1%	194	3.8%	160	3.1%	2078	40.6%	891	17.4%	173	3.4%
Pella	IA	9832	5229	0	0.0%	263	5.0%	1584	30.3%	126	2.4%	363	6.9%	90	1.7%	56	1.1%	228	4.4%	1718	32.9%	659	12.6%	92	1.8%

APPENDIX B

City Employment Data and Percentages by Function (alpha sort)

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C%	Mf	Mf%	W	W%	R	R%	T	T%	I	I%	F	F%	Pf	Pf%	Ps	Ps%	Pa	Pa%
Adel	IA	3435	1668	8	0.5%	124	7.4%	179	10.7%	88	5.3%	215	12.9%	88	5.3%	47	2.8%	209	12.5%	423	25.4%	141	8.5%	90	5.4%
Afton	MN	2839	1552	5	0.3%	94	6.1%	292	18.8%	62	4.0%	125	8.1%	66	4.3%	55	3.5%	86	5.5%	493	31.8%	160	10.3%	97	6.3%
Albia	IA	3706	1578	0	0.0%	168	10.6%	366	23.2%	43	2.7%	216	13.7%	60	3.8%	18	1.1%	57	3.6%	397	25.2%	144	9.1%	62	3.9%
Alexandria	MN	8820	4296	0	0.0%	264	6.1%	943	22.0%	124	2.9%	735	17.1%	135	3.1%	98	2.3%	191	4.4%	1125	26.2%	550	12.8%	79	1.8%
Algona	IA	5741	2728	0	0.0%	140	5.1%	499	18.3%	84	3.1%	392	14.4%	84	3.1%	34	1.2%	126	4.6%	772	28.3%	358	13.1%	122	4.5%
Alliance	NE	8959	4287	5	0.1%	146	3.4%	384	9.0%	87	2.0%	451	10.5%	1164	27.2%	48	1.1%	156	3.6%	893	20.8%	565	13.2%	166	3.9%
Anamosa	IA	5494	2092	0	0.0%	115	5.5%	315	15.1%	71	3.4%	322	15.4%	120	5.7%	63	3.0%	101	4.8%	537	25.7%	212	10.1%	204	9.8%
Annandale	MN	2684	1272	0	0.0%	146	11.5%	223	17.5%	47	3.7%	135	10.6%	59	4.6%	38	3.0%	47	3.7%	355	27.9%	191	15.0%	19	1.5%
Appleton	MN	2871	644	0	0.0%	30	4.7%	72	11.2%	14	2.2%	71	11.0%	35	5.4%	23	3.6%	40	6.2%	150	23.3%	58	9.0%	132	20.5%
Atlantic	IA	7257	3482	0	0.0%	276	7.9%	733	21.1%	80	2.3%	500	14.4%	85	2.4%	59	1.7%	212	6.1%	935	26.9%	424	12.2%	115	3.3%
Auburn	NE	3350	1637	0	0.0%	48	2.9%	160	9.8%	23	1.4%	186	11.4%	363	22.2%	41	2.5%	70	4.3%	411	25.1%	233	14.2%	79	4.8%
Aurora	NE	4225	2135	0	0.0%	139	6.5%	289	13.5%	65	3.0%	217	10.2%	145	6.8%	51	2.4%	138	6.5%	680	31.9%	234	11.0%	114	5.3%
Baxter	MN	5555	3006	0	0.0%	192	6.4%	273	9.1%	97	3.2%	412	13.7%	89	3.0%	72	2.4%	213	7.1%	1136	37.8%	301	10.0%	196	6.5%
Bayport	MN	3162	892	0	0.0%	75	8.4%	183	20.5%	13	1.5%	127	14.2%	43	4.8%	27	3.0%	70	7.8%	199	22.3%	111	12.4%	44	4.9%
Becker	MN	2673	1413	0	0.0%	187	13.2%	259	18.3%	37	2.6%	168	11.9%	117	8.3%	12	0.8%	67	4.7%	334	23.6%	130	9.2%	71	5.0%
Belle Fourche	SD	4565	2126	128	6.0%	220	10.3%	136	6.4%	24	1.1%	347	16.3%	103	4.8%	54	2.5%	71	3.3%	465	21.9%	357	16.8%	116	5.5%
Belle Plaine	IA	2878	1267	0	0.0%	37	2.9%	371	29.3%	36	2.8%	135	10.7%	65	5.1%	9	0.7%	72	5.7%	331	26.1%	156	12.3%	21	1.7%
Belle Plaine	MN	3789	1949	0	0.0%	216	11.1%	389	20.0%	48	2.5%	210	10.8%	116	6.0%	39	2.0%	127	6.5%	417	21.4%	303	15.5%	79	4.1%
Belmond	IA	2560	1308	0	0.0%	79	6.0%	348	26.6%	29	2.2%	158	12.1%	33	2.5%	64	4.9%	44	3.4%	363	27.8%	87	6.7%	15	1.1%
Benson	MN	3376	1616	0	0.0%	90	5.6%	343	21.2%	33	2.0%	296	18.3%	102	6.3%	47	2.9%	71	4.4%	388	24.0%	131	8.1%	66	4.1%
Beulah	ND	3152	1516	187	12.3%	52	3.4%	99	6.5%	8	0.5%	171	11.3%	292	19.3%	31	2.0%	61	4.0%	388	25.6%	183	12.1%	39	2.6%
Big Lake	MN	6063	3291	6	0.2%	308	9.4%	899	27.3%	137	4.2%	421	12.8%	209	6.4%	42	1.3%	137	4.2%	674	20.5%	378	11.5%	80	2.4%
Blair	NE	7512	4027	0	0.0%	392	9.7%	419	10.4%	72	1.8%	612	15.2%	202	5.0%	291	7.2%	184	4.6%	1201	29.8%	589	14.6%	51	1.3%
Bloomfield	IA	2601	1147	0	0.0%	82	7.1%	248	21.6%	19	1.7%	73	6.4%	70	6.1%	18	1.6%	53	4.6%	359	31.3%	166	14.5%	37	3.2%
Blue Earth	MN	3621	1772	0	0.0%	75	4.2%	301	17.0%	50	2.8%	265	15.0%	77	4.3%	51	2.9%	100	5.6%	540	30.5%	189	10.7%	94	5.3%
Brandon	SD	5693	3241	0	0.0%	221	6.8%	331	10.2%	78	2.4%	384	11.8%	258	8.0%	30	0.9%	555	17.1%	860	26.5%	344	10.6%	170	5.2%
Breckenridge	MN	3559	1707	0	0.0%	191	11.2%	310	18.2%	52	3.0%	146	8.6%	48	2.8%	36	2.1%	47	2.8%	564	33.0%	164	9.6%	60	3.5%
Broken Bow	NE	3491	1638	0	0.0%	93	5.7%	217	13.2%	42	2.6%	215	13.1%	100	6.1%	8	0.5%	43	2.6%	484	29.5%	221	13.5%	54	3.3%
Byron	MN	3500	1976	0	0.0%	142	7.2%	319	16.1%	15	0.8%	292	14.8%	48	2.4%	21	1.1%	71	3.6%	815	41.2%	176	8.9%	64	3.2%
Caledonia	MN	2965	1415	2	0.1%	118	8.3%	227	16.0%	40	2.8%	189	13.4%	58	4.1%	32	2.3%	20	1.4%	481	34.0%	168	11.9%	62	4.4%
Camanche	IA	4215	2193	0	0.0%	153	7.0%	644	29.4%	32	1.5%	207	9.4%	166	7.6%	26	1.2%	63	2.9%	532	24.3%	282	12.9%	70	3.2%
Cambridge	MN	5520	2558	0	0.0%	171	6.7%	480	18.8%	41	1.6%	277	10.8%	87	3.4%	106	4.1%	197	7.7%	851	33.3%	242	9.5%	106	4.1%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C%	Mf	Mf%	W	W%	R	R%	T	T%	I	I%	F	F%	Pf	Pf%	Ps	Ps%	Pa	Pa%
Cannon Falls	MN	3795	2038	0	0.0%	113	5.5%	500	24.5%	116	5.7%	261	12.8%	81	4.0%	36	1.8%	117	5.7%	469	23.0%	251	12.3%	56	2.7%
Canton	SD	3110	1599	0	0.0%	155	9.7%	283	17.7%	63	3.9%	260	16.3%	119	7.4%	37	2.3%	146	9.1%	369	23.1%	90	5.6%	66	4.1%
Carlisle	IA	3497	1794	0	0.0%	141	7.9%	244	13.6%	61	3.4%	198	11.0%	123	6.9%	68	3.8%	264	14.7%	466	26.0%	109	6.1%	120	6.7%
Centerville	IA	5924	2252	0	0.0%	80	3.6%	636	28.2%	80	3.6%	297	13.2%	108	4.8%	31	1.4%	65	2.9%	509	22.6%	283	12.6%	108	4.8%
Central City	NE	2998	1386	5	0.4%	91	6.6%	211	15.2%	32	2.3%	172	12.4%	72	5.2%	22	1.6%	56	4.0%	419	30.2%	173	12.5%	68	4.9%
Chadron	NE	5634	3088	4	0.1%	100	3.2%	74	2.4%	62	2.0%	570	18.5%	84	2.7%	73	2.4%	97	3.1%	1170	37.9%	484	15.7%	163	5.3%
Chariton	IA	4573	2056	0	0.0%	120	5.8%	182	8.9%	292	14.2%	367	17.9%	116	5.6%	22	1.1%	96	4.7%	531	25.8%	201	9.8%	80	3.9%
Charles City	IA	7812	3409	17	0.5%	123	3.6%	722	21.2%	144	4.2%	390	11.4%	84	2.5%	65	1.9%	107	3.1%	1130	33.1%	455	13.3%	107	3.1%
Cherokee	IA	5369	2606	0	0.0%	248	9.5%	532	20.4%	114	4.4%	372	14.3%	110	4.2%	22	0.8%	79	3.0%	699	26.8%	264	10.1%	115	4.4%
