Feasibility of Financing Public Information in
Rest Area Interactive Kiosks through Private Advertising

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SUMMARY OF RESULTS

A.   Obstacles to Kiosk Advertising Revenues

The basic problem is that prospective advertisers believe that financial benefits from advertising through kiosk systems are too small to justify the cost of developing and supporting the entire system, especially if it includes a significant public information component. There are several reasons for this situation:

i)   Advertisers currently conceive and evaluate computer kiosk advertising in traditional advertising terms.

ii)   The current inexperience and inability of advertisers to exploit the unique benefits of kiosk systems.

iii)   In low cost advertising sales, the primary profit will be made from advertising renewals. Kiosk advertising renewal rates are unknown.

iv)   The rapid emergence of the Internet as a major potential competing marketplace for future information distribution and service delivery.

B.   Kiosk System Costs

Our research has found that hardware costs for kiosk systems are generally decreasing rapidly. Improved product reliability and the technical performance have reduced the typical hardware costs and enabled significant performance improvements. The hardware for an average kiosk unit may be expected to cost less than $10,000. Most of the cost estimates for the software development ranged from $60,000 to $150,000. However, future software development costs could be expected to decrease substantially. We expect that the average cost for compiling the kiosk information would be approximately $40,000. We judge that an approximate and conservative cost estimate for the full development of a five-unit stand-alone kiosk system to be approximately $150,000.

C. Kiosk System Revenues

Our research concludes that the maximum likely "readership" for an individual kiosk is physically constrained to an average of 200 daily users. Using advertising rates comparable to newspaper rates, the maximum monthly gross revenues for an individual kiosk would be roughly $2,475 a month. Billboard type poster advertising on the kiosk casing is a viable method for gaining additional revenues; we estimate average monthly advertising revenues of $400 per kiosk.

We have also evaluated the revenue generating potential of other funding strategies such as business sponsorships, kiosk sales and user fees. Unfortunately, each of these approaches has significant difficulties and limitations. Business sponsorships are difficult to obtain and may be perceived to imply a government

endorsement of that business which is likely in many cases to be problematic. Financial transactions over the kiosk system is potentially a promising revenue generating source. However, currently the legality of such sales is subject to uncretain statutory interpretation. Furthermore, significant technical and logistical difficulties associated with computerized kiosk transactions currently prevent their wide-spread use.

As result, we estimate that direct advertising base for the kiosk system will be inadequate, under the current rates, to cover the total cost for the development, implementation and operation of the system. Based on the comparable media rates, it is possible that kiosk advertising revenues could cover the cost of operating and maintaining the system, but not system development or hardware.

From our analysis, we conclude that the number of potential kiosk users will be inherently limited by the kiosk units' physical constraints. However, it is possible for the kiosk information to be duplicated on the Internet. Such an approach offers several potential benefits:

  i)   Potential audience would be dramatically increased.
  ii) Demographics of potential Internet users are favorable to advertisers.
  iii) Internet kiosk could assist travelers in their pre-trip planning.
  iv) Travel information can be distributed at a relatively low cost.

However, it remains unclear to what extent advertising revenues could be obtained.

4.   Conclusions

Given our feasibility analysis, we conclude that the potential advertising revenues currently associated with interactive kiosks placed at rest areas rest area interactive kiosks are generally insufficient to cover the costs of kiosk design, implementation and operations. The present difficulty in attracting sufficient advertising revenues severely limits the ability for kiosk developers to gain sufficient net revenues to cover their development costs. However, the current advertising revenue potential does appear to be adequate to cover the kiosk system's operations and maintenance - provided a suitably qualified advertising sales force is chosen.

Financial feasibility examines only the monetary benefits and costs associated with the proposed interactive kiosks and incurred by the developer/operator. Therefore, non-monetary benefits from the kiosk system such as reductions in travel times, greater traveler satisfaction, agency cost savings and greater regional visitation are not considered in a financial feasibility analysis. Economic feasibility recognizes the costs and benefits accruing to the general public. While the interactive kiosks are not financially feasible based on their revenue generating potential, the ability of the kiosks to generate wider social and economic benefits suggests that kiosks may provide sufficient economic and social benefits to justify their development and operating costs.

FEASIBILITY OF FINANCING PUBLIC TRAVELER INFORMATION IN REST AREA INTERACTIVE KIOSKS THROUGH PRIVATE ADVERTISING

EXECUTIVE SUMMARY

I.   Introduction

The National Program Plan for Intelligent Vehicle-Highway Systems identifies five basic goals for the IVHS Program (now referred to as Intelligent Transportation Systems (ITS)): to improve safety: to increase efficiency; to reduce energy and environmental impacts; to enhance productivity; and to enhance mobility.

The IVHS National Program Plan also recognizes the potential value of interactive kiosks (also frequently referred to as Advanced Traveler Information Systems (ATIS)) for directly and indirectly promoting these goals. The IVHS National Program Plan has determined that the development of information kiosks in rest areas and other locations is in the interest of, and should be the prime financial responsibility of the private sector. The IVHS National Program Plan foresees only a limited role for the public sector in the provision of traveler information services. While the public sector's regulatory role is foreseen as necessary, the private sector is expected to bear the majority of the costs for the development, implementation and operation of the ATIS.

For this approach to be successful, the financial feasibility of the proposed ATIS systems must be both clear and readily achievable. The central goal of our analysis is to examine and evaluate the financial feasibility of financing public traveler information in rest area interactive kiosks through private advertising. We have conducted a comprehensive review and analysis of the feasibility issues associated with kiosk development to assess the current and near-term financial feasibility of the proposed interactive traveler information kiosks on rest areas. Our feasibility study consisted of several components:

   1) Review of user needs and travel decision studies to evaluate the potential user base for kiosks located at rest areas.

   2) Investigation of key kiosk design and deployment issues. Research of past and current kiosk systems was conducted to assess their effectiveness and success. Kiosk cost estimates were developed for use in our financial analysis.

   3) Investigation and assessment of potential revenue generating strategies. Specifically, the revenue generating potential of the proposed traveler information kiosk was examined. Kiosk revenue estimates were developed for the financial analysis.

4) Comparison and financial analysis of the estimated costs and revenues associated with the traveler information kiosk was performed to determine the financial feasibility of the kiosk's development and operations.

5) Duplication of the kiosk information on the internet was investigated as the most promising alternative revenue generating approach. The impacts on the kiosk system's feasibility from the development of the "Internet kiosk" were assessed.

Since many of the issues related to kiosk development are dependent on site specific factors such as rest area visitation and locations, we have endeavored to present our analysis in a manner that will provide a framework to assist both public and private entities considering such kiosk developments.

II. Financial Feasibility Analysis

Our feasibility analysis concludes that currently the potential advertising revenues associated with interactive kiosks at rest areas are generally insufficient to cover the costs of kiosk design, implementation and operations. Although significant advertising revenues or sponsorships may be possible under certain circumstances, the current difficulty in attracting sufficient advertising revenues severely limits the ability for kiosk developers to gain sufficient net revenues to cover their development costs.

Potentially, current advertising revenues appear to be adequate to cover the kiosk system's operations and maintenance - provided a suitably qualified advertising sales force is chosen.

A. Obstacles Associated With Kiosk Advertising Revenues

We have identified and examined several fundamental problems with relying on the private sector to finance public traveler information provided by rest area interactive kiosks. These issues have gone largely unexamined by other IVHS research. Most fundamentally, the private sector does not currently believe that the benefits they can derive from a kiosk system will justify the costs necessary to develop and support it. Our research has found that the majority of kiosk developers do not currently perceive that adequate revenues can be obtained from advertising provided through ATIS kiosks. Prospective advertisers remain highly skeptical or unfamiliar with kiosk advertising and are thus reluctant to provide much money to advertise or sponsor the issuance of public information through computer multi-media systems, such as the kiosk envisionedby the IVHS' Traveler

Service Information Program.

The basic problem is that prospective advertisers believe that financial benefits from advertising through kiosk systems are too small to justify the cost of developing and/or supporting the entire system, especially if it includes a significant public information component. There are several reasons for this situation. First, advertisers currently conceive and evaluate computer kiosk advertising in traditional advertising terms. Therefore, when estimating the potential impact of kiosk advertising, advertisers generally consider primarily the likely number of potential viewers/readers that they will reach. Second, some kiosk experts suggest that it is the current inexperience and inability of advertisers to exploit the unique benefits of kiosk systems that are responsible for the poor financial performance of the majority of past and existing kiosk systems. Third, typically in low cost advertising sales, the initial advertising "sale" will barely meet the costs to the advertising agency of the sale. The primary profit will be made from subsequent renewals which can be made at little cost to the advertising agency. However, in the case of kiosks, advertising renewals may be relatively low since the advertising medium is unfamiliar and the fast pace of technological change raises concerns about the system's longevity. Fourth, the rapid emergence of the Internet as a major potential forum and marketplace for future multi-media access and service delivery offers a difficult challenge for future interactive kiosk developments.

These perceptions among the advertising community are largely based on comparisons between kiosk advertising and traditional advertising media. However, their skepticism is also supported by the financial realities of most kiosk developments.

B.   Kiosk System Costs

The system design and development costs will be important factors determining the financial feasibility of rest area interactive kiosks. Lower development costs will improve the financial feasibility of the system. We have identified and developed approximate estimates of the current design and implementation costs associated with kiosk systems based on discussions and interviews with kiosk developers.

The principal design issues associated with the kiosk development are discussed in Chapter IV. We have identified and examined two principal development approaches - stand-alone and networked kiosk systems. Three main cost items determine the development costs for kiosk systems: system hardware, system software and the cost of compiling the kiosk information.

Our research has found that hardware costs for kiosk systems are generally decreasing rapidly. Improved product reliability and the technical performance

have reduced the typical hardware costs and/or enabled significant performance improvements. The hardware for an average kiosk unit may be expected to cost less than $10,000. While there was considerable differences among the kiosk vendors in their cost estimates for software development, it is generally expected that software development will represent a major proportion of the kiosk development cost. Most of the cost estimates for the software development ranged from $60,000 to $150,000. However, future software development costs could be expected to decrease substantially.

Transferring the information into a suitable digital form for inclusion on the kiosk system can also represent a significant additional cost for the kiosk development. Although most vendors provided significantly higher cost estimates, for the purposes of the feasibility analysis, we expect that the average cost for compiling the information will be in the region of $40 per screen. In which case, for a typical kiosk system with 1,000 entries (or screens of information), the cost for compiling this information would be approximately $40,000 for the entire system.

Based on these cost estimates, we judge that an approximate and conservative cost estimate for the development of a five-unit stand-alone kiosk sys tern to be approximately $150,000. This configuration was used for the kiosk feasibility analysis.

C.   Kiosk System Revenues

1.   On Screen Advertising

As discussed previously, obtaining kiosk advertising sales remains a difficult task due to advertisers unfamiliarity and concerns with kiosk advertising. Furthermore, as we demonstrate in Chapter V, the maximum likely "readership" for an individual kiosk is physically constrained to an average of approximately 200 daily users. Since each advertisement will be competing with many other similar businesses for the viewer's attention, the monthly number of impressions that an average advertisement can be expected to achieve would be of the order of 1,000. Price comparisons with other competing media provide CPMs (i.e., cost per thousand) of less than $10 for billboards, $5 - $10 for television, or $40 - $50 for full page newspaper advertising. Even at advertising rates comparable to newspaper rates, the maximum monthly gross revenues for an individual kiosk would be roughly $2,475 a month.

However, it is the kiosk's net operating revenues that will determine a kiosk operator's ability to finance the system's development. The net operating revenues are calculated by subtracting the cost of obtaining and managing the advertising accounts from the gross revenues. Based on our discussions with kiosk vendors,

advertisers and state agencies, the costs involved in obtaining and managing the advertising accounts will be very significant, especially initially. In subsequent years, high advertising renewal rates could significantly improve the profitability of the advertising sales. As a result, the net operating profits that can be applied to the kiosk's operations, maintenance, and development costs are expected to be very limited, especially in the first years of operation.

As a result, we estimate that the direct advertising base for the kiosk system will be inadequate, under the current rates, to cover the total cost for the development, implementation and operation of the system. Based on the comparable media rates, it is possible that kiosk advertising revenues could cover the cost of operating and maintaining the system, but not system development or hardware.

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2.   Other Revenue Generating Approaches

Billboard type poster advertising on the kiosk casing is a viable method for gaining additional revenues. While the poster advertising must be managed to be acceptable to rest area mangers, significant revenues may be obtainable from high traffic locations. Many kiosk designs currently incorporate poster advertising. Monthly revenues for 4' x 3' posters in prime high traffic areas can be up to $1,000. However, recognizing that most rest areas and welcome centers will be less attractive advertising locations, we have used average advertising revenues of $400 per month.

In addition, we have also evaluated the revenue generating potential of other funding strategies such as business sponsorships, kiosk sales and user fees. Unfortunately, each of these approaches has some significant difficulties. Business sponsorship are difficult to obtain and may be perceived to imply a government endorsement of that business which is likely in many cases to be problematic. The capability to conduct financial transactions over the kiosk system is potentially a promising revenue generating source since a processing fee or commission on sales may be obtained from the user or more likely the seller. However, currently the legality of sales or making reservations at kiosks on federally funded highways is subject to uncertain statuatory interpretation. Aside from the legal obstacles, four main categories of travel related spending might be assisted by interactive kiosks, namely: lodging, restaurant, attractions and retail sales.

Lodging sales or booking is the most promising potential application for interactive kiosks. Kiosks have a potential advantage of providing easy comparisons between different hotels, could show relative locations, and provide detailed directions to assist travelers. Although the use of credit card processors could also enable users to purchase or reserve their room from the kiosk, this approach requires the use of a booking agency to perform the transaction. Therefore, most vendors recommended

the use of a telephone handset with computer assisted dialing for lodging transactions. However, this approach makes it extremely difficult for kiosk developers to track lodging sales.

While restaurant information would likely be a popular feature, the difficulty of anticipating the effectiveness of the kiosk in directing travelers to particular restaurants will likely limit the sales impact perceived by business owners. The relatively small average expenditure associated with each individual "sale" also limits the likely revenues that restaurant owners might be expected to make from their advertising.

Ticket sales can be profitably sold and dispensed from kiosks. Earnings from sales can be expected to be around 5% of the gross ticket sales, and in some cases the transactional capabilities necessary to enable credit-card or ATM sales can be incorporated at a minor cost. However, for the kiosk to earn any significant revenues, the face value of the tickets must be relatively high.

Shopping is also one of the most popular traveler activities. Unfortunately there will likely be little opportunity for businesses to correlate the sales impact of kiosk advertising. Some states and individuals suggest that souvenirs and gift sales through kiosks might be a potential source of revenue growth (provided current regulations prohibiting rest area sales could be waived). Under such an approach, the goods could be sent from a single distribution center to any location specified by the user such as their home address or the address of a friend. The potential revenues from t-shirts or other souvenirs could be significant, particularly since the goods would be shipped from a separate location. However, this approach has not been widely used and may still face resistance from users since they will not receive their purchase immediately.

3. Internet Approach

From our analysis, we conclude that the number of potential kiosk users will be inherently limited by the kiosk units' physical constraints. Since the potential advertising audience is limited, the potential advertising revenues will be similarly limited. However, it is possible for kiosk information to be duplicated on the Internet. Such an approach offers several potential benefits. First, the potential audience would be dramatically increased. While access to the Internet kiosk could still be limited by the capacity of the kiosk's Internet server and communication links, these can be upgraded easily. Second, the demographics of the potential users are favorable to advertisers. Most Internet users have relatively high incomes and are better educated than the likely rest area users. Third, while roadside kiosks assist travelers in their en-route travel decision making, the Internet kiosk could assist travelers in their pre-trip planning. By influencing travelers before they have made

trip preparations, the impact of the kiosk's assistance can be greater since the travelers will have more flexibility to alter their travel plans. In particular, the Internet kiosk can have more impact in attracting visitors that might not have otherwise chosen to visit particular locations. Therefore, it should be recognized that the Internet kiosk potential reaches and services a different and potentially economically more valuable visitor population than the rest area kiosks would serve.

Although the Internet offers major potential benefits, it remains unclear to what extent advertising revenues could be increased. Currently advertising on the Internet is relatively new and primarily occurs at very high traffic sites. Future projections by Forrester Research and other analysts predict the dramatic future growth in both Internet use and advertising on the Internet that will occur over the next several years. However, in the meantime, it seems highly unlikely that an Internet kiosk would be able to attract significant advertising revenues in the near term. Another obstacles is that the Internet kiosk would have to establish itself sufficiently to attract both the necessary users and advertisers. Currently, the Internet is highly decentralized and most users are relatively inexperienced. Therefore, content based sites such as the proposed Internet kiosk will face significant challenges in developing the name recognition and the client base to enable them to attract advertising. Furthermore, the majority of Internet advertising is "banner" advertising. Few sites currently rely on listing fees for their advertising approach.

Therefore, we conclude that the Internet provides significant potential for increasing the kiosk user base and that significant potential benefits could be gained from servicing these users - many of whom would not otherwise be reached. However, the additional revenue potential for an Internet kiosk is unclear, although both Internet usage and advertising is expected to grow dramatically over the next several years. Furthermore, traveler information is also predicted to be a major area of future growth.

4.   Economic Feasibility

Financial feasibility examines only the monetary benefits and costs associated with the proposed interactive kiosks that are incurred by the developer/operator. Therefore, non-monetary benefits from the kiosk system such as reductions in travel times, greater traveler satisfaction, and greater regional visitation are not considered in a financial feasibility analysis. Yet these associated non-monetary benefits could be highly significant. For example, general societal benefits from the kiosk system, such as local economic development or reductions in congestion and pollution, might be associated with the kiosk, but these benefits will not improve the kiosk's financial feasibility.

So, if the economic feasibility of the kiosk system is examined, economic impacts associated with the kiosk system as well as other non-monetary benefits would be assessed. If the kiosk system's economic benefits are great enough compared to its economic costs, the kiosk system could be economical feasible. It is by no means contradictory that the kiosk system might be financially infeasible, though economically feasible. Financial feasibility considers the monetary costs and benefits directly affecting the private investor while economic feasibility recognizes the costs and benefits accruing to the general public.

Although it was beyond the scope of our study to determine the economic benefits and costs associated with the proposed kiosk system, it nonetheless seems apparent that while the interactive kiosks are not financially feasible based on their revenue generating potential, the ability of the kiosks to generate wider social and economic benefits seems to suggest that kiosks may provide sufficient economic and social benefits to justify their development and operating costs.

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I. INTRODUCTION

The National Program Plan for Intelligent Vehicle-Highway Systems (IVHS) provides a tactical plan for identifying users needs, key program objectives and strategies for attaining the program objectives. The National Program Plan identifies five basic goals for the IVHS Program (now referred to as Intelligent Transportation Systems (ITS)): to improve safety: to increase efficiency; to reduce energy and environmental impact; to enhance productivity; and to enhance mobility.

The IVHS National Program Plan also recognizes the potential value of Advanced Traveler Information Systems (ATIS) for directly and indirectly assisting in promoting these goals. The primary potential impact of ATIS, such as interactive traveler information kiosks, is to improve the efficiency of travel by users. By improving the availability and quality of information to travelers, ATIS systems can assist travelers making travel decisions and direct them more efficiently to their destinations. While the most immediate benefits of such traveler assistance are gained by the individual traveler, there are potentially considerable benefits for society from improving traveler road use. Better informed travelers can be expected to incur less unnecessary and wasted travel, decreases in energy consumption and pollution, fewer accidents among other societal benefits.

The IVHS National Program Plan has determined that the development of information kiosks in rest areas and other locations is in the interest of, and should be the prime financial responsibility of, the private sector. The IVHS National Program Plan foresees only a limited role for the public sector in the provision of traveler information services. The primary responsibility for the public sector would be administrative and regulatory. While the public sector's regulatory role is foreseen as necessary, the private sector is expected to bear the majority of the costs for the development, implementation and operation of the ATIS.

For this approach to be successful, the financial feasibility of the proposed ATIS systems must be both clear and readily achievable. However, based on our analysis, we have identified and examined several fundamental problems with that concept which have gone unexamined by other IVHS research. Most fundamentally, the private sector does not believe that the benefits they can derive from a kiosk system will justify the costs necessary to develop and support it. Furthermore, this disparity between revenue potential and expected costs threatens to jeopardize future implementation of the kiosk program.

Therefore, we have conducted a feasibility analysis of the development of interactive kiosk systems (ATIS) at rest areas. The analysis' purpose is to determine the feasibility of financing public traveler information in rest areas through private advertising. By determining the expected financial revenues and costs of developing such ATIS systems, we can thereby evaluate the potential effectiveness of an IVHS Traveler Services Information Program that relies primarily on the

private sector for financing future kiosk systems.

A.   Study Purpose

The primary objective of this report is to examine and evaluate the feasibility of providing public travel information using interactive kiosks at rest areas financed by private advertising. The current ITS National Program Plan foresees that the private sector would initiate and fund development of information kiosks at rest areas. This approach would be based on the revenue potential of kiosk advertising focused mainly to the audience of auto-passengers stopping at rest areas.

However, our research has found that the majority of prospective advertisers do not currently perceive adequate advertising revenue potential from advertising through ATIS kiosks. Prospective advertisers remain highly skeptical about the available benefits and are very reluctant to provide much money to advertise or sponsor the issuance of public information through computer multimedia systems, such as the kiosk envisioned in IVHS' Traveler Service Information Program. We have researched this issue in depth in order to determine the key factors determining both the actual and perceived revenue potential associated with interactive kiosks. This analysis is presented in Chapter IV of this report.

We have used three main approaches to understand and evaluate the feasibility of interactive kiosks:

> First, we have investigated the costs of kiosk development, implementation and operation. This analysis includes understanding the costs associated with compiling and updating recreation user information into a digital format, suitable for transmission via kiosks, as well as the administrative costs for implementing the process by the public agencies.

> Second, we have analyzed the revenue generation potential of tying private advertising and sponsorship to dissemination of the public recreation information. Specifically, we have investigated and compiled the kinds of information on rest areas and interactive kiosks which advertisers understand and by which they gauge their advertising expenditures. We have also fully investigated the kiosk revenue potential by seeking innovative ways to maximize revenues. We have examined numerous methods thus far not generally considered by prospective advertisers or advertising companies. In the course of this analysis we have examined, in some detail, the costs and revenue potential associated with also providing the kiosk information services on the internet. Our analysis also identifies and assesses the existing institutional and legal constraints impeding the future development of kiosk systems and possibly reducing their revenue potential.

Third, we have compared the kiosk system costs with their revenue generation potential to assess their financial feasibility. We have also examined some of the non-financial and indirect monetary benefits associated with ATIS systems to assess their economic feasibility.

It has been envisioned that information for national and state parks and recreation areas would be a central component of the proposed kiosk system. In addition, more commercially oriented information on traveler services such as lodging, restaurants and other local attractions would also be permitted on the proposed kiosks system. It is the potential advertising revenues from such businesses which are generally considered the most promising sources of potential kiosk revenues.

The revenue potential for a particular kiosk system can be highly dependant on the specifics of the systems location and the magnitude of traveler vistation to the kiosk sites. Therefore, we have endeavored to provide a framework to assist both public and private entities in analyzing the potential costs and benefits of providing information about public services through kiosk systems.

B.   Study Approach

We have performed several analyses to determine the feasibility of private enterprises providing financing for issuing public recreation information through IVHS Traveler Services Information. The basic structure of our analysis consists of five main components.

Chapter II, "Interactive Kiosk Systems," provides a brief analysis of the general use of interactive kiosk systems. This analysis identifies and discusses some noteworthy and illustrative kiosk applications (not limited to traveler information kiosks). We identify some key principals typically associated with effective and successful kiosk systems.

Chapter III, "Demand for Traveler Services from Interactive Kiosks at Rest Areas," examines the past and current implementation of traveler information kiosks. As a result of the largely negative findings from our financial feasibility analysis, we expanded our research and analysis of past and current interactive kiosks systems at rest areas to provide information on the different approaches and situations among states with kiosk systems. This was performed to gain a more extensive understanding of the specific difficulties as well as special benefits associated with implementing kiosk systems.

This section also provides the results of our review of the user needs analyses and the travel decision studies we obtained relating to travelers at rest areas.

Chapter IV, "Supply of Traveler Information Services from Interactive Kiosks at Rest Areas," examines the key issues associated with the design and deployment of

the interactive kiosks. This section discusses the primary kiosk configurations used to derive the kiosk system cost estimates and the results of the discussions with kiosk vendors and developers.

Chapter V, "Revenue Generating Potential of Interactive Kiosks," discusses the various potential revenue generating strategies for kiosk systems. This section outlines and evaluates alternative approaches for gaining revenues and provides the results of our discussions with prospective advertisers to determine the advertising potential for the proposed kiosk systems.

Chapter VI, "Financial Feasibility Analysis," provides our analysis of the financial issues associated with the proposed kiosk system. The analysis evaluates the revenue potential and assess the future prospects for kiosk system developments.

Chapter VII, "The Internet - An Alternative Strategy for Kiosk System Development," examines the key issues and revenue potential for providing access to the proposed kiosk system over the Internet. This section briefly assesses the costs and benefits associated with providing access to the kiosk information over the Internet.

II.   INTERACTIVE KIOSK SYSTEMS

A.   Overview of Past Interactive Kiosk Systems

In the last decade, as computer technology has become increasingly sophisticated, reliable and inexpensive, computers have played an increasingly central role in our daily lives. Initially, computers were primarily used by businesses to perform highly specialized and mostly technical tasks. Now, however, computers are commonplace and assist us in a wide variety and vast number of ways.

One of the most significant impacts of the computer industry's recent growth has been the development of the personal computer. Very powerful computers are now available at comparatively low costs to consumers.

During the last decade, many businesses and government agencies have sought to use the newly available computer technology to provide information and market products to the public. Typically, these systems consisted of specialized stand-alone computer terminals which allowed its users to perform a limited and predefined set of activities on the system. These systems are generally referred to as kiosk systems.

Unfortunately, the majority of the past kiosk systems were largely unsuccessful in serving the public. Many of the past kiosk projects, such as the United States Post Office's Postal Buddy system, were ambitious and high profile failures.   Broadly speaking, there were several reasons for the widespread failure of past kiosk systems. One of the fundamental problems were these systems' slow and unreliable operating performance. Most of the past kiosk systems had difficulty sustaining stable operation of the system. Early kiosk technology was highly prone to malfunctioning and system failures occurred too frequently. These problems were related to both the kiosk hardware and software. As a result, the early kiosk systems were frequently inoperable and many users quickly became frustrated.

Another major problem was that users frequently found it very difficult to operate these early kiosk systems. Early touch screen technology was highly prone to malfunctioning and keyboard based systems were generally awkward and cumbersome to use. Furthermore, at that time, relatively few public users had any previous experience with using computers. In addition, few systems could be used intuitively by users with limited previous experience or little direction, and therefore were not "user-friendly."

These common limitations were further compounded by the relatively high cost of early kiosk technology. Upgrading the early systems typically required major software redesigns and new hardware. Numerous different computer operating systems competed to provide the operating platform and hardware. Generally, each kiosk system was a custom application since few such systems existed and there were few design or operating standards.

As a result, many kiosk systems that were developed soon fell into disrepair, and did not evolve. Often, the early kiosk developers left the industry and orphaned their kiosk systems.

Almost all of these previous kiosk development problems are difficulties typically associated and experienced with any emerging technology or new market. In such circumstances, it is common for there initially to be a relatively large number of small firms offering the new technology or services to the public. However, due to the newness of the product and market it is likely that these firms will experience difficulty in developing the product that best meets consumer's needs. This difficulty may be further compounded by the public's poor understanding of their own needs due to the relative "newness" of the product or services. Furthermore, in emerging markets for new technologies, many significant technical obstacles must still be overcome before the product is fully defined for the consumer.

Many of the respondents interviewed also observed that most of the initial kiosk systems were poorly conceived so that they failed to provide any useful information/services to the public. Frequently, the information provided on the system's database was too limited, incomplete, inaccurate or too quickly out of date to prove useful to users.

These factors can largely explain (particularly with the benefit of hindsight) why the early kiosks systems were generally unsuccessful. Simply stated, the'early systems were too unreliable and difficult for the public to use. Furthermore, few of the initial systems were useful enough to appeal to users.

B.   Examples of Effective Kiosk Systems

Although it has been a relatively short period of time since the first kiosk systems were developed and implemented, there are several examples of effective kiosks that have proved to be popular. The following section gives a brief overview of some noteworthy kiosk systems as illustrative examples of the diverse types of kiosk applications that have been "successful."

Many of the informants contacted in our research considered automated teller machines (ATMs) as the proto-typical example of a successful kiosk application. Certainly, in terms of prevalence, their past growth and current usage, ATMs have become remarkably widespread and commonly used. As a result, ATMs have had a profound affect on the American banking system, and have succeeded in fundamentally transforming the nature of how consumers manage their finances.

However, the ATM's success was gradual. Initially there was significant public distrust of these computerized systems and the early ATM systems were not widely used by the public. However, over time, many users found that ATMs offered banking services and advantages that traditional teller banking could not provide.

For simple and routine banking transactions, ATMs enabled the users to conduct their business more swiftly, without the delays frequently experienced waiting for a banking clerk. Secondly, transactions could be conducted outside of the traditional banking hours, such as, on weekends or during the evenings. As ATMs became increasingly used by their customers, banking institutions also recognized cost savings for themselves as the automated tellers reduced the personnel needs for counter service, and also reduced the processing cost for manning their customers accounts.

The success of ATMs provides an insight into the potential benefits that automated systems can provide when their service offers significant benefits to users conveniently. These potential benefits can be even more substantial when the services provided by the automated system would otherwise be unavailable.

Within the retail kiosk market, the success of interactive kiosks for creating personalized cards is notable. As the Interagency Kiosk Committee notes,

> "Kiosks are the fastest growing segment of the $6 billion per year greeting card industry. Nearly 9,000 interactive touchscreen greeting card kiosks are in operation nationwide."

A principal reason for the greeting card kiosk system success is that it provides a special service (production of the customized greeting card) conveniently and at a reasonable price. Since this service is unavailable by other means, consumers are more likely to use the kiosk.

Since late 1992, the Province of Ontario has operated a kiosk network system called Service Ontario. The kiosk system allows users to perform many different government transactions and to access government information. For example, kiosk users can renew their car registration and pay parking fines using the credit card reader on the kiosk. The system has proved to be both positively received and widely used. In customer satisfaction surveys conducted on the system, over 90% of the kiosk users have consistently rated its performance positively.

Telephone booking or reservation systems provide some indication of the potential for kiosk system usage. Although most telephone reservation systems are only partly automated, they do serve in many ways as a kiosk-like reservation system. By calling a toll- free 800 number, the user connects with a receptionist who operates the reservation system. Typically, the receptionist asks a series of questions to determine the users requirements. The receptionist then operates the computer reservation system to identify suitable openings that meet the user's specifications. The user is informed of his/her choices and the user can usually reserve or purchase the reservation over the phone using a credit card. Telephone reservation systems have proved to be very popular with travelers. A major and increasing proportion of the reservations for airline, concert tickets, hotel and car rentals are conducted by phone. They are popular with users since typically the booking process

is free, can be made from any phone, and can be conducted outside of standard business hours. This provides greater convenience and flexibility to users and could very easily be conducted with an interactive kiosk. In which case, the necessity for a telephone operator could be removed as the customer could pay with their credit card directly (with the aid of a credit card reader). Such a system could offer distinct benefits.

A key feature of an interactive kiosk system is that it can allow the users to browse through information for longer periods. Without the involvement of the receptionist, the user can spend as long as they want comparing availability and their travel options. A kiosk system may also enable the user to browse more effectively. This is possible because the user would directly control the search process, thus he or she may be better able to tailor their search to meet their requirements. For this to be possible, the system must be well-designed and easy to use.

Finally, the visual and printout capabilities of the kiosk system can provide the user with more information than they would receive over the telephone from the receptionist. A potential hotel guest might, for example, be able to view photographs of the available rooms or determine a hotel's location using maps provided by the kiosk. In such cases, the user would be provided with information on the specific hotels he selects. This would provide the potential guest better information on which to base their choice. Unlike telephone booking systems, kiosks can be designed to dispense actual receipts for purchases, or tickets for events. The ability to receive proof of purchase from the kiosk ensures that the user feels secure about having made the purchase or reservation, as opposed to the telephone reservation systems which, to a certain extent, are secured only by good faith until receipts and or tickets arrive in the mail.

Interactive kiosk systems can offer the same services that telephone booking system provide and many potential additional benefits. As a result, it seems likely that many users should be willing to use a kiosk system to make reservations and bookings that they would otherwise perform over the telephone. Therefore, provided the kiosk systems are well designed and are placed at suitable locations that are accessible and convenient to these potential users, interactive kiosks may provide attractive alternative methods for making reservations and ticket purchases.

C.   Key Factors for Successful Kiosk Systems

More recently, the kiosk industry has matured and the technology has been significantly refined and improved. Many factors of the past, discussed in the previous section, that severely limited the effectiveness and success of previous kiosk systems have been largely overcome. As a result, the current potential for interactive kiosks has significantly improved. Over the last few years some kiosk

applications have been implemented successfully to provide significant benefits and attractions to the public. In such cases, these kiosks have been characterized by frequent and sustained public use. Furthermore, high rates of customer satisfaction and measurable impacts on user behavior have often been observed.

Discussions with industry experts identified several key criteria that influence the kiosk system's effectiveness. Overall, commentators identified the importance of the kiosk in providing a clear and unique service benefiting the user which cannot be obtained from other sources. This specialized service will represent the kiosk system's comparative advantage. Commentators warned that a kiosk system without a clear comparative advantage will be unlikely to succeed given the competition from other more established traditional media and service providers.

A kiosk system's comparative advantage will be dependant on several important and critical factors that determine its operating performance.

The system's informational content has a central role in determining the effectiveness and usefulness of the kiosk. The information should be up-to-date, accurate and relevant to the user's needs. Furthermore, the system's informational content should be provided in a user-friendly manner such that a user can easily identify and obtain the information they want quickly, and without the necessity of any previous experience with the system.

