TAHOE REGIONAL PLANNING AGENCY
ADVISORY PLANNING COMMISSION

NOTICE IS HEREBY GIVEN that the Advisory Planning Commission of
the Tahoe Regional Planning Agency will conduct its regular meeting at
9:30 a.m. on August 14, 1991, at the Tahoe Sands Inn Convention Center, 3600
Highway 50, South Lake Tahoe, California. The agenda for said meeting is
attached hereto and made a part of this notice.

August 5, 1991

David S. Ziegler
Executive Director

This agenda has been posted at the TRPA office and at the following post
offices: Zephyr Cove and Stateline, Nevada, and Al Tahoe, Tahoe Valley,
and Tahoe City, California.
All items on this agenda are action items unless otherwise noted.

AGENDA

I CALL TO ORDER AND DETERMINATION OF QUORUM

II APPROVAL OF AGENDA

III DISPOSITION OF MINUTES

IV PLANNING MATTERS

A. Discussion on 1991 Threshold Evaluation Pertaining to Scenic Resources, Noise, and Economics

V PUBLIC HEARING AND RECOMMENDATION

A. Amendment of Plan Area Statement 170 (Tahoe Park/Pineland) to Permit Professional offices and Personal Services as Special Uses (Continued to September)

B. Amendment of Chapters 2, 4, 5, 8, 18, 20, 25, 34, 37, 38, 53, and 82 to Make Technical Corrections and to Clarify Existing Provisions

C. Man-Modified Designation for APNs 94-190-26 and -22, Placer County

D. Amendments to the 208 Plan Stream Environment Zone Restoration Program (Continued to September)

E. Amendment of Ski Area Master Plan Guidelines Regarding Cumulative Watershed Effects Analysis Policy and Methodology

F. Adoption of the Revised Stream Environment Zone/Land Capability Map Overlay for the Tahoe City Area

G. Amendment to Chapter 18 Regarding Definition of Day Care/Pre-School Facilities

H. Amendment of the United States Postal Service Action Plan and Related Amendments to the Regional Plan
VI  REPORTS

A.  Executive Director
   1.  Status Report on Elkpoint Community Beach Master Plan
B.  Legal Counsel
C.  APC Members
D.  Public Interest Comments

VII  PENDING MATTERS

VIII  ADJOURNMENT
July 29, 1991

To: Advisory Planning Commission

From: TRPA Staff

Subject: Discussion on 1991 Threshold Evaluation Pertaining to Scenic Resources

Attached to this memorandum is the Draft 1991 Scenic Resources Threshold Evaluation Report. The report was prepared by the Scenic Resources Threshold Review Committee consisting of TRPA staff Andrew Strain and Don Sargent, Lake Tahoe Basin Management Unit landscape architect Frank Magary, Sheila Brady, Brady and Associates, Inc. Planners and Landscape Architects, and Wayne Iverson, Scenic Resource Management, Inc. The report consists of six sections:

I. Introduction
II. Background
III. Evaluation Procedures and Methods
IV. Results
V. Discussion
VI. Conclusions

The basic findings of the evaluation are listed below. They are cross-referenced to the appropriate section in the report.

1. Threshold travel route ratings have increased in seven of 45 roadway units. Three of the 7 units which increased are in attainment while four are nonattainment. Ratings decreased in four roadway units, all of which are already considered to be in attainment with the threshold value of 16. None of the units with new ratings changed attainment/nonattainment status. As in 1986, there are still 22 attainment and 23 nonattainment units. Travel route ratings did not increase in any of the 33 shoreline units. Ratings decreased in four shoreline units. One of these units dropped
Discussion on 1991 Threshold Evaluation Pertaining to Scenic Resources -- Page 2

below the minimum attainment rating of eight. There are now 28 shoreline units in threshold attainment and five which have nonattainment status. Refer to Travel Route Rating threshold discussions in Section IV. Results, beginning on page 14, and Section V. Trends, beginning on page 27.

2. Unit-wide threshold scenic route ratings did not change for any roadway or shoreline units. There were, however, changes to individual resources within several units as follows:

A. Resources within five roadway units changed, three resources increased in value, two decreased.

B. A total of eight individual resources within four shoreline units decreased.

Refer to Scenic Quality Rating threshold discussions in Section IV. Results, and Section V. Trends.

3. The report proposes minor language and methodology changes to the scenic quality rating threshold as described in Section VI. Conclusions. The changes will make the threshold clearer with respect to what it is that is being protected, and remove the unit-wide compositing scoring process. Removing the compositing process will remove ambiguity about which value is the actual threshold, and improve the sensitivity of the rating system. Refer to discussions on pages 35 and 41.

4. The report recommends adopting the Scenic Thresholds for public recreation areas and bicycle paths as required by TRPA Resolution 82-11 which, in 1982, originally adopted all the Environmental Threshold Carrying Capacities. Discussion of this threshold begins on page 10 and again on page 41.

Recommendation: At this time staff is not seeking APC action on the 91 Evaluation. Staff will begin the discussion with a slide show and presentation. Please contact Andrew Strain or Don Sargent at (702) 588-4547 if you have any questions or comments.
I. INTRODUCTION

The purpose of the 1991 Regional Plan and Threshold Review for scenic resources thresholds is to evaluate progress toward the threshold attainment schedule adopted in 1989 by TRPA as part of the Scenic Resources Management Plan. Its purpose also includes: evaluating the appropriateness of the thresholds and interim attainment schedule targets; evaluating the effectiveness of the adopted control measures; and recommending revisions to the thresholds, targets, or control measures.

II. BACKGROUND

When first seen from a distance, the inherent scenic character dominates and the basin appears as a relatively homogeneous forested landscape, not unlike other mountainous regions of western North America. The Lake itself adds a unique visual element to many views. As a vast, flat surface, it permits long-distance vistas to shorelines and mountains several miles away. Coarse-textured conifers dominate the forest overstory with prevalent species including White fir, Jeffrey, sugar, and lodgepole pine. Upon closer inspection, however, the basin contains everything from pristine wild lands in the Desolation Wilderness, to dense, multi-story urban core development at Stateline, Nevada. Historical settlement patterns, public land ownership, and topographic constraints have produced a series of long linear or even elliptical, growth patterns generally radiating from urbanized commercial centers. Extensive development of residential, commercial, tourist, and recreational land uses can be directly attributed to its attractiveness. In 1950, the permanent population was estimated at only 500 persons (Sierra Institute for Environmental Research and Education, 1987). Today the region supports a year-round population of some 45,000 people, and as a largely tourist-based economy, has the ability to house, feed, and entertain almost 95,000 people on any given weekend or holiday (Tahoe Regional Planning Agency, 1988). Recent visitor estimates indicate that the basin attracts 10 million annual visitor days (Rosall Remmen and Cares, 1989). On the Nevada side of the Lake, casinos and gaming activities consistently attract substantial numbers of visitors.

The mostly narrow strip of inhabitable land that encircles the Lake's 72 mile perimeter has resulted in strip commercial development in many communities with attendant traffic congestion and visual quality concerns. Communities around the Lake have developed differently in this alpine landscape, from quaint, pedestrian-oriented commercial neighborhoods to loud urban downtowns complete with high-rise hotel towers and casinos. Overall, however, it could be readily seen that the visual quality of the build environment was adversely impacting the scenic quality of the natural
Figure 1. Tahoe's Natural Landscape Serves as a Primary Attraction to Residents and Visitors

PHOTOGRAPH

Figure 2. The Appearance of the Built Environment has been Identified as a Scenic Quality Problem

PHOTOGRAPH
environment. While visitors to the Lake cite scenic resources as one of the primary reasons for visiting, a recent survey of north shore visitors identified the need to upgrade and rehabilitate commercial and tourist facilities as the area's most pressing problem following traffic congestion (Lake Tahoe Visitors Authority, 1988, 1989; Economic Research Associates, 1989). In the same survey, north shore residents also identified the poor apparent quality of the built environment as a significant problem. Similarly, a recently completed American Institute of Architects R/UDAT study identified the need to administer urban and historic design controls, including comprehensive sign regulations, in order to improve the region's competitive position as a resort area (American Institute of Architects, 1989).

Regional Visual Resource Studies

The condition of the region's visual resources has been described and interpreted over the last 20 years through extensive visual inventories. This has provided a well-documented chronology of changes to the resources and related visual quality. Between 1970 and 1978, at least six separate studies which addressed visual resources were prepared. Three of the studies concentrated on inventorying and describing the scenic resources, as well as identifying common qualities (Hagermeier, Ostergaard, Noble, and Kirschenman, 1970; Litton and Shiozawa, 1971; USDA Forest Service, 1978). Three studies developed recommendations regarding site planning and which would preserve the visual quality of the natural landscape (McEvoy and Williams, 1971; Litton and Shiozawa, 1971; Orme, 1972). One study involved preference testing for a variety of shoreline development scenes (Phillips, Brandt, Reddick, McDonald, and Greffe, 1978). Although none of the studies used similar methodologies, all reached the same basic conclusions regarding the effect of man-made development on the Region's overall scenic quality.

In 1970, a team of U.S. Forest Service landscape architects evaluated the relative scenic value of sections of roadways and shorelines against a set of criteria developed for use as part of the original planning of the basin (Hagermeier, et.al., 1970). The system, later to be called the "Travel Route Rating", is still in use today, and included the following criteria:

a. Quality of man-made features
b. Physical distractions along roadway
c. Structure and alignment of roadway
d. Availability of lake views
e. Availability of landscape views, and
f. Variety.

Not surprisingly, urban areas, especially those developed as commercial retail strips, scored lowest. Near-natural forested landscapes located out of town which offered views to the Lake scored the highest.
A 1971 study performed qualitative visual assessments of the same areas studies by Hagermeier, et.al., (1970). The findings of this study reinforced those reached by Hagermeier (1970), regarding the adverse impacts on visual quality attributable to urbanization (McEvoy and Williams, 1971). The report also concluded that, at the time, the existing amount of urbanization had eliminated approximately one quarter of the total viewing opportunities of the Lake.

Also in 1971, a companion study to Hagermeier (1970), described and mapped 11 major landscape units which could be seen when touring the Lake by automobile (Litton and Shiozawa, 1971). The report was intended to identify landscape units and to establish a compatibility between the natural landscape and the built environment which could be applied in future land use decisions. The most dominant spatial characteristic found throughout the region by Litton and Shiozawa was the enclosed bowl shape of the individual units which faced the Lake. Orme's 1972 study of the Lake Tahoe shorezone identified adverse impacts to shoreline visual resources due to high concentrations of shoreline structures, especially piers. Orme found an average pier density around the Lake of 7.5 piers/mile of shoreline, with maximum densities as high as 16 piers/mile. The average mooring buoy density was 20 buoys/mile, with maximum densities of 50 buoys/mile. The study recommended establishing maximum allowable pier densities in TRPA's shorezone ordinance in order to minimize visual impacts (Orme, 1972).

As part of its 1978 Land Management Plan, the U.S. Forest Service Lake Tahoe Basin Management Unit (LTBMU) prepared an inventory of visual resources on national forest land using the Forest Service Visual Management System (VMS). It reported that 1,900 acres of the 133,400 acres of national forest land were in the Modification status, 500 acres in Maximum Modification status, and nearly 1,400 acres in Unacceptable Modification (USDA, Forest Service, 1978). The Lane Management Plan called for restoration of these lands which did not meet the prescribed visual quality objectives. Visual resource policies of the 1988 Land and Resource Management Plan update require that over 90% of national forest lands to be managed for Preservation and Retention objectives, and recommend rehabilitation by the year 2005 of sites on national forest land which do not meet the assigned visual quality objective (USDA, Forest Service, 1986).

A 1978 comprehensive study of the cumulative effects of shorezone development included audio and visual user perception studies. The visual portion of the study involved testing the preferences of shorezone users using photographic slides to depict various densities of shorezone structures. While the overall preference testing produced few firm conclusions, analysis of responses to slides showed that shorezone users generally preferred the complete absence of structures to piers, fences and boat ramps, the dislike of such structures at low densities was generally not widespread (Phillips, et.al., 1978). Although the results gained from Phillips, et.al., (1978) and to a lesser extent Orme (1972), provided an objective basis by which to evaluate cumulative impacts as part of the project review process, they have never been utilized in that manner.
Land Use Issues Affecting Scenic Quality

The historical use of land in the basin has shifted from resource extraction (primarily in the form of timber harvesting which supported the nearby mining industry) to tourism and recreation. Each predominant land use has had identifiable and sometimes distinctive impacts on scenic quality (Iverson, Sheppard and Strain, 1990). Although there has been a tremendous recovery of forest cover since the heavy logging era of the late 1800's mining boom in Nevada, the health and vigor of the forest recently has caused alarm. While no single cause has clearly been identified to explain the declining vigor, several factors are thought to have contributed to the overall decline in forest health:

a. State highway department "bare pavement" policies for snow and ice removal which resulted in the use of excessive quantities of salt and deicing sand resulting in large-scale roadside tree mortality

b. Widespread infestation of the fir engraver beetle

c. Ozone damage to conifer needles produced from localized automobile exhaust, and

d. Short-term climatic drought cycles.

The result of these actions is that previously scenic roadsides, vistas and viewpoints now provide views of dead and dying trees (Iverson, et.al., 1990). This has adversely affected scenic quality on a Region-wide scale. It is important from both an ecologic as well as an economic perspective that the causes become understood and well publicized.

The visual quality of the built environment also has become an issue of increasing importance to residents, local businesses, and community leaders. Typical problems include: poorly maintained commercial buildings, lack of sensitive site planning, overuse of advertising signage, poorly defined road edges, lack of landscaping and parking lot screening, no provisions for accommodating pedestrians, and the proliferation of overhead utility lines. The lack of success of early design and signage policies by local governments and TRPA has made the need to develop greater sensibilities toward site design and visual impacts critical to the Lake's future as a premier vacation area. As an area dependent on tourism, the appearance and aesthetic features of communities take on an economic importance. The desire to attract higher spending visitors who would otherwise vacation in Aspen, Vail, or Park City, has led to the development of urban design plans for several commercial and tourist-oriented districts in order to improve the quality of physical design. Recent economic needs assessments prepared for local community plans have reinforced the importance of providing a high quality vacation experience in a tourism-driven economy (Economic Research Associates, 1988; Rosall Remmen and Cares, 1989).
Figure 3. Poor Site Planning Practices Include Lack of Landscaping, Poorly Defined Road Edges, and No Place For The Pedestrian

PHOTOGRAPH

Figure 4. Dead and Dying Trees Have Negatively Affected Scenic Quality Region-wide

PHOTOGRAPH
Regional Mandate to Conserve Scenic Resources

The Tahoe Regional Planning Compact (Public Law 96-551), requires TRPA to include in its amended regional plan a conservation plan for the preservation, development, utilization, and management of the scenic and other natural resources within the Basin, including but not limited to, soils, shoreline and submerged lands, scenic corridors along transportation routes, open spaces, recreational and historical facilities (94 Stat. 3240, December 19, 1980).

In 1982, TRPA together with other regulatory and land management agencies with jurisdiction in the basin, assembled a comprehensive study team which identified and analyzed alternative strategies for the maintenance and enhancement of regional environmental systems. The Threshold Study Report (TRPA, 1982), also recommended certain threshold levels of acceptable impacts to the environmental systems caused by land use growth and development. The report identified basic causal relationships which directly affected scenic quality, including:

a. Scenic resources are affected primarily by man's activities and use of the land; and

b. Natural features and processes (i.e., seasonal change, landslides and other geologic events) play some role in regional scenic quality, however, it is relatively small and uncontrollable (TRPA, 1982).

The report recommended the use of two separate systems to evaluate on a day-to-day basis, and to monitor a long-term basis, the effects of development on scenic resources. The thresholds were adopted and implemented by TRPA, and applied to the region's major highways and to the shoreline of Lake Tahoe itself. The first system recommended was the Travel Route Rating methodology based on Hagermeier, et.al. It would be used to evaluate the whole of the travel experience, including the view from the road (or from the Lake in the case of shoreline travel routes). Forty-six roadway units and 33 shoreline units were established based on the original units of similar visual character created by Hagermeier, et.al., (1970). Roadway Unit 24, Tahoe Meadows is located along the Mt. Rose Highway near Incline Village is actually outside the Tahoe Region, however, the average traveler may perceive it has part of the Lake Tahoe Basin. It has subsequently been dropped from the Regional thresholds.

Twenty-three of the 45 roadway units were recognized as attaining the threshold with a minimum value of 16. The majority of the nonattainment units were found in the urbanized areas and commercial neighborhoods around the basin. Likewise, only four of the 33 shoreline units did not meet the minimum attainment value of eight. While this system was appropriate to evaluate cumulative land modification and development impacts along a section of a given travel route, the scoring system proved to not be
sensitive enough to reflect changes to scenic quality resulting from
typical small-scale commercial or residential uses. This was due to the
difficulty in disaggregating unit scores to assess the contribution or
effect of individual parcels or improvements (Iverson, et.al., 1990).

A second threshold system was developed to focus on the relative scenic
quality of individual scenic resources which could be seen from the same
travel routes. Scenic resources were defined to include:

a. Foreground, middleground, and background views of the natural
landscape;
b. Views to the Lake from roadways;
c. Views of the Lake and natural landscape from roadway entry points
into the basin; and
d. Unique landscape features such as streams, beaches, and rock
formations that add interest and variety (TRPA, 1981).

TRPA mapped and inventoried 202 scenic resources visible from the roadway
units, and 184 visible from shoreline units. The intent of the ratings was
to define comparative scenic quality among the resources, and not absolute
scenic value. Each resource identified within a unit was numerically rated
(from 1 - low to 3 - high), in four visual quality parameters derived from
Litton's work on descriptors of landscape visual quality. The parameters
included unity, vividness, variety, and intactness. Scores for each re-
source were summed and then composited to form an overall rating for each
unit (from 1 - low to 3 - high). Overall values for each criteria were
again summed and composited to provide a unit-wide measure (from 1 - low to
3 high) of unity, vividness, variety, and intactness. This method of
double-compositing individual values was later found to unnecessarily
desensitize the adopted threshold values to small-scale change within the
unit.

In addition to the composite Scenic Quality Rating, each travel unit was
then assigned a sensitivity to change rating. This rating expressed the
relative degree of vulnerability of the landscape to change (TRPA, 1982).
At the time of threshold adoption, this second system, Scenic Quality
Rating was in attainment regardless of their individual values. In this
way the two thresholds differ. Both systems were, on the surface, quanti-
tatively oriented, a feature which undoubtedly made them attractive to the
threshold drafters. The apparently objective methods by which to measure
areas traditionally subject to personal bias were actually qualitative
measures which assigned numerical values to each level of perceived scenic
quality. There has been criticism relative to the credibility and repli-
cability of the systems (Iverson, et.al., 1990).
Figure 5. View of __________. A Mapped Scenic Resource in Roadway Unit XX, _____.

PHOTOGRAPH

Figure 6. View of ______________. A mapped scenic resource as seen from shoreline Unit XX, __________.

PHOTOGRAPH
Adopted in 1986, the Regional Plan for the Lake Tahoe Basin, Goals and Policies established regional goals and policies affecting scenic quality and related community design. The Plan was to develop a program to achieve attainment of the environmental threshold carrying capacities by the year 2007. The Plan contained the following scenic quality and community design goals:

**Regional Plan Goals and Policies**

a. Community Design

Community design policy and direction was established in 1982 by the TRPA Governing Board as a separate environmental thresholds as follows:

"It shall be the policy of the TRPA Governing Board in development of the Regional Plan, in cooperation with local jurisdictions, to insure the height, bulk, texture, form, materials, colors, lighting, signing and other design elements of new, remodeled and redeveloped buildings be compatible with the natural, scenic, and recreational values of the Region."

From this value statement regarding the Region's basic design philosophy, several goals and policies were formulated and adopted in the Regional Plan for the Lake Tahoe Basin: Goals and Policies.

These goals and policies are intended to apply to both new development and remodeling or rehabilitation projects. They are the criteria by which the need for and success of scenic quality improvements will be measured.

**Goal #1**

**INSURE PRESERVATION AND ENHANCEMENT OF THE NATURAL FEATURES AND QUALITIES OF THE REGION, PROVIDE PUBLIC ACCESS TO SCENIC VIEWS, AND ENHANCE THE QUALITY OF THE BUILT ENVIRONMENT.**

**Goal #2**

**REGIONAL BUILDING AND COMMUNITY DESIGN CRITERIA SHALL BE ESTABLISHED TO ENSURE ATTAINMENT OF THE SCENIC THRESHOLDS, MAINTENANCE OF DESIRED COMMUNITY CHARACTER, COMPATIBILITY OF LAND USES, AND COORDINATED PROJECT REVIEW.**

**ROADWAY AND SHORELINE UNITS**

**NUMERICAL STANDARD**

Maintain or improve the numerical rating assigned each unit, including the scenic quality rating of the individual resources within each unit, as recorded in the Scenic Resources Inventory and shown in Tables 13-3, 13-5, 15-5 and 15-9 of the Draft Study Report.
Maintain the 1982 ratings for all roadway and shoreline units as shown in Tables 13-6 and 13-7 of the Draft Study Report.

Restore scenic quality in roadway units rated 15 or below and shoreline units 7 or below.

OTHER AREAS

MANAGEMENT STANDARD

Maintain or improve the visual quality of views from bike paths and outdoor recreation areas open to the general public. Upon completion of the 1982 Visual Quality Index, this standard shall become a numerical standard.

Goal #1: MAINTAIN AND RESTORE THE SCENIC QUALITIES OF THE NATURAL LANDSCAPE

Goal #2: IMPROVE THE ACCESSIBILITY OF LAKE TAHOE FOR PUBLIC VIEWING

Management Standard for Public Recreation Areas

The Regional Plan also establishes a management threshold standard for the maintenance or improvement of the visual quality of views from bike paths and public outdoor recreation areas. The scenic ratings established in the Lake Tahoe Basin Scenic Resource Evaluation of Public Recreation Areas, 1983 (Wagstaff and Brady) provides the basis for this threshold standard. Recommendations for implementing numerical thresholds for each recreation area based on the 1983 scenic evaluations are included in this report.

III. EVALUATION PROCEDURES AND METHODS

The scenic resources mentor committee reviewed videotaped footage of threshold travel routes together with field inspection of the travel routes in order to evaluate the condition of the scenic resource thresholds since the 1986 update. It also reviewed the draft resource inventory and threshold methodology for scenic resource thresholds from public recreation areas and bicycle trails. Adoption of the public recreation area and bicycle trail threshold is recommended as part of this report.

A. Description of Previous Monitoring

As discussed in Chapter II., the travel route rating threshold was developed in 1970 as a demonstration study under the direction of the USDA Forest Service (Hagermeier, et.al., 1970). In 1978, its methodology was utilized to update the travel route ratings as part of the Environmental Impact Statement which accompanied the South Tahoe Public Utilities District plant
expansion project. The 1978 update showed a substantial decline in scenic quality in 15 of the 43 roadway units which were surveyed (Sedway/Cooke, EPA 1978). No re-rating of shoreline units occurred during the study.

As part of the 1982 Threshold Study Report, Wagstaff and Brady re-rated both the roadway and shoreline units. It found that 13 roadway units had declined in scenic quality, while three had improved (TRPA, 1981). During the 1982 study, three roadway units were added to the system and given initial ratings: Unit 44, Kingsbury Grade; Unit 45, Pioneer Trail North; and Unit 46, Pioneer Trail South. Sixteen of the original 33 shoreline units had declined in scenic quality since the original 1970 rating (TRPA, 1982). No increases in scenic quality were reported in shoreline units (TRPA, 1982). Increasing urbanization combined with a lack of sensitive site planning and design, including signage, were generally cited as the reasons for the decrease (TRPA, 1982). Adopted in 1982 by TRPA, the thresholds set minimum levels of attainment at 16 for roadway units and 8 for shoreline units. Twenty-three roadway and four shoreline units were not in attainment with the adopted threshold. Twenty-two roadway and 29 shoreline units were in attainment.

