WALKER
PARKING CONSULTANTS

CAMPUS PARKING SUPPLY AND
DEMAND FEASIBILITY STUDY

IOWA STATE UNIVERSITY

AMES, IOWA

Prepared for:
IOWA STATE UNIVERSITY

WALKER PARKING CONSULTANTS
1660 S. Highway 100, Suite 350
Minneapolis, Minnesota 55416

Voice: 952.595.9116
Fax: 952.595.9518
www.walkerparking.com

May 12, 2005

Mr. Robert W. Holzwarth, AIA
Project Manager
Facilities Planning and Management
200 General Services Building
Ames, Iowa 50011-4045

Re: Campus Parking Supply and Demand Feasibility Study
Walker Project No. 21-3235.00

Dear Mr. Holzwarth:

We are pleased to submit the attached copy of our final report of the Campus Parking Supply and Demand Feasibility Study for Iowa State University. This report investigates and determines the existing parking adequacy and future parking needs in the central campus area.

We appreciate the opportunity to assist you in evaluating the parking conditions on the main campus of Iowa State University. If you have any questions, please do not hesitate to call.

Sincerely,

WALKER PARKING CONSULTANTS

Trudy B. Elsner, P.E.
Parking Consultant

Terrence A. Hakkola, P.E.
Vice President

Enclosures

TBE/rgh

WALKER
PARKING CONSULTANTS

CAMPUS PARKING SUPPLY AND
DEMAND FEASIBILITY STUDY

IOWA STATE UNIVERSITY

AMES, IOWA

Prepared for:
IOWA STATE UNIVERSITY

PROJECT NO. 21-3235.00

MAY 2005

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

EXECUTIVE SUMMARY

Parking needs for the main campus of Iowa State University (ISU) in Ames, Iowa have been studied for three different conditions: existing conditions, a 10 percent decrease in enrollment, and a peak level matching the Fall 2002 student enrollment. These are referred to as Scenario A, B and C, respectively.

The building projects currently being planned on the ISU campus are intended to replace or upgrade existing classroom and building space rather than create new sources of parking demand. These projects are expected to have a negative impact on the parking supply. The near-term parking supply indicates a loss of 100 spaces. In the long-term, the plans for campus improvements indicate an additional loss of 300 parking spaces.

In managing a parking system, a cushion of parking is needed to accommodate the dynamics of parking such as reducing search time and accounting for cars moving in and out of spaces. When we apply this cushion to the total parking supply we create and "effective supply" of parking. For the numerical analysis, we compare the parking demand to the effective supply to better state parking adequacy. The parking supply, demand and adequacy are summarized below considering the changes planned in the parking supply for both near-term and long-term conditions.

Summary of Parking Needs in the Study Area

Scenario:	A Fall 2004	A–1 Fall 2004	B 10% Less	B–1 10% Less	C Growth	C–1 Growth
Effective Supply:						
Existing	6,479					
Near-Term		6,384	6,384		6,384	
Long-Term				6,099		6,099
Parking Demand	6,491	6,491	5,853	5,853	6,767	6,767
Parking Adequacy	(12)	(107)	531	246	(383)	(668)

Source: Walker Parking Consultants

Parking deficits are expected with Scenarios A and C, which represent the existing and the growth scenario conditions. In considering Scenario C–1, the growth scenario and the long-term future parking supply, an overall deficit of 668 spaces is projected.

Regardless of the scenario, the projected parking deficits are typically located in the central part of campus. The deficit in the East Central Zone ranges from 313 spaces to 453 spaces. The West Central Zone deficit ranges from 473 spaces to 553 spaces. The deficit in

the Northwest Zone varies from 304 spaces to 433 spaces. In the North Central Zone, the deficit varies from 115 spaces to 319 spaces.

Considering the interdependence of parking from one zone to another, the net effect of the parking deficits is concentrated in the West Central and Northwest Zones. The combined deficit in these two zones ranges from 810 spaces for Scenarios B and B–1 up to 986 spaces for Scenarios C and C–1.

When evaluating alternatives to satisfy the projected parking deficit, the location and the assigned user group should be considered.

As indicated in the Campus Master Plan, parking structures toward the perimeter of campus are proposed to meet the future parking needs. The proposed West Campus Parking Facility and the proposed Intermodal Transportation Center would help to alleviate the projected parking shortages.

Considering a five to seven minute walking distance, the proposed West Campus Parking Facility may need approximately 560 new spaces to meet the parking demand projected on the west side of campus.

The proposed Intermodal Transportation Center could meet the parking needs in the northern section of campus and accommodate parkers in the East Central and West Central Zones by using the Cy-ride buses. Approximately 680 new spaces may be needed to meet the parking demand given the Scenario C–1 parking conditions.

BACKGROUND

Iowa State University (ISU), a land grant university located in Ames, Iowa, serves about 27,000 students and employs about 6,000 faculty and staff. ISU is a teaching and a research institution with approximately 55 academic departments. The campus is primarily a pedestrian campus and importance is placed on maintaining the historic Central Lawn and other green space.

The campus is located west of downtown Ames and is approximately 30 miles north of Des Moines with north/south access from Interstate 35 and east/west access from Highway 30.

There have been several documents prepared regarding parking for the ISU campus including 1988 Parking Study by Brice, Petrides–Donohue; 1991 Campus Master Plan by Sasaki Associates; 1996 Parking Master Planning Study by Rich and Associates; 2000 Supplemental Progress Report to the 1991 Campus Master Plan prepared by ISU staff; and 2002 Parking Study by Kirkham Michael.

The 1988 Parking Study by Brice, Petrides–Donohue indicated parking shortages in the central campus area and recommended adding 700 spaces to the parking supply.

The 1996 Rich and Associates Parking Master Planning Study indicated that there were parking shortages in 1995 and expected to increase through the year 2000. Further, this study recommended that a moratorium be placed on granting 24 hour reserved space permits, that signage be upgraded, and that the parking supply be increased on the periphery of the campus with use of the shuttle system.

The Campus Master Plan, in regard to parking and circulation, recommended three new parking structures within a 5 to 7 minute walk of the academic core. These proposed structures were recommended for the west side of campus near the College of Design Building, the north side of campus just north of the Industrial Education II Building, and on the east side of campus south of the Forker Building. The Campus Master Plan also indicated that access to the core area should be met by the shuttle bus service from parking lots south of the core campus by the Iowa Events Center.

The 2002 Kirkham Michael Parking Study recommended that two parking structures be built on campus; one on the east side of campus (above Lot 50B) and one on the west side of campus (southwest of the Design Center and north of Howe Hall).

INTRODUCTION

LOOKING NORTHEAST TOWARD THE CAMPANILE FROM UNION DRIVE

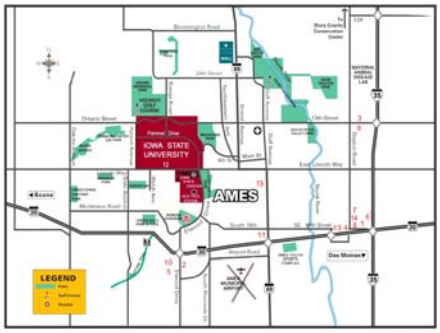
Walker Parking Consultants (Walker) has been engaged by Iowa State University, to provide a Parking Supply and Demand Feasibility Study for the main campus area. This study quantifies the current parking needs, projects the future parking needs and addresses the size of a West Campus Parking Ramp and projects parking demand for the proposed Intermodal Transportation Center. Our complete Scope of Services for this study is included in Appendix A.

The data, assumptions and program requirements were identified and discussed with the following University staff.

Cathy Brown, Campus Planner
Dean Morton, University Architect
Doug Houghton, Program Manager
Robert Holzwarth, Project Manager

STUDY AREA

The study area is bounded by Lincoln Way on the south, Elwood Drive on the east, the railroad tracks on the north and Sheldon Avenue on the west. There are two structured parking facilities within the study area and a number of surface lots as well as some on-street parking. In order to provide a more accurate understanding of the current and future parking conditions, in addition to the campus as a whole, the study area is divided into eleven zones. These zones are shown on Figure 1 and are designated as follows.



MAP OF AMES AREA

The Northeast Zone is located north of Osborn Drive to the railroad tracks and west of Stange Road to Haber Road. Major buildings within this zone include Meats Laboratory, Kildee Hall and USDA Greenhouse. A large parking lot, Lot 41, for faculty/staff is within this zone.

The East Central Zone is defined as those buildings east of an imaginary north/south mid-line through the center of the campus over to Wallace Road and includes the East Campus Parking Deck (ECPD) and Lots 50A and 50B. This zone extends between Osborn Drive and Union Drive. Major buildings within this zone include Bessey, Agronomy, Horticulture Halls, Food Sciences and Gerdin Business Buildings.

LOOKING NORTHEAST ALONG WALLACE ROAD TOWARD THE EAST CAMPUS PARKING DECK

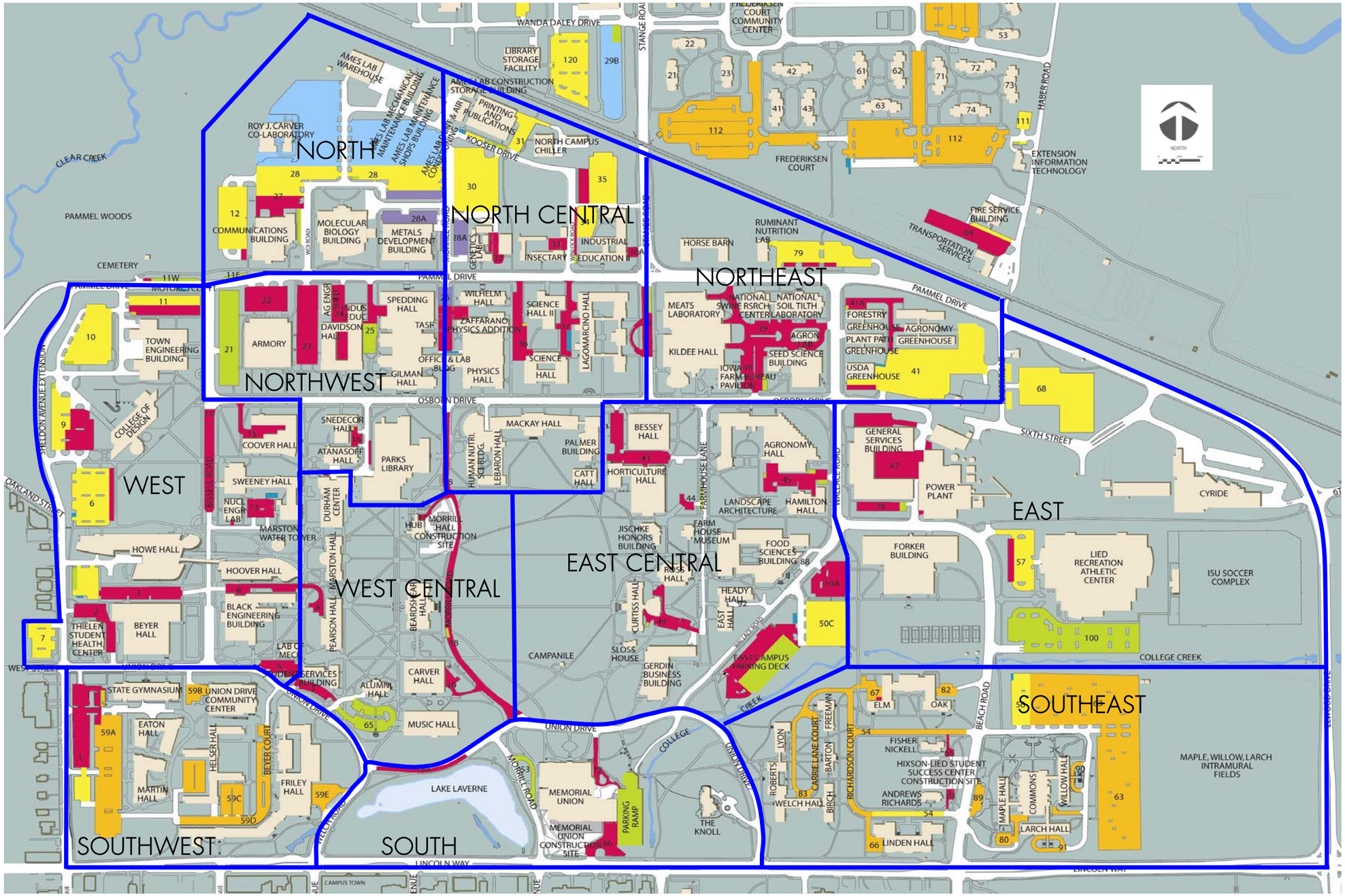


FIGURE 1: STUDY AREA

LEGEND:

ZONE BOUNDARY

- Reserved Permit Spaces
- Staff Permit Spaces
- Commuter Permit Spaces
- Ames Lab Permit Spaces
- Visitor/Metered Spaces
- Residence Hall Permit Spaces
- Motorcycle Permit Spaces

The East Zone extends from Wallace Road to Elwood Drive on the east and north side of the study area and to the area along College Creek. The East Zone includes the General Services Building, Power Plant, Cy-ride, Forker Building, and the Lied Recreation Athletic Center. Lot 68 provides general staff parking and Lot 100 provides pre-pay parking in this zone.