The system's reliability will also be a critical factor affecting the system's success. Many industry experts identified this factor as the primary cause of the failure of previous kiosk systems. The time that the kiosk is out of service associated with each system "crash" not only directly reduces the kiosk availability to users, but also harms the system's reputation. If a kiosk system is perceived to be highly prone to being inoperative, potential users will be reluctant to consider using the system when they are making decisions.

The system's location will also be an important factor in the system's effectiveness. Ideally, a kiosk system should be situated in a location that has a high volume of potential users. The placement of the kiosk should be selected in order to make the kiosk easily visible and inviting to passer-bys, but the kiosk placement should also provide a comfortable setting for the user to operate the kiosk. The model system tested for feasibility in this report meets all of these objectives.

Another factor influencing the development of successful kiosks at rest areas will be the future interpretation of federal regulations controlling the sale of goods on federally funded roadways. Currently, some kiosk systems on federal highways allow users to purchase goods and book reservations by operating as vending machines which are permitted under the current federal regulations. Changes in federal regulations could either assist or prohibit future financial transactions at rest areas. Appendix A provides more discussion of the legal issues associated with operating interactive kiosks at rest areas.

D.   The Current Kiosk Market

In recent years, the kiosk industry has experienced strong growth. The improvements in kiosk technology have reduced system costs, improved their reliability, and added a multitude of new and diverse kiosk applications.

The current kiosk market can be segmented into three principle categories:

> i)   Retail Services
> ii) Government Services
> iii) Traveler Services

The following section briefly characterizes these three kiosk categories.

1.   Retail Kiosks

Retail kiosk systems function primarily as a means to provide product information and to answer customer inquiries. Retail kiosks appear to be most successful in assisting customers with specific product inquiries, and to a lesser extent, helping them to 'browse" a stock of goods. A current example of a typical retail kiosk system is the Muze system in operation at many larger music stores on the West Coast. The kiosk has an extensive database of the available compact disc releases. For each listing the system can provide: detailed information on the compact disc, track listings, a picture of the cover art, selected reviews and, if it is in stock, information directing the user to the location of the product in the store. This system allows a consumer to browse at their leisure and to obtain product information without relying on the sales staff.

In general, industry experts are of the opinion that kiosk systems so far have proved to be effective primarily as marketing tools and as a supplement to sales staff.

Few of the successful retail kiosk applications in operation have sought to complete sales transactions with their users. Many of the respondents interviewed felt that customers are generally reluctant to use a kiosk system to complete retail purchases. A current concern is security, insofar as people are worried that if they give personal financial information to a computer, an unauthorized person could access that information and abuse it. This problem can solved with an encryption system, and the federal government is developing a standard method for such an application.

Different types of consumers can be best served by different kinds of kiosk application. Kiosk developers identified several distinctions between retail customers. Those shoppers for whom receiving the greatest quantity of product at the best price might take to viewing items on a screen, paying for them via the computer, and then picking up their order, either themselves or from a desk where employees form the only human link between the product and the consumer. Such

a system would lower retail costs by minimizing the amount of store floorspace and store employees needed. Such future development is foreseen to appeal to the growing consumer base of shopper frequenting large warehouse stores.

Traditional shoppers would be less likely be attracted to such a system. These customers tend to go to many stores comparing quality and price, until they get the right quality for the best price: they will easily change their shopping locale and/or product choice if they think they will get a comparative product for a lower price. These consumers want information, especially comparative information on products. Therefore, they would be most open to making purchases via a kiosk in a specialist store which stocks many different makes of the same product, for example, an electronics store. If acquiring product specifications from a kiosk means less store personnel and thus lower prices, such a shopper would be even more attracted to such a system.

A basic consumer category is the Convenience shopper, who for reasons of limited time availability, or because they can afford to chose to not go to the store, prefers to pay premium prices for guaranteed quality and/or the shipping and handling costs that mail-order shopping requires. These shoppers are the most likely to have a computer with a modem at home, and represent the group most likely to gather retail information and make purchases via the Internet. They would also be the shopping community who when travelling would be most likely to purchase via a kiosk at a store and have the product shipped to a destination, rather than having to carry the product for the rest of their trip or pack and ship it themselves if it is a gift.

Currently, the majority of retail kiosk applications primarily provide additional product information to potential customers. Since any positive impact by the system on enhancing the retail sales cannot be directly attributable to these kiosks, it is difficult for these systems to "justify" their costs. Although some companies may perceive indirect benefits from providing these kiosk services to their customers (i.e., improved consumer satisfaction, reduction in their sales personnel's time managing customer inquires, enhancement of the store's high-tech image), it is difficult for many retail kiosk systems to prove their worth because these are difficult to quantify. Therefore, kiosk analysts are unclear as to what direction retail kiosk applications should take in the future.

2. Government Kiosks

Many state governments and federal agencies are currently using kiosk systems to provide information and to make governmental services more easily accessible to the public. One example of a government services kiosk currently operating is the Department of Labor's Employment and Training Administration's "Automated Labor Exchange" kiosk (ALEX). This kiosk system is an automated system that enables individuals to review job listings in federal databases of job openings. This system currently operates in numerous states across the country.

Increasingly, government kiosk systems are being developed to automate manual tasks that would otherwise require government personnel to assist the user. According to a recent survey conducted by the Interagency Kiosk Committee of the Government Information Technology Services Working Group (IKC), approximately 38 of the states have "either implemented a pilot project or are in some stage of planning for the deployment of kiosks."[1]   In each case, these government kiosk initiatives are trying to improve the delivery and processing of government services by increasing the availability of services and reducing the time taken, while decreasing the overall cost to complete the transaction.

So far, these systems have been most effective in assisting the processing of relatively straight-forward and repetitive tasks, such as, registering and renewing vehicle licenses or processing parking violations. Many agencies are now exploring the development of inter-aeency kiosks that would provide several different applications on each kiosk." These multi-agency efforts have sought to cost-share the development and deployment expenses and maximize the usefulness to the public of using the system.

3. Traveler Information

At the 1994 U.S. Travel Data Center's Annual Travel Outlook Forum many attendants recognized and foresaw a coming "paradigm shift" in the dominant way that the tourism industry will conduct business in the future. These observers expect new technologies and the broader public use of computers to play an important role in determining the future of the travel and tourism industry.

In her keynote address, the Executive Director of the Center, Dr. Suzanne Cook, acknowledged that "technology will certainly change how we reach consumers in the not- too-distant-future." Cook predicted that information provision and distribution will be greatly influenced by new technologies. In the past, these travel services have been the traditional and primary mode of both reaching travelers and consumers and influencing their decision-making. At the forum, Richard Herbert also recognized this trend and identified the use of "high-tech entertainment and the use of new technology in trip planning, including in-car navigational devices" as a major trend requiring the attention of the tourism industry. Sheldon (1992) has also pointed out that the increasingly complexity of the tourism industry and the increasing sophistication of the travelers, will make access to information both more important and more difficult to provide.

As we will discuss in detail in the next chapter, over the last decade many kiosk systems have been developed to provide traveler and tourist information about

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[1]   "The Kiosk Network Solution," Interagency Kiosk Committee of the Government Information technology Services Working Group. April 1995, Page 9.

local attractions, lodging, food and retail. Typically these systems are located in high volume pedestrian areas such as hotel lobbies, airports and offices. Recently, there has been strong growth in the deployment of temporary kiosk systems at conventions. The primary purpose of these kiosk systems is to provide traveler services information.

Frequently, the funding for such systems will be partly based on advertising revenues from the listing of businesses carried on the system. Recently, many kiosk developers have been exploring the potential for conducting transactions on these systems. By allowing purchases or reservations to be made using the system, many developers believe that the revenue-generating potential of the systems will be significantly improved. However, as yet there are few examples of such systems in operation.

As we discuss in the next section of this report, many state government agencies are considering or have already developed traveler information kiosks to provide travelers with information on local tourism destinations and commercial services. The primary goals of these systems are to encourage state tourism (and thus state revenues from tourism) and often to generate sufficient revenues to be self-funding. In subsequent chapters we examine the key issues associated with traveler information kiosk systems to assess the feasibility of funding the future development of such systems based on advertising revenues.

IIL Demand for Traveler Services Information from Interactive Kiosks at Rest Areas

A.   Past Use of Interactive Kiosks at Rest Areas

According to most states, kiosks have performed poorly in the past. In general, kiosks have not been very successful in attracting much use. The primary reasons for these shortcomings were:

- Poor system reliability and maintenance;
- Systems were not user friendly and the public was unfamiliar with the technology;
- Badly managed advertising components; and
- Information not comprehensive enough to be useful for the public.

1. The Problems

Many of the kiosk systems established in the 1980s were financed by the kiosk system supplier, who hoped to re-coup their outlay with revenues received from advertising. Due to the newness of the medium, and the lack of knowledge about the potential audience for the advertising, businesses were reluctant to advertise on the kiosks. As a result, the kiosk suppliers did not earn enough from the kiosk systems to fund effective kiosk maintenance and development.

Also, break-downs were often more frequent than anticipated, particularly for the touch-screens and the printers, as these were relatively new and untested technologies. The lack of experience of these technologies on the part of the public should be taken into account as it led to their sometimes being used inappropriately (especially by children) and this also contributed to the high rate of sys tern break-downs.

The majority of states with kiosk information systems reported that they were dissatisfied with the breadth of the information provided, and also with its presentation (see Table III-I). This was partly a result of the fact that these kiosk suppliers were hoping to fund their venture with advertising revenues, and therefore in order to attract advertisers they gave the advertising a high profile in any sequence of information that was requested by the kiosk users. Another contributing factor was that often states gave responsibility for software development to the kiosk supplier, and then did not monitor the content of the information database or how it was presented. Sometimes the kiosk computers were not powerful enough (due to cost restrictions) to contain all of the available

TABLE III-1: GENERAL EVALUATION OF TRAVEL INFORMATION KIOSKS BY STATE TOURISM AGENCIES

STATE	SYSTEM EVALUATION				BREAKDOWNS More than Expected		EFFECTIVE MAINTENANCE		RECOMMEND DEVELOPER		IMPACT ON OTHER TRAVEL INFO		
	Very Satis	Satis	Quite Satis.	Not Satis.	Yes	No	Yes	No	Yes	No	Positive	Neutral	Negative
A. KIOSK EVALUATION FROM STATE WITH EXISTING KIOSK SYSTEMS													
CONNECTICUT		█				█	█						
DELAWARE		█						█	█			█	
FLORIDA		█			█		█		█		█		
IDAHO			█		█		█		█				
ILLINOIS	█											█	
KANSAS											█		
KENTUCKY											█		
MARYLAND							█						
MICHIGAN					█		█					█	
MINN (a)Vac.Adv					█								
MINN (b)TravPart					█								
MISSOURI		█					█						
MONTANA													
NORTH CAROLINA					█		█		█			█	
OREGON									█		█		
SOUTH DAKOTA		█											
TENNESSEE		█											
UTAH		█											
B. KIOSK EVALUATION FROM STATES WITH DISCONTINUED KIOSK SYSTEMS													
ALABAMA			█		█		█		█			█	
ARKANSAS			█		█		█		█				
GEORGIA(a)	█				█		█		█		█		
LOUISIANA			█				█		█				
MISSISSIPPI			█				█		█				
MINNESOTA		█					█		█		█		
NEBRASKA			█		█		█		█				
NEVADA				█	█		█		█				
NEW MEXICO				█	█		█		█				

Source: Dornbusch & Company, Inc.

information. And, the designs were not sophisticated enough to be able to limit the amount of accessible information to be appropriate for each individual kiosk, given its location.

As can be seen from Table III-2, several states removed the kiosk systems from their welcome centers after becoming frustrated with kiosk break-downs, and complaints from the public about poor information quality and comprehensiveness. Some states, such as Oregon, kept the kiosk system that was left with them after the kiosk supplier became bankrupt and employed a technologically-conversant specialist to technically up-grade the kiosk system and tailor it to match Oregon's tourist information environment. Other states, such as, Georgia, Tennessee, and North Carolina, kept the kiosks despite system break-downs and limited information availability, because they valued them as a supplemental tool for travel consultants working at the welcome centers. They found that when the welcome centers were very busy, the kiosks kept people occupied while waiting for the travel consultants.

Tables III-3 and III-4 indicate that around two-thirds of the states with travel information kiosks currently in use are owned directly by the states or by state agencies, and that software development and presentation design of the kiosk systems were cooperative efforts. In these cases states usually had to fund all or a significant portion of the initial costs themselves. These states also feel that the information database is limited, but they are not as dissatisfied with the organization or presentation of the information as states who were not involved in the software development for their kiosks. Neither do they report as many problems with kiosk system break-downs and maintenance, probably because most states are able to pay maintenance and administration costs for the kiosk systems from their annual budgets. See Table 1113. Given that these states did not set out by relying on advertising revenues alone to fund the kiosk systems they have more funds available from their agency budgets for kiosk system upgrades when desired, which also gives their systems a greater opportunity for longevity.

2. Future Implications

As a consequence of these experiences, feedback from states that have, or have had, travel information kiosk systems highlights the importance of a well-defined relationship between the kiosk supplier and the state agencies involved (usually Travel/Tourism and/or Departments of Transportation). They suggest that states should define their needs and objectives before they approach any kiosk vendors and that they should examine all the kiosk alternatives available. Once they have chosen a kiosk system supplier, the agency should define the relationship in a detailed contract that covers not only development and set-up of the kiosk system, but also future maintenance and system upgrades. State agencies should be

TABLE III-2: STATE TOURISM AGENCIES IN RELATION TO TRAVEL INFORMATION KIOSKS

STATE	ESTABLISHED SYSTEM		FUTURE SYSTEM		
	DISCONTINUED	CURRENTLY EXISTS	PLANNING NEW SYSTEM	WOULD LIKE A SYSTEM	NO INTEREST
ALASKA				▓	
ALABAMA	▓			▓	
ARKANSAS	▓				▓
ARIZONA			▓		
CALIFORNIA			Discover Am		
COLORADO				▓	
CONNECTICUT		▓			
DELAWARE		▓			
DIST of COLUMBIA					
FLORIDA		▓			
GEORGIA		▓			
HAWAII				▓	
IDAHO		▓			
ILLINOIS		▓			
INDIANA				▓	
IOWA				▓	
KANSAS		▓			
KENTUCKY		▓			
LOUISIANA	▓			▓	
MASSACHUSETTS		▓			
MARYLAND		▓			
MAINE			Discover Am		
MICHIGAN		▓			
MINNESOTA		▓			
MISSISSIPPI	▓			▓	
MISSOURI		▓			
MONTANA		▓			
NEVADA	▓	▓			
NEBRASKA	▓		▓		
NEW HAMPSHIRE				▓	
NEW JERSEY	▓				
NEW MEXICO	▓				
NEW YORK	▓			▓	
NORTH CAROLINA		▓			
NORTH DAKOTA				▓	
OHIO			▓		
OKLAHOMA				▓	
OREGON		▓			
PENNSYLVANIA			Discover Am		
RHODE ISLAND				▓	
SOUTH CAROLINA			▓		
SOUTH DAKOTA		▓		▓	
TENNESSEE		▓			
TEXAS			Discover Am		
UTAH		▓		▓	
VERMONT				▓	
VIRGINIA	▓			▓	
WASHINGTON				▓	
WEST VIRGINIA				▓	
WISCONSIN				▓	
WYOMING			▓		

Source: Dornbusch & Company, Inc.

TABLE III-3: STATE TOURISM AGENCIES' TRAVEL INFORMATION KIOSK SYSTEM ESTABLISHMENT

STATE	NUMBER OF KIOSKS	BECAME OPERATIONAL	OWNED BY		RFP Procured	
			private	public agency	yes	no
A. KIOSK SYSTEM DEVELOPMENT AND ADMINISTRATION IN STATES WITH EXISTING KIOSK SYSTEMS						
COLORADO	1	1992		U.S. Forest Service		
CONNECTICUT	2*	1993	Omnitouch			
DELAWARE	2	1994		State Parks		
FLORIDA	12	1994/5	I.S.E.			
GEORGIA (b)	11**	1996				
IDAHO	10	1992		Parks & Rec		
ILLIONOIS	2 (2 screens)	1994		St. of Illinois		
KANSAS	3	1991		Commerce/Tourism		
KENTUCKY	5	1993		Tourism/Transptn.		
MASSACHUSETTS	10***	1996		Mass Turnpike Authority		
MARYLAND	5	1994		Tourism		
MICHIGAN	13	1991	M.I. Video			
MINNESOTA (a)	3	91 (VacAdviser)		Tourism		
MINNESOTA (b)	4	93 (TravPartners)		Tourism/Transptn.		
MISSOURI	6					
MONTANA	7					
NORTH CAROLINA	8	1991	Touch'n'Go			
OREGON	33****	1989		State Agencies		
SOUTH DAKOTA	7	1990		St. University		
TENNESSEE	12	1985		Touch'n'Go		
UTAH	5	1989		Utah Travel Council		
B. KIOSK SYSTEM DEVELOPMENT AND ADMINISTRATION IN STATES WITH DISCONTINUED KIOSK SYSTEMS						
ALABAMA	8		Touch'n'Go			
ARKANSAS	3					
GEORGIA (a)	11	1983		Touch'n'Go		
LOUISIANA						
MINNESOTA	3	1994-1995		MinnDOT		
MISSISSIPPI	10	1984	Touch'n'Go			
NEBRASKA		1986				
NEW JERSEY			Nynex			
NEW MEXICO	4	1991				
NEVADA		1989-90				
NEW YORK						
VIRGINIA		1985				

*Connecticut has 11 Kiosks in total, 2 are in welcome centers
**Georgia will have 130 Kiosks in all, 11 in welcome centers
***Massachusetts will have 2 at each of their 4 welcome centers, 1 at the Boston Park Station, and 1 at a service area
****Oregon has 33 Kiosks, 2 in State Parks, 17 U.S. Forest Service, 13 Southern Oregon Visitor Association, and 1 at a BLM site.
Blanks indicate no information

Source: Dornbusch & Company, Inc.

TABLE III-1: GENERAL EVALUATION OF TRAVEL INFORMATION KIOSKS BY STATE TOURISM AGENCIES

STATE	SYSTEM DEVELOPMENT	SYSTEM ADMINISTRATION		SOFTWARE DEVELOPMENT		PRESENTATION DESIGN		SYSTEM HAS BEEN UPGRADED	
		private	public agency	private	public agency	private	public agency	yes	no
A. KIOSK SYSTEM DEVELOPMENT AND ADMINISTRATION IN STATES WITH EXISTING KIOSK SYSTEMS									
COLORADO	Milagro Graphics		City of Rifle			Consultant			
CONNECTICUT	Omnitouch								
DELAWARE	Poseidon		State Parks						
FLORIDA	I.S.E.		Dept of Commerce						
GEORGIA (b)	JHK Assoc.		Georgia Net	JHK Assoc		JHK Assoc			
IDAHO	ITT/Innovus		State Agencies						
ILLINOIS	P.I.A. Inc.		Bur. of Tourism						
KANSAS	Poseidon		Ch of Commerce						
KENTUCKY	PlanGraphics		Dept of Tourism						
MARYLAND	Travel Comctns		Dept of Tourism						
MASSACHUSETTS	Questra								
MICHIGAN	M.I.Video								
MINNESOTA (a)	IBM		Tourism						
MINNESOTA (b)	MinnDOT		Tourism/Transptn						
NORTH CAROLINA	Touch'n'Go		Dept of Tourism						
OREGON	Source Interactive		S Or Visitors Assoc						
SOUTH DAKOTA	St. Uni./Tourism		Dept. of Tourism				St. Uni./Tourism		
TENNESSEE	Touch'n'Go								
UTAH	Info Connection		Utah Travel Council						
B. KIOSK SYSTEM DEVELOPMENT AND ADMINISTRATION IN STATES WITH DISCONTINUED KIOSK SYSTEMS									
ALABAMA	Touch'n'Go								
ARKANSAS									
GEORGIA(a)	Touch'n'Go		Dept. of Tourism						
MINNESOTA	Westinghouse		MinDOT						
MISSISSIPPI	Touch'n'Go								

Source: Dornbusch & Company, Inc.

TABLE III-5: COMMENTS ON STATE TOURISM AGENCIES'TRAVEL INFORMATION KIOSKS

STATE	COMPLAINTS FROM THE PUBLIC		RECOMMENDATIONS
	Yes	Nature of the Complaints	
A. KIOSK EVALUATION FROM STATES WITH EXISTING KIOSK SYSTEMS			
COLORADO		Information too limited	Define relationship with, and monitor partner
CONNECTICUT			Kiosks have regional information & state would like it to be more state-wide
DELAWARE			Be Specific about aims before beginning
FLORIDA			Involve private sector from start, so grasp needs
IDAHO		When does not work	State, federal and private partnership is good, get a good printer
ILLINOIS			Detailed contract, 24 hr access, variety of info
KENTUCKY		Information too limited/System down	
MICHIGAN			Research the markey, solicit others opinions, have goals
MINN.(a)Vac.Adv.		Information too limited	Develop system to meet your needs, and keep control
MISSOURI			Keep information updated
NORTH CAROLINA		Information too limited	Ensure public agencies are involved
OREGON		Information too limited	Keep system simple, involve welcome center staff, limit vendor input
SOUTH DAKOTA		Machine not working	Study the market before committing to any one developer
TENNESSEE			Real-time updates, reservation system capacity, comprehensive info
UTAH		Machine not working	People seem to like them, but information not complete
B. KISOK EVALUATION FROM STATES WITH DISCONTINUED KIOSK SYSTEMS			
ALABAMA		Machine not working	Get iron-clad agreement with vendor, especially for maintenance
ARKANSAS		Information too limited	Supplier went out of business
GEORGIA(a)		Information too limited	Kiosks are good idea, people like them
LOUISIANA		Information old/printer boken	Get user-friendly system, with comprehensive information
MISSISSIPPI		Machine not working	State-wide information, good printer (including maps), detailed contract
MINNESOTA			Good printer, weather information too, user-friendly
NEBRASKA			Problems with extreme climate in NH, wants state-owned system
NEVADA		Machine not working	User-friendly, reliable system
NEW MEXICO		Information too limited/System down	Set up strong private/public sector relationship

Source: Dornbusch & Company, Inc.

involved in, or closely monitor, software development to ensure that the information to be made available via the kiosks is included and presented in a manner that is acceptable to them.

Most of the states who have discontinued kiosk systems are not currently planning on developing a new kiosk system, although they are still interested in them and closely observe developments in the field. Arkansas is the only state which is not interested in obtaining a travel information kiosk system. Georgia has developed a new state-of-the-art kiosk system in response to perceived demands for travel and transportation information as a result of the 1996 Olympics. Minnesota has tried three different kiosk systems; two are still operational. The Guidestar/Travlink pilot program run by the Minnesota Department of Transportation is currently in review, and may be combined with one of the other existing kiosk systems(Vacation Advisor or Travel Partner).

States that currently have travel information kiosk systems generally expressed satisfaction with their systems and are not planning on replacing them in the near future. However, most of them would like to up-grade and modernize their systems, particularly with real-time information and mapping capabilities.

Several state Travel and Tourism Department representatives from states that have never had kiosk systems for travel and tourist information report having had favorable experiences with kiosk information systems and their departments are either definitely planning on obtaining systems in the near future, or would definitely like to have a kiosk information system, but currently cannot plan such a venture due to lack of funding. (See Table 111-2).

3. Conclusions

Various states' past experiences with travel information kiosks provide guidance about key issues for kiosk system conceptualization and development. State Travel/Tourism departments and/or Departments of Transportation should clearly specify their aims and objectives for their kiosk systems. They should survey the kiosk system market and study all the alternatives until they find the most appropriate for their needs. They should have a clearly defined contract with the kiosk vendor which covers initial set-up, software development, information organization and presentation, maintenance and potential future up-grades to the system. Preferably, if they have the funds, they should obtain a computer that is powerful enough to allow easy expansion of the information database or facilities.

B.   Current Use of Interactive Kiosks at Rest Areas

Since the first wave of kiosk developments in the mid and late 1980s, most of the factors inhibiting kiosk development have decreased in importance. Several states have initiated kiosk development projects to provide public information. The most notable of those already identified are:

Montana: Travel Montana is opening a new travel information kiosk system for their seven welcome centers in July 1996. Their system has been jointly funded by eight state and federal government agencies. All eight agencies have been involved in amassing the traveler and tourist information that will form the system's database. Initially the kiosk system will not include any advertising or real-time information, although it does have those facilities. They are planning to issue an R.F.P. to contract with a private company to organize the advertising component, after the system has been up and running for two-five years and they have some statistics regarding the number of people who use the kiosks. Montana hopes to include real-time information in the near future, once they have installed the necessary hardware at their headquarters. In the meantime Travel Montana will up-date the information weekly and in person. They received six proposals for software development after issuing an R.F.P. for $80,000. They spent approximately $10,000 on hardware for each kiosk.

Minnesota: The Minnesota Office of Tourism has its own kiosk system, the Minnesota Vacation Adviser, in use at its St. Paul office and at the airport. IBM contributed $75,000 towards development costs for these kiosks and the Office of Tourism covered the rest of the costs. The kiosks include all the tourist information that is available to the Office of Tourism. It can produce print-outs on thermal facsimile paper.

The Minnesota Travel Partners project is a joint effort by the Minnesota Office of Tourism and the Minnesota Department of Transportation at four kiosk sites. It is the traveler information kiosk component of Minnesota's larger transit management sys tern. It has more sophisticated graphics than the Vacation Adviser, but the tourist information database is not so wide-ranging. However, it does include route and map information, which can be printed on plain paper by a good quality laser printer. At one kiosk site 9,900 people used the kiosk in the year between September 1994 and August 1995.

The Minnesota Department of Transportation has also been running the Guidestar/Travlink pilot project. It primarily provides public transportation and park and ride information, and trip routing and map information, which can be printed out on a laser printer. Currently, the system is under review, and may be combined with one of the other existing systems.

There is no advertising on any one of these system, each has been conceived as a service venture only. However, there are listings available of existing privately-run businesses and services, as well as state agency information.

Maryland: As the initial partner in the Discover America project, this kiosk system is designed as a national network of public information and commercial services presently being promoted by the Tourist Information Association and AT&T. Funding for this system is planned to be almost entirely advertising based. Discover America requires a initial membership fee (usually $50,000) from the states. Maryland was able to put up this amount under a state co-operative marketing law which allows some circumvention of the RFP process if the kiosk was defined as a marketing tool and the membership fee was defined as less than 50% of initial costs.

Connecticut: Connecticut has information kiosks in three of their Welcome Centers which are part of a network of eleven kiosks throughout the state. The kiosks are owned and run by a private company and are completely advertising based. Businesses generally pay $895 to advertise on the system. Connecticut Tourism pays a reduced non-profit rate to place public information on the system. The information on each kiosk is specifically for particular regions, and Connecticut has received some complaints about the lack of state-wide information on the system. Connecticut Tourism is planning on issuing an RFP for their own information kiosk system.

Kentucky: A recently purchased system primarily provides public information on the state and local recreation and tourism activities and attractions, with some accommodation information. There is an advertising capability on the five kiosks, however this has not yet been operational. Kentucky Tourism and Transportation Departments are planning to provide free real-time traffic information via telephones adjacent to the information kiosk. The telephones will incorporate a reservations board which allows free telephone access to hotels. The system was jointly funded by the State Tourism and Transportation Departments.

Florida: This system is strongly orientated towards providing information on commercial services to travelers as well as public information. Each of the four state Official Florida Welcome centers has a kiosk. The kiosks have a strong advertising component, which includes a reservation facility, and will contain transactional capabilities in the near future. The system also includes real-time local and state-wide weather conditions and traffic and emergency information, via a reader board adjacent to the kiosk. This system was funded entirely by the kiosk supplier, who has also contracted to give the Florida Department of Commerce 10% of gross revenues from the advertising. The kiosk supplier

(I.S.E.) estimates to have invested $2,000,000 in hardware and software development, and organizing the advertizing component.

Georgia: In July 1996 Georgia will implement the most technologically advanced information kiosk system in the United States for the 1996 Olympic Games. Their system is 80% funded by the Federal Highway Administration, and 20% funded by the state of Georgia. Total system cost is $4,000,000. There are 130 kiosks throughout the city of Atlanta, eleven of these will be in Georgia's Welcome Centers. They will have real-time traffic, public transit, weather, airport, mapping and tourist information. Currently the tourist information is designed to meet the time-frame and perceived needs of the Olympics. The kiosk hardware includes a telephone for making calls directly to the location on the screen. The Olympic Games has an Internet site which includes tourist. travel and accommodation information, as well as reservation and transaction capabilities.

Oregon: Oregon implemented a 33 kiosk information system in 1990, purchased for $370,000 with funds from the Oregon Lottery matched by the U.S. Forest Service. The Southern Oregon Visitors Association (SOVA) and the U.S. Forest Service jointly manage the systems, 32 of which are located in the southwestern portion of the state, 3 in state-run information centers. Systems are located in forst service offices, Crater Lake NP, Oregon Caves NM, local and state visitor centers, the regional mall, regional airport, and a factory stores outlet. The U.S. Forest Service "owns" the hardware for 17 of the systems and SOVA "owns" the hardware for 13 of the systems. The remainder are owned by Oregon State Parks and the Bureau of Land Management. Kiosks have video, graphics, and text information specific to southern Oregon. Advertising comprises 30% of the funding for the running of the kiosks, and 10% of the kiosk information content. A one-screen advertisement on all 33 kiosks costs $120 per year, a four-screen advertisement costs $420 per year. The total system obtains approximately one million "touches" per year, around 175,000 users.

Idaho: Their system has been entirely funded by cost-sharing among the State and federal agencies participating in providing information to the public. The State's Department of Transportation has had the primary responsibility for system development and administration. The system includes a "yellow pages" type listing of commercial traveler services (businesses are listed for free). The system does carry advertising, but it represents only 10% of the content.

Dornbusch and Company surveyed those people who are responsible for the dissemination of tourist and travel information in all 50 states in the U.S., and Washington D.C., concerning their experience and knowledge of interactive travel and tourist information kiosks. These people were usually representatives of state

government Tourist and Travel Departments and/or Departments of Transportation.

Of the 51 people questioned, 18 reported that their states currently have information kiosk systems at their welcome centers or rest areas, nine have had welcome center information kiosk systems that they have discontinued, two have discontinued previous welcome center information kiosk systems to replace them with more sophisticated systems. Of the remaining 32 respondents, 10 are planning on establishing tourist information kiosk systems, 20 would like to plan for this, but are currently restricted from doing so by lack of funding. Only Arkansas expressed no desire for a tourist information kiosk system. See Table III-2

There are other kiosk systems owned by state or federal government agencies, and some privately-owned information kiosk systems, that include travel and tourist information, but are not located in welcome centers or rest areas. Their existence does have implications for the development in the future of state-administered information kiosk systems beyond the boundaries of welcome centers and rest areas, if maximizing financial revenues from advertizing and providing 24-hour access to travel, tourist and transit information in areas of high pedestrian traffic become priorities. The new system in Georgia, for example, has kiosks in its 11 welcome centers and 119 kiosks located in the Metropolitan Atlanta Rapid Transit Authority (MARTA) stations, in shopping malls and in large office buildings. Denali National Park in Alaska has kiosks at their information centers from which people make reservations to enter the park. The extensive Royal Hawaiian Shopping Center has a privately-run kiosk system which carries both retail, mapping and travel information, and is funded by advertising revenues. Colorado has a privately-owned regionally-based travel information kiosk system that is funded primarily by commissions on reservations, mostly for river rafting, and by advertising.

There is some variation in the types of information that is on information kiosk systems. Generally the information can be divided between public agency, including traffic and transit information, and private sector business information. Nearly all of the existing and discontinued information kiosks in welcome centers included both kinds of information. Only state or federal government owned kiosks carry only public agency information, as in Alaska at Denali National Park. Similarly, only privately-owned kiosk systems have only private sector information, these are usually "retail" kiosks, often located in shopping malls and areas of pedestrian traffic density. See Table 111-6.

A key factor affecting the feasibility of tourist information kiosk systems at welcome centers and rest areas is the success of any advertising component on the kiosks. Previous problems with limited available information, which was then often dominated by advertising, demonstrate that the organization and presentation of the advertising has to be carefully managed in order to be successful. Some states

TABLE II-M: GENERAL INFORMATION PROVIDED BY KIOSKS

Note: ■ indicates a shaded (filled) cell.

STATE	SOURCE OF INFORMATION		KIOSK SERVICES			
	Public	Private	Advertising	Reservations	coupons	Real-time Info
A. INFORMATION KIOSKS IN WELCOME CENTERS AND REST AREAS						
COLORADO	■	■	■			
CONNECTICUT	■	■	■	■	■	
DELAWARE	■					
FLORIDA	■					
GEORGIA	■	■		■		■
IDAHO	■	■	■	■		
ILLINOIS	■	■				
KANSAS	■	■	■			
KENTUCKY	■	■			■	
MARYLAND	■	■	■	■	■	
MICHIGAN	■	■	■	■		■
MINN (a)Vac. Adv.	■					
MINN (b)Trav. Part.	■					■
MONTANA	■					
NORTH CAROLINA	■	■	■			
OREGON	■	■	■			
SOUTH DAKOTA	■	■	■			
TENNESSEE	■	■	■		■	
UTAH	■	■				
B. DISCONTINUED INFORMATION KIOSKS IN WELCOME CENTERS AND REST AREAS						
ALABAMA	■	■	■			
LOUISIANA	■	■	■			
MISSISSIPPI	■	■	■			
NEBRASKA	■	■	■			
NEW JERSEY	■	■	■			
NEW MEXICO	■					
NEVADA	■	■	■			
NEW YORK	■	■	■			
VIRGINIA	■	■	■			
C. OTHER STATE GOVERNMENT - OWNED KIOSKS						
ALASKA	■			■		
CALIFORNIA	■					
DIST of COLUMBIA	■					
HAWAII	■					
NEW JERSEY	■					
OREGON	■					
D. PRIVATELY-OWNED KIOSKS						
ALASKA		■	■	■		
ARKANSAS		■	■	■		
HAWAII		■	■			
NEVADA		■	■	■		

Source: Dornbusch & Company, Inc.

have dealt with this problem by simply not including advertising on their kiosk systems, instead they simply offer a business listing. Other states, such as Kentucky and Montana, have recognized the revenue-generating potential of information kiosks and have included an advertising component which will, however, not be brought into operation until the system has been up and running for some time. Tennessee, Connecticut, Maryland and North Carolina are content to allow the kiosk supplier to administer the advertising component. Other states, such as, Oregon and South Dakota, administer the advertising component themselves. It is worth noting that eight of the ten discontinued information kiosk systems had advertising components, and all of these were managed by the kiosk supplier. This would suggest that generally the advertising component is more successfully integrated into the information kiosk systems if it is administered or closely monitored by the states. See Table 111-6.

