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CITY OF HENDERSON GOVERNMENTAL AND FISCAL IMPACT REPORT

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Clark County Department of Comprehensive Planning
Nuclear Waste Division



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EXECUTIVE SUMMARY

The purpose of this study was to examine the projected fiscal and governmental costs to the City of Henderson resulting from proposed future nuclear waste shipments. These projected costs to local units of government are additional costs directly due to having to prepare for, and respond to, proposed nuclear waste shipments. Interviews were conducted with personnel from various City departments including Finance and Parks and Recreation. In particular, the three public safety departments, -- the Fire Department, the Police Department, and the Office of Emergency Management, provided detailed information on projected additional training, equipment and planning needs and their associated costs if and when nuclear waste transportation begins.

The City of Henderson has experienced explosive growth over the last decade, from 69,390 persons in 1990 to an estimated 185,000 persons in 2000. Today, Henderson is the second largest city in Nevada. Projections show that by 2010 Henderson will have a population of 300,000 persons. Although growth has occurred in all areas, the southwest section of Henderson has experienced the largest population increases. City development plans show the growth of master-planned communities in the southwest area of the City and approaching I-15. The proposed shipments of nuclear waste along I-15 could threaten the potential growth of this area of the city. Moreover, a transportation accident involving the release of radioactive materials on I-15 near Henderson would present socioeconomic and health risks to the City, especially the new growth areas planned near I-15.

Projected additional costs to the City's Office of Emergency Management were estimated to be around \$115,000. These costs would result from the need to expand the current Emergency Operations Plan to include a radiation response plan annex, a public information/education

program, and expansion of the 911 Reverse Notification System. Additional personnel may be required as well for regional response planning.

Emergency response preparation costs for the City's Fire Department alone would add \$227,558 to the department's budget for additional staff training and radiation monitoring equipment. These costs do not include actual costs of responding to any possible future nuclear waste incident. Additional costs to the City's Police Department to prepare for any future eventuality were estimated to be \$745,044 at current dollars. These do not include costs attributed to possible responses to accidents in the future. For example, based on a Scenario 3 event, the costs to the Police Department in responding to an accident may be over \$4 million. The City may also be vulnerable from losses in property values near and along I-15. Based on an assumed nuclear waste accident along I-15 without any release of radioactive materials, it is possible that property values will decline from 2 to 4 percent within 3 miles of the route. By 2010, new city development around and near I-15 will have been completed. If and when I-15 is utilized as a shipment route for nuclear waste, a nuclear waste incident occurring on that route near Henderson may impact property values in that section of the City. Such losses in property values and other sources of revenue resulting from a serious transportation accident involving nuclear waste could adversely impact the level of City operations.

1.0 INTRODUCTION

The purpose of this study is to estimate the fiscal and governmental costs and impacts of the proposed Yucca Mountain repository for high-level nuclear waste on the City of Henderson. The present work is focused on determining any governmental impacts on Henderson from the transportation of nuclear waste proposed along I-15. Moreover, the study focuses on the projected additional costs for public safety programs resulting from having to prepare for a potential nuclear waste incident. Efforts to determine the additional costs to the City of Henderson were based on three possible transportation scenarios described in section 3.0. Scenario #3 depicts a serious transportation accident with a release of radioactive materials. The projected costs to the public safety departments are based on preparing the City to respond to such a scenario. This postulated accident occurs at the intersection of I-15 and the Lake Mead Road exit, just west of the new developing section of the City.

The proposed nuclear waste repository and the transportation of high-level nuclear waste and spent fuel has been identified as a source of potential impacts to the development plans of the City and will add costs to three of the city's public safety departments-the Fire Department, the Police Department and the Office of Emergency Management located within the Fire Department. These projected costs to the City's government will result from requirements for training public safety personnel, purchasing new equipment, preparing emergency management plans, and responding to transportation incidents involving nuclear waste.

The City of Henderson is located on approximately 90 square miles in southern Clark County. It is developing to the west towards I-15, a route designated by the U.S. DOE for possible nuclear waste shipments. I-15 may be used to transport nuclear waste from California northward to route 95 to the Yucca Mountain repository. Because of the location of the route

close to newly developing areas of Henderson, the City may experience significant vulnerabilities in the future.

The report identifies the types of impacts that could be experienced by the City and the nature and magnitude of governmental fiscal costs to the City of Henderson. Three types of impacts were identified: potential impacts to new master-planned communities near I-15; impacts to governmental revenues resulting from possible property value diminution effects; and additional costs to the City's public safety departments resulting from requirements to enhance and upgrade their training, equipment and plans.

Information was obtained from interviews with key city personnel, (including the departments of Finance and Parks and Recreation) several visits to the City, and an assessment of needs and associated costs provided by the City's Fire and Police Departments. In particular, the cost analysis benefited greatly from the efforts of Ray Moser (City of Henderson, Police Department) and Michael Cyphers (City of Henderson, Fire Department).

This study was supported by the Nuclear Waste Division, Clark County's Department of Comprehensive Planning. Under provisions of the Nuclear Waste Policy Act, as amended, Clark County has been designated as an "affected unit of local government" that may monitor the siting process and conduct its own impact studies.

In August 2000, the City of Henderson made a decision to work with the Clark County Nuclear Waste Division to undertake an analysis of the impacts of the transportation of high-level nuclear waste to a repository at Yucca Mountain, Nevada. Studies similar to the present one have been conducted in four other incorporated cities in Clark County-Boulder City, Las Vegas, North Las Vegas, and Mesquite.

The results of these studies will be used in a Clark County Yucca Mountain Impact Report that will be submitted to the U.S. Department of Energy in Summer 2001. Under section 114.(A)(F)(G), the Clark County report, the DOE Science and Engineering Report, the DOE Draft Environmental Impact Statement for Yucca Mountain, impact reports submitted by the State of Nevada, affected units of local governmental and other interested parties will be considered as the Secretary of Energy makes a recommendation to the President to advance the siting process.