Roadway and shoreline units were again updated in 1986. Two roadway units and one lake unit had declined in scenic quality, while one roadway unit had increased (Wagstaff and Brady, 1987). No changes occurred in the number of attainment and nonattainment units. The 1986 update also provided specific evaluations regarding the causes of nonattainment in each of the roadway and shoreline units not in attainment with the adopted threshold.

The scenic quality rating threshold was first adopted in 1982 by TRPA. It used the same set of roadway and shoreline ratings units as the travel route rating. The threshold was a nondegradation threshold, and at the time of adoption, all units and all specific resources were declared to be in attainment.

The 1986 re-rating indicated minor changes to specific subcomponent resources in seven roadway units and one shoreline unit. Of the seven roadway units, four improved, while three declined. The shoreline unit resource also declined. This technically violated the nondegradation management standard established by the 1982 threshold. None of the changes, however, were significant enough to alter the units' composite threshold rating.

In terms of changes to the threshold values, there exists a fundamental difference between the two thresholds. The travel route rating measures the holistic view from the road, while the scenic quality rating measures relative scenic quality of specific visual resources. Due to the nature and location of the resources measured by the latter threshold and due to its relative insensitivity caused by double compositing of criteria values, scenic quality ratings have remained mostly unchanged by development whereas the travel route rating has been more significantly influenced.
B. Threshold Review Committee

The Committee assembled to evaluate the scenic thresholds included: Andrew Strain and Don Sargent, TRPA; Frank Magary, landscape architect from the USDA Forest Service, Lake Tahoe Basin Management Unit; Sheila Brady, principal in the firm of Brady and Associates, Berkeley, California; and Wayne Iverson, principal in the firm of Scenic Resource Management, Sedona, Arizona. Mr. Magary, Ms. Brady, and Mr. Iverson were selected, in part, due to their considerable experience with the scenic resources thresholds as they were developed and implemented during the 1970s and 1980s in the Tahoe Region. Ms. Brady and Mr. Iverson were specifically retained to serve as committee mentors.

C. Data Collection

Evaluating changes to the four adopted scenic resources thresholds included recording the existing visual conditions on videotape and review of projects which have been implemented since the last threshold rating in 1986. Primary data was collected and recorded on videotape during October 1990. The videotapes are also intended to serve as documentation of conditions in the field. The taping should be repeated as part of each future regional plan and threshold review, and should be used as a visual resource monitoring record.

Roadway travel routes were videotaped in both travel directions using MII videotape format. The camera was mounted on the hood of a full sized pickup truck and was remotely controlled from inside the vehicle. This permitted pan and zoom features of the camera to be utilized. The camera's resolution was within acceptable limits, however, the speed of the vehicle combined with the roughness of the road surface in many transition and rural units did not allow for stable, high quality images.

Shoreline travel routes were videotaped from the back of a large cabin cruiser using Super VHS video format. The resolution was again acceptable and pan and zoom features were used. The boat cruised along the shoreline in one direction only at a minimum distance from the shore of approximately 300 feet. Shallow water depths along most of the south shore and near Tahoe City and Lake Forest required the boat to remain slightly further away from the shore producing a corresponding loss of detail.

During April 29 and 30, 1991, the Committee toured the roadway units to review visual changes to the viewsheds visible from the roadways which have taken place since the 1986 ratings. The Committee also reviewed shoreline units in the field, using a boat. Videotape was also reviewed following the field tours.

The Committee identified changes which had taken place and evaluated their effect upon the applicable ratings. This included identifying the specific component or subcomponent of the threshold which may be affected. Changes to the existing ratings are presented in Chapter IV, Results.
D. New Research and Studies Considered

The videotape of roadway and shoreline units provided the Committee with relatively recent data. Likewise, the field tour of roadway units allowed the Committee to make their evaluations based on the most recent data available.

Since the 1986 rating, precedent has been set regarding the travel route rating methodology. TRPA accepted at least two scenic threshold studies for proposed projects which used assessment methodology in fractions of points. Historically, ratings were updated every few years and used only full point intervals. The ability to consider changes to travel route ratings using fractions of points improves the system's sensitivity. The use of fractions or decimal ratings provides a means of indicating slightly positive or negative effects of proposed projects which could not be displayed by full point ratings. This is especially helpful because the rating systems are used on a daily basis to make Compact Article V(g) findings regarding threshold attainment and maintenance by individual projects. The amendment should be recognized as part of the methodology, however it should not attempt to ascertain levels of detail smaller than tenths of a point (i.e., 0.1 but not 0.15).

E. Evaluation of Quality Assurance/Quality Control

Quality assurance/quality control is not directly applicable to the data collection and analysis techniques associated with the threshold. The makeup of the Committee, however, does provide some level of consistency between this evaluation and previous ratings, especially those done in 1978, 1982, and 1986. Mr. Magary, Ms. Brady and Mr. Iverson have participated in previous threshold ratings generally related to project applications. Their involvement in this project brings a certain measure of consistency which helps ensure that the evaluation methodology is comparably applied. Ms. Brady and Mr. Iverson have made substantial contributions to threshold development and application in both thresholds. In 1982 and 1986, Ms. Brady has performed similar threshold updates for TRPA.

Since 1987, Mr. Strain has been involved on a daily basis with the application of the thresholds to individual projects and during development of the Scenic Resources Management Plan. Mr. Sargent has the least threshold related experience of the Committee. He has applied the thresholds as part of project review process since November 1990.

IV. RESULTS

A. Travel Route Ratings

Review of all 45 roadway and 33 shoreline travel routes indicated a change in the threshold rating in 16 of the 78 total units. Seven roadway units had increases in their composite score, while four roadway and four shore-


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Table 2. 1991 SHORELINE TRAVEL ROUTE RATINGS

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</table>

1 Decrease criterion #3 due to addition of many structures which do not blend with setting
2 Decrease criterion #3 due to addition of new structures in background which are highly contrasting with setting; new ski run clearings consisting of straight lines/high contrast
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<tbody>
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<td>26</td>
<td>3 Decrease criterion #3 due to addition of many new structures which dominate the shoreline and 2 highly contrast with forested setting</td>
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<th>Variety</th>
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<th>Variety</th>
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<tr>
<td>1986</td>
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</tr>
<tr>
<td>1991</td>
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</table>
line units showed a decrease. One unit, #42, Lower Outlet had a correction made to its 1986 rating. Updated roadway unit ratings are shown in Table 1 and updated shoreline unit ratings in Table 2. Of the 15 units which changed, one shoreline unit, Unit 27, Lincoln Park, fell below threshold attainment level. The remaining 14 did not change attainment status.

Of the seven roadway units which increased, three are already in attainment with the threshold value of 16, and four are below the attainment level. Of the four shoreline units which decreased, one unit remained in attainment with the threshold value of eight. The remaining three shoreline units are not in attainment, with Unit 27 falling below the minimum attainment value, and Units 9 and 15 remaining in nonattainment.

In summary, the same 23 roadway units which were not in attainment in 1986 remain in nonattainment. There are now five nonattainment shoreline units, whereas in 1986 there were four.

B. Scenic Quality Ratings

Review of scenic quality ratings indicated a change in five of the 45 roadway units and four of the 23 shoreline units. Refer to Table 3 for roadway unit changes and Table 4 for changes to shoreline unit resources. Within the five roadway units, change has occurred in five visual resources. Three of the resources have increased while two has decreased. Adopted unit-wide criteria values, however, increased in Unit 20, Tahoe Vista, and decreased in Unit 43, Lower Truckee River. None of the changes was significant enough to change the adopted composite scenic quality rating value assigned to the overall unit.

Within the four shoreline units, change has occurred in eight visual resources, four of which were in Unit 23, Crystal Bay. Scenic quality ratings decreased in all eight resources yet none was enough to change the adopted composite scenic quality rating assigned to the overall unit.

The five resources which had reductions in their composite rating technically violated the nondegradation management standard established by the threshold. The five resources are: roadway 43.2; shoreline 16.7; shoreline 23.2 and 23.3; and shoreline 27.3.
Table 3. 1991 Changes in Roadway Unit Scenic Quality Ratings

Unit 20: Tahoe Vista
Subcomponent 20.5: View to Lake

The views to the Lake through the state recreation area have improved since 1986 in terms of unity and intactness. Landscaping has matured and the view has become more of a focal point in the downtown area.

<table>
<thead>
<tr>
<th></th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
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<tbody>
<tr>
<td>1986</td>
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<td>2</td>
<td>2</td>
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<td>1991</td>
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<td>2</td>
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<td>3</td>
<td>10</td>
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</tbody>
</table>

The changes increased the unit-wide intactness rating from 1 to 2, and the unit-wide subtotal from 7 to 8. The composite total remained a 2, moderate quality.

Unit 33: The Strip
Subcomponent 33.2: View of Natural Landscape

The linear view of the natural landscape has improved since 1986 primarily due to demolition of several structures adjacent to the travel corridor. This has opened up middleground and background views of natural landscape features.

<table>
<thead>
<tr>
<th></th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
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</thead>
<tbody>
<tr>
<td>1986</td>
<td>1</td>
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<td>2</td>
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<td>2</td>
<td>7</td>
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</tr>
</tbody>
</table>

The changes did not increase unit-wide criteria nor the composite total which remained a 1, low quality.

Unit 43: Lower Truckee River
Subcomponent 43.2: Entry Point View

Construction of a Caltrans curve correction project along Highway 89 has reduced the scenic quality of the resource by lowering its unity and intactness. Specific impacts include the removal of river views associated with the previous roadway alignment, removal of natural vegetation which has been replaced with non-native appearing grasses on highly engineered slopes and the erection of a concrete retaining wall with little or no articulation or color.

<table>
<thead>
<tr>
<th></th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
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<td>3</td>
<td>3</td>
<td>1</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>
The change decreased the unit-wide unity criterion from 3 to 2, thus decreasing the unit-wide subtotal from 11 to 10. The change did not, however, lower the composite total which remained a 3, high quality.

Unit 44: Kingsbury Grade
Subcomponent 44.7: Visual Feature

The large graded area near the multiple family residential project has been graded and stabilized. It will be important to complete this improvement with substantial landscaping in order to create a visual buffer from the road and take advantage of the existing building setbacks.

<table>
<thead>
<tr>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
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</table>

Changes to the resource did not affect the unit-wide criteria ratings nor the unit's composite total which remained a 2, moderate quality.

Unit 46: Pioneer Trail South
Subcomponent 46.4.4: Visual Feature

The mapped resource of Lake Christopher was a highly rated visual feature in 1982. It provided distinctive foreground views with the water's edge and diverse vegetation. It was a unique composition among all threshold travel routes as one of the only small lakes found in a meadow. The diversion of Cold Creek around the lake has returned it to a more common meadow land form similar to those along Pioneer Trail and Highway 50.

<table>
<thead>
<tr>
<th>Unity</th>
<th>Vividness</th>
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<th>Composite</th>
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<td>3</td>
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</table>

The change to the vividness criterion lowered the subtotal from 11 to 10. The resource's composite rating remained a 3, high quality. The changes did not affect unit-wide criteria ratings nor the unit's composite total which remained a 2, moderate quality.
Table 4. 1991 Changes in Shoreline Unit Scenic Quality Ratings

Unit 16: Lake Forest
Subcomponent 16.7: View of Shoreline

The addition of several new houses since 1986 has reduced the unity and vividness of the scene. The highly visible character of the hillside combined with large, bulky structures which occupy nearly its entire length have cumulatively contributed to the reductions.

<table>
<thead>
<tr>
<th></th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
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<th>Subtotal</th>
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<td>2</td>
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</tr>
</tbody>
</table>

The changes to the Subcomponent did not change the unit-wide criteria values nor the composite total which remains a 2, moderate quality.

Unit 23: Crystal Bay
Subcomponent 23.2: Visual Feature

The amount of additional highly contrasting structures on this section of slope have resulted in decreases to the resource in terms of unity and vividness.

<table>
<thead>
<tr>
<th></th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>1991</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Subcomponent 23.3: View of Shoreline

The resource has been impacted by the cumulative change in the amount and siting of additional structures visible in the foreground. This has reduced both vividness and variety.

<table>
<thead>
<tr>
<th></th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>1991</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Subcomponent 23.5: View of Shoreline

Changes to the colors of the multiple family residential structures located adjacent to the shoreline have increased their apparent visual magnitude and reduced the resource's vividness. The structures have been painted a light blue which makes them highly visible from the Lake and reduces their ability to fit into the surrounding landscape.
<table>
<thead>
<tr>
<th>Year</th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>1991</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

Subcomponent 23.6: Backdrop Views

The resource has decreased in unity and intactness due to the cumulative impact of numerous additional structures in view. Openings in land cover created by the new building sites have reduced the resource's intactness as a forested area containing unobtrusive housing.

<table>
<thead>
<tr>
<th>Year</th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>1991</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

The combined effects of changes to all four resources was to decrease the unit-wide variety rating from a 3 to 2 and resultant criteria subtotal from 9 to 8. The composite rating for the unit, however, remains a 2, moderate quality.

Unit 26: Cave Rock
Subcomponent 26.12: Visual Feature

The cumulative impact of additional structures in residential developments adjacent to Cave Rock has reduced the unity of the resource from 3 to 2.

<table>
<thead>
<tr>
<th>Year</th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>1991</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>3</td>
</tr>
</tbody>
</table>

Changes to the unity criterion did not change the composite score of the resource which remains a 3, high quality. It also did not change the composite rating for the unit which remains a 2, moderate quality.

Unit 27: Lincoln Park
Subcomponent 27.3: Backdrop View

The addition of more homes and structures in the middleground above Lincoln Park has cumulatively impacted the vividness criterion, lowering it from 2 to 1. This lowers the subtotal from 6 to 5 and results in a lowering of the composite resource rating from 2, moderate quality to 1, low quality.

<table>
<thead>
<tr>
<th>Year</th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>1991</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
Subcomponent 27.7: Visual Feature

Additional residential development visible near the shoreline from the Lake combined with the large box-like structures on the point at the water's edge has reduced the vividness criterion of the Subcomponent from 3 to 2.

<table>
<thead>
<tr>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>1991</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

The combined effect of changes to the Subcomponent did not change unit-wide criteria ratings nor the composite rating assigned the unit which remains a 2, moderate quality.

V. DISCUSSION

A. TRENDS

Travel Route Ratings. Overall, travel route ratings generally tended to improve in urban roadway travel units, while decreasing in transition roadway and shoreline travel units.

The man-made features criterion showed increases in three of the seven units which improved. This is due to improved quality of architecture and to some degree, site planning techniques. Application of design and site planning principles similar to those advocated in TRPA's Design Review Guidelines has incrementally improved the quality of the built environment.

Ratings for landscape views and lake views increased in three urban and transition travel units. This was primarily due to the removal of foreground structures as part of redevelopment projects (e.g., Unit 14: 64-acre tract; Unit 33: wetlands detention basins) or public agency lands acquisition (Unit 20: California Tahoe Conservancy purchases of Sandy Beach and Coon Street commercial block). Land acquisition and removal of structures in urbanized areas provides important visual access to Lake Tahoe and other identified scenic resources. By providing public access to scenic views including Lake Tahoe, these actions aid in direct implementation of Community Design and Scenic Resources regional plan goals.

In general, those units in which travel route ratings decreased resulted from cumulative impacts in two major areas:

1. Reductions in roadway distraction criterion;
2. Reductions in shoreline variety criterion.

Reductions in the two criteria accounted for 78% (7 of 9 units) of the changes. In the three roadway units where the roadway distraction criterion was lowered, two primary causes can be identified. Overall increases in traffic volumes, traffic congestion and other highway users (e.g., bicycles, mopeds, and pedestrians) without a corresponding increase in the provision of identifiable or separate systems for the non-automobile
users tends to compound the level of distractions a driver must negotiate on already busy highway segments. Increases in roadside retail displays and advertising gimmicks which tend to go unregulated and unmitigated also increase the level of foreground roadside distractions, thereby lowering a unit's rating. Increases in the number of regulatory signs along the roadways, many of which lack uniformity or consistency, also add distractions.

Low density, sprawling and in-filling new residential development, combined with remodelled, larger volume structures has adversely impacted the pre-existing natural character of the landscape in a cumulative manner. This problem primarily affects areas of extensive residential development visible from the shoreline, and to a lesser extent, areas along rural transition scenic highway corridors which have infilled with development in the past five years. Additional development has tended to visually impact and physically dominate the natural character of the setting in a negative manner in a manner which was not in balance with the visual carrying capacity of individual landscape units. This has reduced the variety criterion. Variety in the travel route rating is created by changes in the total landscape which can be created by harmonious combinations of topography, vegetation, water or man-made facilities (Hagermeier, et.al., 1970). Positive variety results when the changes harmonize with the natural environment.

Attempts on the part of TRPA to apply the relatively insensitive travel route rating methodology as part of day to day project review found it possible to individually approve each of the new projects without being able to identify the cumulative effects of a specific project or projects which "broke the camel's back" in terms of decreasing a unit's rating.

Scenic Quality Ratings. Overall, three roadway units contained improved scenic resources, while two roadway and four shoreline units showed decreases to one or more scenic resources. The intactness criterion increased in each resource which improved. Variety and unity also improved in one resource each. Intactness describes the degree to which a landscape retains its natural condition, or the degree to which modifications emphasize or enhance the natural condition of the landscape (Threshold Study Report, 1982). Improvements in intactness can be traced to completion of projects such as in Kings Beach (Unit 20) and along the Kingsbury Grade (Unit 44). Previous ratings of the resources showed strong signs of a man-altered landscape, one which did not emphasize or enhance the natural condition of the landscape.

In the six units which had decreased resource ratings, a total of nine resources contained at least one criterion which was degraded. Five of the resources showed decline in at least two criteria, and in four of them the changes resulted in a lowering of the resource's composite rating (i.e., it caused a resource to drop from a 3, high quality to a 2, moderate quality).
Unity was lowered in five resources, vividness was lowered in seven, while variety and intactness were each lowered twice. Unity is defined as a landscape in which the visual resources of a scene join together to form a single, coherent, harmonious visual unit. Unity was often impacted by cumulative effects of highly contrasting, disjointed or poorly screened residential development. This resulted in reductions in the coherence of a scene whereby man-made features were less harmonious with the natural landscape in which they were sited. Vividness is expressed by contrasting elements, such as color, line and shape. It can also be described as distinctiveness (TRPA, 1982). Reductions in vividness tended to occur when a scenic resource such as a forested hillside containing some development incrementally became a substantially built-out residential subdivision located on a hillside. The change generally resulted in a natural-dominating scene becoming a man-dominating scene where the distinctiveness of the natural landscape diminished.

Progress Towards Threshold Attainment Standards and Targets. The 1989 Scenic Quality Improvement Program (SQIP) established a travel route rating threshold attainment schedule for all roadway units rated 15 or below and all shoreline units rated 7 or below. The schedule was set forth by jurisdiction and was based on a rate of improvement which would start slowly and then accelerate by the year 2007. See Table 5 below. Scenic quality ratings were originally adopted as nondegradation standards, meaning there is no attainment target. Several resources have declined and the ability to restore them to the original ratings must be addressed.

Table 5. Attainment Schedule (Adopted in 1989 as part of the Scenic Quality Improvement Program)

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Total Points Needed For Complete Threshold Attainment</th>
<th>Travel Route Rating Point Increase in 5-Year Increments by 1992</th>
<th>by 1997</th>
<th>by 2002</th>
<th>by 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Dorado County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>12</td>
<td>1</td>
<td>5</td>
<td>8</td>
<td>12 (100%)</td>
</tr>
<tr>
<td>Shoreline</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2 (100%)</td>
</tr>
<tr>
<td>City of South Lake Tahoe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>36</td>
<td>2</td>
<td>10</td>
<td>20</td>
<td>36 (100%)</td>
</tr>
<tr>
<td>Shoreline</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Placer County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>37</td>
<td>2</td>
<td>10</td>
<td>20</td>
<td>37 (100%)</td>
</tr>
<tr>
<td>Shoreline</td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>9 (100%)</td>
</tr>
</tbody>
</table>
Combined changes to the travel route ratings as compared with the targets are shown in Table 6. The results generally indicate that some level of positive progress toward threshold attainment is being made. Roadway units located in the City of South Lake Tahoe have nearly reached the 1992 SQIP target of two points of improvement. Likewise, Placer County units showed a total of three net points of improvements, while being targeted for two points. El Dorado County roadway units showed one net point of improvement which was their SQIP target. In terms of the change to the nonattainment units targeted by the SQIP, four nonattainment roadway units improved by a combined 4.5 points. One nonattainment unit, Unit 36, declined by one point.

Shoreline travel units, however, did not fare as well. No improvements were recorded in any of the 29 attainment or four nonattainment units. Only Placer County was scheduled to show one total point of improvement to its three nonattainment units. No improvements were made in any of the Placer County units. Rather, Unit 16, Dollar Point, declined by another point. Additionally, shoreline units in El Dorado, Washoe, and Douglas Counties lost a combined four points among three units.

It should be noted that a total of eight roadway and shoreline units lost a combined 9.5 points since the 1986 rating. This was not provided for in the SQIP and results in the need for additional improvements to stay on schedule. The SQIP schedule called for a combined eight points of improvement from all five jurisdictions. The 1992 actual changes showed a combined 7.5 points of improvement while losing a combined 9.5 points, for a net region-wide loss of 2 points. Adding in the two point correction from 10 to 12 for Roadway Unit 42, the net change region-wide change was no points. In terms of changes to the number of attainment/nonattainment units, only one shoreline unit, Unit 27, Lincoln Park, became a nonattainment unit.
Table 6. Status Toward 1992 Interim Threshold Attainment Targets

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Total Points Needed For All Units to Attain Threshold</th>
<th>1992 SQIP Target For Nonattain-SQIP Target</th>
<th>1992 Change to Nonattainment Units</th>
<th>1992 Change To All Units Improve/Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Dorado County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>+12</td>
<td>+1</td>
<td>-1</td>
<td>+3/-2</td>
</tr>
<tr>
<td>Shoreline</td>
<td>+2</td>
<td>0</td>
<td>-1</td>
<td>0/-1</td>
</tr>
<tr>
<td>City of South Lake Tahoe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>+36</td>
<td>+2</td>
<td>+1.5</td>
<td>+1.5/0</td>
</tr>
<tr>
<td>Shoreline</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0/0</td>
</tr>
<tr>
<td>Placer County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>+37</td>
<td>+2</td>
<td>+3</td>
<td>+3/-1*</td>
</tr>
<tr>
<td>Shoreline</td>
<td>+9</td>
<td>+1</td>
<td>-1</td>
<td>0/-1</td>
</tr>
<tr>
<td>Washoe County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>+14</td>
<td>+1</td>
<td>-1</td>
<td>0/-2.5</td>
</tr>
<tr>
<td>Shoreline</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0/-2</td>
</tr>
<tr>
<td>Douglas County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway</td>
<td>+10</td>
<td>+1</td>
<td>0</td>
<td>0/0</td>
</tr>
<tr>
<td>Shoreline</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td>0/-1</td>
</tr>
</tbody>
</table>

* Data indicating actual improvement to ratings does not include corrections to 1986 variety and landscape views criteria. Refer to discussion in Chapter IV.

B. STANDARDS AND TARGETS

The adopted threshold standards for travel route ratings and scenic quality ratings are generally appropriate and proper for identifying and measuring potential impacts to scenic resources. Some minor adjustments to the manner in which they are implemented are expected to significantly improve their utility and understanding. Rationale and recommendations for improvements to correct identified problems are made in Chapter VI.