A successful kiosk system is one that has a comprehensive enough database to be useful to the public, which has user-friendly technology, and which is well-maintained. However, information kiosk systems have varying information services that they can offer, which can affect how useful or attractive they are to travelers, for example, reservation capabilities, coupons, real-time information and mapping capabilities. There are nineteen travel and tourist information kiosk systems located in welcome centers and rest areas in eighteen states (Minnesota has two similar but different systems running concurrently). Twelve have some kind of mapping ability, five of them have reservation capabilities, via telephone hook-up systems located adjacent to the kiosks. Four print coupons, only three carry real-time information. None of the discontinued kiosk systems printed coupons, had mapping capabilities, or had real-time information, however, some had telephone reservation capabilities. Developments towards more services on kiosks is a result of advances in the technology, which along with cuts in the prices of the technology, have made these services more available. They are also a response to perceived traveler needs and desires, after the frustrations of the early kiosk systems. See Tables III-6 and 111-7.

Over the last 15 years certain elements of kiosk hardware have developed into system standards. Nearly all existing and discontinued kiosks have included touch-screens, personal computers with hard drive storage and black and white printers. These have evolved as the basic elements of all information kiosk system. Nine of the nineteen existing kiosk systems have moving image video with audio, the rest have the simpler, and faster, "stills" graphics, seven have printers. See Table 111-7. The recent rapid development and availability of modems has changed options for up-dating and including real-time information on the systems. GeorgiaNet has distributed hand-held and lap-top computers to several hundred business people visiting Atlanta for the Olympics. These are all connected directly into the information database and can access all the information available on the kiosks.

TABLE III-7: SPECIFICATIONS OF STATE TOURISM AGENCIES' TRAVEL INFORMATION KIOSKS

STATE	STATIC ADVERTISING		ACCESS TO INFO	STORAGE		UPDATE ACCESS			PRINTER	GRAPHICS		MAPPING	
	Mounted on Kiosk	Brochures Adjacent	Touch-Screen.	Laser Disk	Hard Drive	Modem	Networks	In Person	Black & White	Skills	Video	Locational	Driving Directions
A. SPECIFICATIONS OF EXISTING TRAVEL INFORMATION KIOSKS AT WELCOME CENTERS AND REST AREAS													
COLORADO		X	X		X					X			
CONNECTICUT			X					X	X				X
DELAWARE			X					X	X				
FLORIDA	X	X	X		X								
GEORGIA (b)			X		X			X	X		X	X	X
IDAHO		X	X		X				X		X	X	X
ILLINOIS		X	X		X				X		X	X	X
KANSAS		X	X		X				X			X	X
KENTUCKY			X					X	X			X	
MASSACHUSETTS			X		X	X					X		
MARYLAND	X		X		X	X							
MICHIGAN			X		X	X							
MINN (a)Vac.Adv	X		X									X	
MINN (b)TravPart	X		X									X	
MISSOURI						X					X		X
MONTANA													
NORTH CAROLINA		X											
OREGON	X	X	X					X	X		X		X
SOUTH DAKOTA		X	X								X	X	
TENNESSEE			X		X				X		X		X
UTAH		X	X							X			
B. SPECIFICATIONS OF DISCONTINUED TRAVEL INFORMATION KIOSKS AT WELCOME CENTERS AND REST AREAS													
ALABAMA		X	X					X	X		X		
ARKANSAS		X	X					X			X		
GEORGIA(a)		X	X						X				
LOUISIANA			X						X				
MISSISSIPPI		X	X					X	X				
NEBRASKA		X											
NEW JERSEY													
NEVADA													
NEW MEXICO			X	X								X	

Source: Dornbusch & Company, Inc.

Given previous negative experiences with information kiosk systems managed by the kiosk supplier at no cost to the state, most of the recently established systems used an RFP process and are owned by the state or state agencies. The number of kiosks varies between one and twelve, with the average being six. See Table III-3. The number is usually dictated by the number of welcome centers, or the number of kiosks that the state can afford.

Tourist and travel information kiosk systems in state welcome centers and rest areas have been relatively successful. Although 11 systems have been discontinued, some of those were pilot projects only, and others became out-dated as technology advanced. Only two of the state representatives with discontinued systems reported that they were "not satisfied" with the system that they had. Most representatives were "quite satisfied", one was "satisfied" and one was "very satisfied". See Table III-l. The majority of the representatives from states with operational information kiosk systems at their welcome centers are satisfied with their kiosk system. Certainly, tourist information kiosks would be more attractive to travelers, especially given recent traveler trends, if they were user-friendly and reliable, 24-hour accessible, contained a wide-ranging amount of well-organized public and private sector information, and included advanced mapping, real-time information and some kind of reservation capabilities.

In the last few years, most states have received a number of proposals for kiosk development "partnerships." This suggests that the private sector is certainly interested developing information kiosk sys terns. However, many states expressed their frustrations and difficulties in both writing effective RFP's and evaluating different proposals and kiosk systems. The newness of the medium has meant that there is limited available information on travelers' information needs and preferences from kiosk systems.

Recently, however, states have been sharing information regarding their experiences and knowledge of information kiosk systems, with the result that more states have been developing RFPs for information kiosk systems. One approach, recently used by Montana, is to separate the development into different stages; software, hardware and advertising. Other states maintain that development and implementation should be integrated. In any case, it is clear that identifying the objectives for the kiosk system must be an initial step in the kiosk development process that can play an important role in determining the ultimate success of the sys tern.

C. Present Demand for Traveler Information Services

1. Traveler Traffic Volumes

Interactive kiosks placed at rest areas and welcome centers have the potential to influence the largest segment of the U.S. tourism market. Rest areas and welcome centers cater to tourists traveling by automobiles, vans, light trucks and recreational vehicles (RV's). In 1994, total vacation travel was estimated at 658 million person-trips. Vacations by cars, light trucks and RVs accounted for approximately 78% of these vacation person-trips (Herbert, 1994).

A significant portion of vacation trips are taken during the summer months. The Travel Industry Association of America and American Automobile Association (AAA) forecasted that Americans would take 230 million person-trips during the summer of 1994. Automobile travel was expected to account for 80% of all summer vacation trips (Herbert, 1994). It is estimated that 16% of summer vacation trips are taken by air travel, and 4% by train, bus, cruise ship or other transportation modes (Herbert, 1994). Automobile travel is clearly the preferred mode of travel for vacationing Americans. Federal Highway Administration (FHWA) statistics demonstrate that, in 1994, the average annual number of vehicle-miles traveled per person was 15,100 miles. On average over 4,000 of the miles traveled were attributable to vacation trips. According to the American Automobile Association, the average length of a vacation trip is 349 miles (Herbert, 1993).

Statistics show that auto travelers in the U.S. gravitate to some destinations more than others, for example, during the summer of 1993, the Southeast was the favorite auto travel destination favored by 30% of vacation travelers. The next most popular region in the country was the American West favored by 21% of travelers. The Midwest was the location of choice for 20% of vacationers. The Northeast attracted 14% of summer vacationers, and the Great Lakes were favored by 13% of summer travelers (Herbert, 1993).

There has been an increase in auto travel in recent years. Automobile travel, which includes travel in cars, light trucks and recreational vehicles (RVs), was up 2% in 1995 over auto travel in 1994. Travel industry experts predict a 1% to 2% increase in auto travel for 1996. Although a modest increase, this is still noteworthy given auto travel is expected to increase this year on the heels of a string of increases in auto travel in recent years (Herbert, 1995).

The volume and type of a state's traveler traffic will have an important influence on its kiosk development potential. Travelers are more likely to stop at rest areas and welcome centers in search of travel-related information at destination states, such as California and Florida, than drive-thru states, such as Iowa and Alabama. These differences in travelers perceptions of states suggest the need for different

development configurations. Kiosks at rest areas in destination states should make it a priority to offer information about, and reservations for, hotels and attractions, as well as maps and directions to popular destinations. Kiosks in drive-thru states should prioritize information on hotels, restaurants and car maintenance and fueling facilities, as well as highlighting local areas of interest, along the main travel corridors.

2. Traveler Traffic Trends

Research on traveler traffic trends demonstrates the growing importance of en-route tourist and travel information. These trends include the following:

- Increases in the amount of weekender travelling;
- Decreases in pre-trip planning, both in destination and accommodations planning;
- Developing market of travelers seeking more diverse recreational opportunities;
- Continued prevalence of families as an important vacationer market;

a. Increases in Weekender Trips

Travel experts have noted an increase in the popularity of taking vacations over long weekends. Automobile travel managers at 35 American and Canadian automobile clubs were surveyed in 1992. Approximately 97% of the travel managers surveyed observed an increase in the number of travelers taking shorter, more modest vacations. The automobile travel managers associated this trend with the flat national economy at that time. Cost conscious travelers will take shorter, more frequent trips. Typically these trips are planned around weekends to minimize the vacation time taken off from work (Crosby, 1992).

b. Decreases in Pre-Trip Planning

Another travel-related trend is a decrease in pre-trip planning, with a concurrent increase in travel decisions being made on the road. Two factors explain the decrease in pre-trip planning. First, the increases in weekend vacation trips are linked to decreases in pre-trip travel arrangements. Vacationers going away for a long weekend have less time and need to fully plan their trip. Second, a decline in pre-trip planning can be associated with travelers having a greater interest in a more flexible trip itinerary. Several studies have documented the decline in pre-trip planning and the burgeoning popularity of flexible trip itineraries. In a study of welcome centers in Colorado, 69% of the respondents reported having flexible or

very flexible trip itineraries [Tierney, 1993].

In 1985, 40% of respondents at Michigan's welcome centers reported making no pre-trip reservations [Michigan Travel and Tourism]. A 1989 study in Oregon reported that approximately 51% of travelers planned the overall route, but not individual stops, and 23% conducted little pre-trip planning. Interestingly, 74% of Oregon respondents indicated that they would be influenced by information provided to them en-route [Dean Runyan Associates, 1989]. In a welcome center study conducted in Illinois, 54% of respondents said they obtained travel information during their trip, 42% stop at welcome centers whenever they travel and an additional 35% indicated that they stop "somewhat often" (Fesenmaier, 1994).

Kiosks can also assist those who like to pre-plan their destinations by providing maps and directing motorists to businesses or tourist attractions. However, Fesenmaier's conclusions from a welcome center study in 1993 that visitors actively seek information during their trips emphasizes the importance of the need for a well-developed and easily accessible information distribution system within a state, such as can be provided through an interactive kiosk system.

c. Increasing Demand for Diverse Recreational Opportunities

A recent trend among automobile travelers is the increase in vacationers seeking more diverse recreational opportunities. In particular, travel experts have observed an increasing number of tourists that specifically seek destinations with few other travelers. The AAA's 1991 Travel Attitude Monitor (the "Hassle Index") noted that Americans are increasingly sensitive to traffic congestion and crowding, and attempt to avoid such hassles when on vacations. The Hassle Index found that traffic congestion and rising fuel costs were factors contributing to drivers' perceptions that auto travel conditions were worsening in this country (Mason, 1992). An indicator of this is that approximately 87% of auto travelers surveyed reported that they adjust their travel behavior by taking the most direct route to their destinations. Another 70% of respondents reported driving during off-hours to avoid crowds (Mason, 1992).

In addition, more travelers are looking for alternative vacation destinations. While old favorite vacation destinations remain popular, such as Orlando, Florida, Washington D.C., Los Angeles and San Francisco, California and New York City, several new popular destinations have emerged that indicate travelers preferences to vacation in more rural areas. These out-of-the-way locations include "Little Nashville" in Branston, Missouri, the "Mall of America" in Bloomington, Minnesota, and the gold country in Sonora County, California.

Given the increasing numbers of tourists that are seeking destinations and routes

with few other travelers, interactive kiosks are attractive disseminators of information as they can include a comprehensive amount of information, including alternative destinations, which can be made available 24 hours a day, and could include real-time traffic information, all available en-route.

d.   Prevalence of Family Vacationers

Another trend amongst American vacationers that travel by automobile is the prevalence of family vacationers. The family vacation market accounts for approximately 80% of all vacation travel in the United States (Mason, 1992). Families vacationing with children tend to be more cost-conscious and therefore more likely to travel by automobile, than other modes of transportation such as air travel.

Parents traveling with children tend to make more unscheduled stops than other travelers, particularly to use rest facilities. Family vacationers tend to have more detailed trip itineraries, however, they could find an interactive kiosk useful for locating the nearest dining facilities or children's attractions. Kiosk developers should be aware of the high proportion of family vacationers at rest areas and specifically design programs to meet the needs of these travelers. This point is strengthened by the fact that when used by families, the interactive kiosk gets "more bang for the buck" because the information obtained potentially impacts the travel itineraries and vacation dollars of the entire family, but usually only one family member obtains this information from the kiosk.

These observations of increases in weekender traveling, decreases in pre-trip planing, increases in the demand for diverse travel experiences, and the power of the family unit suggest that interactive kiosks placed in rest areas and welcome centers could have a significant affect in assisting traveler and tourist decision-making, particularly if the kiosks facilities are accessible 24 hours a day, have a comprehensive database, and real- time information.

3.   Use of Rest Areas and Welcome Centers

There are 2,700 rest areas and 290 welcome centers in the continental U.S. All states, with the exception of California and Montana, maintain travel promotional programs located in Welcome Centers (also referred to as Traveler Information Centers). These centers are usually located at the borders of the states, and are generally associated with highway rest area facilities. The Welcome Centers offer brochures, static poster displays and are staffed by travel consultants, who give information to the highway travelers and advice on attractions, special events, travel routes and lodging alternatives.

Numerous factors must be considered in order to understand the traveler demand for rest area and welcome center facilities. These factors include the stopping percentages of automobile vacationers, the demographics of rest area and welcome center users, the average stopping times of these users, the information most commonly requested, and the types of activities in which these travelers participate.

a. Stopping Percentages

Estimating percentages of vacationers traveling by automobile that stop at rest areas and welcome centers can be difficult. Many studies have been conducted at welcome centers and rest areas, however, these samples are biased because visitors responding to the survey have already demonstrated that they are likely to stop at welcome centers or rest areas. To get an accurate idea of the percentages of travelers stopping at welcome centers or rest areas, one would need to stop travelers along the Interstate highway system or another neutral area. The logistical demands of this endeavor, however, have proven too difficult for most studies.

In 1990-91, the Virginia Division of Tourism sponsored the *Four-Season* Visitor *Study* in which travelers were interviewed at 40 locations across the state, including at welcome centers. According to this study, 27% of all Virginia visitors used the welcome centers as a source of travel information. Correspondingly, 100% of welcome center visitors used the welcome center as a source of information. It is estimated that over 95% of all drivers have used rest areas at some point during their travels, and approximately 60% of these drivers prefer them over other stopping opportunities for non-gas and non-restaurant stops.

Other studies have examined the reasons that travelers stop at welcome centers and rest areas. In addition, some of these studies specifically requested information on whether travelers obtained travel-related information at welcome centers. Although the majority of travelers stop primarily to use the rest room facilities, a high percentage of visitors gather some traveler information during their stop.

In a study conducted in Indiana on the influence of en-route information obtained at the State's welcome centers, Fesenmaier found that 71% of those surveyed obtained travel related information during their stop at a welcome center (Fesenmaier 1993). 80% of respondents at Illinois' welcome centers indicated they stopped primarily to use the rest room facilities, and 22% indicated they stopped to obtain travel information. The large majority (76%), however, reported that they actually obtained travel information during their stop, regardless of their initial intention in stopping at the welcome center (Fesenmaier, 1994). The same Illinois study found that only 28% of the respondents said they actively collected or read information about travel in Illinois before starting their trips. However, 54% said

they obtained travel information during their trip. This study also reported that a large segment of those surveyed (42%) stop at welcome centers whenever they travel; an additional 35% indicated that they stop "somewhat often." In a 1986 study of Michigan welcome centers, approximately 51% of travelers stopped primarily for information, however, 74% of the welcome center visitors reported that the information they received influenced their trips in some way (Michigan Travel and Tourism, 1986).

These studies indicate that while some travelers are not stopping at welcome centers and rest areas specifically for travel information, the majority of visitors to welcome centers do gather travel information during their stop and, as will be discussed later in this chapter, this information may affect their trip itineraries. This suggests that visitors to rest areas will use interactive kiosks to obtain traveler information if they are made available.

b.   Demographics of Users

In early studies of welcome center visitors, Muha determined that travelers stopping at welcome centers tend to travel with at least one other person, are vacation travelers as opposed to business travelers, and travel during non-weekend times (Muha, 1977). Given that in recent years there has been an increase in weekend vacation travel, one should regard with some caution the finding that welcome center visitors tend to travel during non-weekend times. Generally, rest area and welcome center users:

- are older travelers;
- have above average incomes; and
- have higher than average educations.

A recent Monitor study highlighted the mature American travel market and found that this market segment is very different from their predecessors of 20 years ago. Travel has moved beyond the two-week work-related vacation. Travel is now being perceived as an "expected and integral part of the good life" by mature Americans. Fifty-five percent of the mature market segment agree that "even though there are many things I'd like to own I prefer to spend my money in experiences that will enrich my life, such as travel, vacations, theater and restaurants."

Of additional relevance is that the "Baby Boomer" generation is increasingly becoming a part of the mature market. The "Baby Boomer" generation is generally considered to be more accepting of technological changes and advancements, and more likely to use technological gadgets. It is predicted that their entry into the mature market segment will reflect even greater changes in the way travel will be marketed and the mode by which travel information will be provided in the near

future.

A 1991 study, (Hardy) analyzed segments of the mature market. In this study, 21% of those interviewed were classified into the "Free Spirits" segment. This sector is best described as possessing independence and having an openness to new experiences. An important finding associated with the "Free Spirit" segment is that this group enjoys making their own vacation arrangements and making travel decisions en-route. These findings positively enforce the likelihood that rest area and welcome center visitors would utilize interactive kiosks in making their travel plans.

Numerous studies conducted for states' welcome center programs[1] have confirmed that the majority of welcome center visitors come from the mature population segment. According to these studies, the average age of welcome center visitors is over 45 years. Therefore, this segment of the population represents an important target market of potential kiosk users.

In addition, consumers aged 55 and over represent one of the fastest growing segments of the population (Shoemaker, 1989). In terms of market size, an estimated 59 million people in the United States will be aged 55 or over by the year 2000. Americans aged 55-64 are the wealthiest age group in the country; the over 65 age bracket is the second richest age group in the United States. It has also been estimated that 80% of all vacation dollars in the United States are expended by people over the age of 55 (American Demographics, 1985). This segment travels more often, tends to go longer distances and takes longer trips than any other age group (Shoemaker, 1989). It is clear that program design for interactive kiosks should include information and attractions of interest to this group of potential kiosk users.

Another population group of potential importance as kiosk users is those people born during the low-birth years of 1965-1976. This group comprises 17% of the United States population, and has been called by a variety of labels such as Generation X, Twenty-somethings, Post Boomers, and Baby Busters. Understanding the interests and demands of this group is important to both the tourism industry and to advertisers. Dunn (1994) has identified this group as controlling $150-200 billion annually and, more importantly to this analysis, as the first group that has been widely exposed to computers, and therefore, the group that will be most attracted to obtaining information from a computer source.

A slightly larger group comprising 20 percent of the population and representing 37 million adults of 18 years of age or older, thereby including the post-boomer group,

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[1]   Studies from 15 states were reviewed: Arkansas, Colorado, Georgia, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, North Carolina, Oklahoma, Pennsylvania, Texas, Virginia and Washington.

is one that has been referred to as Techthusiasts by Gugel (1994). As a group, this segment of the population responds positively to innovations in the marketplace. We would expect this segment of the population to be favorably inclined to use a computer kiosk to obtain travel information.

c. Average Stopping Times

Knowledge of the average stopping times of visitors at rest areas and welcome centers is relevant for determining whether stopping times are ample enough to permit perusal of an interactive kiosk for travel information. In addition, the average stopping times of visitors to rest areas and welcome centers would provide some framework for the expected length of time the average kiosk user would utilize the information sys tern.

According to the state of Mississippi, the average stopping time for visitors at welcome centers in the state is 10 minutes, with a range from 5 minutes to 15 minutes (Mississippi Department of Economic and Community Development, 1996). A study conducted by the California Department of Transportation (Caltrans) indicated that the average stopping time for all vehicles using the roadside rest areas is 55 minutes. The average stopping time, however, of travelers using the rest areas for brief stops (stops of less than 3.5 hours) is 29 minutes. The mean stopping time for all vehicles is inflated by motorists who use the roadside rest areas for overnight stops thereby inflating the mean. These travelers are principally operating campers, vans, or motor-homes (Opinion Research Corporation, 1972).

The median stopping times for all travelers is 21 minutes. This figure removes the inflationary factor of overnight stoppers. The median stopping time at rest areas for brief stops is 19 minutes (Opinion Research Corporation, 1972). The shorter stopping times indicated in the more recent Mississippi study may be reflective of the trend towards shorter vacation trips and vacations taken around weekends. Travelers on briefer trips will generally make shorter stops at rest facilities.

We provide these figures with the caveat that the figures may have an inherent bias. Rest area visitors that are spending more time at the facility are more likely to respond to a survey than visitors who stop at the facility only briefly. However, the reported stopping times do permit sufficient time for travelers to gather visitor information from an interactive kiosk. And, visitors may be willing to increase their stopping times to use kiosks. As discussed in more detail in Chapter IV, we estimate that 2-3 minutes is the average length of time a rest area visitor would utilize a kiosk system.

d. Information Requested

A survey of the research conducted on requested information at welcome centers and rest areas points to the overriding importance of road maps, weather and road condition information. Information regarding accommodations and attractions is the second most requested type of information, followed by aid with travel route and reservations, and then regional information (Perdue 1993, Tierney 1993, Marcept 1992).

Currently demand for information concerning food and lodging is not dominant. However, given the growing trends towards decreased pre-trip planning and more flexible trip itineraries, we predict increasing demand in the future for lodging and restaurant information and reservation capabilities.

Interactive kiosks provide a medium through which travelers can be given information on attractions, accommodations, maps and road conditions. The inclusion of an Internet component in the kiosk system, making the kiosk information database available to those with access to computers with modems, could provide travelers with real-time information as they were leaving for their trip.

e. Travelers' Activities

Several welcome center studies have been conducted to determine the types of attractions and activities in which welcome center users participate. Many visitors to these states cite multiple activities in which they plan to participate. There are regional differences in the popularity of types of attractions, however, common interests among travelers across the U.S. include visiting historic sites, shopping, and visiting state or national parks.

According to the Arkansas Department of Parks and Tourism, 85% of visitors went sight seeing, 54% were interested in shopping, 54% were also interested in seeing local attractions, and 35% of visitors wanted to tour historic sites. (See Figure III-l).

In Mississippi, visiting historic sites was the most popular activity (36.2%) for visitors to welcome centers, engaging in casino gaming was the second most popular activity (35.0%), and shopping was the third most popular activity (27.7%) in the State.

A survey of Oregon's welcome center visitors demonstrated that the majority were interested in dining out and shopping. Visiting family friends, going to local attractions, and engaging in outdoor activities were of interest to about half of the visitors, while relaxing and sightseeing were cited by approximately one-third.

FIGURE III-1: ACTIVITIES BY ARKANSAS WELCOME CENTER VISITORS - 1989

Percent of Respondents
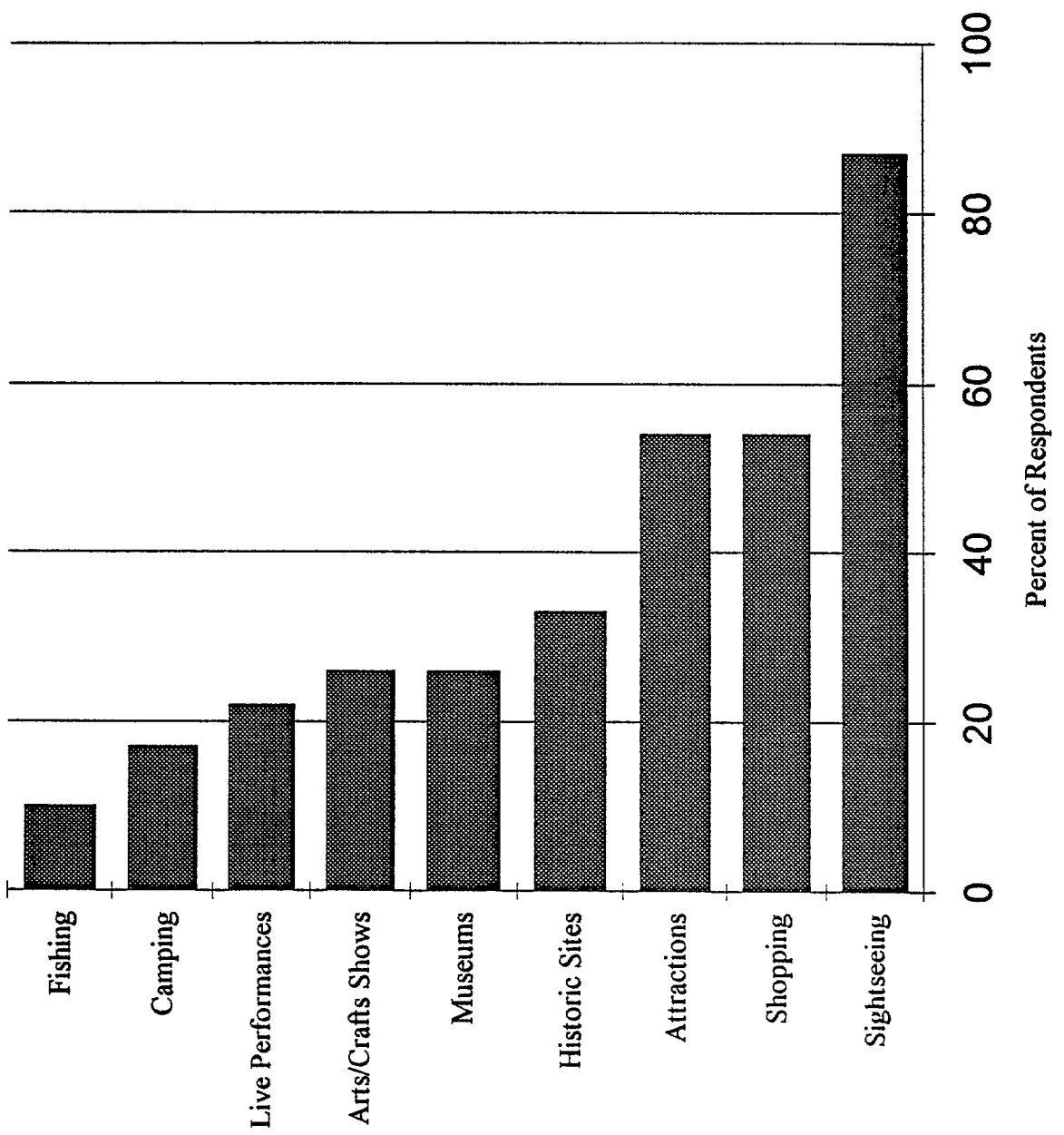
In Tennessee, shopping was the most popular activity among welcome center visitors, followed by the popularity of visits to historic places and museums, national or state parks, theme and amusement parks, and engaging in outdoor activities.

Approximately 83% of visitors to welcome centers in Virginia are interested in visiting historic sites, 64% plan to visit state or national parks, 49% are interested in touring the mountains, 27% are planning a visit to the State's beaches, and 19% are planning to engage in outdoor activities such as camping, fishing, or hunting.

     4.   Kiosk Use by the Public

Interactive kiosks can be used to provide much of the information requested by visitors traveling via the Interstate system, such as state maps, information on attractions, accommodations and road conditions. Also, kiosks can easily provide visitor information on the types of attractions that are popular with welcome center and rest area visitors, such as, the hours of operation and the locations of historic sites, shopping centers, and theme parks, as well as directions to state or national parks.

Currently, 19 states have developed kiosk programs at welcome centers. (See Table 111-2). There is limited information on kiosk use at these centers. However, Iowa and Virginia did obtain such information. (See Figure 111-2.) This is largely due to the cutting-edge nature of the technology, the high turn-over rate of the technology and its tendency to become outdated quickly. In addition, there is wide variation in the type of kiosk systems used thus making comparisons to estimate potential kiosk use difficult.

Although not easily measured, the potential for kiosk use is great. For example, consider the popularity and wide-spread use of the automated teller machine which has made traditional banking necessary only for occasional transactions.

Studies have shown a relatively strong willingness to use kiosk systems. The Economic Analysis Division of the John A. Volpe National Transportation Systems Center has examined the issues surrounding user response and market development for selected ITS products or services. It found that travelers have already been using visitor information obtained from welcome centers to make travel decisions, thus kiosks can be simply considered as a different product delivery system for the end product, i.e. information.

Innovative products are differentiated from new products by providing the customer with "solutions to problems or needs that were previously unmet or recognized." Expansion of the ability of travelers to obtain information, make

FIGURE III-2: PURPOSE OF STOP AT IOWA AND VIRGINIA WELCOME CENTERS

Purpose of Stop
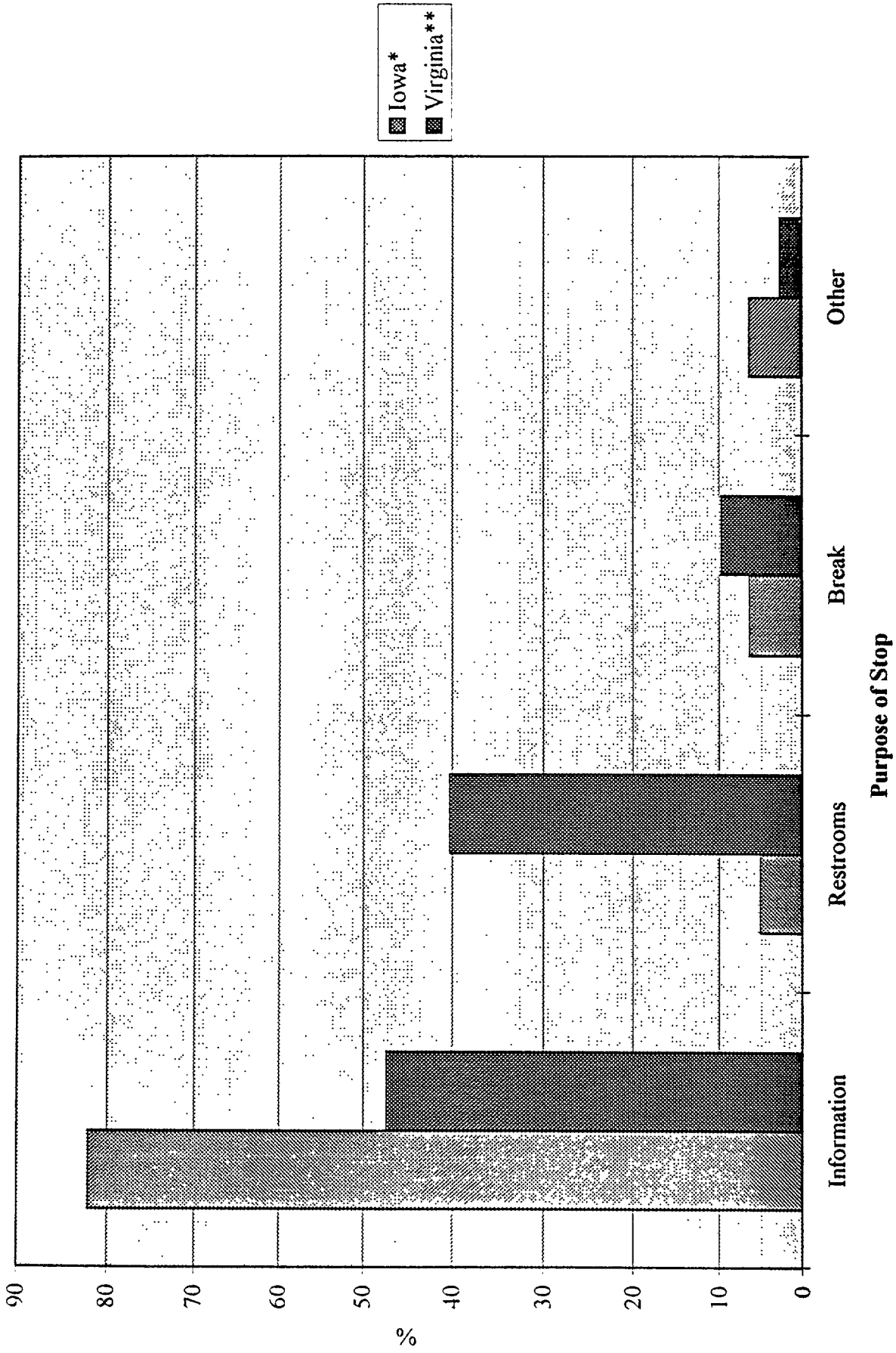
*1995 Iowa Welcome Center Survey

**1993 Report Draft: Virginia Welcome Center Study

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transactions, make purchases, obtain interesting interpretative guidance via this new media source is an innovative service.

It is believed that access to all travel related information in a single, comprehensive package will increase its convenience and usefulness. This will also increase the potential commercial market for interactive kiosk systems. As will be discussed in Chapter IV, fees paid by businesses advertising on the kiosk system can offset the costs incurred to provide this service to the traveling public.

In particular, the JHK/Virginia Tech report titled "Preliminary Assessment of Rural Applications of Advanced Traveler Information Systems (ATIS)" identified the following services as being important user services that can be provided to the traveling public via the kiosk system. These services are particularly important to rest area users in rural areas.