2.0 CITY OF HENDERSON: BACKGROUND

In 1990, the population of the City of Henderson was 69,390. Nine years later, the City had reached a population of 177,030 and as of January 2000, an estimated 185,000 persons lived in Henderson. In 1995, 1997 and in 1999 the City was identified by the U.S. Census Bureau as the fastest growing large city in America. Since 1990, the population has increased by 155 percent, and in 1999, the City was recognized as the second largest City in Nevada. Projections show that by 2010 Henderson will have a population of over 300,00 persons.

In one year alone, 1998 to 1999, the City grew by 11 percent, representing 20 percent of the total growth of Clark County that year. As of January 2000, the total number of housing units was estimated to be 69,346 and the biggest percentage comprised single-family housing (45,986).

Although growth has occurred in all areas, the southwest section of the City has experienced the largest population increases. Growth in the southwest sections of the City along Lake Mead Drive derives from both the annexation of new land and large master-planned communities. According to interviews with City personnel, by 2003, the City plans to develop master-planned communities up to one-half mile from I-15.

The 2000 Economic and Demographic Overview of Henderson shows 25 current master-planned communities. For example, the Del Webb Anthem community in southwest Henderson is built on 2,535 acres of land, with a 2000 population of approximately 1800 persons. The projected population is estimated at 12,500, and with 6,200 housing units proposed. The Seven Hills community next to the Henderson Executive Airport is built on 1,292 acres with a current population of 3,467 and a projected population of 8,200. The Joint Planning Area, a future land use, and development plan of 5000 acres, lies south of the Henderson Executive Airport with Las Vegas Blvd. at its western boundary. This entire development could be vulnerable from nuclear waste shipments along I-15.

Along with explosive population growth, the City's assessed value over the past 10 years has increased more than 465 percent. In 1990, the assessed value of properties in Henderson was \$647,000,000 and by 1999; the total assessed value was estimated to be \$3,656,090,792. Residential property value represents the highest valuation with a 1999 value of \$2,197,988,610. This is followed by commercial assessed valuation of \$445,633,990 and industrial assessed value of \$101,596,710. In 1999, approximately 63 percent of the City's existing land was residential followed by commercial land with 18 percent of the total.

The size of the City of Henderson is approximately 90 square miles. With a rapidly growing population and large-scale development plans, the City is expanding rapidly to the west towards I-15. The new master-planned communities in those areas would be particularly vulnerable to nuclear waste transport along I-15.

3.0 METHODOLOGY

3.1 Background

The case study method was used to estimate fiscal impacts and costs on the City of Henderson's governmental services. A complete description of this methodology is contained in Appendix A. Before discussing the methodology that was employed (Appendix A), it is important to first take note of a primary aspect of the study. What is being studied and estimated is not the total fiscal cost or budget of any governmental entity, but rather the increment or additional cost to governmental units that is directly attributable to the repository's siting at Yucca Mountain and the related HLW shipping campaign. Hence, the cost estimates are fiscal impacts that will be directly attributable to the siting, and would not be incurred if the repository and shipping campaign do not occur. The estimates are based on three different HLW transportation scenarios.

These scenarios are discussed in detail below and are provided in Appendix B. Each contains a different set of conditions concerning the future of HLW transportation should the DOE move forward with its plans contained in its Draft Environmental Impact Statement (DEIS) for the repository. The investigation has given particular attention to the public safety, environmental protection, and health agencies in the community, as they previously have been identified as likely to be most critically affected by long-term nuclear waste shipping campaign. In addition, the public safety agency's programmatic, training, and fiscal needs in providing for emergencies are explicitly recognized and identified in the NWPA and NEPA as being part of the federal responsibility in siting and shipping HLW. Finally, these agencies are charged with protecting the health, safety, and welfare of citizens in an emergency, and they must be prepared to respond should a radiological incident occur.

These governmental impact studies carried out for Henderson and other communities within Clark County are designed to be similar to analyses that have been performed on Nevada's state agencies by the principals of Urban Environmental Research from 1987 through 1997. The state studies were performed at specified intervals on the same state agencies, as more and more information became known about the nature of the repository and the HLW shipping campaign.

These state agency fiscal impact studies at first discovered low levels of awareness among state personnel concerning the HLW repository, the siting process, and how it might affect their agencies. Over time however, not only did state personnel exhibit increasing knowledge about the siting, but also about the potential impacts on their governmental units.

This increased knowledge and familiarity was not only a function of the greater amount of available information about the repository, but also a result of agency personnel beginning to realize that potentially adverse fiscal impacts might result from a repository siting. Just as in these state fiscal studies, scenarios have been used to provide all local agency directors and staff with similar conditions (scenarios) on which to base their assessments of fiscal impacts and projected needs of their agencies.

Because this is the first such study in Clark County, it is also likely that, overtime, local jurisdictional personnel will become more familiar with the details and potential impacts from a HLW repository and concomitant shipping campaign. As this familiarity with the details of the repository project increases, the range of projections from the siting and transportation campaign will narrow just as they have with state agencies.

There was an effort in the Las Vegas Valley in 1995 to attempt to gain perspective on the public safety needs in the Las Vegas area should the proposed Yucca Mountain repository move forward. The report based on this effort by the Public Safety Advisory Group was a needs assessment, and it did not attempt to estimate the fiscal costs of meeting the public safety needs that were identified. Nevertheless, as a result of this 1995 study, we anticipated greater awareness and knowledge about the repository among the public safety agency personnel than otherwise would have been encountered.

3.2 The Scenarios

An additional methodological step was taken to obtain as accurate projections of fiscal impacts as possible, and to augment the research design being used. The interview schedules that were developed were based on three possible scenarios of the future transportation of nuclear waste through the Valley. These three scenarios contained descriptions of the shipping campaign described in DOE's DEIS.

The first two scenarios flow directly out of the DEIS and describe: a) a benign future shipping campaign beginning in 2007 without any events occurring over the twenty four years of shipments; and, b) a future containing an incident described by the DEIS in which a cask containing nuclear waste breaks free of the trailer, remains intact and releases no radiation. The final scenario was developed by the State of Nevada's transportation expert on shipping high-level nuclear waste using information in the DEIS (Section J.4.2. Transportation Accident Scenarios pp. J-52-72). This third scenario contains a serious accident in which radioactive waste materials are dispersed over a wide area. In each community's sets of scenarios, the site of the

transportation incident occurs at a different location. For the City of Henderson, the site of the accident is at the junction of I-15 and the Lake Mead Road exit.

