INTRODUCTION

In order to have a sustainable transportation system at the University of Idaho three goals must be achieved. These goals will be social, economical, and environmental in orientation. Socially the goal will be to have a healthy and equitable transportation system providing diversity between modes of transportation. Economically the goal will be to have a cost efficient transportation system that is affordable to the university, students, and taxpayers. Environmentally the goal will be to have efficient land usage practices not invade on habitat and also not cause excessive emissions by unnecessary travel. To sustain the transportation system a datum or benchmark must be set. This project will not be able to see all trends of sustainability, but will obtain the datum or present condition of the transportation system. Indicators will be needed to set the standards and monitor these goals.

Health and equity will be monitored by the indicators of health and fitness and mobility for non-drivers. Cost efficiency will use the indicator of facilities costs to the University for parking and roads improvements. Land use mix will be the indicator for the environmental goal. The following document will explain in depth each indicator, specific details to quantify them, and other goals they will satisfy. Also the implications of using an indicator by itself and the affects of transportation developments on the indicators will be discussed. There is a data analysis section that will contain the quantified measures of each indicator, supporting data, and methods.

DISCUSSION OF INDICATORS

The following four sections will define, discuss, and give purpose for each indicator for the social, economical, and environmental goals. Each section will also include paragraphs explaining how the indicator will fit into different goals. The quantified results for each indicator are in the analysis section.

HEALTH AND FITNESS

A sustainable transportation system at the University of Idaho that promotes health and fitness is essential. Our goal is to sustain or improve the current health and fitness of students, faculty, and employees by encouraging walking and bike riding. More detailed areas of the indicator that will monitor the plan will be percentage of people who walk and the percentage of people who bike. Another specific area of interest will be intermodel locations and the percentage of campus that is accessible by walking from these locations. Data for these specific areas will come from a survey conducted on campus and a walking time data collection from intermodel locations on campus.

The health and fitness indicator also fits into the economic and environmental goals for a sustainable transportation system. Economically health and fitness indicator will affect the cost efficiency with people choosing more healthy modes of travel like walking and bike riding. On the contrary a healthy transportation system could affect economics

negatively by exposing more people to being injured in the winter when conditions are dangerous for walking. Environmentally a healthy transportation system reduces emissions by mode choice. Also it could lead to different land use practices to allow for more trees and grass areas that will not be needed for vehicular travel.

MOBILITY FOR NON-DRIVERS

The indicator mobility for non-drivers is defined as the quality of accessibility and transport services for non-drivers. This works toward the equitable goal and high quality is needed to achieve the goal. Detailed specifics to quantify this indicator are similar to health and fitness with the addition of quality of bus and walking services. Data will come from a survey conducted on campus.

The mobility for non-drivers indicator fits under other goals as well. Economically it is often focused on transportation options available to non-drivers, particularly those who are physically or economically disadvantaged. It provides a cheaper way to commute within the city, providing accessibility to different services for more people. In terms of the environment, mobility for non-drivers promotes the use of transportation modes that do not pollute the environment. In terms of society, this indicator measures the availability of transportation services. For example walking, bicycling, mobility aids, and wheelchairs paths. Accessibility to commercial areas and job opportunities, variety of transportation modes and transportation facilities must provide the same conditions for all people in the society. Finally, mobility for non-drivers promotes equity to non-drivers, low-income people and those with physical disabilities in the society.

FACILITY COSTS

Facility costs are that per capita expenditure paid on roads, traffic services and parking facilities. Also the cost of parking to the user should be monitored because of the effect that facility cost will have on the price of parking for the user. If facility costs are higher, then it will reflect on parking prices. Prices should be set in such a way that costs should be recovered and also at the same time people must be satisfied. It will increase the use of parking lots in a more efficient manner. If the parking fee is increased more than required then that will have significant impact in the commute speed and consumer transport costs. The commute speed will be reduced because people will choose slower transportation modes. Even modest parking fees can affect the vehicle travel pattern depending upon the trip characteristics.

Detailed specifics for facility costs will include parking and road improvement costs, parking permit prices and the percentage of people who use them. The data will come from survey administered on campus and University of Idaho Facilities and Services budget information.

This facility cost indicator fits all three goals. Socially the percentage of a sample population that uses the parking system will indicate the diversity and equity of the transportation system. Environmentally the same sample will also indicate the amount of emissions and land use practices. Since the indicator is labeled as cost it can assumed that it fits the economic goal.

LAND USE MIX

Land use mix will be a measure of job opportunities and the available commercial services within 10 minutes travel distance of the university. This will show the density of the population and the effectiveness of the land use practices. It will indicate whether roads are planned and positioned properly to provide efficient routes for the work force and consumers. Environmentally this means that there is no excessive encroachment on habitat. Specific details to quantify the indicator will be the percentages of the population that live within a ten-minute travel distance of commercial and employment opportunities.

Land use mix measures economic, social and environmental qualities of transportation system to a large extent. Economically land use mix indicates how well the community uses the land for their economical objectives. Socially it indicates diversity of transportation modes and density characteristics. Environmentally it shows how well the land is being used and how it works with surrounding habitat.