- trip itinerary planning and attractions;
- traveler advisory information;
- traveler services information;
- safety and warning;
- en-route directions; and
- emergency services.

Trip itinerary planning refers to the ability of the user to discover and include new points of interest and tourist destinations while browsing the kiosk system. Travelers may adjust their trip itineraries to accommodate newly discovered attractions or activities.

Traveler advisory services refers to the potential to provide travelers with real time information on road conditions, such as, construction and maintenance activity, congestion information, and incident advisories. This will assist travelers in planning the most efficient trip while en-route, based on current information.

Traveler services information refers to the provision of location and descriptive information regarding services such as food, fuel, and lodging via the interactive kiosk. Visitors can easily peruse a host of traveler services options for a given location. In particular, if the system is Internet connected to the lodgings then real-time availability information can be provided.

Safety and warning services can be provided on a 24-hour basis using an interactive kiosk sys tern. Authorities can be immediately notified of travelers' problems on the road using the computer system and vice versa.

En route direction guidance refers to the provision of directions within easy reach of

the main highway corridors. This information can include trip distances, and exits or turns required. The 24-hour provision of this information is critical element of its success.

Emergency services refers to the 24-hour accessibility of information on the locations of hospitals, car repair shops, towing services that can be provided through a kiosk system.

Finally, interactive kiosks can provide travelers with both static and dynamic travel information simultaneously. Information that is constant (static) can be easily combined and presented with information that changes over time (dynamic). For example, using kiosk technology travelers can receive information on the existence, location and hours of operation of a tourist attraction, such as a museum, as well as dynamic information on the special exhibits currently being shown at the museum. Kiosk systems can simultaneously convey static and dynamic information at low costs compared to static media, such as brochures.

5. Impact of Kiosk Information on Travelers

The extent to which travelers consider the interactive kiosk system to be valuable depends not only on the timeliness and accuracy of the information provided, but also on its usefulness, cost, reliability, and ease of access. In order for the kiosk service to be valuable to users, traveler information must be timely, complete and accurate. The information provided must be credible, and travelers must perceive the information as providing a definite advantage when used.

The information provided through interactive kiosks has two key potential effects on travelers. These effects include:

- Travelers may increase their lengths of stay and use of attractions, thereby increasing their expenditures based on information obtained from a kiosk sys tern; and
- Travelers may experience better use of their travel time as a result of utilizing kiosk information.

a. Increased Lengths of Stay and Expenditures

Several travel decisions studies by state tourism departments indicate that a significant percentage of travelers increase their stays and expenditures in an area based on information obtained from welcome centers. This has been documented by several studies of welcome centers. In addition, there may be direct positive economic impacts to the state from providing travel information services. For

example, travelers may discover new attractions or points of interest from information provided at welcome centers. The additional revenues genera ted from the tourism spending resulting from visiting the newly discovered attractions are positive economic impacts associated with providing traveler information services.

In the same way that traveler information provided by brochures or welcome center staff can increase the length of stay and expenditures of a tourist, we believe that information provided through an interactive kiosk system will have a similar effect. Thus, we believe that there is high transferability between the positive impacts resulting from information provided at welcome centers under the current technology level, and the potential benefits resulting from information provision using an interactive kiosk system. Below is a review of the research on the affects of tourist and travel information at welcome centers.

In a study conducted at welcome centers in Colorado, 67% of respondents indicated at the completion of their trip that their stop at the welcome center had influenced their trip in some way. Approximately 41% of respondents visited a new area, 32% visited a new attraction or special event, 14% stayed in a new lodging facility, and 6% tried a new recreational activity. According to this study, approximately 13% of respondents increased their length of stay in Colorado by an average of 2.2 days (Tierney, 1993).

In addition, Tierney determined that there were significant differences in spending between travelers that stopped at two of the three traveler information centers studied and travelers who did not. Tierney established controls for differences in income, length of stay and party size, and concluded that visitors to traveler information centers had significantly greater expenditures. According to Tierney, welcome centers positively influenced expenditures; direct evidence of welcome centers' financial impacts come from the estimated $1 million (1993 dollars) in additional traveler spending generated by the increased visitors' lengths of stay associated with the information obtained at the welcome centers (Tierney, 1993).

In a study of Florida's welcome centers, 11% of respondents reported adding a day to their Florida trip as a result of the information obtained at the welcome center. In addition, 16% of respondents added two or more days to their trip. Approximately 56% of respondents indicated that they went to a new or different attraction based on information provided by the welcome center (Pitegoff, 1991).

In the state of Indiana, Fesenmaier found that 71% of those surveyed obtained some information during their stop at a welcome center (Fesenmaier, 1993). In this study, 21% of those surveyed extended their visit to the State as a result of the information provided at the welcome centers. In addition, 29% of respondents indicated that they had visited places not planned prior to visiting the welcome centers. Another important finding from that study was that 50% of those surveyed indicated that

they would use the information obtained at the welcome centers for future trips to that state.

In Illinois, 40% of visitors indicated that they stayed in the State longer as a result of information obtained while at the welcome center.

In a study of Michigan welcome centers, 13% of respondents indicated that they increased their length of stay by an average of four days as a result of information obtained at the welcome centers. In addition, 40% of visitors reported visiting new areas as a result of information obtained at the welcome centers (Michigan Travel and Tourism, 1986).

In an Oregon study, 74% of respondents indicated that they would be influenced by information provided to them en-route (Dean Runyan Associates, 1989).

In a study of the welcome centers in Texas, approximately 14% of respondents reported extending their length of stay as a result of the information provided at the State's welcome centers. Approximately 35% of visitors reported visiting new destinations as a result of information obtained at the welcome center (Travel and Information Division, 1990).

In Virginia, 11% of visitors to the welcome centers reported staying an additional 1.9 days as a result of information provided at the State's welcome centers.

See Figure III-3 and Figure III-4 for a summary of these results.

An important finding from Fesenmaier's 1993 study was that travelers on certain types of trips, such as those close-to-home, touring, and outdoor recreational, appear more likely to be influenced by information collected at welcome centers than other travelers. Fesenmaier suggested that the informational material provided at these centers should be oriented to meet the needs of these travelers. Similarly, information could be specifically geared towards these travelers on an interactive kiosk system as well.

Our review and analysis of welcome center studies concludes that many visitors have flexible travel itineraries. The majority of welcome center visitors obtain information while at the welcome centers, and are influenced by that information. Most states reported that the information obtained at the centers induced the visitors to alter or add to their travel plans, which, in turn increased their overall trip expenditures.

One of the important conclusions that can be drawn from these studies is that visitors actively seek information during their trips and often use this information to modify their trip itineraries (Fesenmaier, 1993). This emphasizes the importance

FIGURE III-3: WELCOME CENTER INFLUENCE: VISIT TO NEW AREAS

% of Travelers Visiting New Areas

IND — 29%
TX — 35%
MICH — 40%
CO — 41%
FLA — 50% 59

Dornbusch Company, Inc
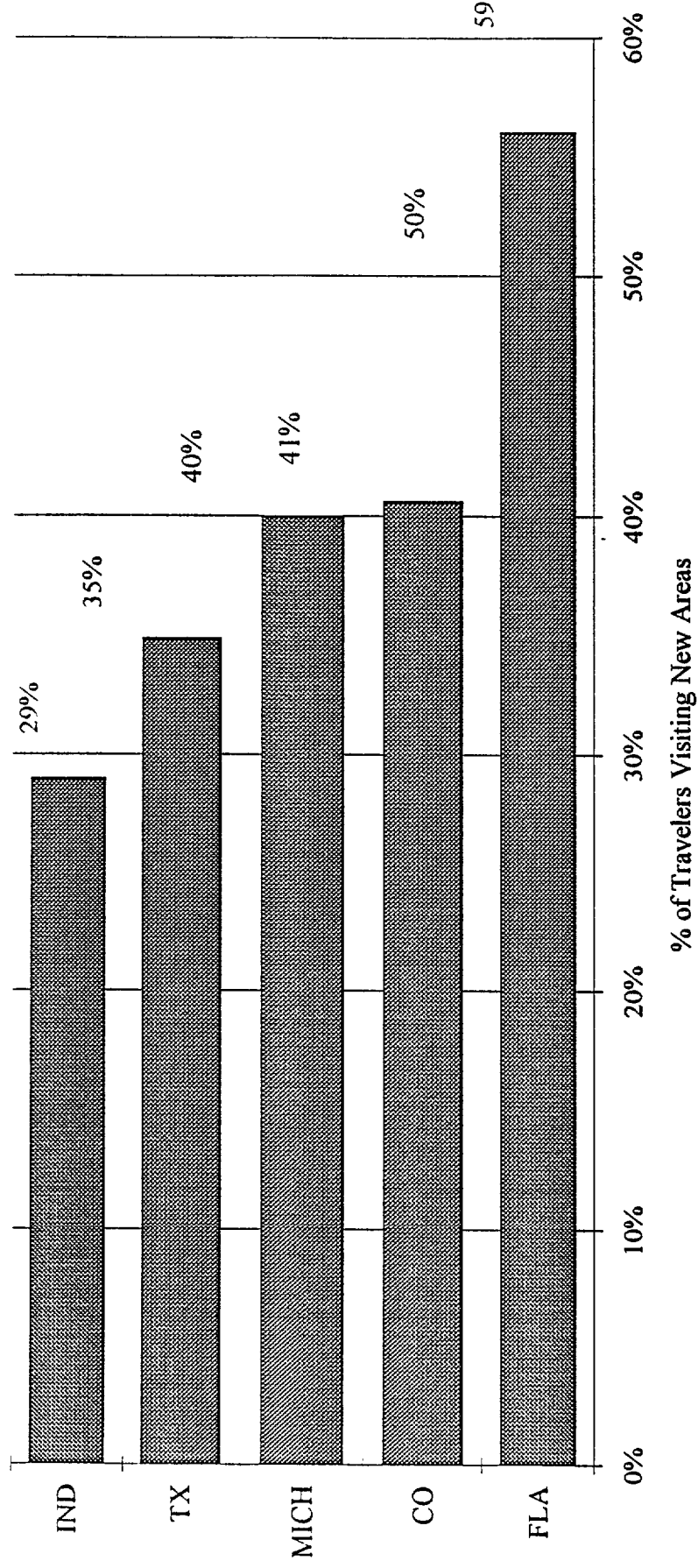
FIGURE III-4: INFLUENCE OF WELCOME CENTERS - VISITORS EXTENDING STAYS

STATE	NUMBER OF DAYS	PERCENTAGE OF VISITORS
COLORADO	2.2	13
FLORIDA	2 or more	16
ILLINOIS	Stayed longer	40
INDIANA	Stayed longer	21
MICHIGAN	4	13
TEXAS	Stayed longer	14
VIRGINIA	1.9	11

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for a well-developed and easily accessible information distribution system within a state, such as could be provided through a kiosk system.

b. Efficiency Gains

Improving the provision of travel information allows motorists to make significant efficiency gains. With better travel information, travelers benefit both from saved travel time and improved efficiency in obtaining travel information. Given the trend toward shorter, more frequent vacation trips, using travel time efficiently is crucial. Vacation time absorbed by trying to find one's way when lost is discouraging to the traveler.

In addition, adequate information provision can lead to more optimal resource use. For example, travelers that have not lost their way use less fuel, generate less pollution, contribute less to traffic congestion, and do not create safety hazards due to excessively slow driving or last minute driving maneuvers.

Efficiency gains will also be realized if the kiosk system is connected to the Internet. Travelers could then access real time information on traffic congestion, accidents, and construction. This improved trip information could greatly reduce delays experienced when traveling.

c. Differences Between Kiosks and Traditional Media

The reason for the above benefits is that interactive kiosks convey information in a different way than traditional media, such as brochures or bill boards. There are several significant components of interactive kiosk technology that improve upon the traditional media methodology of conveying information. These differences include the distinction between conveying active versus passive information; the ability to convey "real time" information; the importance of portability of information for users; and the benefits of browsability on kiosk systems.

Interactive kiosks can be an effective medium to provide travel information. In studies conducted to analyze the impact of interactive television advertising, surrogate testbeds were employed that used kiosk platforms to provide the interactive advertising element. In this kiosk study, Donato found that the public "likes the interactive means of accessing information (Donato, 1994)." When he placed kiosks in the electronics departments of major retailers, Donato found that 95% of the shoppers in the departments thought that kiosks were a very useful source of information. Furthermore, 61% said they would be more likely to shop in the department because of the kiosks.

Perhaps the most important finding from Donato's study was that when he applied regular tests of advertising effectiveness such as "top of mind awareness of advertised brands" that appeared on interactive kiosks, consumers awareness of the advertised brands was much higher than when exposed to traditional advertising media. This result was unsurprising according to Donato because exposure to interactive advertisements (such as those on kiosks) is an active and not a passive experience.

There are significant differences between active information conveyance and passive information conveyance. Information conveyed actively is a more effective than information conveyed passively. Active information is more effective because the user is engaged in acquiring the data. Individuals are more likely to remember and use information that they had to 'work" to acquire.

Classic examples of active and passive advertising media are kiosks and billboards. With kiosks, the target audience is actively engaged in operating the system and gathering information. A billboard reaches its target audience by triggering attention from the periphery of one's consciousness.

In addition, one would not utilize an interactive kiosk unless the user was looking for specific information. In this way, kiosks create a captive audience. To advertisers, a captive audience is more valuable than a passive audience. It is not as difficult for advertisers to get the attention of the captive audience. For example, a golf club manufacturer will spend more to advertise in a Golfing magazine than to advertize in a daily newspaper.

A second improvement on information provision using interactive kiosks is that under some kiosk configurations, "real time" information can be provided to give up-to-date traveler information. For example, Minnesota's Guidestar system provided information on current traffic conditions. Up-to-date information is generally perceived to be more valuable than static information.

A third improvement of information conveyed via a kiosk system as compared with traditional media is the portability of the information provided by the kiosk. Most interactive kiosks are designed to allow computer print outs of the information retrieved by the user. The print out capacity is frequently mentioned as an important kiosk system component. Kiosk users do not have to write down or commit to memory important names, phone numbers, or directions. Rather, the kiosk can print the information for the user, thus requiring the kiosk user to do less work. In addition, this printed information is a reminder of the desired service which can be filed for future trips.

A fourth improvement that interactive kiosks bring to traveler information conveyance is the ability to browse among travel and accommodation options. For

some types of information people prefer dealing with individuals, however, in other situations machines are preferred (e. g. ATMs). Individuals browsing for information on a kiosk are more likely to explore an area of interest more so than when dealing with a person. For example, an individual who is interested in staying at a bed and breakfast outside of Orlando, Florida is more likely to review several different establishments on a kiosk system than if the individual is relying on information provided by a welcome center staff person.

It is likely that some of travelers' information needs are not being met through the traditional welcome center format. For example, welcome centers are typically open from 8 am to 6 pm. Travelers who do not arrive during those hours will not receive the information they require. Interactive kiosks could provide 24-hour information to travelers, along with directions and maps to assist travelers in finding destinations.

In addition, traditional welcome centers will provide only limited information on commercial services. Welcome center staff are also generally uncomfortable about making recommendations, for fear of showing favoritism to specific businesses. And, the length of the service with the welcome center representative may be limited, therefore polite travelers are limited to asking only quick and easy questions-

D. Traveler Information Needs

It has long been recognized that information is the lifeblood of the travel and tourism industry. Travelers require information before they travel to a destination, while they are en-route to their destination and after they arrive at their destination (Sheldon, 1992). However, the term "information" in the context of place and environment, as defined with travel information, is "very difficult to specify for analytical purposes and even more difficult to measure" (Raitz, 1989).

As a result, when we analyze the components of providing information to travelers and examining their utilization of this information, much of the analysis relies on previous research that employed simple measures and generalizations. Nonetheless, when studying the feasibility of using a new, expensive technology to provide or transmit information to travelers, it is important to study the aspects of information that have been well-scrutinized and evaluated. This will lead to an understanding of the potential for the public's use of the technology.

Below is a review of studies that examine the reasons travelers obtain information, the type of information travelers want, and the primary information sources used by travelers. The extent to which individuals accept and use information and thereby influence their travel decisions is based on individuals' perceived attitudes

towards the information itself (Schofer, 1993).

1. Reasons Travelers Obtain Information

A study of travelers in the Midwest conducted by Fesenmaier showed that the primary reason that individuals seek travel information is to meet functional needs to identify places that might be visited and to meet an "efficiency" need to insure that vacation time is "not wasted." Another motive is that individuals seek travel information for pleasure-related reasons, ranging from imaginative aspects to more aesthetic reasons, such as learning about the culture or the beauty of certain places (Fesenmaier, 1992).

An important finding from the Fesenmaier study is that individuals seek travel information for nonfunctional reasons. In addition, the acquisition of information may provide or stimulate pleasurable experiences not just prior to but also during the trip (Fesenmaier, 1992). Marketing researchers have written numerous conceptual papers which suggest information efforts by consumers satisfy aesthetic, experiential, social, innovative and entertainment needs (Vogt, 1994). The large majority of these needs can be successfully met through interactive information kiosks.

Gitelson suggested that reliable sources of information are particularly important to travelers for the following reasons (Gitelson, 1983):

- Tourism involves the use of discretionary money and free time, and can be perceived to be a high risk purchase;
- Since the actual "product" that the consumer is researching is not readily observable, greater use of secondary or tertiary information sources are employed; and
- People are often interested in learning about and discovering unfamiliar destinations, thus the need for variety can be one of their primary travel motives.

Gitelson's third point was examined in other studies that suggested that travel information searches should include non-functional elements which emphasize the more aesthetic, affective and imaginative aspect of product consumption and travel choices (Vogt, 1994). Travel information obtained using an interactive kiosk is likely to provide this stimulus.

2. Information and Services Requested by Travelers

Central to determining the feasibility of interactive kiosks placed at rest areas is

determining the types of information and services requested by travelers and whether interactive kiosks can fill the travelers' information needs. JHK/Virginia Tech conducted a survey to determine the travel information considered to be important by motorists. The survey methodology consisted of conducting focus groups, personal interviews, and telephone interviews. The results of the survey were compiled in a report titled "Preliminary Assessment of Rural Applications of Advanced Traveler Information Sys terns (ATIS)."

During the pre-trip stage, respondents placed the highest priority on information during trip planning. Accurate information on the best travel routes and the routes with the shortest travel time were most desired. The second most important information for pre-trip planning was information on weather and road conditions.

During the en-route stage of a trip while experiencing problems, the ability to transmit a distress signal when confronted with travel problems held the highest importance for those surveyed. The second in importance was information about road closures, congestion, and warnings about hazards. Information needs during the problem stage of travel were considered to be the overall most important information requirements by general travelers.

When not experiencing travel duress, respondents identified the following information needs:

- location of Automated Teller Machines (ATMs);
- location of services providers, restaurants, motels, service stations, including quality ratings and price information;
- a listing of points of interest, types of events available, and other traveler related information along the route and at the final destination; and
- information on local speed limits and traffic regulations in towns en-route.

Survey respondents indicated a willingness to pay for desired pre-trip planning information, particularly if the information could be obtained through a single phone call or interactive television. Because respondents indicated that pre-trip and en-route needs for traveler services were largely the same, one can extrapolate that en-route travelers would also be willing to pay a fee, or view advertisements, in order to obtain such services.

3. Traveler Information Sources

Awareness of preferred travel options is dependent on the information available to the potential consumer and the reliability of that information. There are several categories of information providers and/or searches that consumers commonly use:

- Informal sources, such as, family and friends;
- Marketing sources, such as, advertisements or promotional materials; and
- Objective sources, such as, product-rating and consumer information services (such as automobile clubs) (Andereck, 1992).

Informal sources have consistently been identified as the single most influential source of travel information. This has been confirmed by numerous studies. Rao found that 70% of U.S. citizens traveling abroad used personal contacts, such as family and friends, as primary travel information sources (Rao, 1992). The second most important information source was newsprint according to 30% of respondents.

In 1983, Gitelson performed a study in Texas that showed 72% of respondents relied on friends and family, 50% on destination specific literature (commercial guidebooks, government prepared source material, and brochures), 31% on consultants (automobile clubs and travel agents), and 26% on print media (newspapers and travel magazines). In addition, 75% of respondents in that study also used more than one source of information. The travel research literature suggest that travelers rarely rely on one information source, and the acquisition of information tends to be a cumulative process (Engel, 1973).

In a study conducted by Nolan in South Carolina and Texas, travel advice offered by family and friends was the predominate information source of travelers, followed by guidebooks, commercial brochures, government information, auto club services, travel magazines, advertisements, newspapers, and travel agents. Unlike other studies, Nolan measured the travelers' perceived credibility of each category of information. In applying this measurement, he used the following dimensions (Nolan, 1974):

- Authenticity: Accurate-Inaccurate;
- Valuative: Informative-Uninformative;
- Personalism: Exciting-Unexciting; and
- Objectivity: Unbiased-Biased.

Based on the above criteria, the advice of family and friends was ranked fourth overall, and guidebooks and official state tourist information services were ranked first and second, respectively. This indicates that although travel recommendations from friends and family are rated as being highly influential by a number of studies, this is an indication that informal sources are not necessarily considered to be the most accurate, informative, exciting, or unbiased information sources.

Shoemaker asked respondents to rate attributes that were influential in selecting vacation destinations on a scale of 0 to 10. A surprising result in this analysis was

that the attribute "know someone who's been there" (rated 5.22) was of relatively minor concern in a travel selection, but the same attribute best described the selection process for the last vacation destination more than any other attribute (mean rating 8.96). To further corroborate the finding in this study, Shoemaker performed a cluster analysis that classified the respondents into three market segments: "Get Away/Family Travelers; Adventurous/Educational; Gamblers/Fun Oriented." Although the three segments represented very different population groups, all rated the attribute "know someone who's been there" as the most important variable in their choice of vacation destination (Shoemaker, 1994).

Raitz surveyed college-aged respondents about their preferences of travel information sources. Approximately 25% of respondents relied on friends and 7% relied on information obtained from their families. Raitz expected this age group to show a greater reliance on the knowledge and experience of their peers rather than on family members. In this study of college-aged individuals, television ranked higher than either type of printed media (travel brochures and magazines) which reflects the influence of television on this generation. A somewhat surprising finding about this age group was that radio advertising ranked second last to only that of travel agents (Raitz, 1989), although given the importance of visual stimulus in travel plans this is not wholly surprising.

Capella examined the preferred information sources of elderly travelers and found that word-of-mouth information from family members was the most valuable source. This was followed closely by information provided by friends. Magazines, newspapers and television were also viewed as important sources. A special finding from this study was that senior women relied more on newspapers, while senior men relied more on the personal sources offered by family/friends (Capella, 1987).

These studies support our contention that informal travel information sources, such as from friends and families, are the most relied on method of obtaining travel information. This holds true across different age groups and population segments.

Meis formally recognizes the importance that informal communications, whether positive or negative, can have on travel decisions. He suggests that managing informal communication should be viewed as a key issue by the tourism industry (Meis, 1994). One way to "manage" this communication would be to ensure that travelers are provided with up-to-date and reliable information that enhances or stimulates a pleasurable travel experience.

Sheldon found that the ease with which information about a destination's facilities and events can be accessed is a critical component of visitors' satisfaction with the destination. Sheldon concludes that the availability of reliable travel information at destinations and during the en-route portion of travel is becoming increasingly important as people travel more independently and more spontaneously (Sheldon,

1992).

Perdue found that providing information to tourists not only affects their destination decisions, but also their satisfaction while at the destination. Perdue found a positive correlation between visitor satisfaction and repeat visitation, as well as a positive correlation between visitor satisfaction and visitor willingness to share positive "informal" information with other potential visitors (Perdue, 1985).

Overall, these studies suggest that travelers have increased trip satisfaction when information about travelers' destinations is easily accessible, and satisfied travelers are more likely to act as positive informal information sources about these destinations to future travelers. Providing accurate, informative, exciting, unbiased, and up-to-date information to travelers through an interactive kiosk system could assist in providing a pleasurable travel experience motorists and ensure the communication of this experience to other travelers.

E. Potential For Increased Future Kiosk Use

As an emerging technology it is difficult to directly assess the potential for future use of information kiosk systems. However, technological and developmental advances in the last few years, for example, the availability of color touch screens, full motion video and high speed modems, have enabled dramatic improvements in the user-friendliness of kiosks at relatively low prices. In addition, the reliability of kiosk technology has also improved significantly. Therefore, some of the difficulties with past kiosks can be avoided in the future.

The predominance of the elderly among auto travelers could be seen as a handicap to the effectiveness of information kiosks as the mature market is understood to be less able to adopt new technologies for everyday use. However, the composition of this sector is rapidly changing, as "Baby-Boomers" come into that age group. This generation is far more open to new technologies, and should take on the kiosk concept easily.

Comparisons with other "convenience" services also suggests that there may be strong potential demand for similar such services offered by kiosks. For example, the common usage of l-800 hotel booking services suggests that a similar service available on the kiosk system, supplemented with photographs and detailed room information should be equally, if not more, popular.

Similarly, the popularity of other automated booking or purchasing systems, such as Ticketmaster, 777-film, and television shopping channels, also indicates that the public is already comfortable with making some automated transactions. Provided any transaction fees are low enough to be competitive, there appears to be strong

usage potential.

An investigation conducted by Etzel (1985) showed that high information seekers, such as kiosk users, tend to spend more money on their trips and take trips of longer duration than low information seekers. This finding is significant for the financial feasibility of future kiosk systems, particularly if the kiosk system is to include an advertising component.

IV. Supply of Traveler Information Services From Interactive Kiosks at Rest Areas

A fundamental factor determining the feasibility of the proposed kiosk system will be the costs to develop and operate the system. If these costs are comparatively low, then less revenues will be necessary to cover the capital investment costs and the kiosk developer's return on investment.

In this section of the report we discuss briefly the key design and cost issues associated with the proposed kiosk. We also discuss the cost estimates that will be used in the feasibility analysis in Chapter VI.

A. Kiosk Design Issues

The Kiosk system's design will be an important factor in determining the system's success. The kiosk design is important since it primarily determines both the system development costs and the subsequent quantity of the system and, hence, the user's experience. As we discussed in Chapters II and III, two of the primary factors responsible for the poor effectiveness of past kiosk systems were poor system reliability and the difficulty of using the systems. Good kiosk design, taking full advantage of the improvements in computer technology and capabilities, should enable kiosk systems to be operated easily and reliably.

The design should be appropriate for the expected users and the planned uses. Many of the kiosk developers and state agencies interviewed stressed the importance of the user interface of the kiosk in determining the users' perception of and ease in using the kiosk. Tourism staff at one of Maryland's Welcome Centers reported extensive user frustration with the early deployment of the DiscoverAmerica kiosks at their particular site. Users were frequently unable to use the system during hot sunny days, the telephone handset worked poorly and may users mistakenly inserted and lost their credit cards in the open (but non-functioning) credit card slot. Such difficulties can severely limit user satisfaction with the system - irrespective of the kiosk system's travel information service performance.

The following section briefly outlines some observations on kiosk design obtained during the course of our research.

1. Information

The information available from the kiosk system is a central factor affecting the system's performance. It is essential that the system not only contain the necessary information relevant to the user's wants and needs, but that information must also be organized and delivered efficiently and effectively to the users. The process by which the user interacts with the computer is referred to as the system interface. An

effective interface will be highly intuitive so that it can be easily understood and quickly used even by users unfamiliar with the kiosk or computers. Most of the informants agreed that the "user-friendliness" of the interface will be vital for the kiosk to be successful. The quality of the interface is largely dependant on the quality of the software design for the kiosk - although the hardware used for accessing information and the speed of the system's operation will also be important factors.

The comprehensiveness of the information is also an important consideration for the kiosk system. In the past, many kiosk systems met with poor user responses due to the limited listing and information provide on them. Therefore, many respondents recommended that efforts should be made to ensure that extensive information is provided especially for business listings. Otherwise, users can be dissatisfied with the information provided if they feel it does fairly represent the indicated purpose.

However, as computers have become more prevalent and widely used, there is also the danger of providing too much information on the system. This will particularly be a problem if the quantity and organization of the information impedes the system's performance or confuses the user by overwhelming them with information. Some of these problems can be solved by hierarchical organizing of the data. A truly efficient kiosk would only provide the information that matches the user's specific needs at each level of information choice.

The issues of interface and information are also very relevant to the kiosk operator whose interests generally rest with providing as many users as possible with their desired information swiftly. Therefore, if users find the kiosk to be too captivating, the overall effectiveness of the kiosk in providing travel information services will suffer since only a few individuals will be able to use the system. Choosing between providing too much or too little information is a central challenge for the kiosk designers.

a. Public Information

The provision of public information is expected to be a central feature of the system for both distinguishing and legitimizing the kiosk as an asset to the rest area. The primary public information to be provided is expected to included, but is not necessarily limited to: tourism and recreation opportunities (e.g. local attractions, national and state parks, historical sites and landmarks), local public facilities and services, and transportation information (e.g. weather and traffic conditions).

b. Travel Services Information

Information on lodging is one of the most frequently requested topics at most

welcome centers. In addition, information on restaurants, gas stations and shopping areas are also likely to be popular. Basic yellow pages type listings of the local lodging, food and retail businesses can only meet the most basic information needs. Additional business information, including more detailed descriptions of business hours and amenities, location, directions and assistance in phoning the business (e.g. through direct dial telephone handsets) will provide valuable assistance sufficient to meet the basic needs and expectations of most users.

c. Advertising

Michael North of North Communications strongly believes that high quality sound and video capabilities with eye-catching graphics are essential for attracting the kiosk users necessary for success. While the provision of animated "attract loops" to invite users to the system are an increasingly common component of most traveler information kiosks, it was argued by many of the informants that video was not an important component for the system's success. However, most respondents agreed that good quality color photo reproduction and printer capabilities would be necessary for the advertising component of the kiosk to succeed.

If the system is well designed, advertising should be possible on the kiosk system while still maintaining a consistent overall identity or "look and feel" to the kiosk. However, standardization and regulation of kiosk advertising may decrease the potential advertising revenues by discouraging some potential advertisers. In addition to maintaining a sense of order, standardization of the advertising can lower the data conversion and operating costs by simplifying the data management on the system.

2. Functionality

The kiosks capabilities and amenities will also be important factors influencing the user experience and the kiosk system's success. Several different aspects of the kiosk's operating performance should be designed to match the user's needs with the system's capabilities. Moreover, both advertising agencies and developers admitted that it is essential that users do not get confused by or lost in the system - otherwise they are likely to become dissatisfied and stop their use.

a. Format and Presentation

As mentioned in the previous section, 17" color monitors are generally considered the minimum standard for kiosk information display. While sound and video capabilities are often promoted by developers, printer performance was the most frequently mentioned aspect of kiosk information presentation. Many kiosk systems such as New Jersey's Infovision (typically 60%) have a very high proportion

of printer use by kiosk users. Printer reliability is a key issue for most users, since it is the primary means for users to record the information obtained from the kiosk for future reference. If the printer is not operating, users will be frustrated and kiosk usage will decrease as users spend more time to manually transcribe information or simply give up using the system.

b.   Input Devices

Touchscreens are the predominant input device used by kiosk systems. Modern touchscreen technology has evolved dramatically since its introduction over ten years ago. Current touchscreens are generally reliable (some manufacturers claim lifespans of between 20 to 50 million touches). However, touchscreens are limited in their ease of use for keying in information such as addresses or other personal information such as credit card information.

c.   Database Searching Capabilities

Database searching is commonly promoted by kiosk vendors as an important kiosk amenity. While a search capability will potentially provide a clear ease of use advantage over print directories for obtaining travel information, in many cases, searching capabilities can actually detract from system performance. The kiosk search design should be by selection via touchscreens since keying in words is often awkward and tiring for users. Furthermore, by limiting the search options in this way, many of the problems associated with searching capabilities can be lessened.

Database searching capabilities can significantly complicate the kiosk system's software design. To enable the system to identify and select listings, search criteria and protocols must be designed into the system. Furthermore, the search process can slow down the kiosk operations as the computer runs through the database searching for matches. Kiosk users have only limited tolerance for slow information processing. Some kiosk developers suggested that straight forward hierarchical information layout can often meet the needs of most users.

d.   Financial Transactions

Financial transactions can be performed on kiosks in two major ways. Credit card and ATM card readers are rapidly becoming increasingly prevalent and can be incorporated into interactive kiosks. However, as we discuss in Chapter VI, the processing procedures for completing financial transactions with individual advertisers (e.g. for hotel room sales on the kiosk) are a major obstacle. Alternatively, telephone handsets can be used easily and inexpensively to enable kiosk users to conduct credit card transactions "through" the kiosk.

e.   Mapping and Directions

Mapping and directional information services are another emerging new technology that can be applied to kiosk operations. Information on directions to transfer destinations is one of the more common types of information requested by travelers at welcome centers. However, full mapping and directional information remains highly complex since the amount of information that has to be sorted and organized is extremely large. This information would need to either be located on or accessible by a network server with high speed telecommunications for the information to be provided reasonably quickly at the kiosk. Transferring the necessary data over a PC modem (for inclusion on a "stand-alone" configuration) using current technology would be very cumbersome.

Since kiosks have fixed locations, the information necessary to provide maps and directions can be minimized if directions are only provided from that particular location to a limited set of possible destinations. The necessary information would be stored and accessed through the kiosk's computer hard-drive, but that would dramatically decrease the speed and reliability of providing this information to users.

Many of the informants warned that users have very high expectations for the accuracy of information received from kiosks. As a result, in their experience users will be very dissatisfied if the information obtained is inaccurate, out of date or misleading, This suggest that particular attention should be paid to ensuring the quality of the kiosk information. Developers suggested that this can be achieved by obligating businesses to provide their own directions for inclusion on the kiosk together with their advertising. This approach is cost-effective for the kiosk developer since subscribing businesses, and not the developers, are responsible for determining the best route for the users.

f.   Tracking System Use

The ability of kiosk software to record the patterns of kiosk usage is considered a potentially valuable tool for assisting kiosk operators and advertisers to modify and refine the system. By observing the most popular information requests and typical usage patterns, improvements to the system can be made over time which will allow the system to evolve and improve. In addition, advertisers can be informed of the number of viewers their advertisements reached which might assist in enrolling and renewing advertisers.