In addition, each scenario contained a description of the projected effects of that shipping scenario on property values within one mile, and one to three miles of the transportation corridor. These projected property value impacts for residential, commercial and industrial property were based on the study recently completed in the Las Vegas Valley that estimated property value diminution effects from waste shipments. This property value research utilized the same three scenarios (without the projected property value impact projections) and was based on interviews with experienced real estate appraisers and bankers in Clark County, as well as a separate survey of Clark County residents.

3.3 Research Design

The research design for this study and those for other communities not only permits cross walks between the state sponsored property value study, but also provides the community personnel being interviewed with considerable detail about the number and nature of the projected shipments of waste. Each scenario also contained the number of projected shipments and the potential routes this waste would be shipped along.

By providing the scenarios that were based on DOE's own DEIS, a series of credible futures could be constructed with some additional detail that aids in familiarizing personnel with the project and insures comparability among the communities. In this way, personnel from different communities are responding to the same description of the transportation shipping campaign. The only factor that varies in the scenarios is the location of the incidents in two of the scenarios for each community. Yet it must be emphasized, that because this study is the first

effort to study fiscal impacts from the repository in these communities, the level of information of governmental personnel interviewed varies dramatically.

We have previously noted that in the State fiscal impact studies, agency personnel grew in their understanding of potential impacts as they became more familiar with the characteristics of the project. This first effort often could not estimate actual dollar costs because of the lack of necessary details in the scenarios or because agency personnel had not had the time to study and reflect on potential impacts. In these instances, areas of vulnerability had been identified, but no range of dollar estimates was yet available. Often, after the first interviews, agency personnel took time to evaluate and study future needs and determine projected requirements (and sometimes costs). This information was then made available to the researchers. In the City of Henderson, the study benefited greatly from public safety personnel who provided an inventory of their needs and associated costs in order to prepare the City for a possible nuclear waste transportation emergency.

4.0 FIRE, EMERGENCY MANAGEMENT AND POLICE SERVICES: BASELINE CONDITIONS

4.1 The Fire Department

The City of Henderson's Fire Rescue Operations Division staffing in year 2000 was approximately 160 personnel including 48 paramedics. The Department as a whole had 182 employees but the department's five-year plan projects 264 staff operations personnel by 2005. Although there is no Hazardous Materials Response Team, the City's Fire Department trains all personnel to the Hazardous Materials Operations response level. Moreover, an Automatic Aid agreement with Clark County Fire is in place for hazardous materials incidents that will require a

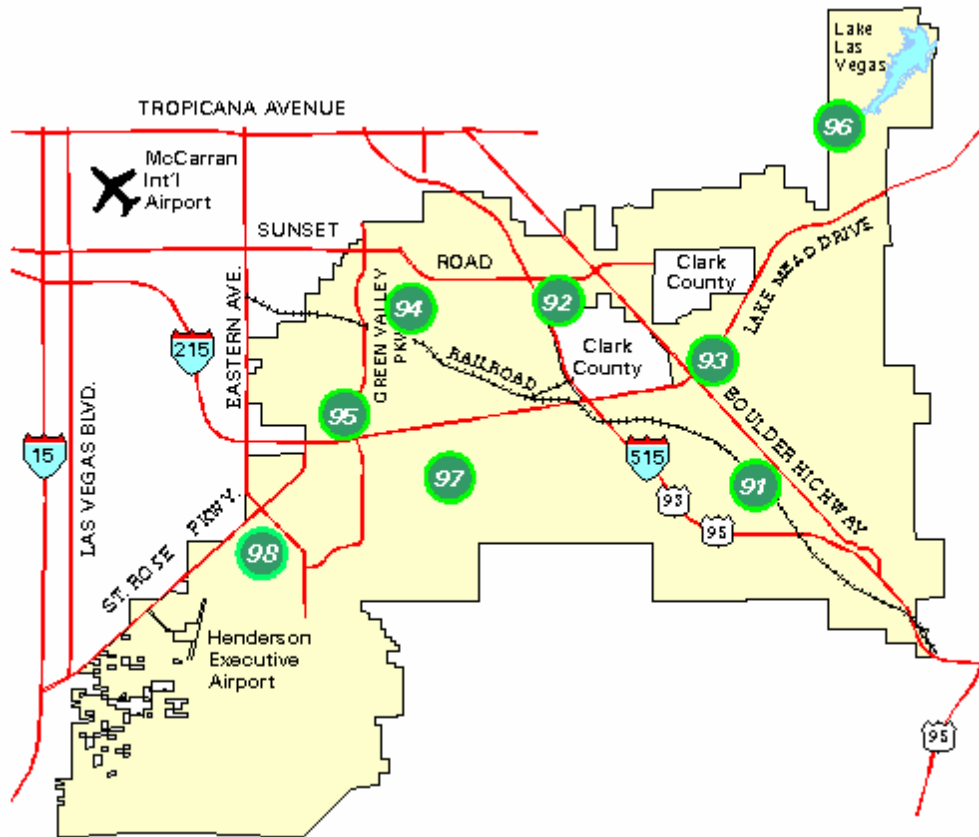
response. The City of Henderson has no Mobile Command Post or a 911 back up for radiological or other large-scale emergencies.

The Fire Department's budget ending 6/30/00 was estimated to be \$18,278,783. The budget was broken down as follows: Salaries and Wages \$11,244,180; Employee Benefits, \$3,847,078; Services and Supplies, \$1,136,471; and Capital Outlay, \$1,136,471. The Department operates eight fire stations covering 94.4 square miles of the City limits. As a full-service department, the Department provides services in fire/rescue operations, emergency medical services, public fire safety education, and code enforcement. The City's Office of Emergency Management is located within the Fire Department.

In June 1997, a combined Fire Training Center and Fire Station (Station 92) was completed. The entire site covers 8.4 acres with a training academy of over 10,000 square feet. The total cost of the Center was \$7.4 million paid for through general fund capital project funding. In addition to the eight current fire stations, three others are planned to be constructed by 2004.