TRANSPORT DEVELOPMENTS AFFECTING INDICATORS

There are many developments that could affect the use of an indicator. For example if a light rail system were implemented in the city. This will affect health and fitness in a negative way by decreasing the amount of the population who rides a bike or walks to their destination. It will positively affect the mobility for non-drivers because more people will choose not to drive and take the rail instead. Facility costs may be affected in both directions. It will be affected negatively if the university will have to contribute a large amount of funds to the system. Positively it may promote more students with increased accessibility to the campus. A light rail system will impact land use mix by dispersing the population from the ten-minute travel distance and possibly encroach on habitat.

IMPLICATIONS OF USING INDICATORS ALONE

Many conventional transportation improvement strategies solve one or two problems, but generate others. For example, increasing the capacity on a highway may help reduce traffic congestion but it will tend to increase traffic volumes and mileage, which goes against the economic, social and environmental objectives. The appropriate use of indicators is an important issue. An individual indicator can show a specific necessity but it can have negative effects. For example, an indicator can show that is necessary reduce parking costs but it encourages inefficient use of parking facilities; it also increases traffic

congestion, roadway costs, crashes and pollution. Similarly, under pricing road use increases not only congestion and roadway costs, but also parking costs, traffic accidents and pollution.

Transportation activities have so many impacts related to sustainability. For this reason is important to identify indicators that help achieve multiple objectives, looking forward to fulfill the three transportation sustainability dimensions (economic, social and environment), and avoid those that solve just one transportation problem and exacerbate others. The most sustainable are those that simultaneously help reduce traffic congestion, pollution, crashes and consumer costs, increase mobility options for non-drivers, and others, or at least avoid having conflicting effects between them.

ANALYSIS OF INDICATORS

The following section has quantified results for the indicators discussed above. Some of the indicators use the same results which signifies that we are attempting to simultaneously achieve our goals without creating other problems.

Health and fitness and Mobility for Non-Drivers:

The following charts table and maps show the detailed information for the health and fitness indicator as well as the mobility for non-drivers

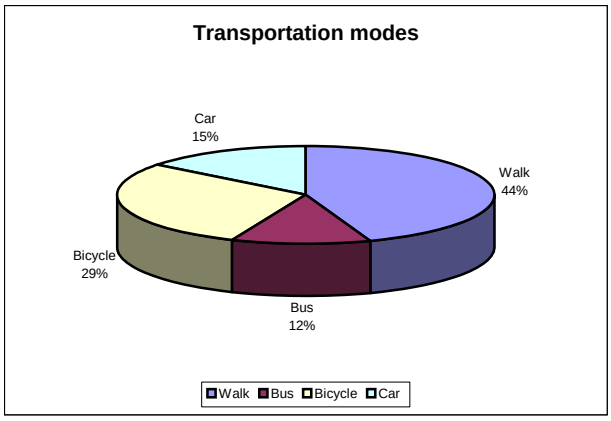


Chart 1

Chart 1 shows the current usage and dispersion on the various transportation modes available.

Transp Modes	*Nº people*	*%*
Walk	98	44.55%
Bus	26	11.82%
Bicycle	64	29.09%
Car	32	14.55%
Total	220	100.00%

Table 1

Table 1 is a tabular form of Chart1. The total number of people specified is the sample that was surveyed on campus.

BUS	3.5
WALKING	4.2
PARKING	2.4

Table 2

Table 2 shows the overall view of the bus, walking, and parking services available to the people surveyed. They were asked to answer on a scale of 1 to 5. 1 was bad service and 5 was excellent service. The table suggests that the sample population, on average, is neutral to satisfactory as a response to the walking and bus service, but leans toward poor for the parking.

Walking accessibility maps are in the appendix and labeled for the intermodel location and walking time accessibility.

Facility Costs:

Facility Costs	
FY05	$112,409
FY06	$22,815

Table 3

Table 3 shows the facility cost to the University for road and parking improvements. The amounts indicated are for their respective fiscal year. Fiscal year 2006 amount is the amount planned and spent to date. There are plans for more spending in the spring.

