The Las Vegas Monorail, an innovative solution for public transportation problems within the resort corridor

Cam C. Walker

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THE LAS VEGAS MONORAIL, AN INNOVATIVE SOLUTION

The Las Vegas Monorail: An Innovative Solution for Public Transportation Problems within the Resort Corridor

By

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Bachelor of Science
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Master

of

Public Administration

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April 1999
The Las Vegas Monorail: An Innovative Solution for Public Transportation Problems within the Resort Corridor

By

Cam C. Walker

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The Las Vegas Monorail project is the first and quite possibly the only private sector endeavor to construct mass transit grade transportation at no cost to the taxpayer, and with no public sector investment, subsidy, or guarantee. The Las Vegas Monorail project follows a structure similar to the innovative toll road projects of the last decade, illustrating how other transportation problems can be solved by similar procedures. This study provides an opportunity to get an inside look at the process of designing, building, operating, maintaining, and financing a major transportation project in Las Vegas and the unique cooperation between public and private entities.
CHAPTER 1

INTRODUCTION

Today, a man and woman arrive at McCarran International Airport the evening before their convention and take a taxi to their hotel. As the taxi creeps slowly down the Strip, the couple is dazzled by the lights and attractions of the various resorts and become excited about being the entertainment capital of the world. The next morning as they stand in line for about 30 minutes while waiting to catch a taxi to the Convention Center, they notice the distinct gray haze of pollution hiding Las Vegas’s blue sky. After a busy morning at the convention, the man and woman decide that a quiet lunch at a restaurant in their hotel would be just what they need to relax. However, the line to catch a taxi is long so they opt for a hot dog and pretzel at the convention instead. At closing time the couple, seeing the long taxi line and cars everywhere, decide to take the large bus which travels between their hotel and the convention center. Again, they have a 20-minute wait to leave and then they have a long ride in convention congestion. Back at their hotel, they eat dinner and gamble for several hours. Next, they decide to take a walk to see several hotels down the street. On their walk, the sidewalks are as crowded as Disneyland’s Main Street at closing, and they notice that despite the crowded sidewalks, they are moving more quickly than the cars driving down the strip. They are tired as they return to their hotel that evening, and for the duration of their stay they rarely leave their hotel and casino. They leave on the third day, taking a taxi back to the Airport. They agree that their stay in Las Vegas was enjoyable; however, they wish they could have seen more of the city’s attractions.
Three years from today, another man and woman arrive at McCarran International Airport the evening before their convention and take a taxi to their hotel. As the taxi creeps slowly down the Strip, this couple is also dazzled by the lights and attractions of the resorts and becomes excited about being in the entertainment capital of the world. However, this couple also notices a sleek, futuristic looking people mover snaking its way behind and through some of the resorts. Upon checking into their hotel they discover that part of their convention fees include a pass to the Las Vegas Monorail. The next morning they only have to wait a minute or two for the Monorail, which quickly takes them to Convention Center. At lunchtime they take the Monorail back to their hotel for a relaxing lunch. Later that evening the couple enjoys dinner and gambling at their hotel and casino for several hours. Next, they take the Monorail down the Strip to see several other resorts. Their ride is fast as they move from the Sahara to the MGM in only 15 minutes. They attend the convention each day on the Monorail, and spend their free time not only at their hotel, but also exploring the other attractions Las Vegas has to offer with the ease of travel provided by the Monorail. When their convention is over they decide to extend their stay at their hotel a couple of days to continue exploring Las Vegas, "the Disneyland for adults."

These two couples are of course hypothetical, but their hypothetical experiences while visiting Las Vegas illustrate both the problems facing Las Vegas involving crowding and transportation and a proposed solution to these problems. Over the last several years in Southern Nevada there have been phenomenal increases in tourism accompanied by air quality problems and the need for transportation solutions. There are now more than 30 million tourists who visit Las Vegas per year, or an average of
approximately 90,000 tourists each day. Las Vegas is now in non-attainment for Carbon Monoxide and must show future improvements to come into attainment. In order to make traveling on the Strip easier and to decrease carbon monoxide levels, the need for improved mass transit has become apparent. One of the transportation improvements which is currently proceeding through the public process is the implementation of rail transit, or in other words a fixed guideway system. Typically in the United States the building of rail transit has been the responsibility of the public sector; however, the public process can be slow, and Las Vegas’s need is immediate. Since Las Vegas is a one of a kind tourist destination, it is only customary that the private sector has come up with an innovative means to provide a fixed guideway transportation solution.

History

As Southern Nevada saw rapid growth in the late 80’s with an increase in visitor volume in 1987, 1988, 1989, and 1990 at 15.3%, 16.7%, 18.7%, and 20.2% (Las Vegas Perspective, 1997, p. 73) respectively it has become evident that an elevated transit system was necessary to keep pace. In 1989 Clark County along with the Regional Transportation Commission (RTC) commissioned a study by KPMG Peat Marwick identifying route alignments within the resort corridor for a future elevated transit system. Over the last ten years the public sector through the RTC has been pursuing the development of a regional rail transit system. The private businesses over the same ten years have recognized the need to move visitors within the resort corridor, which is evidenced by construction of people mover systems between eleven resort properties.

The monorail people mover system that connects the MGM Grand Hotel and Bally’s Hotel was constructed with the intent of expanding, enhancing, or even possibly
becoming the transit grade public rail fixed guideway system. The private sector has been working to move this process forward as is evidenced by the formation of a Limited Liability Company created by the MGM Grand Hotel and Bally's Hotel. However, the Monorail project that is currently being advocated by the private sector is not the first. Over the last 20 years southern Nevada has had two different groups propose building a rail transportation system within the resort corridor. We still have remnants from a failed attempt by HSST, a German company within the City of Las Vegas. The people mover system connecting the MGM Grand Hotel with the Bally's Hotel runs adjacent to Audrie Blvd., a small road behind the properties that does not go through to the major arterial roadways. In June of 1993 MGM Grand hired a transportation consultant and a request for Proposals (RFP) was created with specific and clear goals:

- The rail transportation system had to be capable of becoming an urban transit grade system connecting the East Side of the Strip to the convention center area and beyond.
- It had to efficiently connect the Bally's and the MGM Grand facilities along a .7 of a mile alignment.
- It had to be provided at the lowest possible cost and be in service in the shortest time frame.

MGM Grand and Bally's conducted an international competition for a turnkey transportation project to connect the properties and meet the goals of the project. This international competition attracted turnkey transportation suppliers including the following: German's Adtranz (then called AEG Westinghouse), the Bombardier team, the
HSST group (who had tried in the past), the Japanese maglev, and some other smaller suppliers also competed.

The urban transit grade expansion criteria proved to be the deciding factor in the selection of the nearly 30 year old refurbished Disney six car Mark IV monorail trains. Since the old Disney vehicles and the new transit grade Bombardier’s M-VI monorails use a similar guideway, engineering the guideway and station infrastructure to the faster, heavier M-IV monorail met and exceeded the criteria of the RFP. Considering that Orlando is second only to Las Vegas as a tourist capital and that Orlando has the transportation question solved with the sleek and exciting Disney monorail it was only natural that Las Vegas make its own statement. Choosing the Disney monorails made it possible to meet the RFP criteria for both the short and long term. Following design and construction the older trains began commission in June of 1995.

