

THE PLANNING PROCESS

Project Scope and Objectives

The NDOT Advisory Steering Committee considered various alternatives as to approach and content for the master plan and ultimately recommended that the Department enter into inter-local agreements (agreement between government agencies) between the Department and the University of Nevada Las Vegas Landscape Architectural Department, and the University of Nevada, Reno Departments of Environmental and Resource Sciences, and the Cooperative Extension to accomplish the following categories of work.

Work by the University of Nevada, Reno, is undertaken as a research project. Work by the University of Nevada, Las Vegas is undertaken as a planning project.

Consultants

THE UNIVERSITY OF NEVADA, RENO

1. **Title:** A consideration of revegetation practices along Nevada highways as determined by the distribution of the natural vegetation and soils.

2. PRINCIPAL INVESTIGATORS:

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3. PROBLEM STATEMENT

This proposal is designed to provide information and guidelines to the Nevada Department of Transportation relative to placing vegetation on various sites along the highways including cuts and fills, areas newly worked for various reasons or areas that for various reasons require additional vegetation for aesthetic or environmental considerations. This will be based on an understanding of the natural vegetation ecosystems found along the rights-of-way. In addition this research will address other associated environmental questions (e.g. vegetation conducive to wildfire hazard and the movement of invasive and noxious weeds) related to the vegetation resources along the rights-of way. In addition we will be providing information on species that might be useful in a landscape architectural context to be used in high traffic areas in urban areas, rest stops and some exits in the rural areas. This effort will address itself to the Nevada Department of Transportation Landscape and Aesthetics Policy.

4. BACKGROUND SUMMARY

The proposal is to work closely with the NDOT's landscape architect, and landscape architects at UNLV to develop plans for improving aesthetics and maintaining the ecological integrity of rights-of-way across the state of Nevada. A guiding principle will be the scoping activities of the NDOT Landscape Advisory Planning Committee and the Landscape Master Plan Proposal as well as the NDOT Landscape and Aesthetics Policy. Of interest is the development of standards and guidelines related to types of plants by vegetation ecosystem, soil guidelines, irrigation guidelines and maintenance guidelines. Both urban and rural highways will be included in this study.

5. PROPOSED RESEARCH:

Objectives

1. To inventory the major plant communities and general soil classification units along the various highways across the state.
2. To recommend the best procedures and best management practices (BMP) management practices for each segment of highway across the state to correspond with the kinds of vegetation and soil inventories in #1 above.

Our first step will be to acquire shape or vector files of all highways to be used as a part of this study, if available from the Nevada Department of Transportation. We will then place these on several mosaics of Nevada based on year 2000 Landsat 7 Thematic Mapper Images. This will provide a first cut analysis of the basic and general kinds of plant communities found along each of the highways across the state. We will probably develop 7 or 8 mosaics of the Landsat data to cover the state. We have complete coverage of the state in our remote sensing laboratory in the Department of Environmental and Resource Sciences. It will be necessary to supplement this data with additional kinds of data.

- a) Fieldwork to document the natural vegetation along reaches of highways that are somewhat difficult to determine from the Landsat data. Much of the interpretation here will be done by the principal investigators, which between them have over 60 years of experience in the state of Nevada looking at vegetation questions.
- b) Determine if the NDOT has somewhat recent larger scale aerial photographs along various highways that can be further interpreted to determine the kinds and amount of vegetation found there. We will also determine the potential use of other

images that may be available in our remote sensing laboratory or in the aerial photo/image archives of the Nevada Bureau of Mines or possibly other sources.

- c) We will examine soil surveys for the state published by the Natural Resources Conservation Service of the U. S. Department of Agriculture. The ecological site write-ups along with their associated soil classification units will be very helpful as we determine some of the seeding efforts as part of the second objective of this proposal.

Relative to the second objective of this proposal we will use the data obtained above to make recommendations relative to the establishment of vegetation areas deemed to require new or increased vegetation for either aesthetic or environmental reasons. We will begin by following some of the general guidelines in the publication “Conservation Plantings for Natural Resources Management –Rangelands, Windbreaks, Wildlife Habitat, Soil Protection, Conservation Cover and Mined-Land Reclamation,” joint recommendations by the University of Nevada Cooperative Extension and the USDA, Natural Resources Conservation Service. This manuscript will serve as the first line of information and will be supplemented with new information that has become available since this manuscript was published. Some of the considerations are as follows:

- a) Selection of species or species mixtures that would be most appropriate and most successful for use on any given area of concern along any of the highway rights-of-way. Emphasis will be given in indigenous species of plants. The availability of plant materials, especially for native plants, is often tenuous and somewhat costly. Recent efforts for wildfire rehabilitation have tended to completely use up any available seed sources. It will be necessary for us to determine the availability and general cost of these resources for this project and provide guidelines for future efforts by NDOT. The many species listed in the publication mentioned above are provided with information such as drought tolerance, minimum annual rainfall needs, salt and alkali tolerance, seedling vigor, growth habit, suitable soil groups, seeding rates lbs/ac. PLS (Pure Live Seed) and other information.
- b) maintenance by NDOT over the long period. This might require a change in roadside maintenance. Some the suggested species might be importance from the standpoint of defensible space for wildfire along the highway corridors.