The Southeast Zone is anchored by residence halls at the southeast corner of the study area by Lincoln Way and Elwood Drive. The parking lots in this zone are for residential parkers.

The South Zone is bordered by Lincoln Way, along Union Drive and over to Welch Road. The South Zone contains the Memorial Union and the Memorial Union Parking Ramp with 635 parking spaces.

LOOKING SOUTH FROM UNION DRIVE AT THE MEMORIAL UNION

The Southwest Zone also has residence halls in the southwest corner of the study area along Lincoln Way to Sheldon Avenue, from Union Drive to Welch Road. The State Gymnasium is also in this zone.

The West Zone extends along Sheldon Avenue to Pammel Drive over to Bissell Road to Osborn Drive and east of Coover, Sweeney and Hoover Halls, and the Black Engineering Building. Other buildings within this zone include Town Engineering Building, College of Design, Howe Hall, Beyer Hall, and the Student Health Center. Most of the parking lots in the West Zone provide parking for faculty/staff. The campus master plan includes increasing the parking supply with a structured parking facility in the West Zone.

The West Central Zone is defined as those buildings west of an imaginary north/south mid-line through the center of the campus and west of Durham Center, Marston and Pearson Halls, and the Student Services Building. The West Central Zone is south of Parks Library and extends to Union Drive and includes Alumni Hall, Carver Hall Beardshear Hall. The West Central Zone has only a few small parking areas.

The Northwest Zone contains Parks Library, Spedding Hall, Gilman Hall, Davidson Hall and the Armory. Pammel Drive, Bissell Road, Morrill Road and Parks Library bound the Northwest Zone. There are only six parking lots in this zone.

The North Zone is on the north and west boundary of the study area north of Pammel Drive and west of Morrill Road. The North Zone contains the Carver Co-Laboratory, Communications Building, Molecular Biology Building and Metals Development Building. This

zone has the most parking spaces of the eleven zones with several large surface lots.

The North Central Zone is bounded by the railroad tracks, Stange Road, Morrill Road and extends south to include Mackay Hall. Physics Hall, Science Hall, Lagomarcino Hall and the Insectary are in the North Zone as well as several parking lots and the site for the proposed Intermodal Transportation Center.

LOOKING NORTHWEST AT LOT 35, WEST OF STANGE ROAD

The parking analysis is based on the supply and demand within these eleven zones. However it should be noted that there are remote parking lots for commuter students and a vehicle storage lot for resident students south and east of the study area. The Cy-ride bus service provides shuttle service from these lots to the main campus. Further, Cy-ride provides bus service on and around the campus as well as service to off campus destinations.

DEFINITION OF TERMS

The following definitions are provided to help clarify some of the parking terms used and are particular to this document. More complete discussions are provided throughout this document.

Parking Supply: The total number of parking spaces within the defined study area.

Effective Parking Supply: The number of parking spaces, less a cushion (effective supply factor) to keep parking patrons from spending time looking for the last available spaces, to allow for the dynamics of vehicles moving in and out of spaces, and to account for spaces lost to poor or improper parking, or snow cover/removal. The cushion is also needed to provide extra spaces when parking facilities are under repair.

Effective Supply Factor: The occupancy rate at which a parking facility operates at peak efficiency. The factor may vary based on the assigned use of a facility.

User Group: The amount of parking spaces required for various groups (employees, commuter or resident students and visitors) are determined separately. Each of these populations is classified as a user group.

Parking Demand: The number of parking spaces required to satisfy student, faculty/staff and visitor needs on any given day. This is estimated by considering the number of vehicles parked in the study area, the building destination and number of students and faculty/staff in the study area. A parking demand model is developed for existing conditions and used to project demand for future conditions in the study area.

Driving Ratio: The percentage of a particular user group that drives a vehicle to the campus and parks.

Presence Factor: The portion of a user group present on the campus during a specific time period, usually the peak hour.

Occupancy: The number of parking spaces occupied by vehicles. This information is gathered by performing parked vehicle counts in each parking facility located within the study area.

Demand Ratio: The ratio of the number of vehicles observed to occupy parking spaces compared to a reference statistic. For example, if there are 1,000 commuter students and observed peak occupancy of 400 vehicles in the commuter student lot, the Demand Ratio is 0.40 (400/1000) spaces per commuter student.

Survey Day: The day(s) set aside for observation of parking trends and recording of parking data within the study area.

Parking Adequacy: Parking adequacy is measured in terms of supply versus demand, resulting in a surplus or deficit. The parking surplus/deficit is the difference between the supply of parking spaces and the demand for those spaces. The demand is compared to the effective supply.

METHODOLOGY

The methodology of this parking supply and demand study consists of the following:

- Reviewing background information and data provided by the University including previous parking studies and the campus master plan.
- Obtaining parking supply data, occupancy counts and permit sales data.
- Analyzing the current parking occupancy.
- Developing a parking model for existing parking demand.
- Utilizing projections provided by ISU to develop the future scenarios for evaluating parking supply/demand.

The primary objective of the parking supply and demand is to quantify the parking surplus/deficit that exists now and in the future. The parking deficit is the difference between the parking supply and parking demand. When the parking supply exceeds the parking demand, a surplus of parking is said to be present. However, a deficit of parking exists when the parking demand exceeds the parking supply.

It is important to define the conditions upon which a parking system should be designed. Some organizations intend to provide adequate parking for every potential parking facility user every day of the year. Consequently, a substantial number of parking spaces lie vacant throughout much of the year. The benefit of such a parking system is that parkers, whether employees, students, or visitors, are never turned away because of lack of adequate parking.

As is more commonly the case, most organizations would rather have fewer of their assets utilized as parking. These organizations plan for a parking system that meets the needs of its parking patrons most days of the year, but less than every day of the year. The disadvantage of this type of parking system is that from time to time, the parking demand may exceed the effective parking supply.

The level at which the parking demand should be accommodated is a policy decision that must be made by the University. For the purpose of this analysis, adequate parking conditions are defined as those that occur on a typical weekday during the fall semester, because the fall semester traditionally has the highest enrollment counts.

It is impossible to identify in advance one day that will perfectly represent the typical busy day; however, parking occupancy data was collected on Wednesday October 27, 2004 and Thursday, October 28, 2004 between 8:00 a.m. and 4:00 p.m. Doug Houghton and the Parking Division were instrumental in gathering the occupancy data.

Parking demand ratios reflect the number of parking spaces required per user group. The parking demand ratio is equal to the presence ratio multiplied by the driving ratio. The presence ratio is the portion of a user group that is present during the peak hour. The driving ratio is the percentage of a particular user group that drives a vehicle to the campus. The parking occupancy counts, as well as data provided by the Parking Division, and Campus Planning, was used to determine the user group parking demand ratios to establish the existing parking demand model.

Using the design statistics for the future scenarios and the existing parking demand model allows us to estimate future parking demand.

Parking demand has been estimated based on several classifications of user groups:

- Faculty/Staff: this group also includes other employees but does not include student employees.
- Resident Students: this accounts only for the students whose university residence is within the study area boundaries.
- Commuter Students: this group represents a portion of the group of students who live outside of the study area and beyond a reasonable walking distance to campus. A number of commuter students utilize the parking lots south of Lincoln Way that are not within the study area boundaries.
- Visitors: this includes general campus visitors, visitors to the admissions office, the Union, etc.
- Others: This includes service and loading zone parkers.

The parking demand for the users groups has been divided into the parking zones for comparison purposes to the parking supply. The parking adequacy has been measured in terms of effective supply versus demand, resulting in a surplus or deficit of spaces.

EXISTING PARKING CONDITIONS

EXISTING PARKING SUPPLY

Doug Houghton of the Parking Division provided an inventory of parking spaces in the study area on the ISU campus. The total number of parking spaces, or the inventory, is 7,368 spaces in the study area.

This inventory includes 1,044 spaces in the two parking facilities, 6,189 spaces in the various surface parking lots, and 135 spaces on street for students, faculty/staff and visitors. A detailed table summarizing the parking supply by individual lots is included in Appendix B.

The following table summarizes the parking supply by the eleven parking zones used for this analysis.

Table 1: Existing Parking Supply by Zone, 2004

Parking Zone	Capacity (spaces)	% of Total
Northeast	570	8%
East Central	781	11%
East	750	10%
Southeast	955	13%
South	662	9%
Southwest	605	8%
West	898	12%
West Central	107	1%
Northwest	383	5%
North	1,034	14%
North Central	623	8%
Total	7,368	100%

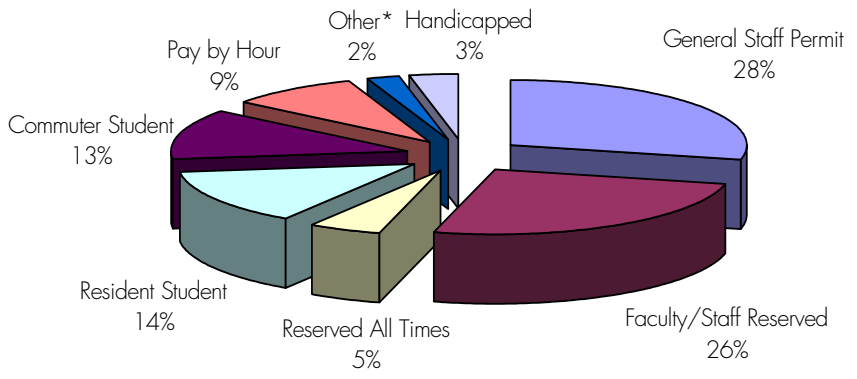
Source: Iowa State University Parking Division and Walker Parking Consultants

The parking supply is spread out around the campus. The table above indicates the highest numbers of spaces are in the North, Southeast and West Zones with 14 percent, 13 percent and 12 percent of the spaces, respectively. As would be expected for a pedestrian oriented campus, the majority of the parking is located around the center of campus rather than in the center core of the campus.

This parking supply is divided between the various user groups on campus. There are general staff permits, reserved permits for specific locations, 24-hour reserved, residence hall permits, as well as pay by the hour, metered, loading zone and handicap spaces.

The breakdown between the various users is shown in the following figure with the percentage of spaces allocated for the various user groups or specific permits and/or restriction.

Figure 2: Parking Supply by User Groups in the Study Area



Source: Iowa State University Parking Division

PARKING ASSIGNMENT BY USER GROUP

General Staff Permit	2,100	28%
Faculty/Staff Reserved	1,884	26%
Reserved All Times	377	5%
Resident Student	1,020	14%
Commuter Student	929	13%
Pay by Hour	654	9%
Other*	159	2%
Handicapped	245	3%
Total	7,368	

* Note: Other includes designated visitor, metered, and loading zone spaces

The total study area parking supply of 7,368 spaces includes approximately 28 percent general staff parking, 31 percent reserved faculty/staff parking, 14 percent resident student parking, 13 percent commuter student, and 9 percent pay by hour parking.

EFFECTIVE PARKING SUPPLY

It is a generally accepted principle in a parking system that a supply of parking achieves optimum efficiency at 85 percent to 95 percent occupancy. At high occupancy levels, a small reserve provides a necessary "cushion" to allow for the dynamics of vehicles moving in and out of parking stalls and reduces the time required to search for the last few available parking spaces. This cushion also allows for daily, weekly and seasonal variations as well as vacancies created by restricting facilities to certain users, improperly parked vehicles, snow cover and minor maintenance or construction.

When occupancy exceeds the optimum level, delays and frustration in finding a parking space are typically observed. Thus, at levels of occupancy that exceed the effective parking supply, the parking system may be perceived as inadequate even though parking spaces are available. As a result, the "effective parking supply" is used for analyzing the adequacy of the parking system rather than the total supply or inventory of spaces.

The point of optimum efficiency for a particular facility depends on a variety of factors, including:

- Capacity: Small scattered facilities operate less efficiently than one large facility. Conversely, it is more difficult to find the available space in a large lot than in a smaller surface lot.
- Type of Users: Regular parkers, such as students or faculty/staff, can find the available space more efficiently than an infrequent user, such as a visitor.
- Assignment of Spaces: A facility or area of a facility that is dedicated for a specific group of users will have vacancies that cannot be used by other parkers. In general, a facility that has individually reserved spaces will have more vacancies than a facility that has area-reserved spaces.