The MGM Grand and Bally’s monorail system has been operating successfully for four years. There are several facts about the current system, which will prove valuable when assessing the viability of the enhanced transit upgrade. The current system runs with two Disney trains that are over 30 years old. The two stop monorail “ride” is only .7 of a mile, and is considered a “ride” by the Clark County building department since it does not meet the fire, life, and safety standards of a transit grade system. This current system has been carrying approximately 5,000,000 people per year. The current system does not charge a fare for rides, nor do the resorts advertise or induce riders to the system. The history of this people mover system will prove valuable as the resorts undertake to enhance and expand the system to a transit grade public system.
Purpose of Case Study

This project is a case study of a one of a kind transportation development put forward entirely by the private sector: the Las Vegas Monorail. A course manual written by Federal Publication Inc. titled Public-Private Infrastructure Development (Tieder et. al., 1996) describes how the "development and operation of rail transit infrastructure in the U.S. has for the past thirty years been almost exclusively in the purview of the public sector" (Tieder et. al., p. 97). This case study examines the first and quite possible the only private sector endeavor to construct mass transit grade transportation at no cost to the taxpayer, and with no public sector investment, subsidy, or guarantee. The Las Vegas Monorail project follows a structure similar to the innovative toll road projects of the last decade, illustrating how other transportation problems can be solved by similar procedures. This study also provides an opportunity to get an inside look at the process of designing, building, operating, maintaining, and financing a major transportation project in Las Vegas and the unique cooperation between public and private entities which have been and will be necessary in order to make this project a reality.

Although private groups have financed the monorail project, cooperation with local, state, and federal governments is crucial. The scope of this case study will include the following:

(1) A description of the consortium which makes up the Las Vegas Monorail Team and an examination of the proposed Monorail project.

(2) A national perspective of Public Transportation and the cooperation between the resort and business communities and the city, county, state, and federal agencies.
(3) The benefits of a Design, Build, Operate, Maintain (DBOM) “Turnkey” contract.

(4) The complications of choosing a monorail route that would benefit the most people and the difficulty in obtaining right of way.

(5) A discussion of options for financing along with the allocation of risk.

(6) An assessment of the viability of private sector rail transit, which has never been accomplished before.
CHAPTER 2

THE NEW MONORAIL

As required by MGM Grand-Bally’s monorail LLC the system must be a transit grade system, capable of meeting the Regional Transportation Commissions (RTC) specifications for expansion and operation. A transit grade system is one, which meets the fire, life, and safety standards of the Federal Government. All rail transit systems in the Las Vegas area have been constructed under amusement ride standards. The new and enhanced system is required to meet all the Major Investment Study standards of the RTC. The characteristics of the enhanced and improved Las Vegas Monorail include the following:

- 4 miles of guideway, which will have dual tracks, and switches on each end to keep the trains running in a circular rotation.
- An average travel time from MGM Grand Hotel to the Sahara Hotel of approximately 16 minutes, including the stops at each station.
- Seven four-car M-VI trains- an enhanced transportation grade car similar to that found in Orlando, Florida at Disneyworld.
- Initial capability of moving approximately 3,500 people/hour/direction and capable of being expanded to handle approximately 20,000 people/hour/direction.
- Average wait time between cars of approximately 3 minutes.
- A system so quiet it will be able to travel through the Bally’s hotel. (In Orlando the monorail runs through a hotel, right above the buffet.)
• A proposal including a 15 years of Operation & Maintenance contract (the maximum allowable given current IRS rules) with the same companies that build the system.

Las Vegas Monorail Team

While the Design/Build and Operation/Maintenance contracts have not been executed, the MGM Grand-Bally’s monorail LLC has been working with a team that has reserved the name “Las Vegas Monorail Team.” The Las Vegas Monorail Team is a consortium made up of Bombardier, Granite Construction, Carter Burgess Engineers, Gensler Architects, and Solomon Smith Barney. The LLC agrees with Tiong’s (1996) research concluding “the financial and technical strength of the consortium is regarded as the most important critical success factor” (p. 205). The ability to find corporations with proven track records and the ability to manage risk and take on risk in the project's completion are also success factors. The following qualifications of the monorail team members are best represented from their brochure titled “The Las Vegas Monorail” (1998), which highlights the DBOM proposal.

Bombardier is a world leader in the supply of fully automated transit systems and a wide range of mass transit vehicles. Bombardier designs, integrates and delivers a full spectrum of transit systems ranging from low capacity people mover systems to light rail, monorail, commuter rail, rapid transit and high speed rail. Fully automated systems delivered by bombardier include the Vancouver SkyTrain, the world’s longest driverless system, and now 18 miles in length after three extensions. Its M-VI Monorail system is based on the fleet of Mark VI Monorail vehicles
The Monorail 13

delivered to the Walt Disney World Resort in 1989-90 and was the basis for the guideway design for the existing MGM-Bally's Monorail system.

**Granite Construction Company**, in its 75th year, is the largest civil contractor in Nevada, and second largest nationwide. Granite is a leader in privatized transportation, such as California's SR-91 project, the first U.S. toll road to be privately financed in 50 years. Granite has built elevated transit guideways and stations nationwide, for transit clients that include Bay Area Rapid Transit (BART), Santa Clara Transportation Agency, Southern California Rapid Transit District, Metro Atlanta Rapid Transit Authority (MARTA), and Washington D.C. Metro Transit Authority (WMATA). With 1996 revenue of $928 million, a strong balance sheet, and a company-owned fleet valued at over $500 million, Granite is well-qualified to provide the people of Clark County with a monorail system they will be proud to use.

**Carter Burgess** is one of the nation's fastest-growing and most progressive full-service engineering and construction management firms, with over 1,000 employees nationwide, and a multi-discipline office in Las Vegas. In Las Vegas, Carter Burgess has designed several important transportation facilities, including the highly successful pedestrian bridge system at Tropicana and the Strip, and the RTC's new bus maintenance facility. The firm's staff includes nationally-recognized leaders in rapid transit planning and design, with hands-on experience implementing transit systems world-wide on a design/build basis. The firm's Las Vegas
office also includes the senior structural engineer who served as Project Engineer for the MGM/Bally’s monorail.

Gensler has been the largest architectural group in North America for the past fourteen years, with revenues in excess of $125 million. Architect of record for the MGM Grand-Bally’s monorail; Gensler’s services include architecture and master planning. Extensive work has been completed in airports and transportation facilities, L.A. Metro Red Line stations and Multi-modal Facility Studies for Palm Springs and Chino.

Solomon Smith Barney is the Nation’s leader in transportation financing. It has extensive experience in creating and implementing innovative finance packages including privatized transportation projects. In Las Vegas, Smith Barney has served as underwriter for the McCarran Airport expansion projects and has worked extensively with resort owners as underwriter and financial consultant.

Private Initiative

In 1997 the MGM Grand and Bally’s LLC began showing their commitment to enhancing and expanding the current system. Upon Robert Broadbent’s retirement from McCarran International Airport he was retained as chairman of the LLC and was asked to begin that process. Robert Broadbent’s experience includes being an elected Boulder City Councilman and Clark County Commissioner followed by an appointment to the Reagan Administration as the Assistant Secretary in the Department of Interior. As the Director of Aviation Robert Broadbent was responsible for the operation and expansion
of one of the busiest airports in the United States. MGM Grand & Park Place
Entertainment (which spun off from Hilton Hotels, which acquired Bally's Gaming)
committed the needed direction and resources to begin the process. My association with
Robert Broadbent began shortly after he began working for the LLC, and I am a partner
now with Robert Broadbent in Broadbent Consulting Inc. Our efforts to move the
development of the Las Vegas Monorail forward has given me the opportunity to have a
first hand view, which means that I am a participating observer in this case study.

Geoffrey S. Yarema, a partner with the law firm of Nossaman, Guthner, Knox &
Elliott (NGKE) in Los Angeles, California, was retained to represent the LLC. The
NGKE firm has extensive experience representing public agencies and private contractors
in design/build, turnkey and franchise contracts for transit systems.