Each of the eight fire stations in the City has a paramedic/advance life support capability and staff with a fire engine and four of the eight stations provide paramedic ambulance services. Three fire stations were opened in 2000, with two providing fire protection services to the rapidly growing areas in the southwest part of the City. Figure 1, displays the eight fire station locations in Henderson.

Figure 1 – Henderson Fire Station Locations



A recent development that may be important in any future radiological emergency is the involvement of Henderson’s Fire and Police departments with the Southern Nevada Area Communication Council. The Council provides an 800 MHz emergency radio system to Southern Nevada jurisdictions and permits communication with regional public safety organizations.

4.2 The Office of Emergency Management

The City of Henderson’s Office of Emergency Management consists of one Emergency Management Coordinator (EMC). The responsibilities of the EMC are to develop plans and prepare for emergencies within the City including hazardous materials responsibilities. These activities would include matters involving evacuation, coordination of emergency response

agencies, sheltering, command center and organization planning, and communications, among others. According to the EMC, the Office has developed an Emergency Operation Plan, but the Plan does not address the types of potential radiological emergencies and responses needed as a result of an accident that involve the transportation of nuclear waste.

In the City's Emergency Operation Plan, radiation response planning currently is confined to medical responses for shipments of low-level nuclear waste. Therefore, if nuclear waste shipments take place on transportation routes that could impact the Henderson area, the Plan would have to be updated and expanded to include emergency management functions and coordination related to potential accidents involving the release of nuclear waste.

The EMC participates in a number of local and regional groups involved in training, education, and the development of multi-jurisdictional exercises. For example, the EMC is responsible for an annual work plan through the Nevada Division of Emergency Management. In year 2000, the City of Henderson's EMC was the chairman of the Nuclear Waste Subcommittee for the LEPC--the Local Emergency Planning Committee. LEPC consists of all jurisdictions, hospitals, and various NGO's that meet to plan for major emergencies. In year 2000, a full-scale field exercise was completed by the Community Awareness and Emergency Response Group. The Office of Emergency Management Committee also assists other City Departments with the development of emergency plans.

4.3 The Police Department

There are currently approximately 200 officers in the City's Police Department and plans call for 366 officers by 2005. There are also 100 marked units assigned to patrol responsibilities. All officers meet the mandatory training requirements, but have no specific training related to the handling of nuclear accidents. In addition, the City has neither a 911 backup, nor a mobile

dispatch or mobile command post vehicle. Ion Chamber measuring devices that are needed during radiation emergencies are not currently carried in police patrol vehicles.

The estimated 2000 year budget (ending 6/30/00) for the City's Police Department was \$30,652,470. This budget consists of the following categories: Salaries and Wages, \$18,197,522; Employee Benefits, \$6,404,710; Services and Supplies, \$4,638,662; and Capital Outlay, \$1,411,576.

5.0 PROJECTED ADDITIONAL COSTS FOR PUBLIC SAFETY

The projected costs for additional public safety training, equipment and plans associated with nuclear waste shipments along Interstate 15 are estimated in this section. There are two categories of costs. The first, are the additional costs required in the areas of fire, police and emergency management in order to *prepare* for an accident that is depicted in Scenario 3. As stated earlier, these costs are additional to the provision of services to an already existing and growing population and economic base. These additional costs are related directly to the specific needs for new public safety facilities, equipment, training, and planning in order for the City to be prepared for an accident involving nuclear waste.

The second category of projected costs are those that will directly impact the City's three public safety departments fire, police and emergency management, in actually responding to each of the three individual events found in Scenario 1, 2 and 3, respectively. These costs are also additional to routine protection and rescue operations expected of city service providers. Costs related to emergency response activities include overtime salaries, possible vehicular decontamination, special barricades and fences, and costs of evacuation.

The information regarding the City's public safety needs and costs related to preparedness and response to possible accident events were developed by Ray Moser of the

Henderson Police Department and Michael Cyphers of the City Fire Department. They were assisted by personnel from the two City departments. All cost estimates are based on year 2007 dollars and base salaries and do not include employee benefits and administrative costs.

5.1 Projected Costs to the Office of Emergency Management

As mentioned earlier, although the Office of Emergency Management maintains Henderson's Emergency Operations Plan, the Plan does not contain a planning element devoted to a serious radiological emergency. The Office identified the need for preparing, printing, and distributing a high-level nuclear waste emergency management plan that would be added to the City's Emergency Operations Plan as an annex. The preparation and printing of an emergency response plan that incorporates a nuclear waste accident on I-15 is estimated to cost \$13,401 (2007 dollars).

The memorandum (September 25, 2000) by the City of Henderson to UER on Henderson's needs in the area of emergency preparedness includes public notification and education associated with the emergency management plan and possible simulation exercises. The basic costs for a public information program housed in the Office of Emergency Management would amount to approximately \$61,463 (2007 dollars). This would include the development and dissemination of information targeted to key stakeholders, public safety organizations, NGO's, and personnel responsible for hospitals, day-care centers, nursing homes and schools. Public education and outreach on nuclear waste issues is supported as an important public safety activity by most City personnel that were interviewed.

Currently, City personnel are active on various commissions and committees regarding the proposed nuclear waste program. If the proposed program is implemented, then additional personnel may be required in the planning, public information, and education areas. Based on

additional personnel requirements in other Valley cities, the City of Henderson may require an additional two staff persons to help in planning, information activities, and interact with other cities, the County, and the State in regional planning issues connected with nuclear waste.

While Henderson currently has a Reverse 911 System, emergency management personnel indicated that it would be necessary to increase the number of phone lines available for outgoing emergency messages. The estimated costs of expanding the current 48 lines to 96 (the number of lines identified by the Office of Emergency Management) is estimated to be around \$73,705 (2007 dollars).

Three items were specifically identified as needed in the Emergency Management Office: emergency response plan preparation; an expanded 911 Reverse Notification System; and a Public Information/Education Program. The projected costs of these three items were estimated at \$150,576 in year 2007 dollars.

5.2 Projected Costs to the Fire Department

Preparation by the City of Henderson's Fire Department to be able to effectively respond to a Scenario 3 event would require additional training of its operations personnel in the areas of radiation response and mass evacuation. The fire department provided information on the costs of this training. Based on the salaries of major classes of personnel (Captains, Engineers, Firefighter/Paramedics and Firefighters); a projected staff of 264 by year 2005; and overtime salaries for training (20 hours for radiation response and 10 hours for mass evacuation), the cost was estimated at \$210,888 (2007 dollars).