Chisago City	MN	2622	1185	0	0.0%	95	8.0%	209	17.6%	80	6.8%	103	8.7%	59	5.0%	34	2.9%	70	5.9%	365	30.8%	114	9.6%	52	4.4%
Chisholm	MN	4960	2057	279	13.6%	127	6.2%	290	14.1%	75	3.6%	219	10.6%	169	8.2%	30	1.5%	56	2.7%	415	20.2%	366	17.8%	29	1.4%
Clarinda	IA	5690	2143	0	0.0%	57	2.7%	551	25.7%	36	1.7%	248	11.6%	54	2.5%	33	1.5%	59	2.8%	694	32.4%	213	9.9%	165	7.7%
Clarion	IA	2968	1439	0	0.0%	80	5.6%	234	16.3%	50	3.5%	115	8.0%	140	9.7%	35	2.4%	67	4.7%	442	30.7%	139	9.7%	31	2.2%
Clear Lake	IA	8161	4341	0	0.0%	266	6.1%	648	14.9%	209	4.8%	575	13.2%	185	4.3%	127	2.9%	221	5.1%	1338	30.8%	609	14.0%	92	2.1%
Cokato	MN	2727	1294	0	0.0%	123	9.5%	337	26.0%	28	2.2%	150	11.6%	39	3.0%	28	2.2%	54	4.2%	349	27.0%	128	9.9%	35	2.7%
Cold Spring	MN	2975	1382	0	0.0%	82	5.9%	372	26.9%	43	3.1%	191	13.8%	41	3.0%	7	0.5%	113	8.2%	377	27.3%	121	8.8%	22	1.6%
Cozad	NE	4163	2081	0	0.0%	120	5.8%	708	34.0%	39	1.9%	224	10.8%	123	5.9%	11	0.5%	72	3.5%	424	20.4%	227	10.9%	49	2.4%
Cresco	IA	3905	1882	0	0.0%	138	7.3%	469	24.9%	78	4.1%	197	10.5%	73	3.9%	45	2.4%	104	5.5%	430	22.8%	202	10.7%	63	3.3%
Creston	IA	7597	3797	6	0.2%	216	5.7%	716	18.9%	95	2.5%	509	13.4%	198	5.2%	108	2.8%	160	4.2%	1035	27.3%	492	13.0%	161	4.2%
Crete	NE	6028	2987	7	0.2%	103	3.4%	900	30.1%	69	2.3%	272	9.1%	107	3.6%	94	3.1%	77	2.6%	899	30.1%	330	11.0%	69	2.3%
Crookston	MN	8192	3806	5	0.1%	198	5.2%	476	12.5%	100	2.6%	380	10.0%	128	3.4%	84	2.2%	145	3.8%	1381	36.3%	539	14.2%	234	6.1%
David City	NE	2597	1160	0	0.0%	63	5.4%	275	23.7%	30	2.6%	115	9.9%	95	8.2%	5	0.4%	34	2.9%	368	31.7%	63	5.4%	59	5.1%
De Witt	IA	5049	2585	19	0.7%	232	9.0%	449	17.4%	91	3.5%	310	12.0%	140	5.4%	25	1.0%	264	10.2%	705	27.3%	224	8.7%	85	3.3%
Decorah	IA	8172	4549	20	0.4%	167	3.7%	495	10.9%	114	2.5%	528	11.6%	67	1.5%	94	2.1%	161	3.5%	2179	47.9%	563	12.4%	122	2.7%
Dell Rapids	SD	2980	1517	12	0.8%	108	7.1%	157	10.3%	69	4.5%	168	11.1%	80	5.3%	49	3.2%	160	10.5%	483	31.8%	159	10.5%	45	3.0%
Denison	IA	7339	3497	0	0.0%	171	4.9%	1129	32.3%	129	3.7%	337	9.6%	150	4.3%	74	2.1%	104	3.0%	864	24.7%	368	10.5%	117	3.3%
Detroit Lakes	MN	7348	3258	0	0.0%	193	5.9%	380	11.7%	65	2.0%	502	15.4%	173	5.3%	57	1.7%	152	4.7%	920	28.2%	544	16.7%	186	5.7%
Devils Lake	ND	7222	3327	0	0.0%	196	5.9%	177	5.3%	70	2.1%	600	18.0%	82	2.5%	102	3.1%	181	5.4%	1088	32.7%	559	16.8%	221	6.6%
Dilworth	MN	3001	1440	0	0.0%	132	9.2%	189	13.1%	82	5.7%	203	14.1%	91	6.3%	19	1.3%	77	5.3%	349	24.2%	189	13.1%	83	5.8%
Dyersville	IA	4035	2202	0	0.0%	110	5.0%	508	23.1%	112	5.1%	273	12.4%	72	3.3%	40	1.8%	95	4.3%	577	26.2%	311	14.1%	50	2.3%
Eagle Grove	IA	3712	1709	0	0.0%	141	8.3%	341	20.0%	80	4.7%	124	7.3%	181	10.6%	33	1.9%	57	3.3%	489	28.6%	182	10.6%	30	1.8%
East Grand Forks	MN	7501	3659	8	0.2%	304	8.3%	287	7.8%	118	3.2%	594	16.2%	228	6.2%	51	1.4%	139	3.8%	1169	31.9%	555	15.2%	131	3.6%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C%	Mf	Mf%	W	W%	R	R%	T	T%	I	I%	F	F%	Pf	Pf%	Ps	Ps%	Pa	Pa%
Eldora	IA	3035	1321	0	0.0%	93	7.0%	216	16.4%	29	2.2%	156	11.8%	36	2.7%	36	2.7%	53	4.0%	404	30.6%	144	10.9%	92	7.0%
Elkhorn	NE	6062	3127	0	0.0%	278	8.9%	409	13.1%	160	5.1%	422	13.5%	177	5.7%	159	5.1%	347	11.1%	839	26.8%	289	9.2%	47	1.5%
Ellsworth AFB	SD	4165	996	0	0.0%	28	2.8%	33	3.3%	14	1.4%	113	11.3%	23	2.3%	11	1.1%	83	8.3%	268	26.9%	173	17.4%	237	23.8%
Ely	MN	3724	1666	124	7.4%	112	6.7%	83	5.0%	21	1.3%	226	13.6%	33	2.0%	53	3.2%	97	5.8%	540	32.4%	277	16.6%	53	3.2%
Emmetsburg	IA	3958	1979	0	0.0%	95	4.8%	304	15.4%	39	2.0%	191	9.7%	91	4.6%	61	3.1%	75	3.8%	705	35.6%	289	14.6%	33	1.7%
Estherville	IA	6656	3402	12	0.4%	179	5.3%	864	25.4%	83	2.4%	447	13.1%	170	5.0%	54	1.6%	130	3.8%	891	26.2%	373	11.0%	115	3.4%
Eveleth	MN	3865	1651	166	10.1%	61	3.7%	155	9.4%	51	3.1%	258	15.6%	121	7.3%	28	1.7%	40	2.4%	427	25.9%	263	15.9%	76	4.6%
Fairbury	NE	4262	1827	0	0.0%	115	6.3%	515	28.2%	23	1.3%	169	9.3%	85	4.7%	78	4.3%	60	3.3%	431	23.6%	177	9.7%	53	2.9%
Fairfield	IA	9509	4907	7	0.1%	293	6.0%	662	13.5%	129	2.6%	609	12.4%	115	2.3%	379	7.7%	334	6.8%	1843	37.6%	396	8.1%	97	2.0%
Falls City	NE	4671	1972	0	0.0%	116	5.9%	283	14.4%	68	3.4%	203	10.3%	216	11.0%	90	4.6%	114	5.8%	515	26.1%	209	10.6%	116	5.9%
Forest City	IA	4362	2298	0	0.0%	117	5.1%	808	35.2%	50	2.2%	202	8.8%	66	2.9%	14	0.6%	73	3.2%	614	26.7%	207	9.0%	47	2.0%
Forest Lake	MN	6798	3539	6	0.2%	315	8.9%	565	16.0%	118	3.3%	447	12.6%	186	5.3%	116	3.3%	327	9.2%	928	26.2%	384	10.9%	140	4.0%
Garner	IA	2922	1501	0	0.0%	28	1.9%	447	29.8%	59	3.9%	186	12.4%	75	5.0%	28	1.9%	85	5.7%	396	26.4%	94	6.3%	57	3.8%
Gering	NE	7751	3776	15	0.4%	329	8.7%	235	6.2%	106	2.8%	455	12.0%	395	10.5%	69	1.8%	316	8.4%	1157	30.6%	527	14.0%	117	3.1%
Glencoe	MN	5453	2604	7	0.3%	194	7.5%	828	31.8%	59	2.3%	361	13.9%	67	2.6%	58	2.2%	125	4.8%	611	23.5%	161	6.2%	107	4.1%
Glenwood	MN	2594	1078	0	0.0%	39	3.6%	161	14.9%	69	6.4%	124	11.5%	59	5.5%	34	3.2%	58	5.4%	329	30.5%	145	13.5%	29	2.7%
Glenwood	IA	5358	2459	0	0.0%	232	9.4%	141	5.7%	75	3.1%	307	12.5%	85	3.5%	64	2.6%	153	6.2%	978	39.8%	269	10.9%	134	5.4%
Goodview	MN	3373	1947	0	0.0%	104	5.3%	645	33.1%	116	6.0%	139	7.1%	54	2.8%	62	3.2%	91	4.7%	480	24.7%	183	9.4%	57	2.9%
Gothenburg	NE	3619	1781	0	0.0%	142	8.0%	214	12.0%	80	4.5%	217	12.2%	122	6.9%	41	2.3%	90	5.1%	379	21.3%	267	15.0%	59	3.3%
Grafton	ND	4516	2162	0	0.0%	133	6.2%	177	8.2%	47	2.2%	247	11.4%	98	4.5%	27	1.2%	90	4.2%	801	37.0%	201	9.3%	161	7.4%