Initially, the team attempted to expand by constructing the needed additional
guideway and just using the old trains and possibly purchasing more. However, Bruce
Woodbury, Chairman of the Regional Transportation Commission, wrote to the Hilton
Corporation and the MGM GRAND Corporation and asked them to consider the
importance of a "transit grade system." In consideration of Commissioner Woodbury's
comments and with Robert Broadbent on board, the development of a private transit
grade system was begun. It became evident very early that unique project development
and financing was essential, and that cooperation from the public sector would be
important.
CHAPTER 3

GOVERNMENT INVOLVEMENT

Government involvement is an essential part of making the Las Vegas Monorail project a success. The attempt by the private sector to construct a rail transit system, which would meet fire life and safety standards for public use, and without any financial commitment from the public sector has never been accomplished. Having never been accomplished it was important to involve all levels of government in their respective roles for the project. While a progressive project, the public-private partnership needed to accomplish the monorail has to overcome the national perspective of public transit.

State of Nevada

The first step in the public process for building the monorail was to make changes in state legislation. Assembly Bill 333 (AB333) was passed in the final days of the 1997 Nevada State Legislature. The legislation authorizes private companies to install and operate monorails in a county whose population is over 400,000. AB333 required the local jurisdictions, only in Clark County, to have an ordinance or agreement, which include provisions regarding licensing and zoning, provide for compatibility of the private monorail with other systems. The resort properties requested that the legislation provide some protection from the use of eminent domain for the taking of the private monorail. This provision requires that should the local jurisdiction acquire a privately built monorail system through the power of eminent domain, that the entity must continue to provide the same level of service. The resorts in this case would retain the right to approve future deletions from the system or changes in its configuration. Most
importantly, the legislation allowed for the granting of a franchise to build and operate a “public transit system” (AB333).

Clark County

While the MGM Grand-Bally’s LLC began the process immediately following the legislative action, Clark County decided that rather than moving straight to a franchise agreement, they wanted another step, a corridor agreement. As may be suggested from the following research by Giglio (1997), the County moved forward just like a bureaucracy and began by establishing a “broad set of public sector approval processes [to] frustrate private developers and... lead to outright failure” (p. 26).

Giglio identified three areas of problems faced in developing more private toll roads, (which are built following a process similar to that of the monorail) in the United States:

1. The public sector’s access to ostensibly low-cost tax-exempt debt discourages consideration of alternate financing mechanisms.

2. Poor communications between the public and private sectors. This includes a broad set of public sector approval processes that frustrate private developers and sometimes lead to outright failure.

3. The multiple (often conflicting) objectives of private firms that can get in the way of structuring a reasonable deal for the project.” (p. 26)

Although the state legislation became effective on December 1, 1997, the County’s additional step, the corridor agreement, first had to be approved by the County Commission in the form of ordinances. The corridor agreement application was
submitted and a corridor agreement was received by the MGM Grand-Bally's monorail LLC in March of 1998. The corridor agreement gave the LLC the exclusive ability to work on a specific route inside a defined corridor. Following the corridor agreement additional ordinances had to be structured which would define the franchise agreement, grant a master business license for the whole system, and address the fire life and safety issues through a building ordinance. It became evident in this first approval process that the use of eminent domain would not be allowed, and that the County staff was skeptical of the LLC's ability to actually follow through and accomplish the project.

The next step occurred on July 7, 1998, when the County Commissioners enacted a building ordinance, a business license ordinance, and a franchise ordinance. These three ordinances laid out the ground rules and procedure to be followed when applying for a franchise to build and operate a public transit system. Following enactment of these ordinances, the LLC submitted an application for a franchise on August 31, 1998, and began the process for award of a franchise from Clark County. The detailed application for a franchise was submitted in four parts. One part to the Clark County Comprehensive Planning department to address the land use application and zoning issues. The second part to the Clark County Department of Public Works for the right-of-way and traffic issues. The third part went to the Clark County Building Department for the approval of the systems and technology issues including fire life and safety issues. The forth and final submission was to the Clark County Managers office covering the financing and business points along with all the other parts of the application.

On December 2, 1998 the Clark County Commission awarded the MGM Grand-Bally's monorail LLC a franchise on a 6 - 1 vote. The one dissenting vote was
not "against the monorail," but was against elements of the proposed monorail route. According to Gomez-Ibanez, "The dilemma, of course, is to strike a balance between protecting the private operator from excessive free-road competition (so that profits are a possibility) and protecting the public from the potential abuses of a monopoly franchisee (in the form of high toll rates or the limits of capacity)." (Gomez-Ibanez, Meyer, 1991, p. 200) The franchise addressed these two very important issues in several ways. First, by the creation of a non-compete zone, for protection against the construction of another fixed guideway within the previously approved corridor agreement area. Second, by understanding that the actual operating entity following the construction would be a non-profit and thus could not be making a profit at the expense of the public. Third, by Clark County having an independent financial consultant review and make recommendations for the franchise.

National Perspective of Public Transportation

In urban metropolitan areas, publicly built and operated rail transit systems have not always achieved expected results. "Overall, federal, state, and local transit subsidies since 1964 total $310 billion in 1996 dollars – nearly as much as the $329 billion cost of the Interstate highway system." (Wendell Cox, Urban Transport Fact Book) Poole in Defederalizing Transportation Funding questions the benefits of public transit and asks: "What have been the results? The premise of federal transit aid was the modernized transit systems would reverse the long-term decline in transit ridership, thereby easing traffic congestion, reducing air pollution, and saving energy" (1996, p. 9). However, the following table illustrates the continued decline in the use of mass transit by commuters.
The Congressional Budget Office (CBO) (1988, as cited in Poole, 1996, p. 9) concluded the following:

After 25 years of federal aid, transit agencies have modern fleets, and many own considerably more vehicles than they need for rush-hour traffic. Yet most of the equipment in service is underused, and the federal operating subsidies go largely to pay for buses and trains running empty rather than service improvements or fare discounts.

Poole in Defederalizing Transportation Funding concluded from the research of the CBO that to have up to 80% of a capital transit program paid for by someone else created the desire by transit operator in urban areas to push for capital expenditures for bus and especially rail systems that are not cost effective. Ironically, the relative cost per passenger mile of five different transit modes was also calculated during the study by the
CBO and they were not surprised that the most expensive “Light Rail” or fixed guideways was the preference of most urbanized areas given the “free federal money.”(p. 10)

<table>
<thead>
<tr>
<th>Transit Cost Effectiveness</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost per Passenger Mile (1985 Cents/Mile)</td>
<td></td>
</tr>
<tr>
<td>Commuter Rail</td>
<td>65</td>
</tr>
<tr>
<td>Heavy Rail</td>
<td>140</td>
</tr>
<tr>
<td>Light Rail [Fixed Guideway]</td>
<td>340</td>
</tr>
<tr>
<td>Bus</td>
<td>35</td>
</tr>
<tr>
<td>Commuter Van</td>
<td>12.5</td>
</tr>
</tbody>
</table>

(Congressional Budget Office, as cited in Poole, 1996, p. 10)

“Again, the CBO report concludes that, ‘New transit systems financed with federal aid – particularly rapid rail projects – have not lived up to their promise. Generally they have lowered the efficiency of transit service by adding expensive unused capacity’”(Poole, p. 10). The 1980 and 1990 U.S. Census determined the percentage of commuters using public transit in new rail cities. Five cities were represented in the finding: Buffalo, Pittsburgh, Portland, Sacramento, and San Diego. Each city except San Diego, which remained relatively the same, saw a decline in commuters when the federal grant was awarded. Poole also concluded that “Urban transit is clearly the most obviously local and the furthest removed from being a federal matter. When this fact is combined with an appreciation of the harm done by federal transit aid, the case for shifting this function to the local level is overwhelming.”(p. 13)
The Las Vegas Monorail project is a local project and has no reliance on federal transit aid. While no federal transit aid is required, it is important to note that the standards of fire, life, and safety along with the transit standards created by the Regional Transportation Commission (RTC) in the Major Investment Study (MIS). It will be interesting to watch in the upcoming years if the RTC looks to create local match with the investment by the private sector in the form of the Las Vegas Monorail project.