Lower effective supply factors were used for the most restricted spaces in the study area to reflect utilization of these spaces. A factor of 50 percent was used for the accessible/'handicap' spaces scattered throughout the study area.

For specifically assigned parking spaces, such as 24 hour reserved spaces, spaces reserved for individual users, a factor of 85 percent was used as these spaces are more restricted and therefore not typically as highly utilized as less restricted spaces. A factor of 85 percent was used for visitor spaces, loading zones, and metered parking areas. An effective supply factor of 90 percent was used for reserved permit 7:00 a.m. – 5:30 p.m. spaces. A 95 percent factor was used for the general staff permit spaces to reflect field observations.

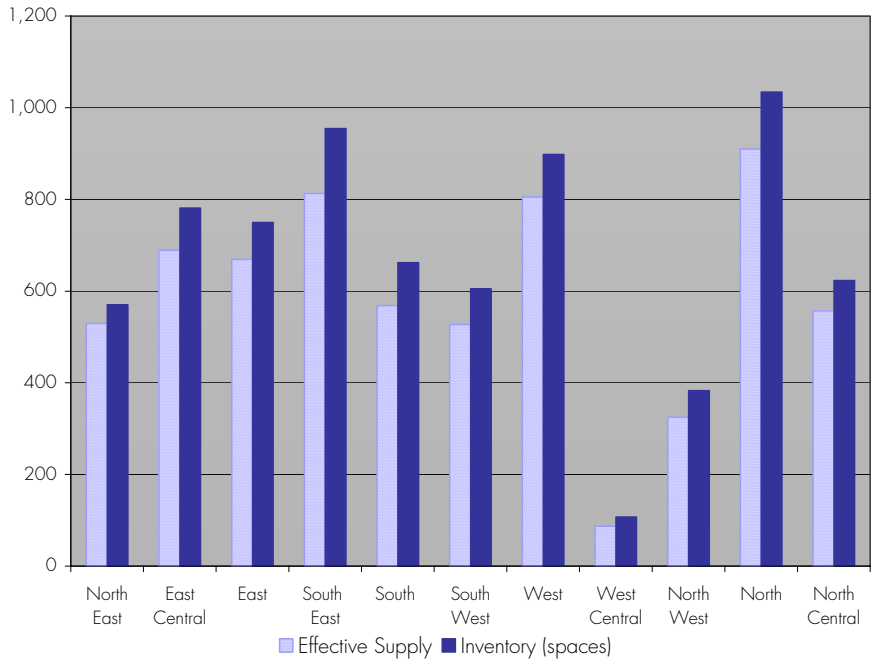
The parking inventory is multiplied by the effective parking supply factor to determine the effective parking supply. The total parking inventory is 7,368 spaces and the total effective parking supply is 6,479 spaces.

A detailed breakdown is included in Appendix B of the total capacity and of the effective supply by lot number.

The North Zone has the highest percent of spaces with 1,034 total spaces and an effective supply of 915 spaces. The fewest number of spaces are in the West Central zone, near the center of campus, with 107 total spaces and an effective supply of 87 spaces.

The figure below shows the parking inventory and the effective parking supply by zone.

Figure 3: Parking Inventory and Effective Supply by Zone



Parking Zone	Inventory (spaces)	Effective Supply
North East	570	529
East Central	781	689
East	750	669
South East	955	813
South	662	568
South West	605	527
West	898	805
West Central	107	87
North West	383	325
North	1,034	910
North Central	623	557
Total	7,368	6,479

Source: Iowa State University and Walker Parking Consultants

PARKING OCCUPANCY

Parking occupancy counts were taken on Wednesday, October 27, 2004 and on Thursday, October 28, 2004, with the assistance of the Parking Division. The focus of the occupancy counts was to capture the parking needs of faculty/staff and commuter students during the daytime hours.

The Southeast and Southwest Zones include a large percentage of residential parking spaces. The residential parking needs typically peak in the evening hours, whereas the parking needs for other users are expected to peak during the daytime hours. The counts on Wednesday did not include the Southeast, South and Southwest Zones and therefore, these zones are not included for comparison purposes between the Wednesday and Thursday counts.

Although the peak accumulation of vehicles in individual lots occurred at various times throughout the day, the overall observed peak occupancy in the study area occurred between 11:00 a.m. and 12:00 noon on both days surveyed. The overall campus parking occupancy was higher on Wednesday than it was on Thursday as

would be expected due to class scheduling. The peak on Wednesday indicated that 82 percent of the surveyed spaces were occupied at 11:00 a.m. and the peak on Thursday was 74 percent.

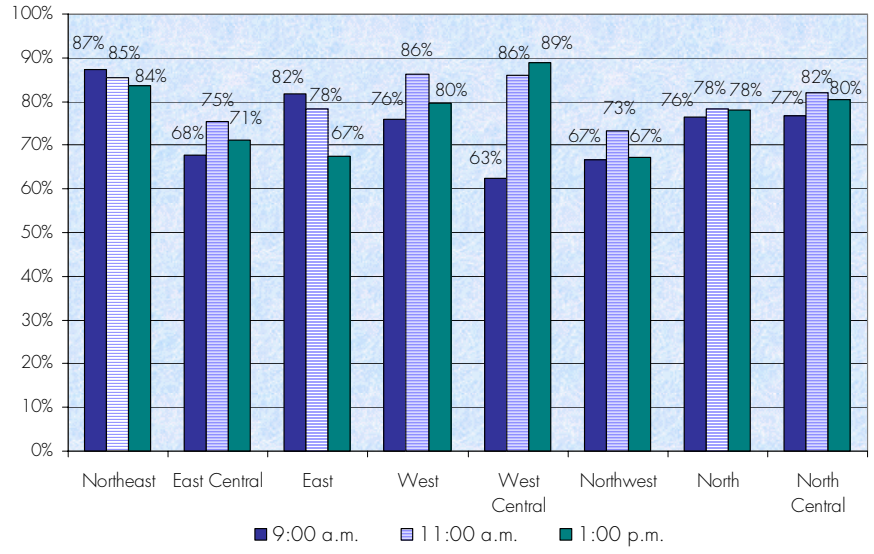
The following table and figure show the variation by zone for the parking counts taken on Wednesday, October 27, 2004.

Table 2: Parking Accumulation by Zone, Wednesday, October 27, 2004

Parking Zone	9:00 a.m.	11:00 a.m.	1:00 p.m.
Northeast	87%	85%	84%
East Central	68%	75%	71%
East	82%	78%	67%
West	76%	86%	80%
West Central	63%	86%	89%
Northwest	67%	73%	67%
North	76%	78%	78%
North Central	77%	82%	80%
Overall	77%	82%	76%

Source: Iowa State University and Walker Parking Consultants

Figure 4. Parking Accumulation by Zone, Wednesday, October 27, 2004



Source: Iowa State University and Walker Parking Consultants

The zones operating with over 85 percent peak occupancy include:

- Northeast Zone with 87 percent at 9:00 a.m.;
- West Zone with 86 percent at 11:00 a.m.; and
- West Central Zone with 89 percent at 1:00 p.m.

The parking system is currently operating at or above the peak level of efficiency in these zones.

The peak occupancy in the other zones ranged between 73 and 82 percent occupancy.

- East Central Zone with 75 percent at 11:00 a.m.;
- East Zone with 82 percent at 9:00 a.m.;
- Northwest Zone with 73 percent at 11:00 a.m.;
- North Zone with 78 percent at 11:00 a.m. and 1:00 p.m.; and
- North Central Zone with 82 percent at 11:00 a.m.

EXISTING PARKING DEMAND

The parking demand has been estimated by reducing the survey data collected to parking demand ratios. Parking demand ratios reflect the number of parking spaces required within the study area per user group (resident student, commuter student, faculty/staff and visitor). The parking demand ratio is equal to the presence ratio multiplied by the driving ratio. The presence ratio is the portion of a user group that is present during the peak hour. The driving ratio is the percentage of a particular user group that drives a vehicle to the campus or has a vehicle on the campus.

Since many commuter and resident students utilize Cy-ride and park outside of the study area in the remote lots by the stadium, the commuter and resident ratios used for this analysis account for only a portion of the total number of commuter and resident students parking on or near the campus. The ratio used represents a reasonable percentage that would be parking within the study area.

For the parking demand model, the parking demand ratios are multiplied by the existing Fall 2004 data. These statistics include the entire Ames campus rather than just the study area defined for this analysis. Cathy Brown of Campus Planning provided data on the employee (faculty/staff) population in campus buildings and the Student Clock Hours by buildings. This data was used to estimate the

demand within the study area and exclude the demand for those buildings outside of the study area, for example the Veterinary Medicine, Towers Residence Complex, etc. Approximately 14 percent of the faculty/staff are located outside of the study area.

The Fall 2004 data is summarized below.

Table 3: Fall 2004 User Group Data

User Group	Fall 2004
Faculty/Staff	6,462
Total Students	26,380
Resident Students in Study Area	4,130
Resident Students Out of Area	4,044
Students in Walking Distance	6,500
Commuter Students	11,706

Source: Iowa State University

Utilizing the statistics for each user group within the study area and the parking demand ratios developed for each user group, the parking demand has been calculated for existing conditions.

In addition, several specific demand generators as identified by University staff were accounted for in the visitor category: Memorial Union, Beyer Hall, Forker Building and Mackay Hall.

Table 4: Parking Demand Ratios

User Group	Parking Demand Ratio
Faculty/Staff	0.67 / Faculty/Staff, Non-Student Employee
Resident Students	0.23 / Resident Student
Commuter Students	0.09 / Commuter Student
Visitors and Others	0.06 / Faculty/Staff

Source: Walker Parking Consultants

For existing conditions, the parking demand is 6,491 spaces, which represents the current or Fall 2004 conditions. The demand for each user group is shown in Table 5.

Table 5: Existing Parking Demand by User Group (spaces)

User Group	Fall 2004
Faculty/Staff	3,703
Resident Students	940
Commuter Students	1,008
Visitors	782
Other	58
Total Parking Demand	6,491

Source: Walker Parking Consultants

To correlate the demand to the location of the parking demand, the employee FTE numbers per building were used to assign the faculty/staff/non-student employee demand to building assignments. Further, the data for the Student Clock Hours was used to assign the commuter student demand to the various buildings.

The demand for parking by the various user groups has been distributed to the eleven parking zones as shown in the table below for existing Fall 2004 conditions.

Table 6: Existing Parking Demand by Zone (spaces)

Parking Zone	Fall 2004
Northeast	236
East Central	1,113
East	388
Southeast	641
South	500
Southwest	560
West	789
West Central	622
Northwest	629
North	267
North Central	745
TOTAL DEMAND	6,491

Source: Walker Parking Consultants

EXISTING PARKING ADEQUACY

Parking adequacy is measured in terms of supply versus demand, resulting in a surplus or deficit. The parking surplus/deficit is the difference between the effective supply of parking spaces and the

demand for those spaces. For existing conditions, with an effective parking supply of 6,479 spaces and parking demand of 6,491 spaces, there is a small deficit of 12 spaces.

It is not enough, however, to just compare the numbers. The comparisons should include comparing the demand by the various user groups to the effective number of parking spaces assigned for those users, and the location of the available spaces must be compared to where the demand is generated.

The parking adequacy by user group has been determined by comparing the effective parking supply to the user group parking demand. The faculty/staff supply category includes the general staff permit, faculty/staff reserved and reserved at all times. The visitor spaces include the pay by the hour spaces. The accessible spaces, service and loading zone spaces are included in the "Other" category for the parking supply.

Table 7: Existing Parking Adequacy by User Group (spaces)

Fall 2004 Conditions	Effective Supply	Demand	Adequacy
Faculty/Staff	3,987	3,703	284
Resident Students	888	940	(51)
Commuter Students	790	1,008	(219)
Visitors	557	782	(225)
Other	258	58	200
Totals	6,479	6,491	(12)

Source: Walker Parking Consultants

As shown in the table, there are deficits projected for resident and commuter students, and visitors with a surplus of spaces for faculty/staff and others.

The existing parking demand has also been compared to the existing effective parking supply for each of the eleven parking zones. There are parking surpluses in about half of the parking zones while there are parking deficits in the other half. The largest parking deficits are in the East Central and West Central Zones.

The interplay between the zones plays a critical role in establishing the parking needs on the ISU campus. The table below shows the comparison by zone for existing conditions.