Grand Forks AFB	ND	4832	847	0	0.0%	2	0.2%	39	4.6%	11	1.3%	118	13.9%	38	4.5%	0	0.0%	31	3.7%	327	38.6%	147	17.4%	129	15.2%
Grand Rapids	MN	7764	3327	33	1.0%	168	5.0%	411	12.4%	65	2.0%	464	13.9%	184	5.5%	115	3.5%	118	3.5%	1081	32.5%	583	17.5%	86	2.6%
Granite Falls	MN	3070	1426	0	0.0%	115	8.1%	230	16.1%	48	3.4%	154	10.8%	82	5.8%	4	0.3%	58	4.1%	433	30.4%	233	16.3%	57	4.0%
Grant	MN	4026	2220	0	0.0%	237	10.7%	433	19.5%	34	1.5%	219	9.9%	58	2.6%	36	1.6%	99	4.5%	747	33.6%	231	10.4%	115	5.2%
Grimes	IA	5098	2951	0	0.0%	261	8.8%	244	8.3%	104	3.5%	296	10.0%	123	4.2%	122	4.1%	568	19.2%	885	30.0%	248	8.4%	69	2.3%
Grinnell	UA	9105	4620	0	0.0%	124	2.7%	812	17.6%	113	2.4%	471	10.2%	199	4.3%	236	5.1%	255	5.5%	1688	36.5%	562	12.2%	101	2.2%
Grundy Center	IA	2596	1189	0	0.0%	42	3.5%	227	19.1%	41	3.4%	170	14.3%	64	5.4%	21	1.8%	62	5.2%	316	26.6%	135	11.4%	74	6.2%
Hampton	IA	4218	2013	6	0.3%	92	4.6%	388	19.3%	77	3.8%	224	11.1%	57	2.8%	36	1.8%	61	3.0%	611	30.4%	253	12.6%	58	2.9%
Harlan	IA	5282	2587	6	0.2%	202	7.8%	288	11.1%	265	10.2%	370	14.3%	159	6.1%	64	2.5%	129	5.0%	725	28.0%	184	7.1%	93	3.6%
Holdrege	NE	5636	2868	0	0.0%	204	7.1%	444	15.5%	97	3.4%	256	8.9%	200	7.0%	63	2.2%	165	5.8%	770	26.8%	379	13.2%	124	4.3%
Hot Springs	SD	4129	1607	14	0.9%	135	8.4%	47	2.9%	34	2.1%	197	12.3%	127	7.9%	38	2.4%	65	4.0%	582	36.2%	222	13.8%	99	6.2%
Humboldt	IA	4452	2086	10	0.5%	98	4.7%	559	26.8%	71	3.4%	282	13.5%	120	5.8%	34	1.6%	107	5.1%	428	20.5%	200	9.6%	121	5.8%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Independence	IA	6014	2820	5	0.2%	143	5.1%	633	22.4%	71	2.5%	364	12.9%	111	3.9%	60	2.1%	124	4.4%	885	31.4%	231	8.2%	153	5.4%
International Falls	MN	6703	2864	0	0.0%	94	3.3%	662	23.1%	25	0.9%	373	13.0%	109	3.8%	53	1.9%	252	8.8%	805	28.1%	362	12.6%	115	4.0%
Iowa Falls	IA	5193	2436	16	0.7%	240	9.9%	335	13.8%	204	8.4%	274	11.2%	88	3.6%	32	1.3%	84	3.4%	695	28.5%	263	10.8%	72	3.0%
Jackson	MN	3501	1751	0	0.0%	91	5.2%	359	20.5%	46	2.6%	241	13.8%	101	5.8%	75	4.3%	112	6.4%	362	20.7%	230	13.1%	55	3.1%
Jefferson	IA	4626	1981	0	0.0%	158	8.0%	331	16.7%	69	3.5%	224	11.3%	57	2.9%	34	1.7%	127	6.4%	632	31.9%	243	12.3%	73	3.7%
Jordan	MN	3833	1958	1	0.1%	151	7.7%	406	20.7%	70	3.6%	311	15.9%	114	5.8%	33	1.7%	94	4.8%	469	24.0%	238	12.2%	57	2.9%
Kasson	MN	4398	2385	5	0.2%	180	7.5%	389	16.3%	59	2.5%	305	12.8%	82	3.4%	40	1.7%	177	7.4%	817	34.3%	181	7.6%	83	3.5%
Kimball	NE	2559	1214	46	3.8%	59	4.9%	141	11.6%	45	3.7%	150	12.4%	123	10.1%	21	1.7%	71	5.8%	267	22.0%	163	13.4%	73	6.0%
Knoxville	IA	7731	3412	12	0.4%	119	3.5%	820	24.0%	43	1.3%	444	13.0%	106	3.1%	69	2.0%	243	7.1%	940	27.5%	473	13.9%	104	3.0%
La Crescent	MN	4923	2465	0	0.0%	91	3.7%	308	12.5%	123	5.0%	380	15.4%	110	4.5%	62	2.5%	142	5.8%	947	38.4%	254	10.3%	33	1.3%
Lake City	MN	4950	2608	0	0.0%	117	4.5%	773	29.6%	54	2.1%	211	8.1%	73	2.8%	53	2.0%	67	2.6%	745	28.6%	348	13.3%	95	3.6%
Le Mars	IA	9237	4560	0	0.0%	299	6.6%	1024	22.5%	164	3.6%	658	14.4%	265	5.8%	106	2.3%	269	5.9%	1003	22.0%	544	11.9%	121	2.7%
Le Sueur	MN	3922	1993	7	0.4%	107	5.4%	704	35.3%	66	3.3%	154	7.7%	57	2.9%	50	2.5%	95	4.8%	569	28.5%	171	8.6%	13	0.7%
Lead	SD	3027	1511	165	10.9%	92	6.1%	25	1.7%	16	1.1%	163	10.8%	28	1.9%	27	1.8%	35	2.3%	293	19.4%	594	39.3%	38	2.5%
Lindstrom	MN	3015	1611	0	0.0%	122	7.6%	302	18.7%	30	1.9%	177	11.0%	40	2.5%	25	1.6%	82	5.1%	543	33.7%	207	12.8%	83	5.2%
Litchfield	MN	6562	3070	0	0.0%	136	4.4%	935	30.5%	56	1.8%	333	10.8%	86	2.8%	74	2.4%	89	2.9%	939	30.6%	260	8.5%	67	2.2%
Little Falls	MN	7719	3291	0	0.0%	179	5.4%	624	19.0%	71	2.2%	477	14.5%	86	2.6%	15	0.5%	75	2.3%	1051	31.9%	480	14.6%	172	5.2%
Long Prairie	MN	3040	1203	0	0.0%	63	5.2%	337	28.0%	6	0.5%	129	10.7%	37	3.1%	45	3.7%	52	4.3%	341	28.3%	137	11.4%	39	3.2%
Luverne	MN	4617	2213	3	0.1%	115	5.2%	295	13.3%	78	3.5%	230	10.4%	97	4.4%	38	1.7%	205	9.3%	644	29.1%	343	15.5%	84	3.8%
Madison	SD	6540	3447	9	0.3%	205	5.9%	624	18.1%	186	5.4%	507	14.7%	132	3.8%	52	1.5%	156	4.5%	991	28.7%	435	12.6%	63	1.8%
Manchester	IA	5257	2490	0	0.0%	198	8.0%	526	21.1%	69	2.8%	374	15.0%	49	2.0%	44	1.8%	94	3.8%	714	28.7%	222	8.9%	95	3.8%
Maquoketa	IA	6112	2993	5	0.2%	277	9.3%	704	23.5%	86	2.9%	406	13.6%	99	3.3%	84	2.8%	180	6.0%	773	25.8%	247	8.3%	104	3.5%
Marengo	IA	2535	1321	0	0.0%	67	5.1%	403	30.5%	15	1.1%	169	12.8%	30	2.3%	31	2.3%	35	2.6%	307	23.2%	178	13.5%	49	3.7%
McCook	NE	7994	3974	26	0.7%	253	6.4%	376	9.5%	109	2.7%	660	16.6%	207	5.2%	91	2.3%	251	6.3%	1133	28.5%	540	13.6%	174	4.4%
Melrose	MN	3091	1517	0	0.0%	73	4.8%	400	26.4%	67	4.4%	190	12.5%	81	5.3%	40	2.6%	84	5.5%	349	23.0%	131	8.6%	56	3.7%
Milaca	MN	2580	1061	0	0.0%	68	6.4%	198	18.7%	12	1.1%	155	14.6%	36	3.4%	24	2.3%	47	4.4%	335	31.6%	149	14.0%	21	2.0%
Milbank	SD	3640	1642	58	3.5%	63	3.8%	134	8.2%	138	8.4%	213	13.0%	124	7.6%	29	1.8%	163	9.9%	376	22.9%	232	14.1%	55	3.3%
Minden	NE	2964	1514	4	0.3%	112	7.4%	217	14.3%	18	1.2%	200	13.2%	56	3.7%	35	2.3%	82	5.4%	392	25.9%	266	17.6%	43	2.8%
Minot AFB	ND	7599	1308	13	1.0%	17	1.3%	36	2.8%	8	0.6%	210	16.1%	26	2.0%	9	0.7%	57	4.4%	579	44.3%	171	13.1%	163	12.5%
Missouri Valley	IA	2992	1459	4	0.3%	108	7.4%	144	9.9%	38	2.6%	219	15.0%	88	6.0%	36	2.5%	213	14.6%	388	26.6%	159	10.9%	37	2.5%
Mobridge	SD	3574	1510	0	0.0%	137	9.1%	20	1.3%	57	3.8%	223	14.8%	83	5.5%	22	1.5%	42	2.8%	466	30.9%	307	20.3%	84	5.6%
Montevideo	MN	5346	2609	0	0.0%	188	7.2%	559	21.4%	39	1.5%	321	12.3%	145	5.6%	96	3.7%	94	3.6%	680	26.1%	310	11.9%	112	4.3%