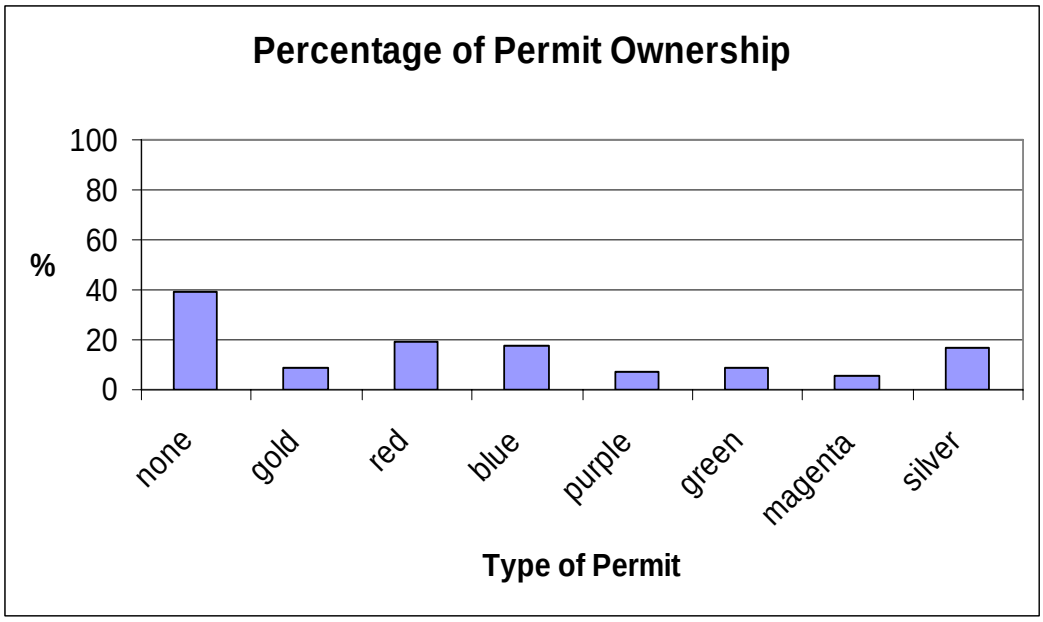


Chart 2

Chart 2 shows the percentages of permit ownership for the population sampled.

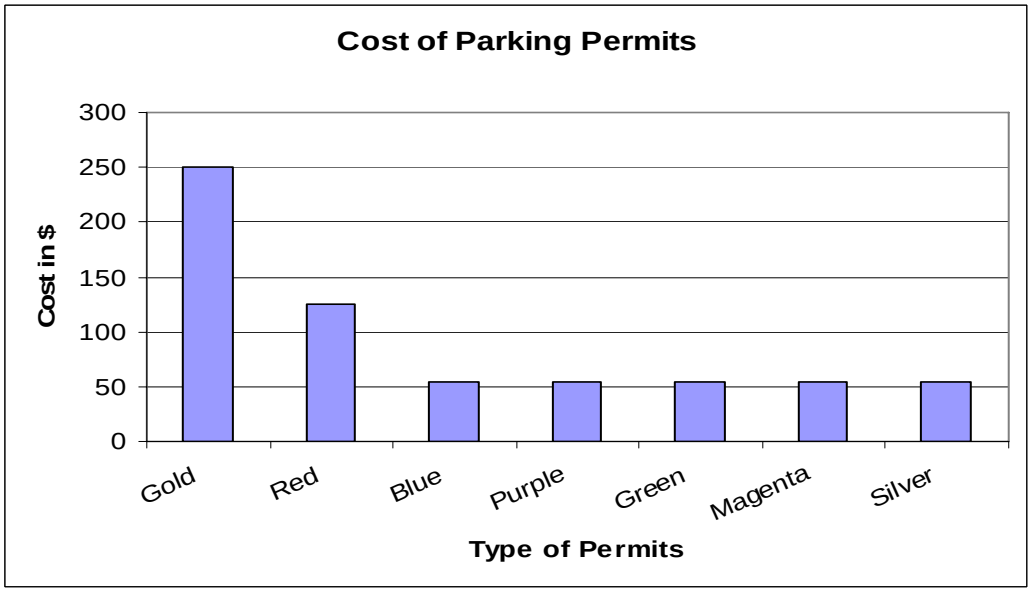


Chart 3

Chart 3 shows the cost of the individual parking permits to the user.

Land use mix:

The percentage of people within 10 minutes travel distance from employment opportunities and commercial services has been calculated. The results are shown in Table 4 and Chart 4 below.

LAND USE MIX	
NUMBER OF PEOPLE- INSIDE 10 min TRAVEL DISTANCE	9875
MOSCOW TOTAL POPULATION	24955
% OF PEOPLE - INSIDE 10 min TRAVEL DISTANCE	39.57%
NUMBER OF PEOPLE- OUTSIDE 10 min TRAVEL DISTANCE	3042
MOSCOW TOTAL POPULATION	24955
% OF PEOPLE - OUTSIDE 10 min TRAVEL DISTANCE	12.19%
NUMBER OF PEOPLE - COMERCIAL AREA	12038
MOSCOW TOTAL POPULATION	24955
% OF PEOPLE - OUTSIDE 10 min TRAVEL DISTANCE	48.24%

Table 4

These values show that almost half of the population of Moscow lives within a 10 minutes travel distance to the commercial area and employment opportunities. It means that from anywhere around the city a person can have access to the commercial area just by walking. But there is 12% that does not have this benefit, it indicates that the northern part of the city needs a depth study in order to determine whether or not a new commercial area may be develop there.

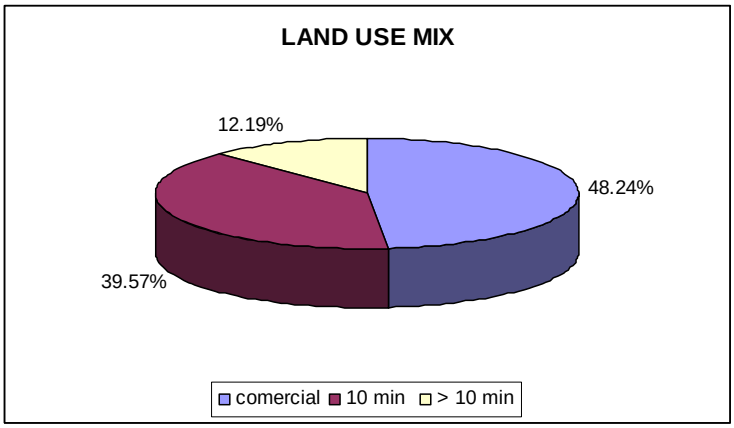


Chart 4

INDICATOR PREPARATION

SUPPORTING DATA

Survey information and the walking accessibility maps are in the appendix.