Currently, the City's Fire Department has 28 vehicles. In the case of a radiological incident, these vehicles will require radiation (Ion Chambers) survey meters as first response units. Based on the current 28 vehicles, the cost of the Ion Chamber equipment is estimated at

\$75,045 in 2007 dollars. Again, because the nuclear waste transportation program in the scenarios is assumed to commence in 2007, this cost estimation will be increased based on the number of vehicles in the fire department in 2007 and the likely increased costs of the radiation meters. Preparedness costs based on current dollars includes both training costs and equipment costs for a total of \$287,941 (2007 dollars).

6.0 SCENARIO-BASED RESPONSE COSTS

Three scenarios were developed and assigned to public safety agencies in order to project additional governmental costs to reiterate, scenario #1, which describes a non-incident transportation program would not result in any additional costs to the City's Fire Department except for the preparedness costs estimated above. Scenario #2 depicts a transportation mishap but without any release of radioactive waste materials. Because I-15 is not within the City's jurisdiction, the County Fire would respond in addition to other emergency response organizations. However, it is likely that Henderson Fire Department personnel may be the first-on-scene responders.

Fire Department personnel provide information on the additional costs resulting mostly from salary expenditures during a response period of 12 hours. These costs were based on response activities of the Fire Chief and Deputy Chief (EOC responsibilities), one engine, one battalion Chief, and 2 EMS. The total cost for utilizing existing resources in salaries was estimated to be \$3,347.52 (2000 dollars).

Scenario #3 depicts a serious transportation accident involving the release of radioactive materials and clean-up operations for up to one-year. Fire Department personnel view their responsibilities in such a case as immediate on-scene response and operating the EOC.

Therefore, the costs under Scenario #3 were based on utilizing existing resources for a 5-day

response period. In addition, the EOC would be staffed for at least 7 days. The costs were broken down by salaries as follows:

On Scene Response:

Battalion Chief @ \$50.11 X 24 hours X 5 days
Truck Crew @ \$88.62 X 24 hours X 5 days
2 Engines with crews @ \$117,24 X 24 hours X 5 days
3 Rescue vehicles with crews @ \$125.38 X 24 hour X 5 days
2 EMS @ \$22.20 X 24 hours X 5 days

EOC:

Fire Chief @ 62.04 X 12 hours X 7 days
Deputy Chief @ \$55.99 X 12 hours X 7 days
2 Division Chiefs @ \$100.22 X 12 hours X 7 days

The cost estimated for the Fire Department to respond to a Scenario #3 event was \$73,959.00 (2000 dollars). However, given the ambiguities of the radiation contamination plume in the scenario, cost estimates were not provided for possible equipment replacement or decontamination that could result, although replacement costs for vehicles could be significant.

6.1 Projected Additional Costs to the Police Department: Preparedness

By the time the transportation of nuclear waste is assumed to begin, the number of officers on the police force is projected to be around 366. Additional training for police to handle a nuclear waste transportation accident as depicted in Scenario #3, would include: 20 hours of training directed at managing nuclear accidents; 10 hours of updated training in handling mass evacuations; and 10 hours of other training needs. The total cost for such training was estimated by Police Department personnel to be about \$510,195 (2007 dollars).

The need for a specialized vehicle to function as a mobile 911 back-up, as well as mobile command post, was identified by both fire and police personnel. The cost of such a vehicle was estimated to \$402,029 (2007 dollars). Lastly, the cost of Ion Chamber survey meters for 15

vehicles was estimated at \$40,203 (2007 dollars). The total cost for preparing the Police Department for a possible nuclear waste transportation accident was estimated to be \$954,434 in 2007 dollars.

6.2 Scenario-Based Additional Projected Costs for the Police Department

Costs were projected for Scenarios 2 and 3 on the basis of the number of personnel and time required to respond to each event. The Police Department response to a Scenario 2 event would require a 24-hour or less response with 10 officers assigned to two twelve-hour shifts. The estimated cost for responding to a scenario 2 accident was \$11,436 (2000 dollars).

A Scenario 3 event according to Police Department personnel would exceed the capacity of the Henderson Police Department. The closure of Interstate 15 and possible surrounding areas, mass casualties near or in Henderson would require State and Federal assistance. Based on the number of officers required, their salaries and substitution costs the closure of Interstate 15 and surrounding areas for up to six months would require police involvement at a cost of over \$4 million (2000 dollars).

6.3 Total Additional Cost for Henderson's Public Safety Department

Table 1 shows the projected cost breakdown by Department and purpose. These costs are associated with being prepared for an accident event as depicted in Scenario 3. The projected costs for training, equipment and planning for the three public safety departments are \$1,087,602. These are in current dollars and salaries. Actual responses by Henderson's public safety departments in the case of a Scenario 3 emergency could result in an additional \$4.2 million. These costs may be underestimated because they do not include special equipment needs not anticipated at this juncture, or costs of replacing equipment due to contamination, and other costs that are uncertain due to the ambiguities of a scenario-based accident event.

**TABLE 1
CITY OF HENDERSON PROJECTED PUBLIC SAFETY COSTS FOR EMERGENCY
PREPARATION**

AGENCY	COST 2007\$	PURPOSE
Police Department		
Salaries During Training for 366 officers	\$510,195	Overtime Budget during Nuclear Accident Training
Equipment-vehicles	402,029	Specialized Mobile Command Post, Dispatch Center, and 911 backup vehicle
Equipment- Ion Chambers Survey Meter	\$40,203	15 Ion Chamber Survey Meters
Subtotal	\$954,434	
Fire Department		
Salaries During Training	\$140,592	Overtime Budget during 20 Hours of Radiation Training
	\$70,296	Overtime Budget During 10 Hours of Mass Evacuation Training
Equipment	\$75,045	28 Ion Chamber Survey Meters
Subtotal	\$287,941	
Emergency Management		
Emergency Response Plan Preparation	\$13,401	Preparation and Printing of an Emergency Response Plan
911 Reverse Notification System	\$73,705*	Reverse Notification System Expansion from 48 to 96 lines
Public Information Program	\$61,463	
Subtotal	\$150,576	
TOTAL	\$1,392,951	