There is a need to continually check back to the original basis for the scenic thresholds in order to evaluate how well the established thresholds are working. Three key value statements in Chapter 13, Scenic Resources, of the Threshold Study Report call for maintaining and enhancing the dominant natural appearing landscape for the vast majority of views and lands in the Basin, maintaining or improving the aesthetic characteristics of the man-made environment to be compatible with the natural environment, and restoring damaged natural landscapes whenever possible (TRPA, 1982).
It appears that the concerns arose from the fact that the natural beauty of the Lake Tahoe Basin was being degraded by the built environment, especially the strip commercial developments that lined many of the routes around the lake with buildings and a proliferation of signs. There may still be a question of whether the scenic thresholds truly reflect changes that respond to the key value statements. A definitive means of efficiently and effectively assessing scenic threshold attainment of individual development and redevelopment projects does not appear to have been established as yet although there are some steps in that direction.

The main value in continuing the use of the existing scenic threshold system is that of continuity. More objective state-of-the-art systems could be developed with the improvements in knowledge and in technology that have occurred since the original thresholds were developed. Whether doing so would significantly improve the ability to manage the review process, meet the Region's goals and monitor change needs to be considered. TRPA's Geographic Information System, when fully operational, along with other computerized techniques to objectively and consistently measure visual impacts should not be overlooked in the efforts to improve the system.

Travel Route Ratings. The existing travel route ratings contain two problem areas which should be corrected. The first problem is their use on a daily basis as part of the project review and approval process. The travel route rating system was, from its inception in 1971, intended to be used as a cumulative record of changes in the landscape. It is not intended to be used on a project review level basis. It is simply too insensitive to minor changes in the landscape to be used in day to day review mode. The average travel route unit length is in excess of two miles on each side of the roadway for a total of four miles (4 miles = 21,120 linear feet). Yet project review findings are made using the system applied to parcels with as little as 50 feet of roadway frontage (50 ft./21,120 ft. = 2/1000ths of the length). It is nearly impossible to use the system to indicate change on a scale of 5 - 30 points expressed in integers.

Secondly, the travel route rating systems are set up in a manner that would anticipate that all roadway and shoreline units should have a similar acceptable rating despite differences in the inherent landscape character. Landscape units such as roadway units #1, 6, 7, 9, 11, 14, 15, 16, 18, 19, 20, 25, 28, 33, 34, 35, 40, 42, and 45 have rating of one and two for Lake Views and Landscape Views. Much of this low rating may be due to inherent landscape character. Similarly, roadway units #1, 6, 7, 9, 11, 14, 15, 16, 18, 19, 20, 25, 28, 33, 34, 35, 40, 42, and 45 have Variety ratings of one and two which may be largely due to inherent landscape character. Interestingly enough, roadway units #1, 7, 9, 10, 11, 13, 14, 15, 16, 18, 19, 20, 22, 25, 28, 31, 32, 33, 35, 36, 40, 42, 44, and 45 also were rated as not achieving the minimum threshold level in 1986. Thus, only four of the 24 roadway units failing to attain the scenic threshold had average or better ratings in the
criteria which deal with inherent scenic quality. This does not appear to be equitable as all units of roadway are to achieve a minimum numerical rating of 16 for roadway units and 9 for shoreline units. Although it may be nice to have a high degree of scenic quality in all roadway and shoreline units, those which were not blessed with natural "good looks" seem to be penalized.

It should also be recognized that this problem in ratings is exacerbated by the fact that units having poor ratings on Lake and Landscape Views are often thereby rated low in Variety. This might be considered to be double counting of negative attributes. All units do not start out on an equal footing, but all are expected to attain the same basic numerical rating.

A possible way to resolve this problem would be to analyze the roadway units inherent capacity to provide Lake and Landscape Views and Variety. Then adjust the scenic thresholds in the roadway units to reflect the varying degrees of capability.

Until the Urban, Rural-Transition and Rural visual environment types were established in 1989, there was no difference in expectations for the differing areas. With the establishment of such visual environment types, there were differing design guidelines set up. However, there is no allowance in the scenic thresholds for varying degrees of dominance of the natural appearing landscape or of compatibility/degree of dominance of the man-made environment. All roadway zones are expected to achieve a rating of 16 no matter if they are in a Rural or Urban environment type. This would seem to be a flaw in the system that needs to be addressed and corrected.

Resolution of this problem would seem to involve adjustment of the scenic thresholds for roadway and shoreline travel units in accordance with the visual environment types into which they fall.

The Travel Route Ratings which were adopted as one of the threshold measures are based upon a mix of factors not specifically designed to reflect the needs of the scenic thresholds or of the key value statements. They could be separated as:

a. Factors dealing with the effect of man-made alterations of the landscape -- Man-Made Features, Physical Distractions, and Road Structure relate entirely to this. Lake Views and Landscape Views may relate to either natural or man-made obstructions to views. Variety includes man-made features although in its original Forest Service concept at the time of the development of the system in 1971, variety was largely judged on the basis of the landforms, waterforms, and vegetative forms in the landscape -- inherent landscape characteristics.
b. Factors dealing with the blockage of views -- Lake Views and Landscape Views.

c. Factors dealing with inherent scenic quality -- Variety.

d. In project review, there is normally little opportunity to judge changes in Road Structure unless it is a major highway project. That factor is generally insensitive to change.

Resolution of this problem, other than redevelopment of the system, might involve adding a discussion of this situation in the directions on the use of the system. This would make future raters aware of the problem and allow them to compensate for it.

The rerating process tends to weight the effects of development or redevelopment in a unit more so than on a basis of comparison between units. Rating effort tends to be concentrated on units where notable project change has occurred. Cumulative minor degradation due to repainting or reroofing and vegetation removal as well as cumulative improvements due to vegetative growth for screening and additional plantings and positive repainting and reroofing tend to be missed in other units. This, in combination with the one full number requirement (no decimals) in rating tends to give undue blame or credit. The raters want to indicate a positive or negative effect on a unit when they have evidence. Being limited to a full number increase or decrease, there is often overkill in the ratings. If this happened in a particular unit in 1978, and then again in 1986 the ratings soon become skewed out of line over time.

A thorough and even re-rating process that cross-rates and compares units is essential to avoiding this problem. The next re-rating should be a rigorous one involving a completely new rating team of three or more individuals who independently rate the units before determining consensus ratings. This would help determine the relative degree of replication that can be achieved based upon the then current rating criteria. There is also need for explanations of the rationale for each of the numerical ratings and why it might have varied from that of the previous rating.

A recommendation to provide for ratings refined to less than full point increments should resolve that part of the problem.

The scenic thresholds, as adopted, call for the maintenance or improvement of the numerical rating assigned each unit. This apparently was decided without consideration of the degree of build-out of the units at the time of adoption. Taken literally, this would imply that any development within a unit should similarly work towards maintaining or improving the numerical rating. It is almost impossible to develop a property which was formerly undeveloped natural forest land and maintain the same degree of scenic quality as regards Man-made Features (and in many cases Roadside Distractions). The intent to maintain or improve the scenic quality of the Region
cannot be faulted. It would seem that every developable property should have the right to a fair share of visual impact as long as it is in line with that allowed in the Visual Environment Type. To expect that a number of adjacent and recently developed projects will not cause some scenic degradation seems unreasonable.

Rather, it would seem appropriate to establish some reasonable degree of "fair share" of visual impacts for development and redevelopment tied to the visual environment type's goals. In such a case some units might be allowed to drop slightly in their ratings over time until fully built out. The overall cumulative scenic quality ratings of all roadway and shoreline units, however, should reflect improvement over that same time period. This would result from improved ratings in areas redeveloped or undergoing scenic improvement. VisMag/Contrast Rating would appear to be a reasonable tool to handle this.

The adopted interim targets for travel route ratings are appropriate and should be maintained in order to attain travel route rating thresholds. They provide for an accelerated rate of improvement over time. The schedule recognizes the lag time between approval and implementation of community and redevelopment plans and large scale projects, all of which are expected to contribute to incremental improvement of scenic resources. Based on the mixed results of the 1991 threshold evaluation, the targets will require amendment to reflect the changes. Interim target and attainment schedule recommendations are contained in Chapter VI.

Scenic Quality Ratings. The existing scenic quality rating methodology contains two problems which should be corrected in order for the system to function as intended. The first problem results from the three step compositing process used to convert individual resource ratings to unit-wide totals. Refer to Table 7. The original intent of this system was to identify, evaluate, and monitor the relative scenic quality of discrete scenic resources. They have been cataloged within the same travel units as the travel route rating threshold. Compositing was done as part of the 1982 Threshold Study to simplify the system's appearance. While, at that time, it may have served its purpose, today it has become more of a hindrance than a benefit. Compositing is not necessary to keep track of the resources. It adds confusion and fosters misunderstanding in the project review process.

The adopted threshold stated that there was to be no degradation of the individual resources, as well as the unit-wide composite ratings. By preventing degradation to the individual resources it is possible at the same, to prevent degradation to the unit-wide totals. Refer to proposed threshold format in Table 8.

The second problem which should be addressed is the unit-wide sensitivity to change rating. It is not directly related to the degree of scenic quality but serves as an indicator of the relative ability of a given
### Table 7. EXISTING SCENIC QUALITY THRESHOLD RATING METHODOLOGY

**Roadway Unit:** 23 Mt. Rose Highway

<table>
<thead>
<tr>
<th>Entry Point Views</th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>12</td>
<td>3 Open vista across forested area of Third Ck. 0 drainage area to lake; 3 Occasional glimpses of lake and mtns. 3 Backdrop of Rose Knob Pl., w/open scrub area 3 Natural appearing forest for 0.3 miles 0 South of Country Club Drive</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Views of Natural Landscape</th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite Narrative</th>
</tr>
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<tbody>
<tr>
<td>23.4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>11</td>
<td>3 Occasional glimpses of lake and mtns. 3 Backdrop of Rose Knob Pl., w/open scrub area 3 Natural appearing forest for 0.3 miles 0 South of Country Club Drive</td>
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<tr>
<td>23.7</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>11</td>
<td>3 Backdrop of Rose Knob Pl., w/open scrub area 3 Natural appearing forest for 0.3 miles 0 South of Country Club Drive</td>
</tr>
<tr>
<td>23.9</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>3 Natural appearing forest for 0.3 miles 0 South of Country Club Drive</td>
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<table>
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<tr>
<th>Views to Lake</th>
<th>Unity</th>
<th>Vividness</th>
<th>Variety</th>
<th>Intactness</th>
<th>Subtotal</th>
<th>Composite Narrative</th>
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<tr>
<td>23.5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>12</td>
<td>3 Closer and more panoramic views of lake 3 Occasional glimpses of lake and mtns. 3 Backdrop of Rose Knob Pl., w/open scrub area 3 Natural appearing forest for 0.3 miles 0 South of Country Club Drive</td>
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<tr>
<td>23.6</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>12</td>
<td>3 At vista point, most expansive panorama in 0 entire basin (250 deg.*+) 3 Occasional glimpses of lake and mtns. 3 Backdrop of Rose Knob Pl., w/open scrub area 3 Natural appearing forest for 0.3 miles 0 South of Country Club Drive</td>
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<table>
<thead>
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<th>Visual Features</th>
<th>Unity</th>
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<th>Variety</th>
<th>Intactness</th>
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<tr>
<td>23.8</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>3 Stream zone of Third Ck. has diverse vegetation, but is marred by road cuts, gravel heaps, and nearby large scale development</td>
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<table>
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<th>Criteria Mean</th>
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<tbody>
<tr>
<td>2.57</td>
</tr>
<tr>
<td>2.71</td>
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<tr>
<td>3.00</td>
</tr>
<tr>
<td>2.43</td>
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</table>

<table>
<thead>
<tr>
<th>Criteria Rounded</th>
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<tbody>
<tr>
<td>3</td>
</tr>
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<td>3</td>
</tr>
<tr>
<td>3</td>
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<tr>
<td>2</td>
</tr>
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</table>

<p>| Composite Conversion: | | | |
|----------------------|---------------------|---------------------|
| Subtotal Scores      | Composite Scores    | Unit Composite      |
| 10 - 12              | 3, high             | 3                   |
| 6 - 9                | 2, moderate         | 2                   |
| 3.5                  | 1, low              | 1                   |
| ∞                    |                      |                     |</p>
<table>
<thead>
<tr>
<th>Roadway Unit</th>
<th>23 Mt. Rose Highway</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Unity</td>
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<tr>
<td><strong>Entry Point Views</strong></td>
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<td>23.3</td>
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<tr>
<td><strong>Views of Natural Landscape</strong></td>
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<td>23.4</td>
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<td>23.9</td>
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<td><strong>Views to Lake</strong></td>
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<tr>
<td><strong>Visual Features</strong></td>
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</tbody>
</table>
travel unit to absorb change. This information is certainly useful when planning or reviewing a project, so that it should not be completely discarded. It is possible, however, for the sensitivity of a given unit to change many times within the unit to the point that a sensitivity rating of 1, 2, or 3 become too generalized for the entire unit.

C. Effectiveness of Control Measures

The relative effectiveness of several control measures which are presently in place has lead to improvements in threshold ratings since adoption of the Regional Plan and subsequent implementation of the Scenic Resources Management Plan. There are three primary areas of control measures presently in place under the Regional Plan:

1. Code of Ordinance standards which directly affect site planning and physical design;
2. Design Review Guidelines;
3. Scenic Quality Improvement Program

Code of Ordinance regulations which address physical site planning and design include Chapters 20, 22, 24, 26, 29, 30, 53, 54, 64, 65, 77, and 81. Minor amendments to the standards in several chapters are expected to result in additional improvements in threshold ratings for additional as well as nonattainment units. Refer to the recommendations in Chapter VI.

The effectiveness of the Design Review Guidelines has met with mixed success. As guidelines under the Regional Plan, they are not requirements, merely recommendations. Their status as voluntary suggestions has resulted in their lack of use, therefore, depressing potential improvement levels. At this time, TRPA has no design or site planning checklist for individual projects to demonstrate consistency with the guidelines.

Similarly, the Scenic Quality Improvement Program was intended to be used in conjunction with the previous measures to gain incremental improvements from existing development. There have been few opportunities to use the program as part of remodel or minor addition projects. The perceived uncertainty of its regulatory status has contributed to the lack of action. In instances where it has been implemented, however, the results have been very successful in improving scenic quality. Examples include the Kings Beach overhead utility line undergrounding, the City of South Lake Tahoe Redevelopment Project #1, and completion of the 64-acre tract clean-up near Tahoe City.

The most urgent need with respect to the success of existing control measures is enforcing the standards. Numerous violations of design and sign standards occur throughout the region and contribute significantly in a cumulative manner. None of the violations could individually be held responsible for a drop in a threshold rating. It is the cumulative impact
which has prohibited threshold increases, especially in urban areas which
tend to be nonattainment travel units. Common examples include placement
of additional signage without permits. The additional signage generally
could not be approved because the existing signage is already at or above
the maximum limits. Unscreened storage and placement of unscreened satel-
lite dish antennae are common violations of design standards. Enforcing
the existing standards would go a long way toward solving small scale,
threshold related impacts.

The relative effectiveness of supplemental measures is difficult to ascer-
tain because they've not been used. Some parallel conclusions from other
threshold-related disciplines, however, may provide some insight as to
their potential effectiveness. Three supplemental measures have been
adopted by TRPA. They include:

1. Formation of Scenic Tahoe, Inc., a watch-dog group for scenic re-
   sources;
2. Use of the visual magnitude/color contrast rating system on all
   projects within threshold travel route viewshed;
3. Nevada side overhead utility undergrounging program.

The effectiveness of implementing Scenic Tahoe, Inc., as called for in the
SQIP would be expected to increase the rate of scenic improvements. No
such group presently exists and improvement projects are dealt with on a
property by property basis, usually with the property owner or user. Using
TRPA's Capital Finance Committee as a model, more attention and resources
would be used to improve scenic thresholds.

The visual magnitude/color contrast rating system (VisMag) is presently an
existing control measure for certain projects located within TRPA Rural
Scenic Highway Corridors. At this time, it is not applied to any other
project type. It has proven extremely successful in achieving its objec-
tive established in subparagraph 30.13.C(3) of the Code which requires
projects to be "...sited in such a manner that they are not visually
evident from the scenic highway." Field testing of VisMag ratings for
urban and transition visual environments in such matters as additional
building height suggests its usefulness as a design development and eval-
uation tool.

Based on the measured improvements attributable to California side under-
grounding projects, a Nevada side overhead utility undergrounding project
is expected to significantly raise the threshold rating of at least the
following four non-attainment units: Unit 20, Tahoe Vista (North Stateline
segment); Unit 22, Crystal Bay; Unit 25, Ponderosa Area; and Unit 44,
Kingsbury Grade. Comparable undergrounding projects on the California side
cost approximately $325.00 per linear foot, making cost a major constraint.
D. Monitoring Program

The monitoring program for scenic resource thresholds has traditionally been different from other monitoring efforts carried out in the Tahoe Region. To this point, monitoring has consisted of a complete re-rating of all adopted ratings, concentrating on the travel units where the most change was thought to have occurred since the previous rating. Travel route ratings have been monitored on five different occasions since 1971. Scenic quality ratings have been monitored twice since their 1982 adoption. The SQIP calls for rerating of threshold ratings every five years.

Two separate actions are recommended to improve monitoring of scenic resource thresholds:

1. More complete tracking of projects located within travel route units by TRPA as part of Chapter 28 tracking program. The information would be more accessible during the five year reviews in order to focus on areas of change.

2. Field review of all project sites visible from Lake Tahoe as part of project review process. The existing review process generally requires a static visual simulation from a single viewpoint of the proposed project. Presently, no field review from the lake is conducted. The simulation provides information regarding potential impacts of a project on the parcel, however, it does not provide any information regarding the cumulative impacts over the entire shoreline unit. As stated earlier, it has been shown to be possible to make threshold attainment findings and approve individual projects while at the same time, see unit-wide degradation based on cumulative impacts of individually acceptable projects.

VI. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made regarding attainment and maintenance of regional scenic resources thresholds:

A. Threshold Related

Adopted Threshold Language

1. Conclusion: Adopted threshold language is unclear and does not accurately prescribe specific management strategy for each threshold.

Recommendation: Amend the adopted threshold language as follows:
NUMERICAL STANDARD

Maintain or improve the numerical scenic quality rating assigned to each unit, including the scenic quality rating of the individual resources within each roadway and shoreline unit, as recorded in the Scenic Resource Inventory 1991 Threshold Evaluation Report and shown in Tables 13-6, 13-7, 13-8 and 13-9 of the Draft Study Report.

Maintain the 1982 travel route ratings for all roadway and shoreline units as shown in Tables 13-6 and 13-7 of the Draft Study Report.

Restore scenic quality in roadway units rated 16 or below and shoreline units rated 7 or below.

The 1991 Threshold Evaluation Report would contain the reformatted and updated scenic quality ratings. Refer also to recommendation #4 below, it contains the proposed format which would not use the compositing process and would not contain unit-wide criteria ratings.

Travel Route Rating Thresholds

2. Conclusion: Travel route ratings in urban nonattainment units are generally improving consistent with the targets and schedule established in the SQIP. Travel route ratings in certain roadway and shoreline units located in transition areas (includes both attainment and nonattainment units), however, have declined due to several factors.

Recommendation: Amend SQIP schedule to reflect 1991 updated travel route ratings. Make greater use of applicable sections of Design Review Guidelines as conditions of project approval. Specific sections include: site design and building design.

3. Conclusion: Use of travel route ratings as part of individual project review process is inappropriate due to the lack of sensitivity of the adopted methodology. It does not permit adequate evaluation of cumulative or unit-wide impacts resulting from individual project applications.

Recommendation: Amend the project review process to add a Regional Plan Design Review compliance checklist. Focus travel route ratings primarily as part of five-year regional plan and threshold evaluations, and secondarily as part of large-scale project or master plan applications.

Scenic Quality Rating Thresholds

4. Conclusion: The scenic quality rating threshold composited numerical rating as used today is not sensitive enough to permit accurate analysis of potential impacts to the individual resource criteria during project review.
Recommendation: Eliminate all compositing processes at both the individual resource level and unit-wide criteria and total levels. Keep track of scenic quality ratings by resources only, not unit totals. Use existing travel unit boundaries to assist locating individual resources. Refer to Table 8, Chapter V. Section B. Standards and Targets.

5. Conclusion: The Sensitivity of Change rating is an inherent landscape characteristic of the travel route and is not integral to use of the threshold methodology. Its role in threshold evaluation is often misleading and leads to confusion.

Recommendation: Eliminate the Sensitivity to Change rating as part of the threshold. Use it during project review process as a data source to indicate the inherent landscape characteristic.

6. Conclusion: The 1982 adopted threshold inventory combined certain roadway travel units into groups of two for inventorying purposes. The units included: Units 1/2, Units 5/6, Units 7/8, Units 10/11, Units 12/13, Units 17/18, Units 22/25, and Units 42/43.

Recommendation: Separate resources which had previously been combined into two travel units. Use of travel units is recommended to be eliminated for analytical purposes per recommendation #4 above.

Public Recreation Area Scenic Quality Thresholds

7. Conclusion: Scenic quality thresholds from public recreation areas and bicycle trails have never been implemented. Resolution 82-11 which adopted the environmental thresholds and the Regional Plan Goals and Policies stated the following:

OTHER AREAS

MANAGEMENT STANDARD
Maintain or improve the visual quality of views from bike paths and outdoor recreation areas open to the general public. Upon completion of the 1982 Visual Quality Index, this standard shall become a numerical standard.

The 1982 Visual Quality Index was completed and transmitted in 1983 to TRPA under the title, Lake Tahoe Basin Scenic Resource Evaluation, 1983. The numerical standards, however, have never been implemented.

Recommendation: Amend the threshold as shown below. Implement the amended scenic quality thresholds from public recreation areas. Utilize the methodology identified in the 1986 Wagstaff and Brady report prepared for TRPA as modified by the 1991 scenic resources threshold review committee. The modifications consist of eliminating individual resource and unit-wide compositing in a manner identical to scenic quality ratings recommendation #4 above, and removing the Sensitivity of Change rating.
OTHER AREAS

MANAGEMENT STANDARD

Maintain or improve the visual numerical scenic quality rating of views from bike paths and outdoor recreation areas as identified in the Lake Tahoe Basin Scenic Resource Evaluation, 1983. Establish numerical scenic quality ratings for all Class I bike paths which have opened since the 1983 evaluation. Update the bike path evaluations as necessary with new Class I bike paths as part of each five year regional plan and threshold review. Maintain or improve the numerical scenic quality rating of views from the additional bike paths opened since the 1983 evaluation. open-to-the-general-public, open-accession-of-the-1983-visual-quality-index-this-standard-shall become-a-numerical-standard.
MEMORANDUM

August 7, 1991

To: TRPA Advisory Planning Commission

From: Agency Staff

Subject: 1991 Threshold Evaluation Pertaining to Noise.

In February of 1991, TRPA selected Engineering Dynamics Inc. of Engelwood, Colorado to assist staff in the Agency’s evaluation towards the noise thresholds, and interim noise targets established by the Regional Plan, and Code of Ordinances. In conjunction with this evaluation, Engineering Dynamics has collected additional Community Noise Equivalent Levels (CNEL) and traffic noise data associated with identified Plan Areas, and traffic corridors around the Tahoe Region.

The discussion scheduled to take place at the August Meeting of the Advisory Planning Commission is intended to focus on the findings of this noise collection effort, and to discuss the progress TRPA has made towards the noise thresholds, and indicators, currently in place. A copy of the report will be submitted to the Commission at their meeting on Wednesday.