PROCESSING METHOD

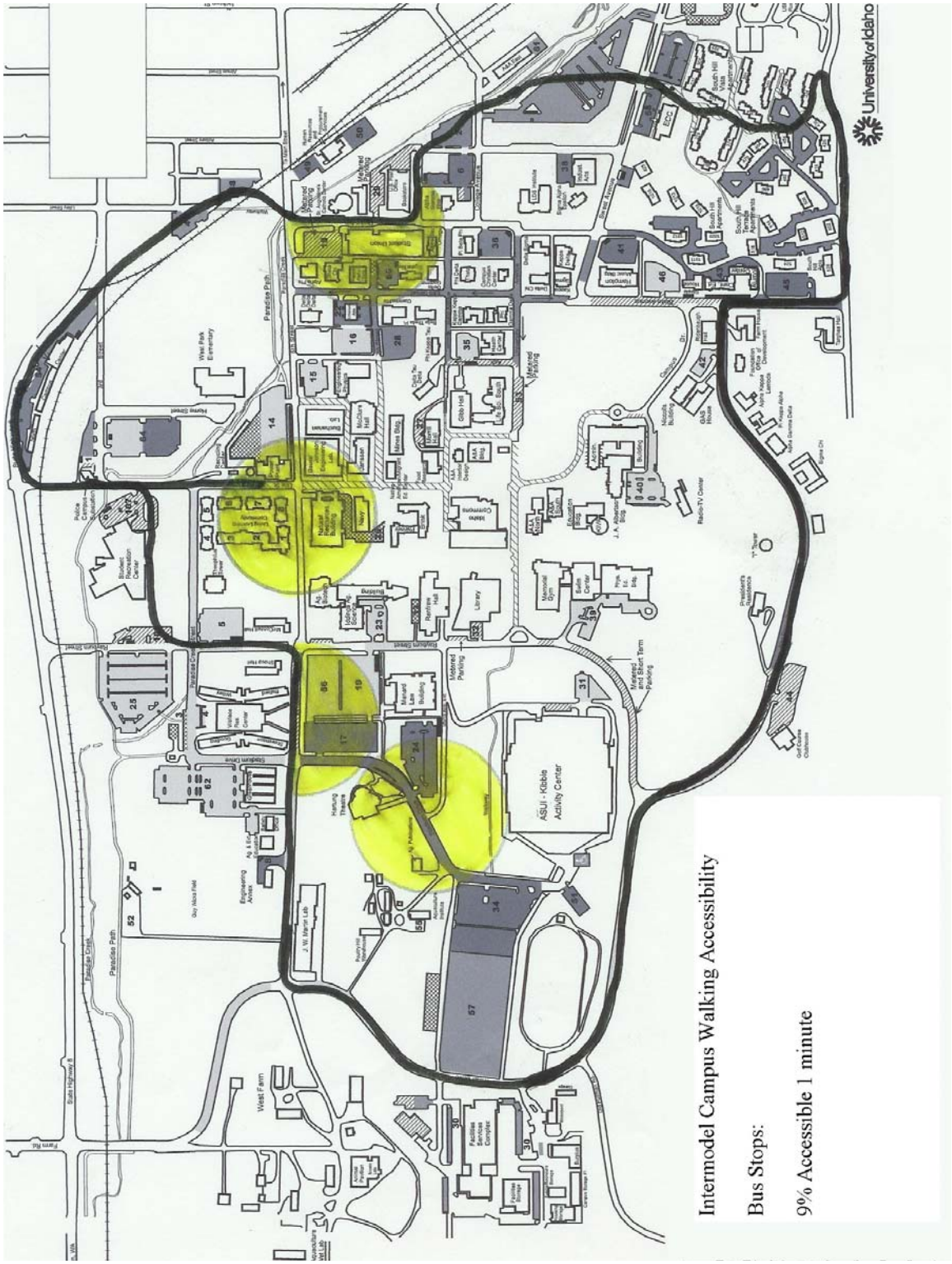
The processing method for the health and fitness indicator was to create and administer a survey tool and analyze the results. The walking accessibility maps were created by a data collection of walking times from various intermodel locations on the campus. Mobility for non-drivers used the same approach.