Regional Transportation Commission

The Regional Transportation Commission (RTC) has played an important role in the development of the Las Vegas Monorail project while continuing to promote a public fixed guideway project in Southern Nevada. First, the RTC helped by developing a sophisticated ridership study of the proposed fixed guideway. This project was all encompassing and had a price tag of over two million dollars. The Major Investment Study (MIS) identified the need and was prepared to begin the application process for federal aid. Second the RTC also helped in the development of a memorandum of understanding with the (MGM Grand-Bally's monorail LLC) Las Vegas Monorail to ensure compatibility and connectivity.

The MIS specifically focused on the resort corridor, which is the economic center of not only Las Vegas and Southern Nevada, but also the entire state of Nevada. "Business expansion, primarily in the gaming industry, has spurred unprecedented growth in the Resort Corridor and the region. This growth has placed tremendous demands on the existing transportation infrastructure, raising community concerns about existing and future mobility needs in the Resort Corridor.” (Parsons Brinckerhoff Quade & Douglas, 1997, p. S-1)
The MIS “findings of need” concludes that there are factors to consider which are important for business operators in the resort corridor. The “findings of need”, which have been identified below, are especially important to the Las Vegas Monorail project and its efforts to invest private capital into transportation which is not in their expertise.

- Between 1995 and 2020 the full implementation of the Regional Transportation Plan (RTP) will increase roadway capacity by 27 percent. During this same period, demand for vehicle travel will increase approximately 54 percent.

- If the community attempts to provide for mobility in its traditional manner of building streets and highways to accommodate the travel demand, the equivalent of 20 east-west and 18 north-south arterial lanes of roadway will have to be built in the Resort Corridor in addition to the roadway projects already programmed in the RTP. Projects beyond those in the RTP would require acquisition of new rights-of-way in the densely developed Resort Corridor.

- Meeting the mobility demands within the Resort Corridor will require the establishment of a multi-model, fully integrated set of transportation solutions.

- Travel volumes, land use densities, and concentrations of employment warrant consideration of establishing a higher order of public transit that operates in a separate right-of-way. (p. S-1 - S-2)

The Major Investment Study was completed just after the passage of AB333, the state legislation, which was the first step for the Las Vegas Monorail project. While only
in the beginning steps of the private monorail project the MIS still recognized the potential of the project and included section 2.7 POTENTIAL FOR PUBLIC/PRIVATE FIXED GUIDEWAY FACILITIES.

Section 2.7 of the MIS includes the following:

Any fixed guideway system, whether public, private or a combination, that meets the requirements set forth in the Evaluation Report will provide the mobility benefits estimated here. Systems that fall short of these criteria probably will not provide the mobility enhancement identified in this report and may fail to meet the travel needs of the Resort Corridor and the region.

The conceptually defined Fixed Guideway Element may accommodate seamless connections with smaller people-movers, pedestrian access, or other private-property transit facilities (including motor carriers and fixed guideway). Stations will be designed with such existing or planned systems in mind, to maximize user convenience and connectivity. In this way, the benefits of private systems that accommodate localized traffic can be enhanced by connections to the regional system. (p. 2-43)

The real cooperation and coordination between the RTC and the LLC began shortly after the enactment of the state legislation and was greatly enhanced throughout the process. Prior to the granting of a franchise by Clark County the team worked to ensure that compatibility and connectivity which was written in state legislation and was to be defined and addressed in the granting of a Franchise. The team attempted to do as Poole suggests in “Privatizing Wisconsin’s Interstate Highways” which “is to think
through what public concerns must be addressed and then incorporate legally enforceable provisions into the franchise agreements"(1996, p. 11)

A memorandum of understanding (MOU) was agreed to and signed by both the Chairman of the RTC Bruce Woodbury, and the manager of the LLC, Bob Broadbent. The MOU identified areas for discussion purposes, and following successful accomplishment of given tasks on either the public or the private system, the MOU outlined timeframe and discussion points. Importantly, the MOU outlined the monorail's cooperation and assistance with the regional bus system and its ability to access and use the monorail. This coordination with the bus system is to the interest of the monorail since working in concert the two modes of transportation can only enhance one another.
CHAPTER 4

DESIGN, BUILD, OPERATE, MAINTAIN (DBOM) or “TURNKEY”

The MGM Grand and Bally’s LLC is not looking to enter the public transportation business, because the headaches, which traditionally accompany fixed guideway transit projects. From the beginning of the project to enhance and expand the current system, the LLC has looked for proposals that identify their ability to design, build, operate, maintain (DBOM) and finance. The DBOM approach included financing of the project and the resorts made themselves clear that their commitment would not include ridership guarantees. The LLC recognizes that “one of the goals of owners electing to use the design/build method is to obtain reasonable certainty as to cost. Simply as a result of combining the design and construction functions, there should be fewer change orders than in an ordinary contract.”(Smith, p. 2) This DBOM approach continues to be reassuring to the resort properties because of its ability to clarify costs, and limit project risk.

The bid process can be significantly improved by the use of a two-step approach. Bidders are invited to submit an initial proposal – usually without a price – and the Owner can then discuss with each candidate any deficiencies in their initial submission. The Owner, in turn, has the opportunity to revise the bid documents to address problems that have become apparent from the initial proposals. Finally, the Owner calls for submission of a “Best and Final Offer” and awards the contract based on the lowest price, or where permitted, price and other factors.(Hedlund, 1996, p. 2)
This approach, following the passage of state legislation, was discussed with system vendors by the MGM Grand-Bally’s monorail LLC. Although another RFP process was not undertaken, proposals were received and analyzed for their ability to meet the simple criteria of a DBOM proposal with financing.

The RTC recognized the value of the DBOM approach and was in the 1997 state legislative session supporting AB333 not only for the granting of a monorail franchise, but also for the ability to use a turnkey (DBOM) procurement process which was also in the legislation. The RTC has made an attempt in the state legislation to use a turnkey DBOM approach; however, the RTC continues to follow the traditional public process. The RTC has argued against the use of monorail technology citing lack of competition compared to other technologies when using the traditional bidding process. The LLC is truly looking into the use of DBOM and innovative financing along with other factors.

One research project identified two different critical variables for analyzing alternative approaches for awarding a concession. These two critical variables illustrate the differences in the RTC and the Private monorail project. The two critical variables are:

- The opportunities for innovation in design, toll pricing, and sharing of risks, responsibilities, and other elements of the concession process; and
- The value of transparency and competitiveness in the concession process.

The tradeoff between these variables and the implications for the preferred concession process are summarized in the following table:
As the RTC has moved forward in the process of developing a fixed guideway, their preference has been to use competitive procurement as the largest factor in technology selection, and until recently it has not looked at innovative ideas. The RTC now has the ability to use a DBOM approach thanks to the state legislation; however, the staff and consultants remain blinded in the public process and view the fixed guideway project "with limited opportunities for private sector innovation [thus] should use a more transparent and competitive concession process..." (Fishbein and Babbar, 1996, p. 25)

The MGM Grand-Bally's monorail LLC, on the other hand, prefers a "project with large opportunities for innovation in environments where transparency and competitiveness are secondary priorities generally should adopt more flexible and innovative approaches, perhaps drawing on the California model [SR-91]." (p. 25-26)

For the owner, there are a number of advantages to the design-build method. First, "a single contract, as opposed to separate contracts, for design and construction simplifies the lines of liability and responsibility for the owner." (Roberts and Smith, 1996, p. 646) Second, "the contractor, walks away with a much better understanding of the scope of the project and the Owner's expectations. The parties are much more likely
Third, "The design-build method also complements other business and contractual arrangements, such as public private-partnerships, in which public agencies contract with private corporations to design, construct, own, and operate such things as toll facilities and transit systems, or fast track construction, in which construction begins before the design is complete." (Roberts and Smith, 1996, p. 646)

While DBOM is the approach in major transportation projects in the U.S., in Europe a similar and much more common approach used is Design, Build, and Transfer. "The build-operate-transfer (BOT) model of project development is implemented through the award of a concession to a private sector consortium for the financing, building, and operating of infrastructure projects." (Tiong, 1996, p. 205) "Since World Ward II toll roads have become far more common in Europe and the Pacific Rim than in the United States. The International Bridge, Tunnel & Turnpike Association identified 9006 miles of toll roads in Europe as of 1990, compared with 4657 in the United States. Most of the major intercity highways in Italy, France, and Spain are tollways, and many have been developed under a form of public-private partnership called build-operate-transfer (BOT)." (Poole, Privatizing Wisconsin’s Interstate Highways, 1996, p. 3)

Build-Operate-Transfer while being used extensively throughout the world has been researched from the contractor and builder perspective to identify factors which can assist private industry in winning concession awards. Tiong (1996) identified six critical success factors, which should assist the promoters to maximize their chances of winning a BOT concession.