If you have any questions in regard to this agenda item, please contact Keith Norberg at (702) 588-6782.
MEMORANDUM

August 5, 1991

To: Advisory Planning Commission

From: TRPA Staff

Subject: 1991 Threshold Evaluation Pertaining to Economics

The 1991 threshold evaluation report pertaining to economics will be sent under separate cover, or presented at the Advisory Planning Commission meeting.

If you have any questions regarding this agenda item, contact Jim Dana at (702) 588-4547.

/rd
8/5/91
MEMORANDUM

August 5, 1991

To: TRPA Advisory Planning Commission
From: TRPA Staff
Re: Amendment of Chapters 2, 4, 5, 20, 34, 37, and 53

BACKGROUND: Over the past two years, staff has compiled a list of technical corrections that should be made to the Code for consistency and clarification. These amendments do not add new policies or change existing policies; they clarify existing provisions and make the Code more consistent and understandable.

PROPOSED AMENDMENTS: The proposed amendments are set forth with a brief explanation of the problem preceding the proposed amendment. New language is underlined.

A. Chapter 2:

(1) The definition of "derelict" is currently hidden in Chapter 34. The amendment brings it forward to Chapter 2 with the other definitions.

PROPOSED AMENDMENT: Derelict Development: See Chapter 34r. An abandoned structure or other development. Abandonment is determined without regard to intent to abandon. Evidence of abandonment includes lack of maintenance, access, utility connections, habitability or ability to function in the applicable use category.

(2) The definition of "canopy" in Chapter 2 should include a "built" canopy as referenced in the setback provisions in subparagraph 30.5.D(1).

PROPOSED AMENDMENT: Canopy: The more or less continuous cover of branches and foliage formed by the crown of adjacent trees and other woody growth. A manmade structure consisting of a suspended covering or roof or similar structure.

SES:jm
8/5/91
(3) The definition of "existing" should clearly exclude discontinued uses and expired approvals.

PROPOSED AMENDMENT: Existing: Legally present or approved on the effective date of the Regional Plan or subsequently legally constructed, commenced or approved pursuant to necessary permits. Derelict structures are not considered existing for purposes of Chapter 33, 34 and 35 nor are discontinued uses or projects whose approvals have expired.

(4) The definition of "overhang" should delete the cantilevered requirement to reflect current project review practice.

PROPOSED AMENDMENT: Overhang: The portion of a structure that is cantilevered so as to not require a structural member attached to the ground or is a deck supported by posts with no structure underneath. For a building or deck, the overhang is that portion of the structure extending beyond a line connecting the last row of structural posts or beyond a continuous foundation wall.

(5) The definition of "sedimentation" contains a misspelling.

PROPOSED AMENDMENT: Sedimentation: The process of subsidence and deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. Usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material. Also called settling. In geology, sedimentation consists of five fundamental processes: weathering, erosion, transportation, deposition, and diag enesis or consolidation into rock.

B. Chapter 4:

(1) The provision for fire rebuilds needs to clarify that failure to apply within the deadline results in the structure losing its existing status such that a new allocation, if applicable, would be required to reconstruct. The requirement for a dual application should be deleted.

A complete application, as defined in the Rules of Procedure, shall be submitted to TRPA within eighteen months of the damage or destruction resulting from the calamity. Structures for which applications are not timely filed shall be considered derelict and not as existing structures.

C. Chapter 5:

(1) The provision which exempts projects from preparation of an EIS should clarify that IECs and EAs are not required either.

PROPOSED AMENDMENT: 5.5.A Projects Exempt From Preparation of Environmental Impact Statement: The following projects are exempt from preparation of an EIS and other environmental documents:

(2) The list of exemptions from environmental documents currently include a class of activities which are exempt from TRPA review and should be amended to exempt the lowest level of vehicle trips which constitute a project. Also, the list of exempt activities should include transfers of development rights and residential allocations since these do not result in "built" projects and are largely ministerial.

PROPOSED AMENDMENT: (2) Insignificant Changes in use consisting of minor increases in vehicle trips (See Chapter 93).

(3) Transfers of development rights and residential allocations (does not include construction of new units).

D. Chapter 20:

(1) The example of a PUD calculation should have a division sign, not a minus sign.

PROPOSED AMENDMENT: 20.3.A(3) Remaining Allowable Base Coverage (13,560) \( \div \) Number of Parcels (10) = Allowable Base Coverage Per Parcel (1350).

(2) The provisions for the transfer of land coverage should include reference to IPES scores.

AGENDA ITEM V B.
PROPOSED AMENDMENT: 20.3.C(3) Sending Parcels Classified As Sensitive Lands (Land Capability Districts 1-3): If land coverage is transferred from a sending parcel that is located, in whole or in part, in Land Capability Districts 1 through 3, inclusive, or is at or below the initial level defining the top rank under IPES (i.e., 725), the coverage transferred shall be permanently retired in the manner set forth in Subparagraph 20.3.C(7) and may not be returned to the sending parcel.

PROPOSED AMENDMENT: 20.3.C(4) Sending Parcels Classified As High Capability Lands (Land Capability Districts 4-7): If land coverage is transferred from a sending parcel that is located entirely within Land Capability Districts 4 through 7, inclusive, or is above the initial level defining the top rank under IPES (i.e., 725), land coverage may be returned to the sending parcel subject to the limitations of Subsections 20.3.A and 20.3.B.

(3) The Code provisions for mitigating SEZ disturbance are inconsistent with the 208 Plan and should require mitigation for all disturbance in an SEZ.

PROPOSED AMENDMENT: 20.4.B(1)(b), 20.4.B(2)(e), and 20.4.b(3)(c) The impacts of the land coverage and disturbance are fully mitigated in the manner set forth in Subparagraph 20.4.A(2)(e), with the exception that the restoration requirement in such Subsection shall apply exclusively to stream environment zone lands and shall include coverage and disturbance within the permitted Bailey coefficients.

E. Chapter 34:

(1) The definition of "derelict" should be deleted since it will be moved to Chapter 2.

PROPOSED AMENDMENT: 34.4.C(2) Transfers of use shall not be permitted for development that has become derelict. *Defined as having been abandoned.* Abandonment shall be determined without regard to intent to abandon as evidenced by such evidence as lack of maintenance, access, utility.
connections7-habitability7-or-ability-to-function-as-a
facility-in-the-category-of-use-for-which-a-transfer-is
proposed:

(2) The reference to environmental documentation for a development
right transfer should be deleted consistent with the proposed
amendment to Subsection 5.5.A.

PROPOSED
AMENDMENT: 34.2-F-Environmental-Document--The-approval-of-a-transfer
shall-require-environmental-documentation-pursuant-to
Chapter-5-

F. Chapter 37:

(1) The IPES appeal process currently requires two applications for
appeals. This procedure made sense for the initial appeals but
not for the small number of appeals being received today.

PROPOSED
AMENDMENT: 37.10.D The owner of a parcel who has received notification of
the parcel's score under IPES may file an appeal with
TRPA by submitting a complete written appeal
application no later than 180 days notifying TRPA of
the intent to appeal.--Such notification shall be in
writing and shall be filed with TRPA no later than 45
working days from the date notification is received
in accordance with Subparagraph 37.9.B(2). It is given pursuant to
TRPA's Rules of Procedure.--Complete applications for
appeals shall be filed with TRPA within 45 working
days from the date notification, in accordance with
Subparagraph 37.9.B(2). Complete applications shall
include, at a minimum, identification of the IPES
criteria the parcel owner feels was improperly or
incorrectly applied and any data, reports, or other
information in support of the appeal.

(2) Score notification should not include ranking due to the extreme
administrative burden in recalculating the rankings each time a
property owner requests a new score or review of an alternative
building site.

PROPOSED
AMENDMENT: 37.9.B(2) Once TRPA has taken action on requests for reevaluation
in accordance with Subsection 37.10.C and has
established the numerical level defining the top ranked

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parcels in accordance with Subsection 37.8.B and the formula for determine allowable base land coverage in accordance with Section 37.11, the owners of parcels evaluated under IPES shall be notified by mail, in accordance with TRPA's Rules of Procedure, of the parcel's total score, ranking-within-the-appropriate jurisdiction, percentage of allowable base land coverage and the numerical value at which the line identifying the top ranked parcels is located. This notification shall also identify the score received under each element of IPES and the procedure for filing an appeal.

PROPOSED AMENDMENT: 37.9.B(3) TRPA shall notify each parcel owner of the score resulting from the procedure established in Subparagraph 37.10.D(1) once TRPA has completed its review of the appeal application. This notification shall include the parcel's total score, ranking-within-the-appropriate-jurisdiction, percentage of allowable base land coverage, the score received under each element of IPES and the procedure for requesting that the appeal be heard by the Governing Board.

G. Chapter 53: There is a typographical error in a cross-reference.

PROPOSED AMENDMENT: 53.9.B Development Standards: In addition to the standards set forth in Chapter 54 and 55, the standards set forth in Subsection 53.8.B for Tolerance Districts 4 and 5 shall be applicable to Tolerance Districts 6, 7 and 8. The following standards also shall apply:

ENVIRONMENTAL DOCUMENTATION AND FINDINGS: Because the amendments correct or clarify existing provisions, staff recommends a finding of no significant adverse effect. With respect to the new exemptions from EISs, these exemptions clearly have no significant adverse effect because they do not involve new construction or other environmental impacts.

RECOMMENDATION: Staff recommends that the APC conduct a public hearing and, if appropriate, recommend adoption of the amendments to the Governing Board.
August 5, 1991

To:           Advisory Planning Commission
From:         TRPA Staff
Subject:      Man-Modified Assessment, Payless Site: APN 94-190-22 & 26
              State Highway 89 Tahoe City, California

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STAFF RECOMMENDATION

Staff recommends the Advisory Planning Commission take no action on the
Man-Modified report.

If there are questions or comments relating to this agenda item, please contact
Joseph A. Pepi at (702) 588-6787.

Summary of position of TRPA Staff

A significant amount of testimony has been presented by TRPA staff based on
field work done by experts retained by the Agency. In addition, the agents
representing Payless Drug Stores Northwest have retained several experts (some
of them the same as TRPA's) to present information contained in a report
entitled "Report of Investigation of Man-Modification to Payless Site, Tahoe
City, CA." for TRPA of them the same as TRPA review. This report attempts to
refute the work completed for TRPA in 1987.

The staff continues to support the findings and conclusions of the original land
capability report prepared by the team of experts hired by the Agency in 1988.
This report was done pursuant to Chapter 20.2.E of the Code of Ordinances and
was initiated by TRPA as a part of the Tahoe City Community Plan.

8/4/91
/jp

AGENDA ITEM V.C.

Planning for the Protection of our Lake and Land
The land capability report prepared under contract to TRPA for the Tahoe City Community Plan was done by a team of experts employed by Davis2 Consulting Earth Scientists and consisting of of Sid Davis, Grant Kennedy and Lawrence Welch, Soil Scientists, and C.M. Skau, Ph.D., Hydrologist.

STREAM ENVIRONMENT ZONE CRITERIA

The land capability overlay maps adopted in 1987 depicted areas of SEZ pursuant to the criteria set forth in the Lake Tahoe Basin Water Quality Management Plan (TRPA 1978) and labeled these SEZ areas as land capability class 1b.

The SEZ criteria set forth in the TRPA Code of Ordinances, Section 37.3 adopted in June 1987 for vacant single family parcels, were incorporated into the Water Quality Management Plan for the Lake Tahoe Region (TRPA 1988). Upon approval of the Water Quality Management Plan in June 1989, the SEZ criteria referenced in Chapter 37 became the criteria for determination of SEZ areas for all lands in the Lake Tahoe Region. The Land Capability Classification 1b is assigned to all areas exhibiting the characteristics of an SEZ as defined in the Water Quality Management Plan for the Lake Tahoe Region (TRPA 1988).

LAND CAPABILITY REPORT BY DAVIS2 TEAM

In the Davis2 report, background information was presented on the environmental setting of the Payless site. In this environmental setting description, this site was identified as soil map unit Gr (Gravelly alluvial lands) in the Soil Conservation Service Tahoe Basin Area Soil Survey prepared by John H. Rodgers in 1974. The Land Capability Classification of the Lake Tahoe Basin, California and Nevada, A Guide for Planning (Bailey, 1974) assigned the 1b classification to the areas mapped as the Gr soil map unit. Based on these two publications, the Land Capability Overlay Maps adopted by TRPA in 1987, show the Payless site to be land capability class 1b.

The Geomorphic Analysis of the Lake Tahoe Basin (Bailey, 1974) maps this area as geomorphic unit E-3 (Alluvial Lands). This geomorphic unit is classified as high hazard land. The soils and land capability identified on the parcel in the Davis report are consistent with the mapped geomorphic hazard rating.

The soils investigation report and the land capability assessment for the Tahoe City Community Plan area prepared by Davis2 Consulting Earth Scientists, included a specific soil profile for the Payless site. This profile describes a dark gray to grayish brown silty clay soil in a topographically low concave position. This soil designated as "Soil B", developed in very slow moving drainage water under anaerobic (i.e. no or very little oxygen due to saturation with water) conditions, causing organic matter and fine grained materials to accumulate, turning the surface black, with gray colors below 40 inches. It was recognized in this report that portions of the Soil B on the Payless site had been filled. But because the fill was less than 20 inches in depth, the soil

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below the fill is predominate and this portion of the soil profile is what is classified according to the rules of soil taxonomy.

Soil B was found to be very poorly drained and in Soil Hydrologic Group D. The conclusion of the team of experts employed by Davis, based on the soil and landform characteristics of the Payless site, was that it was best classified as land capability 1b.

These conclusions based on soil characteristics are supported by direct evidence of a near surface seasonal water table at varying depths on this parcel. Information from the "Tahoe City Urban Runoff Treatment Facility Hydrogeologic Site Investigation" (Fenske, 1990) on the depth to water in a series of 10 observation wells on the Payless site, indicates that the depth to the near surface water table ranges from 0 to 30 inches from the surface on March 23, 1990, and from 6 to 40 inches in January and May 1990. The observation well data, which measured actual water levels on the parcel during the spring of drought year, is strong evidence of a near surface water table for the majority of the Payless site.

There is also vegetative information to support the designation of this site as land capability class 1b. Although the graded areas at the front of the parcel are dominated by mostly bare ground and a sparse stand of native and introduced grasses and weeds, which does not support wet meadow species at this time, the area along and adjacent to the ditch is dominated by native and introduced wetland species which are secondary riparian species indicating a Wet Mesic Meadow community. The back portion of the site, which has been least disturbed and can be classified as a transition zone with some Jeffrey pine, grasses and weeds is best classified as Herbaceous, Wet Mesic Meadow. The ditch areas of the site are dominated by primary riparian species and can be classified as swamp areas because of the presence of water the majority of the year and throughout the growing season.

The surface water found in the ditches on this parcel is the result of drainage from upslope areas onto the Payless site. Some of the surface water drains across the parcel and into the Truckee River via a series of ditches and culverts. There is some exchange of surface flow to the near surface water table as a result of seepage from the earthen ditches. There is evidence that some of the surface flow results from a series of drains in the golf course area which brings subsurface water to the drained ditches. Often there is ponded water on the Payless site during periods of spring snow melt. This can also be attributed to the poorly drainage nature of the soils and the compacted fill material located on some areas of the site.

The ditches along the back, sides and front of these parcels serve to drain water away and lower the water table to a depth below where it would be without the man-made ditch system. The ditch system above this parcel may increase the amount of water which is conducted onto this parcel, however, the ditches on the parcel assist in moving the additional water off more quickly than would be the case if they were not present.

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In October 1987, a field crew retained by TRPA to conduct field evaluations of vacant parcels for the Individual Parcel Evaluation System (IPES) inspected the Payless site. The parcel was subject to IPES evaluation since single family residential development could be allowed as a special use. The IPES field evaluation found the soils to be compacted fill material, sampled to a depth of only 9 inches. The slopes were measured at 1% gradient with poor vegetative cover. The soils analysis was incorrectly done since the criteria for soils interpretation requires the soils be analyzed to a depth of at least 20 inches, and in most cases more appropriately analyzed to at least 40 inches. Since the soils were only analyzed to 9 inches there was no way for the team to determine if there was evidence of a water table at less than 20 inches. Evidence of a water table at less than 20 inches is a primary indicator of stream environment zone (SEZ) areas. The soil investigation report prepared by Davis' was not available to the IPES field team at the time of their evaluation.

The results of the IPES evaluation were mailed to the owners of record (PNW, Inc., 9275 SW Peyton Lane, Wilsonville, OR 97070) during the spring of 1988, with the final IPES score of 843 being mailed on February 10, 1989. The error in the soil evaluation procedure was not discovered by TRPA until the information was presented by the Payless representatives at the May 1991 APC meeting. The owners of the Payless property did not request reevaluation of their IPES score nor did they file an appeal of the IPES score for parcel 94-190-26.
Summary of position of Payless Stores Northwest

The report submitted by representatives for Payless Drug Stores Northwest has information which they felt should be included in a Man-Modified report for the Payless site. The key components of this report were the soils, hydrology and vegetation assessments, conducted by Grant Kennedy and John H. Rodgers, Soil Scientists, C. M. Skau, Ph.D., Hydrologist and Linda Nelson, Botanical Resource Consultant. The findings and conclusions made by this group in their May 1991 report now find the Payless site to be best classified as land capability class 5 and 1b. The bulk of the Payless report is made up of information and pictures relating to and depicting the previous uses, modifications, and physical state of the property for the past 130 years.

The soil investigation conducted by Grant Kennedy and John Rodgers consisted of six soil pits excavated using a backhoe and the detailed description of the soil profiles exposed. The soil conditions found were similar to those found in previous work. The soils were characterized as having a dark highly organic loam to silty clay loam topsoil and a dark gray silty clay subsoil. The depth of fill material over the soil ranged from 6 to 30 inches. In five of the six pits water seeped into the pits at 42 to 72 inches. In the one pit into which there was no seepage, the soil still had dark surface soils and a greenish-gray or grayed substrata.

These soils are described as having very slow infiltration rates and are slowly permeable. They are classified in Hydrologic Soil Group D, with a slight relative erosion hazard and high runoff potential.

In the soils report, the drainage is described as poorest at the back of the Payless Site, with portions having a fairly long duration of saturation above a depth of 20 inches. Nearer the front of these parcels adjacent to Highway 28, the period of soil saturation is described as being of short duration during the snowmelt and peak runoff periods, and the water tables are lower.

Mr. Kennedy concludes that due to modifications to this site due to grading, filling and redirection of water, that the physical properties have been significantly altered from the natural state. Using the criteria listed on page 20 of the "Guide to Land Capability Classification in the Lake Tahoe Basin" and information compiled from the Payless Site, Mr. Kennedy concludes that a large portion should be classified as Land Capability Class 5. He further concludes that only a small portion of the site appears to be in Land Capability Class 1b, and that restoration of the remainder is impractical in view of the costs and possibilities of success.
Dr. Clarence Skau, Hydrologist, conducted a surface and subsurface hydrologic investigation of the Payless Site. He found a series of drainage ditches that nearly surround the site. The ditches on adjacent properties serve to channel surface runoff from those properties to the drainage ditch along Highway 28. Skau claims that ditches with water coming from the golf course above the Payless site, an abandoned well above another open ditch and an upper 2 to 3 1/2 foot deep ditch intercepting subsurface flow all feed water to the Payless Site through exfiltration.

The effect of these ditches, according to Skau, is to produce a substantially man-modified hydrologic condition: (1) by bringing in off-site water; (2) by lowering watertable levels during seasonal wet periods; (3) by creating corridors of wetland vegetation; and (4) by creating "saturation wedges" during dry periods. The channelization done on the site also contributes to storm runoff, higher peak flows and channel erosion.

An additional substantial modification noted by Skau is the presence of fill material over the native soil. The effect of this fill according to Skau is to lower the level of the subsurface water and due to compaction to reduce the infiltration capacity and soil water recharge from above.

Dr. Skau characterizes the data from observation wells installed on the site as being biased and not representative of the actual level of the subsurface water levels. In his opinion, this bias is due to seasonal variation in water levels, confining layers in the soil profiles, the unintentional placement of observation wells in the wetter sites, and the melting of snow piled from the Lucky Store parking lot on the edge of the Payless site.

The vegetative report prepared by Linda Nelson is a representation of the species occurring on the Payless site. Her report delineates the vegetative species into map units according to wetland criteria developed and used by the U.S. Army Corps of Engineers, which is the criteria adopted by TRPA for identification of SEZ areas.

Nelson identified four vegetation map units. Map Unit #1 is dominated by native "obligate" wetland species. Map unit #2 is dominated by a mix of native and introduced graminoid species. According to the guide "Vegetation of the Lake Tahoe Region" this map unit equates to Type 2, wet Mesic Meadow. The vegetative types in Map Unit #3 are a combination Type 1A (Bareground disturbed) and Type 2 (Herbaceous, Wet Mesic Meadow). Map unit 4 is located throughout the central portion of these parcels and equates with vegetative Type 1A (Bareground-Disturbed).

She concludes that only a small portion of the Payless Site is presently functioning as Land Capability Class 1b and that the majority is significantly man-modified.
Staff Conclusion

TRPA staff has reviewed all of the information available at this time and concludes the Payless site is still best classified as predominately land capability class 1b. The poorly drained nature of the soils coupled with the presence of secondary riparian species in those areas which have not been least disturbed by man's activities and uses indicate that the site still maintains the characteristics of a SEZ area.

The staff has reviewed the information available relating to the land capability of the Payless site and has addressed the seven elements of the Man-Modified report and found that we cannot make all six of the required findings necessary to approve a Man-Modified determination for the Payless site.

Of the six required findings, staff is unable to make the following findings:

b) further development will not exacerbate existing problems

c) land does not exhibit the Stream Environment Zone (SEZ) land capability class 1b characteristics originally assigned

d) restoration is infeasible

e) further development can be mitigated offsite

f) mitigation is provided onsite and offsite for losses caused by the modification

Except for finding (c), the property owner has presented no evidence to support making the other required findings. In addition, staff does not agree that the experts hired by the property owner have provided sufficient evidence to support the conclusions they make with regard to finding (c).
MEMORANDUM

August 1, 1991

To: Advisory Planning Commission
From: TRPA Staff
Subject: Amendment of Ski Area Master Plan Guidelines
Regarding Cumulative Watershed Effects Analysis
Policy and Methodology

Background: In November 1990, the Governing Board adopted the Ski Area Master Plan Guidelines. At the time of adoption, the Governing Board directed staff to reconvene the Master Plan Guidelines Drafting Committee in May 1991, to review potential amendments to the ski area cumulative watershed effects analysis (CWE) element of the guidelines. During the intervening time, the Lake Tahoe Basin Management Unit, under the leadership of Andrea Holland, staff hydrologist, assembled an interdisciplinary team of specialists to examine the adopted CWE methodology and recommend revisions. The Drafting Committee has met twice to discuss proposed revisions.

A copy of the adopted guidelines is included in the AFC packet. A summary of the amendments is listed below. The specific language is provided in three attachments to the staff report.

Summary of Proposed Amendments:

1. Clarifies the policy regarding the preparation and role of the Ski Area Cumulative Watershed Effects Analysis (CWE), including what goes in the master plan and what goes in the environmental document (Attachment A, Amendments 1 and 2).

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2. Defines the need for and role of the technical interdisciplinary team. Setting the Threshold of Concern will remain with the master plan steering committee, based on the recommendations of the interdisciplinary team (Attachment A, Amendment 2).

3. Identifies the process for substitute cumulative effects methodologies (Attachment A, Amendment 2).

4. Provides the procedural CWE methodology based on Andrea Holland's example using Heavenly Valley Creek (Attachment B).

5. Identifies specific CWE data collection needs also based on Andrea Holland's work with Heavenly Valley (Attachment C).