3. Deployment

    a. Number of Units

The optimal deployment for a private kiosk operator will be determined by the configuration and system size which maximizes the return obtained from the capital investment in the system. As a result, if an additional kiosk does not bring in sufficient net revenues to cover and provide an adequate return on the additional cost, a private developer will not be likely to add that kiosk.

For the public sector, typically less restrictive financial constraints will operate. Tthe public sector tends to favor system expansion when *total* revenues of the system meet or even slightly exceed the costs. A public agency developer of the kiosk could be more willing accept a low rate of return or break-even to provide wider service availability.

This difference between public and private interests partly reflects the possible divergence between narrower financial interests and the broader economic and policy of the public sector. This divergence can lead to difference in expectation and incentives between the public and private sector partners in a kiosk developer. For example, travelers stopping at a remote rest area location may need travel assistance more than travelers in more populated areas. However, the profitably of locating a kiosk at such sites will be far less since there will be fewer uses at these remote or rural rest areas.

In order to be conservative in our financial feasibility analysis we have projected an initial deployment of five kiosk units. An analysis of the marginal net returns of an additional kiosk will indicate whether a larger deployment would be feasible.

There seems to be no fundamental reason for prohibiting the expansion of the rest area kiosks to other locations besides rest areas. As discussed above, for the private sector, if there is expected to be sufficient additional profitability, then they will be likely to want to pursue placement of additional kiosk at other non-rest area locations. Likely locations would have high levels of pedestrian and traveler traffic. Under such circumstance state agencies' administrative oversight, regulatory control and share of advertising revenues might be limited if the operating agreement with the private partner does not clarify the arrangements.

    b. Advertisers

A primary factor determining the kiosk system's revenue potential will be the number of advertisers that can be accommodated by the kiosk system. As we discussed above, users' generally require comprehensive traveler information for them to "trust" the system. If a user is offered only a few choices in response to their information request, they may be dissatisfied with their kiosk experience.

Therefore, it is recommended that deployment approaches should favor and encourage the inclusion of more comprehensive traveler service information. Tiered price and the inclusion of free basic listings for businesses are two strategies that will increase the number of businesses with representation on the system.

From our discussion with kiosk vendors and developers it is apparent that there are few hardware and software limitations on the information storage and access capabilities of current kiosk sys terns. While sophiscated database searching capabilities might be required for very large databases, basic kiosk operation should not be negatively impacted by relatively high quantities of information included. Recent technological improvements indicate that current hard drive capacities are sufficient to store and present hundreds of screens of information and color photographs. Furthermore advances in high speed CD-ROMs, CD-ROM records and digital compression even enable kiosks to present significant musical and video features without limiting overall system performance noticeably or at a prohibitively high additional cost.

Therefore, for the purposes of this feasibility study we have assumed that the proposed kiosk would likely contain up to 1000 pages/screens of information. While multiple listings could be provided on a single screen for most basic business listings, *at* least one full screen of information is expected to be dedicated to each paying advertiser. Many advertisers may wish to be able to provide several screens of advertising and information. In addition, while advertising could be location by location, it is expected that significant amounts of travel service information for non-local destinations would also be accessible from each kiosk.

Discussions with kiosk developers for kiosk systems in Florida and New Jersey reported attaining an advertiser base of 500 and 300 businesses respectively. Since the states represent either densely populated or major tourism locations, we have used these advertising sizes as upper limits of the likely advertising base that an average kiosk system could attain. Therefore, for the purposes of the feasibility analysis, we have conservatively assumed that once the proposed kiosk system is fully operational, there would be about 250 advertisers on the system. Furthermore, we also expect the full advertising base to be achieved in the second year of operation.

Our assumed kiosk system deployment is for five kiosk units. An average of 50 advertisers per kiosk may appear small. However, multiple units would be located at some locations where the expected visitor traffic is sufficient to warrant such groupings. Indeed, many states have multiple kiosks at their welcome centers. Furthermore, hotel chains with multiple locations are counted as a single advertisers (albeit at a higher advertising rate). In addition, as we discuss in more detail in Chapter V, it is not currently expected that significant restaurant advertising revenues will be attained except from major restaurant chains.

c. Kiosk System Usage Projections

A key factor determining the effectiveness and the revenue generating potential of the proposed kiosk system will be the future usage of the system. The kiosk developers interviewed generally agreed that daily usage of 1,800 to 2,400 touches a day was considered successful. Table IV-1 applies typical operating parameters to estimate the average number of daily users and the relative proportion of the system's service potential corresponding with these levels of usage.

The table illustrates that, given typical operating parameters, 1,800 to 2,400 daily touches represent a 50% to 67% usage of the kiosk system's potential. This level of usage would correspond to between 150 to 200 daily users. 1,800 to 2,400 daily touches would correspond to approximately 55,000 to 73,000 touches per month. On an aggregate basis, if all the information on the kiosk was advertising related, this level of usage would correspond to 55 or 73 CPM units per month.[1]

This estimate of monthly touches per kiosk does not account for likely reductions in kiosk use that would be associated with users conducting telephone transaction via the kiosk. When kiosk users make calls via the kiosk handset, during the duration of their call, the kiosk will not be availible for use by other travelers. An average telephone call checking on room availibility and/or making a reservation might be estimated to take between one to two minutes to complete, and many users may wish to make several calls before selecting a hotel. In which case the average time per user on the system would decrease. Therefore, it is our opinion that the an average daily kiosk use estimate of 200 people per day will be a high estimate of likely usage.

In addition, a significant portion of the user's kiosk operation may be expected to be non-advertising related (such as navigating the system and public information). Therefore, the actual advertising exposure on the kiosk would be expected to be significant less, perhaps decreasing by as much as much as 25%. For the purposes of the feasibility analysis we have reduced the total monthly CPM rate per kiosk by 15% to determine a reasonable approximation of the potential amount of advertising coverage that each kiosk unit may be expected to generate.

This approach illustrates each kiosk's overall constraints on advertising revenues. However, an ability to sell advertising would be weakened by such low use and the limited likelihood of users viewing each advertisement. If even only a 100 listings are contained on the kiosk, this would reduce the likely average number of touches to a specific advertiser's information to less than 730 a month.

As we discuss in more detail in Chapter V, the physical limitation of each kiosk to accommodate use will be a primary factor limiting its service capabilities and

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[1]   CPM is an advertising price measure for the cost of advertising to a thousand individuals (or homes). See Chapter V, for more discussion.

TABLE IV - 1

DAILY KIOSK SYSTEM USE PROJECTIONS

Assumptions

Average Kiosk Operating Period (Hours)	10
Average Rate of Use by Traveler (Touches/Min)	6
Average Kiosk System Use per Customer (Touches/Use)	12

Touches/Day	Touches/Hour	Touches/Minute	% of Full Capacity	Estimated # of Users/Day
2700	270	4.5	75%	225
2400	240	4	67%	200
2100	210	3.5	58%	175
1800	180	3	50%	150
1500	150	2.5	42%	125
1200	120	2	33%	100
900	90	1.5	25%	75

Source : Dornbusch & Company, Inc.

thereby the advertising revenues potential associated with the proposed kiosk sys tern.

B. Kiosk Configurations

We contacted many kiosk vendors and developers and conducted extensive interviews with over twenty of their representatives to identify the key design and configuration issues associated with the proposed traveler information kiosks. Whenever possible we obtained cost information from these informants.

While many of the informants were extremely helpful, there was a general unease and reluctance amongst the individuals contacted to provide specific information on many aspects of kiosk development. Informants often cited proprietary concerns and insufficient information on the systems proposed operations and parameters as reasons for their unwillingness to "go on the record." Nonetheless, our research has been able to identify the important kiosk development issues and to obtain sufficient cost estimates to provide for a high degree of confidence in the financial feasibility analysis and conclusions. The following section presents the key results from our analysis.

1. Kiosk System Design Configurations Analyzed

We identified and analyzed the two most likely kiosk system design approaches:

a)   a stand-alone PC based system with most of the database stored on the hard drive, with a modem for remote updating.

b)   a network and server system.

We concluded that both systems would need to include a 17" touchscreen, laser printer and casing. Initially, the system size might be limited to 10 kiosks but should be designed to be easily expandable. In addition, we also considered the addition of kiosk system enhancements, such as, credit card readers and other transactional capabilities.

In the course of our feasibility analysis, it became apparent that the physical limitations of each kiosk and the overall system, and the monetary limits of potential advertising revenues indicated that these kiosk approaches would be not be financially feasible. Therefore, we expanded the scope of our analysis to examine the potential impacts on system feasibility of also providing kiosk access to the Internet. Therefore we analyzed an additional kiosk design approach:

c)   that provides the kiosk information through the Internet as a possible kiosk system enhancement and additional revenue generating source.

2.   Comparison of Configurations

It was expressly stated in the discussions with kiosk developers and vendors that the design and configuration recommendations for the network and stand alone system would be assumed to be adequate to ensure comparable system performance.

From our discussions with the kiosk developers and vendors, Table IV - 2 provides a brief summary of the results of our research. As can be seen from the summary table, typically, a stand-alone system approach will offer a quick response and processing time between the users and the kiosk. However, unless very large databases need to be search or accessed (such as mapping information), respondents generally agreed that the "slowness" of a networked approach would not be great enough to detract from the user experience.

The key advantages of the stand-alone approach are related to its relative simplicity. Stand-alone systems will operate on a daily basis as self-contained units. Changes in their system software to update their data can either be performed by disk or remotely by telephone modem during the night when little system use is likely. Since standard telephone lines will be perfectly adequate for most kiosk functions, these kiosks can generally be installed at remote and/or rural locations.   Since the kiosk units operate independently, difficulties with one unit will not affect other kiosks - thus there is little chance of full system failure under this approach.

The network approach will be better for enabling more sophisticated activities to be performed. Networked kiosks can offer real-time information and access to much larger sets of information since each unit can access the central server which can contain a greater quantity of information than a PC hard drive. However, many kiosk developers pointed out that many users may not want non-local or out-of-state information from a rest area location. The DiscoverAmerica kiosk's fundamental approach is based on a network server. Their system intends to allow travelers in one state such as Maryland to receive information about other states that are on the system such as Pennsylvania or California. But it is arguable whether providing such information will be useful to individuals in all three states.

Deployment of a networked kiosk system will require high quality telecommunication connectivity such as ISDN lines. This can represent a prohibitive expensive connection for a networked approach - especially in remote or rural locations. Current wireless technology is not yet adequate to provide a reliable alternative. Furthermore, the speed of operation on the network system can be sensitive to the system's usage. As a result, during peak period of system use, overall system performance may suffer if the network server is not sufficiently powerful to handle all the system's use. By contrast, the operating performance of the stand-alone system will generally be independent of the degree of system use.

Overall, developers generally concluded that for a relatively small deployment, a stand alone system was probably preferable - particularly if only basic system

TABLE IV-2

COMPARISON OF ALTERNATIVE KIOSK SYSTEM DESIGN CHARACTERISTICS

Characteristics	Stand Alone PC System	Network and Server System	Internet System
Processing Speed	High	Medium	Varies – especially during peak usage periods
Database Size	Medium	High	High – but will affect speed of operation
System Hardware Cost	Medium	Medium	Very Low
System Software Cost	Medium	High	Low
Ease of Updaing Information	Poor – Each unit must be updated Separately	Good – Realtime Updating	Good
Ease of Upgrading Software	Poor – Each unit must be updated Separately	Fair – System can be upgraded at once	Fair
Search Capabilities	Limited	High	High – but will affect speed of operation
User Base	Number of users per kiosk is limited	Number of users per kiosk is limited	Depends on Demand – Potentially very large
Primary Limiting Component	Each unit can only physically accommodate a limited # of users	Connections b/n server and kiosk units	User's modem and telephone line capabilities
Other Major Limiting Factors	Hard drive capacity	Capabilities of the network Each unit can only physically accommodate a limited number of users	Limited stability of the operating platform

Source: Dornbusch & Company, Inc.

capabilities were desired for the system. However, for larger deployments vendors suggested that the administrative savings from central information administration could be significant. Furthermore, if the kiosk system needed to provide more sophisticated computer operation and capabilities, a networked approach would likely be preferable.

As an additional enhancement, providing access to the kiosk information over the Internet is regarded by a majority of the interviewees as a highly promising and potentially cost-effective approach of providing traveler information. However, it must be clearly recognized that the "Internet kiosk" is only considered as an additional application. The instability of Internet connections, the slow operating speed (especially during peak periods) and the limited "user friendliness" of the current Internet "browsers" are considered currently insurmountable flaws to using a web-based kiosk at rest areas. RiderLink, a recent initiative by the King County local government is a hybrid "Internet kiosk" providing transportation information for commuters in the Seattle area. So far the kiosk system's performance has been problematic particularly due to the frequent system crashes that cannot be easily detected or remotely reset. In addition, difficulties in simplifying and adapting the interface for use as a kiosk has also proved difficult.

C.   Kiosk System Costs

One of the principal constraints on the feasibility of traveler information service kiosks is the system's cost. The system design and development costs will be important factors determining the financial feasibility. Lower development costs will improve the financial feasibility of the system. We have identified and developed approximate estimates of the current design and implementation costs associated with kiosk systems based on discussions and interviews with kiosk developers. We also conducted a survey of kiosk developers to obtained specific es tima tes for kiosk development costs.

Three main cost items determine the development costs for kiosk systems: system hardware, system software and the cost of compiling the kiosk information. Each of these are discussed briefly in the following sections.

1.   Hardware

The principal hardware cost for the proposed kiosk systems will include : 17" touchscreen, Pentium Personal Computers, Laser printers, PC or Network modems, and kiosk casing. In addition an administrative server will be needed to update the stand-alone kiosks, while a more powerful network server will be necessary for the network approach.

Table IV - 3 presents the hardware cost estimates derived from our survey of kiosk

TABLE IV-3: ESTIMATED HARDWARE COSTS

Respondent	Average Total Kiosk Cost		Server Cost		Addition of Transactional Capabilities		Credit Card Payment Capabilities	
	stand-alone	fully networked	stand-alone	fully networked	stand-alone	fully networked	stand-alone	fully networked
Advertising Technologies Inc. (ATI)	$8,000-$10,000	$6,500-$7,200	$1,500	$13,000	Telephone handset is $98		$1,000	$1,000
Big Head Productions	$5,000	$7,000	$10,000	$15,000-30,000				
i-MEDIA	$12,000	$12,500	$6,000	$9,000	$0	$0	$200	$200
Interact Multimedia	$4,000-$8,000	$4,000-$8,000		$15,000			Inexpensive (you can use a touch screen)	
Interactive Media Worldwide			$6,000		$250 for a modem		$300	
King Products	$5,000-$25,000	$5,000-$25,000	$3,000	$50,000-100,000 (real server)			$400-500 per terminal plus network service charges	
Midi, Inc.	NA	NA	NA	NA	NA	NA	NA	NA
New World Media	$8,500	$10,000	$3,000	$4,000	$5,000	$25,000	$1,000	$5,000
North Communications	$8,500	$12,500	$2,000	$9,000	$4,000	included	$1,000	included
Rocky Mountain Multimedia	$5,000	$5,000	$5,000	$5,000	$2,000	$2,000	$2,000	$2,000

Source: Dornbusch & Company, Inc.

developers. As can be seen from the Table, there is some variation between the vendor cost estimates. However reaonable cost estimates can be derived from this information for use in our financial feasibility analysis.

Our research indicated that hardware costs for kiosk systems are decreasing rapidly. Improved product reliability and the technical performance have reduced the typical hardware costs and/or enabled significant performance improvements. As of this report's publication, the hardware for an average kiosk unit for a stand-alone kiosk may be expected to cost in the region of $8,500. The administrative server is estimated to cost approximately $3,000.

The individual kiosk units for the network approach were generally estimated by vendors to be more costly than the stand-alone kiosk, primarily because of the more sophisticated telecommunications hardware necessary for the network linkage. The approximate average cost for a networked kiosk unit is estimated to be around $10,000. The network server cost estimates were significantly higher than those for the stand-alone approach but comparable to the unit kiosk costs. The approximate server cost used for the feasibility analysis is $10,800.

There was considerable variation in the vendor responses to questions on the costs for adding transactional and credit card payment capabilities to the kiosk systems. From the responses and our other discussions with kiosk vendors, we conclude that while basic telephone capabilities can be added at a negligible cost, more significant hardware expenditures on the order of several thousand dollars, will be necessary to enable more sophisticated transactional capabilities such as data searches. Automatic credit card reader capabilities can also be obtained for about $1,000.

The majority of kiosk developers and vendors interviewed agreed that future hardware cost may be expected to continue to decrease over the foreseeable future as further technological improvements provide greater performance at lower prices.

Based on these estimates and a kiosk configuration with only basic telephone transactional capabilities, we estimate that the total hardware cost for the proposed ten-unit kiosk system would be approximately $45,000 (stand-alone system) and $61,000 for a networked kiosk system.

2. Software Development

As can be seen from Table IV - 4, the survey respondents were significantly vaguer in their software cost estimates than they were for the hardware costs. Most kiosk developers stated that costs would vary significantly according to the sophistication and design of the interface and system desired by the client. This may explain much of the variation between many of the developer's responses.

While there were also considerable differences among the kiosk vendors in their

TABLE IV-4: ESTIMATED SOFTWARE COSTS

Respondent	Average Total Software Development		Additional Cost of Making Software Application Accessible on the Internet		Addition of Transactional Capabilities		Credit Card Payment Capabilities		Automatic Ability to Give Directions to Travelers	
	stand-alone	fully networked	stand-alone	fully networked	stand-alone	fully networked	stand-alone	Fully networked	stand-alone	fully networked
Advertising Technologies Inc. (ATI)	$3,000-30,000	$30,000	$30,000+	$30,000	$500-1,000	$500-1,000	$500-1,000	$1,000	$500 for one large map and a simple database. $500 plus license for mapping software	
Big Head Productions	$200,000-500,000		$75,000-150,000							
i-MEDIA	$60,000	$75,000	$30,000	$30,000	$20,000	$35,000	$10,000	$10,000	$10,000	$10,000
Interact Multimedia	$5,000-200,000 depending on number of screens and if there is a video	$1,000-100,000	$2500/month for a T1 line. A standalone kiosk without Internet tools requires. Internet presentation, adding 50% premium..		$1000 programming fee				$5,000 to create a program	
Interactive Media Worldwide	$1,000-200,000				$10,000 for a modem					
King Products	$100,000-1,000,000		Doesn't see why there should be any additional cost.		$10,000-50,000				$1,000,000 for metropolitan area	
Midi, Inc.	$75,000	$120,000	$40,000	minimal	$25,000	$25,000	$20,000	$20,000	$15,000	$15,000
New World Media	$75,000	$150,000	$20,000	$50,000	$10,000	$15,000	$5,000	$10,000	$20,000	
North Communications	$60,000	$150,000	$20,000	$35,000	$35,000	Included	Included	Included	5 kiosks with 20 destinations requires about $6K to program, increasing geometrically with the number of sites and number of destinations.	
Rocky Mountain Multimedia	$20,000	$20,000	$0	$0	$2,000	$2,000	$2,000	$2,000	$10,000	$10,000

Source: Dornbusch & Company, Inc.

software development cost estimates, kiosk vendors generally agreed that software development will represent the major proportion of the kiosk development cost. According to all the respondents, the network system incurred far greater software development costs than those for the stand-alone kiosk.

Most of the cost estimates for the software development ranged from $60,000 to $150,000. For the purposes of the feasibility analysis we have relied on the information provided by I-Media, Midi Inc., New World Media and North Communications to base our estimates of likely kiosk software development costs. Therefore we have used software development costs for the total kiosk system of $67,500 (stand-alone) and $125,000 (network sys tern).

Generally, the software cost estimates for additional amenities such as transactional capabilities, credit card payment and directions were considerable. Therefore, given the findings from our revenue analysis in Chapter VI that these amenities are unlikely to be significant revenue sources in the near-term, the costs for these additional kiosk services were not included in our feasibility analysis.

Recently, more standardized software development tools are emerging which may make development of "standard" kiosks more inexpensive. However, the applicability and limitations of such development approaches remain unclear. Most vendors emphasized that kiosk design should be a central component of the kiosk development, since it determines and controls the interface which defines the user experience. The software development costs can also be expected to decrease significantly after the initial systems have been developed. Once the basic software has been developed and the human factors, design, and programming work have been invested, the cost of modifying the software to serve other systems will be far less than the initial development cost. Many vendors agreed that a successful kiosk system could easily have its informational content replaced for use in another location or for another system.

This suggests that future software development costs could decrease substantially as the prototype systems become accepted. In which case, the feasibility of later systems (from the perspective of a public agency) would be improved.

3. Data Completion and Transfer

Compiling and transferring the information into a suitable digital form for inclusion on the kiosk system can represent a significant cost for the kiosk development. Unfortunately, the cost of compiling and transferring information into the system will be the major unknown cost for a kiosk development. For example, if a database of hotels has already been collected, then it will be a relatively minor task to incorporate this information into the software. However, if this information has to be collected and then entered into the system, then there will be a significant additional labor cost. Most of the agencies interviewed had little idea of

the costs associated with compiling and transferring information into a suitable format for the kiosk system.

However, it has become increasingly common for agencies to compile their tourist information in an electronic format either as a word processor file or database. Based on our discussions with kiosk developers, the estimates of information conversion varied greatly. Many vendors provided rates of several hundred dollars per screen. However, part of these cost estimates may be attributed to graphic design and electronic conversion. However, as new software applications emerge, facilitating data conversion and digitization, the costs for information conversion will decrease.

Therefore, for the purposes of the feasibility analysis, we estimated that the average cost for compiling the information will be in the region of $40 per screen. This might also be considered equivalent to an hour's work by a production assistant. In which case, if a typical kiosk system has an equivalence of 1,000 entries (or screens of information), the cost for compiling this information would be approximately $40,000 for the entire system.

This estimate may also be considered more reasonable compared to the estimates provided in Table IV - 5 if it is recognized that the proposed kiosk presentations would have a highly standardized form for the content. Furthermore, it may be possible that a significant proportion of the total data compilation and transfer costs could be paid by advertisers willing to pay for the digitization of their own information.

4. Total Kiosk Development Cost Estimates

Based on the above cost estimates, for our feasibility analysis we estimate that the approximate and conservative cost estimate for the development of the proposed ten unit kiosk system will be approximately $147,500 for a stand-alone system and $226,000 for a networked system. Table IV - 6 presents general recommendations by the kiosk vendor respondents

5. Operating Expenses

The cost of administering the kiosk project might be carried by either the private sector or the state agency. In any case, the agency can at least be expected, to have a minor oversight cost from ensuring that the kiosks operate in accordance with the state guidelines.

The principal operating cost items for the purposes of the financial feasibility analysis will be the costs for: sales staff and administration, overhead, kiosk operation and maintenance, and advertising to promote the kiosk system itself.

TABLE IV-5: KIOSK SYSTEM IMPLEMENTATION AND OPERATIONS

Respondent	Cost of Creating a Screen Full of Content		Cost of Updating Information		Cost of Kiosk Buyers Updating and Maintaining Software Themselves		Monthly Operation and Maintenance Cost	
	stand-alone	fully networked	stand-alone	fully networked	stand-alone	fully networked	stand-alone	fully networked
Advertising Technologies Inc. (ATI)	$30-40 programming charge for each client		$30/hour		Requires training only.			
Big Head Productions					The buyers could be trained at about 15% of development cost		15%	
i-MEDIA	$500	$500	$100/screen	$100/screen	$5,000	$7,500	$125	$200
Interact Multimedia	$300 without video on the web, $400-500 per screen without web development tools		$125/hr but it is beneficial if done on a retainer or quote on a project				$2,500 for the T1 and maintenance	
Interactive Media Worldwide								
King Products	$500-2,000 for a straightforward screen with qa picture		$50-2,000				15% of purchase price annually	
Midi, Inc.	$75,000	$75,000	$30,000	$30,000	$5,000	$5,000		
New World Media	$450	$450	$90/line(?)	$90/line(?)	$5,000	$1,000	$50-100	$100-200
North Communications	$800	$1,200	It depends on frequency and method		Maintenance of the system could be accomplished at customer site by licensing their Info/Media Environment		$200	$550
Rocky Mountain Multimedia	$100	$100	$65/hr	$65/hr	$0	$0		

Source: Dornbusch & Company, Inc.

TABLE IV-6: GENERAL INFORMATION

Respondent	Advice to an Agency Developing a Kiosk System	Current and Future Revenue Generating Potential of Interactive Kiosks	Recommended Design Configuration
Advertising Technologies Inc. (ATI)	Know what you want before you start.	There is a lot of revenue potential. There is the advertising and entertainment value.	Something sheltered in a gazebo, stand-alone or networked.
Big Hand Productions	Know exactly what you want. Be prepared to fund a prototype. Price should not be main consideration when choosing a vendor.	Many factors govern usage - location. Private environment of a kiosk is conducive to impulse buying. Application should be fun for novelty value.	
i-MEDIA	Use a firm with experience. The application must be compelling, intuitive, and provide a useful service. Don't underestimate the complexity and cost in developing self-service applications and kiosk hardware. Invest in reliability and support.	The revenue possibilities are outstanding for an application that is easy and provides a service that is easy, fun, and reliable for the consumer. There are a number of success stories.	Info Access Kiosk and Outdoor Kiosk.
Interact Multimedia			
Interactive Media Worldwide			Stand alone PC with modem.
King Products	Make a plan and follow it. Don't try to do too many things with one machine.	Revenue is absolutely doable.	
Midi, Inc	Hire a firm or firms with experience in the design, development and implementation of kiosk systems. Separate software development and hardware configuration and maintenance. Make sure kiosk developer's design makes updating easy and cost-efficient.	Transactional kiosks that allow use of credit card have a great deal of potential if users come to trust the security of such systems.	Needs more information.
New World Media	Solicit many requests for information.	Currently, revenue is ad-based, and faces many marketing issues. The Future, as transactions gain consumer acceptance, is quite bright.	Networked web kiosks.
North Communications	Work with someone who has done this successfully with demonstrated track record of successful operation. These are not conventional software, systems integration or network skills. Require highly focused management.	Growing quickly. Kiosks must be multi-purpose, multi-tenant, to attract continuing audience and generate stable revenue flows over time.	Basic stand alone, dial-up configuration, compact and easily moved, ADA-rated and easily opened and serviced.
Rocky Mountain Multimedia	Develop the web presents first. Find working models that actually produce a positive cash flow and copy them.	If you make a kiosk that does "everything" it is confusing. Visits should be 2 minutes total or less. Want high turn around activity.	Stand alone with auto internet update capabilities.

Source: Dornbusch & Company, Inc.

We have estimated that for the first two of operations 3 full-time sales staff would needed to sell the kiosk advertising. At an annual cost of $50,000, these staff cost will be $150,000 for the first two year. Afterwhich, it may expected that sales staff could then be reduced to 2 full time employees if a high level of advertising renewals are achieved by the system.

For feasibility analysis, we have used annual administration cost estimates of $80,000 for managing the advertising sales and kiosk operations. If a high level of advertising renewals are achieved in the later years, then the administrtaion costs could be expected to decrease. In which case the annual overhead cost for the kiosk operator is expected to be approximately $40,000.

The annual cost of operation and maintenance of the kiosk system is estimated to be 18% of the total kiosk development costs. Advertising for promotion of the kiosk system might be convervatively estimated to be $50,000 a year for the first two years, afterwhich it may be expected to decrease to approximately $32,000 a year.

V.   REVENUE GENERATING POTENTIAL OF INTERACTIVE KIOSKS

A.   Key Factors Determining Kiosk Revenue Generating Potential

The limited implementation and the generally poor success of past kiosk systems provides little positive evidence of their revenue generating potential. As we have discussed in Chapter II, the poor performance and weak revenues generated by early kiosk systems operating in the 1980s are partly attributable to the difficulties common to fledgling technologies: system performance was slow and unreliable, early touchscreen technology was prone to malfunctioning, printers frequently broke down, and the technology was both expensive and difficult to upgrade. Furthermore, many early kiosk developers soon left the industry and orphaned their systems.

As we discussed in Chapter III, kiosk technology and the kiosk vendor companies have both matured significantly. As a result, the worst of these problems have been overcome so that relatively stable and sophisticated kiosk systems can now be developed at comparatively low prices. As mentioned in Chapter IV, currently a relatively small number of independent kiosk and multi-media companies perform the major share of kiosk development. Increasingly, large and well established computer and informational technology companies such as EDS, AT&T, Unisys and IBM are entering the kiosk development market. The maturing of the kiosk vendor market suggests that further technological innovation should occur and greater downward pressure on system prices will be likely in the foreseeable future.

From our discussions with kiosk developers, state agencies and advertising agencies, we have identified several key factors that will determine the revenue generating potential, and hence the feasibility of interactive kiosk systems. The following sections outline these key factors and their expected role in interactive kiosk developments at rest areas.

1.   System Location

The great majority of respondents interviewed mentioned the central importance of the kiosk location for determining the system success and revenue potential. Most importantly, it is the size and demographics of the potential user population at the kiosk locations which are most relevant for assessing a site's revenue potential. In Chapter III, the findings from our review of the existing analysis relating to traveler rest areas are presented.

In general, the rest area studies provide data on the visitor behavior, population demographics and information needs. Each of these aspects can be expected to influence traveler use of interactive kiosks. In general, the studies find that the majority of travelers stopping at rest areas seek traveler information. Furthermore, the research suggests that many traveler trips are affected by information obtained at

rest areas and welcome centers. In addition, much of the available analysis finds that the growing proportion of baby-boomers in the traveler population and the increasing familiarity of older travelers with computer technology suggest that there is considerable potential for kiosk use by travelers at rest area locations.

2. System Capabilities to Serve User Needs

The kiosk systems' informational resources and capabilities will directly determine the kiosk user experience. The effect of user experience on the user will also be dependent on the individual's traveler information needs. Therefore, the kiosk system's effectiveness (and thereby revenue potential) will depend on the kiosk system's information capabilities and the match of those capabilities with user needs.

Tom Leonard, a principal industry analyst for Inteco Corp., (one of the leading multimedia research firms) identifies the poor locational and market research connected with many of the previous commercial systems as a major weakness attributing to their inability to attract a sufficient user base. Leonard maintains that the rapid growth of travel information kiosks at hotels, convention centers and airports was generally misguided since the majority of these systems targeted an audience and user base that had already made their travel arrangements before arriving at the kiosk locations. As a result, by and large, these systems were severely under-utilized by travelers. This highlights a centrally important aspect for successful kiosk development at rest areas. It is essential that the services offered by the kiosk system complement the likely users and those users' needs at the rest areas.

The importance of the match between user needs and the kiosk system's capabilities also influences the impact of additional kiosk capabilities on the kiosk's revenue generating potential. Simply stated, enhancements to the kiosk can be expected to have negligible positive impact on the system's revenue potential unless they serve specific visitor needs. Otherwise, the value of these enhancements to the user experience can be expected to be minimal. While many enhancements, such as database search capabilities and directional mapping, may offer potentially useful informational services, if users are not familiar enough with the system to use the enhancements, then they will have little positive effect on the user experience.

Lee Seitelman of Interactive Media World was particularly adamant on this point. Seitelman maintains that the failure of many kiosk developments is related to the common tendency to overdesign kiosk systems. He stated that the inclusion of unnecessary and overly complicating "bells and whistles" generally tends to obscure the kiosk's central purpose of traveler information provision.

3.   Sys tern Deployment Size

The number of units in the kiosk system will naturally affect system usage since it determines the opportunities for travelers to use the system. While more units will generally mean more users, it is the relationship between kiosk usage and total cost that will be most relevant for determining the optimal deployment size. In general, if the net revenue associated with an additional kiosk is positive, then expansion of the kiosk system should improve the kiosk feasibility.

Several kiosk developers pointed out that a kiosk system development may require a critical deployment to be attained before the feasibility of the system can be achieved. For retail kiosks, these developers stated that a relatively large number of kiosk units may need to be deployed to attract the necessary advertising revenue base and public usage of the system. Richard Haukom, a kiosk developer at Haukom Associates, identified this as a past problem that prevented the implementation of a kiosk system design for pharmacies:

> "The kiosks worked fabulously. We had 4,000 people a month using them, and we gathered great demographic statistics," says Haukom. However, the installed base was not large enough. "Our business plan called for 500 machines. The pharmaceutical company told us to come back when we had 5,000."

The major differences between the likely kiosk user population and the user population considered necessary to obtain an adequate advertising revenue base will be central problems for kiosk system feasibility. In such cases, the necessary number of kiosks installed as an initial deployment may act as a critical obstacle to kiosk development since the kiosk operator may be otherwise unable to make a reasonable rate of return on his investment. For the purposes of this feasibility analysis, we have primarily considered a small initial deployment of five kiosks. We have also examined the marginal income per kiosk to determine whether larger kiosk deployments would be expected to positively influence kiosk feasibility.

B. Principal Advertising Strategies

We have identified two basic advertising approaches that have been previously used and that can reasonably be adopted by kiosk systems and on the Internet. From our discussions with advertisers and advertising agencies, we have identified and assessed the major advantages and disadvantages that each of these approaches has for both the information providers and advertising clientele. The following section briefly discusses each of these approaches as they are considered applicable to interactive kiosks and/or the Internet.

1.   Sponsorship

The sponsorship approach is typically characterized by a limited number of advertisers who pay relatively high fees for their involvement with the project. As a result, project sponsors frequently become closely identified with the application itself. The prices paid by each sponsor are comparatively high since the business is paying in part for the exclusivity of their association with the application. In addition, in the case of "new" applications the sponsor may be willing to pay a premium price since the sponsor recognizes that such cost-sharing of the application is essential for implementation to occur.

Under the sponsorship approach, the sponsoring firm's advertisement typically receives prominent and frequent placement on the system when the application is used. "Sponsorship" and "linkage" advertising is becoming increasingly common on Internet sites such as Yahoo and Netscape. On these sites, a sponsoring business' logo/advertisement and links to their web-page appear as a small banner heading (1" x 4") to the information requested by the user. In many cases, a sponsor's advertisement may appear on several subsequent pages. According to Ken Sacharin of Young & Rubicon, this advertising approach is attractive to many advertisers since it allows them to leverage their existing Internet investment. The linkage media business is an emerging and important approach for enhancing a site's presence.