Table 8: Existing Parking Adequacy by Zone (spaces)

Zone	Effective Supply	Demand	Adequacy
Northeast	529	236	293
East Central	689	1,113	(424)
East	669	388	281
Southeast	813	641	172
South	568	500	68
Southwest	527	560	(33)
West	805	789	16
West Central	87	622	(535)
Northwest	325	629	(304)
North	910	267	643
North Central	557	745	(188)
TOTAL STUDY AREA	6,479	6,491	(12)

Source: Walker Parking Consultants

There are localized parking deficits even though the overall data indicates only a small deficit of 12 spaces. For example, considering only the central zones (East Central, West Central and North Central) a deficit of 1,147 spaces is shown.

The parking surpluses and deficits by zone are also shown graphically on the figure on the following page for the existing conditions.

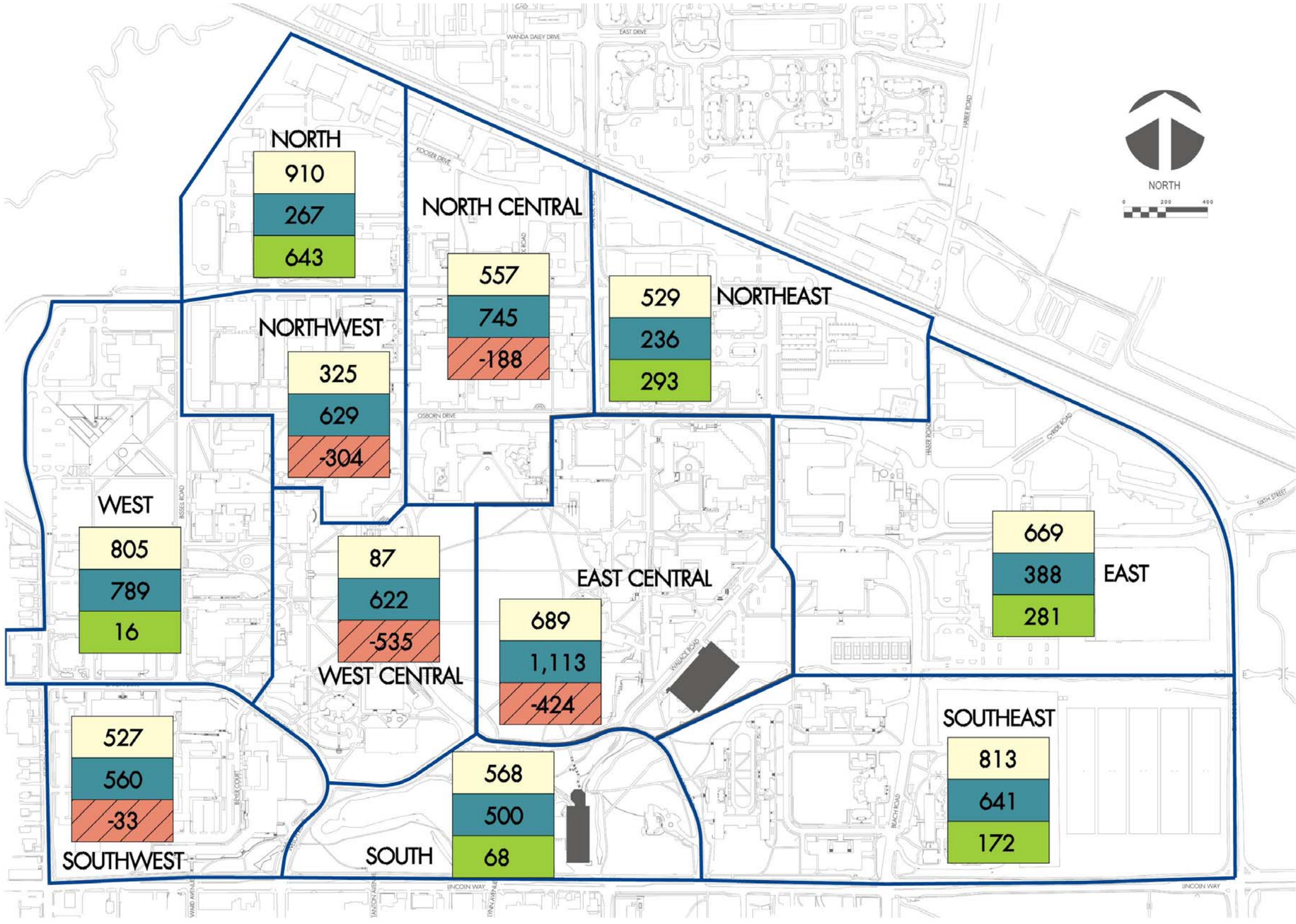


FIGURE 5: EXISTING PARKING ADEQUACY

LEGEND:

	TOTAL
EFFECTIVE SUPPLY	6,479
DEMAND	6,491
SURPLUS	–
DEFICIT	-12

ZONE BOUNDARY

PARKING STRUCTURE

CAMPUS PLANS AND IMPROVEMENTS

Three variables could impact future campus parking conditions: changes in student and faculty/staff populations; changes in the existing parking supply; and additional facilities that would require redistribution of parking demand or new demand.

To account for the fluctuations in the populations on campus, Walker has evaluated three basic scenarios to project parking needs as listed herein as Scenario A, B and C.

Scenario A represents the no change (Fall 2004) parking needs; Scenario B is a 10 percent reduction in the number of students and staff; and Scenario C is a growth scenario with the student population at the previous peak level of 27,898 students (2002-2003) and an increase of 200 faculty/staff over the current levels. This data is summarized in the table below.

Table 9: Base Data for the Scenarios

User Group	Scenario A Fall 2004	Scenario B Less 10%	Scenario C Growth
Faculty/Staff	6,462	5,816	6,662
Total Students	26,380	23,742	27,898
Resident Students in Study Area	4,130	3,717	4,368
Resident Students Out of Area	4,044	3,640	4,277
Students in Walking Distance	6,500	5,850	6,874
Commuter Students	11,706	10,535	12,380

Source: Iowa State University and Walker Parking Consultants

In our planning discussions with University staff, it has been indicated that the building projects currently in the planning stages and proposed will replace and upgrade existing classroom and building space on campus rather than create new users. The building projects are to include replacement of any parking displaced by the project; however some parking will be lost and space does not allow for it to be replaced within a reasonable walking distance.

We have evaluated the future parking conditions on campus for a near-term future assuming that the proposed building expansions will eliminate 100 parking spaces. For the long-term future, a total loss of 400 spaces is anticipated.

FUTURE PARKING SUPPLY

Several projects are proposed within the North, Northwest and North Central Parking Zones over the near-term and long-term future. These projects are anticipated to create a total loss of approximately 400 spaces over the long-term future. We have evaluated the future parking supply for two conditions. The near-term future assumes that the proposed building expansions will eliminate 100 spaces; and the long-term future assumes a total loss of 400 parking spaces.

NEAR-TERM FUTURE EFFECTIVE PARKING SUPPLY

In the near-term future, the parking supply is expected to be the total less 100 general staff permit spaces in the Northwest Zone east of the Armory for a total of 7,268 spaces. Considering the reduction with the effective supply factor of 95 percent (general staff factor), the effective near-term future parking supply is 6,384 spaces.

LONG-TERM FUTURE EFFECTIVE PARKING SUPPLY

In addition to the 100 spaces expected to be lost in the near-term future, that is projects currently in the planning stages, losses of 200 spaces in the North Zone (in the lot north of Molecular Biology) and 100 spaces in the North Central Zone are anticipated. This would bring the total future parking supply to 6,968 spaces in the study area. Again considering the effective supply factors, the effective long-term supply is 6,099 spaces.

Table 10: Summary of Effective Parking Supply (spaces)

	Effective Parking Supply		
Zone	Existing	Near-Term Future	Long-Term Future
Northeast	529	529	529
East Central	689	689	689
East	669	669	669
Southeast	813	813	813
South	568	568	568
Southwest	527	527	527
West	805	805	805
West Central	87	87	87
Northwest	325	230	230
North	910	910	720
North Central	557	557	462
TOTAL STUDY AREA	6,479	6,384	6,099

Source: Walker Parking Consultants

FUTURE PARKING DEMAND

To account for the fluctuations in the populations on campus, Walker has evaluated the parking demand for the three scenarios discussed previously and identified as Scenario A, B and C. Utilizing these statistics, and the parking demand model/ratios developed for the existing demand analysis, the parking demand has been projected for the possible future conditions. Note that the data includes the entire Ames campus and again the data is adjusted to include only those buildings/destinations within the study area.

For Scenario A the parking demand is 6,491 spaces, which represents the current or Fall 2004 conditions. The parking demand for Scenario B, considering a 10 percent reduction in the student and the faculty/staff populations, is 5,853 spaces. The parking demand for Scenario C, that represents the peak student population as represented by the 2002-2003 academic year is 6,767 spaces.

PARKING DEMAND BY USER GROUP

The demand for parking by the various user groups is shown in the table below.

Table 11: Parking Demand by User Group (spaces)

User Group	Scenario A Fall 2004	Scenario B Less 10%	Scenario C Growth
Faculty/Staff	3,703	3,333	3,834
Resident Students	940	846	994
Commuter Students	1,008	908	1,066
Visitors	782	709	815
Other	58	58	58
Total Parking Demand	6,491	5,853	6,767

Source: Walker Parking Consultants

PARKING DEMAND BY ZONE

The user group demand for parking has been distributed to the eleven parking zones as shown in the table below for the three scenarios using the data on the employee population in campus buildings and the Student Clock Hours by buildings.

Table 12: Parking Demand by Zone for Scenarios A, B and C (spaces)

Parking Zone	Scenario A Fall 2004	Scenario B Less 10%	Scenario C Growth
Northeast	236	213	240
East Central	1,113	1,002	1,142
East	388	350	397
Southeast	641	579	680
South	500	450	529
Southwest	560	505	589
West	789	714	811
West Central	622	560	640
Northwest	629	567	663
North	267	241	295
North Central	745	672	781
TOTAL DEMAND	6,491	5,853	6,767

Source: Walker Parking Consultants

FUTURE PARKING ADEQUACY

The future parking adequacy is summarized for the three parking demand conditions, Scenario A, B and C, and for the two future parking supply conditions, near-term future and long-term future.

Scenario A represents the existing conditions, Fall 2004, or a no growth scenario. The Scenario A demand is compared with the existing effective parking supply. Scenario A–1 represents the no growth demand compared to the near-term effective parking supply.

Scenario B represents the 10 percent reduction in parking demand. Scenario B demand is compared to the near-term effective parking supply; Scenario B–1 considers the long-term effective parking supply.

The growth scenario, Scenario C is first compared to the near-term effective parking supply, and Scenario C–1 considers the long-term effective parking supply.

PARKING ADEQUACY BY USER GROUP

The following table summarizes the adequacy by user groups for all three scenarios and the near-term and long-term effective supply conditions.

Table 13: Parking Adequacy by User Group (spaces)

Existing	Existing Effective Supply	Demand	Adequacy
Faculty/Staff	3,987	3,703	284
Resident Students	888	940	(51)
Commuter Students	790	1,008	(219)
Visitors	557	782	(225)
Other	258	58	200
Totals	6,479	6,491	(12)

Scenario A–1	Near-Term Effective Supply	Demand	Adequacy
Faculty/Staff	3,892	3,703	189
Resident Students	888	940	(51)
Commuter Students	790	1,008	(219)
Visitors	557	782	(225)
Other	258	58	200
Totals	6,384	6,491	(107)

Scenario B	Near-Term Effective Supply	Demand	Adequacy
Faculty/Staff	3,892	3,333	559
Resident Students	888	846	43
Commuter Students	790	908	(118)
Visitors	557	709	(152)
Other	258	58	200
Totals	6,384	5,853	531

Scenario B–1	Long-Term Effective Supply	Demand	Adequacy
Faculty/Staff	3,607	3,333	274
Resident Students	888	846	43
Commuter Students	790	908	(118)
Visitors	557	709	(152)
Other	258	58	200
Totals	6,099	5,853	246

Scenario C	Near-Term Effective Supply	Demand	Adequacy
Faculty/Staff	3,892	3,834	58
Resident Students	888	994	(105)
Commuter Students	790	1,066	(277)
Visitors	557	815	(258)
Other	258	58	200
Totals	6,384	6,767	(383)

Scenario C–1	Long-Term Effective Supply	Demand	Adequacy
Faculty/Staff	3,607	3,834	(227)
Resident Students	888	994	(105)
Commuter Students	790	1,066	(277)
Visitors	557	815	(258)
Other	258	58	200
Totals	6,099	6,767	(668)

Source: Walker Parking Consultants

Parking deficits are projected for visitors and commuter students in all of the scenarios. Deficits are also projected for resident students in all scenarios except Scenario B and B–1. The faculty/staff category indicates a surplus of spaces in all the scenarios except Scenario C–1. Recall that Scenario C–1 represents growth in the faculty/staff and student enrollment as well as a decrease in parking for the long-term future supply.