1. Entrepreneurship and leadership
2. Right project identification
3. Strength of the consortium
4. Technical solution advantage
5. Financial package differentiation
6. Differentiation in guarantees (p. 205)

Tiong’s research concluded, “the financial and technical strength of the consortium is regarded as the most important critical success factor in a BOT tender.” (p. 205) This factor for the LLC was very important considering that the resorts would be giving the right-of-way and allowing this consortium to construct on their valuable property. Another important reason for the financial and technical strength of the consortium is because of the risk that the resorts intend to place with the consortium in the DBOM contract. Risk allocation is to be discussed later in the project.

The Design Build contract along with the Operations and Maintenance contract is currently being drafted between the LLC and the consortium. As with any contractual arrangement the LLC had to look at the downside to design build and determine what their goals were for the project. “The downside of design/build, at least from the owner’s perspective, is loss of control over much of the process. Also, real estate acquisition can cause delays because the contract is awarded well before final design is complete.”(Port-Hull, 1997, p. 44) The LLC looked at the downside and considering again that their interests are not to get in the transportation business they prefer that experts move in and control the project construction.
CHAPTER 5

RIGHT-OF-WAY

Throughout the public process Clark County has been reluctant to use its powers of eminent domain. Research has shown that the County Commissions position on the use of eminent domain was similar to that found in the research of toll road development. "Local and state governments might be less willing to exercise powers of eminent domain for a private road than a public road, fearing that they may be subject to charges that they are exercising public powers on behalf of private rather than public interests." (Gomez-Ibanez, Meyer, 1991, p. 17) Having reviewed the comments and listened to the public hearing on the monorail process it is evident that several of the elected officials have reluctance to use eminent domain for private interests, especially considering that the project is being proposed by resort hotels. The perception in the Las Vegas community is already that if the resorts want it then it will happen.

The Las Vegas Monorail project while being proposed by two of the largest gaming companies in Southern Nevada has been portrayed to the public sector as not needing any use of eminent domain. We have been working through the process trying to build consensus and keep informed all properties from which right-of-way will be needed. Transportation projects throughout the United States have the most difficulty in acquiring right-of-way necessary for the development of projects. It is believed that "private owners may have the incentive and flexibility to reduce the need for eminent domain. Most of the private projects reviewed were selected to minimize land assembly problems and delays. Even faced with comparable land assembly problems, however, a
private firm may be able to avoid eminent domain where a public agency could not." (Gomez-Ibanez and Meyer, 1991, p. 200)

Similarly, “Virginia’s 1988 act authorizing private toll roads did not grant private operators eminent domain powers; the private company proposing the Dulles-Leesburg toll road was able to assemble its right-of-way because much of the land is owned by large developers with a strong interest in the roadway, but only after protracted negotiations and delays.” (Gomez-Ibanez and Meyer, 1991, p. 17) Nevada’s law like Virginia’s does not grant the power of eminent domain to private operators. Also, the large resort owners will grant the majority of right-of-way to the new special purpose entity, which will be created upon financing the project. “In most of the projects studied, the government took primary responsibility for political risk and right-of-way acquisition, while the private partner took primary responsibility for pre-construction (excluding right-of-way acquisition)…” further proof that transportation projects have the most difficulty in acquiring right-of-way necessary for the development of projects. The acquisition of needed right-of-way by the public sector in large transportation projects is fraught with legal issues and lawsuits. The route for the Las Vegas Monorail must withstand, so far, one legal challenge from two property owners. Because of my personal involvement with the project and under advice of legal counsel I am required not to address the legal proceedings moving through the court system.

Monorail Route

A major advantage for the private sector moving the project forward as opposed to the public sector is the ability to use very expensive and hard to get right-of-way for the monorail route. The ability to acquire right-of-way and have the rail transit project
use high concentrations of activities and population centers make for increased ridership, thus increased revenues from which to bond, build, operate, maintain, and enhance public mass transit in Las Vegas. The public sector could not afford such land and has almost always succumbed to the easiest means to construct transportation projects. Research shows that “A fundamental tradeoff in metropolitan rail transit planning pits cost versus ridership. To locate a rail line through existing concentrations of activities and populations may make for numerous riders, but it also makes for higher costs of easements and capital improvements.” (Loukeitou-Sideris and Banerjee, 1996, p. 3) This is evidence by the positioning of the Los Angeles Blue Line which was constructed through the lower socioeconomic areas of Los Angeles with the hopes that mass transit stations would bring with it economic redevelopment. “Despite all these well-intended proposals for station-area development, residents in the Blue Line’s environs have yet to enjoy economic growth or physical improvement.” (p. 5)

The MGM Grand-Bally’s LLC will provide the backbone for the route, and given the budgetary constraints for the construction of the system will most likely be donating the needed right-of-way for the project. This will be the precedence going into the project and should greatly enhance the ability to quantify all costs and enable the financing of the project.

The following describes the monorail route from south to north as stated in the franchise application.

This alignment will link the existing monorail between MGM Grand and Bally’s to a new terminus near the Sahara Resort. ... The proposed alignment will begin with a tail track and switch section parallel to Tropicana
Avenue that turns north into the station at the MGM Grand. This will permit southbound trains to cross over to the opposite guideway for the return trip to the north. The route proceeds north along the existing alignment (East Side of Audrie Lane) to a [possible] new station constructed near Harmon Avenue for the new Aladdin Hotel. From there, it will proceed north to the existing station at Bally’s which will be upgraded to include the new Paris Hotel.

From the Bally’s/Paris station, the alignment will proceed north, up a short grade of 6.5 percent, to pass through part of the existing Bally’s complex at an elevation of approximately 45 feet. The alignment will leave the building at the same elevation, turning west and north to cross Flamingo Road, gradually reducing elevation to an approximate height of 21 feet above the ground to the top of the guideway, and passing the east frontage of the Flamingo Hilton Resort, where a new station will be constructed. Continuing north, the alignment will reach Imperial Palace/Harrahs Station.

After leaving the Imperial Palace/Harrahs’s station, the alignment will turn east until it reaches Koval Lane, where it will turn north within the median of Koval Lane. At Sands Avenue, the alignment will turn east and follow Sands Avenue to and through the Las Vegas Chamber of Commerce property. The alignment will leave the Chamber’s property, turning north within the median of Paradise Road. The alignment will cross Desert Inn Road, to a possible station at the Las Vegas Convention Center and then onto the Las Vegas Hilton station. From this station, the alignment will proceed
north along the east side of Paradise Road to the terminus at the Sahara Resort.

The following table illustrates the private and public right-of-way interests, which must approve and contract for the needed right-of-way. Table one lists station participants. Table two illustrates all other private and public parties which will need to grant right-of-way on the franchised route.