7.0 OTHER FISCAL COSTS RESULTING FROM NUCLEAR WASTE SHIPMENTS

A large number of studies to date have shown the potential for economic downturns and property value diminution in areas close to routes that will transport nuclear waste. For example, a study that examined the potential impacts on development and growth of using the Northern Beltway for nuclear waste shipments found potentially adverse impacts on growth, changes in projected land uses, and property values. In addition, a recent study for the State of Nevada

showed that property value losses may also occur as a result of nuclear waste transportation and related accident events. Properties located up to three miles from a route carrying nuclear waste may be adversely impacted. If and when the transportation of nuclear waste commences along I-15, this area of the City may well be fully built out as plans suggest. Not only is it possible that the risk of nuclear waste transport may thwart some development or cause a change in proposed land uses, but an accident along I-15 may result in property value losses to areas near the route. At this point, there is a lack of information on possible diminution effects by specific land uses to provide estimates of any revenue impacts to City operations.

Interviews with the directors of the City's Finance Department and Parks and Recreation Department suggest the potential for adverse impacts. First, details of the State financial and tax system and the revenue allocations to communities are dealt with in the fiscal impact report completed on the City of Las Vegas. Based on the interview with the director of Henderson's Finance Department (S. Hanson, 10/16/2000), it seems that Henderson may be bonded to a larger extent than other communities in the Las Vegas Valley. Hence a downturn in revenues from property value declines and other sources of tax revenue could have a potentially larger impact in the City's ability to retire their bonds. Currently a contingency plan is in place for economic downturns because the City's fiscal system is reliant on growth.

The City's Parks and Recreation Department is also vulnerable to a downturn in growth and property values. The budget for Culture and Recreation ending 6/30/01 was \$20,747,318 indicating the importance given to this department. Moreover, according to the Director of the Department (Interview 10/16/2000 with S. Rongyocsik), the City has an estimated \$50 to \$55 million in general obligation bonds for parks and recreation. Because these bonds are retired

from a variety of taxes, any downturn in growth and property values may affect the City's ability to retire bonds and expand new programs.

The *Five Year Plan* (Progress for the 21st Century) for the Parks and Recreation Department, demonstrates the importance the City places on recreation, open space, and parks. The Plan specifically addresses the rapid expansion of the City to the west towards I-15, (including the significant Del Webb community), the growth along Lake Mead Drive, and the Black Mountain area to the south. Given these growth areas, the *Five Year Plan* recommends principles and alternatives for park and recreation facility development that is proactive, based on high standards, and sensitive to open space needs.

It is important to note that the *Five Year Plan* addresses the importance of parks and recreation as key to the quality of life in Henderson, especially in the context of the unprecedented urban growth the city is experiencing. In 2000, the Department was seeking accreditation from the National Recreation and Park Association which would make it one of the few nationally accredited departments. It is clear from the interview with the Director of the department, that nuclear waste transportation along I-15 could potentially and significantly impact the quality of life of Henderson's population.

APPENDIX A

Methodological Notes

A.1 HISTORY OF GOVERNMENTAL FISCAL IMPACT METHODS

Governmental fiscal impact analysis has a long history in both the planning, and the intergovernmental finance fields. Early fiscal impact studies emerged from the need of local communities to estimate impacts on their local revenues and their ability to deliver city services. These needed fiscal and service estimates were the result of the constantly increasing public costs associated with land development. In addition, these studies recognized the increasing costs resulting from public service demands of various forms of residential and nonresidential growth.

Fiscal impact analysis is used by municipalities in forecasting the public costs resulting from increased demands caused by growth. In a similar vein, such impact analysis can, and is, applied to estimating the public costs from a particular or group of private projects of significant size as cities attempt to determine fiscal impacts so that they may levy concomitant impact fees. For example, fiscal impact assessment has been done on forecasting the public costs and revenues of various growth management policies or large central city developments.

Fiscal impact analysis may also be found in the intergovernmental fiscal literature focusing on mandates and their costs. Mandates are often defined very simply as any legislative or executive order that conditions or regulates the behavior of another level of government. Mandates entail the imposition of authority by one level of government on another and often take the form of rules and regulations. Most frequently, mandates originate at the state level of government and are imposed on local governments. One study showed that between 1990-1993, the average state passed 37 mandates on to its local governments per legislative session. In another study that examined just seven bills introduced in Congress in 1991, it was estimated that the cost of this legislation to the states was estimated at over \$1.6 billion. The research literature increasingly has demonstrated the expanding costs of mandates by the federal government on the

states' governments, and similarly increasing costs on local governments resulting from state mandates.

These costs have resulted in efforts by the federal government, but mostly by the states, including Nevada, to estimate, and in some cases at the state level to reimburse, the costs of mandates on impacted governments. The growth of estimating the effects of mandates, known as fiscal noting, is most impressive. Mushkatel and Pijawka noted the following in summarizing this growth: in 1978 only four states had reimbursement programs for local governments to cover the costs of state mandated programs; in 1985, 15 states had adopted such programs with another 41 states attaching fiscal notes to legislation estimating impacts. These two authors have demonstrated that both the Nuclear Waste Policy Act (NWPA) and the Nuclear Waste Policy Act Amendments of 1987 (NWPAA) contain several mandates for Nevada and her municipalities that involve fiscal costs that can and should be reimbursed.

Nevada first required fiscal noting in its 1993 legislation (NRS 218.272 – 218.276). The state does not require reimbursement of county and local governments affected by legislation. The Legislative Counsel Bureau, Fiscal Analysis Division is responsible for preparing fiscal notes under a variety of conditions set out in the legislation that need not concern us here. The Fiscal Analysis Division details the effects of certain bills, resolutions, and ballot questions. The degree of complexity and the methods used varies from state to state in projecting costs. What is consistent for the planning based fiscal impact projections and these mandated fiscal notes is that they entail cost projections for government.