Several informants recommended that a kiosk system could have several sponsors. They suggested that in order to optimize the sponsorship revenues each sponsor should be from a different type of business. In that way, each sponsor can be granted the banner placement for the category of user activity on the system that is most relevant to their business. For example, a hotel sponsor might get its logo placed on the screen during any user search of the system's accommodation listing, but would be replaced by McDonalds when the user views the restaurant listings.

It was also suggested that multiple sponsors might also be accommodated on the system (especially on the attractor loop) by allowing the system to randomly or successively select the banner display for each screen. However, it should be recognized that the revenues from sponsoring advertisers will likely be related to the amount of screen time they receive.

a) Advantages

The sponsorship approach can be highly favorable since there can be relatively low administration costs to the kiosk provider for attracting and displaying the sponsorship advertising compared with relatively high revenues coming from the sponsor. When the association between the system and the sponsor is successful, the relationship will generally be stable. If the system is successful, then the sponsor can gain additional positive and broader public awareness based on its association

with the system.

Several informants suggested that in order to be financially successful using the sponsorship approach, a kiosk system needs to develop an advertising identity different from traditional advertising media. If the kiosk offers information or services that otherwise are unavailable or difficult to obtain, then usage by the public is likely to be encouraged. Furthermore, by asserting a separate identity from other media, there will be less likelihood for potential sponsors to compare directly the costs of sponsorship with other potential media "buys," such as billboard or newspaper advertising.

In addition, the potential for a positive association with the system can be a significant factor in the sponsors decision-making. A positive association between the system and the sponsor can, under some circumstances, translate into a comparative business advantage over its competitors. For example, a local hotel chain might be able to enhance its image as a state-wide or regional chain by its sponsorship with a state-wide kiosk system. Similarly, the often mentioned "high-tech" effect may occur when businesses find themselves in a positive association with a new technology, such as interactive kiosks or the Internet.

b) Disadvantages

Due to the high price and limited number of sponsorship opportunities on a kiosk system, managing the sponsorship approach can be difficult. First, the potential "pool" of possible candidate sponsors may be limited due to the high price of sponsorship. In particular, several of the informants emphasized the difficulty of attracting and maintaining initial project sponsors.

Furthermore, in order to maximize the systems revenues and long term associations with its sponsors, it is important that the kiosk system identifies and attempts to attract those businesses whose interests are most compatible with the system. For example, several informants suggest that it might be unwise for a kiosk system to select Hilton Hotels as a corporate sponsor if the majority of users will be more likely to stay at a budget motel chain such as Travelodge or Motel 6.

Elly McGirr of the Government Information Technology Services Working Group (GITS) of the Interagency Kiosk Committee warns that the inclusion of advertising, and particularly sponsorship advertising, might be problematic for governmental agencies. She cautions that if the public perceives that the government is favoring or sanctioning these commercial business there may be serious dissatisfaction and possibly even legal action by users or other business.

The sponsorship approach can also make the kiosk system highly dependent on the interests of the few businesses that form its narrow base of advertising revenues. Under such circumstances, the kiosk developers may face strong pressure from the

sponsoring organizations or business to change its operations or mission. The kiosk developers will be likely operate with less independence from their advertisers. This will be particularly a problem if the kiosk system's performance does not meet the expectations and requirements of the corporate sponsors. Lee Seitelmann of Interactive Media World warned of the considerable danger from relying solely on a sponsorship approach. He has witnessed the complete collapse of one municipal tourism information project when it was orphaned after a key private sponsor withdrew its financial support after the first year of operation.

2. Listing Fee

An alternative approach for kiosk developers is to pursue a broad number of advertisers for the system in a manner similar to the advertising revenue approach used by the Yellow Pages. Under the listing fee approach, the kiosk developers charge a large number of businesses relatively small fees for their inclusion on the system. The advertising rates under this approach can also be tiered to accommodate different advertising needs. For example, businesses wishing to display a photograph or to supply a coupon to the users can be charged a higher monthly fee than other businesses that only want a basic text listing.

Under the listing fee approach, the advertising rates charged for the system generally must be comparable with those charged by other media. Since the system will include numerous competing firms under each type of business (for example several different hotel chains), there will be little comparative advantage over other media outlets from advertising on the system - unlike the sponsorship approach.

It was suggested by many kiosk developers that it is important that the system and its advertising has a standardized "look and feel." In their experience, the kiosk system must develop a clear identity in order to generate user confidence. Without a clear identity, users will be liable to become confused and frustrated when operating the system. This will both slow down the users ability to navigate the system and will degrade the quality of the user's experience with the system.

The listing fee approach also raises an important issue about the database comprehensiveness. Several kiosk developers emphasized the importance of collecting an adequately large database of business listing. Developers warned that if insufficient businesses are available on the database, users will tend to mistrust the system and will likely be dissatisfied with the information they do obtain from the kiosk. Therefore, it was recommended that efforts should be made to develop a comprehensive database of businesses if a listing fee approach is adopted. This can be done by charging no fee for basic inclusion on the database. In which case, advertising revenues would be obtained by charging businesses wishing to have a larger listing, such as a full page advertisement with photo.

a) Advantages

A tiered pricing system can enable the kiosk developer to maximize potential advertising revenues by allowing the advertiser to chose the level of advertising spending that they want. As a result, even small and rural businesses should be able to afford to advertise on the kiosk. Furthermore, the hierarchy of advertising options can encourage businesses to spend more money on advertising in order to maintain their perceived status. Yellow Pages advertising executives reported that they enjoy a very high renewal rate amongst their clients. Furthermore, many clients upgrade their advertising over time. Therefore, the administrative and sales costs in subsequent years is relatively slight which significantly improves future profitability.

Since the revenue base associated with a successful listing fee approach is broad and numerous, once established the kiosk system will face less risk of sudden reductions in its funding. Furthermore, the kiosk system will probably be able to operate more autonomously from its advertising clients since they are more numerous and each has limited financial leverage over the kiosk developer.

Since each advertiser makes a minor financial contribution to the system, and their contribution is comparable to other media buys, individual advertisers will likely have less association with the system. This decreases the risk to the kiosk developer that the advertising base will abandon the system if its fails initially to perform adequately.

One of the frequent recommendations from kiosk developers and state agencies interviewed was that the database of information should be relatively comprehensive. Otherwise, the informants warn that users may be dissatisfied and suspicious of the information that is provided. Under the listing approach, the kiosk developer will naturally develop a more comprehensive database of advertisers.

b) Disadvantages

The fundamental problem with the listing approach is the very high initial cost in attracting and administering the advertising base. Contacting and selling advertising space on the kiosk will be very time consuming and difficult. Furthermore, developing the advertising base effectively will demand specialized advertising sales expertise - particularly when the media and the system are as innovative and untested as interactive kiosks are.

As a result, adopting the listing approach will require the kiosk developer to have sufficient financial resources for both the development costs and the working capital necessary to operate the system until advertising revenues are obtained. This is a major challenge for kiosk developers. Due to the fast pace of technological

development in the field, most developers commit the majority of their capital resources in their software development (see Chapter V). As a result, frequently the kiosk operation will suffer if the project is underfunded during the implementation phases. Under a listing fee approach, the potential danger of underfunding during project implementation will be particularly acute since the system is reliant for its primary revenue source on collecting small individual advertising fees from a very large number of new clients. For a new venture, this process will necessarily be highly labor intensive and the revenues will most likely be received slowly over time.

Another difficulty for the listing approach is that it encourages comparisons with other media advertising rates since there is little comparative advantage for businesses advertising on the system. As a new, and mostly untested system and media, there is still major uncertainty for potential advertisers regarding advertising effectiveness and the system's likely usage and user clientele. Furthermore, the physical limitations of the system also ensures that each kiosk unit will not be able to serve a mass audience. As a result, kiosk advertising reach will be relatively low (see Section IV).

C. Advertising Rates

1. General Issues

Discussions with kiosk developers and advertising personnel consistently coalesced around several central observations regarding the advertising potential of interactive kiosks at rest areas. First and foremostly, the informants generally agree that there is little understanding of the appropriate advertising rates for kiosks or on the Internet. The informants stressed that the absence of financially successful ATIS case studies is currently a key limitation on the industry's ability to build kiosk advertising revenues.

The importance of locational factors in determining the advertising rates for the kiosk system was another observation commonly made by the informants. First, the specific kiosk site location and traffic conditions will affect the advertising's "reach" (i.e., the potential number of individuals that will be exposed to the advertising). A high volume of user traffic composed primarily of upper income travelers would generally enable the kiosk developer to sell advertising at a higher rate. Second, the local advertising market conditions will be another major consideration influencing potential advertising rates. The comparable rates for other advertising media in the area will be a factor in the decision-making process by the potential advertisers. One possible approach for estimating a kiosk system's potential advertising revenues can be derived from comparing the kiosk system's expected audience with the advertising rates for other competing media. Although the delivery and impact of interactive media is significantly different from that of print or traditional broadcast media, the advertising and financial value of the differences in the viewer

experience has not yet been adequately evaluated.

Third, the kiosk system's configuration and multi-media capabilities are another factor that affects the revenue potential. However, it is the opinion of several commentators (such as Lee Seitelman of Interactive Media World) that most kiosk developers overestimate the role of the system's capabilities in determining the advertising revenues potential. In their view, provided that a kiosk system adequately delivers basic traveler information in a reasonably timely manner, the basic value of the advertising transaction has been successfully completed. They believe that most of the past and current kiosk systems are not financially self-supporting because the developers have overdesigned the system's non-essential capabilities, and have lacked the necessary expertise to sell advertising.

2. Sponsorship Rates

In the past, most sponsorship arrangements between kiosk developers and the private sector have been structured or developed as partnerships. As a result, in many cases, due to the uniqueness of their situations, the financial contribution by the sponsoring businesses cannot be easily compared with other systems.

According to several kiosk developers and advertising agencies familiar with multimedia applications, a willing sponsor would likely be able to pay several thousands of dollars a month to sponsor a small kiosk system (i.e., 5 - 10 units). However, they also warned that it will be difficult to attract these major corporate sponsors for such small kiosk systems. In their experience, businesses typically expect larger deployments in order for them to contribute funding.

The informants on this issue also generally pointed out that sponsors will expect a highly visible presence and association with the kiosk for their financial contribution. For example, placement of a business logo on the kiosk casing will likely be an important issue for negotiation between the kiosk developer and the sponsor(s). The extent and nature of the public sector's involvement in the kiosk system will be another major issue affecting the financial contribution that can be obtained from potential sponsors. Generally speaking, if the public sector's involvement can be perceived by the public as an endorsement of the sponsor, then the sponsor will be willing to make a greater financial contribution. However, most public agencies are understandably very sensitive and reluctant to be regarded as endorsing a private business.

Many of the informants on this issue also emphasized the potential to increase the system's sponsorship revenue base by attracting numerous sponsors to the system. Under this approach, sponsors would be displayed according to the category of information being requested by the users. For example, the Motel 6 banner would be shown when the user is selecting amongst the lodging information, while the Wendy's logo would appear when the user is in the food directory.

Under such a sponsorship strategy, each sponsor's financial contribution would of course be less than that obtained from a sole sponsor. However, under the multiple sponsor approach the total sponsorship revenues are likely to be greater. This can occur because of two general observations by the informants. First, advertising to a "captive" audience of potential users is more valuable to the advertisers than advertising to a general audience. Second, the financial "premium" that a major sponsor is expected to be willing to pay to be the sole sponsor is estimated to be relatively small compared with the additional revenues that can be obtained by matching numerous sponsors with their targeted users. As a result, several informants recommended that kiosk developers should obtain multiple sponsors under the sponsorship approach.

The sponsorship advertising rates currently charged to advertisers on popular Internet sites such as the Netscape home page, Yahoo and other search engine provide some indication of the current advertising revenue potential associated with multi-media and Internet advertising. However, while admittedly there are significant differences with kiosk sponsorship or advertising, the Internet advertising rates do provide useful comparative figures. Since mid-1995 there has been a rapid proliferation in the presence of banner advertising and paid linkage at the more popular Internet sites. Over this time there has also been a significant fluctuation in the advertising rates charged by these sites. As recently as April 1, 1996 Forrester Research was quoted in Newsweek Magazine estimating a typical Internet advertising CPM of approximate $75 (based on ad costs of $15,000/month for an online magazine with a circulation of 200,000). In more recent discussions with Forrester Research, they suggested that currently considerable advertising was occurring at lower average CPM rates of around $30.

Webtrack is one private company that collects and publishes extensive information on web advertising rates and spending. According to Webtrack, CPM rates may vary from $10 to $60 or more - although the majority of rates are in the $20 to $30 region. Webtrack also notes that sites attracting more focused traffic can often charge higher rates than search engines. Webtrack also argues that the number of click-through traffic (i.e., viewers choosing to obtain more information associated with a banner advertisement) associated with an advertisement would be a better measure of multi-media effectiveness.

While these rates are more easily comparable with the kiosk listing fee rates (see the next section), the kiosk sponsorship rates may not be fairly assessed using this method since the expected usage will be relatively limited. Furthermore, if private sponsorship of the kiosk system is adopted as the primary funding source, the sponsorship revenues would need to be sufficient to cover the kiosk development costs. As can be seen from the kiosk cost analysis in Chapter V, the development costs alone may be several hundred thousand dollars. In which case, the necessary sponsorship rates for a solely privately sponsored kiosk development would be tens of thousands of dollars - even if several sponsors share these costs. Based on our

research, we judge that such a private sponsorship approach is not likely to be feasible as the principal approach for kiosk funding.

3.   Listing Fees

As a result of the relative simplicity of the listing fees approach, kiosk listing fees are expected to be directly comparable to advertising fees for other local media such as the yellow pages and local print media. It may be expected that potential advertisers will compare kiosk advertising rates with the cost per thousand (CPM) for the various local media as part of their advertising buying decision.

Most advertisers assess potential advertising purchases based on the "reach" (number of expected viewers) and the "frequency" (average number of times each viewer is expected to be exposed to the advertisement). By multiplying these two measures, advertisers can estimate the total gross delivery of advertisement viewers (commonly referred to as GRP or gross rating points). This is a measure by which advertisers estimate the advertising impact of potential advertising purchases. Advertising rates are typically provided based on the cost-per-thousand (CPM), i.e., the cost per one thousand individuals (or homes) delivered to by a medium or media schedule. One approach for estimating a kiosk system's potential advertising revenues can be derived from comparing the kiosk system's GRP with the advertising rates for other competing media.

Although advertising rates will vary among different media and media outlets (e.g. such as different newspapers), rough estimates were obtained from advertising agencies, media sales organizations and trade publications such as Burrelle's Media Directory and "Marketer's Guide to Media" published by Adweek. For the purpose of our feasibility analysis we have used the following advertising rates:

Media	Cost per 1000
Billboard	less than $10
Television (30 second spot)	$5 - $10
Radio	$5 - $10
World Wide Web	$20 - $30
Magazine	$30 - $40
Newspaper	$40 - $50

The costs differences between media and specific media outlets will depend on the demographics of the audience reached and the "character" of each media. For example, specialty magazines, such as Golfer's Digest, can often obtain higher than "standard" rates if the demographics and/or the subject matters attracts a readership that has particular value to some advertisers (such as golf equipment

manufacturers). In addition to the price comparisons, other factors will influence advertisers media purchase decisions. According to Bruce Denner (of the Media Planing and Buying Group), outdoor advertising, such as billboards, offer the potential advantages of being geographically specific and last over a longer period of time (therefore can achieve high levels of frequency which can assist in advertising retention).

a) Kiosk's Physical Limitations on Advertising Revenues

In Section IV, we have analyzed the physical limitations associated with an individual kiosk unit. Based on this analysis we conclude that it may be reasonably expected that each kiosk on the proposed system would be able to serve realistically at most approximately 200 users a day. This level of usage would correspond to between 150 to 200 daily users. On a monthly basis, this will correspond to approximately 55,000 to 73,000 touches per month. On an aggregate basis, if all the information on the kiosk was advertising related, this level of usage would correspond to 55 or 73 CPM units per month.

However, a significant portion of the user's kiosk operation may be expected to be non-advertising related (such as navigating the system and public information). For the purposes of the feasibility analysis we have reduced the total monthly CPM generated per kiosk by 15% to determine a reasonable approximation of the potential amount of advertising coverage that each kiosk unit may be expected to generate. Therefore we estimate that the likely monthly CPM generated by an individual kiosk unit will at most likely be between 48 to 62 CPM per month. For the feasibility analysis we have used the average of these figure (55) to represent the likely average CPMs per kiosk.

If television advertising rates are used as comparable advertising media, then the monthly CPMs generated per kiosk would be expected to generate $620 dollars a month (55 x $10 = $550). For the entire kiosk system this would correspond to $33,000 a year in advertising revenues. At comparable newspaper rates, each kiosk would generate $2,475 in advertising revenues a month. This would correspond to annual gross advertising revenues of $148,500 for the entire kiosk system. We judge that potential advertising rates for kiosk advertising would actually lie within this range.

The kiosk system usage analysis shows that the number of potential system users is relatively limited. Therefore, advertising revenues for each kiosk will be limited by the number of potential viewers. In advertising parlance this is often referred to as the specific media's coverage.

This approach illustrates the kiosk system's overall constraints on advertising revenues. However, in addition the ability to sell advertising to individual advertisers would also be weakened by the low likelihood of users seeing their

advertisement at such levels of system usage.   If even only a 100 listings are contained on the kiosk, this would reduce the likely average number of touches to a specific advertisers information to less than 730 a month.

As we discuss in more detail in Chapter V, the results from analyzing the system's usage capabilities suggest that the physical limitation of each kiosk will be a primary factor limiting the service capabilities and thereby the advertising revenues potential associated with the proposed kiosk system.

In addition, the number of times people are exposed to the advertisement will be another relevant factor in determining the advertisement's effectiveness. If only relatively few viewers can be served by the kiosk system, the advertising revenues based on CPM will therefore be limited.

b)   Advertising Rates on Existing Kiosk Systems

From our discussion with kiosk developers, most informants acknowledged the difficulties of comparing kiosk advertising rates to other media. The kiosk operators also commented that their advertisers sales efforts required them to market effectively to advertisers the unique aspects and opportunities associated with kiosk advertising.

Although most informants were reluctant to share exact rates in general average listing, several kiosk developers were willing to indicate their approximate rates to advertisers. In general, the rates for each advertisers on average ranged between $50 - $100 per month for relatively small kiosk systems. It was not possible to obtain detailed information on the renewal rates for advertisers on these systems.

We have used an average monthly advertising fee rate of $80 per month to represent the maximum conceivable advertising rates that could be obtained from advertisers for the proposed kiosk system. On a CPM basis, this advertising rate is almost twice the cost of the advertising rates charge for newspaper advertising. This assumes that advertisers would be willing to pay a premium rate to advertise on the kiosk, perceiving that the kiosk advertising will have sufficient additional advertising impact to justify the higher CPM rates.

c)   Potential Advantages of Kiosk Advertising

Kiosk listing can offer some presentation advantages over these other media. For example, kiosk listings can provide color photographs and directions from the kiosk locations. Kiosk advertising might also be easily kept current even on a weekly or if necessary daily basis. Furthermore, many individuals within the kiosk and multimedia community emphasize that the impact of the kiosk advertising is significantly different and more effective than other traditional media. However,

there is as yet no direct and widely accepted evidence of any qualitative differences in the advertising impact of multimedia versus traditional media.

One clear benefit that kiosk advertising does possess is the ability to engage a targeted audience of potential customers. Among advertising agencies and advertisers the "audience composition" for the specific media and location is an important factor in determining the effectiveness of the advertising. For advertisers, reaching their target audience is a key goal. As we discussed in Chapter III, due to the profile and demographics of the individuals stopping at rest areas, the majority users of the system will be travelers who need information. It is also expected that users will consist of a high proportion of individuals who can be highly influenced by the information they receive on their travel options. In the future, the size of the traveler population that can be influenced by travel information at rest areas is expected to increase given the past trends in pre-trip planning and user familiarity and acceptance of computer technologies. This audience will be of particular interest to traveler related businesses such as hotels, restaurants and attractions.

Furthermore, compared with typical broadcast media, due to the interactive nature of the system, kiosk advertisers can be assured that a relatively high percentage the viewers have some interest in the advertising information presented since they have selected the information themselves. As a result, despite the kiosk system's limited "reach," the kiosk system may have a good ability to deliver potential customers.

For the purposes of our feasibility analysis in Chapter VI, we have used these comparative advertising rates from other media to assess the kiosk's revenue generating potential. We have also examine the rates that would be necessary to generate adequate net income to cover the kiosk system's development and operating costs.

D. Additional Revenue Potential

There are numerous additional potential revenue generating sources associated with interactive kiosk systems. Unfortunately, most of these revenue sources are unproven both on kiosk systems or over the Internet. Therefore, it is difficult to estimate the potential revenue generating contribution these approaches might make to the proposed kiosk systems. The following section provides a brief description of the additional revenue generating approaches. In addition we also provide a brief discussion of the principal issues associated with each approach.

1. Kiosk User Charges

A general alternative approach for raising revenues for the kiosk system is to directly charge the system users. The basic idea is to charge those individuals or

organizations that make use of and gain benefit from the kiosk system.

In theory, this approach is promising. Provided users and organizations receive adequate benefits from the system, these users should be willing to pay fees to obtain those benefits. However, according to the industry informants several major difficulties generally preclude the use of such approaches to generate kiosk revenues.

In general, these approaches incur the difficulty of receiving payment from the users or organizations using the system. Requiring users to pay in cash to use the system presents several problems. First, individuals must have cash to insert via a coin or dollar collection system on the kiosk. These collection systems are cumbersome and typically require regular maintenance and cash collection. Furthermore, they increase the risk of theft, vandalism and other security problems associated with the kiosk. Second, psychologically, it will be difficult for people to accept paying for information and convenience that they might otherwise obtain for free.

Other payment methods will also face similar difficulties - especially on the issue of security. Using credit card readers to process payments to use the system requires overcoming user's concerns of overbilling, and would prevent access to the system by individuals without cards (other electronic payment issues are discussed in Chapter VII).

A fundamental difficulty with kiosk user charges, is that potential and particularly first-time kiosk users must be willing to pay in order to use the system. For a new and unfamiliar system such as a traveler information kiosk , it was the opinion of many informants that the vast majority of the public will be unwilling to "gamble" their money to access the system's information and services.

It should also be recognized that in determining the price that users would be willing to pay, the "cost" in the individual's time to obtain the information or complete the transaction should also be subtracted from the net benefit that a user gets from the system. For example, if the kiosk takes 5 minutes to complete a transaction then based on the user's value of their time (for example $12/hr), the transaction will also have cost user $1's worth of their free time. Of course, if the only alternative method of completing the transaction would have required the user to spend 15 minutes of time, then the kiosk might reasonably be estimated to have provided an additional net benefit of $2's worth of time savings to the users. However, for new technologies it will take familiarity with the system before users will generally appreciate and then be willing to pay for such advantages.

a) User Fees

Charging user fees to individuals to access the system information is the most direct approach for obtaining revenues from the users. Under this approach, anyone

wishing to use the system must first pay. Virtually all the informants questioned on this approach generally agreed that such an approach would be infeasible for traveler information sys terns. In their view, consumer resistance to paying for using the sys tern is insurmountable.

This "pay as you go" approach was recently tried by the City of Vienna on their traveler information system using a system of prepaid telephone cards. The telephone cards were already fairly widely used by the public. However, after several months the kiosk developers removed the charge for system usage because it was too prohibitive to potential users. In the United States very few user fee systems have been tried and our research has not identified any that were successful in obtaining significant revenues from user fees. Kiosk developers agreed that in their opinion user fees are not a viable revenue generating approach for traveler information.

A potential advantage of such a system however, is that it encourages efficient use of the system since children and other users can and will only use the system if they are willing to pay. As a result, overcrowding of the system is minimized since any users will naturally ration their use.

b)   Reservation Fees and Transaction Charges

Reservation fees or transaction charges offer a more attractive and promising approach for obtaining kiosk user fees. Under this approach, general use of the system may be free. Thus the public could obtain general traveler information or even identify hotel and restaurants at no charge. However, if an individual wishes to make a reservation or purchase goods or services through the system (e.g. to confirm hotel reservation or concert tickets) then under this approach the user would be charged a "convenience" or "processing" fee to complete the service. This approach has the advantage that such "processing" charges are familiar to most credit card and ATM users.

This approach has the advantage of applying usage fees to the most valuable information on the system. The greater portions of traveler daily spending is on services such as food and especially lodging. Therefore, individuals are more willing to spend additional money to receive those services than they would be to obtain "cheaper" goods and services, such as public park admissions. Lodging is a central determinant of the traveler's trip. Therefore, it is not surprising that individuals will be more willing to spend addition money to secure lodging reservations when accommodations are scarce. Moreover, people are more willing to bear addition service costs to obtain more expensive goods and services.

However, as we discuss in Chapter IV, adding this amenity to a kiosk system will require some additional hardware and software changes. Furthermore, until a majority of businesses have the capability to accept electronic payment from a kiosk,

some intermediatory booking and processing agency will have to be established or incorporated to process the kiosk transaction. The costs and risks of incorporating such booking intermediatories was cited by Peter Arnold of ISE as a key factor in their use of automated telephone dialing to connect users with hotels so that room reservations can be made.

There are other significant difficulties in using this approach besides the additional software and hardware requirements necessary to enable the kiosk to apply such transaction charges. The process of transferring the funds becomes complex. Under the current credit card payment arrangements, the kiosk developer might be expected to hold the funds received from users until they can then be transferred to hotel or other businesses providing the purchased services. This may not only make the process more time-consuming, but it also may put the kiosk developer under additional financial obligation and risk until the transaction has "cleared." Under such circumstances, providing this transactional capability would likely increase the kiosk system's working capital needs to cover the financial risk and monetary exchange between the user and the service seller.

Second, the familiarity and availability of using other less expensive booking methods (e.g. toll free telephone reservations) will limit the transaction or convenience fees that the kiosk system can charge. Otherwise, if the kiosk charge is considered excessive individuals will simply go to a nearby public telephone to make their hotel booking.

Third, the existing federal regulations and legal statutes prohibit financial transactions on federal highways which are constructed with federal funds. As we discussed earlier in our discussion of the current legal issues, there is considerable ambiguity to this issue. Until the legal issues are clarified and settled, the legality of completing financial transactions at a highway kiosk will likely remain unresolved. Currently, many kiosk systems are considered vending machines and thereby have been permitted to allow some transactions.

Another possible approach for obtaining transaction fees from a kiosk could be from the supplier of services i.e. the hotel or reservation agency with whom the kiosk user has made their booking. Naturally, it will be critical for the kiosk developer to be able to track the transaction so that they can obtain their due compensation. Also, the privacy issues associated with monitoring the financial transactions and the logistics of ensuring the kiosk developer's repayment may severely reduce the potential revenues from transaction charges. Peter Arnold of ISE cited this as a major issue in evaluating the effectiveness of their own travel information system performance at Florida welcome centers.

As a result of these difficulties, we judge that user transaction charges cannot be relied on in the near future as a primary or even a likely funding source for interactive kiosks, especially on federally funded highways. However, if the processing and legal issues can be adequately resolved there is the potential for

obtaining additional revenues from hotel bookings to supplement other kiosk revenues.

2. Sales Commissions

The garnering of sales commissions from items sold via the kiosk faces most of the same difficulties associated with the transaction or convenience fees discussed in the previous section. In fact, the two processes are nearly identical except perhaps for the origin and nature of the goods sold.

As discussed in Chapter II, generally even among retail kiosk systems, the use of interactive kiosks to complete sales has been largely ineffective. Customers have serious misgivings about "trusting" these systems to transact sales. Nonetheless, if the consumer resistance can be overcome there is significant revenue potential from kiosk sales. Recently, the ISE's kiosk system at Florida welcome centers and the Georgia's Internet kiosk for the 1996 Olympics allow users to purchase tickets and items through their systems. ISE earns a commission on each sale. According to the kiosk developers familiar with such arrangements, commission rates of 5% of gross sales can be obtained by kiosk operators.

According to David Heyliger of Rocky Mountain Media, a principal source of income from his kiosk system in Colorado is the returns he receives from individuals using the system to make river rafting reservations. These sales are directly analogous to hotel reservations sales. However, under his arrangement with the local river rafting trip providers, he receives a direct commission for the sales generated through the kiosk system. Coupons from the kiosk's printer can be used to facilitate and track this process.

The profit margins associated with direct sales via the kiosk systems are much greater than those for assisting in completing transactions. Adam Block of Block & Associates, a national restaurant and hotel consultant, points out that merchandise sales are a major source of profits for national restaurant chains such as the Hard Rock Cafe or Planet Hollywood. Kiosks might offer a potentially attractive mechanism for selling tourism related merchandise items. Kiosk locations offer travelers and tourists a convenient opportunity to purchase souvenirs and gifts during their journey. Such a system could operate like the interflora kiosks/web site which has proved to be profitable. The actual merchandise could be shipped by the kiosk vendor to any locations specified by the customer.

A few kiosk systems (including the one operated by Rocky Mountain Media) even advertise major items, such as, house listings. Although no sales have yet been attributed to the kiosk system, the potential commission to the kiosk developer if a sales does occur is likely to be significant. Of course, identifying subsequent sales from the kiosk is a fundamental difficulty for the kiosk developer to ensure they receive their commission. However, this does demonstrate some innovative sales

potentials associated with travel information kiosks currently being tried by kiosk developers.

3. Additional Advertising Fees

a> Static Display Advertising on the Kiosk

Advertising personnel suggested that additional advertising revenue from kiosks could be generated by selling static display advertising on the kiosk casing. This advertising could be either poster/logo type displays and/or pamphlet distribution. The approach would be similar to traditional poster or pamphlet advertising. As such the revenue generating potential can be comparable to typical in-store advertising rates. One key disadvantage with using this advertising approach with the interactive kiosk is that it may distract potential user attention from the kiosk. Furthermore, the high visibility of advertising around the kiosk casing will suggest a strong association between the kiosk content and the advertisers. This might undercut the perceived "objectivity" of the system and its content. In addition, the public's perception of the state government's role in administering the kiosk might be misunderstood if the kiosk advertising content is too strong.

Nonetheless, display advertising is a frequently used approach for supplementing kiosk revenues. ISE earns between up to a $1,000 per month from each full poster advertisement on display at its kiosks in Florida. Their rates partly reflect the high tourism traffic at Florida welcome centers. Therefore, for the purposes of our feasibility analysis we used more conservative estimates of $400 per month for static advertising on the kiosk casing.

b) Coupon Distribution

Coupon advertising is another commonly used advertising approach that can be applied by interactive kiosks. The kiosks could easily be designed to dispense coupons when users specifically request them or whenever a printout is generated by the system. In either case, businesses may be willing to pay additional fees in order to have their coupons dispensed.

Coupon advertising has several positive attributes. First, coupons directly demonstrate to the advertiser the additional business that has been generated by the kiosk. Therefore, the advertiser will have a better sense of the impact of their advertising. Second, coupons can immediately provide value to the kiosk user. The user can gain both useful information and also save money by using the kiosk. The fees for coupons can be either set at a flat rate or even a charge per coupon. Most of the informants on this issue suggested that flat rate fees are preferable since it is easier for the kiosk developer to adjust the rates to accommodate different businesses.

Recently, some businesses involved in multi-media advertising have adopted advertising rate schemes based on the number of times the advertisement has been shown (i.e., pay per display). This approach can be attractive to advertisers since their advertising costs are directly related to the number of times the advertisement can be viewed. Depending on the circumstances, this approach can reduce the advertising revenues since less popular advertisers will pay little to the developer. Such an approach makes it more difficult for the kiosk developer to charge different rates to different advertisers. Under the pay per display approach, a kiosk operator is, in effect, selling each screen of information irrespective of the type of information displayed. It may be difficult to charge a different per display rate to a fast food restaurant or a hotel, despite the fact that the value for each advertiser of a subsequent customer may be very different.

Under the listing fee or sponsorship approach, the sale of the advertising space is less dependent on the number of times the advertisement is shown. Therefore, even if the rate for a full page listing is the same for a restaurant and a hotel, the charge per customer may be different (i.e., if more users make fast food inquiries and become customers than make inquiries about accommodations). The fact that the cost per customer for the hotel chain is higher (since the frequency of hotel inquiries is low) can be understood to be reasonable since the profit per customer for a hotel will be higher than the profit per meal sold by the fast food restaurant. So far, few kiosk developers and Internet businesses have adopted this "pay per display" approach to set their advertising rates.

E.   Conclusions

Until kiosk systems can demonstrate strong advertising impact and performance, the fees that can be gained from advertisers will be primarily determined by the prices for other traditional advertising media. The limitations on kiosk advertising revenue potential are strongly related to the physical limitations in usage associated with each unit. This will tend to severely limit the revenue potential for kiosk systems - particularly in rural locations. Despite differences in the kiosk media, current advertising rates for kiosk advertising will be generally limited by the rates for other media. Advertisers will generally assess the expected CPM and coverage of the system to determine their willingness to purchase advertising on the system.

While some kiosk developers indicated that they currently obtain advertising rates between $50 and $100 per month from advertisers, the divergence between comparable rates even for the most costly advertising media such as newspaper advertising, raised concerns for our analysis that such revenues might be difficult to obtain. Furthermore, it is unclear whether expansion of the kiosk system would enable corresponding increases in the kiosk system revenues. However, for the purposes of the feasibility analysis we have used an average advertising fee of $80 per month consistent with the kiosk developer to determine the feasibility

associated with these rates.

Furthermore, there is a further difficulty that sufficiently comprehensive food and lodging listings must be provided, otherwise many users will tend to "mistrust" the system and will be reluctant to use the system's information. Therefore, it is recommended that whenever possible, full "yellow pages" type listings be provided for all establishments.

Sponsorship advertising is an alternative approach for providing traveler service information. However, it is generally found to be very difficult to attract appropriate and sufficient private sector sponsors to fund the kiosk's development and operations. Therefore, based on our research, we judge that such a private sponsorship approach is not likely to be feasible as the principal approach for kiosk funding.