Urban Place	ST	Pop.	Empl.	MI	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Montgomery	MN	2794	1360	1	0.1%	121	8.9%	417	30.7%	55	4.0%	173	12.7%	59	4.3%	8	0.6%	40	2.9%	289	21.3%	148	10.9%	24	1.8%
Monticello	IA	3607	1692	0	0.0%	97	5.7%	428	25.3%	100	5.9%	195	11.5%	72	4.3%	66	3.9%	48	2.8%	390	23.0%	167	9.9%	91	5.4%
Monticello	MN	7868	4359	9	0.2%	325	7.5%	821	18.8%	196	4.5%	686	15.7%	213	4.9%	89	2.0%	294	6.7%	1144	26.2%	482	11.1%	84	1.9%
Mora	MN	3193	1430	5	0.3%	148	10.3%	303	21.2%	22	1.5%	189	13.2%	20	1.4%	31	2.2%	50	3.5%	329	23.0%	298	20.8%	34	2.4%
Morris	MN	5068	2692	2	0.1%	122	4.5%	235	8.7%	27	1.0%	290	10.8%	71	2.6%	88	3.3%	97	3.6%	1264	47.0%	313	11.6%	90	3.3%
Mount Pleasant	IA	8751	3772	0	0.0%	121	3.2%	990	26.2%	71	1.9%	569	15.1%	158	4.2%	82	2.2%	87	2.3%	1125	29.8%	363	9.6%	160	4.2%
Mount Vernon	IA	3390	1971	0	0.0%	88	4.5%	201	10.2%	50	2.5%	231	11.7%	64	3.2%	51	2.6%	115	5.8%	873	44.3%	186	9.4%	64	3.2%
Mountain Iron	MN	2999	1556	197	12.7%	95	6.1%	57	3.7%	110	7.1%	205	13.2%	80	5.1%	49	3.1%	78	5.0%	432	27.8%	172	11.1%	72	4.6%
Nebraska City	NE	7228	3468	0	0.0%	282	8.1%	607	17.5%	50	1.4%	522	15.1%	279	8.0%	58	1.7%	146	4.2%	789	22.8%	510	14.7%	111	3.2%
Nevada	IA	6658	3582	0	0.0%	258	7.2%	564	15.7%	60	1.7%	441	12.3%	140	3.9%	72	2.0%	208	5.8%	1216	33.9%	374	10.4%	224	6.3%
New Hampton	IA	3692	1729	0	0.0%	122	7.1%	359	20.8%	46	2.7%	294	17.0%	60	3.5%	22	1.3%	57	3.3%	474	27.4%	192	11.1%	63	3.6%
New Prague	MN	4559	2144	5	0.2%	162	7.6%	510	23.8%	73	3.4%	218	10.2%	64	3.0%	39	1.8%	105	4.9%	567	26.4%	315	14.7%	56	2.6%
North Branch	MN	8023	4169	0	0.0%	429	10.3%	775	18.6%	201	4.8%	553	13.3%	239	5.7%	92	2.2%	199	4.8%	1086	26.0%	404	9.7%	156	3.7%
Norwalk	IA	6884	3956	0	0.0%	259	6.5%	261	6.6%	131	3.3%	407	10.3%	281	7.1%	174	4.4%	683	17.3%	1169	29.6%	352	8.9%	221	5.6%
Norwood Young America	MN	3108	1657	5	0.3%	121	7.3%	501	30.2%	55	3.3%	154	9.3%	76	4.6%	20	1.2%	86	5.2%	399	24.1%	201	12.1%	25	1.5%
Oak Park Heights	MN	3957	1820	0	0.0%	110	6.0%	367	20.2%	40	2.2%	203	11.2%	104	5.7%	39	2.1%	93	5.1%	489	26.9%	267	14.7%	100	5.5%
Oelwein	IA	6692	2819	7	0.2%	177	6.3%	516	18.3%	66	2.3%	426	15.1%	121	4.3%	84	3.0%	95	3.4%	851	30.2%	340	12.1%	68	2.4%
Ogallala	NE	4930	2475	6	0.2%	155	6.3%	199	8.0%	82	3.3%	466	18.8%	174	7.0%	40	1.6%	158	6.4%	588	23.8%	402	16.2%	103	4.2%
Olivia	MN	2570	1261	0	0.0%	83	6.6%	196	15.5%	35	2.8%	187	14.8%	61	4.8%	11	0.9%	69	5.5%	351	27.8%	103	8.2%	91	7.2%
Onawa	IA	3091	1492	0	0.0%	113	7.6%	196	13.1%	49	3.3%	179	12.0%	68	4.6%	58	3.9%	28	1.9%	421	28.2%	251	16.8%	79	5.3%
O'Neill	NE	3733	1762	0	0.0%	164	9.3%	23	1.3%	155	8.8%	269	15.3%	119	6.8%	15	0.9%	110	6.2%	401	22.8%	254	14.4%	97	5.5%
Orange City	IA	5582	2978	0	0.0%	118	4.0%	556	18.7%	54	1.8%	438	14.7%	69	2.3%	62	2.1%	130	4.4%	1103	37.0%	354	11.9%	69	2.3%
Osage	IA	3451	1608	0	0.0%	116	7.2%	429	26.7%	40	2.5%	217	13.5%	42	2.6%	15	0.9%	69	4.3%	424	26.4%	173	10.8%	41	2.5%
Osceola	IA	4659	2272	0	0.0%	133	5.9%	529	23.3%	75	3.3%	252	11.1%	115	5.1%	5	0.2%	129	5.7%	561	24.7%	384	16.9%	66	2.9%
Park Rapids	MN	3276	1263	0	0.0%	93	7.4%	197	15.6%	63	5.0%	150	11.9%	26	2.1%	14	1.1%	66	5.2%	374	29.6%	163	12.9%	72	5.7%
Pella	IA	9832	5229	0	0.0%	263	5.0%	1584	30.3%	126	2.4%	363	6.9%	90	1.7%	56	1.1%	228	4.4%	1718	32.9%	659	12.6%	92	1.8%
Perham	MN	2559	1140	4	0.4%	77	6.8%	283	24.8%	22	1.9%	116	10.2%	56	4.9%	60	5.3%	30	2.6%	324	28.4%	121	10.6%	26	2.3%
Perry	IA	7633	3664	0	0.0%	167	4.6%	891	24.3%	130	3.5%	440	12.0%	176	4.8%	105	2.9%	204	5.6%	1016	27.7%	328	9.0%	120	3.3%
Pine City	MN	3043	1311	0	0.0%	95	7.2%	246	18.8%	21	1.6%	191	14.6%	59	4.5%	11	0.8%	32	2.4%	294	22.4%	279	21.3%	63	4.8%
Pine Ridge	SD	3171	741	0	0.0%	28	3.8%	0	0.0%	0	0.0%	37	5.0%	6	0.8%	0	0.0%	11	1.5%	318	42.9%	177	23.9%	164	22.1%
Pipestone	MN	4280	2190	0	0.0%	136	6.2%	345	15.8%	49	2.2%	276	12.6%	126	5.8%	51	2.3%	66	3.0%	663	30.3%	342	15.6%	37	1.7%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C%	Mf	Mf%	W	W%	R	R%	T	T%	I	I%	F	F%	Pf	Pf%	Ps	Ps%	Pa	Pa%
Plainview	MN	3190	1621	2	0.1%	147	9.1%	233	14.4%	64	3.9%	219	13.5%	89	5.5%	31	1.9%	84	5.2%	562	34.7%	124	7.6%	27	1.7%
Plattsmouth	NE	6887	3314	7	0.2%	431	13.0%	345	10.4%	104	3.1%	392	11.8%	235	7.1%	71	2.1%	265	8.0%	788	23.8%	456	13.8%	213	6.4%
Pleasant Hill	IA	5070	2954	0	0.0%	148	5.0%	236	8.0%	164	5.6%	275	9.3%	160	5.4%	122	4.1%	439	14.9%	916	31.0%	297	10.1%	197	6.7%
Princeton	MN	3933	1947	3	0.2%	128	6.6%	599	30.8%	34	1.7%	279	14.3%	97	5.0%	48	2.5%	48	2.5%	473	24.3%	174	8.9%	43	2.2%
Red Oak	IA	6197	2729	12	0.4%	221	8.1%	566	20.7%	90	3.3%	465	17.0%	78	2.9%	61	2.2%	139	5.1%	565	20.7%	322	11.8%	107	3.9%
Redfield	SD	2897	1080	0	0.0%	46	4.3%	33	3.1%	33	3.1%	174	16.1%	41	3.8%	15	1.4%	39	3.6%	387	35.8%	132	12.2%	146	13.5%
Redwood Falls	MN	5459	2789	0	0.0%	189	6.8%	522	18.7%	101	3.6%	418	15.0%	178	6.4%	30	1.1%	133	4.8%	573	20.5%	488	17.5%	114	4.1%
Rock Rapids	IA	2573	1265	0	0.0%	64	5.1%	202	16.0%	35	2.8%	161	12.7%	59	4.7%	38	3.0%	101	8.0%	347	27.4%	150	11.9%	51	4.0%
Rock Valley	IA	2702	1441	0	0.0%	85	5.9%	315	21.9%	57	4.0%	176	12.2%	42	2.9%	18	1.2%	69	4.8%	473	32.8%	134	9.3%	29	2.0%
Roseau	MN	2756	1417	0	0.0%	42	3.0%	516	36.4%	8	0.6%	177	12.5%	25	1.8%	37	2.6%	65	4.6%	410	28.9%	76	5.4%	46	3.2%
Rugby	ND	2939	1249	7	0.6%	64	5.1%	66	5.3%	69	5.5%	151	12.1%	68	5.4%	37	3.0%	66	5.3%	468	37.5%	178	14.3%	39	3.1%
Sartell	MN	9641	5223	0	0.0%	310	5.9%	875	16.8%	219	4.2%	805	15.4%	231	4.4%	153	2.9%	281	5.4%	1652	31.6%	530	10.1%	167	3.2%
Sauk Centre	MN	3930	2042	0	0.0%	77	3.8%	283	13.9%	77	3.8%	302	14.8%	129	6.3%	96	4.7%	108	5.3%	570	27.9%	273	13.4%	49	2.4%
Schuyler	NE	5371	2551	12	0.5%	126	4.9%	1176	46.1%	33	1.3%	204	8.0%	112	4.4%	33	1.3%	75	2.9%	368	14.4%	267	10.5%	38	1.5%
Seward	NE	6319	3252	0	0.0%	120	3.7%	372	11.4%	120	3.7%	316	9.7%	165	5.1%	67	2.1%	155	4.8%	1271	39.1%	435	13.4%	172	5.3%
Sheldon	IA	4914	2503	0	0.0%	123	4.9%	520	20.8%	163	6.5%	254	10.1%	128	5.1%	72	2.9%	35	1.4%	833	33.3%	181	7.2%	58	2.3%