**TABLE 1**

**Station Participants**

<table>
<thead>
<tr>
<th>1. MGM Grand Hotel</th>
<th>2. Bally’s Hotel</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Flamingo Hilton</td>
<td>4. Imperial Palace/Harrahs Hotel</td>
</tr>
<tr>
<td>5. Las Vegas Convention Center</td>
<td>6. Las Vegas Hilton Hotel</td>
</tr>
<tr>
<td>7. Sahara Resort</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 2**

**Right-of-Way Participants**

<table>
<thead>
<tr>
<th>Battista Locitelli</th>
<th>Ramada Executive Suites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunrise Apartments</td>
<td>The Howard Hughes Corporation</td>
</tr>
<tr>
<td>The LV Chamber of Commerce</td>
<td>Silver Star Development</td>
</tr>
<tr>
<td>Clark County</td>
<td>Nevada Department of Transportation</td>
</tr>
</tbody>
</table>
The easements and impacts of existing public utilities must also be considered a major factor when determining the needed right-of-way for the route. Two major hurdles are evident in any preliminary assessment of utilities and the route. First, two major Nevada Power transmission lines one along Flamingo road and the other being constructed along Koval. Second, is the infamous Winnick storm drain, which runs under the Imperial Palace parking structure, and is televised regularly during flooding in Southern Nevada.

The monorail route has been questioned at every turn. With the specific route defined and the project moving forward, there are still a few frequently asked questions about the route which have a public impact:

- Expansion to McCarran Airport? While the MGM Grand-Bally’s monorail LLC believe someday that rail transit will move to the Airport they only focus on the construction of this system to show the significance that the monorail will bring.

- Expansion to Fremont street? The RTC is looking at issuing a “Request for Proposals” for the initial operating segment of the regional public system. The Private Resorts along with the Las Vegas Monorail Team are looking at funding alternatives and costs.

- Will the monorail be “Compatible” with a Regional System? A regional system is at least 5 years behind; however, we have been meeting regularly to discuss the timing of comparability issues like fare collection, transfer stations, bus interaction, hours of operation, liability etc.
CHAPTER 5

FINANCING & RISK

The current provisional maximum price is approximately $350 - 400 million. This includes right-of-way as previously discussed, which is expected to be given to the system from casino resort properties that have stations. The participating resorts will also have to invest up front capital of approximately $60 - $70 million. This equals approximately $9 million dollars for each resort property having a station. “Although the private sector may be willing to provide capital and construct and operate a facility, this willingness is contingent on an expectation of sufficient revenues.” (Tieder et. al., 1996, p. 98) This initial investment put forward by the resort properties will be looked at as subordinated debt. Subordinated debt means that the resorts, instead of taking a hit to earnings in the market, can show an interest-bearing asset on the books.

One very unique characteristic to the project is that individual, competing properties have checked their agendas at the door and will all be equal partners and will remain as equal as possible dividing the number by the needed up front capital. This will mean a station will cost about $9 million. Again this concept is not new but one that has rarely been used. “Private sector ownership and operation usually involves equity investment that reduces the required amount of debt. Although returns on equity are typically higher than the interest cost of debt, the fact that the equity risk is unsecured and returns are subordinate to debt generally yields interest rate savings on the debt component of the financial structure.”(Hedlund, n.d., p. 4)
Financing the Project

In order to finance the Las Vegas Monorail, a non-profit corporation to sell tax-exempt bonds has to be created. The definition of the non-profit board, and who the representatives are that will serve on the board, is currently being researched by bond council for the State of Nevada. Hedlund describes this process in her research for the Reason Public Policy Institute. Private ownership has been replaced by ownership and/or operation by a nonprofit corporation that, in turn, contracts with the private entities for construction and operation of the project. A 1963 IRS revenue ruling, Rev. Rul. 63-20, and its progeny recognize the right of state and local governments to finance public projects through nonprofit corporations that issue debt "on behalf of" their government sponsors. This proposal was met with some reluctance from financial representative for Clark County. The concern was that the debt may in some way effect the bond rating for the government sponsor. While the risk has not been identified with any other project of this sort the MGM Grand-Bally’s LLC turned to the State of Nevada as the government sponsor. The Nevada Department of Business and Industry is looking to induce the application for financing and begin their own financial analysis in May, 1999.

By creating a non-profit corporation to sell tax-exempt bonds, the LLC has not solved all its problems. As Hedlund explains, "The nonprofit can enter into contracts with private companies for development and construction of a project, generally free of procurement restraints binding on the public sector. (p. 5) The process may not be perfect, but the LLC still determines it to be the best solution. Hedlund concurs in her article stating that, "The use of independent nonprofit corporations as a financing vehicle
is flawed and imperfect, but under current law, it may be the best and only option to get the private sector involved and reduce project financing costs.”

“For any…private infrastructure project, a critical component of assessing feasibility involves establishing the projected revenue stream. Infrastructure requires a large up-front capital investment as well as significant on-going expenditures for operations and maintenance.” (Tieder et. al., 1996, p. 98)

With the commitment of the Franchise from Clark County, the LLC began a ridership and revenue investment grade study, similar to that done for toll roads. “To ensure the success and accurate assessment of an investment in this type of infrastructure it is imperative to have comprehensive market studies.” (Tieder et. al., 1996, p. 98) This type of ridership study can only be successful if completed by a company with high reputation and regard in transportation infrastructure. URS Griener is currently working on the investment grade study and is one of those firms recognized by the investment community.

The LLC has made its intentions very clear that the bonds would be pledged to ridership fares only. The bondholder will have the risk, should the system not perform. The performance and repayment of debt is called a net pledge since operations and maintenance will be the first thing paid from ridership revenues. Public transportation’s ability to cover operations & maintenance alone by fare box revenues has only been accomplished with the San Diego’s Trolley system. The Las Vegas Monorail will easily cover the operations and maintenance and will probable never occur again in our country. The unique characteristics of the route place the following demographics with direct station access:
URS Griener determined the preliminary ridership numbers for the Las Vegas Monorail Team’s proposal to the LLC of a preliminary maximum price with the tax exempt financing. The preliminary ridership numbers for this system are 14 million passengers per year. The 14 million passengers were assumed at a fare of $2 - $2.50, and were only based on tourists, no locals, no employees, no bus transfers, no public fixed guideway transfers. The actual ridership of an existing system, and the Regional Transportation Commission’s (RTC) extensive ridership study strengthens the validity of the ridership numbers. The RTC’s ridership study actually takes into account all factors and is quite sophisticated, however it is typical of public transit agency’s to paint the pretty picture of the public transit usage. In fact the RTC study actually shows approximately double the number of riders on the same route as the LLC. The goal of the LLC is to continue the preliminary engineering to secure a Guaranteed Maximum Price, secure the needed right-of-way, and secure the up front capital from station participants. Should the timeline continue to be met the LLC and the Las Vegas Monorail Team will enter the marketplace to sell bonds in October of 1999 and give the “Notice To Proceed”(NTP) upon closing. The construction process of the four-mile minimum seven-station system is approximately 3 years from the NTP. The three-year construction time is not for the guideway and column but for the trains, control system, and commission of the cars.