In some circumstances, retail kiosk have already been successful "vending" locations for selling both tickets and merchandise. In Minnesota, sporting event tickets can be purchased at many kiosk locations, including bars. Amongst travel information kiosks, there has been some initial success in obtaining some revenues from sales commissions on ticket sales. However, the volume of such sales is not expected to be adequate in the near term to represent a major revenue generating sources for traveler information kiosks.

The sale of static display advertising on the kiosk casing is considered a potential source of supplementary advertising revenues. However, its magnitude is limited.

VI. FEASIBILITY ANALYSIS

A. Introduction

This section compares the costs with the revenues associated with the proposed kiosk system. The purpose is to determine the feasibility of providing public travel information on interactive kiosks entirely funded by advertising. In Chapter IV, we discussed the principal design issues and costs related to the kiosk system. This information provides the kiosk's development and operating costs in the feasibility analysis. In Chapter V, we discussed potential kiosk advertising strategies and evaluated the revenue generating potential for each of the approaches. The results from the analysis are used to assess the potential future advertising revenues.

The feasibility of the proposed traveler information kiosks depends on several factors affecting the project's costs and revenues. The many additional factors influencing the project's feasibility are also discussed in this chapter.

B. Financial versus Economic Feasibility

The central focus of this analysis is to examine the financial feasibility of providing traveler information through advertising from the point of view of the investor. Financial feasibility examines solely the monetary benefits and costs associated with the proposed interactive kiosks. Therefore, non-monetary benefits from the kiosk system, such as reductions in travel times, greater traveler satisfaction, and financial benefits to others, such as tourist information agency cost savings and greater regional visitation will not be considered when determining the financial feasibility of the proposed kiosk system. The associated non-monetary benefits could be significant as are possibly the financial benefits not captured by the system's developers. However, these benefits are either obtained directly by the travelers or are distributed diffusely to the region. In either case, since these benefits do not have clear financial effects on the kiosk developer they will not be considered in the financial evaluation of the system.

If the economic impacts associated with the kiosk system were to be assessed to determine whether the kiosk is economically feasible, many non-monetary benefits could be attributed to the kiosk system. In this way, travelers' travel time savings benefits might be assessed, based on the travelers value of time, to determine the economic value of the aggregate reduction in travel time. Similarly, many state agencies reported interest (and concerns) that interactive kiosks could assist or replace the work of traditional welcome center staff. The Minnesota Department of Tourism recently completed a study of their kiosk program and concluded that for each kiosk interaction replacing a staff consultation represented a cost savings of approximately $1.87. Such savings, if they would be achieved, would represent a direct economic benefit to the state.

If the travel information provided by the kiosk has the positive effect of increasing the visitation time and spending (that would otherwise not have occurred), the economic impacts of the visitation effects could be attributed to the kiosk system. For example, if the kiosk convinces users to stay an extra night in the state, then additional traveler spending (on items such as lodging, etc.) would represent a direct impact of the kiosk. The benefits of that additional spending could represent economic benefits to the local economy from the kiosk system. And certainly, we envision a program which would attempt to capture as much of those benefits as possible.

It is by no means contradictory that the kiosk system might be economically feasible but financially infeasible, since financial feasibility only considers the monetary costs and benefits to the entity investing in the system and which are directly associated with the system's operation. So, the distinction between economic and financial feasibility is important for evaluating the kiosk system performance.

        C.   Principal Assumptions for the Feasibility Analysis

The rationale behind the principal assumptions are discussed in the previous chapters. Only limited information was available on the advertising revenue potential associated with kiosk systems. In general, most advertising firms were largely unfamiliar with kiosks or related multi-media and interactive advertising. Yet most of the advertising agencies interviewed also suggested that comparisons with other media rates were likely to limit the potential advertising revenues. Therefore, we began our analysis using comparable media rates from television, print and billboard advertising to estimate approximate revenues projections for the proposed kiosk system. But we also estimated what we believe to be the advertising rates which would be availible once the market learned to appreciate the kiosk's advertising effects.

For comparison purposes, we have also estimated the advertising rates considered necessary to provide adequate revenues to provide a sufficient rate of return to make the proposed kiosk system feasible.

As we discussed in Chapter IV, the physical limitations of kiosks on their potential usage are, in our opinion a fundamental constraint on their feasibility. Since only a relatively few users can use each kiosk per day, the advertising revenues which can be expected from each unit will be limited. On the other hand, if the kiosk system information can also be transmitted via modem to home-based computers, the audience reached and therefore advertising benefits would be considerably greater. The problem is that such advertising benefits cannot be readily translated into advertising revenues for the kiosk operator.

D. Cash Flow Forecasts

1. Capital Investment

Under the most common models of private-public partnerships and the approach suggested by the IVHS National Program, the majority of the capital investment in the kiosk development would be made by the private sector. In this way, the kiosk system's research and development costs would be funded by the kiosk developer. Once implementation of the system is completed, it is then expected that the revenues from the kiosk operations would hopefully cover the costs of operations as well as the total past development costs. The private kiosk developer will face several important costs associated with the venture.

a. Hardware

There is only a limited lifespan for the kiosk systems hardware (and to a lesser extent the system software). These items will "wear out" as the kiosk system is used over time. According to many of the kiosk vendors interviewed, the working life for a kiosk installation is short, and might reasonably be estimated to be at most five years. The brevity of the average working life for the interactive kiosks is the result of several factors. Normal wear and tear from daily use and the constant operation of the system is the primary cause of the short lifespan of the hardware. Unattended kiosks will incur higher rates of damage and vandalism. In addition, the rapid technological innovation within the industry frequently causes a "perceived" obsolescence and dramatic reductions in the resale value of the kiosk components.

The following tables represent a cash flow analysis. And, as such, the full investment is indicated prior to operation. The cash flow extends for only five years, which is considered a reasonable contract period between public and private partners for such systems. Due to the rapid pace of technological change within the industry, we anticipate the entire system might have to be redesigned and replaced every five years. As a result, to be conservative in our feasibility analysis, we have assumed that little of the initial development would reduce the development costs for the replacement system.

b. Kiosk Research and Development

Currently, the majority of kiosk applications for public agencies require a significant degree of customized development to meet the agency's specific needs and purposes. Therefore, major development costs will be necessary for software design and hardware purchases before the kiosk implementation can occur. In addition, other work will be necessary for information conversion. Text and graphics must be digitized and arranged in a suitable format for use and presentation on the kiosk. All these cost items are included in kiosk development which must be completed

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before implementation can begin and revenues can be generated.

c. Working Capital

The kiosk developer will also need additional operating funds as working capital to cover the costs of the daily operations. The working capital for funding the developers daily operations is normally partly financed with debt. For the purposes of this feasibility analysis, the working capital necessary for the developers operations is estimated to be equal to 20% of the first year's gross receipts. Any debt service associated with borrowing the necessary working capital must be subtracted from the cash flow from operations to determine the annual cash flow. This represents a conservatively low estimate, given the relatively low initial revenues.

d. Equity and Debt Financing

It is expected that kiosk vendors will have to make a significant equity investment in the kiosk development costs, although in many cases, kiosk developers may be able to borrow some of the capital necessary to fund the kiosk's development. There is a significant opportunity cost to the kiosk developer associated with making the equity investment in the kiosk development. Alternatively, the developer could invest that equity in other businesses obtaining a return on uch ventures. Given that the relative riskiness of the kiosk investment, we expect investors to seek a return on equity invested of 25%, before taxes and depreciation.

It is not clear that kiosk developers will be able to obtain financing for kiosk developments. A key problem with a project like the kiosk system is that it is new and largely untried. Bankers will probably not consider the kiosks to be sufficient collateral, and they will be completely unfamiliar with the risk associated with the kiosk industry. As a result, many banking and loan institutions will be unwilling to make loans to developers. If the kiosk develop can obtain financing, it will likely be based upon the credit-worthiness of the investor and not the kiosk venture itself. Therefore, the likely interest rate will be somewhat higher than for less risky ventures. For the purposes of our feasibility analysis, we have used an annual interest rate of 12%.

We assumed that the total capital investment could be financed with 50% debt and 50% equity, a ratio prevalent for commercial lending and the most favorable mix which might be considered reasonable by lending institutions. The capital investment loan was also amortized over five years. These loan terms should be recognized as relatively favorable terms for an untried venture such as the proposed kiosk development.

2. Revenues

Chapter V provides a detailed discussion of the issues associated with the revenue projections for the feasibility analysis. We have indicated revenue estimates for two principal revenue sources for the proposed kiosk system. They are 1) the advertising revenues associated with business listing and advertising on the kiosk database, and 2) revenues from sales of display space on the kiosk.

We used two sets of advertising revenues estimates for the feasibility analysis. The first analysis uses comparable rates from the most lucrative of common advertising media (newspaper rates with a CPM of $45) to determine the possible advertising rates for the kiosk system. This assumes that advertisers would play comparable rates for kiosk advertising.

The second advertising revenue estimates are based on advertising fee rates reported by kiosk developers of $80 per month. This higher rate corresponds to a CPM rate almost twice that for newspaper advertising. It is our judgement that these rates represent the maximum conceivable advertising rates that could be obtained from advertisers for the proposed kiosk development. This assumes that advertisers would be willing to pay a premium rate to advertise on the kiosk or perceiving that kiosk advertising will have sufficient additional advertising impact to justify the significantly higher CPM rates.

3. Operating Expenses

Current kiosk developers and advertising agencies were mostly unwilling to provide estimates of their net earnings and operating costs. Therefore, we have based our estimates on the information which was provided and which enabled us to conceive the business operation and cost for each of its elements. Based on discussions with kiosk developers and advertising agencies, we have assumed that initially three sales staff would be necessary. However, once the advertising base has been achieved, the sales staff could be reduced to two full time employee equivalents. The administrative costs for the project are also expected to decrease once full implementation has been achieved.

The annual operating and maintenance costs for the kiosk system are estimated to be equivalent to 18% of the total kiosk development costs.

For the purposes of the feasibility analysis, we have initially presumed that the public agency administering the kiosk project would receive no revenues from the kiosk developer. This assumption will yield the maximum possible return to the developer and therefore represents the best case scenario for the project's financial feasibility for the developer.

E.   Cash Flow Analysis

1.   A Five-Kiosk ITS System

The feasibility analysis is presented in three sets of tables: Tables VI-lA&B, VI-2A&B and VI-3A&B. The "A" tables present five-year cash flow projections, recognizing all operating revenues and costs, and indicating the expected income before depreciation and taxes in each year. The estimates are for a five-kiosk system. Later, we address the potential for developing and operating a larger system. The "B" tables are based upon the "A" tables, and incorporate the necessary capital investments, and indicate the expected overall return on equity for the system.

The tables present the cash flows and returns for only five years, because it is expected that each ITS system investment would have to be renewed every five years. Therefore, each five-year ITS investment would need to demonstrate feasibility by producing a reasonable return- Longer-term ITS investments would merely be comprised of a series of 5-year investments.

The tables represent the cash flows for a system of only five-kiosks, recognizing that: 1) most market areas would be able to support no more than five kiosks, and 2) a five-kiosk system represents the limit of the total capital investment which most reasonable investors might be expected to make, given the risk of the venture. Recognizing, however that some market areas will support more than five kiosks, and that some investors might be willing to risk more capital, we also analyzed the marginal revenues and costs associated with additional kiosks.

The three sets of tables differ only in the assumed value of kiosk advertising. The first set of tables (Tables VI-1A&B) assume that advertising revenues would reflect the most lucrative medium of the current advertising market. That is, the first set of tables assume that advertisers would pay what they are currently paying for newspaper advertising.

However, kiosk developers suggested that ITS kiosks might be able to provide a significantly greater advertising value, once their special capability for reaching a target audience is fully appreciated. The second set of tables (Tables VI-2A&B) represent our best judgement about the maximum conceivable advertising revenues available to an ITS kiosk system. Essentially, the estimates in the second set of tables reflect an assumption that the attraction of the ITS technology, the information provided, and the more focused advertising capability will be understood and appreciated by prospective advertisers who would be willing to pay a higher rate per personal exposure for those benefits. They also assume that such advertiser understanding and appreciation will be possible without requiring a greater sales effort than for the lower revenue estimates of Tables VI-1A and B.

The third set of tables (Tables VI-3A&B) recognize that the ITS venture is not feasible for a five-kiosk system under the second assumption. The third set

TABLE VI - 1A

ITS KIOSK FEASIBILITY ANALYSIS
ESTIMATED CASH FLOW FROM OPERATIONS

STAND-ALONE APPROACH (Newspaper CPM Rates)

		FY1		FY2	FY3	FY4	FY5
REVENUES							
ADVERTISING SALES	– Kiosk Listings (6)	$74,250	(1)	$155,925	$163,721	$171,907	$180,503
	- Display Advertisements (6)	$48,800	(2)	$51,240	$53,802	$56,492	$59,317
SPONSORSHIPS		$0		$0	$0	$0	$0
TOTAL REVENUE:		$123,050		$207,165	$217,523	$228,399	$239,819
OPERATING EXPENSES:							
SALES STAFF		$150,000	(3)	$150,000	$100,000	$100,000	$100,000
ADMINISTRATION		$80,000		$80,000	$40,000	$40,000	$40,000
OVERHEAD		$40,000		$40,000	$40,000	$40,000	$40,000
OPERATION & MAINTENANCE		$27,450	(4)	$27,450	$27,450	$27,450	$27,450
MARKETING AND ADVERTISING		$48,000	(5)	$41,433	$21,752	$22,840	$23,982
TOTAL COSTS:		$345,450		$338,883	$229,202	$230,290	$231,432
INCOME BEFORE DEPRECIATION & TAXES		($222,400)		($131,718)	($11,679)	($1,891)	$8,387

Source: Dornbusch & Company, Inc.

Notes:
(1) Annual advertising revenues from the kiosk listing are estimated using comparable newspaper advertising rates of $45/CPM. Therefore, total annual revenues for the 5 unit kiosk system, with 55 CPM (Le., equivalent to 55,000 touches per month on advertiser listings) will be $146,500. However, the system Is not expected to achieve these full advertising revenues until FY 2.
(2) Annual advertising revenues from display advertising is estimated to be $9,600 per unit.
(3) Sales staff estimated to be 3 FTE @ $50,900 per year for the first two years. In subsequent years a safes staff of only 2 FTE is projected
(4) The kiosk system annual operations and management costs are estimated to be 16% of the total kiosk development cost.
(5) Initial marketing and advertising expenses equivalent to 20% of full annual sates Is anticipated for the first two years. Advertising expenses are estimated to be reduced to 10% in FY 3 - FY 5.
(6) Advertising revenues are expected to increase at an annual rate of 5%.

TABLE VI - 1B

ITS KIOSK FEASIBILITY ANALYSIS
INTERNAL RATE OF RETURN

STAND-ALONE APPROACH (Newspaper CPM Rates)

ASSUMPTIONS		CAPITAL INVESTMENT		WORKING CAPITAL	
Kiosk Development Cost	$152,500	Kiosk System Development Cost		Working Capital	
		Hardware	$45,000	(20% of 1997 Revenues):	$25,000
Equity Portion	50%	Software	$67,500		
		Information Conversion	$40,000	Loan Amount	$12,500
Target Rate of Return	25%	Total Kiosk Development Cost	$152,500		
				Loan Interest Rate (Annual):	12.0%
		Loan Amount (Kiosk Development)	$76,250	Amortization Period (Years):	5
		Loan Interest Rate (Annual):	12.0% (1)	Annual Loan Payment	
		Amortization Period (Years):	5	for Working Capital	$3,337
		Annual Loan Payment			
		For Kiosk Development	$20,354		

Fiscal Year	Gross Receipts	Cash Flow from Operations	Equity Investment	Working Capital	Debt Service	Annual Cash Flow
Development	$0	$0	$76,250	$0	$0	($75,250)
FY1	$123,050	($222,400)	$12,500	$0	$23,690	($258,590)
FY2	$207,165	($131,718)	$0	$0	$23,690	($155,408)
FY3	$217,523	($11,679)	$0	$0	$23,690	($35,369)
FY4	$228,399	($1,891)	$0	$0	$23,690	($25,581)
FY5	$239,519	$8,387	$0	$25,000	$23,690	($15,303)

INTERNAL RATE OF RETURN: Cash flow is never positive

Notes: (1) Since the kiosk project has little collateral and is unfamiliar to loan institutions, loan rates would likely be a minimum of 12%.

Source: Dornbusch & Company, Inc.

TABLE VI - 2A

ITS KIOSK FEASIBILITY ANALYSIS
ESTIMATED CASH FLOW FROM OPERATIONS

STAND-ALONE APPROACH (Maximum Expected CPM Rates)

		FY1		FY2	FY3	FY4	FY5
REVENUES							
ADVERTISING SALES	– Kiosk Listings (6)	$120,000	(1)	$252,000	$264,600	$277,830	$291,722
	- Display Advertisements (6)	$48,800	(2)	$51,240	$53,802	$56,492	$59,317
SPONSORSHIPS		$0		$0	$0	$0	$0
TOTAL REVENUE:		$168,800		$303,240	$318,402	$334,322	$351,038
OPERATING EXPENSES:							
SALES STAFF		$150,000	(3)	$150,000	$100,000	$100,000	$100,000
ADMINISTRATION		$80,000		$80,000	$40,000	$40,000	$40,000
OVERHEAD		$40,000		$40,000	$40,000	$40,000	$40,000
OPERATION & MAINTENANCE		$27,450	(4)	$27,450	$27,450	$27,450	$27,450
MARKETING AND ADVERTISING		$48,000	(5)	$60,648	$31,840	$33,432	$35,104
TOTAL COSTS:		$345,450		$358,098	$239,290	$240,882	$242,554
INCOME BEFORE DEPRECIATION & TAXES		($176,650)		($54,858)	$79,112	$93,440	$108,484

Source: Dornbusch & Company, Inc.

Notes:
(1) Annual advertising revenues from the kiosk listing are projected to be on average initially equivalent to $80 per month for each listing. Therefore, total annual revenues for the 5 unit kiosk system, with 250 advertising per unit, would be $240,000. However, the system is not expected to achieve these full advertising revenues until FY2.
(2) Annual advertising revenues from display advertising is estimated to be $9,600 per unit.
(3) Sales staff estimated to be 3 FTE @ $50,000 per year for the first two years. In subsequent years a safes staff of only 2 FTE is projected
(4) The kiosk system annual operations and management costs are estimated to be 16% of the total kiosk development cost.
(5) Initial marketing and advertising expenses equivalent to 20% of full annual sates is anticipated for the first two years. Advertising expenses are estimated to be reduced to 10% in FY 3 - FY 5.
(6) Advertising revenues are expected to increase at an annual rate of 5%.

TABLE VI – 2B

ITS KIOSK FEASIBILITY ANALYSIS
INTERNAL RATE OF RETURN

STAND-ALONE APPROACH (Maximum Expected CPM Rates)

ASSUMPTIONS			CAPITAL INVESTMENT			WORKING CAPITAL	
Kiosk Development Cost	$152,500		Kiosk System Development Cost			Working Capital	
			Hardware	$45,000		(20% of 1997 Revenues):	$34,000
Equity Portion	50%		Software	$67,500			
			Information Conversion	$40,000		Loan Amount	$17,000
Target Rate of Return	25%		Total Kiosk Development Cost	$152,500			
						Loan Interest Rate (Annual):	12.0%
			Loan Amount (Kiosk Development)	$76,250		Amortization Period (Years):	5
			Loan Interest Rate (Annual):	12.0%	(1)	Annual Loan Payment	
			Amortization Period (Years):	5		for Working Capital	$4,538
			Annual Loan Payment				
			For Kiosk Development	$20,354			

Fiscal Year	Gross Receipts	Cash Flow from Operations	Equity Investment	Working Capital	Debt Service	Annual Cash Flow
Development	$0	$0	$76,250	$0	$0	($76,250)
FY1	$168,800	($176,650)	$17,000	$0	$24,892	($218,542)
FY2	$303,240	($54,858)	$0	$0	$24,892	($79,750)
FY3	$318,402	$79,112	$0	$0	$24,892	$54,220
FY4	$334,322	$93,440	$0	$0	$24,892	$68,548
FY5	$351,038	$108,484	$0	$34,000	$24,892	$83,593

INTERNAL RATE OF RETURN: negative

Notes: (1) Since the kiosk project has little collateral and is unfamiliar to loan institutions, loan rates would likely be a minimum of 12%.

Source: Dornbusch & Company, Inc.

TABLE VI - 3A

ITS KIOSK FEASIBILITY ANALYSIS
ESTIMATED CASH FLOW FROM OPERATIONS

STAND-ALONE APPROACH (Target Advertising Revenues)

		FY1	FY2	FY3	FY4	FY5
REVENUES						
ADVERTISING SALES	– Kiosk Listings (6)	$171,000 (1)	$359,100	$377,055	$395,908	$415,703
	- Display Advertisements (6)	$48,800 (2)	$51,240	$53,802	$56,492	$59,317
SPONSORSHIPS		$0	$0	$0	$0	$0
TOTAL REVENUE:		$219,800	$410,340	$430,857	$452,400	$475,020
OPERATING EXPENSES:						
SALES STAFF		$150,000 (3)	$150,000	$100,000	$100,000	$100,000
ADMINISTRATION		$80,000	$80,000	$40,000	$40,000	$40,000
OVERHEAD		$40,000	$40,000	$40,000	$40,000	$40,000
OPERATION & MAINTENANCE		$27,450 (4)	$27,450	$27,450	$27,450	$27,450
MARKETING AND ADVERTISING		$48,000 (5)	$82,068	$43,086	$45,240	$47,502
TOTAL COSTS:		$345,450	$379,518	$250,536	$252,690	$254,952
INCOME BEFORE DEPRECIATION & TAXES		($125,650)	$30,822	$180,321	$199,710	$220,068

Source: Dornbusch & Company, Inc.

Notes:
(1) To attain a 25% internal rate of return, first year listing revenues must be $171,000 and increasing to $359,100 in the second year
(2) Annual advertising revenues from display advertising is estimated to be $9,600 per unit.
(3) Sales staff estimated to be 3 FTE @ $50,000 per year for the first two years. In subsequent years a safes staff of only 2 FTE is projected
(4) The kiosk system annual operations and management costs are estimated to be 16% of the total kiosk development cost.
(5) Initial marketing and advertising expenses equivalent to 20% of full annual sates is anticipated for the first two years. Advertising expenses are estimated to be reduced to 10% in FY 3 - FY 5.
(6) Advertising revenues are expected to increase at an annual rate of 5%.

TABLE VI – 3B

ITS KIOSK FEASIBILITY ANALYSIS
INTERNAL RATE OF RETURN

STAND-ALONE APPROACH (Target Advertising Revenues)

ASSUMPTIONS		CAPITAL INVESTMENT		WORKING CAPITAL	
Kiosk Development Cost	$152,500	Kiosk System Development Cost		Working Capital	
		Hardware	$45,000	(20% of 1997 Revenues):	$44,000
Equity Portion	50%	Software	$67,500		
		Information Conversion	$40,000	Loan Amount	$22,000
Target Rate of Return	25%	Total Kiosk Development Cost	$152,500		
				Loan Interest Rate (Annual):	12.0%
		Loan Amount (Kiosk Development)	$76,250	Amortization Period (Years):	5
		Loan Interest Rate (Annual):	12.0%	(1) Annual Loan Payment	
		Amortization Period (Years):	5	for Working Capital	$5,873
		Annual Loan Payment			
		For Kiosk Development	$20,354		

Fiscal Year	Gross Receipts	Cash Flow from Operations	Equity Investment	Working Capital	Debt Service	Annual Cash Flow
Development	$0	$0	$76,250	$0	$0	($76,250)
FY1	$218,800	($125,650)	$22,000	$0	$26,226	($173,876)
FY2	$410,340	$30,822	$0	$0	$26,226	$4,595
FY3	$490,857	$180,321	$0	$0	$26,226	$154,095
FY4	$452,400	$199,710	$0	$0	$26,226	$173,484
FY5	$475,020	$220,068	$0	$44,000	$26,226	$193,842

INTERNAL RATE OF RETURN: 25%

Notes: (1) Since the kiosk project has little collateral and is unfamiliar to loan institutions, loan rates would likely be a minimum of 12%.

Source: Dornbusch & Company, Inc.

indicates the level of advertising revenues which would be necessary to produce a target return on equity of 25%, before depreciation and taxes. This is the minimum rate of return which we expect a prudent investor would seek, given the investment and operating risks.

Note that the revenue estimates apply the conservative assumption that all income would derive from advertising sales and that no sponsorship revenues would be available. The missionary nature of the sales effort is reflected in the much higher sales costs in Years 1 and 2. However, we assumed that advertisers who subscribe in the first two years will renew for the last three years, and that the sales effort could be reduced by a third in the last three years. We also assumed that the administrative effort will be considerably less in the last three years, once the sys terns are operational.

We assumed that the total capital investment could be financed with 50% debt and 50% equity, a ratio which might be considered reasonable by aggressive lending institutions, but possibly somewhat optimistic for such a new and possibly risky venture. We recognized the risk by applying an interest cost on the debt of 12%, somewhat higher than the 9.5% to 10% rate available for similar but less risky investments. The amortization period was assumed to be 5 years and equal to the life of the investment.

Three assumptions were made which may not be as conservative as our other assumptions. First, we accepted the development cost estimates offered by our key informants without providing for an additional contingency reserve to allow for higher than expected costs. We judged from our interviews that our informants understood the venture very well and themselves had assumed enough of a cost cushion to cover such contingencies.

Second, we assumed that the development stage, involving preparation of the operating programs, compilation of the data, and installation of the hardware and software, would require only one year. This is reasonable, given the present stage of ITS technology development. But problems could delay start-up.

And, third we assumed that the project developer and equity investor would be the same entity. Consequently, the developer/investor would not require, and the lender would not allow, payment of an administrative fee during the one-year development stage. If an administrative fee was required, the initial costs would be higher. But, in that case, debt to cover the initial administration fee might not be possible to leverage that portion of the investment.

Certainly, somewhat more conservative assumptions would increase costs and require greater revenues to justify the investment.

Tables VI-2B and VI-3B indicate that a five-kiosk stand-alone ITS kiosk system will not be feasible (without a subsidy) until it can demonstrate a significantly greater

advertising value than is presently perceived as the maximum possible, even once the market fully appreciates the system's potentials.

2.   Marginal Net Returns of Additional Kiosks

It appears that due to the very high initial fixed costs, the relatively low variable costs, and the reasonably high variable revenues that the marginal net returns of additional kiosks would be substantial. Indeed, applying the same assumptions and judgements used for the five kiosk system, the net marginal income for each additional kiosk looks to be quite high.

Each additional kiosk would require a capital investment of an estimated $9,000. Incremental annual advertising revenues per kiosk under Scenario Two are about $40,000. And, incremental annual variable costs would be about $7,500 for administration, operation and maintenance. So, it would appear that the net marginal annual income would be about $32,500 on the $9,000 investment for each kiosk, which presumably could be leveraged with 50% debt. This would represent a very attractive return on investment, presumably justifying the addition of as many kiosks as possible. A number of problems arise, however, if the system were to be expanded to accommodate the additional kiosks.

a.   Advertising   Revenues

The first set of problems concerns advertising revenues. Given the assumed advertising rate charged per exposure, additional advertising revenues can be raised only by increasing the fee charged to each advertiser as the audience exposure increase (which it presumably does with each additional kiosk) and/or increase the number of subscribing advertisers.

The problem with the first possibility is that there is a limit which advertisers will pay for this relatively new and untried system. Until the advertising benefits can be convincingly demonstrated, advertisers will be unwilling to pay more than a moderate amount on the expectation of additional sales. $80 per month is about the limit which we can envision the average advertiser paying until the returns can be clearly proven, regardless of the advertisement's exposure.

The problem with the second possibility is that as the number of subscribing advertisers increases, the potential exposure of each decreases. Therefore, the value of each subscriber's advertisement, and correspondingly the rate paid per advertisement, becomes proportionately less. A tiered rate system, providing greater advertisement space for a higher fee, does not solve the problem. It merely permits some advertisers to obtain greater exposure while reducing the relative exposure of others.

Another problem with increasing the number of kiosks is that only a limited number of rest area locations will provide the potential user traffic, and therefore the required exposure, to justify added kiosks. When that limit is reached, the additional kiosks would need to be located at other sites, such as airports and other public areas with high traveler use. And, there is only a limited number of those availible.

b. Investment Required

The second set of problems relate to the investment required to support a greater number of kiosks. Investors will already perceive significant risks associated with (1) the cost and possible delays to develop and implement the system's operation, (2) ability to raise advertising revenues, and (3) advancement of technology, possibly shortening the expected five-year life.

Assuming that the net annual marginal return for each additional kiosk is as much as $15,000, a total of 17 kiosks, with a capital investment of $270,000, would be required to yield an expected 25% return on equity. And, that assumes a lender could be found to loan 50% of the capital. If not, 20 kiosks would be necessary to yield the target return on equity. We believe it is very doubtful that enough adequate sites can be found to support 17-20 kiosks in any single market area or that an equity investor or a lender would be willing to risk that much capital, given the inherent collective risks of the venture.

3. Internet Connection

We conclude that, for now, the only way to capitalize on the high initial development costs of an ITS kiosk system, would be to provide the same information and therefore raise additional advertising revenues, through the Internet. But, the Internet's revenue potential is still very uncertain. Advertising rates of $30 per CPM on the Internet are possible. However, as yet these rates have only been achieved by high volume internet sites. Furthremore, it is unclear whether the potential interest in the ITS information and related advertisements which would be provided within a geographic reach to justify such a rate. The initial capital cost of $30,000 to $40,000 for the system development, and annual operating costs of $3,600 to $12,000, for the Internet service represent a significant financial risk, given the very uncertain returns.

F. Conclusions

Our feasibility analysis concludes that currently the potential advertising revenues associated with rest area interactive kiosks are insufficient to cover the costs of kiosk design, implementation and operations let alone generate a reasonable profit for the

investor. Although significant advertising revenues or sponsorships may be possible under certain circumstances, the current difficulty in attracting sufficient advertising revenues severely limits the ability for kiosk developers to gain sufficient net revenues to cover even their development costs.

From our discussions with kiosk vendors, it is seems likely that changes in the kiosk development costs can be anticipated. Over the last ten years the costs and performance capabilities of kiosk systems have changed dramatically. Similar technological advances in the future are also expected. In particular, hardware costs relative to performance may be expected to continue to decrease significantly. Software development costs for current kiosk functionality are also expected to decrease, although new capabilities (such as sophisticated mapping and real-time information) could add significant additional software development costs if they are included in the kiosk system design. Finally, the increasing common use of electronic media by agencies, software improvements and growth of the multi-media industry are also expected to reduce the costs of the data conversion necessary for creating information databases for kiosk developments. Such reductions in the development costs would be expected to have a positive effect on the feasibility of future kiosk developments.

Positive changes in the advertising community's familiarity, acceptance and use of kiosks and other new media is expected by many industry analysts. Such changes would improve the feasibility of providing public travel information on interactive kiosks by improving their revenue generating potential. However, it is very unclear how quickly such improvemetns in the conditions affecting feasibility will occur.

VII. The Internet - An Alternative Strategy for Kiosk System Development

Our analysis in Chapters IV and V determined that the physical limitations of the individual kiosks has a major impact on the revenue generating potential of the kiosk system. The number of viewers that can use each kiosk is simply insufficient at the current expected advertising rates to generate sufficient earnings to cover the costs of developing the system. Therefore, in order to improve the profitability of the proposed kiosk development, we have investigated the benefits and the net revenue generating potential of providing access to the kiosk informational database over the Internet by means of the world wide web.

A. Advantages and Disadvantages of an "Internet Kiosk" Approach

There are several potential advantages of enabling Internet users to access the kiosk information. Most fundamentally, allowing Internet users to access the kiosk increases the number of kiosk users dramatically. As will be discussed later in this section, the number of individuals that currently have access to the Internet is generally estimated to be more than 15 million in the United States alone. One of the principal advantages of the Internet as a mechanism for distributing information is that a very wide body of information could be accessed by users - far more than could be provided merely through dedicated software and the database in a stand-alone kiosk. Moreover, that information could be easily updated and improved. Users might also have the option to collect that information for their later personal reference.

For users their are several potential benefits. Users would have the opportunity to access the travel information from their homes or offices - before they begin their travel. This can assist them in their pre-trip-planning. Furthermore, users can go "on-line" at anytime and would be unlikely to have to wait to access the travel information.

If the Internet "kiosk" can achieve an adequate presence on the Internet, tens of thousands of individuals could use their own personal computers as kiosk terminals to access the kiosk information daily. The Internet "kiosk" can be located on a mainframe computer easily leased from Internet service providers. Therefore the hardware costs for the Internet system could be limited. Since part of the hardware for the system is supplied by the user (i.e. the modem and personal computer), the average cost for making the information available to users will be lower.

In addition, by dramatically increasing the number of kiosk users, the potential advertising revenues that could be obtained could be significantly increased. Depending on the costs of developing and operating the kiosk on the Internet, the additional advertising revenues might be able to improve the kiosk system's overall profitability.

The expected number of users of the Internet kiosk system will be difficult to predict. But, it is important to recognize that the Internet kiosk could reach many potential travelers that would not be reached by the kiosks situated at rest areas. Individuals considering and pre-planning travel to a location could be assisted in their travel decision-making by the Internet kiosk. By providing travel information to users before their travel, the Internet "kiosk" might increase users' total expenditures by inducing greater demand. In addition, the kiosk could spread user's expenditures over a wider region, by inducing the user to visit regions which they might otherwise not be visited. This would have a greater economic effect since that additional traveler spending would represent new traveler spending in the state's economy. As discussed in Chapter III, the rest area kiosk can also increase traveler spending in a state by encouraging individuals to stay longer or to spend more money in the region. However, a major portion of the rest area kiosk's effect may be expected to involve redirecting traveler spending by directing travelers to businesses that are not directly on their route, in which case, the traveler spending has merely been redistributed, having no net impact on the total spending in the region.

The Internet kiosk also offers an opportunity to influence traveler pre-trip planning. As discussed in Chapter III, many travelers conduct significant pre-planning of their travel itinerary. These individuals could be assisted and influenced by information they obtain from the Internet kiosk. However, it may be expected that the majority of these pre-trip planners would be unlikely to use a rest area kiosk en-route since they have already chosen their travel route. Therefore, again the Internet kiosk would provide a mechanism for reaching some individuals that would be unserved by the rest area kiosks.