PARKING ADEQUACY BY ZONE

The parking adequacy for each of the eleven zones has been determined for the three parking demand scenarios and the projected near-term and long-term future parking supply conditions.

SCENARIO A AND A–1

Scenario A represents the existing conditions discussed previously in this report with a deficit of 12 spaces.

Scenario A–1 represents the no growth demand compared to the near-term future effective parking supply. The parking deficit increases to 107 spaces considering the near-term future effective parking supply.

Table 14: Parking Adequacy by Zone Scenario A–1 (spaces)

Zone	Near-Term Effective Supply	Demand	Adequacy
Northeast	529	236	293
East Central	689	1,113	(424)
East	669	388	281
Southeast	813	641	172
South	568	500	68
Southwest	527	560	(33)
West	805	789	16
West Central	87	622	(535)
Northwest	230	629	(399)
North	910	267	643
North Central	557	745	(188)
TOTAL STUDY AREA	6,384	6,491	(107)

Source: Walker Parking Consultants

Again there are parking surpluses in about half of the parking zones while there are parking deficits in the other half. The parking deficit increases in the Northwest Zone is due to the displacement of 100 spaces.

SCENARIO B AND B–1

Scenario B represents the 10 percent reduction in the number of students and faculty/staff. The Scenario B parking demand has been compared to the near-term future effective parking supply and Scenario B–1 looks at the long-term future effective parking supply.

The parking surplus for Scenario B is 531 spaces considering the near-term future effective parking supply.

Table 15: Parking Adequacy by Zone Scenario B (spaces)

Zone	Near-Term Effective Supply	Demand	Adequacy
Northeast	529	213	316
East Central	689	1,002	(313)
East	669	350	319
Southeast	813	579	234
South	568	450	118
Southwest	527	505	22
West	805	714	91
West Central	87	560	(473)
Northwest	230	567	(337)
North	910	241	669
North Central	557	672	(115)
TOTAL STUDY AREA	6,384	5,853	531

Source: Walker Parking Consultants

For Scenario B–1, the surplus decreases to 246 spaces considering the long-term future effective parking supply.

For both Scenarios B and B–1, deficits are noted in the three central zones of the study area (East Central, West Central and North Central Zones), and the Northwest Zone. These deficits are offset by the surpluses in the remaining zones; however, parkers may find it difficult to find a space close to their destination in the West Central and Northwest Zones.

Table 16: Parking Adequacy by Zone Scenario B–1 (spaces)

Zone	Long-Term Effective Supply	Demand	Adequacy
Northeast	529	213	316
East Central	689	1,002	(313)
East	669	350	319
Southeast	813	579	234
South	568	450	118
Southwest	527	505	22
West	805	714	91
West Central	87	560	(473)
Northwest	230	567	(337)
North	720	241	479
North Central	462	672	(210)
TOTAL STUDY AREA	6,099	5,853	246

Source: Walker Parking Consultants

SCENARIO C AND C–1

The Scenario C parking demand (growth scenario based on the Fall 2002 enrollment) has been compared to the near-term future effective parking supply projecting a deficit of 383 spaces.

Table 17: Parking Adequacy by Zone Scenario C (spaces)

Zone	Near-Term Effective Supply	Demand	Adequacy
Northeast	529	240	289
East Central	689	1,142	(453)
East	669	397	272
Southeast	813	680	133
South	568	529	39
Southwest	527	589	(62)
West	805	811	(6)
West Central	87	640	(553)
Northwest	230	663	(433)
North	910	295	615
North Central	557	781	(224)
TOTAL STUDY AREA	6,384	6,767	(383)

Source: Walker Parking Consultants

Deficits are projected in six of the eleven parking zones considering Scenario C. Although the surpluses in the Northeast and East Zones

may offset the deficit in the East Central Zone, the surplus in the North Zone is not great enough to satisfy the deficits in the West Central, Northwest and North Central Zones.

The deficit increases to 668 spaces considering Scenario C–1, the growth demand compared to the long-term future effective supply.

Table 18: Parking Adequacy by Zone Scenario C–1 (spaces)

Zone	Long-Term Effective Supply	Demand	Adequacy
Northeast	529	240	289
East Central	689	1,142	(453)
East	669	397	272
Southeast	813	680	133
South	568	529	39
Southwest	527	589	(62)
West	805	811	(6)
West Central	87	640	(553)
Northwest	230	663	(433)
North	720	295	425
North Central	462	781	(319)
TOTAL STUDY AREA	6,099	6,767	(668)

Source: Walker Parking Consultants

Scenario C–1 is considered the 'worst-case' scenario that is the greatest demand and the lowest supply. The figure on the following page graphically indicates the areas of parking surpluses and deficits.

To satisfy the parking deficit of 668 spaces, it is not simply a case of constructing 668 new parking spaces on campus. The location and the assignment of user groups for any new spaces should be considered. As shown in the table and on the figure, deficits are anticipated in the central and west areas of the campus. The parking deficit in the central western part of campus totals 1,325 spaces in the East Central, West Central, and North Central Zones. The deficit in the western part of campus totals 1,054 spaces in the West, West Central, Northwest and Southwest Zones.

The parking surplus in the eastern part of campus totals 694 spaces in the Northeast, East, and Southeast Zones. The surplus spaces in the eastern part of campus are not likely to offset the deficits in the western part of campus due to the walking distance from the desired destination(s).

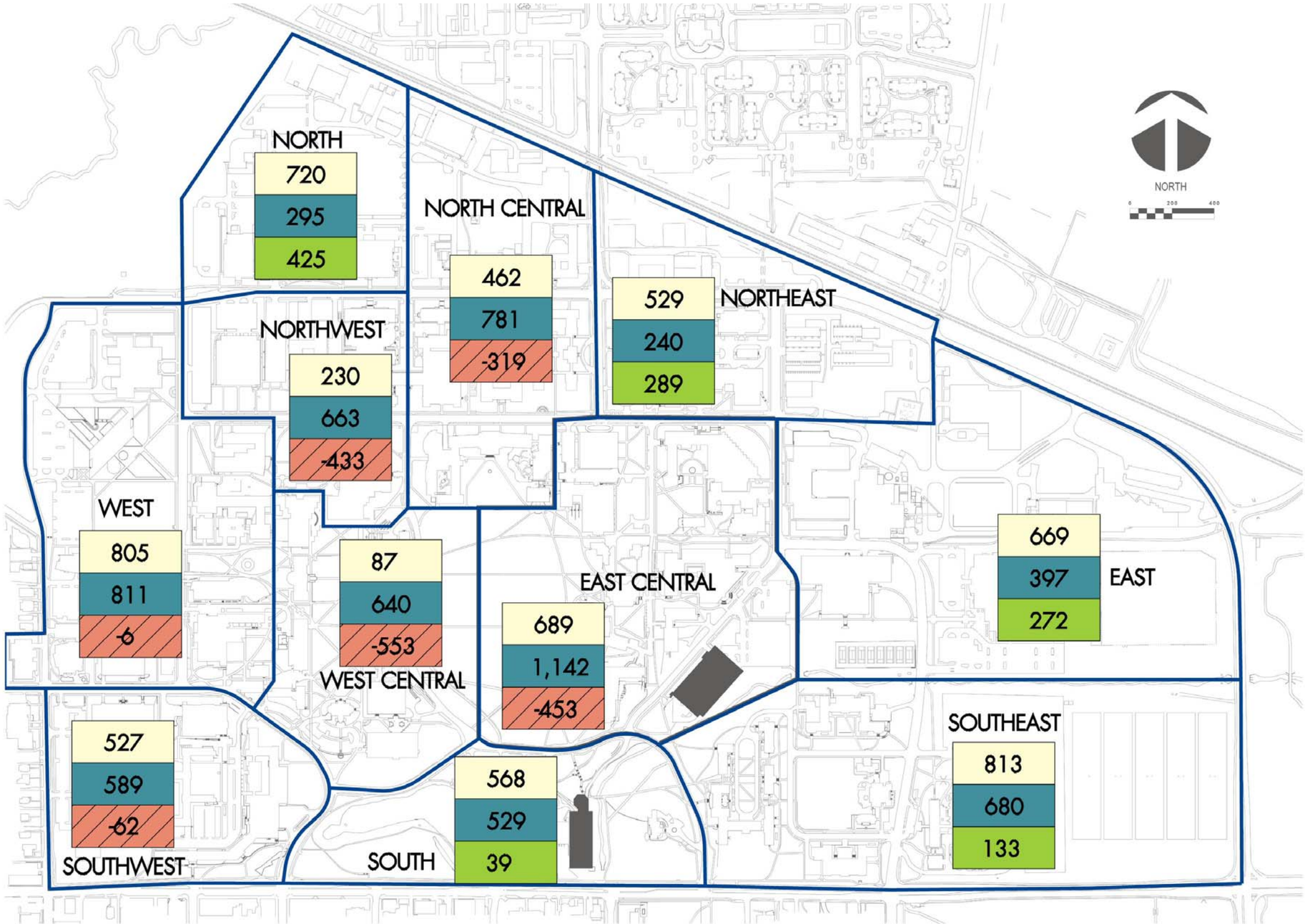


FIGURE 6: PARKING ADEQUACY, SCENARIO C–1

LEGEND:

	TOTAL
EFFECTIVE SUPPLY	6,099
DEMAND	6,767
SURPLUS	–
DEFICIT	-668

ZONE BOUNDARY

PARKING STRUCTURE

WALKING DISTANCE

Typically, a five–minute walking distance from parking areas to destinations is the goal at most Universities. A five–minute walk would be equivalent to approximately 1,200 to 1,500 feet.

The East Campus Parking Deck opened in December of 2003 and has helped to ease the parking pressures in the eastern part of campus. The proposed West Campus Parking Facility and the proposed Intermodal Transportation Center are planned to alleviate the parking pressure on campus as well.

The following figure with three circles of 1,200-feet and 1,500-feet radii (to represent a five-minute walk) are located in the East Central Zone, the West Zone and the North Central Zone.

East Central Zone: The 1,500 foot circle centered on the East Campus Parking Deck extends into the East, Southeast, South, West Central, and Northeast Zones. The parking deficit for Scenario C–1 considering the adequacy in only these zones is 273 spaces.

West Zone: The 1,500 foot circle centered in the West Zone extends into the Northwest, West Central, and Southwest Zones. The parking deficit for Scenario C–1 considering the adequacy in only these zones is 1,054 spaces.

North Central Zone: The 1,500 foot circle centered in the North Central Zone extends into the Northeast, Northwest, and North Zones. The parking deficit for Scenario C–1 considering the adequacy in only these zones is 38 spaces.

As you can see, these 1,500-foot radius circles overlap and therefore simply adding these deficits together would overstate the deficit. The Campus Master Plan recommendations adding a West Campus Parking Facility in the West Zone and an Intermodal Transportation Center in the North Central Zone. It is our understanding that the Intermodal Transportation Center will be served by Cy-ride and is intended to help alleviate the parking deficit in the center core of the campus or specifically the East Central and West Central Zones.

The proposed West Campus Parking Facility should be designed to meet the deficit in the West and Southwest Zones as well as at least one-half of the needs in the West Central and Northwest Zones. For Scenario C–1, this represents approximately 560 new spaces are needed to meet these parking needs. If the entire West Central Zone

parking needs are to be met in the proposed West Campus Parking Facility, then approximately 840 spaces are needed.

Likewise, for the proposed Intermodal Transportation Center, in addition to any needs to accommodate additional commuter students or other user special groups, the deficit in the North Central Zone should be met as well as considering one-half of the parking needs in the North, Northeast and Northwest Zones. In consideration of this facility as an Intermodal facility, we estimate that approximately 50 percent the parking needs in the East Central and West Central Zones could be met in this facility. For Scenario C–1, approximately 680 new spaces are needed to meet these parking needs.

FIGURE 7: WALKING DISTANCES

LEGEND:

ZONE BOUNDARY

PARKING STRUCTURE

CONCLUSIONS AND RECOMMENDATIONS

The total existing parking supply in the study area was established at 7,368 spaces. Approximately 59 percent is for faculty/staff, 14 percent for resident students, 13 percent for commuter students, 11 percent for visitors and others, and 3 percent for handicap/accessible spaces.

The parking supply is adjusted to provide a cushion of spaces needed to accommodate the dynamics of parking such as reducing search time and accounting for cars moving in and out of spaces. By adjusting the supply to provide this cushion, we create an "effective parking supply". The existing effective parking supply is 6,479 spaces.