Risk
With billion dollar resort properties involved in the development, with Clark County and the State of Nevada playing a role in the project, and with a well qualified consortium working on a turnkey DBOM proposal, the Las Vegas Monorail must assess project risk. Geoff Yarema an international transportation attorney and legal counsel to the LLC in one of his published articles addressed the characteristics of risk in project development. He stated that “attorneys and procurement specialists should keep in mind that risk is like energy. You can neither, create it or destroy it. All you can do is allocate it.” (p. 8) Research done for the Department of Transportation on “Turnkey” procurement identified that “capital and operating cost overruns has demonstrated the need for risk-sharing arrangements that can minimize public sector exposure for the complexities of fixed guideway acquisitions.”(Gomez-Ibanez & Meyer, 1991, p. 3) The private development of the Las Vegas Monorail will not be a risk-sharing arrangement. The resort properties have always been very clear that their intent is to provide right-of-way and the needed up front capital. Risk on the other hand is not something the resort properties want. The importance of having a qualified and deep pocketed consortium in order to allocate the risk to the Las Vegas Monorail Team in the DBOM turnkey contract. Mr. Yarema, attorney for the LLC, has created the following charts that represent the allocation of both responsibility and risk in both the traditional and DBOM contracts between the contractor, designer, and owner or agency.
### Allocation of Responsibilities/Risks in Traditional Construction Contracts

<table>
<thead>
<tr>
<th>TYPE OF RESPONSIBILITY/RISK</th>
<th>AGENCY BEARS</th>
<th>DESIGNER BEARS</th>
<th>CONTRACTOR BEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differences Between 35% and 100% Design</td>
<td>X</td>
<td>If designer was negligent</td>
<td></td>
</tr>
<tr>
<td>Design Errors Discovered During Construction</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacy of Design</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alignment Changes Due to Right-of-Way constraints</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of Delay in Right of Way Acquisition</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of Environmental Review Process</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permitting/Governmental Approval Process</td>
<td>Major approvals</td>
<td></td>
<td>Most permits</td>
</tr>
<tr>
<td>Coordination with Other Work</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Assurance/Quality Control</td>
<td>Substantial inspection/testing responsibility</td>
<td></td>
<td>Overall responsibility for work quality</td>
</tr>
<tr>
<td>Subsurface Conditions Differing Materially from Those Indicated</td>
<td>Type I, Type II</td>
<td></td>
<td>Conditions ordinarily encountered and recognized as inherent in type of work</td>
</tr>
<tr>
<td>Cost/Delay from Unidentified Utilities</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Utility-Related Delay</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Defects</td>
<td>Extent of liability depends on state law</td>
<td>If designer was negligent</td>
<td></td>
</tr>
<tr>
<td>Construction Defects</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strikes, Walkouts, Labor Disputes, etc.</td>
<td>Some</td>
<td></td>
<td>Some</td>
</tr>
<tr>
<td>Weather</td>
<td>Some</td>
<td></td>
<td>Some</td>
</tr>
<tr>
<td>Fire, Flood, etc.</td>
<td>Some</td>
<td></td>
<td>Some</td>
</tr>
<tr>
<td>Major Earthquakes</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epidemic, War, Sabotage, etc.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Archaeological Resources, Endangered Species</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous Substances</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in Law</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Party Litigation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Allocation of Responsibilities/Risks in Turnkey “DBOM” Contracts

<table>
<thead>
<tr>
<th>TYPE OF RESPONSIBILITY/RISK</th>
<th>AGENCY BEARS</th>
<th>CONTRACTOR BEARS through turnkey contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differences Between 35% and 100% Design</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Design Errors Discovered During Construction</td>
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<td>X</td>
</tr>
<tr>
<td>Efficacy of Design</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Design Review Process</td>
<td>Delays which Agency causes</td>
<td>All other costs and delays</td>
</tr>
<tr>
<td>Alignment Changes Due to Right of Way constraints</td>
<td>Agency is generally expected to bear this risk</td>
<td>Contractor could take on the risk of “non-material” project changes</td>
</tr>
<tr>
<td>Impact of Delay in Right of Way Acquisition</td>
<td>If relates to Agency obligations</td>
<td>If relates to Contractor obligations</td>
</tr>
<tr>
<td>Environmental Review Process</td>
<td>General consensus that Agency should bear this</td>
<td>It may be appropriate to involve the Contractor in the process</td>
</tr>
<tr>
<td>Permitting Process</td>
<td>Limited to major approvals</td>
<td>All other permits/approvals</td>
</tr>
<tr>
<td>Coordination with Other Work</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Quality Assurance/Quality Control</td>
<td>Limited to oversight</td>
<td>X</td>
</tr>
<tr>
<td>Subsurface Conditions Differing from Those Indicated</td>
<td>May be required by statute to bear certain risks</td>
<td>Most</td>
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<tr>
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<td>May be required by statute to bear certain risks</td>
<td>X</td>
</tr>
<tr>
<td>Other Utility-Related Delay</td>
<td></td>
<td>May be unwilling to accept this risk</td>
</tr>
<tr>
<td>Inflation</td>
<td></td>
<td>Negotiable</td>
</tr>
<tr>
<td>Design Defects</td>
<td>Extent of liability depends on state law</td>
<td>X</td>
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</tr>
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<td>Epidemic, War, Sabotage, etc.</td>
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<td>Archaeological Resources, Endangered Species</td>
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</tbody>
</table>
Gregory Fishbein and Suman Babbar understood that private development requires that project risks and responsibilities be assigned to the public or private entity that is best able to manage them. The private sector is generally better at managing commercial risks and responsibilities, such as those associated with construction, operation, and financing. But in order for a project to obtain financing, public participation may be required in areas such as acquisition of right-of-way, political risk, and, in some cases, traffic and revenue risk. (p. 10) Since the MGM Grand and Bally's monorail LLC assumes to shift all risk to the DBOM contractor. The acquisition of right-of-way is currently being undertaken and prior to close of finance the only remaining risk should be to assist in political areas. Research into private financing of toll roads by Fishbein and Babbar identify that "the main risks facing private toll road projects include pre-construction, construction, traffic and revenue, currency, force majeure, tort liability, political, and financial"(p. 11). These risks appear to be the same risks that are currently being addressed by the resorts. The design-build contract and the operation-maintenance contract will be the mechanism by which risk is moved from the LLC to the contractor with some amounts to the non-profit.

The area with the greatest divergence among the private toll road projects studied by Fishbein and Babbar was the treatment of traffic and revenue risk, although there were also differences in the approaches to currency and financial risk (p. 14). The MGM Grand-Bally's monorail LLC will not retain the revenue risk of ridership nor the financial risk of debt; however, since the resorts are public companies with participation in the project the financial markets remain attracted to the project.
CHAPTER 6

CONCLUSION

Las Vegas, a one of a kind tourist destination, is now looking at an innovative means to provide a fixed guideway transportation solution. The Las Vegas Monorail is well on its way to becoming the first rail transit system constructed and operated thanks to the fare box revenues and up front private investment. The franchise has been given to the MGM Grand-Bally's Monorail Limited Liability Company (LLC) from Clark County. The franchise began several different areas of work. The State of Nevada is working on the financial questions in order to created the non-profit corporation and fund the tax-exempt debt. The funding of the project is anticipated in the fourth quarter of this year. The Las Vegas Monorail Team, which will design, build, operate, maintain, and finance the project, is completing the engineering and designing needed to determine the guaranteed maximum price for the contracts. The LLC is currently securing the needed right-of-way, and is working on the needed engineering to receive a guaranteed maximum price to officially start the project in October of 1999.
References

1997 Las Vegas Perspective (1997). Las Vegas Chamber of Commerce


Nossaman, Guthner, Knox & Elliott. Los Angeles, California.


Las Vegas Monorail Team. (1998). Las Vegas Monorail [Brochure]


Parsons Brinckerhoff Quade & Douglas, Inc. (1997). Regional Transportation Commission, Resort Corridor Major Investment Study. Clark County, NV.


Figure 3.2.1-1

System Alignment Diagram

Desert Inn
Treasure Island
Sands Hotel
The Mirage
Caesars Palace
Bellagio
Monte Carlo
New York New York
Excalibur
Tropicana
Luxor

Sahara
Las Vegas Hilton
Convention Center
Possible Convention Center Station
Harrah's / Imperial Palace
Flamingo Hilton
Bally's
Aladdin
MGM Grand

McCarran International Airport

North Scale in Miles

0 1/4 1/2 3/4 1
**MGM/Bally's Monorail -- A History of Success**

The MGM-Bally's monorail carried over 5 million passengers in its first year of operation. This ridership is more than many urban transit rail systems carry annually in the U.S., making the MGM-Bally's system one of the most successful in America today.