Shenandoah	IA	5546	2558	0	0.0%	153	6.0%	514	20.1%	56	2.2%	492	19.2%	103	4.0%	82	3.2%	87	3.4%	659	25.8%	311	12.2%	58	2.3%
Sibley	IA	2796	1336	0	0.0%	62	4.6%	405	30.3%	38	2.8%	116	8.7%	103	7.7%	30	2.2%	60	4.5%	316	23.7%	93	7.0%	68	5.1%
Sidney	NE	6282	3193	13	0.4%	178	5.6%	240	7.5%	106	3.3%	928	29.1%	223	7.0%	30	0.9%	162	5.1%	667	20.9%	399	12.5%	98	3.1%
Sioux Center	IA	6002	3388	0	0.0%	189	5.6%	515	15.2%	127	3.7%	375	11.1%	115	3.4%	63	1.9%	106	3.1%	1347	39.8%	385	11.4%	20	0.6%
Sisseton	SD	2572	1113	0	0.0%	66	5.9%	37	3.3%	16	1.4%	131	11.8%	24	2.2%	18	1.6%	57	5.1%	434	39.0%	221	19.9%	80	7.2%
Sleepy Eye	MN	3515	1645	6	0.4%	126	7.7%	376	22.9%	30	1.8%	156	9.5%	74	4.5%	26	1.6%	60	3.6%	459	27.9%	212	12.9%	18	1.1%
Spearfish	SD	8606	3814	72	1.9%	201	5.3%	225	5.9%	40	1.0%	601	15.8%	122	3.2%	60	1.6%	225	5.9%	1238	32.5%	888	23.3%	85	2.2%
Spirit Lake	IA	4261	2149	0	0.0%	191	8.9%	453	21.1%	45	2.1%	300	14.0%	53	2.5%	23	1.1%	67	3.1%	578	26.9%	362	16.8%	55	2.6%
Spring Valley	MN	2518	1258	0	0.0%	69	5.5%	166	13.2%	28	2.2%	149	11.8%	79	6.3%	18	1.4%	89	7.1%	382	30.4%	182	14.5%	46	3.7%
St. Charles	MN	3295	1748	3	0.2%	170	9.7%	286	16.4%	38	2.2%	281	16.1%	82	4.7%	12	0.7%	48	2.7%	545	31.2%	200	11.4%	59	3.4%
St. Francis	MN	4910	2517	0	0.0%	386	15.3%	577	22.9%	105	4.2%	240	9.5%	160	6.4%	17	0.7%	157	6.2%	644	25.6%	182	7.2%	38	1.5%
St. James	MN	4695	2086	0	0.0%	135	6.5%	729	34.9%	15	0.7%	240	11.5%	123	5.9%	18	0.9%	50	2.4%	516	24.7%	188	9.0%	30	1.4%
St. Joseph	MN	4681	2585	4	0.2%	133	5.1%	299	11.6%	52	2.0%	397	15.4%	62	2.4%	66	2.6%	75	2.9%	994	38.5%	416	16.1%	66	2.6%
St. Peter	MN	9747	5224	27	0.5%	184	3.5%	750	14.4%	106	2.0%	330	6.3%	168	3.2%	118	2.3%	140	2.7%	2400	45.9%	722	13.8%	195	3.7%
Staples	MN	3104	1311	3	0.2%	63	4.8%	317	24.2%	51	3.9%	201	15.3%	62	4.7%	14	1.1%	44	3.4%	356	27.2%	149	11.4%	28	2.1%
Stewartville	MN	5411	2819	0	0.0%	178	6.3%	385	13.7%	92	3.3%	439	15.6%	129	4.6%	30	1.1%	109	3.9%	1087	38.6%	246	8.7%	86	3.1%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Story City	IA	3228	1533	11	0.7%	120	7.8%	215	14.0%	69	4.5%	248	16.2%	54	3.5%	26	1.7%	99	6.5%	469	30.6%	143	9.3%	79	5.2%
Sturgis	SD	6442	3025	90	3.0%	233	7.7%	158	5.2%	50	1.7%	545	18.0%	59	2.0%	79	2.6%	201	6.6%	840	27.8%	526	17.4%	156	5.2%
Tama	IA	2731	1224	0	0.0%	84	6.9%	249	20.3%	24	2.0%	110	9.0%	43	3.5%	13	1.1%	43	3.5%	290	23.7%	316	25.8%	38	3.1%
Thief River Falls	MN	8410	3978	0	0.0%	183	4.6%	733	18.4%	176	4.4%	664	16.7%	169	4.2%	65	1.6%	115	2.9%	1061	26.7%	583	14.7%	152	3.8%
Tipton	IA	3155	1556	13	0.8%	128	8.2%	265	17.0%	26	1.7%	245	15.7%	84	5.4%	31	2.0%	43	2.8%	399	25.6%	187	12.0%	86	5.5%
Toledo	IA	2539	1176	0	0.0%	90	7.7%	145	12.3%	15	1.3%	114	9.7%	30	2.6%	24	2.0%	27	2.3%	281	23.9%	351	29.8%	97	8.2%
Two Harbors	MN	3613	1682	60	3.6%	86	5.1%	207	12.3%	21	1.2%	204	12.1%	94	5.6%	27	1.6%	101	6.0%	461	27.4%	263	15.6%	105	6.2%
Valentine	NE	2820	1347	0	0.0%	101	7.5%	36	2.7%	65	4.8%	192	14.3%	103	7.6%	16	1.2%	46	3.4%	435	32.3%	242	18.0%	69	5.1%
Valley City	ND	6826	3250	5	0.2%	281	8.6%	268	8.2%	93	2.9%	473	14.6%	93	2.9%	58	1.8%	118	3.6%	1217	37.4%	374	11.5%	171	5.3%
Vermillion	SD	9765	5122	0	0.0%	175	3.4%	445	8.7%	97	1.9%	681	13.3%	161	3.1%	194	3.8%	160	3.1%	2078	40.6%	891	17.4%	173	3.4%
Victoria	MN	4025	2203	0	0.0%	116	5.3%	389	17.7%	130	5.9%	312	14.2%	72	3.3%	28	1.3%	185	8.4%	751	34.1%	170	7.7%	41	1.9%
Vinton	IA	5102	2347	17	0.7%	239	10.2%	234	10.0%	74	3.2%	290	12.4%	137	5.8%	118	5.0%	151	6.4%	779	33.2%	214	9.1%	62	2.6%
Virginia	MN	9157	3830	436	11.4%	200	5.2%	265	6.9%	99	2.6%	558	14.6%	139	3.6%	109	2.8%	102	2.7%	1069	27.9%	702	18.3%	149	3.9%
Wabasha	MN	2599	1177	0	0.0%	69	5.9%	239	20.3%	22	1.9%	132	11.2%	54	4.6%	34	2.9%	54	4.6%	333	28.3%	146	12.4%	83	7.1%
Waconia	MN	6814	3612	0	0.0%	248	6.9%	722	20.0%	215	6.0%	496	13.7%	71	2.0%	129	3.6%	319	8.8%	995	27.5%	319	8.8%	81	2.2%
Wadena	MN	4294	1814	0	0.0%	107	5.9%	307	16.9%	102	5.6%	290	16.0%	48	2.6%	19	1.0%	54	3.0%	584	32.2%	233	12.8%	44	2.4%
Wahoo	NE	3942	1917	0	0.0%	186	9.7%	346	18.0%	79	4.1%	251	13.1%	66	3.4%	24	1.3%	68	3.5%	475	24.8%	264	13.8%	134	7.0%
Wahpeton	ND	8586	4277	0	0.0%	282	6.6%	740	17.3%	90	2.1%	436	10.2%	189	4.4%	51	1.2%	149	3.5%	1462	34.2%	510	11.9%	174	4.1%
Waite Park	MN	6568	3752	18	0.5%	227	6.1%	672	17.9%	163	4.3%	801	21.3%	96	2.6%	76	2.0%	185	4.9%	830	22.1%	580	15.5%	76	2.0%
Waseca	MN	8493	4434	0	0.0%	191	4.3%	1509	34.0%	84	1.9%	474	10.7%	146	3.3%	260	5.9%	229	5.2%	930	21.0%	392	8.8%	172	3.9%
Washington	IA	7047	3544	6	0.2%	252	7.1%	600	16.9%	141	4.0%	539	15.2%	116	3.3%	93	2.6%	156	4.4%	1021	28.8%	390	11.0%	132	3.7%
Watertown	MN	3029	1634	2	0.1%	123	7.5%	345	21.1%	47	2.9%	217	13.3%	96	5.9%	17	1.0%	94	5.8%	428	26.2%	227	13.9%	29	1.8%
Waukee	IA	5126	2876	8	0.3%	245	8.5%	192	6.7%	148	5.1%	335	11.6%	114	4.0%	93	3.2%	575	20.0%	747	26.0%	228	7.9%	174	6.1%
Waukon	IA	4131	2038	0	0.0%	138	6.8%	372	18.3%	84	4.1%	337	16.5%	65	3.2%	27	1.3%	65	3.2%	664	32.6%	152	7.5%	60	2.9%
Waverly	IA	8968	4582	0	0.0%	156	3.4%	590	12.9%	104	2.3%	580	12.7%	91	2.0%	108	2.4%	472	10.3%	1877	41.0%	483	10.5%	91	2.0%
Wayne	NE	5583	3189	0	0.0%	164	5.1%	326	10.2%	75	2.4%	517	16.2%	67	2.1%	154	4.8%	251	7.9%	979	30.7%	479	15.0%	67	2.1%
Webster City	IA	8176	4218	0	0.0%	235	5.6%	1262	29.9%	92	2.2%	366	8.7%	223	5.3%	81	1.9%	126	3.0%	1154	27.4%	402	9.5%	163	3.9%
West Burlington	IA	3161	1571	0	0.0%	113	7.2%	396	25.2%	50	3.2%	221	14.1%	110	7.0%	23	1.5%	17	1.1%	392	25.0%	135	8.6%	81	5.2%
West Liberty	IA	3332	1553	0	0.0%	49	3.2%	647	41.7%	24	1.5%	159	10.2%	65	4.2%	29	1.9%	26	1.7%	347	22.3%	165	10.6%	23	1.5%
West Point	NE	3660	1748	16	0.9%	97	5.5%	457	26.1%	82	4.7%	236	13.5%	87	5.0%	36	2.1%	70	4.0%	387	22.1%	203	11.6%	37	2.1%
West Union	IA	2549	1242	0	0.0%	62	5.0%	256	20.6%	90	7.2%	132	10.6%	42	3.4%	8	0.6%	55	4.4%	295	23.8%	149	12.0%	92	7.4%
Williamsburg	IA	2622	1348	0	0.0%	111	8.2%	270	20.0%	49	3.6%	189	14.0%	41	3.0%	47	3.5%	28	2.1%	395	29.3%	85	6.3%	44	3.3%