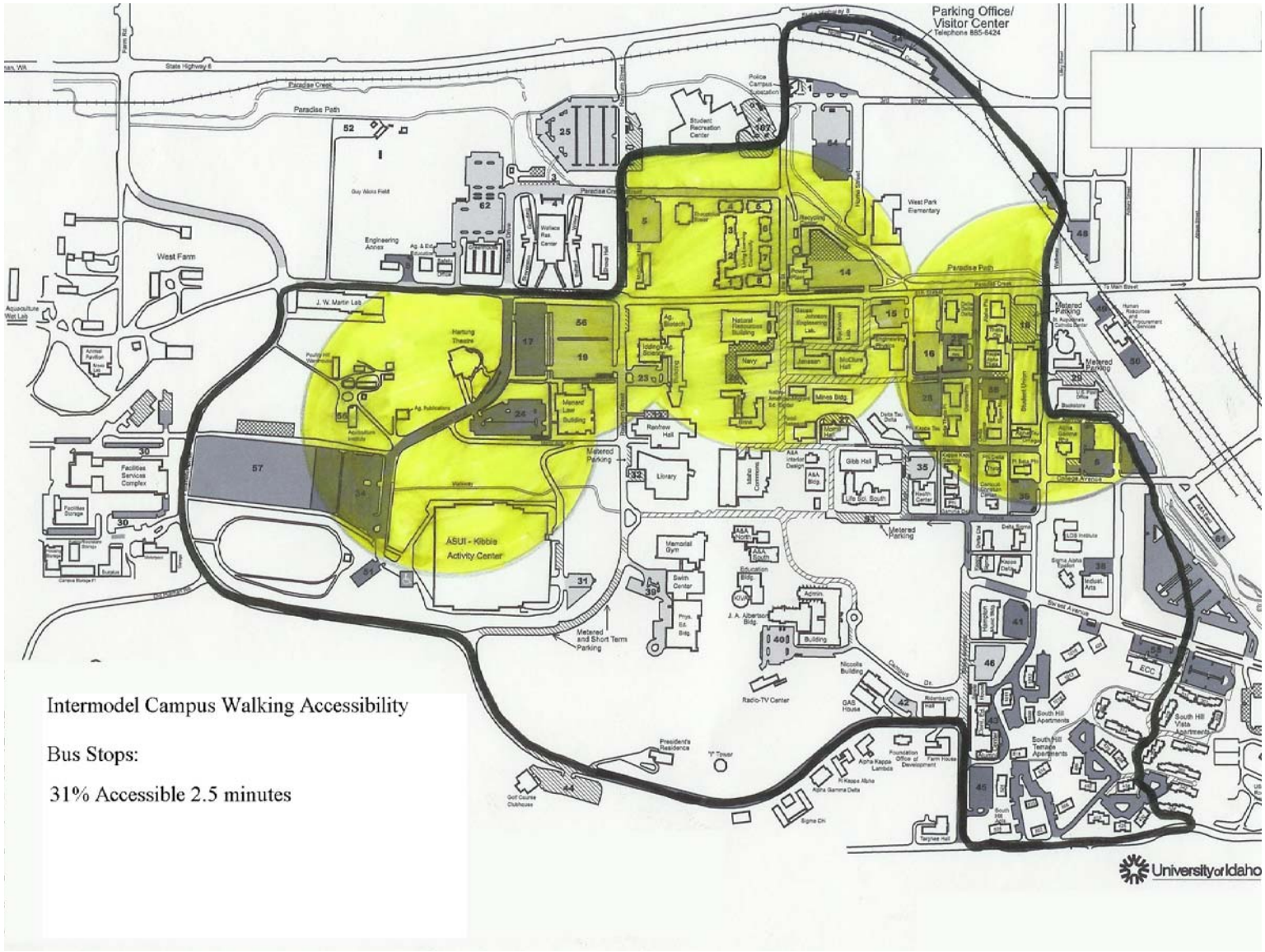
The method used to obtain facility cost data used the survey, University of Idaho Parking Services website, and direct phone conversations with University of Idaho Facilities and Services budget personnel.