The Campus Master Plan Projects are typically going to replace or upgrade existing space and thus not create "new" parking demand. Due to the planned construction in the near-term future, the parking supply is expected to decrease by 100 spaces east of the Armory (Northwest Zone). In the long-term future, the parking supply is expected to decrease by about 300 more spaces. For this analysis, we have eliminated 200 spaces in the lot north of Molecular Biology (North Zone) and 100 spaces in the North Central Zone.

The near-term and long-term future parking supply, adjusted by the effective supply factors, is 6,384 and 6,099 spaces, respectively.

Parking demand for Scenario A is 6,491 spaces for the Fall 2004 conditions. The parking demand for Scenario B, considering a 10 percent reduction in the student population, is 5,853 spaces. The parking demand for Scenario C, that represents the peak student population as represented by the Fall 2002 enrollment is 6,767 spaces.

When evaluating parking needs, the demand is compared to the effective supply for the numerical analysis of adequacy. Consideration should also be given to the location of additional parking in relationship to the parking generators and the various user groups.

The parking adequacy is summarized for the three different demand scenarios and the parking supply changes. In considering Scenario C–1, the growth scenario and the long-term future effective parking supply, an overall deficit of 668 spaces is projected.

Table 19: Summary of Parking Needs in the Study Area (spaces)

Scenario:	A Fall 2004	A–1 Fall 2004	B 10% Less	B–1 10% Less	C Growth	C–1 Growth
Effective Supply:						
Existing	6,479					
Near-Term		6,384	6,384		6,384	
Long-Term				6,099		6,099
Parking Demand	6,491	6,491	5,853	5,853	6,767	6,767
Parking Adequacy	(12)	(107)	531	246	(383)	(668)

Source: Walker Parking Consultants

Regardless of the scenario, the projected parking deficits are typically located in the central part of campus. The deficit in the East Central Zone ranges from 313 spaces to 453 spaces. The West Central Zone deficit ranges from 473 spaces to 553 spaces. The deficit in the Northwest Zone varies from 304 spaces to 433 spaces. In the North Central Zone, the deficit varies from 115 spaces to 319 spaces.

Considering the interdependence of parking from one zone to another, the net effect of the parking deficits is concentrated in the West Central and Northwest Zones. The combined deficit in these two zones ranges from 810 spaces for Scenarios B and B–1 up to 986 spaces for Scenarios C and C–1.

The proposed West Campus Parking Facility and the proposed Intermodal Transportation Center would help to alleviate the projected parking shortages.

Considering the proposed West Campus Parking Facility, approximately 560 new spaces may be needed to meet the parking needs projected on the west side of campus within a five to seven minute walking distance.

The proposed Intermodal Transportation Center could meet the parking needs in the northern section of campus and accommodate parkers in the East Central and West Central Zones by using the Cy-ride buses. Approximately 680 new spaces may be needed to meet the parking needs given the Scenario C–1 parking conditions.

APPENDIX A

WALKER
PARKING CONSULTANTS

SCOPE OF SERVICES

TASK 1 - SUPPLY/DEMAND ANALYSIS

1. Meet with the appropriate personnel of Iowa State University to discuss the study's goals and objectives and to confirm campus boundaries, procedures and project schedules.

2. Obtain and review any parking studies completed by Iowa State University in the last fifteen (15) years.

3. Review the Master Plan for Iowa State University including all future plans for expansion and new buildings under construction or planned.

4. Inventory all existing parking spaces on the campus to determine the total number of spaces. During our kickoff meeting and initial visit, we will determine existing parking users, existing user assignments, and parking characteristics.

5. Provide the university with a Background Information Survey to gather vital current and estimated future census and service statistics about Iowa State University.

6. To determine parking characteristics and parking patterns, we will perform occupancy counts (on a day considered a "typical" busy day) for all spaces in the campus study area. Some assistance from university personnel will be required for this task. This assessment will also help us develop parking demand ratios for the user groups of the parking system.

7. Based on the data we obtain, we will determine present and estimate future parking adequacy on the campus. Parking adequacy will be stated in terms of parking space surpluses or deficits and delineated by user groups and parking areas.

8. Assemble all of our findings and recommendations in a draft report for review and presentation to the appropriate institutions and constituencies of the university. Based on the comments received, generate a final report for the university's use.

9. The campus boundaries for this study are approximately Lincoln Way, Sheldon Avenue, Elwood Drive, and the railroad.

10. Fifteen copes of the final report will be submitted.

11. Two trips to Ames, Iowa, are included in this proposal.

APPENDIX B

TABLE B-1: PARKING SUPPLY BY LOT, 2004
Iowa State University
Ames, Iowa

Effective Supply Factor:		0.90	0.85	0.85	0.85	0.90	0.95	0.85	0.85	0.50	0.90	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85		
		Permit Parking										Metered Parking						Reserved Parking			Visitor Parking				
Lot No.	Parking District / Zone	Reserved Permit Req'd 7-5:30 M-F	Reserved Permit Req'd All Hours All Days	Reserved Specific Users All Hours All Days	Reserved Specific Users 7-5:30 M-F	Reserved Students All Hours All Days	General Staff Permit 7-5:30 M-F	Vendor / Department Permit Req'd	Patient / Visitor Permit Req'd	Handicapped Permit Req'd	Construction Parking	Off-Street 30 min	Off-Street 1 hr	Off-Street 2 hr	Off-Street 5 hr	On-Street 30 min	On-Street 1 hr	Resident Student	Loading Zone	Commuter Permit	Pre-Pay	Cashier	Drop Off only 15 min limit	Capacity	Effective Parking Supply
46	East																		2					2	2
47	East		6	6	43				14										2					71	60
57	East	10		1			72			8									1	0				92	83
68	East						277																	277	263
76	East		56						7	2														65	55
78	East	16						2		4			2											24	20
100	East																				219			219	186
43	East Central	52	1		1				10	4														68	59
44	East Central	2			5					2		1												10	8
45	East Central	16	2					7		5	2	9												41	34
49	East Central		10	1				1		13	1													26	18
50A	East Central	70								8														78	67
50B	East Central						144																	144	137
ECPD	East Central	315								8											86			409	361
88	East Central																		2					2	2
92	East Central							3																3	3
12	North						123			3														126	118
27	North	16		1			26	3		4		7												57	50
28	North	11		6	129		200		1	6	2										5			360	325
29	North						0													487				487	414
11E	North																4							4	3
26	North Central		3	8	43			1	1	8										0	2			66	53
30	North Central						180																	180	171
31	North Central						37		2										9	0	8			56	51
32	North Central	9																			1			10	9
33	North Central																							0	0
34	North Central	14					34			2														50	46
35	North Central	32					71																	103	96
36	North Central	36	4							9		1								0				50	41
37	North Central	14	3							4									1	0				22	18
38	North Central	7		1	5					8	10	3							2					36	29
87-Osbourn Dr	North Central							50																50	43
39	Northeast	11		10	3			2	1	4														31	26
40	Northeast	57		4	1				2	4		5												73	64
41 & 41A	Northeast	28		2	1		299	1		1		2								0				334	315
79	Northeast	17		2	2		106	2											2		1			132	124
16	Northwest									7		1												8	4
21	Northwest			1				1		5											119			126	105
22	Northwest	62	5	16				3		2														88	77
23	Northwest	105		1						4														110	97
24	Northwest	14	2	3	1			3		1		1		1					2					28	24
25	Northwest			2						4				14					3					23	18
52	South	5								1														6	5
53	South							1							11									12	10
72	South			3																				3	3
Union Ramp	South	95																				540		635	545
86	South			6																				6	5
54	Southeast				16	9	19			10									5					59	49

TABLE B-1: PARKING SUPPLY BY LOT, 2004
Iowa State University
Ames, Iowa

Effective Supply Factor:		0.90	0.85	0.85	0.85	0.90	0.95	0.85	0.85	0.50	0.90	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85		
		Permit Parking										Metered Parking						Reserved Parking			Visitor Parking				
Lot No.	Parking District/Zone	Reserved Permit Req'd 7-5:30 M-F	Reserved Permit Req'd All Hours All Days	Reserved Specific Users All Hours All Days	Reserved Specific Users 7-5:30 M-F	Reserved Students All Hours All Days	General Staff Permit 7-5:30 M-F	Vendor/ Department Permit Req'd	Patient/ Visitor Permit Req'd	Handicapped Permit Req'd	Construction Parking	Off-Street 30 min	Off-Street 1 hr	Off-Street 2 hr	Off-Street 5 hr	On-Street 30 min	On-Street 1 hr	Resident Student	Loading Zone	Commuter Permit	Pre-Pay	Cashier	Drop Off only 15 min limit	Capacity	Effective Parking Supply
55	Southeast	4										2												6	5
56	Southeast			49	25															0				74	63
63	Southeast					91				4								607	10	0			7	719	614
66	Southeast			9																				9	8
67	Southeast			1			18													0	1			20	19
80	Southeast			17																				17	14
81	Southeast	5								1		1												7	6
82	Southeast			13																				13	11
83	Southeast			2	4					1														7	6
89	Southeast				9					2														11	9
90	Southeast			5						2														7	5
91	Southeast			3						3														6	4
1	Southwest	101	2				17	2		3		6												131	117
59A	Southwest					216																		216	194
59 B-E	Southwest			52	72	93		9		22		5							5	0				258	216
2	West	1		2	13				18	3														37	30
3	West	59	1	6		4	45			6		4		8						0				133	119
4	West		19	1				1		5														26	20
6	West	22					110	1		2														135	126
7	West						53			2														55	51
8	West			6				3		6														15	11
9	West	57					70			6		4							4					141	128
10	West						152			2				4										158	149
11	West	39					47	2		5	1	2		13						0				109	98
13	West	23	2	4				1		1		1								0				32	28
14	West	13								13														26	18
15	West	18	1					1		2														22	19
11W	West																9							9	8
5	West Central	13								1														14	12
17	West Central		2	1															1					4	3
18	West Central			5	10			1		4		4												24	19
19	West Central		4					2		1										0				7	6
65	West Central							1	34	7														42	33
84	West Central		4					12																16	14
	TOTAL	1,369	127	250	383	413	2,100	116	90	245	16	59	2	40	11	0	13	607	51	487	442	540	7	7,368	6,479
		19%	2%	3%	5%	6%	29%	2%	1%	3%	0%	1%	0%	1%	0%	0%	0%	8%	1%	7%	6%	7%	0%	100%	88%