Urban Place	ST	Pop.	Empl.	Mi	Mi%	C	C %	Mf	Mf %	W	W %	R	R %	T	T %	I	I %	F	F %	Pf	Pf %	Ps	Ps %	Pa	Pa %
Wilton	IA	2829	1482	3	0.2%	43	2.9%	424	28.6%	67	4.5%	178	12.0%	99	6.7%	47	3.2%	54	3.6%	419	28.3%	97	6.5%	47	3.2%
Windom	MN	4490	2324	2	0.1%	116	5.0%	459	19.8%	58	2.5%	398	17.1%	114	4.9%	48	2.1%	100	4.3%	626	26.9%	238	10.2%	113	4.9%
Winner	SD	3137	1415	0	0.0%	109	7.7%	10	0.7%	66	4.7%	240	17.0%	92	6.5%	23	1.6%	75	5.3%	368	26.0%	260	18.4%	73	5.2%
Winterset	IA	4768	2110	7	0.3%	174	8.2%	180	8.5%	75	3.6%	343	16.3%	92	4.4%	100	4.7%	276	13.1%	509	24.1%	183	8.7%	84	4.0%
Wyoming	MN	3048	1619	0	0.0%	109	6.7%	304	18.8%	87	5.4%	193	11.9%	69	4.3%	48	3.0%	138	8.5%	440	27.2%	154	9.5%	77	4.8%
York	NE	8081	4042	0	0.0%	236	5.8%	596	14.7%	112	2.8%	489	12.1%	301	7.4%	101	2.5%	222	5.5%	1140	28.2%	601	14.9%	175	4.3%
Zimmerman	MN	2851	1516	0	0.0%	178	11.7%	455	30.0%	38	2.5%	179	11.8%	70	4.6%	18	1.2%	73	4.8%	306	20.2%	136	9.0%	38	2.5%
Zumbrota	MN	2789	1467	0	0.0%	106	7.2%	204	13.9%	64	4.4%	159	10.8%	90	6.1%	29	2.0%	94	6.4%	503	34.3%	165	11.2%	38	2.6%