We have considered several key issues related to the feasibility of providing Internet access to the kiosk database. First, we have assessed the demographics of the potential users gained by providing Internet access to evaluate the market potential. Second, we have researched the existing traveler information sources on the Internet to understand the current market potential. Third, we have examined the issue of electronic payment on the Internet, which is generally perceived as a major obstacle to the revenue generating potential of commercial services on the Internet. Fourth, we discuss the general net revenue generating potential for an Internet traveler information kiosk.

B. Demographics of Internet Users

An important factor influencing the potential for generating revenues from an Internet component of the proposed kiosk system will be the demographics of the potential and projected users of the service. In the past few years, numerous organizations have conducted studies on Internet use. This research has generally sought to collect information on both the type of people using the Internet and the patterns of their Internet use. These studies are valuable for understanding the

potential user market.

1.   Online Surveys of Internet Users

It is important to understand the methodologies used to generate the study results. The majority of completed studies have conducted their surveys on-line. This is the approach used by the University of Michigan in its Hermes consumer survey and the Georgia Institute of Technology's GW Center's WWW User survey. Several other online business and user surveys have also been conducted by private companies such as the ActivMedia Internet Business Survey and the Netsurfer Digest Reader Survey. Online surveys have the advantages of being very inexpensive to administer since most of the data gathering is electronic. Furthermore, such a survey approach clearly identifies individuals that are actually using the Internet.

However, it is important to analyze carefully the results from such surveys. The survey results cannot be used to represent the general population since the survey respondents were not randomly selected and only included individuals actively using the Internet. As a result, these surveys only provide information on the patterns of Internet use by the current Internet users and not the general public. Furthermore, since respondents are self-selecting there is a high possibility of sampling bias in the results since the characteristics of individuals that were unwilling or unable to complete the survey are not represented in the survey results. Therefore, it will likely be misleading to attribute the results of the willing respondents to represent all current Internet users in general.

Despite the limitations of the information generated by these online surveys, the results can provide information relevant to the revenue potential of the Internet. The findings from these surveys generally provide similar observations on the Internet user population:

> The majority of Internet users are male. The most recent Hermes study determined that 71% are male.

> The majority of Internet usage is not surprisingly also by males. The Hermes study also found that males were responsible for 86% of all Internet use.

> However, there is rapid growth in the number of women using the Internet.

> The average age of Internet users is relatively young. The Georgia Tech Survey found that the average age of respondents was 33 years.

> The majority of current Internet users are well-educated. The Georgia

Tech study found that the majority of the respondents had been to college.

The average income of Internet users is significantly higher than the national average. According to the Georgia Tech survey, the average income of the respondents was $63,000 per year.

All these characteristics are favorable for most potential advertisers. This suggests that there can be good advertising revenue potential if advertisers can achieve an effective means of communicating their advertising message to these Internet users.

2.   Telephone Surveys of Internet Users

Recently, two extensive telephone surveys were completed by organizations designed to identify, quantify and characterize Internet users in the United States.

Between May and September 1995, O' Reilly & Associates and Trish Information Services conducted a survey of U.S. residents to determine the size of the current Internet user population. The primary goal of the study was to determine the demographic profiles and buying patterns of the existing U.S. Internet market. For the study, over 32,000 screening interviews and 1,500 in-depth telephone studies were conducted. The final results from the O'Reilly's U.S. Internet Market Study were published in October 1995.

The CommerceNet/Nielsen Internet Demographics Survey was completed in late 1995. This survey involved a gross sample of approximately 280,000 telephone calls from which more than 4,200 telephone surveys were conducted. The Nielsen survey questioned interviewees on their internet usage patterns and obtained general socio-demographic information on each respondent. The results were published in late 1995 but have since been revised significantly by CommerceNet.

Both of these surveys were designed and conducted to develop estimates of the proportion of the general population that had access to and used the Internet. Both studies surveyed randomly called individuals and questioned them about themselves and their experience with the Internet. However, these two survey created a considerable controversy when their results indicated the aggregate number of individuals with access to the Internet were very different.

O'Reilly and Associates concluded that there were 5.8 million U.S. adults with direct Internet access in 1995 and 3.9 million adults with online subscriptions only. The projection for the U.S online user population for 1996 was 15.7 million. The study looked at gender, age groups, income, and occupation. The study found that Internet users were predominantly male (67%) and the median age of users was between 30-34 years old. In addition, the study also concluded that 40% of web users have average incomes of more than $50,000 a year.

In contrast, the Nielsen survey concludes that 19.4 million people have accessed the Internet within the last 3 months and that 14.6 million of those users accessed the World Wide Web during that period. The Nielsen survey also estimated that 1.9 million users used the world Wide Web to purchase a product or services. Using the same data, however, Professor Hoffman at Vanderbilt University instead estimates corresponding Internet usage figure of 16.4 million, 11.5 million and 1.51 million users, respectively.

The Nielsen study's other findings are similar to those made by the Internet based surveys. According to Nielsen's analysis, over approximately a quarter of these Internet users earn more than $85,000 a year compared with national figures that only IO% of the general population are in that income bracket. Neilsen also concluded that more than half of the current Internet user population consists of professional or managerial workers (compared with national figures of 27%). and that 64% have had a college level education (compared with national figures of 29%).

While the results from the two studies vary considerably in their estimates of Internet users, the demographic information are all clearly favorable for advertisers, indicating significant advertising revenue potential. Based on the very rapid growth of Internet use over the last two years, industry observers all agree that considerable growth is anticipated over the next several years - particularly in World Wide Web access. Therefore, this suggest that the future advertising revenue potential of the Internet will also grow dramatically in the future.

3. Other Observations

However, many commentators warn that the statistical information on Internet use must be considered carefully. Robert Harkun of Harkun & Associates maintains that the broad overview surveys of general Internet use fail to reveal important aspects and characteristics of Internet users. Specifically, his research into Internet usage demonstrated to him that a major proportion of Internet users are online only for a short period of time and that after an initial period of relatively frequent usage, many become either frustrated or bored. At which point, these individuals will typical dramatically reduce their time online. Mr. Harkun also suggests that since the available surveys only provide "snap-shot" information on Internet usage and do not conduct follow-up studies on the respondents, these studies miss the fact that many of the self-identified users are unlikely to remain Internet users over time. As a result these results effectively overstate the "real" size of the Internet user population.

C. Statistical Information on Internet Site Visitation

Information is also available on user access of Internet sites in order to understand

the Internet "traffic" behavior. Several software applications exist and are commonly used to record the number of times a web page has been "visited" by users. Each of these visits is commonly called a "hit." By measuring the number of daily "hits" a site receives, analysts have tried to estimate the number of viewers hitting a site. This approach is similar to traditional advertising audience counting systems that estimate the number of times that an ad is seen by individuals and the number of individuals viewing the ad. Such figures are used by agencies to determine the ad price for a specific media purchase.

Currently, most of the software used to count the number of "hits" to a site does not track the origin, viewing time, user behavior nor subsequent hit destination of the viewers. The privacy and ethical issues of monitoring or tracking such viewer behavior is generally considered to make it inappropriate to do so. Certainly, such information on the specific behavior of visitors to a site would be valuable to advertising and marketing firms for understanding the advertising and other revenue potential of a site.

Advertising agencies are very aware that accurately measuring the use of web sites would be an important guide for garnering advertising revenues from advertisers. In 1994, the American Association of Advertising Agencies and Association of National Advertisers have formed the "Coalition for Advertising Supported Information and Entertainment (CASIE). CASIE also has the support of the Advertising Research Foundation, the organization originally involved in developing the existing measurement standards for print and other "traditional media." CASIE's stated aim is to ensure that similar measurement approaches and standards are developed for interactive media like World Wide Web sites and on-line services. It is CASIE's view that accurate and comprehensive measurement of consumer ad exposure in these media essential for continued growth of these emerging media. As Judy Black from CASIE and a senior partner of Bozell, Jacobs, Kenyon & Eckhardt stated in the New York Times,

> "For the new media to succeed, they must offer the advertising industry acceptable measures of the advertising opportunities they deliver and a means to measure them against comparative alternatives."[1]

In September 1995, CASIE produced a report entitled "Guiding Principles of Interactive Media Audience Measurement." The working paper concluded that measuring the aggregate number of "hits" to a site was an unacceptably crude approach to evaluating activity on the Internet in that it overestimates the actual usage by not considering whether the information had been actually "seen" by the users. As the report states,

> "'Hits' implies that the user has been exposed to the deeper material, which may never have been selected for display on the screen."

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[1]   New York Times, page C6, October 3, 1995.

Instead, CASIE recommends the development of measurement approaches that are more similar to those used for print and broadcast media. Furthermore, the working paper recommends the use of demographic information in the measurement approaches. In addition, the reliance on "objective third-party research suppliers" is considered a viable approach. The report also recognizes the importance that the usage estimates for one location should be directly comparable to estimates covering others in the same medium.

Several other approaches are also being pursued in both the advertising and interactive media communities. However, until accurate and reliable measurement standards are both developed, and generally agreed upon within the advertising community, it is very likely that the advertising and other revenue generating potential of the Internet and alternative emerging media will be limited.

In the meantime, it is likely that the use of aggregate "hits" to a site will be the primary measure of the Internet's success. Unfortunately, as we discussed before this will not distinguish between individuals access the site with no interest in the information provided and those reading it keenly. Furthermore, this approach will not measure of the amount of time spent at the site, identify repeat users, nor indicate individuals actually using the information.

     D.   Travel Information on the Internet

        1.   Commercial Travel Information Services

Currently, several on-line businesses provide travel information on the World Wide Web. The information services vary greatly in their size, capabilities and the type of information provided. Several major airlines have developed software and computer sites to enable individuals to obtain airline information and make reservations on-line. There are also a few hotel listing services that provide users with information on the hotel facilities, room availability and in some cases even allow the user to make room reservations. The following section briefly describes a few of the most noteworthy systems that are similar to the information and services that might be provided on the proposed kiosk system development.

Destination Florida   *(America Online)*
This site lists major events, attractions and lodging information. Disney has purchased its own segment of the site to promote Disney World as a tourism destination.

The Hotel Guide   *(www.hotelguide.ch)*
This service has more than a thousand listings and allows users to search for hotel rooms by location, amenities and price. Users can also verify room availability. Photographs of some hotels are also available for viewing by the

users. Users can e-mail to make rooms inquiries, but booking transactions must be completed by fax or by toll-free telephone calls to the service's operators.

World Hotel's Travelscope *(www .worldhotel.com)*
This service operates very similarly to The Hotel Guide.

United States Travel and Tourism Information Network
(www.colorado.edu/USTTIN/home.html)
The Virtual Tourist *(www.wings.buffalo.edu/world/)*
The GNN Travel Center *(www.nearnet.gnn.com/gnn/meta/travel/res/)*
These information sources on the web are primarily large directories that provide listings of and links to other travel information sites on the web. The data available for different locations is highly varied and these sites do not develop their own information for the traveler destinations.

Travel Web *(www. travelweb.com)*
In addition to the services provided by the other hotel listing sites, the Travel Web also allows users to make confirmed reservations for rooms directly online. After navigating through a series of questions from the system, the user can identify the specific accommodation arrangements they wish to book. Users may then transmit their credit card information to the system in order to confirm the booking. The system then provides the users with a summary of their booking information and a confirmation number for the reservation. Shortly, afterwards the system also e-mails this information to the user so that they have separate record of the transaction from which they can print out a hard copy.

Travelocity *(www.traveIocity.com/)*
Travelocity is designed to provide users with one location where it is possible to reserve and purchase airline tickets, access travel and entertainment information, and purchase customized travel guides. It also allows users to share travel experiences through chat groups, conferences, and Internet postings. It is a project of SABRE Interactive and Worldview Systems Corporation. Currently Travelocity offers schedules for more than 700 airlines and reservations and tickets for more than 370 airlines. They will be offering reservation and purchase capability for 28,000 hotels and 50 car rental companies. Travelocity helps you to locate the lowest fares and keeps track of your reservations.

These systems all function adequately to serve the purposes for which they are designed. However, the usefulness of their services to the public is effectively determined by the size and quality of their listing database. And the source of the information affects the quality. For example, information provided by the businesses themselves will provide a different type of information than more objective review information of the same businesses provided by an independent

source, for example, a travel guide such as Fodor's. It is currently unclear which kind of information is more desired by potential traveler's looking for travel information.

2.   Restaurant or Airline Specific Information

Several major airlines provide Internet based information services to the public. The Southwest Airlines system (www.iflyswa.com) can be accessed using standard web browsers such as Netscape. However, Southwest's web page only provides general information on routes and ticket prices. The system is supposed to allow ticket purchases in the near future. Flight information can be checked and airline tickets purchased on Alaska Airline's website.

United Airlines "United Connection" on-line service allows travelers to access directly the Apollo computerized reservation system. The Apollo reservation system is jointly owned by several major airline systems and is the same system used by travel agents. The "United Connection" service requires users to install special software in order to use the reservation system. Once installed, users can obtain the same booking and availability information on airline flights, hotel rooms and car rentals. The cost of the software is slight and purchases includes six vouchers, redeemable aboard United Airlines flights.

These current travel service websites indicate that travel information services are increasingly emerging on the Internet. according to Forrester Research, they anticipate that there will be significant growth over the next few years in the amount of transactions and thereby also Internet advertising.

3.   Public Traveler Information Services on the Internet

Nearly all the states and major cities have websites on the Internet for providing at least basic traveler and tourism information. However, the quality and quantity of information on these sites vary greatly. Most sites allow users to specify the region within the state that they are interested in and limit their information search accordingly. Many sites also contained hot links to other non-state pages for traveler related information provided by other organizations. A few of the sites allow users to download maps although this is frequently time-consuming.

In general, the more sophisticated sites appear to be specific initiatives by state tourism agencies. A list of the state traveler information web-sites is provided in the Appendix to this report. Several notable websites have recently emerged on the Internet. Each of these provides users with several categories of information including local attractions, historical sites and wildlife areas, weather, events and tourism activities. In addition, these sites access to lodging, restaurant and shopping information.

The most notable websites investigated belong to: Arizona, California, Illinois, Maryland, Michigan and New York. All these sites provided fairly comprehensive and detailed traveler information. Illinois's site provides information on hotels and restaurants that includes hours, approximate prices and directions. Users can narrow their search of local accommodations by selecting the region, accommodation type and amenities they wish. Detailed text description for many of the listings are also available. Similarly detailed tourism and lodging information can be obtained from Michigan's website, while the California and Arizona sites enable users to download maps of different parts of the state. Photographs of some specific hotels were also available from the California site. The New York and Maryland sites offered a particularly wide range of state traveler information including information on transportation both to, and within, the state.

The recent emergence of such traveler information sites clearly demonstrates that many state governments and tourism agencies consider the Internet to be a potential media for providing and distributing traveler information. The relatively low cost of maintaining the information's accessibility on the Internet is undoubtably one reason for the growing interest in Internet tourism sites. Several of the individuals interviewed during our research mentioned that a strong presence on the Internet was considered by many to be, in and of itself, good state advertising. Their web sites are expected to promote an image of their state as a technologically sophisticated and "vibrant" location that would be an attractive location to visit, live or work in.

These sites are also considered good methods for reaching individuals either only casually considering the states as travel destinations or visiting the state on business. The proliferation and development of such state websites suggests that many state agencies consider it an effective state marketing approach to use of the Internet to provide instant distribution of the information in an exciting manner. If such sites can promote and prove themselves to be popular amongst the growing Internet population, it seems reasonable that advertising revenues could be obtained from businesses associated with these sites.

E.   Electronic Payment and Security on the Internet

A central issue to future Internet development is the "safety" of transmitting personal information over the Internet. Security on the Internet is particularly an issue for transactions. Maintaining general protection and secure control of the database and information is naturally important. However, most system developers feel that conventional password protection for system access, and physically secure terminals would provide sufficient protection to safeguard the integrity of personal financial information.

However, security is still of primary concern for kiosk systems that have

transactional capabilities. The majority of key informants we interviewed acknowledged that the issue of security on the Internet is one of the key obstacles to the future growth of commerce on the Internet. Most of the informants stressed that it is the public's perception that the Internet was "insecure" that is more relevant a factor than the actual risk that credit card or financial information can be obtained by unauthorized individuals. Public perception of the potential risk of having one's credit card information intercepted has been heightened by several highly publicized news reports of flaws in software such as Netscape (e.g. "Discovery of Internet Flaws is Setback for On-Line Commerce,", New York Times, October 11, 1995, pg Al).

The issue of electronic payment on the Internet has been a central issue in the discussion and the growth of the Internet. Currently, several approaches are being pursued by businesses and organizations looking to improve the ease and amount of "electronic shopping" on the Internet.

1.   Methods of Electronic Payment

Currently, the majority of financial transactions over the Internet are conducted using conventional credit cards. Individuals making purchases transmit their orders and credit card information (i.e., account number, name and expiration date) to the seller either on the Internet via e-mail or more commonly by telephone or fax. This approach is very similar to the existing procedures that millions of people use daily to purchase goods from mail-order catalogs or make hotel room bookings from 800 number operators. The simplicity of this approach is attractive for Internet commerce since it is very familiar to the general public and a majority of the public has credit cards. However, many kiosk developers, advertisers and users are concerned that the security of the financial information during the transfer is currently inadequate. Perhaps even more importantly, it is the public's perception of the "danger" involved in such financial transactions that is most important in influencing the amount of electronic commerce conducted by users. The common public apprehension and distrust of transferring financial information online is both the result of the media coverage of security flaws and the public lack of familiarity and trust of the Internet.

 In the autumn of 1995 Visa and Microsoft released the Secure Transactions Technology (STT) encryption standard. At the same time Master Card, Netscape, CyberCash, GTE, and IBM introduced Secure Electronic Payment Protocol (SEPP). In February of 1996 they teamed up and released a joint draft standard Secure Electronic Transaction (SET). The SET partners include: GTE, IBM, Mastercard, Microsoft, Netscape, SAIC, Terisa Systems, Verisign, and Visa. The system adds encryption to scramble the card so only the vendor and customer can read it. The system is a voluntary standard for online financial transactions, including bank card purchases. With SET the merchant never receives the customers credit card number. Instead,

they receive a token, which is passed on to the bank who then uses the token to get the actual number, authorizes or declines the transaction, then sends the merchant an authorization number. The merchant is assured that the card is good, and completes the transaction. All the steps of the process are conducted with public-key encryption to assure authenticity of the parties and the consumer receives a certified digital receipt for the transaction.

Several other more sophisticated approaches are currently under development to facilitate and improve the security of electronic financial transactions on the Internet. Several "true" Internet based payment systems are currently in use such as First Virtual, CyberCash, Digicash, and The NetBank. First Virtual confirms every purchase by E-mail to the customer to verify the validity of the transaction. The only number sent over the net is the customer's First Virtual ID code. They have the largest number of merchants and information vendors. CyberCash has the purchaser download a CyberCash wallet which is similar to the money handling software from the other firms. Digicash is based on creating a "cash" which consists of 64 bit numbers that are passed from the customer to the vendor, and back to the bank for verification. The NetBank transfers funds through a series of non-encoded numbers that are E-mailed to vendors.

CyberCash was introduced in April of 1995. It is one of the most popular secure credit card services available now on the Internet. The CyberCash Wallet has the graphical look and feel of a real wallet. It is a free software program that is installed on a consumer's personal computer and supports any number of credit cards including Visa, Mastercard, Discover, and American Express.

Systems such as Digicash and NetCash allow the customer to deposit cash into a bank account and then use the cash to purchase items off the Internet. The customer receives an encoded 64 bit number for each nickel they convert to "ecash" which is then transferred to the user's hard drive. The customer can transfer the "ecash" to the vendor who then can exchange it with the bank for real money. The advantages are privacy and limited liability, however, the disadvantage is that the digital dollars are uninsured. CheckFree, NetCheque, and NetChex are the major players in trying to create a way to transfer electronic checks across the web.

     2.   The Degree of Risk

Many commentators emphasize that the risk of individuals intercepting the communications during on-line transactions is very slight due to the technical skills necessary to identify, intercept and, in some cases, decode communications that have valuable credit card information. Instead, commentators suggest that it is more likely that computer hackers would obtain the financial information from an business computer database storing the information insecurely. This was precisely the approach followed when the credit card information of approximately 30,000 individuals was stolen from the unsecured computers of Netcom On-Line

Communications Services in 1994. Such intrusions can be protected by better use of authentication and authorization procedures, computer "firewalls" that limit the amount of access that intruders can achieve and the actual physical access to the computers themselves.

Second, commentators also point out that the everyday practices currently used by individuals using their credit-cards daily are often relatively insecure. For example, during typical store or restaurant transactions, credit card information is handled by numerous individuals in the course of the purchasing process. At each stage of the process, there are frequent opportunities for individuals to gain access to the credit card information. In addition, the use of cordless or cellular phones during the telephone transactions also provides a relatively simple opportunity for unauthorized individuals to overhear the credit card information.

Third, currently credit card companies remain the ones most liable for the costs incurred from the losses from stolen credit card information - even if the theft is electronic. Most credit card companies will hold their cardholders liable for only $50 for purchases made on a stolen card and in most cases that fee is waived by the credit card company. Therefore, unless credit card companies change their liability terms, consumers using credit cards over the Internet will face only limited financial cost even if their credit card is misused.

Never the less, we conclude that until there is a decrease in the public's perception of the risks of online transactions, users will likely remain wary of making financial transaction over the Internet. As a result, direct financial transactions over the Internet are unlikely to be widely used by individuals. Although future technological improvements may strengthen the security of online financial transactions, these improvements must also convince users that the Internet is a safe medium for transferring financial information. Otherwise, there is likely to be little success from encouraging online commerce. Financial payment systems that instead rely on currently trusted approaches to transfer financial information (i.e. telephone and fax) are presently recommended for completing reservations or sales with online users.

F.   General Financial Feasibility

The previous analysis illustrates that there is, at least in theory, significant revenue generating potential for providing traveler information services over the Internet. In Section V, we discuss the revenue potential associated with both rest area kiosks and Internet advertising. Under the current circumstances, partly due to the rapid growth and change within the Internet, most of the respondents agreed that few businesses can earn sufficient revenues either from advertising or from transactions over the Internet to cover their development and operating costs.

However, the current pace of Internet development by commercial business seems

to indicate extensive faith that adequate operating profits will be forthcoming in the future. In the meantime, Kern Sacharin of Young & Rubicon suggests that many businesses will increasingly be interested in finding ways to leverage their existing web investments by obtaining quality links to other sites that might introduce users to their site.

Still, businesses consistently emphasize the importance of developing a high-profile presence on the Internet in order to be well-positioned with high name recognition when revenue opportunities emerge in the future. The frantic scramble by many business is encouraged by the highly decentralized nature of the Internet. While the number of sites is enormous, the location of these sites is essentially unorganized. Currently, Internet users must either know the precise Internet address for the location they wish to access, or must rely on search "engines" to inform and guide them to appropriate sites. As a result, for users looking for specific information, identifying the best source can be extremely time-consuming, difficult and frustrating.

The growth of private travel information commercial services offers an opportunity for public agencies to partner in providing public information on the Internet. Certainly, a public-private partnership may allow public agencies to make their information accessible together with commercial travel information and services at no direct cost. However, respondents differed in their opinions about the perceived value to users of public-private partnering. Bill Bass of Forrester Research raised concerns that some users may be disinclined to use an information system which is closely aligned with a State Tourism Board. He argues that many users would perceive such information as not being "impartial," unlike the more objective information entities from such as AAA or Fodor.

While this is a legitimate concern, other observers argued that state agencies currently do and would continue to have an interest in maintaining reasonable quality control over their listings. Furthermore, if state or local agencies can provide the private sector with better quality information or have good working relationships with travel businesses, then it may be in the private sector's interests to work with the agencies to gain access to, and incorporate these advantages into their informational database.

The future performance of the more content based websites such as those noted earlier in the Chapter should provide sufficient indication of the potential for state websites to emerge as popular travel information sources. However, the current decentralized nature of the Internet offers both promise to those with positive name recognition (such as State Tourism Agencies) and an imperative to use that advantage to attract an Internet audience. Currently, the importance of hotlinks and more traditional marketing approaches to attract Internet users suggests that for state agencies, private partnerships with organizations that share incentives for promoting such joint ventures may be an effective course of action for developing a strong Internet presence.

However, based on our advertising analysis in Chapter V and the difficulty in projecting future Internet visitation rates for such traveler information sites makes it difficult to determine the financial feasibility of the Internet. However, our discussions and cost analysis with kiosk vendors indicates that the development and operating costs for an Internet kiosk are more modest than for a rest area kiosk system - primarily because the hardware costs are significantly reduced. While the financial feasibility of such Internet kiosk is not currently apparent, the analysis does suggest the potential economic benefits to states from an Internet kiosk could be considerable and would outweigh its financial costs.

APPENDIX A: Legal Issues Related to the Use of Interactive Kiosks at Rest Areas

One key aspect of kiosk feasibility and the willingness of businesses to advertise on a kiosk system is the permissibility of sales activity at safety rest areas according to Federal law. Federal law prohibits commercial sales along the Interstate System's rights-of-way. According to United States Code Title 23, Section III, paragraph a (23 U.S.C. IIIa):

> "... the State will not permit automotive service stations or other commercial establishments for serving motor vehicle users to be constructed or located on the rights-of-way of the Interstate System."

Paragraph b of the same section does permit the placement of vending machines at rest areas. Particular deference is given to vending machines operated by the blind pursuant to the Randolph-Sheppard Act (20 U.S.C. 107a(a)(5)). According to 23 U.S.C. IIIb:

> "...any State may permit the placement of vending machines in rest and recreation areas, and in safety rest areas, constructed or located on rights-of-way of the Interstate System, in such States. Such vending machines may only dispense such food, drink, and other articles as the States highway department determines are appropriate and desirable. Such vending machines may only be operated by the State. In permitting the placement of vending machines, the State shall give priority to vending machines which are operated through the State licensing agency designated pursuant to section 2(a)(5) of the Act of June 20, 1936, commonly known as the "Randolph-Sheppard Act" (20 U.S.C. 107a(a)(5)). The costs of installation, operation, and maintenance of vending machines shall not be eligible for Federal assistance under this title."

According to the Federal Aid and Design Division in the Office of Engineering of the Federal Highway Administration, traveler service kiosks placed at rest areas and welcome centers can be classified as vending machines. For example, according to Information Station Express, Inc. (ISE) which operates interactive kiosks for the State of Florida, the kiosks operating at Florida's welcome centers are considered to be vending machines because they are stand-alone machines that offer valuable travel-oriented services to the public.

There are three crucial distinctions made with respect to the operation of kiosks as vending machines along the Interstate System's rights-of-way: the vended services must be travel-related; no cash may exchange hands in the transaction of services, and the state must be directly or indirectly involved in the installation, operation and maintenance of the vending machines.

According to Title 23 of the Code of Federal Regulations (23 C.F.R. Ch. 1 §1.23(b)), all property within the Federal-aid highways' rights-or-ways must be devoted exclusively to public highway purposes. The State is responsible for maintaining the right-of-way free of public and private encroachments that are not related to highway purposes.

Safety rest areas should provide facilities reasonably necessary for the comfort, convenience, relaxation, and information needs of the traveler (23 C.F.R. Ch. 1 § 752.5(a)). Thus, only travel-oriented goods and services may be vended at rest areas.

In addition, direct sales from one person to another are prohibited at rest areas. The FHWA does not allow currency to be exchanged in a revenue generating transaction. According to Title 23 of the Code of Federal Regulations:

> "No charge to the public may be made for goods and services at safety rest areas except for telephone and articles dispensed by vending machines (23 C.F.R. Ch.1 §752.5(g))."

Because kiosks are classified as vending machines a nominal fee could be charged for the provision of a service, such as issuing tickets to an attraction or booking a hotel reservation. As mentioned previously, kiosks are funded primarily through advertising revenues and not by charging user fees. However, any payments that are made when booking or paying for a hotel room or tickets to a tourist attraction must be paid for by credit card. Cash may not be used for these transactions at a rest area.

Precedents have been established in Florida for the use of credit cards in booking hotel reservations or purchasing tickets to attractions. These transactions typically involve using the kiosk and an adjacent phone to book the hotel room. For example, a visitor would use the touch screen of the kiosk to select a hotel, and the kiosk's computer would initiate a phone call to the hotel. The visitor would then speak directly with a reservation agent at the hotel, and could use a credit card to reserve a hotel room.

According to the FHWA, the agency would also permit using credit cards by directly inserting the card into the kiosk to book the hotel room or reserve tickets, much like an automated teller machine (ATM). To date, however, the technology to accomplish this has not been implemented. In addition, kiosk users may have security concerns about entering their credit card information into the kiosk computer.

Finally, it is specified in Title 23 of the Code of Federal Regulations that vending machines at rest areas must be State-operated. The state can contract the operation

and maintenance of the vending machine out to a private vendor. According to 23 C.F.R. Ch.1 §752.5(c):

> "The State may operate the vending machines directly or may contract with a vendor for the installation, operation, and maintenance of the vending machines. In permitting the placement of vending machines the State shall give priority to vending machines which are operated through the State licensing agency designated pursuant to section 2(a)(5) of the Randolph-Sheppard Act."

States, such as Florida and South Carolina, have found it to be most efficient to enter into public-private partnerships with kiosk vendors to design, operate, and maintain their kiosk systems. In Florida, ISE designed, purchased, installed, and currently operates and maintains the kiosk systems placed at welcome centers. Florida's Department of Commerce (soon to be reorganized into a public-private entity) administers the kiosk program and receives 10% of the program's operating revenues.

The approval process of a proposed new venture, such as, the development of a kiosk program, is as follows: typically the process begins in the state Department of Commerce or Division of Tourism. Often these agencies are the promoters of an interactive kiosk system at welcome centers or rest areas. These agencies request the approval of the state Department of Transportation (DOT) for the project. The DOT may approve the proposal of the requesting agency, if the DOT is certain that the proposed project does not conflict with Federal transportation laws and guidelines. States have autonomy in deciding the program's allowed along their Interstate highways, however, if the program conflicts with Federal law then Federal highway funding may be withdrawn. It is rare for a state DOT to allow programs along the Interstate that conflict with Federal transportation laws.

If the state DOT is uncertain whether a proposed project is within Federal guidelines, then the DOT may refer the project to the regional office of the Federal Highway Administration (FHWA). The regional office of the FHWA may make the determination to approve or reject the project, particularly if the regional office has already set precedents on the issue or has clear statutory language on which to base its decision. If the project request falls into unclear areas, then the request will be referred to the headquarters of the FHWA. The Federal Aid and Design Division in the Office of Engineering typically is involved in the final project approval.

In recent years, the Federal government has demonstrated increased interest in allowing innovative public-private funding of public endeavors. In the case of rest areas, the Federal government requires states to operate and maintain rest areas for the traveling public. Often the funds to maintain the rest areas come from Federal highway monies provided to the state. States have made the argument in the past

that the monies ear-marked for rest areas may have "better" uses in other highway repair or development projects. Some states have viewed kiosk systems as a possible revenue generators that could offset some of the costs of maintaining rest areas.

To our knowledge, the states that operate interactive kiosks at welcome centers and rest areas have classified the interactive kiosks as vending machines if there is a sales component to the system's operation, such as, booking hotel reservations or issuing tickets to attractions. According to Title 23 of the Code of Federal Regulations, states have the option to install Information systems within the rights-of way of the Federal-aid highway system. Information systems are facilities that provide information of interest to the traveling public, but are not signs, displays, or devices prohibited by any local, State or Federal laws (23 C.F.R. Ch. 1 §752.3(d)). There are several restrictions placed on information systems. The more pertinent restrictions include:

- Forty percent or more of all display areas and audible communications shall be devoted free of charge to providing information to the traveling public and public service announcement; and

- No charge to the public may be made for goods or services except telephone and articles dispensed by vending machines (23 C.F.R. Ch. 1 §752.8(c)).

If the interactive kiosk system under consideration by a state has a sales component, then it is to that state's advantage to classify the kiosk system as a vending machine. However, if the kiosk system is designed for informational purposes only, then the state may want to consider classifying it as an information system.

APPENDIX B: STATE TOURISM INFORMATION ON THE INTERNET

STATE	INTERNET ADDRESS
Alaska	www.state.ak.us
Arizona	www.arizonaguide.com.
Arkansas	www.ono.com\arkansas
California	www.gocalif.ca.gov
Delaware	www.state.de.us
D.C, Washington	www.washington.org
Georgia	www.georgia-on-my-mind.org.gom.com
Hawaii	www.hawaii.gov/tourism
Idaho	www.idoc.state.id.us
Illinois	www.enjoyillinois.com
Indiana	www.ai.org\tourism
Iowa	www.state.ia.us/tourism/index.html
Kentucky	www.state.ky.us/tour/tour.htm
Lousiana	www.state.la.us/crt/tourism.htm
Maine	www.state.me.us/decd/tour/
Maryland	www.mdisfun.org
Massachusetts	www.magnet.state.ma.us/travel/travel.html
Michigan	vvww.travel\michigan.state.mi.us
Minnesota	www.tccn.com\mn.tourism\mnhome.html
Mississippi	www.decd.state.ms.us/tourism.htm
Montana	www.travel.mtgov
Nebraska	www.ded.state.ne.us/tourism
New Hampshire	www.visitnh.gov
New Mexico	www.newmexico.org
New York	www.iloveny.state.ny.us
North Dakota	www.ndtourism.com
Ohio	www.travel.state.oh.us
Oklahoma	www.oklaosf.state.ok.us\-odt
Pennsylvania	www.state.pa.us
South Carolina	www.prt.state.sc.us/sc
South Dakota	www.sdinfo@goed.state.sd.us &
Tennessee	www.state.tn.us
Texas	www.traveltex.com/
Utah	www.netpub.com\utah!
Vermont	www.genghis.com.tourism/vermont.htm
Virginia	www.virginia.org
Washington	www.tourism.wa.gov
Wisconsin	www.badger.state.wi.us/agencies/tourism
Wyoming	wwvf.state.wyo.us/state/welcome/html

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