- c) As we evaluate the vegetation we will, at the same time, also consider certain other important aspect if importance to the sate. These include a consideration of invasive and noxious weeds. There is presently great concern throughout Nevada and throughout the United States relative to the influx of noxious weeds and their relationship to degrading the natural vegetation, reducing aesthetics and enhancing the probability of ignition and carrying of catastrophic wildfires. Since the highways of the state provide a natural corridor for the distribution such plant materials it is very important that these problems be considered. The number of these species of concern is already quite large and is growing as new materials are brought into the state. Among these species are plants such as Dyer's Woad, Yellow Star Thistle, Halogeton, Cheat grass, White Top, Diffuse knapweed, Spotted knapweed, Russian knapweed, Squarrose knapweed, Rush skeletonweed, Hoary cress Medusa head Dalmation toadflax, yellow toadflax, Saltcedar. As we consider the natural vegetation and their ecosystems we will be aware of the relationship between the movement of these weedy species and the activities of the DOT.

6. ANTICIPATED BENEFITS.

A ready list of recommendations for procedures and species to do revegetation with anywhere along any of the DOT rights-of-way depending upon the preexisting natural vegetation and the types of soils associated with the preexisting vegetation. Information will be available on other environmental questions including the probability of high fire hazard associated with different kinds of vegetation and the possible movement of invasive and noxious weeds along the rights-of-way.

7. PRODUCTS AND IMPLEMENTATION PLAN

Our report will include maps of the major kinds of vegetation ecosystems along the highways of the state. Recommendations for revegetation opportunities and procedures will be provided for each of the major vegetation ecosystems and soil types along any of the states highways. This will include a review of availability of seeds, seeding procedures, potential supplemental irrigation efforts, and soil amendments for various reaches of highway based on precipitation, natural vegetation, soils and other factors. As we document the natural vegetation along the rights-of-way our reports will suggest any vegetation problems that may be associated with invasive and noxious weeds or with fire hazard.

8. DURATION/SCHEDULE

The project will run for one year terminating on July 1, 2002.

Schedule of Activities

July 2001 - Prepare mosaics of Landsat data

August through November 2001. Initiate the work to examine and define vegetation and soils along highway reaches; initiate the preparation of mosaics of Landsat data, acquire and begin to interpret aerial photographs.

December 2001 Begin organizing data vegetation data, species selection and species mixtures for various reaches.

January 2002 through March 2002. Initiate and work on the development of species lists and various recommendations for seeding procedures and techniques.

April through June 2002 Continue to examine and define vegetation and soils along highway reaches using various forms of field work plus remote sensing.

July 2002 - Present findings and produce final report.

FACILITIES

This work will be accomplished both in the field and in the remote sensing laboratory of the Department of Environmental and Resource Sciences, University of Nevada Reno. All required image processing hardware and software is available. Some of the work may be accomplished in field offices of the Nevada Cooperative Extension.

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Scope of Work and Schedule

Phase I & II - Data Collect, Transfer, and Analysis.....Jul 15 to Sept 15, 2001

- Collect, review, and analyze various data and background information.
- Prepare and submit for review and input by the Department and the Advisory Committee a detailed and comprehensive background information report.
- Revise and finalize the background information report to reflect input from the

Phase II - Prelim Vision and Concept Development....Sept 15 to Nov 15, 2001

- Prepare a preliminary vision and concept development plan and make preliminary recommendations regarding five major focus areas (urban highways, rural highways, city streets, maintenance facilities, and open space; and, four major work categories (existing facilities, new construction, capacity improvements, milling and overlay) within a stated framework of work items.
- Submit the plan for review and input by the Department and the Advisory Committee.
- Revise the plan in accordance with input and information received during the review process.
- Organize and conduct three public hearings and/or workshops to gain public input, guidance, and direction.

Phase III - Final Vision and concept Development.....Nov 15, 2001 to Feb 15, 2002

- Revise and finalize the preliminary vision and concepts plan and report based upon input from the Department, the Advisory Committee, and the general public.
- Submit the plan for review and input by the Department and the Advisory Committee.
- Organize and conduct three public hearings and/or workshops to gain public input, guidance, and direction.
- Revise the plan in accordance with input and information received during the review process.

Phase IV - Policies, Procedures, Standards, and Guidelines Development...Feb 15 to Mar 15, 2002

- Review existing Department policies, standards, guidelines, and procedures.
- Prepare and submit for review recommended changes and new policies, procedures, standards, and guidelines.
- Revise the plan in accordance with input and information received during the review process
- Present final conclusions and recommendations to the Advisory Committee and make appropriate revisions.

- Prepare final documentation for State Transportation Board presentation.

Phase V - Final Conclusions and Recommendations.....Mar 15 to May 15, 2002

- Consolidate work, make final revisions to plans, reports, policies, guidelines, standards, and procedures based upon input from the Department, the Advisory Committee, and the general public.
- Present final recommendations and conclusions to the Department and the Advisory Committee.
- Prepare final documentation for presentation to the State Transportation Board.

Phase VI - Transportation Board Presentation.....May 15 to June 15, 2002

- Participate in presentation of recommended policies, procedures, standards to the Transportation Board in June of 2002.
- Make final revision in accordance with changes and direction given by the Board.

Final Closeout.....August 30, 2002

- Revise, finalize and prepare documentation in an camera-ready format for delivery to the Department for publication and distribution.
- Archive study materials.
- Prepare and submit a final research grant summary report.
- Prepare and submit a final budget reconciliation report.