The story began in 1993 when MGM Grand and Bally's conducted a six month international competition among transit suppliers for a monorail system. The selection criteria first required the system to act as a shuttle between the two resorts and eventually expand into a public transportation system for Las Vegas, connecting the strip to the airport, convention center and downtown.

To reduce initial costs and speed the system's opening, MGM and Bally's bought and refurbished two monorail trains that had previously been used in service at the Walt Disney World Resort in Orlando, Florida. Since the refurbished monorail trains utilize the same foundations, guideway, and stations as the existing MGM/Bally's vehicles, **BUT . . .**

- **It's Faster**
  - 50 mph speed meets RTC transit specifications.
- **It's More Spacious**
  - Full stand-up interior, flexible seating configuration and luggage racks.
- **It Has More Capacity**
  - 5,000 passengers per hour per direction, expandable to 20,000.
- **It Offers Easier Entry**
  - Wide bi-parting doors provide flush entry with stations. Fully compliant with the Federal Americans with Disability Act.

**RTC-Recommended**

- Two billion monorail passengers to date worldwide, over 35 years.
- Bombardier's Mark VI Monorail is the most heavily traveled passenger monorail in the world. It transports up to 200,000 passengers/day with reliability record in excess of 99%.
- Manufacturing guideway and columns segments off-site creates less disruption on-site.
- The lightweight guideway structure means less costly and fast construction.
- Foundations are small, with less excavation and faster completion.

**Proven Technology**

- Fully automated operation.
- Operating headways of 90-120 seconds.
- Federal, State and local fire and life safety requirements.
- High capacity air conditioning, proven in Florida heat and humidity.
- 2.8 mph/sec. acceleration/deceleration.
- Minimum turning radius of 175 feet.

**Simpler to Build**

- Manufacturing guideway and columns segments off-site creates less disruption on-site.
- The lightweight guideway structure means less costly and fast construction.
- Foundations are small, with less excavation and faster completion.

**Unequaled Safety**

- No passenger fatalities in the history of monorail systems worldwide.
- Meets or exceeds urban transit safety standards including crashworthiness and flame and smoke resistance.
- Emergency walkways built into guideways.

**Real Urban Transit**

- Fast speeds.
- High capacity.
- Fully automated.
- High speed switching.
- AC propulsion.
- Life Safety compliant.

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**M-VI Monorail -- Meeting Las Vegas' Transit Challenges**

The MGM Grand - Bally's (Hilton) Monorail Company, LLC has offered to build a nearly 3.5 mile, $250 million Urban Transit Grade M-VI Monorail system, with no tax dollars and no risk to the taxpayers. This offer represents an historically unequalled opportunity to start a private-public partnership and build a more comprehensive system, such as that considered by Clark County in its Major Investment Study (MIS). With the M-VI Monorail meeting all the technical specifications and the Resorts having invested their money in the M-VI Monorail up-grade capability, using the M-VI in the Resort Corridor makes ultimate sense and enhances the chance of a larger, County system being built in the future.

**M-VI -- An Historic Opportunity**

The M-VI Monorail is one of the finalist candidate technologies recommended in the Regional Transportation Commission's Major Investment Study Report, having met the technical specifications established by the RTC. It has the speed, capacity, and versatility, and is proven in service, plus offering:

- Fully automated operation.
- Operating headways of 90-120 seconds.
- Federal, State and local fire and life safety requirements.
- High capacity air conditioning, proven in Florida heat and humidity.
- 2.8 mph/sec. acceleration/deceleration.
- Minimum turning radius of 175 feet.

The M-VI Monorail uses the same foundations, guideway, and stations as the existing MGM/Bally's vehicles, **BUT . . .**

- **It's Faster**
  - 50 mph speed meets RTC transit specifications.
- **It's More Spacious**
  - Full stand-up interior, flexible seating configuration and luggage racks.
- **It Has More Capacity**
  - 5,000 passengers per hour per direction, expandable to 20,000.
- **It Offers Easier Entry**
  - Wide bi-parting doors provide flush entry with stations. Fully compliant with the Federal Americans with Disability Act.

**Easy Access: wide sliding doors**

**Spacious: stand-up interior**

**Safety: emergency exit walks**

**Construction: less disruption**
M-VI MONORAIL -- FIVE FACTS AND AN OPINION

FACT: With a cruise speed of 50 MPH, the M-VI Monorail is a true urban transit, not a slow "people-mover".

FACT: Monorail is one of the world's safest transit technologies. To our knowledge, there has never been a single passenger fatality in all its millions of passenger miles.

FACT: The M-VI Monorail has the smallest footprint of any elevated transit system. Its guideway is a mere 26 inches wide.

FACT: The M-VI Monorail has less construction impact on its site than any other elevated transit system.

FACT: The M-VI Monorail is the most cost effective transit system of its size.

OPINION: The M-VI Monorail is the most attractive transit system in the world. Its sleek, futuristic appearance and unobtrusive guideway will enhance the image of Las Vegas as an exciting and visionary city.

THE TEAM

Gensler

Bombardier is a world leader in the supply of fully automated transit systems and a wide range of mass transit vehicles. Bombardier designs, integrates and delivers a full spectrum of transit systems ranging from low capacity people mover systems to high rail, monorail, commuter rail, rapid transit and high speed rail. Fully automated systems delivered by Bombardier include the Vancouver SkyTrain, the world's longest driverless system, now 18 miles in length after three extensions. Its M-VI Monorail system is based on the fleet of Mark VI Monorail vehicles delivered to the Walt Disney World Resort in 1989-90 and was the basis for the guideway design for the existing MGM-Bally's Monotail system.

Gensler has been the largest architectural group in North America for the past fourteen years, with revenues in excess of $125 million. Architect of record for the MGM Grand-Bally's monorail, Gensler's services include architecture and master planning. Extensive work has been completed in airports and transportation facilities, L.A. Metro Red Line stations and Multi-modal Facility Studies for Palm Springs and China.

Carter Burgess is one of the nation's fastest-growing and most progressive full-service engineering and construction management firms, with over 1,000 employees nationwide, and a multi-discipline office in Las Vegas. In Las Vegas, Carter Burgess has designed several important transportation facilities, including the highly successful pedestrian bridge system at Tropicana and the Strip, and RTC's new bus maintenance facility. The firm's staff includes nationally-recognized leaders in rapid transit planning and design, with hands-on experience implementing transit systems world-wide on a design/build basis. The firm's Las Vegas office also includes the senior structural engineer who served as Project Engineer for the MGM/Bally's monorail.

Smith Barney is the Nation's leader in transportation financing. It has extensive experience in creating and implementing innovative finance packages including privatized transportation projects. In Las Vegas, Smith Barney has served as underwriter for the McCarran Airport expansion projects and has worked extensively with resort owners as underwriter and financial consultant.

Granite Construction Company, in its 75th year, is the largest civil contractor in Nevada, and second-largest nationwide. Granite is a leader in privatized transportation, such as California's SR-91 project, the first U.S. toll road to be privately financed in 50 years. Granite has built elevated transit guideways and stations nationwide, for transit clients that include Bay Area Rapid Transit (BART), Santa Clara Transportation Agency, Southern California Rapid Transit District, Metro Atlanta Rapid Transit Authority (MARTA), and Washington D.C. Metro Transit Authority (WMATA). With 1996 revenue of $928 million, a strong balance sheet, and a company-owned fleet valued at over $500 million, Granite is well-qualified to provide the people of Clark County with a monorail system they will be proud to use.

Which guideway would you rather see in Las Vegas?
Figure 3.2.1-3
Las Vegas (M VI) Monorail Vehicle
General Layout, Elevations and Plan