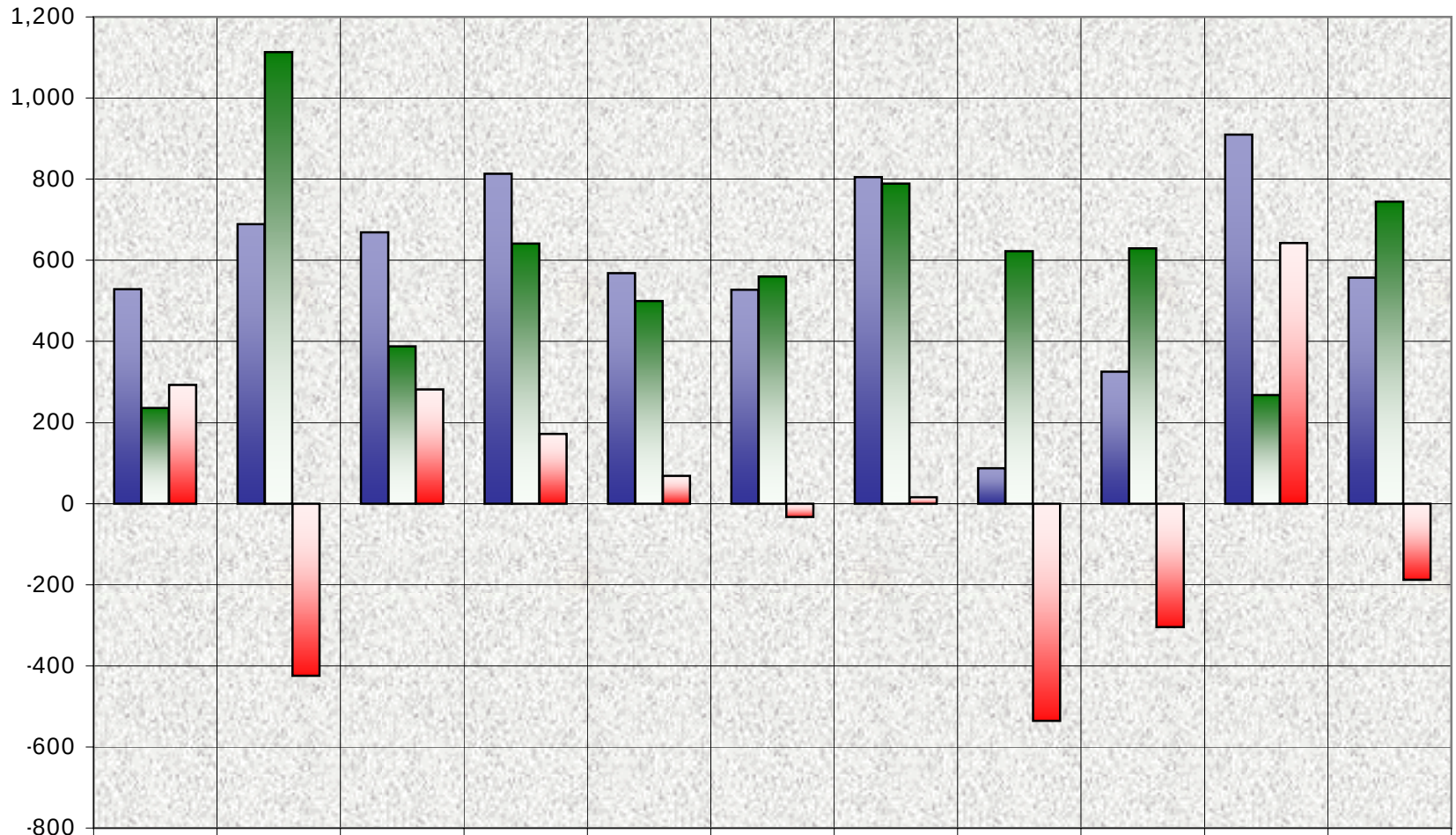
TABLE B-1: PARKING SUPPLY BY ZONE, 2004

Iowa State University

Ames, Iowa

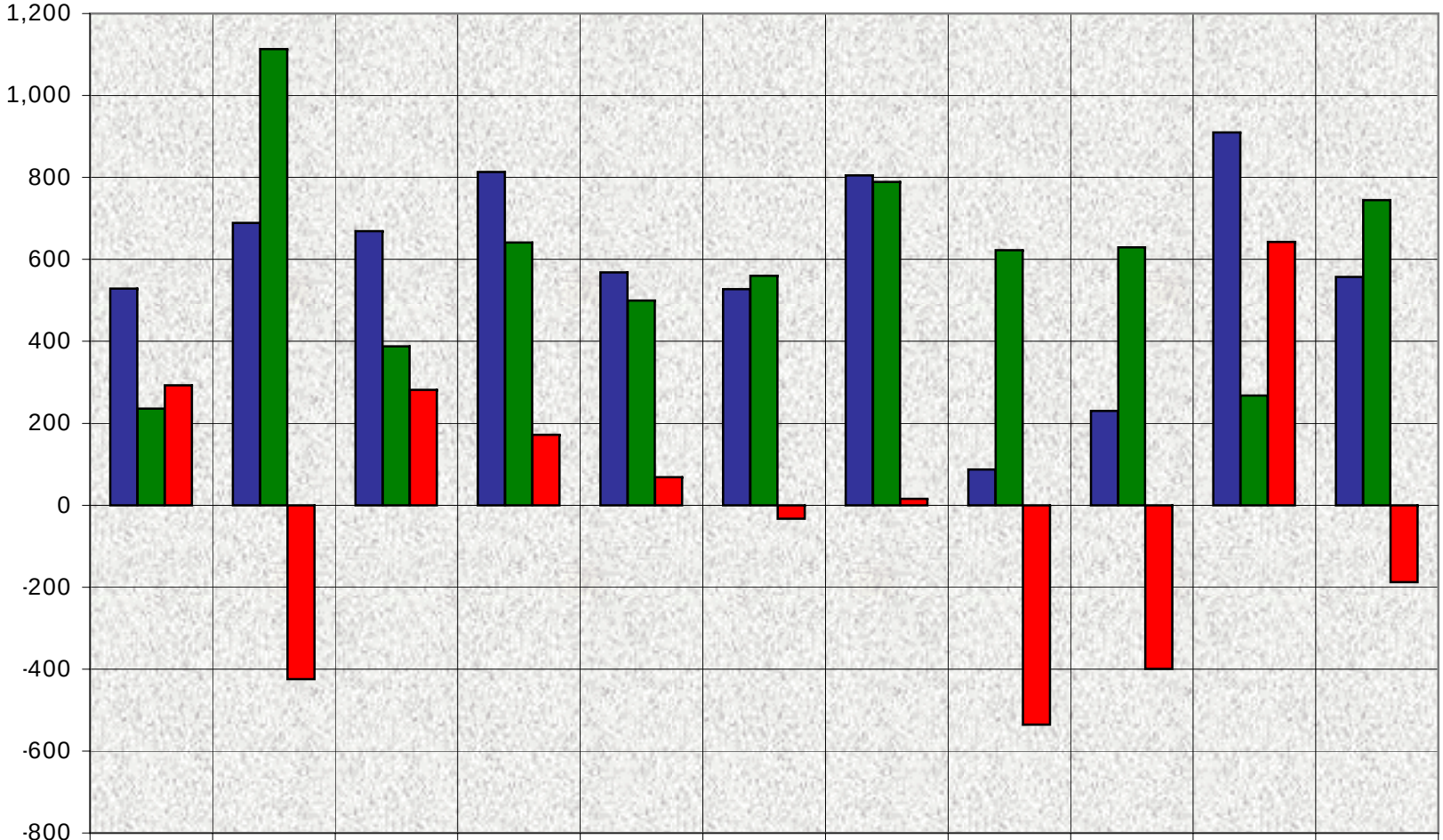
Effective Factor:	0.90	0.85	0.85	0.85	0.90	0.95	0.85	0.85	0.50	0.90	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85		
	Permit Parking										Metered Parking						Reserved Parking			Visitor Parking				
											Off-Street				On-Street									
Parking District / Zone	Reserved Permit Req'd 7-5:30 M-F	Reserved Permit Req'd All Hours All Days	Reserved Specific Users All Hours All Days	Reserved Specific Users 7-5:30 M-F	Reserved Students All Hours All Days	General Staff Permit 7-5:30 M-F	Vendor / Department Permit Req'd	Patient / Visitor Permit Req'd	Handicapped Permit Req'd	Construction Parking	30 min	1 hr	2 hr	5 hr	30 min	1 hr	Resident Student	Loading Zone	Commuter Permit	Pre-Pay	Cashier	Drop Off only 15 min limit	Capacity	Effective Parking Supply
North	27	0	7	129	0	349	3	1	13	2	7	0	0	0	0	4	0	0	487	5	0	0	1,034	910
Northwest	181	7	23	1	0	0	7	0	23	0	2	0	15	0	0	0	0	5	0	119	0	0	383	325
North Central	112	10	9	48	0	322	51	3	31	10	4	0	0	0	0	0	0	12	0	11	0	0	623	557
Northeast	113	0	18	7	0	405	5	3	9	0	7	0	0	0	0	0	0	2	0	1	0	0	570	529
West	232	23	19	13	4	477	9	18	53	1	11	0	25	0	0	9	0	4	0	0	0	0	898	805
West Central	13	10	6	10	0	0	16	34	13	0	4	0	0	0	0	0	0	1	0	0	0	0	107	87
East Central	455	13	1	6	0	144	11	10	40	3	10	0	0	0	0	0	0	2	0	86	0	0	781	689
East	26	62	7	43	0	349	2	21	14	0	0	2	0	0	0	0	0	5	0	219	0	0	750	669
Southwest	101	2	52	72	309	17	11	0	25	0	11	0	0	0	0	0	0	5	0	0	0	0	605	527
South	100	0	9	0	0	0	1	0	1	0	0	0	0	11	0	0	0	0	0	0	540	0	662	568
Southeast	9	0	99	54	100	37	0	0	23	0	3	0	0	0	0	0	607	15	0	1	0	7	955	813
TOTAL	1,369	127	250	383	413	2,100	116	90	245	16	59	2	40	11	0	13	607	51	487	442	540	7	7,368	6,479

SCENARIO A



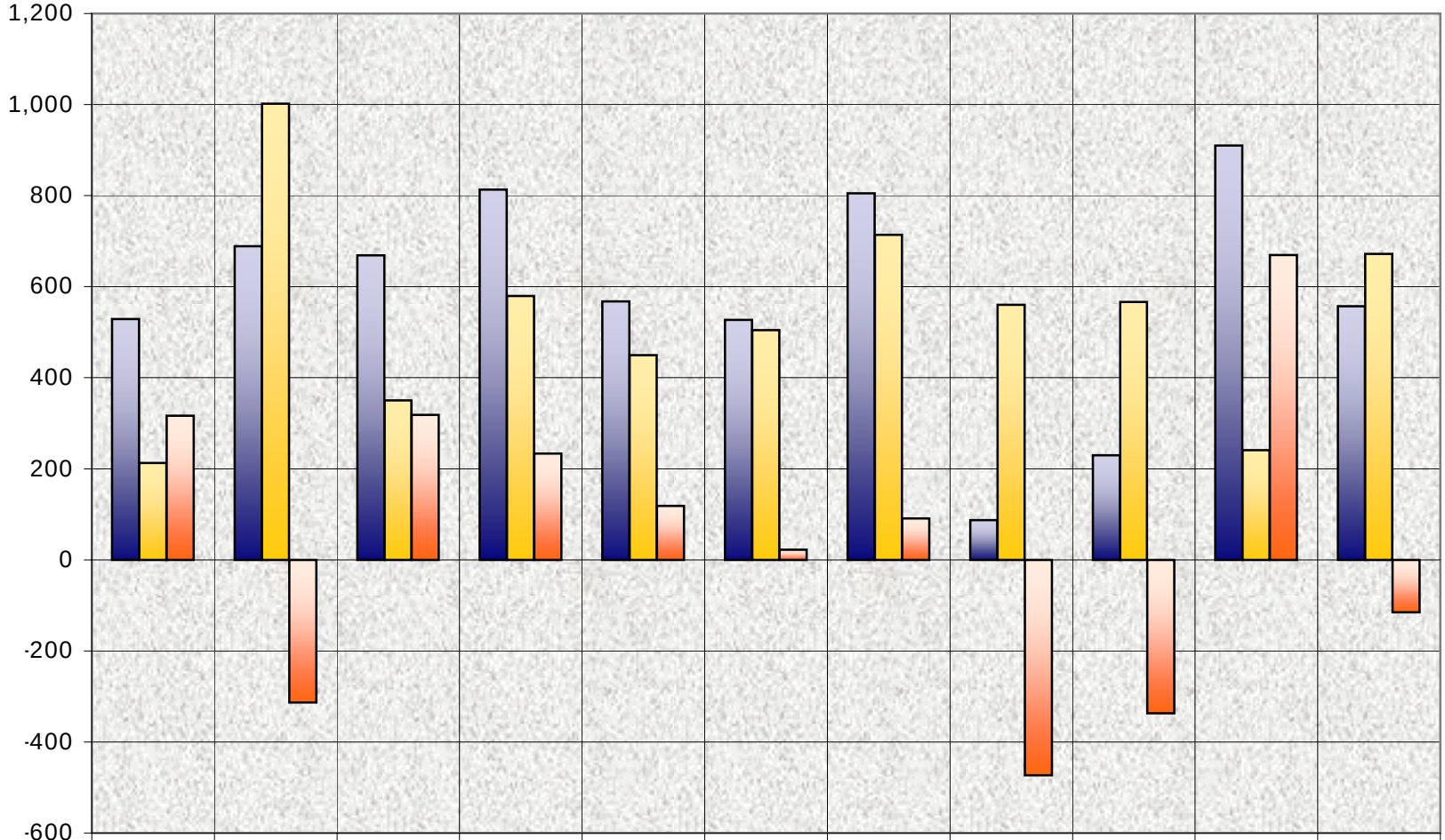
	Northeast	East Central	East	Southeast	South	Southwest	West	West Central	Northwest	North	North Central
Effective Supply	529	689	669	813	568	527	805	87	325	910	557
Demand	236	1,113	388	641	500	560	789	622	629	267	745
Adequacy	293	(424)	281	172	68	(33)	16	(535)	(304)	643	(188)