Environmental Documentation: Staff has completed an Initial Environmental Checklist and proposes a Finding of No Significant Effect (FONSE) for the amendments because they are designed to conserve and enhance watershed values which may be affected by individual projects contained in the master plan.

Staff Recommendation: Staff recommends the APC conduct the public hearing and based on its outcome, recommend adoption of the amendments to the Governing Board. Please contact Andrew Strain at (702) 586-4547 if you have any questions regarding this agenda item.
PROPOSED CUMULATIVE WATERSHED EFFECTS ANALYSIS AMENDMENTS

Stricken language is to be deleted; underlined language is to be added.


9. The master plan shall achieve a balanced facility as measured by the following relationships:

a. The Ski Area Cumulative Watershed Effects Analysis (CWE) shall be prepared for the master plan. The CWE shall follow the procedures set forth in Appendix 5 of this chapter. Following master plan adoption, CWE shall be incorporated as part of individual project applications to identify and assess potential adverse impacts to the beneficial uses of water, and determine appropriate mitigation measures.


In determining the appropriateness of the type, location, and timing of additional land disturbance and development activities, a Ski Area Cumulative Watershed Effects Analysis (CWE) shall be prepared as part of the master plan. The accompanying environmental document shall assess the technical adequacy and conclusions of the CWE for the preferred alternative plan and shall perform a CWE for the alternative master plans as they may differ from the preferred alternative plan.

It is recommended that the CWE follow the process outlined below. It has been derived for use in the Tahoe Region from USDA Forest Service Region 5 Soil and Water Conservation Handbook, FSH 2509.22. The complete procedural methodology, including data collection needs is located in Chapter V. References To Be Used During Master Plan Preparation. Upon recommendation from the Ski Area Master Plan Guidelines Committee, individual master plans may propose an alternate process to the one outlined below. The alternate process will be an amendment
Attachment A: Proposed Ski Area Master Plan Guidelines Amendments
7/19/91
page 2

to the Ski Area Master Plan Guidelines document, requiring approval by the TRPA Governing Board.

With the exception of Thresholds Of Concern, individual master plan steering committees shall utilize an interdisciplinary team to establish all variables necessary to complete the CWE. The team shall consist of persons not otherwise associated with the master plan with expertise in: water quality, hydrology, land use (including ski area design), geology and soils. Based on the recommendations of the interdisciplinary team, the steering committee shall establish the Threshold Of Concern for each watershed or portion thereof, within the master plan boundary.

The following steps shall be included in the CWE:

1. Identify beneficial uses of surface and ground waters within and downstream from the master plan boundary.
2. Identify applicable water quality protection standards, criteria and thresholds.
3. Calculate the size of each watershed within the master plan boundary.
4. Describe watershed characteristics in terms of their climate, hillslope and stream channel geomorphology, hillslope and stream channel hydrology, soils, geology, and physical and biological sensitive land units; quantify where appropriate and possible.
5. Describe hillslope and stream channel attributes (including geomorphic, biologic, and hydrologic) in terms of the watershed’s response to land uses; quantify where appropriate and possible.
6. Identify potential or known mechanisms for significant adverse cumulative watershed effects.
7. Describe watershed history, including current disturbance and development.
8. Define the natural sensitivity of each distinguishable land unit within each watershed. Consider climatic and watershed characteristics.
9. Estimate a maximum tolerance limit of each watershed to externally applied factors including climate and land use. The maximum tolerance limit to land use shall become the Threshold of Concern (TOC).
10. Quantitatively compare existing and proposed land disturbance activities.
11. Estimate the relative impact of land use activities identified in #10.
12. Identify Best Management Practices (BMPs) appropriate to each type of disturbance. Where possible, quantitatively estimate their effectiveness in reducing the susceptibility of the watershed to significant adverse cumulative effects (e.g., mitigated coefficients of disturbance).
13. Estimate the potential for site recovery.
14. Estimate the relative susceptibility of the watershed to each proposed disturbance to initiate a significant adverse cumulative effect.
15. Develop a comprehensive monitoring plan to provide data necessary to refine the Ski Area Cumulative Watershed Effects Analysis for use over time. Coordinate with the Master Plan monitoring program.
3. **Chapter V. Section C. Ski Area Cumulative Effects Analysis Disturbance Activities and Conditions, Pages 34-5.** Delete all existing language. Replace with Attachment B provided below, titled Ski Area Cumulative Watersheds Effects Analysis Procedure.

4. **Chapter V. Section D. Natural Sensitivity Index Attributes, Page 36.** Delete all existing language. Replace with Attachment C provided below, titled Ski Area Cumulative Watershed Effects Analysis Data Requirements.

/as
C. **SKI AREA CUMULATIVE WATERSHED EFFECTS ANALYSIS PROCEDURE**

Prepared by: Andrea Holland  
Hydrologist  
Lake Tahoe Basin Management Unit

The analysis outlined in this report addresses the procedure for preparing the Ski Area Cumulative Watershed Effects Analysis (CWE) as an integral part of ski area master planning. The procedure is based on a CWE study prepared for the Heavenly Valley Creek watershed at Heavenly Valley Ski Area under the direction of Andrea Holland, Lake Tahoe Basin Management Unit hydrologist.

In developing the model in this report, an interdisciplinary team (IDT) considered each of the following factors required in evaluating CWE susceptibility (per R-5 FSH 2509.22). As long as each factor is considered in the CWE analysis, the analysis was valid. These factors and a discussion of each follows:

1. **Beneficial Uses of Water.** Beneficial uses of water can include water quality and fisheries. Water quality is important in the Lake Tahoe Basin and is strictly regulated by regional and state standards. Fisheries may also constitute a beneficial use of water. For example, Lahontan Cutthroat Trout, a threatened species, has been identified in Heavenly Valley Creek.

2. **Water Quality Protection Criteria.** For each beneficial use, indicators of unacceptable disturbance should be identified. For water quality, the California State water quality standards apply as identified in the Lahontan Regional Board's waste discharge requirements for ski area parking lots and lodges on the California side. Nevada State water quality standards will be applied to ski areas or portions thereof in Nevada. Provide available data from streams or channels presently monitored. Identify and discuss their attainment status. For fisheries, the minimum stream habitat condition for a viable fish population includes a pool/riffle ratio of 1:1 and embeddedness no greater than 20%.

3. **Watershed Size.** Map and measure the area of each watershed or portion thereof, within the ski area master plan boundary.

4. **Watershed Characteristics.** Describe the characteristics of each watershed in terms of topography, soils, geology and geomorphology, climate, hydrology, water quality and vegetation. Quantify where appropriate. Provide a discussion of watershed conditions.
5. **Hillslope and Stream Channel Attributes.** These will be included in the discussions of the above watershed characteristics and will address the existing condition of the watershed in terms of the affects of development on soil stabilization and channel modification.

6. **Probable Mechanisms for CWE.** Several possible mechanisms can initiate a CWE. Within these mechanics lies the core of the CWE assessment procedure. Discuss the possible mechanisms below as they relate to the watershed(s) in question.
   a. Chronic sedimentation
   b. Hydrologic changes
   c. Changes in woody debris
   d. Change in snow hydrology
   e. Other possible mechanisms

7. **Watershed History.** Discuss the history of land use and development of the ski area by watershed. Include a chronology of development of each ski run.

8. **Natural Watershed Sensitivity.** Using the Bailey Report as a basis, describe the natural sensitivity of each watershed. Provide quantitative data, including climatic data, where possible. Identify comparable watersheds that have data describing their natural sensitivity.

9. **Watershed Tolerance to Land Use.** In this analysis, two objectives are necessary. First, determine whether an adverse cumulative effect has already occurred. If it has, then determination must be made of the scope of mitigative measures that must be applied at specific disturbance sites throughout the ski area to bring the watershed back to a more balanced hydrologic system. Second, analysis of the CWE impacts of proposed projects must be made to prescribe mitigation to assure against further degradation of the watershed.

Watershed tolerance to land use is tied most closely to natural watershed sensitivity. Watersheds with a high natural sensitivity tolerate less land disturbance and require greater attention to land use planning details than watersheds of lower sensitivity.

This factor is closely connected to the estimation of the Threshold of Concern (TOC). An interactive and multi-step process as described in the CWE Handbook, it requires comparison of several watersheds with respect to the extent of land use disturbance and the occurrence or non-occurrence of adverse CWE. When it has been determined that an adverse cumulative effect has occurred, then the current disturbance level and condition of the ski area exceeds the TOC for that watershed. This, at least, provides an upper limit of the range of possible TOC’s for a watershed.

It must be stressed that regardless of what number is derived for the TOC, that value is not a precise measurement. It does not signify that all disturbances up to that point will not cause adverse CWE nor does it imply that once that value is exceeded adverse CWE will automatically occur. The TOC is based on water quality data, watershed stability data and, lacking that, professional judgement. It serves as a yellow light to the land manager, suggesting an
increasing susceptibility of the watershed to significant adverse cumulative effects. As that watershed is studied and new information is available, the TOC may be adjusted and fine tuned for better accuracy.

10. Land Disturbance. The concern here is comparing land disturbance activities in a quantitative way. The ski runs, lift lines, snow making lines and roads are all evaluated based on soil loss calculations and sediment delivery indexes.

11. Site Disturbance. Site disturbance coefficients are estimates of the effects of land disturbances as they relate to alteration of hillslope and stream channel attributes which, in turn, influence the mechanics for initiating CWE.

When the most probably mechanism for initiating an adverse cumulative effect is determined to be chronic erosion and sedimentation, coefficients developed for this particular area should reflect hillslope stability at a minimum and sediment budgets and routing, if possible. The CWE model developed for Heavenly Valley is based on a model employing the following factors:

- soil erosivity
- rainfall (in this case a 2 year, 6 hour event)
- slope gradient
- slope length (in this case, usually the distance between waterbars)
- percent canopy cover (probably not much of a factor in the ski area)
- percent ground cover (this includes rock)
- percent fine roots
- available water (as a transport agent)
- soil texture (percent of eroded material finer than 0.05 mm)
- slope shape (concave to convex)
- delivery distance (to channel)
- surface roughness (smooth to rough)

Of these factors, the three most significant to erosion are slope gradient, slope length and ground cover. The factors affecting sediment delivery to the channel include the last five as well as slope gradient and ground cover.

12. Mitigation Measures. Best Management Practices (BMPs) should be considered in any project planning, design and implementation. In Heavenly Valley's case, many BMP's were not implemented at the onset of the ski area's development. Today, although some BMP's are in evidence, there are many other sites where erosion control would be greatly improved with implementation of effective mitigative measures. In addition, due to extreme erosion hazards, special BMP's should be formulated.

The CWE coefficients should include values for mitigated land use activities. For example, some of these BMP's include revegetation, graveling unsurfaced roads, installation of more water bars and stabilization of cut and fill slopes.
13. **Site Recovery.** A CWE analysis should be performed each time a land use activity is proposed. When more data become available and the rate of recovery over time of current revegetation efforts is monitored, a recovery curve will be developed which is useful for broader planning efforts that address longer time spans.

14. **Land Use History.** This is covered under the section "Watershed History."

15. **Current Watershed Disturbance.** This factor refers to development of site disturbance coefficients (CWE coefficients). The current condition of each site disturbance is evaluated followed by assigning an appropriate coefficient.

16. **Proposed Land Use.** Future land use activities can be assessed using the CWE model and evaluated in terms of the watershed's overall conditions, including water quality data.

17. **CWE Susceptibility Evaluation.** As alluded to above, using the information gathered in the first 16 steps, an evaluation is made of each proposed action's susceptibility to initiate a CWE.

18. **Documentation.** This is the final report, including a detailed description of the factors mentioned in steps 1 through 17. The report provides a qualitative assessment of the watershed under study as well as a quantitative result reflecting the total acreage of disturbance.

19. **Monitoring.** Perhaps the most important step in the CWE process, monitoring provides data to better define TOC, land disturbance coefficients and other related aspects to watershed health and the CWE procedure.

**Derivation of Land Disturbance Coefficients**

The CWE procedure proposed in this report is based on a surface erosion model that is expanded to consider sediment delivery to a channel within a watershed. More widely used to estimate surface soil erosion on agricultural lands, the Universal Soil Loss Equation (USLE) was adapted to apply to surface erosion in forest environmental conditions. This Modified Soil Loss Equation (MSLE), is used for our purposes to evaluate the relative magnitudes of soil loss from different site conditions. In addition, a sediment delivery index is incorporated into the model. Keep in mind that for the purposes of developing a CWE analysis for Heavenly Valley, the MSLE is used for comparative purposes and does not, in any way, reflect true soil loading to Heavenly Valley Creek.

Both the MSLE and sediment delivery index procedures are discussed in a procedural handbook entitled "An Approach to Water Resources Evaluation on Non-Point Silvicultural Sources" (a.d.a. WRENS) which was written by the U.S. Forest Service and published in 1980 by the Environmental Protection Agency. Ken Cawley, hydrologist for the Plumas National Forest, developed a computer program incorporating the formulas needed to use these procedures. While used on his forest primarily for timber harvesting planning, it was easily adapted for
developing the CWE procedure described in this report. Note that comparisons can be made between existing ("Before") conditions and planned ("After") activities.

A standardized unit of measure is desirable when comparing land disturbance effects of various management activities. From it, numerical disturbance coefficients can be developed to track overall land disturbance within a watershed. In most instances, roads are the single most disruptive activity in a watershed, altering and concentrating runoff. They form a logical basis upon which to compare other management activities in a given watershed. In the CWE analysis developed for Heavenly Valley, one acre of road is given the value of 1.0 Equivalent Roaded Acre (ERA).

In the Heavenly Valley CWE analysis, the sediment delivery of one acre of road is calculated using the MSLE and sediment delivery formula. The resulting number is then used as the basis upon which all other land disturbance activities in the watershed are compared. These land disturbance numbers are also calculated using the MSLE and sediment delivery formula, providing a means of comparing magnitudes of disturbance. Mitigative factors are either factored into the MSLE or derived from figures provided in published studies.

**CWE Procedural Steps**

The following steps represent the CWE procedure as developed for Heavenly Valley Ski Area. A brief discussion accompanies each identified step.

1. Define the base ERA unit. The ERA unit is based on an unsurfaced road with the following characteristics:
   a. 4% gradient
   b. 12 foot wide
   c. 30% side slope
   d. cut and fill slopes at 1.5:1 slope (66.7%)
   e. cut and fill slopes each 6 feet high on the slope

2. Apply the MSLE and sediment delivery ratio to obtain sediment loss from one ERA. The road, as characterized above, is divided into cut, bed and fill. Each section is analyzed as a portion of one acre of road. The resulting figures are added to attain the base ERA coefficient (one ERA) expressed in tons/acre.

3. Develop sediment production rates for different practices, conditions and sensitivities. The MSLE and sediment delivery ratio are employed to calculate these numbers which are, in turn, compared to the base ERA coefficient.

4. Determine natural sediment production rate. For the first run at this CWE analysis, the procedure outlined in WRENS (Chapter V) for obtaining average natural sediment rate is used. This rate can be modified to be more...
representative as additional data become available. Monitoring an undisturbed creek of equivalent acreage and with similar soils, geologic and hydrologic characteristics will augment this information.

5. Develop a threshold of concern (TOC). This number will represent some percentage over the natural background of sediment production. It should be derived from one or a combination of the following:
   a. State Water Quality Standards, including turbidity
   b. Professional judgement based on field assessment of actual watershed conditions
   c. Increased sediment production above the natural sediment production rate

6. Determine existing sediment production rate. This will be in terms of ERA in tons/acre and expressed as a percentage of the total area of the watershed.

7. Compare existing rate to the TOC. Compare the numbers from step 6 to the number from step 5. Similarly, if water quality standards are not being met and/or the watershed is judged to be in poor condition, the TOC, whatever it is, has likely been exceeded. In the case of Heavenly Valley, the channel condition implies that the TOC has already been exceeded. Therefore, it is expected the existing ERA's to surpass the TOC. Thus the comparison provides an idea of the amount of mitigation the ski area must accomplish in order to bring the watershed back to a healthier state where beneficial uses are protected.

Summary

The CWE procedure developed for Heavenly Valley ski area assesses the current condition of the watershed. It can also be used to analyze the effects of future restoration or development activities at Heavenly and any other ski area in the Tahoe Basin.

One example of its use is as an accounting system for each land disturbance. If the sum of disturbances exceed the TOC, then mitigative measures must be carried out to bring the watershed back into a healthier state. The scope of mitigation is indicated through the results of the CWE analysis, which are then compared to the TOC. By locating the more critical problem areas, the ski area can set priorities in their correction within a given time period.

The procedure also allows for development planning by assessing current suitability of the watershed to additional land disturbance. As a planning tool, the analysis can serve to weigh the pros and cons of development in certain areas of the watershed in terms of CWE. Extended development can thus be planned out over time to allow for stabilization of one segment of a development project before beginning another, thus minimizing the chance of adverse CWE in the watershed.
It must be kept in mind that monitoring must be an inherent part of the model analysis. As in any model, the elements that are included in it must be critically analyzed to allow for modifications. Thus, the model can be refined to reflect a greater accuracy over the time the monitoring occurs.

It must also be emphasized that this is not a predictive model. It is a management model, intended as a tool to trigger closer, more careful management as apparent thresholds are approached.
SUMMARY of
USDA Forest Service, Region 5 (California)
CUMULATIVE WATERSHED EFFECTS METHODOLOGY

prepared by
Andrea Holland
Hydrologist
USDA Forest Service
Lake Tahoe Basin Management Unit
May, 1911

The purpose of this report is to summarize the Cumulative Watershed Effects (CWE) methodology as outlined by the California Region of the Forest Service.

Background
The cumulative watershed effects (CWE) assessment procedure used on National Forest system lands in California is described in Chapter 20 of the Forest Service's "Soil and Water Conservation Handbook" (R-5 FSH 2509.22). The basic purpose of the CWE procedure as described in the handbook is to:

1. Assist forest managers in scoping issues and concerns during land management planning and to identify areas requiring additional evaluation of CWE-related issues.

2. Identify beneficial uses of water and factors concerning watershed, climatic and land uses that combine to influence and define beneficial uses.

3. Use existing information to assess the influence of multiple land use activities on beneficial uses of water.

Cumulative watershed effects are collective effects on beneficial uses of water that occur within a watershed and are transmitted through the fluvial system. These effects can result from synergistic or additive effects of management activities within a watershed.

Analysis of any CWE is considered a growing field and requires, at this point, considerable professional judgement. Thus, it is important that development of a CWE analysis include the input from an interdisciplinary team and that any formula or numbers derived in the assessment be tempered by the collective professional judgement of the team.
Assumptions Behind CWE Methodology

Certain assumptions govern the procedural steps in evaluating CWE as outlined in Chapter 20 of the USDA Soil and Water Conservation Handbook. They include:

1. Beneficial uses of water can be identified; acceptable degradation limits can be established for each type of development.

2. Key indicators of unacceptable degradation can be identified for each type of development and these indicators monitored over time.

3. For a given hydrologic event, or sequence of events, an upper limit of tolerance to disturbance exists for each watershed. The risk of initiating adverse CWE greatly increases as this upper limit is approached or exceeded. The upper limit of tolerable disturbance may represent a geomorphic, biologic, management or legal threshold.

4. Traditional management practices can cause severe adverse impacts when applied to sensitive lands through human error, misunderstanding or incomplete knowledge of the landscape.

5. The potential for initiating adverse CWE can be reduced by:
   a. Limiting management practices on highly sensitive lands to those required to maintain or improve water quality and land stability.
   b. Dispersing land disturbing activities in time and space.
   c. Controlling the physical size, shape, location and timing of land disturbing activities.
   d. Implementing other Best Management Practices (BMPs) to mitigate adverse on-site effects.

6. In most cases, watersheds should not reach or exceed the upper limit of tolerable disturbance, provided that assumption 5 is reasonably implemented.

CWE Development

There are several steps to developing a CWE analysis. These steps are identified and described in detail in the example provided in the appendix to this report.

The information required in a CWE analysis is necessary to understanding the natural processes at work in a watershed as well as how the disequilibrium of these processes can occur due to land disturbances such as logging, roads or ski runs. Such information is typically provided in an analysis both qualitatively and quantitatively. The qualitative information is based upon historical accounts as well as current observations of the physical, biological and anthropomorphic processes affecting a watershed.
Land Disturbance Coefficients

The quantitative portion of a CWE analysis is based upon a standardized unit of measure, allowing comparisons of land disturbance effects of various management activities. From it, numerical disturbance coefficients can be developed to track overall land disturbance within a watershed. In most instances, roads are the single most disruptive activity in a watershed, altering and concentrating runoff. They form a logical basis upon which to compare other management activities in a given watershed. For example, one acre of road is assigned a value of 1.0 Equivalent Roaded Acre (ERA). All other land disturbance activities (ski runs, lift lines, landings, etc.) are evaluated in terms of ERA. An acre of well vegetated ski run on a gentle slope, for instance, might be assigned a value of 0.2 ERA; an acre of badly eroding ski run on a very steep slope might be considered 2.0 ERA.

The objective of a CWE analysis is to prevent adverse effects to a watershed due to land use. It can help locate problem areas where land disturbance activities may substantially increase the chances of adverse CWE. Through this planning tool, such land disturbance can be prevented or mitigated before it is implemented and causes irreparable damage.

In some cases, an adverse CWE has already occurred. In these instances, a CWE analysis can be useful to determine the scope of mitigative measures necessary to bring the watershed back to a more balanced hydrologic system.

Threshold of Concern

The cumulative effects of land disturbances within a watershed must be related to that watershed's tolerance to land use. Watersheds with a high natural sensitivity tolerate less land disturbance and require greater attention to land use planning details than watersheds of lower sensitivity.

This factor is closely connected to the estimation of the Threshold of Concern (TOC) of a particular watershed. An interactive and multi-step process as described in the CWE Handbook, it requires comparison of several watersheds with respect to the extent of land use disturbance and the occurrence of non-occurrence of adverse CWE. If such data are scarce, then the interdisciplinary team must rely on its observations and knowledge of the watershed of concern and designate a TOC based on its collected professional judgement.

It must be stressed that regardless of what number is derived for the TOC, that value is not a precise measurement. It does not signify that all disturbances up to that point will not cause adverse CWE nor does it imply that once that value is exceeded adverse CWE will automatically occur. The TOC is based on watershed stability data and, lacking that, professional judgement. It serves as a yellow light to the land manager, suggesting an increasing susceptibility of the watershed to significant adverse cumulative effects. As that watershed is studied and new information is available, the TOC may be adjusted, much as the dial of an instrument is fine tuned for better accuracy.
Thus, monitoring is a crucial element in any CWE analysis. Even after completion of a CWE analysis, monitoring must continue in order to assess a watershed's vital signs and verify or amend the TOC.
D. SKI AREA CUMULATIVE WATERSHED EFFECTS ANALYSIS DATA REQUIREMENTS

In order to complete a Ski Area Cumulative Watershed Effects Analysis certain information on the roads, ski runs, lift lines and facilities is required. The following list is the baseline information needed for the analysis. The qualitative information contained in Reference C, Ski Area Cumulative Watershed Effects Analysis Procedure will also be used as part of the analysis. Additional specific data may be required as the analysis progresses.

1. The following ski run and lift line information is needed. Ski runs and lift lines shall be broken down into segments of similar gradients and coverage and analyzed as such.
   a. type of summer grooming (intense, using earth movers or selective using tree removal, brushing or blasting).
   b. ground cover (%) and type (i.e. grass, brush, shrubs, rock or combination)
   c. canopy cover (%) if applicable (usually only on lift lines)
   d. slope length (average distance between waterbars in a given run segment)
   e. slope gradient (%)
   f. slope shape (concave, convex, 1/2 concave and 1/2 convex or 1/3 concave and 2/3 convex)
   g. surface roughness (scaled in magnitude of 4 units between extremely smooth surface condition to very rough surface)
   h. location of nearest ephemeral, intermittent and perennial channels and meadows (distance measurement)

2. The following information on facilities is needed:
   a. area of impervious surface (structures, paved walkways)
   b. area of compacted, unsurfaced areas not considered roads.