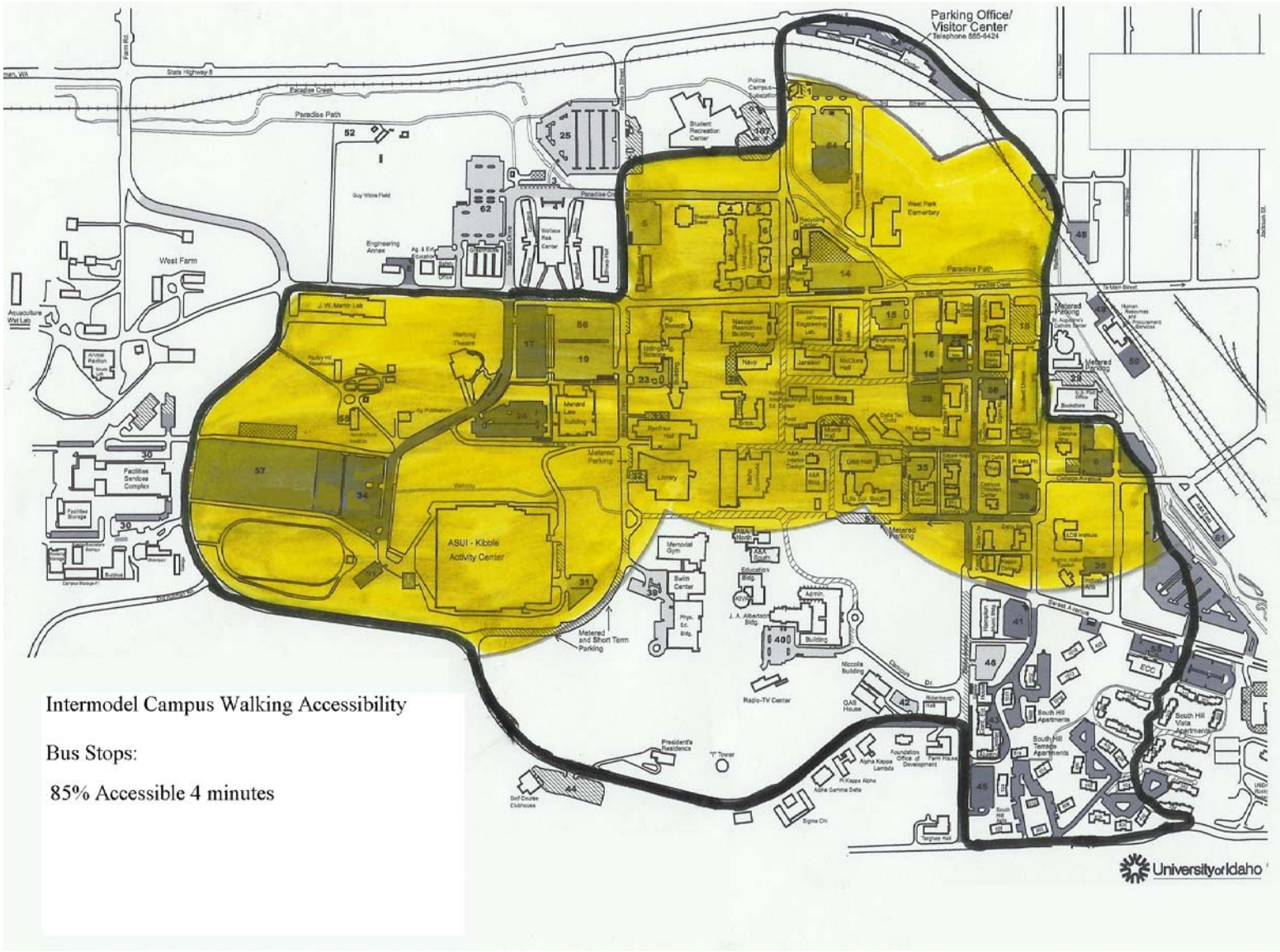
The source of the data for the land use mix was the US Census web page. The block population and block maps to the city of Moscow have been downloaded from that web site. The employment opportunities and commercial area were defined on the maps. The 10 minutes travel distance was calculated assuming and average speed of 2.5 mph. After that, a buffer of 10 minutes was defined on the maps. Finally the numbers of blocks within those two areas were counted. The areas outside of this buffer were also counted.