A.2 METHODOLOGICAL APPROACHES TO GOVERNMENTAL FISCAL IMPACT ANALYSIS

The potential fiscal costs to government in the form of expenditures include increased operating expenditures (salaries, training, services, statutory and material costs) and capital outlays. Some types of fiscal impact analysis focus primarily on population and or employment multipliers and the resulting fiscal costs to government associated with these changes. These studies tend to be formula driven or multiplier types of studies as applied to public services to determine the increased costs based on a per unit expenditure. This ‘average’ costing per unit technique is the first type of approach to fiscal impact analysis and is often used in large siting impact studies.

Average costing approaches often do not consider existing excess or deficient capacity that might exist for particular services. That is, the possibility that a new mandate or requirement might fall at the threshold level, requiring new capital construction, equipment or personnel to meet the demands of the new requirements, or in this case the new repository project and the associated costs due to expanded transportation demands. Hence, because the existence of current capacity can heavily affect the potential costs that a new project has on government (e.g. existing capacity is deficient and the requirements of the new project, plant, policy lead to government failure to provide adequate services) the average costing approaches may not be appropriate for estimating fiscal impacts.

The second approach, and the one utilized in this study, is a marginal cost approach. This approach takes into account existing supply and demand relationships by determining existing excess or deficient capacity, projecting the new demand and determining what additional (if any) capacity at what cost is necessary. In instances where communities or government have excess

capacity, the fiscal impact projections using a marginal cost approach will lag behind average costing techniques or be roughly similar. When there are deficiencies in capacity, or where government is providing services at its full capacity, average costing approaches will not provide an accurate estimate because they may not account for the costs of new plants, personnel, equipment, training (etc.).

Within these two general approaches, average and marginal costing, there are three variants of each. For our purposes, it is important to note that the three marginal costing approaches consist of the 1) case study, 2) comparable city, and 3) employment anticipation techniques. One selects the method depending in large part on the nature of the problem faced. The marginal cost approaches are most appropriate when confronting unique projects or developments. Unfortunately, there are neither any comparably sized or situated cities that can be used for easy comparisons concerning expenditures (etc.), nor is there reason to anticipate that there will be sufficient numbers of employees from the siting to warrant the use of the third approach. Instead, the case study marginal cost approach is adopted here. This case study approach is particularly well suited for rapidly growing areas where over-used service capacities are likely to exist, and where the average of yesterday's costs per capita multiplied by the population to be added is not a good indicator of future costs. Rather, this approach is ideally suited when it is necessary to be sensitive to existing excess, deficient or strained service capacity, and is invaluable for examining fiscal impacts from non-residential or public facility projects.

A.3 THE CASE STUDY METHOD FOR PROJECTING GOVERNMENTAL FISCAL COSTS

The case study method “employs intensive site-specific investigations to determine categories of excess or slack in public service delivery capacity.” Excess capacity exists when there is capacity beyond that needed to accommodate existing service need or demand, and deficient capacity exists when the current capacity is below what is needed or near the limits of what can be provided. These deficient or excess service capacities are subtracted from or added to the projected estimates of operating and capital demands. Hence, excess existing capacity can actually mitigate the effects of a project on a community, as it may already possess the capacity to meet these future or projected service needs and demands. Alternatively, should a community be at peak capacity or deficient capacity already exists, then additional demand may have far greater impact than an average cost technique would project. In fiscal impact analysis used by planners, when a new development results in, for example a new fire station, or rescue station, the new development may be charged for the entire cost. In a similar vein if a new project or mandate results in the necessity of new equipment, training, or various capital outlays, the relevant acts (NWPA, NWPAA) specify that the agent of these new costs be charged for the entire amount of the new capacity.

Several assumptions underlie the use of the case study cost projection method. Briefly, the first assumption is that communities differ in the degree to which they exhibit excess or deficient capacity. The second assumption is that marginal changes in providing various municipal and county services are a reaction to service excesses or deficiencies. A third assumption is that local standards (not national ones) in large part represent the criteria by which local excess and deficient service levels will be measured. Finally and most importantly, local

department heads and personnel are the individuals that are best suited and most knowledgeable about the service capacity of their agencies, and about the future service needs associated with new projects or mandates. It is this case study method that has been used extensively on state agency personnel in Nevada to project the costs of the high-level nuclear waste repository at the state governmental level.

The case study methodology for estimating fiscal impacts was adopted for projecting fiscal costs to the governmental agencies in incorporated cities in Clark County. This methodology entails the following steps:

1. Convene a meeting of city and tribal representatives (and their selected emergency service representative from their city) to the Clark County Nuclear Waste Division's (NWD) Advisory Committee to explain the purpose and methodology of the study and enlist their cooperation.
2. Contact and interview the city representative to the County Nuclear Waste Division's Advisory Committee to identify the likely city agencies that will be impacted.
3. Contact and interview these key governmental and public officials (emergency management, police, fire, budget, planning).
4. Categorize current local governmental services by function and the administrative agencies responsible for each (particular attention to each community's governmental organization is required at this stage);
5. Determine current levels of service provision, as well as existing service excess or deficiency for various public services;
6. Project future service needs and demands using existing mandates and agency responsibilities, as well as through the interviews conducted;
7. Interview local agency personnel to determine how their departments will respond to the scenarios characterizing the nature of the future repository and transportation