3. The following information on roads at the ski resort is needed. Roads will be broken down into segments related to slope gradient. These segments are roads less than 4%, 4 - 8%, and greater than 8% in slope.
a. length and width of road segment (identified on a map)

b. road treatment, if any (e.g., paved, gravel, rock lined ditches, drop inlets, etc.).

Proximity of a ski run, road or facility to a stream channel must also be recorded. Thus the following information is required:

c. acreage of each road, ski run or facility within 100 feet of a live stream or 75 feet from an ephemeral channel.

d. number of stream/channel crossings of each road and ski run.

4. Other information including the following:

a. Watershed description (map)
   soil types and location
   geology and geomorphology (including geologic hazards)
   riparian area locations
   vegetation type - natural and introduced

b. Hydrology of watershed

c. Water quality data if available

d. Rosgen and Pfankuch ratings on all perennial channels
August 6, 1991

To: Advisory Planning Commission

From: TRPA Staff

Subject: Amendment of Regional Plan Land Capability Overlay Map (C-7) for the Tahoe City Community Plan Area

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Staff Recommendation

The TRPA staff has inspected the area and supports the findings and conclusions of the land capability report prepared by the team of experts. The attached Land Capability Map (C-7) identifies the boundaries of the proposed land capability districts, as defined in the land capability report and staff summary. While certain portions of the central Tahoe City area have been disturbed by grading and importation of fill material, the information and evidence provided by field inspection and from the team of experts does not support the required findings for man-modified determinations as set forth in Section 20.2.F(3) of the TRPA Code of Ordinances. The staff recommends that the Advisory Planning Commission recommend to the Governing Board approval of the proposed Regional Plan Amendment to change the Land Capability Overlay Map (C-7) for the Tahoe City Community Plan Area.

Background

Agency staff is proposing to amend the TRPA Land Capability Overlay Map (C-7) as a component of the Tahoe City Community Plan adoption process. The current land capability overlay maps were adopted by TRPA in 1987 pursuant to Chapter 12 of the Code of Ordinances. A summary of the information available relating to the land capability investigation report for the Tahoe City Community Plan area is described in the findings below. TRPA is proposing the amendments to the Land Capability Overlay Map (C-7) pursuant to the Community Plan process set forth in Chapter 14.6 of the Code of Ordinances, specifically Subsection 14.6.C(2) and (3) of that Chapter. Additionally, the provisions of the 1988 Water Quality Management Plan for the Lake Tahoe Region (208 Plan) call for TRPA to precisely identify and map stream environment zone (SEZ) areas prior to the approval of any Community Plan (Volume I, p.132). This amendment will update and change the designated land capability in the Tahoe City Community Plan area as shown on the attached map. Special Policy #7 of the Tahoe City Planning Area Statement (PAS 001A) states that TRPA will assist with a study of the entire area to identify areas that are man-modified in accordance with Chapter 20 of the Code of Ordinances. A discussion of the man-modified findings for this area are also addressed in the findings below.

/jp
8/6/91

AGENDA ITEM V.F

Planning for the Protection of our Lake and Land
Amendment of Regional Plan
Land Capability Overlay Map (C-7)

Findings

The procedures used to amend the TRPA Land Capability Overlays are set forth in Chapter 20.2.E of the Code of Ordinances. The process in this case was initiated by TRPA as a part of the Tahoe City Community Plan.

A land capability report was prepared for the Tahoe City Community Plan area by Davis Consulting Earth Scientists under contract to TRPA. The team of experts employed by Davis included Sid Davis, Grant Kennedy and Lawrence Welch, Soil Scientists, and C. M. Skau, Ph.D., Hydrologist. The attached report covers an area 282 acres in size and contains information concerning the soils, geomorphology, topography, surface and subsurface hydrology, vegetative characteristics and related environmental factors pertaining to the land capability of the area.

Field work for this land capability report was started in August 1987 with the initial soils investigations. During the following two months, additional soil testing, hydrologic evaluations and field inspections were conducted to prepare the proposed land capability amendments. The area was studied using soil mapping and classification techniques which utilize the Soil Survey of the Tahoe Basin Area, aerial photography, U.S. Geological Survey topographic quadrangle maps and on-site soil observations. Areas exhibiting soil characteristics or hydrologic conditions which were determined to be different than as mapped were intensively examined.

Since the fall of 1987, some additional field work relating to land capability and hydrology of this area has been completed, and those reports available to TRPA staff have been reviewed and incorporated into these findings. In the spring of 1988 Wayne Sheldon, Soil Conservation Service Area Soil Scientist, was asked by TRPA to review the findings of Davis' report. A copy of his May 16, 1988 memorandum to Gordon Barrett pertaining to the Tahoe City Soil Investigations is attached. There were seven representative soil profiles described in the land capability report which are supported by numerous observations points (see April 17, 1991 letter from Sid Davis) that were used to identify the soil characteristics of the major soil map units. Auger holes and vegetative species were used to assess the subsurface hydrologic conditions and identify stream environment zone (SEZ) areas. Additionally, the report entitled, "Hydrologic Site Investigation, Tahoe City Urban Runoff Treatment Facility" (Penske, 1990) was reviewed, and the depth to groundwater information was incorporated into our findings related to the hydrology of a specific 3.69 acre parcel within the Community Plan area.

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The land capability report was broken into four areas of study divided by major roadways, streams or other land forms. The findings related to each of the areas are as follows:

Cathedral Drive North to the Truckee River

This area is mapped as land capability 5 associated with the Tallac and Jabu soil series, with areas of class 1b associated with the gravelly alluvial lands and beaches. The upper areas, south of the Tahoe Tree Company, were verified as mapped, land capability class 5 associated with the Tallac soil series. The lower areas displayed characteristics of SEZ with soils which were seeped in the transition zone to the flat alluvial soils which were poorly and very poorly drained. The flat alluvial soils which are well drained gravelly sandy loams are best classified as land capability class 5. These soils are similar to the Tallac (Tc8, gravelly coarse sandy loam, seeped, 0 to 5 percent slopes) soil map unit, except that these soils were formed as a result of alluvial deposition rather than glacial deposition.

Quarry Area

The quarry area was verified as mapped, pits and dumps, land capability class 1c. The area between Highway 89 and the Truckee River was verified as mapped, land capability class 5 and 1b. The SEZ lands verified as class 1b are associated with the gravelly alluvial lands (Gr) and are within the Truckee River flood plain. A small area west of the quarry was verified as mapped, land capability class 2. Although there are some minor boundary line adjustments, there are no changes in land capability in this area.

Fairway Drive Central Core Area

The majority of this large area is mapped as SEZ, land capability class 1b, associated with the gravelly alluvial land (Gr) soil map unit. The remaining upsloping lands in this area are mapped as land capability class 6 and 5. The soils found in the concave areas of the golf course and to the west were moderately fine and fine textured soils associated with old lake beds. These soils have evidence of high water tables. The depth to groundwater in the proposed land capability district varies seasonally from 40 inches to the surface. Some portions of this area have a surface horizon comprised of fill material which has been imported and compacted. The extent and depth of the fill material varies throughout the area and does not significantly alter the soil profile (see April 17, 1991 letter from Sid Davis). These areas which have been disturbed by grading may be restored by removal of the fill material which would allow riparian vegetative growth. While these soils are not identified in the Soil Survey, they do have the texture and color of an inclusion described in the gravelly alluvial land (Gr) map unit. Based on these findings, the soil labeled in the land capability report as "Soil B" is very poorly drained and

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exhibits the characteristics of near surface wet soil conditions and is best classified as land capability class 1b.

The terrace along Highway 28, which encompasses most of the commercial core area of Tahoe City, has soils which are moderately well drained gravelly clay loams underlain by cemented lake sediments, similar to the Jabu moderately fine subsoil variant soil series. This area is best classified as land capability class 5.

The areas along the Lake frontage and below the terrace exhibit wet soil conditions and are complexes of beach and gravelly alluvial soils. These areas are classified as land capability class 1b.

Grove Street and East

This area is predominately mapped as land capability class 5 associated with the Fugawee soil series. There are small areas of class 6 associated with the Jabu soil series and 1b associated with gravelly alluvial land (Gr). The areas mapped as the Fugawee soil series were verified based on physical inspection of the soils in several undisturbed locations. The Tahoe City Creek has been rerouted and straightened to a channel which flows due south to Lake Tahoe. The soils which were developed from the former drainage channel are shallow, seeped sandy loam soils, most similar to the Jabu (JbD) soil map unit. These areas are classified as land capability class 3. The soils found in the area east of Tahoe City Creek and the State Park campground were found to have physical properties similar to the mapped Jabu (JhC) soil map unit. This area remains as mapped, land capability class 5.

The area at the far eastern end of the community plan area was mapped as SEZ, land capability class 1b. This area exhibits the characteristics of a wet meadow with poorly drained soils, which are consistent with the gravelly alluvial land (Gr) as mapped.

Man-Modified Analysis

The Tahoe City Community Plan area is extensively developed with existing buildings, parking lots, roads and houses. Many of the undeveloped areas have been subjected to varying levels of disturbance as a result of man's actions or previous uses. During the course of the soils investigations and hydrologic analysis for the Community Plan area, the vacant undeveloped parcels were studied most extensively since they can be evaluated with the least disruption to the existing uses. Pursuant to the procedures set forth in Chapter 20 of the TRPA Code of Ordinances, the first step of the land capability determination is to analyze the physical properties and characteristics of the soils, slope, vegetation, hydrology and geomorphology. Based on the findings of the field evaluations, if there is "information showing that the land in question was modified by man's placement of fill, dredging or grading, in so substantial a
Amendment to the Regional Plan
Land Capability Overlay Map (C-7)
Page 5

fashion as to generally exhibit the characteristics of a land capability
district other than the one depicted for said land on the TRPA Land Capability
Overlays*, then it is reasonable to proceed with a man-modified report. The
man-modified report is required to include essentially the same information
relating to the physical properties of the site as is included in the land
capability determination. A key component of the man-modified soils analysis is
to assess, based on the characteristics of the soils which are present as a
result of the modification, what is the land capability of the modified soils.

To proceed with a man-modified determination once the land capability
information has been completed and appropriate land capability has been
determined for the property, TRPA must make all of the six findings in
Subsection 20.2.F(3) of the TRPA Code of Ordinances before amendments to the
land capability overlays can be made. A copy of applicable sections of Chapter
20 of the TRPA Code of Ordinances, pertaining to man-modified areas, is
attached.

In the Tahoe City Community Plan area, the results of the land capability
determinations found that most of the lands continued to exhibit physical
properties and characteristics that would keep them in the same land capability
as the current TRPA land capability overlay maps. In some areas the physical
properties and soil characteristics were different than as mapped, but not as a
result of man's modifications. These areas were assigned the representative
soil map unit and appropriate land capability classification. Of the vacant
lands evaluated where there was evidence of man's alterations, disturbances or
modifications to the land, the physical properties or characteristics were not
modified to the extent that the land capability no longer exhibited the
characteristics of the original land capability classification.

Those areas which have been developed and have been covered by buildings,
parking lots, roads or houses, any have been modified to the extent that the
land capability is different than as originally mapped. These properties could
proceed with the man-modified procedure, but it is highly unlikely the
owners of the properties would want to commit to finding (f) of the six required
findings (see Code Section 20.2.F(3) attached), since it would require them to
provide for either on-site or off-site mitigation for the losses caused by the
modification. In most cases, the currently developed properties have an
existing legal use and more existing land coverage than would be allowed under
the man-modified land capability.

Based on the above information, it was TRPA staff's assessment that there was
insufficient justification to proceed with an area wide man-modified
determination since, in the cases of the vacant parcels, finding (c) could not
be made and in many cases it would be difficult to make finding (d). For the
developed properties, it is inappropriate for Agency staff to make commitments
for the property owners regarding on-site or off-site mitigation pursuant to
finding (f). These conclusions do not preclude individual property owners from
conducting their own land capability investigations and filing for a
man-modified determination pursuant to Chapter 20.2.F of the TRPA Code of
Ordinances, if they feel there is sufficient information to support the required
findings.

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(b) **Creation Of New Land Capability Districts Or Geomorphic Units:** Creation of a new land capability district on the Land Capability Overlays, which new district shall be five contiguous acres or more in area, or creation of a new geomorphic unit, which new unit shall be one square mile or more in area, unless smaller, more precise mapping units are adopted by TRPA, in which event the smaller units may be used.

(6) **Procedure After Amendment:** Once TRPA has completed its action on an amendment to the Regional Plan pursuant to Subsection 20.2.E, it shall follow the procedure set forth in Subparagraph 20.2.C(6) as though it applied to an amendment to the Regional Plan pursuant to Subsection 20.2.E, including, but not limited to, the report prepared for and action on the amendment.

20.2.F **Amendment Of Land Capability Overlays For Man-Modified Areas:** The TRPA Land Capability Overlays may be amended for man-modified areas through an amendment of the Regional Plan in the manner set forth in this Subsection. The amendment may be initiated by TRPA or the owner of the pertinent land, provided there is sufficient information demonstrating a reasonable possibility the requirements of this Subsection can be met.

(1) **Team Of Experts:** An amendment of the Regional Plan pursuant to this Subparagraph shall be evaluated by the team of experts referred to in Subparagraph 20.2.D(1) under the conditions set forth in that Subparagraph.

(2) **Man-Modified Report:** The team of experts shall prepare a man-modified report analyzing the proposed plan amendment. The report shall contain information showing that the land in question was modified by man's placement of fill, dredging or grading, in so substantial a fashion as to generally exhibit the characteristics of a land capability district other than the one depicted for said land on the TRPA Land Capability Overlays. In addition to the foregoing information, the man-modified report shall contain the following concerning the pertinent land:

(a) A statement of geomorphic characteristics;
(b) An analysis of surface and subsurface hydrology;
(c) A statement of physical and chemical soil characteristics;
(d) An analysis of erosion hazard;
(e) An analysis of vegetation;
(f) A statement identifying the land capability characteristics resulting from the modification and an opinion by the team identifying the land capability district generally exhibiting those characteristics; and
(g) Additional information reasonably required by TRPA to properly assess the merits of the application.

(3) Action on Amendment: An amendment of the Regional Plan pursuant to Subsection 20.2.F shall be processed, both procedurally and substantively, in the manner of amendments to the Regional Plan generally. The amendment may be approved if TRPA finds that:

(a) The land was modified prior to February 10, 1972;
(b) Further development will not exacerbate the problems resulting from the modification of the land and will not adversely impact sensitive lands adjacent to or nearby the man-modified area;
(c) The land no longer exhibits the characteristics of land bearing the same, original land capability classification;
(d) Restoration of the land is infeasible because of factors such as the cost thereof, a more positive cost-benefit ratio would be achieved by offsite restoration, onsite restoration would cause environmental harm, restoration onsite would interfere with an existing legal use, and the land is not identified for restoration by any TRPA program;
(e) Further development can be mitigated offsite; and
(f) Mitigation to offset the losses caused by modification of the land and pertinent land capability district, shall be as follows:

(i) Onsite and offsite mitigation;
(ii) Pursuant to a maintenance program, including schedule of maintenance, proposed by the owner and approved by TRPA; and
(iii) Collection of a security, if deemed necessary by TRPA, to guarantee mitigation.

(4) Effect Of Approval: If the amendment is approved, the land coverage limitations of the land capability district, whose characteristics are exhibited by the pertinent land, shall apply to the land.

(5) Conditions Upon Amendment: Approval of an amendment of the Regional Plan pursuant to Subsection 20.2.F may be granted subject to reasonable conditions in addition to those otherwise referred to in such Subsection.

(6) Procedure After Amendment: Once TRPA has completed its action on an amendment to the Regional Plan pursuant to Subsection 20.2.F, it shall follow the procedure set forth in Subparagraph 20.2.C(6) as though it applied to an amendment to the Regional Plan pursuant to Subsection 20.2.F, including, but not limited to, the report prepared for and action on the amendment.

20.3 Land Coverage Limitations: No person shall create land coverage in excess of the limitations set forth in this chapter. The means to determine base land coverage, the manner to transfer land coverage and prohibitions of certain land coverage are set forth in this Section.

20.3.A Base Land Coverage Requirements: The allowable base land coverage ("base coverage") shall be determined by using the coefficients set forth in the report entitled, Land Capability Classifications of the Lake Tahoe Basin, Bailey, R. G. 1974. These coefficients are:

<table>
<thead>
<tr>
<th>Lands Located In Land Capability District*</th>
<th>Base Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a, 1b, 1c</td>
<td>1%</td>
</tr>
<tr>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>3</td>
<td>5%</td>
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<tr>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>6, 7</td>
<td>30%</td>
</tr>
</tbody>
</table>

*Lands located in Geomorphic Group I are classified land capability district 1 and are permitted one percent coverage.
POOR QUALITY ORIGINAL (S) TO FOLLOW
Introduction:

This is a report of soils and stream environment zones in the Tahoe City area and Lake Forest plan areas. It was performed by DAVIS Consulting Earth Scientists in association with Mr. Grant M. Kennedy, Mr. Lawrence E. Welch, Soil Scientists and Dr. Clarence M. Skau, Hydrologist, at the request of the Tahoe Regional Planning Agency (TRPA) to verify Land Capability (Code of Standards, Subchapter 20) and to identify stream environment zones using two methods; (1) Those described in Chapter 3, Volume II of the Handbook of Best Management Practices; (2) Those described in Section 37.3 of the TRPA Code.

Field work for this project was conducted in August, September and October, 1987. In general the area comprises the commercial area of Tahoe City along Highway 89 and Highway 28 and in the Lake Forest area, that portion of commercial property either side of Lake Forest road, south of Lake Forest Glen Unit No. 1 (please refer to the attached maps for the exact boundary delineations).

Because of the size and complexity of the study area, the report narrative is broken into smaller areas generally divided by major roadways, streams or other land features to relate pertinent information regarding Land Capability verifications.

Procedure:

The areas were studied utilizing existing TRPA soils mapping, aerial photography (U.S.D.A.-U.S. Forest Service, 1939, 1972, 1983; Cartwright Aerial Surveys, 1962; Andregg Inc., 1964-65; U.S.D.A. Soil Conservation Service, 1967), and U.S. Geological Survey 7.5 minute quadrangle of Tahoe City (1969 photo revised). The area was also reconnaissance surveyed on the ground. Areas exhibiting soil physical properties, drainage conditions or vegetation patterns determined to be different than presently mapped were more intensively examined, using soil auger borings or by road cut inspections. The soil in the quarry on th
western border of the study area was described in a backhoe pit. Vegetation species and growth patterns were used as indicators of soil drainage conditions in some cases.

- **Area 1 - Lake Forest**

  **Environmental Setting:**

  This area is shown on TRPA map sheet D6 (Dollar Point) to be mainly within a delination of JHC (Jebu sandy loam, moderately fine subsoil variant, 2 to 9 percent slopes) with a smaller portion represented as Gr (Gravelly alluvial land). The geology map (Mathews, 1968) shows this area to be within a unit of Ql (Recent lake beds). The geomorphic analysis (Bailey 1974) shows this area to be within two delinations, E2 (Outwash, till, and lake deposits) and E3 (Alluvial lands).

  Typical vegetation is Jeffrey pia (Pinus jeffreyi), wyethia (sp.), bitterbrush (Purshia tridentata) and perennial grasses. A drainage way along Main Street displayed willow (salix), alder (Alnus rhombifolia) and perennial grasses.

  Topography in the study area is fairly level with an incised drainage (piped at depth) running north to south through the west - central portion. This area receives local storm drainage from the north, east and west.

  The Lake Forest area is heavily developed with small lots consisting of both residential dwelling units and commercial establishments.

  **Findings:**

  All of the area with the exception of a narrow strip of land adjacent to Main Street was found to be fairly uniform with respect to soil type. It exhibited a grayish brown medium acid gravelly sandy loam surface over a light yellowish brown massive brittle and hard gravelly clay loam subsoil. This unit occurs on the western side of the area and was verified on the northeast side as well. A typical profile description was taken near the intersection of Aspen Street and Hillcrest Avenue in the abandoned roadway easement.

  The area along Main Street exhibited a very dark grayish brown mixed very gravelly fill over mottled black and dark grayish brown loam underlain by mottled dark brown, reddish yellow and strong brown silty clay loam. The mottled colors are indicative of wetness. The representative soil profile description was taken at the intersection of Hillcrest Avenue and Main Street.

  **Conclusions:**

  The majority of the Lake Forest area is placed in soil unit JHC (Jebu sandy loam, fine subsoil variant, 2 to 9 percent slopes). The area adjacent to

  **DAVIS² Consulting Earth Scientists**
  P.O. Box 724 Georgetown, CA 95634 (916) 333-1405
Main Street is placed in the unit Lo (Loamy alluvial land).

JHC receives Land Capability class 5 with 25 percent allowable coverage. Lo is placed in Land Capability class 1b with an allowable 1 percent impervious coverage. Please refer to the attached map for delineation of the Land Capability districts.

- Area 2 - Tahoe City; Cathedral Drive north to the Truckee River

Environmental Setting:

This area comprises the land from approximately 450 feet north of Cathedral Drive, 500 feet west of Highway 89 to Tonopah Drive. It spreads westward from Tonopah Drive to the Truckee River and includes both private and U.S. Forest Service ownership. Land north of Tahoe Tavern, including Tavern Shores, is also included in Area 2.

This area is shown on IBPA map sheet C-7 as having three soil delineations: TdD (Tahoe stony coarse sandy loam, 5 to 15 percent slopes); Jhc (Jebu stony sandy loam, fine subsoil variant, 2 to 9 percent slopes); Or (Gravely alluvial land). The geology map, by Mathews (1968), shows this area to be in delineations of Qla (Older lake beds) and Qm (Glacial moraines). The geomorphic analysis by Bailey (1974) of this area shows delineations E1 (Moraine land undifferentiated) and E2 (Outwash till and lacustrine deposits).

The area has three fairly distinct landforms: a high bluff composed of glacial till materials; an intermediate terrace; and lower position flat lands. The two lower position landforms consist of lacustrine sediments with seeps and springs surfacing along transitions zone from high to low topography.

Typical vegetation is white fir (Abies concolor), Jeffrey pine, incense cedar (Libocedrus decurrens) and manzanita in the well drained areas. Seeps display willow, alder, sedge and juncus.

Findings:

Soils were found to be different on each land form. The upper unit was determined to be the Tellec series as presently mapped and no further investigation of that unit was carried out.

The intermediate land form west of Highway 89 was found to display a well or moderately well drained slightly acid brown sandy loam surface over a yellowish brown gravelly sandy loam subsoil, underlain by brittle dark grayish brown sandy loam lacustrine parent materials. This soil was examined in a construction pit at the intersection of Tonopah Drive and Highway 89. The representative pedon was described

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from the eugene boring, near the southwest corner of Comstock Village. This unit extends north of Tonopah Drive to the slope breek where seeps and springs surface to ponding. Soils surrounding the ponds in this area are somewhat poorly and poorly drained with color mottling and riparian vegetation as indicators of wetness.

The well or moderately well drained soils are similar to the Jdbu series as mapped in the Lake Tahoe Basin. The somewhat poorly drained soils resemble the Jdbu, seeped, soil.

Lower position soils are derived from alluvium of mixed source. Most of the area displays a well drained grayish brown slightly acid gravelly sandy loam surface over pala brown slightly acid very gravelly sandy loam. This soil has the same taxonomic classification as the Taltec series. It has similar hydrologic properties. This low position soil has not been previously recognized in the Tahoe Basin and differs from other established units because it has formed from river flood plain materials rather than from glacial sources. It lacks a fragipan at depth.