APPENDIX C

Functional Classification

Functional Classification

KEY

Function	*Plus 1SD*	*Plus 2SD*	*Plus 3SD*
Mining	Mi	Mi2	Mi3
Construction	C	C2	C3
Manufacturing	Mf	Mf2	Mf3
Wholesale Trade	W	W2	W3
Retail Trade	R	R2	R3
Transportation	T	T2	T3
Information Technology	I	I2	I3
Finance	F	F2	F3
Professional Service	Pf	Pf2	Pf3
Personal Service	Ps	Ps2	Ps3
Public Administration	Pa	Pa2	Pa3
Diversified	D		

Iowa

Adel	W F2
Albia	C
Algona	D
Anamosa	Pa
Atlantic	D
Belle Plaine	Mf
Belmond	Mf I2
Bloomfield	D
Camanche	Mf
Carlisle	I F3
Centerville	Mf
Chariton	W3 R
Charles City	D
Cherokee	C
Clarinda	Pa
Clarion	T
Clear Lake	D
Cresco	D
Creston	D
De Witt	C F
Decorah	Pf3
Denison	Mf
Dyersville	W
Eagle Grove	T2
Eldora	Pa
Emmetsburg	Pf
Estherville	D
Fairfield	I3 Pf
Forest City	Mf
Garner	Mf
Glenwood	C Pf
Grimes	C I F3
Grinnell	I2 Pf
Grundy Center	D

Hampton ..... D
Harlan W3
Humboldt ..... Mf
Independence ..... D
Iowa Falls ..... C W3
Jefferson ..... D
Knoxville ..... D
Le Mars ..... D
Manchester ..... D
Maquoketa C
Marengo ..... Mf
Missouri Valley F3
Monticello ..... W I
Mount Pleasant ..... Mf
Mount Vernon Pf2
Nevada ..... D
New Hampton ..... R
Norwalk ..... I F3
Oelwein ..... D
Onawa ..... I Ps
Orange City ..... Pf
Osage ..... Mf
Osceola ..... Ps
Pella ..... Mf
Perry ..... Mf
Pleasant Hill ..... W I F3
Red Oak ..... R
Rock Rapids ..... D
Rock Valley ..... D
Sheldon ..... W
Shenandoah R2
Sibley ..... Mf T
Sioux Center ..... Pf
Spirit Lake ..... C Ps
Story City ..... R
Tama Ps3
Tipton ..... R
Toledo ..... Ps3 Pa
Vinton ..... C I2
Washington ..... D
Waukee ..... W F3
Waukon ..... R
Waverly F1 Pf2
Webster City ..... Mf
West Burlington ..... D
West Liberty Mf2
West Union ..... W2 Pa
Williamsburg I
Wilton ..... Mf
Winterset ..... R I2 F2

Minnesota

Afton I
Alexandria ..... R
Annandale C2
Appleton ..... I Pa3
Baxter ..... Pf
Bayport ..... D
Becker ..... C3 T
Belle Plaine C2
Benson ..... R
Big Lake ..... C Mf
Blue Earth ..... D
Breckenridge C2
Byron ..... Pf
Caledonia ..... D
Cambridge I
Cannon Falls ..... W
Chisago City W2