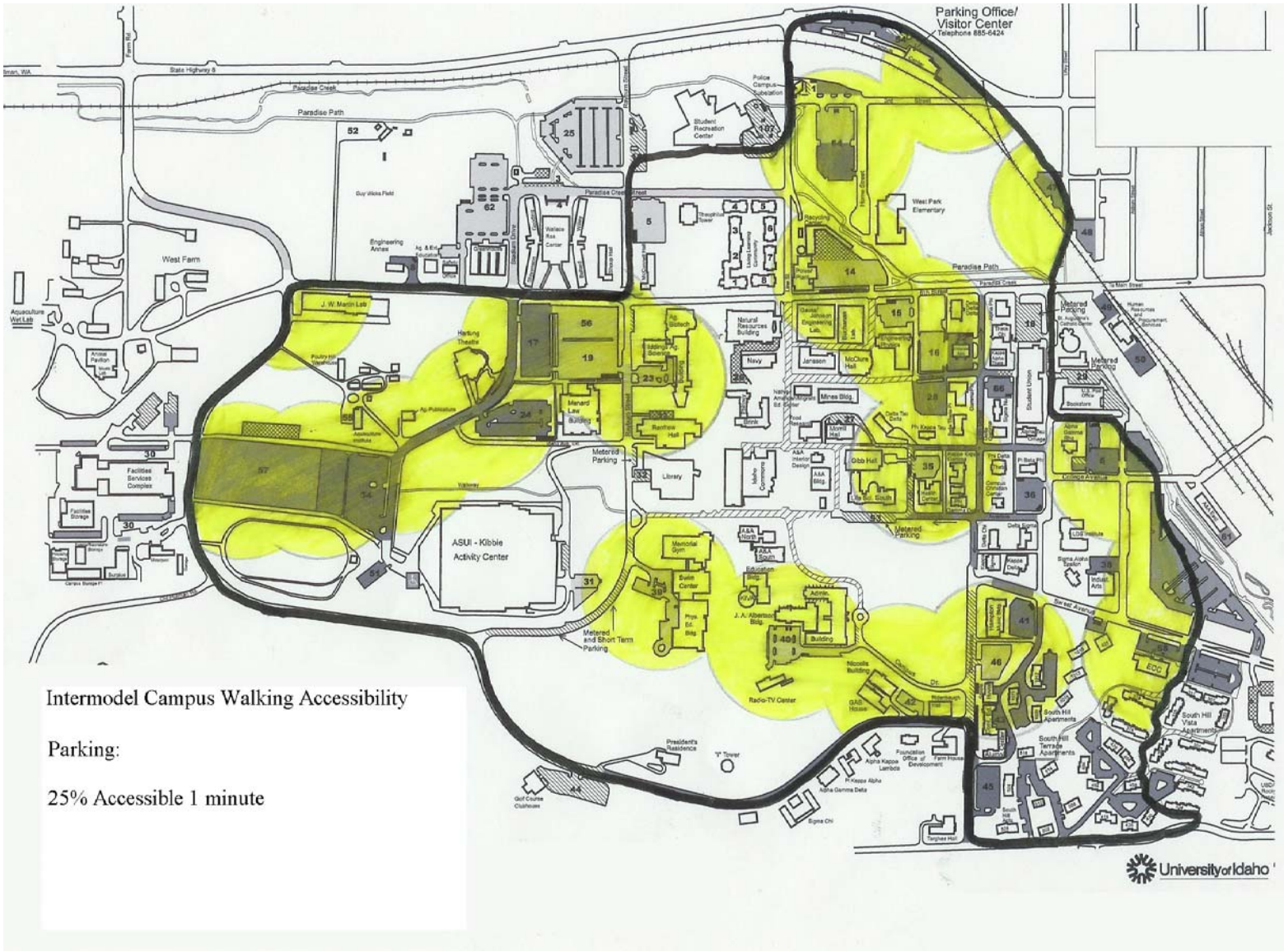
APPENDIX

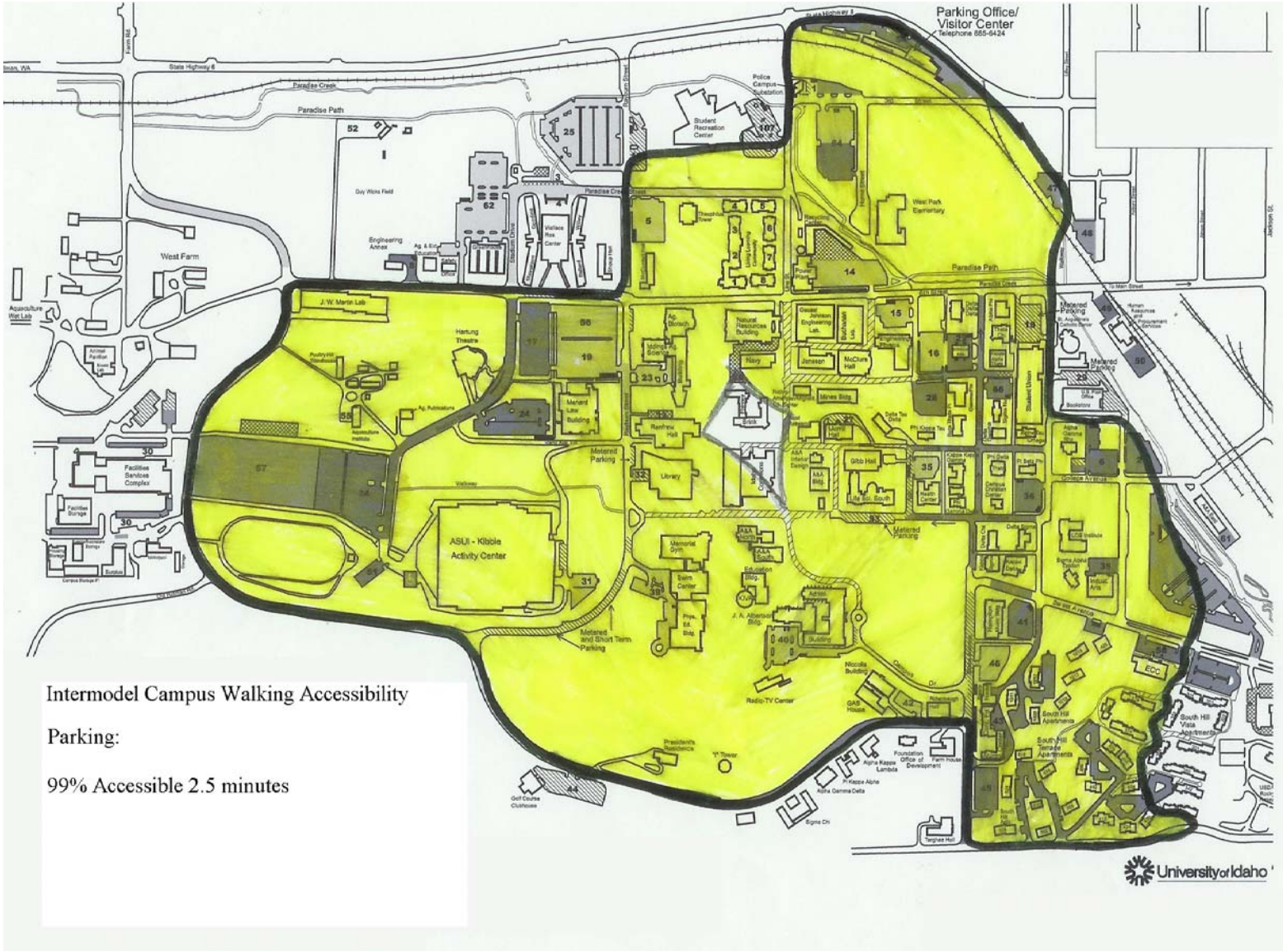
The appendix contains the walking accessibility maps. The survey instrument and data base can be found at www.webs1.uidaho.edu/ce573/ in the project heading.