A wet soil area along the intermediate to low position transition zone adjacent to the Jdbu seeped unit was found to have the same properties as Gr (Gravelly alluvium), originally mapped nearby. It was poorly or very poorly drained. Inspection of aerial photography between 1964 and 1965 showed that fill material had been placed along the terrace transition zone.

A strip of land influenced by wetness along the lakefront also has properties similar to Gr or Be (Beaches) where wave action from the lake has routinely reworked alluvial materials.

Conclusions:

Soils displaying characteristics similar to Jdbu are placed in the soil unit Jdc (Jdbu coarse sandy loam, 0 to 9 percent slopes) and in Land Capability class 5. This unit is assigned an allowable coverage of 25 percent. The Jdbu, seeped unit is placed in Jbd (Jdbu coarse sandy loam, seeped, 2 to 15 percent slopes) and receives Land Capability class 3 with 5 percent allowable coverage.

The soil unit with properties similar to Taltec soils, for the purpose of this report, will be called "Soil A" and would be placed in Land Capability class 5. This soil is assigned 25 percent allowable coverage. Gr (Gravelly alluvium) and Be (Beaches) are assigned Land Capability class 1d with 1 percent allowable coverage.

• Area 3 - Tahoe City; The quarry and west
  Environmental Setting:

This area is located west of Fairway Drive and north of the Truckee

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River. Some of the area has been previously used as a gravel quarry. Several hundred vertical feet of sand and gravel material have been excavated from the mountainside. A leveled surface is currently being utilized as parking for the rafting industry and as a construction corporation yard for heavy equipment maintenance and storage. It is shown on TRPA map sheet C7 as being within soil unit Px (Pits and dumps). Five commercial lots, extending from the quarry to the western study boundary, are steeply sloping down to Highway 89. Levelled parking areas surrounding buildings have been excavated into the hillsides, and paved.

Between Highway 89 and the fence surrounding the maintenance yard at the quarry site, Jeffrey pine and willow has been established by landscaping efforts. Leveler areas of the quarry were void of vegetation. Cut slopes ranged from 40 to 68 percent and were sparsely vegetated with rabbitbrush (Chrysothamnus viscidiflorus) and mountain whitethorn (Ceanothus cordulatus). Slopes under 50 percent were moderately vegetated.

The area south of Highway 89 is mostly associated with the Truckee River flood plain and alluvial terraces. Portions of the properties along the River are shown to be influenced by the Standard Protected Flood (Dept. of the Army, Sacramento District, Corps of Engineers, 1971). The geology map (Mathews, 1968) shows this area to be within two units, T1v2 (andesite) and Q1o (Older lake beds). The geomorphic analysis (Bailey, 1974) shows this site to be in units D1 (Toe slope lands) and E2 (Outwash, till and lake deposits).

Riparian vegetation, largely willows and alders, grows along the Truckee River flood plain.

Findings:

A backhoe pit was examined in the level portion of the quarry area, near the western fence separating the corporation yard from the parking lot. This pit displayed a very tightly compacted, platy, olive brown very gravelly sand and sandy loam surface over mixed very tightly compacted massive very dark grayish brown very gravelly sandy loam and sandy clay loam, underlain by stratified beds of light olive brown silt. The excavation was moist from 14 to 54 inches. The steep cut slopes surrounding the quarry had a thin mantle of loose mixed andesitic and gravelly colluvial material over exposed older lake terrace.

The area west of the quarry consisted of soils derived from andesite resembling the Jorge soil series.

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Conclusions:

Most of the quarry area is disturbed and absent of soil processes. It is presently accurately mapped as Px (Pits and dumps). This unit is assigned Land Capability class 1c with 1 percent allowable coverage.

A small portion of the quarry site and the area west of the quarry, excluding paved parking areas and structures, is representative of the soil unit JwF (Jorge - Tahoma very stony sandy loam, 30 to 50 percent slopes). This unit is assigned Land Capability class 2 with allowable coverage of 1 percent.

Land between Highway 89 and the Truckee River remains as mapped: JhC (Jebu stony sandy loam, 2 to 9 percent slopes); Gr (Gravelly alluvial land), with the lower lands within the Projected Standard Flood zone. JhC receives Land Capability class 5 with 25 percent allowable coverage; Gr and the Projected Standard Flood are Land Capability 1b with 1 percent allowable coverage.

- Area 4 - Tahoe City: All the area encircled by Fairway Drive and Grove Street, in addition to land between Highway 28 and the Lake.

Environmental Setting:

This area has andesitic materials adjacent to and upslope of old lake deposits. In some places the andesite has overrun the lake terraces. The old lake beds along the public beach area dip, creating a concave shaped landform northwest of the commercial lots. There, fine textured alluvium has accumulated under a marsh-like condition. Most of the golf course has been developed on the marsh land. Several perennial streams interfinger the golf course. They have been piped underneath the commercial lots and Highway 89 to outlet in the Truckee River. The Highway 28 - 89 "T" area was historically the confluence of several small perennial streams before they were captured by piping.

TRPA map sheet C7 shows most of this area to be within a delineation of Gr (Gravelly alluvial land) and only a minor portion to be within JhC (Jebu stony sandy loam, moderately fine subsoil variant, 2 to 9 percent slopes). The geology map shows (Mathews, 1968) the area within delineations of Qlo (Older lake beds) and Tva (andesite). Geomorphic analysis (Bailey, 1974) shows the area to be within delineations E2 (Outwash, till and lake deposits) and E3 (Alluvial lands).

Topographic high areas display vegetation consisting of Jeffrey pine, White fir, incense cedar, wyethia and perennial grasses. Concave landforms and stream zones display willow, alder, aspen, sedge, juncus and perennial grasses.
Findings:

The area adjacent to Fairway Drive and Highway 89 was formed from andesitic materials over lacustrine sediments. This soil was described on Fairway Drive approximately 600 feet north of Highway 89. The soil displayed a brown medium acid gravelly loam surface over a variegated light yellowish brown and brown medium acid very gravelly clay loam, underlain by firm white lacustrine sediments. This soil was determined to be similar to the Fugawee soil series. Elsewhere along Fairway Drive, on moderately sloping terrains, the soils were found to be similar to the Jabu series as presently mapped. Stream environment zones have incised the Jabu unit in several places.

Soils on concave landscapes within the golf course area exhibit very dark gray mildly alkaline clay or silty clay surfaces, under ill materials some places. Subsoils were light gray mildly alkaline clay, to greater than 4 feet depth. These soils were described from auger borings, one in the parking lot near the school ball field behind the Family Tree restaurant, and from other borings inside a roped off parking lot east of the Shell service station at Highway 89. Soils such as these have not been described in the Lake Tahoe Basin.

Soils on the tilted lake beds were found to be moderately well drained with a slightly acid dark brown sandy loam surface over a variegated strong brown and dark brown slightly acid gravelly clay loam subsoil, underlain by cemented lacustrine sediments. These soils are similar to the Jabu moderately fine subsoil variant. The Jabu soil was described on a gently sloping northwest facing surface, northeast of the Gallery. This terrace, adjacent to the lake shore, terminates as an escarpment with slopes exceeding 30 percent, running from northeast to southwest, from the Firehouse to Grove Street. This terrace is dissected by a small stream zone (now piped) leaving an island of the higher ground between the "Y" and Mackinaw Road.

Soils along the Lake frontage, at the public beach and below Mackinaw Road are wet and/or subject to wave action and fluctuating lake water levels. Lake frontage soil units are complexes of Be (Beaches) and Gr (Gravelly alluvium).

Road ditches, in places, along Fairway Drive and Grove Street conduct active water and support riparian vegetation.

Conclusions:

The small area of Fugawee soils is placed in soil unit FuD (Fugawee very stony sandy loam, 2 to 15 percent slopes). This unit is Land Capability class 5 with 25 percent allowable coverage. For unnamed soils in the golf course and topographic low position areas surrounding the Highway 28-89 "Y", a "Soil B" designation is proposed with Land Capability class 1b and allowable coverage of 1 percent.

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The tilted terrace along Highway 28, or core commercial area, is placed in JhC (Jebu stony sandy loam, moderately fine subsoil variant, 2 to 9 percent slopes). This unit receives Land Capability class 5 with 25 percent allowable coverage.

Areas along the lake shore are Gr (Gravelly alluvial land) and Be (Beaches) with Land Capability class 1b and allowable 1 percent coverage.

- Area 5 - Tahoe City: From Grove street to the eastern boundary

Environmental setting:

This area is heavily developed with commercial shops and paved parking areas. It comprises soils formed from lacustrine sediments and from endosseous materials (possibly colluvial). TRPA map sheet C-7 shows the soils to be mainly FuD (Fugawee very stony sandy loam, 2 to 15 percent slopes), JhC (Jebu stony sandy loam, moderately fine subsoil variant, 2 to 9 percent slopes) and Gr (Gravelly alluvium). The geology map (Mathews, 1968) shows this area to be in older lake beds. Geomorphic analysis (Bailey, 1974) shows this area to be in geomorphic unit E2 (Outwash, till and lake deposits).

An order 2 stream used to flow from where the service station presently sits at the corner of Jack Pine Street and Highway 28, down through the public library parking lot, and over to a path between the Boat Works and Safeway shopping areas. It has been re-routed and straightened to flow directly from above the service station, due south, to down between the Fantasy Inn and the Safeway parking lot where it rejoins the pre-existing drainage near the Boat Works. The paved shopping mall parking lot in front of the library, the Boat Works and the Round House diverts Highway 28 storm runoff water all the way to the lake.

Findings:

The area mapped FuD was inspected in several place along Pioneer Way and Tahoe Street and found to exhibit physical properties (soil texture, depth and drainage) similar to the Fugawee series. It was considered to be accurately defined on TRPA map sheet C-7 and was not changed.

The State Park and the area, northeast of Tahoe Street was found to be poorly drained, growing willow, alder and juncus vegetative types, and consistent with the Gr unit as mapped.

A narrow strip along Highway 28, between the State Park and the east boundary, and a land remnant in the Safeway parking lot were found to have physical properties similar to those described on the dipping terrace near the Gallery, and left in JhC, as mapped.

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Four lots on the far east end of the project were noted as derived from volcanic sources on slopes between 15 and 30 percent. These soils were deep and well drained, similar to the Jorge series.

The area of land in the vicinity of the library, Round House and Boat Works has been extensively altered. Because of improvements consisting of paving and underground utilities, field investigations were primarily surficial; they were supplemented with aerial photography to determine the extent of change.

The lawn area near the Boat Works appears to have emerging springs, and much of the pavement in front of the Round House displays signs of alligator cracking or symptoms of subgrade failure due to saturated conditions. Drainage has only slightly improved in this area which used to be stream environment. At best it reflects a soil with hydrologic properties similar to Jabu sandy loam, seeped variant.

Conclusions:

With the exception of the rerouted drainage down through the Round House - Boat Works area, and soils on the four east end lots in the survey area, Land Capability districts remain unchanged.

The rerouted drainage is an order 2 stream and requires 50 feet setbacks to improvements on either side of the center of the flow line. The area which was originally the old stream zone has slightly improved drainage but still exhibits signs of seasonal wetness and is placed in JbD (Jabu coarse sandy loam, seeped, 2 to 5 percent slopes). This unit is Land Capability class 3 with 5 percent allowable coverage.

Soils on the four lots at the northeast end of the study area are JwE (Jorge - Tahoma very stony sandy loam, 15 to 30 percent slopes) rather than Rx (Rock outcrop and rubble land). JwE is Land Capability class 4 with 20 percent allowable coverage.

Please refer to the attached map for proper capability district delineations.

Respectfully submitted,

Sidney Davis,
Certified Professional
Soil Scientist No. 1031

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Representative soil Profiles:

Lake Forest:

Profile No. 1

Location: Near intersection of Hillcrest Avenue and Aspen Street
Vegetation: Jeffrey pine, wyethia perennial grasses, bitterbrush

Soil Classification: Fine-loamy, mixed frigid Ultic Haploxeralfs
Soil Series: Jabu moderately fine subsoil variant

0  1 to 0 inches, litter and duff.

A11 0 to 10 inches, grayish brown (10YR 5/2) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine and medium, few coarse roots; many very fine and fine interstitial pores; medium acid; 15 percent gravel; clear smooth boundary.

A12 10 to 14 inches, grayish brown (10YR 5/2) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine and medium common coarse roots; many very fine and fine interstitial pores; medium acid; 15 percent gravel; clear wavy boundary.

B1 14 to 23 inches, brown (7.5YR 5/4) gravelly loam, dark brown(7.5YR 3/4) moist, weak fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; many fine and medium few coarse roots; common very fine tubular and interstitial pores; medium acid; 15 percent gravels; gradual smooth boundary.

B2it 23 to 30 inches, light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderates medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; few very fine and fine tubular pores; few thin clay films on ped faces; medium acid; 15 percent gravel; gradual smooth boundary.

B22t 30 to 36 inches, light yellowish brown and brownish yellow (10YR 6/4, 6/6) gravelly clay loam, dark yellowish brown and yellowish brown (10YR 4/4, 5/6) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; many moderately

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thick clay films on ped faces; medium acid; 25 percent gravel; gradual smooth boundary.

B23tx 36 to 55 inches, brownish yellow (10YR 6/6) gravelly clay loam, dark brown (10YR 3/4), moist; massive; hard, very firm, sticky and plastic; many moderately thick clay films coating mineral grains; medium acid; 35 percent gravel; gradual, smooth boundary.

B3tx 55 to 60 plus inches, light brownish gray (2.5Y 6/2) very gravelly clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, very firm, sticky and plastic; many moderately thick clay films coating mineral grains; medium acid; 35 percent gravel.

Lake Forest: Profile No. 2
Location: Intersection of Hillcrest Avenue and Main Street
Vegetation: Willow, alder, perennial grasses
Soil Classification: Loamy, mixed, frigid Aquic Haploxeralfs
Soil Series: Unknown

C 0 to 14 inches, dark brown (10YR 4/3, 3/3) very gravelly mixed fill material

A1 14 to 20 inches, black (10YR 2/1) loam, moist, with many medium faint mottles of dark grayish brown (10YR 4/2); strong medium granular structure; hard friable; slightly sticky and slightly plastic; common very fine, fine and few medium roots; common very fine and fine interstital pores; slightly acid; clear, smooth boundary.

A3 20 to 26 inches, very dark brown (10YR 2/2) with many medium distinct mottles of very dark brown (10YR 3/3) loam, moist; moderate fine subangular blocky structure; slightly hard; very friable; slightly sticky and slightly plastic; common very fine, fine, medium and few coarse roots; pores and reaction as above; gradual smooth boundary.

B21t 26 to 36 inches, dark brown (10YR 3/3) siltly clay loam with many coarse prominent mottles of strong brown (7.5YR 5/6); strong medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; many thin clay films on ped faces and

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In pores; slightly acid; gradual wavy boundary.

B22t 36 to 40 inches, mottled dark brown, reddish yellow and strong brown (10YR 3/3, 7.5YR 6/6,4/6) silt clay loam; strong subangular blocky structure; hard, firm, sticky and plastic; common thin clay films on ped faces and in pores; slightly acid; manganese concretions.

Tahoe City Soil Profile No. 1

Location: Near southwest corner of Comstock Village
Vegetation: Fir, Jeffrey pine, incense cedar, manzanita
Soil Classification: Coarse-loamy, mixed frigid, Ultic Haploxeralfs
Soil Series: Jepu

0 1 to 0 inches, twigs, conifer needles and duff.

A11 0 to 4 inches, brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure parting to weak fine granular; soft, friable, nonsticky and nonplastic; common fine and medium roots; common fine tubular pores; slightly acid; 10 percent gravel; clear smooth boundary.

A12 4 to 14 inches, brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine, medium and coarse roots; common fine interstitial pores; slightly acid; 10 percent gravel gradual smooth boundary.

B1 14 to 30 inches, yellowish brown (10YR 5/4) gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, nonsticky and nonplastic; common fine, medium and coarse roots; few fine tubular pores; few thin clay films in pores; medium acid; 15 percent gravels; gradual smooth boundary.

B21t 30 to 48 inches, light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) sandy loam (near loam) dark grayish brown (10YR 4/2) moist; moderate medium angular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few very fine tubular pores; common thin clay films bridging sand grains; medium acid; gradual smooth boundary.
822tx 48 to 55 inches, yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; hard, friable, slightly sticky and very slightly plastic; few very fine tubular pores; common thin clay films in pores; clear smooth boundary.

H0x 55 to 60 inches, light gray (10YR 7/2) sandy loam, very dark greyish brown (2.5Y 3/2) moist; weak fine platy structure; hard, friable, slightly sticky and nonplastic; few very fine tubular pores; slightly acid.

Note: Peds in last two horizons have brittle feeling when crushed by hand.

Tahoe City Profile No. 2

Location: South of Tavern Shores, 75 feet east of State Highway 89, about 1500 feet south of the Truckee River bridge.

Vegetation: Jeffrey pine, Lodgepole pine, service berry, sweet clover

Classification: Coarse-loamy (or loamy skeletal), mixed, frigid Entic Xerumbrept

Soil Series: Not defined in Lake Tahoe Basin (Soil "A")

A11 0 to 8 inches, grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, few medium roots; common very fine and fine interstitial pores; slightly acid; 25 percent gravel; gradual smooth boundary.

A12 8 to 14 inches, brown (10YR 5/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine to medium, few coarse roots; common very fine and fine interstitial pores; slightly acid; 30 percent gravel; clear smooth boundary.

C1 14 to 36 inches, pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; many very fine to medium, few coarse roots; few very fine and fine interstitial pores; slightly acid; 35 percent gravel; gradual smooth boundary.

C2 36 to 40 inches plus, pale brown (10YR 6/3) very gravelly sandy loam, dark brown

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(10YR 3/3) moist; massive, slightly hard, friable, nonsticky and nonplastic; few fine and medium roots; few very fine and fine interstitial pores; slightly acid; 35 percent gravel.

Tahoe City Soil Profile No. 3

Location: Fairway Drive - approximately 500 feet north of intersection with Hwy 89

Vegetation: Jeffrey pine, wyethia, bitterbrush, perennial grasses

Soil Classification: Fine- loamy, mixed, frigid, Utlc Haploxeralfs

Soil Series: Fugawa

A1 0 to 7 inches, brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine to medium roots; common very fine to coarse tubular pores; medium acid; 15 percent gravel, 10 percent cobblestones; clear smooth boundary.

B1 7 to 20 inches, brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; many very fine to medium roots; common very fine to fine tubular pores medium acid; 15 percent gravels; 10 percent cobblestones; clear smooth boundary.

B21t 20 to 34 inches, yellowish brown (10YR 5/4) gravelly sandy clay loam (near loam), brown (10YR 4/3) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; moderate fine and medium, few coarse tubular pores; few thick and common thin clay films on ped faces; medium acid; 25 percent gravels; 5 percent cobblestones; gradual wavy boundary.

B22t 34 to 42 inches, variegated light yellowish brown (10YR 6/4) brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) gravelly clay loam, variegated yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) moist; massive; very hard, friable, sticky and plastic; few very fine roots; few very fine and fine tubular pores; few moderately thick clay films in pores; slightly acid; 35 percent gravels, 5 percent cobblestones; gradual wavy boundary.

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Tahoe City Soil Profile No. 4

Location: Corner of ballfield, and golf course off Grove Street
Vegetation: None - lot used for vehicle traffic and parking
Soil Classification: Fine montmorillonitic, nonacid, frigid, Fluventic Humaquepts
Soil Series: Not defined in the Lake Tahoe Basin (Soil "B")

Note: There is 18 inches of compacted fill over the original surface.

0 to 18 inches, fill consisting of sandblow loam to sandy clay loam material, dark grayish brown in color.

A1 18 to 25 inches, very dark gray (N3/0) clay, black (10YR 2.5/1) moist; very coarse prismatic structure; hard, friable, sticky and plastic; no roots; mildly alkaline; gradual smooth boundary.

C1 25 to 34 inches, light gray (N 7/0) silty clay, black (N 2/0) and dark gray (N 4/0) moist; very coarse prismatic structure; very hard, firm, sticky and plastic; no roots; mildly alkaline; clear smooth boundary.

C2 34 inches plus, light yellowish brown (2.5Y 6/4) and light gray (N 7/0) clay, black (10YR 2/0) and grayish brown (2.5Y 5/2) moist; weak very coarse prismatic breaking to moderate medium angular blocky structure; very hard, firm, sticky and plastic; mildly alkaline.

Tahoe City Soil Profile No. 5

Location: 50 feet northwest of the Gallery - 15 feet from escarpment to Tahoe City beach
Vegetation: Jeffrey pine, wyethia, perennial grasses
Soil Classification: Fine-loamy, mixed frigid Ultic Haploxerals
Soil Series: Jabu moderately fine subsoil variant

A1 0 to 12 inches, dark brown (7.5YR 4/4) sandy loam, dark brown (7.5YR 3/2) moist; moderate medium granular structure; soft, friable, nonsticky and nonplastic; common fine and medium, few coarse roots; common very fine and fine interstitial pores; slightly acid; clear smooth boundary.

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B1 12 to 24 inches, dark brown (7.5YR 4/4) sandy loam (near loam), dark brown (7.5YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common fine and medium and few coarse roots; common very fine and fine tubular and interstitial pores; slightly acid; gradual smooth boundary.

B21 24 to 36 inches, dark brown (7.5YR 4/4) gravelly loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure; hard, friable, sticky and slightly plastic; common fine, medium, and few coarse roots; few very fine tubular pores; few thin clay films on ped faces; slightly acid; 20 percent gravel; gradual smooth boundary.

B22 36 to 48 inches, variegated dark brown (7.5YR 4/4) and strong brown (7.5YR 5/8) gravelly clay loam, moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; few fine roots; few very fine tubular pores; common thin clay films on ped faces and in pores; slightly acid; 15 percent gravels; clear smooth boundary.

I1C1 48 to 58 inches, olive brown (2.5Y 4/4) clay loam with yellowish red (5YR 4/6) iron mottles, moist; massive; hard, slightly firm, sticky and plastic; very few very fine tubular pores; slightly acid; abrupt smooth boundary.

I1C2 58 inches, cemented lacustrine sediments.

Tahoe City Soil Profile No. 6

Location: Payless lot near Shell station
Vegetation: Very sparse growth of weeds
Soil Classification: Fine, montmorillonitic, nonacid, frigid, Fluventic Humaquepts
Soil Series: Not defined in the Lake Tahoe Basin ("Soil B")

0 to 15 inches, very compacted gravelly engineered fill imported to site

A1 15 to 32 inches, dark gray (10YR 4/1) silty caly, black (10YR 2.5/1) moist; strong very coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; pressure faces; mildly alkaline; abrupt smooth boundary.

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32 to 46 inches, grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) and black (10YR 2.5/1) moist; strong very coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; pressure faces; mildly alkaline; abrupt smooth boundary.

46 to 55 inches, dark gray (10YR 4/1) and brown (10YR 5/3) silty clay, black (n 2/0) and very dark grayish brown (2.5Y 3/2) moist; structure, consistence as above; pressure faces; mildly alkaline; gradual smooth boundary.

55 to 60 inches, light gray (5Y 7/2) and pale olive (5Y 6/4) silty clay, olive gray (5Y 4/2) and olive (5Y 5/6) moist; weak medium prismatic structure; extremely hard, firm, very sticky and very plastic; mildly alkaline.