Chisholm ..... Mi3 T Ps
Cokato ..... C Mf
Cold Spring ..... Mf
Crookston ..... Pf
Detroit Lakes ..... Ps
Dilworth ..... C W
East Grand Forks ..... R
Ely ..... Mi Ps
Eveleth ..... Mi3 R
Forest Lake ..... C F
Glencoe ..... Mf
Glenwood ..... W
Goodview ..... Mf W
Grand Rapids ..... I Ps
Granite Falls ..... Pf
Grant C
International Falls ..... F
Jackson I
Jordan ..... R
Kasson ..... D
La Crescent ..... W Pf
Lake City ..... Mf
Le Sueur Mf2
Lindstrom ..... D
Litchfield ..... Mf
Little Falls ..... D
Long Prairie ..... Mf I
Luverne ..... F
Melrose ..... Mf
Milaca ..... D
Montevideo I
Montgomery ..... C Mf
Monticello ..... R
Mora ..... C Ps2
Morris Pf3
Mountain Iron Mi3 W2
New Prague ..... D
North Branch C
Norwood Young America ..... Mf
Oak Park Heights ..... D
Olivia ..... Pa
Park Rapids ..... W
Perham I2
Pine City Ps2
Pipestone ..... D
Plainview ..... C Pf
Princeton ..... Mf
Redwood Falls ..... Ps
Roseau Mf2
Sartell ..... D
Sauk Centre I2
Sleepy Eye ..... D
Spring Valley ..... D
St. Charles ..... C R
St. Francis C3
St. James ..... Mf
St. Joseph ..... Pf
St. Peter Pf3
Staples ..... D
Stewartville ..... P F
Thief River Falls ..... R
Two Harbors ..... Mi
Victoria ..... W F
Virginia ..... Mi3 Ps
Wabasha ..... Pa
Waconia ..... W I F
Wadena ..... W R
Waite Park R3
Waseca ..... Mf I
Watertown ..... D

Windom ..... R
Wyoming ..... W F
Zimmerman ..... C2 Mf
Zumbrota ..... D

Nebraska

Alliance T3
Auburn T3
Aurora ..... D
Blair ..... C I2
Broken Bow ..... D
Central City ..... D
Chadron ..... R2 Pf
Cozad ..... Mf F
Crete ..... Mf
David City ..... T
Elkhorn ..... C W I2 F2
Fairbury ..... Mf I
Falls City T2 I2
Gering ..... C T2 F
Gothenburg ..... D
Holdrege ..... D
Kimball ..... Mi T
McCook ..... R
Minden ..... Ps
Nebraska City ..... T
Ogallala R2
O'Neil ..... C W3
Plattsmouth C3
Schuyler Mf3
Seward ..... Pf
Sidney R3
Valentine ..... T Ps
Wahoo ..... C Pa
Wayne ..... R I2
West Point ..... Mf
York ..... D

North Dakota

Beulah Mi3 T3
Devils Lake ..... R Ps
Grafton ..... Pf Pa
Grand Forks AFB ..... Pf Ps Pa3
Minot AFB ..... R Pf2 Pa2
Rugby ..... W Pf
Valley City ..... C Pf
Wahpeton ..... D

South Dakota

Belle Fourche ..... Mi2 C R Ps
Brandon ..... T F3
Canton ..... C R F
Dell Rapids ..... F
Ellsworth AFB ..... F Ps Pa3
Hot Springs ..... T Pf
Lead Mi3 Ps3
Madison ..... W
Milbank ..... Mi W3 F
Mobridge ..... C Ps2
Pine Ridge Pf2 Ps2 Pa3
Redfield ..... R Pf Pa3
Sisseton ..... Pf Ps Pa
Spearfish ..... R Ps2
Sturgis ..... Mi Ps
Vermillion ..... I Pf2 Ps
Winner ..... R Ps

BIBLIOGRAPHY

Atchley, Robert C. "A Size-Function Typology of Cities." *Demography* 4, no. 2 (1967): 721-733.

Aurousseau, M. "The Distribution of Population: A Constructive Problem." *Geographical Review* 11, (1921): 563-592.

Berry, Brian. "A Note Concerning Methods of Classification." *Annals of the Association of American Geographers* 48, no. 3 (1958): 300-303.

Berry, Brian. "Cities as Systems Within Systems of Cities." *Regional Science Association, Papers and Procedures* 13, (1964): 147-165.

Berry, Brian, and William Garrison. "The Functional Bases of the Central Place Hierarchy." *Economic Geography* 34, (1958): 145-154.

Boloton, P.J., and W.J. Krzenowski. "Characterization of Principal Components for Projection Pursuit." *The American Statistician* 53, (1999): 108-111.

Brush, John E. "The Hierarchy of Central Places in Southwestern Wisconsin." *Geographical Review* 43, no. 3 (1953) : 380-402.

Clark, Audrey N. *The Penguin Dictionary of Geography*. London: Penguin, 1998.

Clark, P.J., and F.C. Evans. "Distance to Nearest Neighbor as a Measure of Spatial Relationships in Populations." *Ecology* 35, (1954): 445-453.

Cline, G. "Basic Principals of Soil Classification." *Soil Science* 67, (1949): 83.

Environmental Systems Research Institute, Inc. (ESRI). ArcGIS 9.

Environmental Systems Research Institute, Inc. (ESRI). *Using ArcView GIS*. Redlands: Environmental Systems Research Institute, Inc., 1996.

Freestone, Robert, Peter Murphy, and Alan Jenner. "The Functions of Australian Towns, Revisited." *Tijdschrift voor Economische en Sociale Geografie* 94, no. 2 (2003): 188-204.

Fuguitt, Glen, and Donald Field. "Some Population Characteristics of Villages Differentiated by Size, Location and Growth." *Demography* 9, no. 2 (1972): 295-308.

Gildersleeve, Charles. "Changing Patterns of Communities in the Midwest." *Business in Nebraska* 48, no. 16 (1969): 1-5.

Hammond, Robert, and Patrick McCullagh. *Quantitative Techniques in Geography: An Introduction*. London: Oxford University Press, 1975.

Haring, Lloyd L., John F. Lounsbury, and John W. Frazier. *Introduction to Scientific Research*. Boston: WCB McGraw-Hill, 1992.

Harris, Chauncy. "*A Functional Classification of Cities in the United States.*" *Annals of the Association of American Geographers* 33 no. 1, (1943): 86-99.

Harris, Chauncy, and Edward Ullman. "The Nature of Cities." *The Annals of the American Academy of Political and Social Science* 242, (1945): 7-17.

Hart, John Fraser. "Functions and Occupational Structure of Cities of the American South." *Annals of the Association of American Geographers* 45, no. 3 (1955): 269-286.

Hart, John Fraser, and Neil E. Salisbury. "Population Change in Middle Western Villages: A Statistical Approach." *Annals of the Association of American Geographers* 55, no. 1 (1965): 140-60.

Hill, Edward W., John F Brennan, and Harold L Wolman. "What is a Central City in the United States? Applying a Statistical Technique for Developing Taxonomies." *Urban Studies* 35, no. 11 (1998): 1935-1969.

McGrew, Chapman J. Jr., and Charles B. Monroe. *An Introduction to Statistical Problem Solving in Geography*. Dubuque: WCB, 1993.

Nelson, Howard. "A Service Classification of American Cities." *Economic Geography* 31, no. 3 (1955): 189-210.

Nelson, Howard J. "Some Characteristics of the Populations of Cities in Similar Service Classifications." *Economic Geography* 33, no. 2 (1957): 95-108.

Northam, Ray M. *Urban Geography.* New York: Wiley & Sons, 1975.

Pownall, L.L. "The Functions of New Zealand Towns." *Annals of the Association of American Geographers* 43, (1953): 352-350.

Sawada, M. *Nearest Neighbor GIS Application.* 2002.

Silk, John. *Statistical Concepts in Geography.* London: George Allen & Unwin, 1979.

Smith, Robert. "Method and Purpose in Functional Town Classification." *Annals of the Association of American Geographers* 55, no. 3 (1965): 539-548.

Stafford, Howard Jr. "The Functional Bases of Small Towns." *Economic Geography* 39, no. 2 (1963): 165-175.

Steigenga, W. "A Comparative Analysis and a Classification of Netherlands Towns." *Tijdschrift voor Economische en Sociale Geografie* 46, (1955): 108-119.

Thomas, Edwin N. "Some Comments on the Functional Bases for Small Iowa Towns." *Iowa Business Digest*, (1960): 10.

United States Census Bureau. "2000 Industry Data." http://www.census.gov. Viewed September 15, 2004.

Webb, John. "Basic Concepts in the Analysis of Small Urban Centers of Minnesota." *Annals of the Association of American Geographers* 49, no. 1 (1959): 55-72.

Wilson, M.G. "Some Population Characteristics of Australian Mining Settlements." *Tijdschrift voor Economische en Sociale Geografie* 53, (1967): 125.

Yeates, Maurice. An *Introduction to Quantitative Analysis in Human Geography.* New York: McGrew-Hill, 1974.

Yeates, Maurice, and Barry Garner. *The North American City.* New York: Harper & Row, 1976.