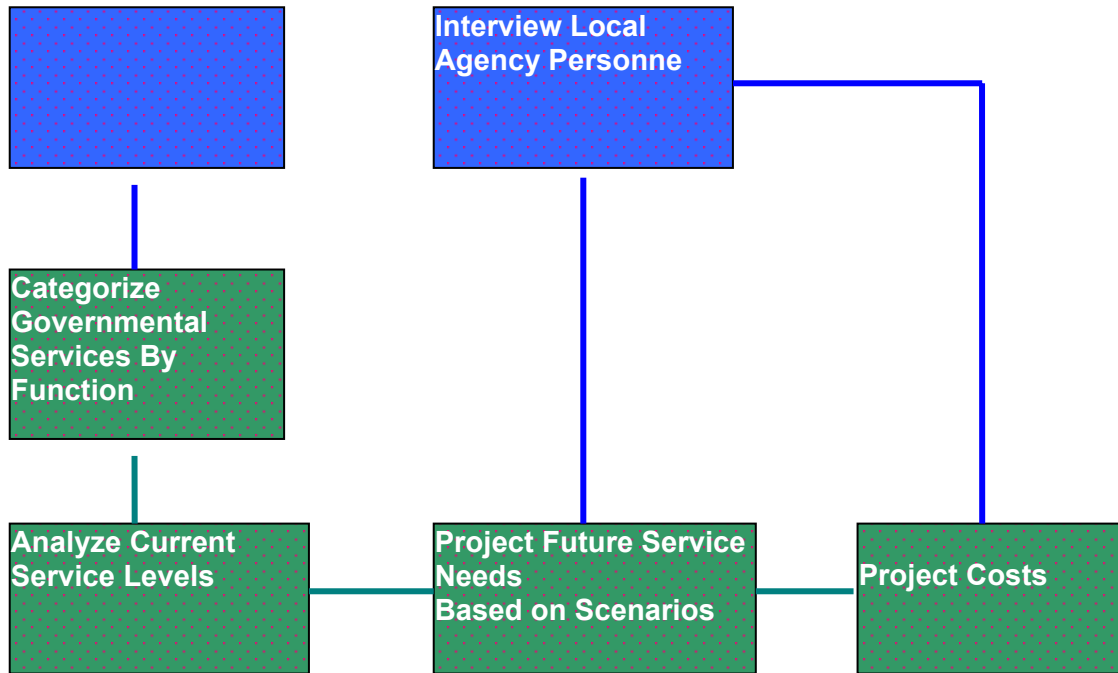
of waste, and how these scenarios will either result in the necessity of expanded capacities (or not) and the projected response of the agency;

8. Estimate fiscal costs that will be incurred by each affected agency and the affected units of local government as a result of their projected response to the scenarios (needed training, equipment, operational expenditures, and capital outlays over the life cycle of the project).

These steps in the methodology that was employed can be collapsed, and be viewed diagrammatically as the basic approach to projecting fiscal impacts from the proposed repository for city agencies (Figure A-1). Figure A-1 outlines the approach to projecting the fiscal impacts and it can be seen clearly that the process is iterative and non-linear. These steps are not linear as there are several contacts and interviews with agency personnel as the study progresses.

Frequently, after an interview with agency personnel it is necessary to again interview that individual for clarification or draw on their expertise to adequately project the impacts of the project. Often interviews with agency staff members results in being referred to another member of an agency's personnel. In addition, in order to increase the comparability of the projections, interview schedules contained a basic set of questions that were developed and used for each informant interviewed.

Figure A-1 – Methodological Approaches



The first meeting (Step 1 above) to explain the purpose of the study and enlist support of the city members of the NWD’s Advisory Committee, designated representatives from public safety agencies, and Tribal representatives was held on August 23, 2000 at the Clark County Governmental Complex. Fourteen representatives from the four cities and Tribes involved in the study attended the meeting along with several governmental agency representatives from the State, County, and Regional Transportation Commission. Immediately following the meeting, interview appointments were made with each of the City and Tribal representatives present.

APPENDIX B

Transportation Scenarios

B.1 GENERAL INFORMATION

Over the next 24 years, beginning July 2007, the U.S. Department of Energy plans to ship high-level nuclear waste through Clark County to a repository to be built at Yucca Mountain, Nevada. The U.S.DOE plans to ship:

Number of Highway Shipments Expected - All Truck Scenario

Total number of truck shipments projected over a 24 year shipping period:	49,500
Number of shipments per year:	2,063
Number of shipments per week:	40
Number of shipments per day:	5.7

The shipment routes are as follows: (See attached map for route depictions)

- **I-1 5 south from the Utah border to U.S. 95 north**
- **I-1 5 south from the Utah border to the northern Las Vegas Beltway to U.S. 95 north**
- **I-1 5 north from the California border to U.S. 95 north**
- **I-15 north from the California border to the southern Las Vegas Beltway to U.S. 95 north**

These shipment numbers and routes were used to establish context for interviews with local government and tribal officials. The three scenarios remained the same for the interviews in each community, but different routes and locations of incidents were used within the respective jurisdictions.

B.2 TRANSPORTATION SCENARIO 1

Under Scenario 1, no accident of any kind has occurred by the end of the third year of shipments, and the probability of an accident is remote. However, interested parties have generated considerable adverse publicity. Residential property values have declined an average of almost 4% within one mile of the transportation corridor, while commercial properties have declined an average of 3% and industrial properties have declined an average of just over 1% within one mile of the transportation corridor.

B.3 TRANSPORTATION SCENARIO 2

Shipments of nuclear waste to the Yucca Mountain repository site progress for three years without incident. Three days after New Year's Day 2010, the driver of a truck transporting nuclear waste loses control of the vehicle and the truck overturns at I-15 at Exit 122. The cask containing the nuclear waste breaks away from the trailer and skids 50 yards. *The cask remains intact and no radiation is released*, but the local and national media cover the event heavily. Emergency management personnel respond effectively to the incident and redirect traffic until it is determined that no radiation was released. Within one day traffic resumed on I-15.

B.4 TRANSPORTATION SCENARIO 3

In the third year of the shipping campaign, a truck carrying one cask of nuclear waste from a reactor destined for the Yucca Mountain high-level radioactive waste repository is involved in a major accident on I-15 at Exit 122. The spent fuel truck overturns at 60 mph. Seconds later, a fully loaded gasoline tanker crashes into the wreckage and bursts into flames. The fire burns for more than two hours.

Winds carry the fire plume towards populated areas, dispersing radioactive materials over a wide area. Five persons receive doses of radiation at levels that result in cancer fatalities.

The affected highway is closed for seven days. The two drivers of the spent fuel hauler and the gasoline tanker, and one driver-escort, die from head injuries and burns. Six months later, the cleanup effort is still under way and is completed within one year. The accident receives repeated worldwide news coverage.

Residential property values decline an average of 34% within one mile and an average of 24% between one and three miles of the transportation corridor; commercial property values

decline an average of 32% within one mile and an average of 20% between one and three miles of the transportation corridor. Finally, industrial property values decline an average of 25% within one mile and an average of 17% between one and three miles of the transportation corridor.