Parking Office/
Visitor Center
Telephone 885-6424
Intermodel Campus Walking Accessibility
Bus Stops:
31% Accessible 2.5 minutes
University of Idaho


Parking Office/
Visitor Center
Telephone 885-6424
Intermodel Campus Walking Accessibility
Bus Stops:
85% Accessible 4 minutes
University of Idaho


Parking Office/
Visitor Center
Telephone 885-6424
Paradise Path
West Farm
ASUI - Kibbie
Activity Center
Metered Parking
Metered and Short Term Parking
Intermodel Campus Walking Accessibility
Parking:
25% Accessible 1 minute
University of Idaho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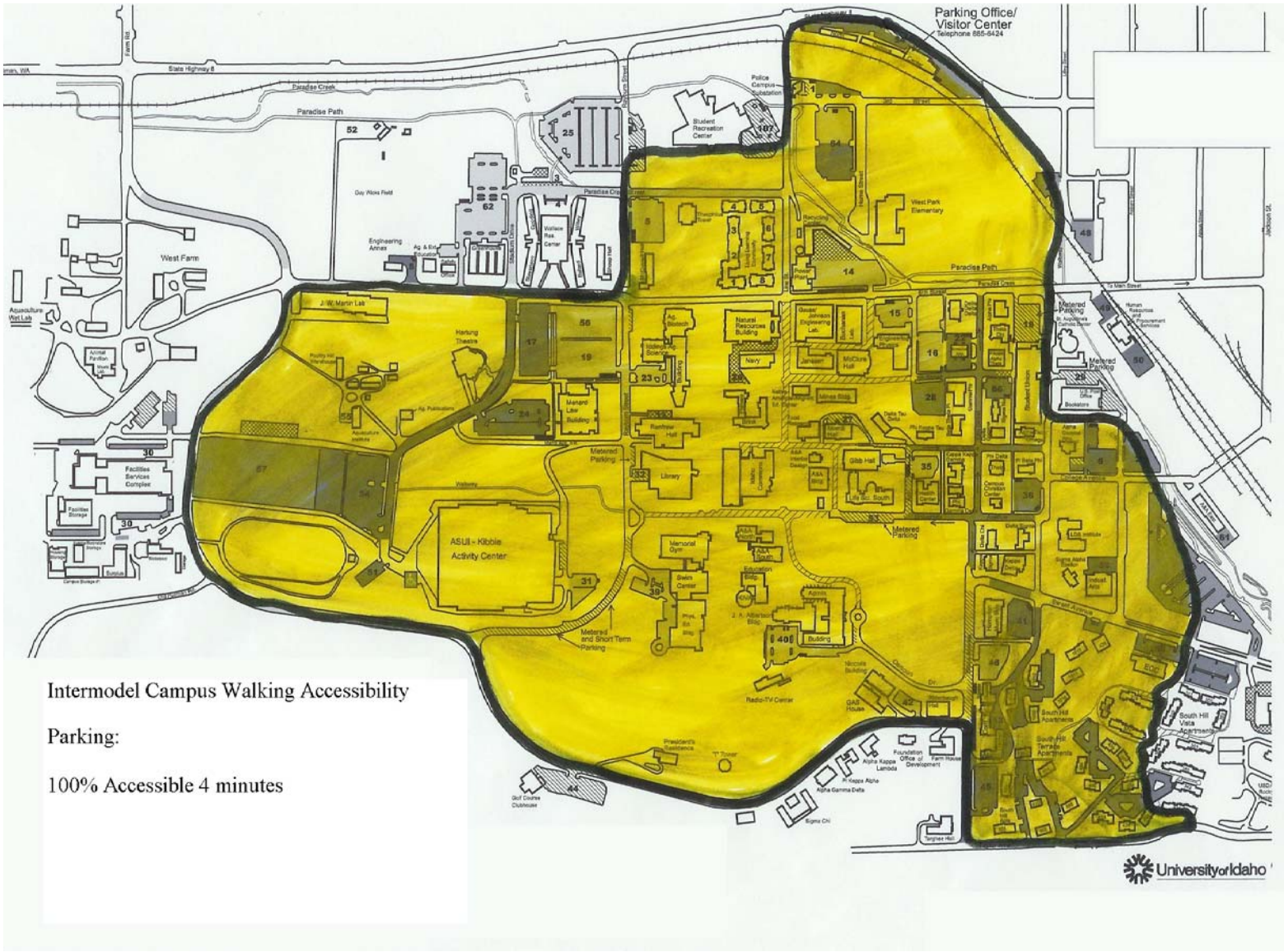
ASUI - Kibbie
Activity Center
Metered Parking
Metered and Short Term Parking
Intermodel Campus Walking Accessibility
Parking:
99% Accessible 2.5 minutes
University of Idaho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