SCENARIO A-1



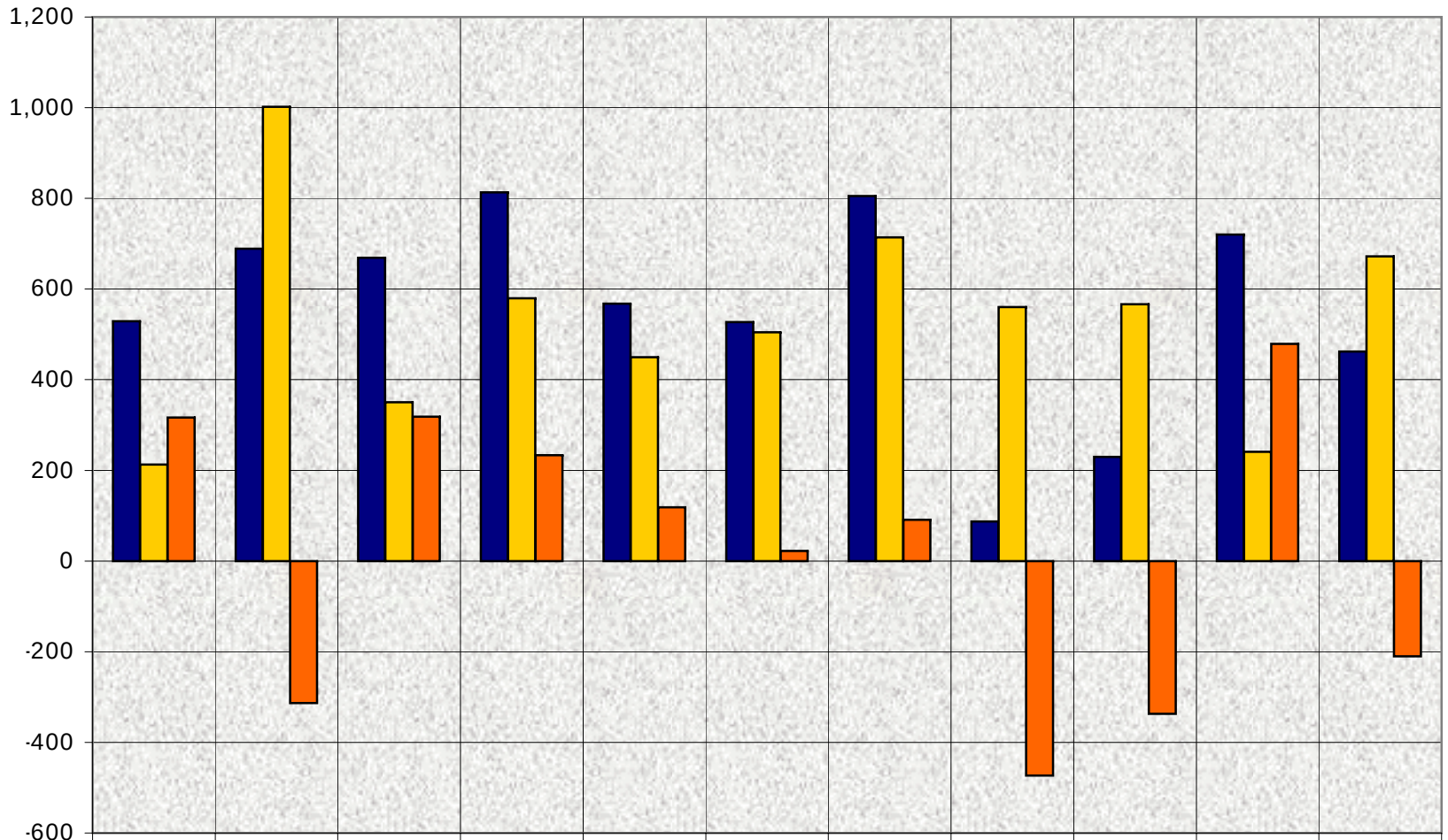
	Northeast	East Central	East	Southeast	South	Southwest	West	West Central	Northwest	North	North Central
Near-Term Supply	529	689	669	813	568	527	805	87	230	910	557
Demand	236	1,113	388	641	500	560	789	622	629	267	745
Adequacy	293	(424)	281	172	68	(33)	16	(535)	(399)	643	(188)

SCENARIO B



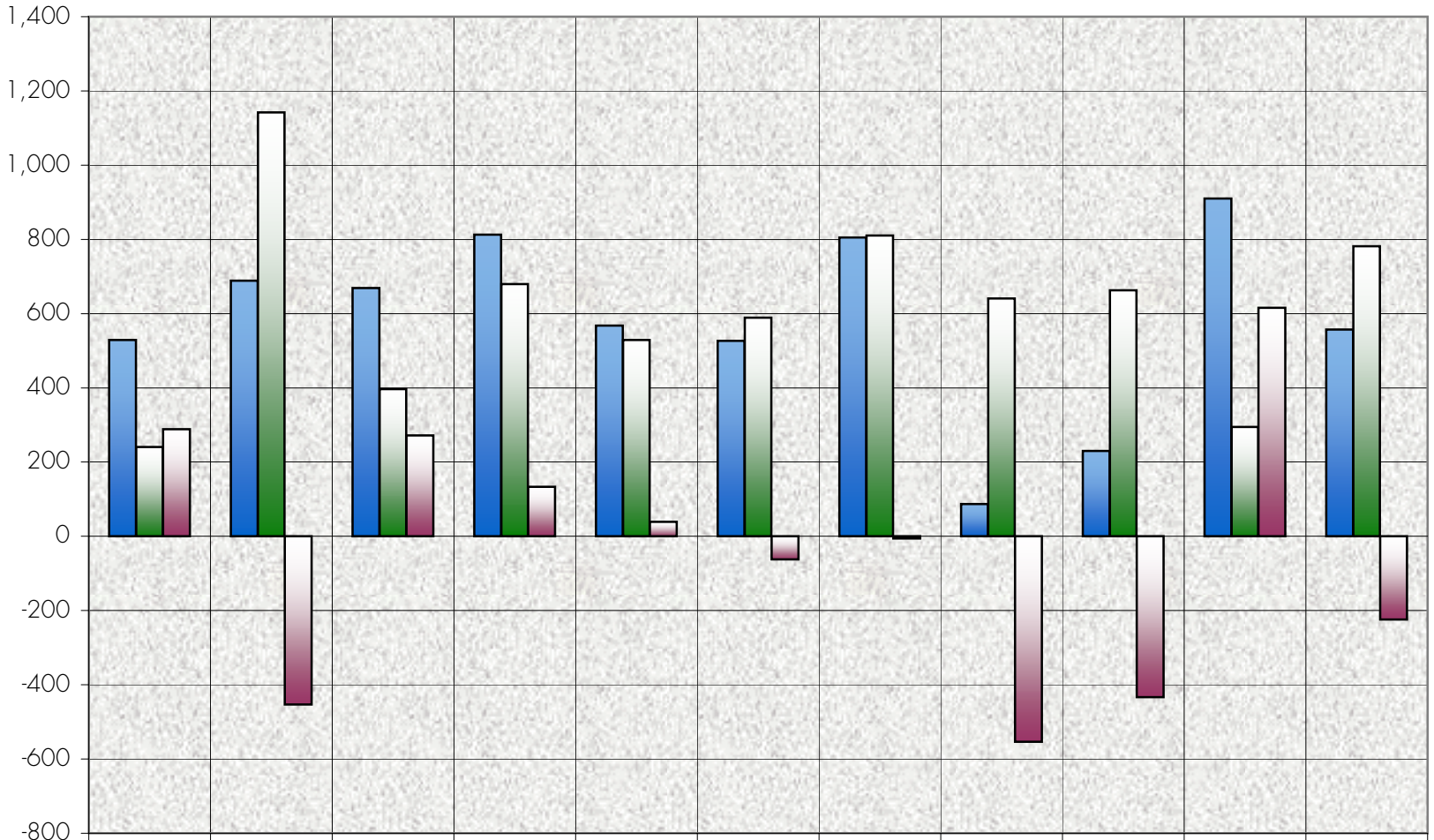
	Northeast	East Central	East	Southeast	South	Southwest	West	West Central	Northwest	North	North Central
Near-Term Supply	529	689	669	813	568	527	805	87	230	910	557
Demand	213	1,002	350	579	450	505	714	560	567	241	672
Adequacy	316	(313)	319	234	118	22	91	(473)	(337)	669	(115)

SCENARIO B-1



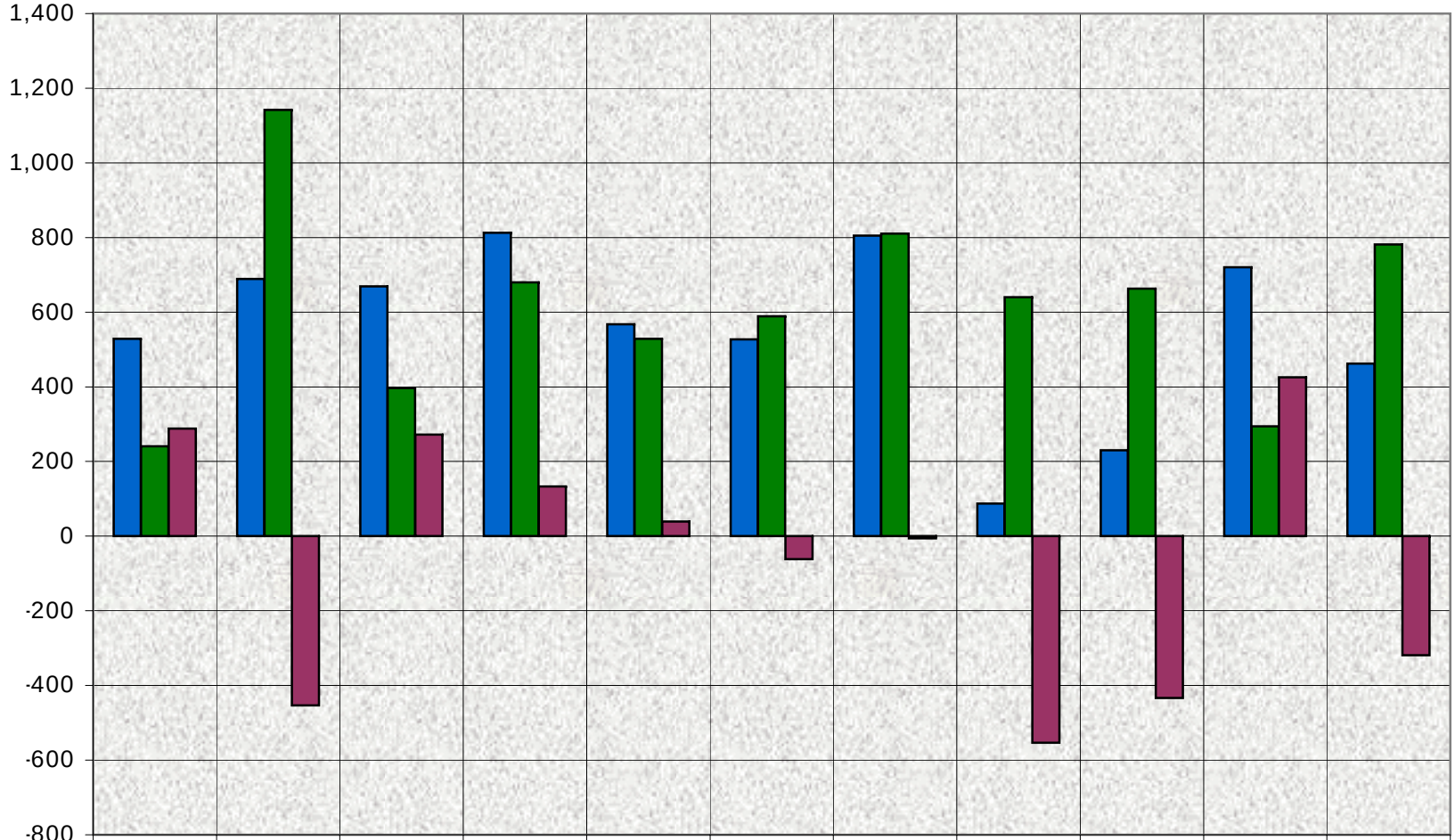
	Northeast	East Central	East	Southeast	South	Southwest	West	West Central	Northwest	North	North Central
Long-Term Supply	529	689	669	813	568	527	805	87	230	720	462
Demand	213	1,002	350	579	450	505	714	560	567	241	672
Adequacy	316	(313)	319	234	118	22	91	(473)	(337)	479	(210)

SCENARIO C



	Northeast	East Central	East	Southeast	South	Southwest	West	West Central	Northwest	North	North Central
Near-Term Supply	529	689	669	813	568	527	805	87	230	910	557
Demand	240	1,142	397	680	529	589	811	640	663	295	781
Adequacy	289	(453)	272	133	39	(62)	(6)	(553)	(433)	615	(224)

SCENARIO C-1



	Northeast	East Central	East	Southeast	South	Southwest	West	West Central	Northwest	North	North Central
Long-Term Supply	529	689	669	813	568	527	805	87	230	720	462
Demand	240	1,142	397	680	529	589	811	640	663	295	781
Adequacy	289	(453)	272	133	39	(62)	(6)	(553)	(433)	425	(319)