Tahoe City Soil Profile No. 7

Location: Quarry, near the west fence
Vegetation: None
Classification: Engineered fill materials (nonsoil)
Soil Series: None

C1 0 to 7 inches, pale yellow (2.5Y 7/4) very gravelly sand to sandy loam, olive brown (2.5Y 4/4) moist; strong coarse platy structure; very hard, very firm, nonsticky and nonplastic; abrupt, smooth boundary.

C2 7 to 46 inches, very dark grayish brown (2.5Y 3/2) very gravelly sandy loam to sandy clay loam, moist; massive; very hard, very firm; slightly sticky and slightly plastic; 15 percent cobbles, stones and 25 percent gravel; abrupt, smooth boundary.

46 to 54 inches, light olive brown (5Y 5/4) silt, moist; massive; slightly hard, friable, slightly sticky and slightly plastic; banded lacustrine sediments.
References:

1. Andeck Inc. 1964, 65. Aerial photography, black & white, Tahoe City area.


3. Cartwright Aerial Surveys Inc. 1962. Aerial photography, black & white, 1: 20,000 scale, Tahoe City and Lake Forest area.


10. 1971. Map sheet C-7 (Tahoe City), scale 1" = 400'.


14. United States Department of Agriculture, Forest Service. 1983. Aerial photography, color contact prints, Tahoe City and Lake Forest area, scale 1" = 100'.

15. 1939. Aerial photography, black & white contact prints, Tahoe City and Lake Forest Area, scale 1: 20,000.
April 17, 1991

Mr. Gary Shellhorn
IPES Program Manager
Tahoe Regional Planning Agency
P.O. Box 1038
Zephyr Cove, NV 89448

RE: Tahoe City Land Capability Mapping.

Dear Gary:

Following our conversation yesterday, I will recount for you our methodology for arriving at the Land Capability districts in the Tahoe City Plan Area. I will also comment on "Soil B" that was delineated in the golf course area.

Before we went to the field, a variety of aerial photographs, in stereo pairs, were utilized for the purpose of three dimensional landform identification and separation of geomorphic surfaces. Photographic material utilized included U.S.F.S. 1939 (located in Nevada City, CA) to gain a sense of what the area looked like fifty years ago. In addition, we also had a set of aerials from Cartwright Aerial Surveys (Sacramento, CA) flown in 1962. We also researched files of Andregg, Inc., (Auburn, CA), a land survey company that did extensive subdivision work back in the late 1950's and early 1960's. They provided low elevation photography of Tahoe City for the years 1964 - 65. Dr. Skau (hydrologist, subcontractor on the job) provided U-2 color infra red photography, useful for delineating wet areas. TRPA provided us with a large color aerial blowup of Tahoe City, 1986.

After the major landforms were delineated, we set out to describe the soils found on them. We excavated no less than fifty small diameter holes, in addition to examining escarpments, bankcuts, roadcuts, construction site excavations, vegetation lines and other subtle variations in topography that might alter drainage patterns or soil types. After we had a sense of what constituted major soil units, based upon soil color, texture, structure, depth, drainage class and vegetation, we excavated or selected sites along road cuts that were considered representative for that particular unit. In all, we had seven sites we felt were representative of Land Capability districts in the Tahoe City Area. If one were to revisit those sites, and examine them, they would be able to see what we considered to be the "Typical" soil for a given map unit. Each map unit was traversed and closed, on the ground. There were many more than seven sites examined to delineate the Land Capability districts in the Tahoe City area.

With regard to Soil B, this unit was found to be a fairly extensive soil body (approximately 60 acres) that exists in the golf course area. It extends from Grove Street down to Highway 28/89. A similar soil exists in a meadow of about 20 acres size, on the West shore of the Lake, between Meadow and Ellis Roads, south of Homewood. Like Soil B in Tahoe City, this soil body did not receive recognition as a separate soil series in the published survey, but was lumped into the miscellaneous land type Gr (gravelly alluvial land). Where complex areas of lake or channel deposits had become reworked by natural forces, miscellaneous land types were developed to describe them, because of high variability. There can be many unnamed soils in a miscellaneous land type. Gr has no formal description, and no soil series designation. Gr is typically associated with coarse textured materials in seasonally saturated areas, with minor inclusions of marshes, in and adjacent to, active stream channels.

When soils of small acreage extent were found in a soil survey area of Order 2 level, such
as the Lake Tahoe Basin Survey, they were considered too insignificant to stand as a single mapping unit in a published report. At that time, 2,000 acres was the usual acreage requirement, along with 10 modal descriptions, to set up a soil series. Because soils of small acreage amounts received no mention in the final soil survey report does not mean they do not exist. Small areas of unnamed soils were usually lumped into a similar unit, or a miscellaneous land type such as Gr, Lo or Mh. Usually budget constraints were the reason for lumping small areas of unnamed soils into larger units. Had the Soil Conservation Service been discharged to map at Order 1 level, then Soil B might have been separated and had a soil series name set up for it.

Soil B formed in a basin-type landform (concave area) behind an uplifted and tilted, Pleistocene terrace. The terrace, because it was tilted upward at the Lake front, caused drainage water to impound behind it, in the area of the golf course. Soil B developed in very slow moving drainage water under anaerobic conditions, causing organic matter and fine grained materials to accumulate, turning the surface black, with dull gray color at depth. The drainage outlet from the vicinity of Soil B is into the Truckee River, via a pipe system beneath the "Y" intersection of Highways 28 and 89. Aerial photographs (Andregg, 1965) show two converging streams inside the roadway island at the "Y", now covered by a sculpture and paved walkways.

It was recognized that a portion of Soil B had been filled, southwest of the Lucky Market. To classify this soil, Soil Taxonomy was utilized. According to the rules of taxonomy, a soil must have more than 50 cm (20 inches) of fill over it, before it can be recognized as a different soil. If the fill is less than 50 cm, the soil beneath dominates the characteristics of the profile with regard to land use performance. Only 15 inches of fill was found in two auger borings near the center of the vacant lot. Soil B, found beneath the fill, dominated the profile and was mapped in this area.

Soil B was then evaluated by the Bailey Land Capability system (page 20). It was found to be very poorly drained, a member of Hydrologic Group D and placed in Class 1b.

To qualify for "Man modified", a soil must be significantly altered as to change the previous land capability designation, according to Chapter 20, TRPA code of ordinances. In the case of the lot next to the Lucky Market, the Gr capability district as originally mapped placed the lot in Class 1b. Now, as mapped, Soil B is Class 1b. This site, in our analysis, could not technically qualify for man modified designation.

As defined by Section 404 of the Clean Water Act and the Federal four agency criteria, Soil B is technically a "Hydric Soil" because it has an aqic moisture regime, with evidence of seasonal wetness above 20 inches (low chroma mottling or gleying). Where it has been filled and no hydrophytic plants thrive, it may not qualify as a Jurisdictional Wetland.

As it exists today, Soil B receives Class 1b, under the Bailey Land Capability system and TRPA code of ordinances.

Respectfully submitted,

Sidney Davis,
Certified Professional
Soil Scientist/Soil Classifier
No. 1031
MEMORANDUM

May 16, 1988

To: Gordon Barrett, Team Leader, Land Use/Regulations

From: Wayne Sheldon, SCS, Area Soil Scientist

Subject: Review of Tahoe City Soils Investigation

On April 27, 1988, I reviewed the Tahoe City - Lake Forest Plan Areas for soil mapping. My method of review was to spot check various areas as mapped by Davis at a scale of 1 inch = 400 feet. I dug auger holes at his modal profile, labeled no. 2, 3, 4 and 6. All of these were as he has reported. I also dug additional holes in his soil "A" and soil "B". In one place in soil "A", I might have drawn a soil line slightly different, but this is a judgement call. Much of the Lake Forest area is under buildings or parking lots, but the soils and lines look reasonable. I basically can't find anything wrong with these maps and reports. They look like a lot of thought and effort has been done on them. I agree with this report concerning when sizeable acreage of a new soil is found, to define it and then make interpretation of it (soil A and B). At this scale of mapping, numerous inclusions will be found compared to the Soil Survey of the Tahoe Basin Area (Rodgers, 1974).

cc: Gary Shellhorn
MEMORANDUM

August 5, 1991

To: Advisory Planning Commission

From: TRPA Staff

Subject: Amendment to Chapter 18 Regarding the Classification of School/Pre-school Facilities

Proposed Action: Move School/Pre-School from Commercial Use List to Public Service Use List.

Background: Under the current TRPA Code of Ordinances, Day Care is a Public Service use only if limited to 7-12 children. A facility for 13 or more children is defined as a school/pre-school, and classified as a commercial use.

Analysis: It is apparent from public input, Community Plan team discussions, and survey results that the Tahoe Region is in need of expanded child care services. When the Regional Plan was drafted, the question of how to classify child day care facilities was a debated issue. The current TRPA definition relies on a numerical distinction for purposes of determining whether the use is public service or commercial. Local jurisdictions do not directly deal with the issue of commercial use in relation to child care facilities for more than 12 children. A special use permit is required in all jurisdictions, and the child care facilities are subject to state licensing requirements as well. Local government generally treats day care as a home occupation and deals with any compatibility issues in the context of a special use permit.

The question of whether child care use should be classified as a public service or commercial use comes down to whether child care is a use which should be provided to meet the basic service needs of the existing population, similar to schools and other public service uses that are basic components of a community's well being. It appears that this is indeed the case and, therefore, provision of child care should not be classified as commercial activities subject to allocation limitations.

DS:rd
8/5/91

AGENDA ITEM V.G.

Planning for the Protection of our Lake and Land
Amendment to Chapter 18 Regarding the Classification of School/Pre-school Facilities -- Page 2

Proposed Amendment Language:

III. COMMERCIAL

C. Services

Animal husbandry services  Personal services
Auto repair and service  Professional offices
Broadcasting studios  Repair services
Business support services  Sales lots
Contract construction services  Schools - business and vocational
Financial services  School --- pre-schools
Health care services  Secondary storage
Laundries and dry cleaning plant

IV. PUBLIC SERVICE

A. General

Airfields, landing strips and heliports (new non-emergency sites prohibited)  Local public health and safety facilities
Cemeteries  Power generating
Churches  Public owned assembly and entertainment
Collection stations  Public utility centers
Cultural facilities  Regional public health and safety facilities
Day care centers  Schools - college
Government offices  Schools - kindergarten
Hospitals  through secondary
Local assembly and entertainment  School - pre-schools
Local post office  Social service organizations

Chapter 6: The required Chapter 6 findings and brief rationales are set forth below:

1. Finding: The project is consistent with, and will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies, plan area statements and maps, the Code and other TRPA plans and programs.

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AGENDA ITEM V.G.
Amendment to Chapter 18 Regarding the Classification of School/Pre-school Facilities -- Page 3

Rationale: The day care and pre-school uses would continue to be regulated by the plan area designation as either allowed or special uses. They would be reviewed similarly to schools and other public service uses under applicable state, local, and regional plans, policies, codes and licensing procedures.

2. Finding: The project will not cause the environmental thresholds to be exceeded.

Rationale: The use would be reviewed at the project review level. The review would include the V(g) checklist with all coverage and air quality rules remaining unchanged to assure that thresholds will not be exceeded.

3. Finding: Wherever federal, state and local air and water quality standards applicable for the Region, whichever are strictest, must be attained and maintained pursuant to Article V(d) of the Compact, the project meets or exceeds such standards.

Rationale: See Findings 1 and 2 above.

4. Finding: The Regional Plan and all of its elements, as implemented through the Code, Rules and other TRPA plans and programs, as amended, achieves and maintains the thresholds.

Rationale: See Findings 1, and 2 above.

Ordinance 87-8: The required Ordinance 87-8 findings and brief rationales are set forth below:

1. That the amendment is consistent with the Compact and with the attainment or maintenance of the thresholds.

Rationale: See Findings 1 and 2 above.

2. One or more of the following:
   a) There is demonstrated conflict between provisions of the Regional Plan Package and the conflict threatens to preclude attainment or maintenance of thresholds;
   b) That legal constraints, such as court orders, decisions or Compact amendments, require amendment of the Goals and Policies or Code;

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Amendment to Chapter 18 Regarding the Classification of School/Pre-school Facilities -- Page 4

c) That technical or scientific information demonstrates the need for modification of a provision of the Goals and Policies or Code;

d) That the provision to be amended has been shown, through experience and time, to be counter-productive to or ineffective in attainment or maintenance of the thresholds;

e) That implementation of the provision sought to be amended has been demonstrated to be impracticable or impossible because of one or more of the following reasons:

1) The cost of implementation outweighs the environmental gain to be achieved;
2) Implementation will result in unacceptable impacts on public health and safety; or
3) Fiscal support for implementation is insufficient and such insufficiency is expected to be a long-term problem.

f) That the provision to be amended has been shown through experience to be counter-productive or ineffective and the amendment is designed to correct the demonstrated problem and is an equal or better means of implementing the Regional Plan Package and complying with the Compact.

Rationale: Finding (f) is recommended for the reason that the current provision appears to limit the availability of child care in the Tahoe Region.

Environmental Documentation: Based on the completion of an Initial Environmental Checklist, staff proposes a Finding of No Significant Effect (FONSE) for classifying school - pre-school as a Public Service use.

Recommendation: Staff recommends that the current category of School - Preschool, Commercial (13 or more children) be classified a Public Service use.

Staff will begin this item with a presentation. Please contact Don Sargent at (702) 588-4547 if you have any questions or comments.

8/5/91

AGENDA ITEM V.G.
MEMORANDUM

August 5, 1991

To: Advisory Planning Commission
From: TRPA Staff
Subject: Amendment of the United States Postal Service Action Plan and Related Amendments to the Regional Plan

Background: The Governing Board adopted the 1982 Air Quality Plan for the Lake Tahoe Basin on August 26, 1982. As a measure to reduce trips, the 1982 Air Quality Plan proposed mail delivery to a neighborhood system of cluster boxes, satellite stations, or home mail delivery. This system was to serve the City of South Lake Tahoe and the El Dorado County portion of the Basin and was included as a measure to reduce auto trips on Highway 50.

The TRPA Governing Board approved the U.S. Postal Service Action Plan, Lake Tahoe, on February 24, 1983. The Board approved the Action Plan as a measure to implement an element of the 1982 Air Quality Plan.

On December 20, 1989, the Governing Board adopted several amendments to the U.S. Postal Service Action Plan (see Attachment A). Said amendments were designed to implement the following postal delivery system goals:

1. Commencement of home mail delivery to businesses along the main traffic corridor of Highway 50 from the Wye to the state line;
2. Implementation of home mail delivery to residences beginning with the stateline area and expanding to all areas within the city limits;
3. Reduction of services and eventual dissolution of Bijou Station, Stateline Station, and the Tahoe Valley Station;
4. Consolidation of post office boxes and window service to the Main Post Office;

AGENDA ITEM V.H.
Planning for the Protection of our Lake and Land
5. Relocation of the Tahoe Paradise Branch to a larger facility with expanded services; and

6. Conversion of the existing NDC units to Detached Post Office Box Unit facilities; existing NDC program participants will remain status quo.

Proposed Action:

The Postal Service is now requesting the following amendments to the previously adopted Phase II through Phase V of Attachment A (pages 4 and 5):

Phase II

Proceed with the implementation of residential home mail delivery from the Tahoe Valley "Wye" area towards Stateline, within the City limits. It is projected that this phase will have reached the Al Tahoe subdivision by October 15, 1991.

There will be no changes in service at any of the branch offices. The lease at the Tahoe Valley Station will be extended to 1995.

The process of acquiring an alternative location for the Tahoe Paradise (Meyers) Branch office is currently underway to expand the existing facility to approximately 3,000 postal boxes.

Phase III

Proceed with the implementation of residential home mail delivery from the Al Tahoe area to Stateline. Residential service should be completely implemented within the City limits by October 15, 1992.

The Stateline station will remain in operation, status quo, and the lease will be extended for three years to 1996.

The Tahoe Paradise (Meyers) Branch office permits will be in process to open the office in the Fall of 1992 or Spring of 1993.

Phase IV

Proceed with the implementation of carrier delivery in the unincorporated area of El Dorado County: Montgomery Estates, portions of the Tahoe Paradise Subdivision, Christmas Valley Subdivision, and the commercial areas along the Highway 89 and 50 corridors. This phase should be implemented by October 15, 1993.
Amendment of the United States Postal Service Action Plan and Related Amendments to the Regional Plan

Page 3

Phase V

Proceed with the implementation of residential delivery in the remainder of the county area. Total carrier delivery should be implemented by October 15, 1994.

At the completion of the implementation of the carrier delivery in the South Shore area there will be a gradual closure of the postal stations dictated by the rate of relinquishment of boxes at the stations and the transfer of boxes as space becomes available to the main post office.

Staff Recommendation:

Staff recommends the Advisory Planning Commission approve the above proposed amendments to the United States Postal Service Action Plan (Attachment A). This recommendation is based upon a review of the Action Plan, the 1982 Air Quality Plan, the Goals and Policies of the Regional Plan and the Regional Transportation Plan, and the Postal Service Neighborhood Delivery Center Program Evaluation.

Staff also recommends that the United States Postal Service continue to evaluate its postal delivery system throughout the Lake Tahoe Region, and where appropriate, implement home mail delivery. TRPA supports the United States Postal Service in its efforts to improve the environment of the Lake Tahoe Region by implementing programs which reduce the dependency on the private automobile by making postal services more readily available to the residents of the Region.

If you have any questions on this agenda item, please contact John Hoole at (702) 588-4547.

8/5/91

AGENDA ITEM V.H.
"ATTACHMENT A"

PROPOSED U.S. POSTAL SERVICE ACTION PLAN REVISIONS

SOUTH LAKE TAHOE REGION ELEMENT

The following is a brief outline of the proposed modifications to the neighborhood delivery program in the South Lake Tahoe Region of the Lake Tahoe Basin. This area includes the area within the limits of the City of South Lake Tahoe, the unincorporated areas adjacent to the city limits and the communities of Meyers, Tahoe Paradise, and Christmas Valley.

In this proposed program there are several items that need to be coordinated between the local planning and public works departments and the U.S. Postal Service prior to implementation, which may result in some modifications to the proposed program. An example of one Postal Service concern is that before home mail delivery can proceed, street addresses must be sequential and consistent with City, County, police and fire departments records.

For the purpose of this discussion, a definition and description of operations for the relevant service terminology is provided below, as well as proposed changes in existing services if applicable.

Home Mail Delivery:

a. Residential mail delivered by a carrier from a vehicle to a mail box(es) located at the curb. Mail boxes will be generally clustered in groups of two or more where applicable. The Postmaster with the cooperation of the local public works department will determine where the box(es) is to be located. The resident postal service customer is responsible for the following items:

1) Providing the box.
2) Installing the box (to postal and local specifications).
3) Maintaining the box, and
4) Maintaining accessibility to the box for the postal delivery vehicle (removing all obstacles including snow).
H. **Business delivery and multi-family dwelling complexes.** This service can include curbside boxes as described above, or two or more box clusters placed at a central commercial complex/apartment house location. The Postmaster will determine which type of service is the most appropriate on a case by case basis. The Postmaster with the cooperation of the local public works department will determine the location of the box(es). Customers are responsible for the following items:

1) Providing the box(es).
2) Providing the physical location.
3) Installing the box(es).
4) Maintaining the box(es).
5) Maintaining accessibility to the box(es) for the postal vehicle and/or delivery personnel (including snow removal).

**Detached Post Office Box Unit "DPOBU":**

The same type of facility as an NDC but not subject to customer use restrictions and boxes are rented.

**Neighborhood Delivery Center "NDC":**

Free standing building located adjacent to a residential neighborhood area. The facilities include postal boxes, parcel lockers, mail drop boxes, stamp machines. The postal boxes are offered free to residents who live within the boundaries of a prescribed service radius. Residents who qualify for use of the NDC must show proof of residency every six months to continue to use the facility.

Existing participants in the NDC program will remain status quo as long as they continue to show verification of residency.

Remaining unutilized p.o. boxes in the NDCs will be rented per DPOBU guidelines. Post Office boxes in the converted DPOBU units will be rented to persons displaced in the transition program from Stateline Station, Bijou Station, or the Tahoe Valley Station, depending on the general vicinity of their physical home address.
Currently there are three NDCs:

<table>
<thead>
<tr>
<th>NDC</th>
<th>Location</th>
<th>Postal Boxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eloise</td>
<td>Tahoe Keys Blvd./Eloise</td>
<td>1440</td>
</tr>
<tr>
<td>Lakeside</td>
<td>Alameda Avenue/Harrison Avenue</td>
<td>880</td>
</tr>
<tr>
<td>Black Bart</td>
<td>Black Bart Avenue/Pioneer Trail</td>
<td>800</td>
</tr>
</tbody>
</table>

3120 Total

Plug a Box:

Placement of a "plug"/insert into the rear of a p. o. box from postal handling room to indicate box is not to be rented or used.

General Delivery:

Mail is received by customers over the counter at a full service facility. Currently approximately 6,000 customers in the South Lake Tahoe region receive their mail using this form of service. When the proposed program has been fully implemented all General Delivery Service shall be consolidated at the Main Post Office.

EXHIBIT 1 illustrates existing service.
Proposed Five Phase Program Outline:
(See attached map.)

Phase I

Implementation of business/apartment type or rural mailbox delivery to all customers along Highway 50 within South Lake Tahoe city limits whose actual physical address is on Highway 50.

As boxholders from the Stateline, Bijou and Tahoe Valley Stations relinquish their existing postal boxes these boxes will be plugged, not used or re-rented to facilitate the transition programs from these existing full service facilities.

During the transition period to home mail delivery service, the window services at the Bijou Station will be transferred to the Main Post Office; the post office box service will continue until the lease on the facility expires in June of 1990. Upon expiration of the lease the remaining post office boxes will be transferred to the Main Post Office.

Phase II

Proceed with the implementation of residential home mail delivery from Stateline to Ski Run Blvd.

The window services at the Stateline Branch will be transferred to the Main Post Office; the post office box service will continue until the lease on the facility expires in July of 1993. Upon expiration of the lease the remaining post office boxes will be transferred to the Main Post Office.

Phase III

Proceed with the implementation of residential home mail delivery from Ski Run Blvd to Al Tahoe Blvd, including the Al Tahoe Subdivision.

Phase IV

Proceed with the implementation of home mail delivery service to the remainder of the residents within city limits.
The Tahoe Paradise Branch will be relocated to a larger facility in the vicinity of Meyers. The number of p.o. boxes at the larger facility will be increased to approximately 3000 boxes and the counter service will be expanded to 3 windows.

Phase V

County residents who live in the vicinity of Meyers, and who do not want to participate in the neighborhood delivery program will be encouraged to transfer their post office box service from the Tahoe Valley Station to the expanded Tahoe Paradise Branch office.

The window services at the Tahoe Valley Station will be transferred to the Tahoe Paradise Branch or the Main Post Office. Post office box service will continue until the facility lease expires in April of 1992. Upon expiration of the lease, the remaining post office boxes at the Tahoe Valley Station will be transferred to the Main Post Office.

Proceed with the implementation of with home mail delivery to county residents. The county service areas must meet the U.S. Postal Service Regulation's qualifications for road surface maintenance and snow clearance.

EXHIBIT 2 illustrates the postal services configuration in the South Lake Tahoe Region upon completion of the five phased program.
<table>
<thead>
<tr>
<th>FACILITY</th>
<th>SERVICE TYPE</th>
<th>LOCATION</th>
<th>WINDOW COUNTERS</th>
<th>GENERAL DELIVERY</th>
<th>P. O. BOXES</th>
<th>SELF SERVICE VENDING</th>
<th>ZIP CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Office</td>
<td>Full</td>
<td>Al Tahoe Blvd.</td>
<td>6</td>
<td>2100</td>
<td>4258</td>
<td>Yes</td>
<td>95702</td>
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<tr>
<td>Tahoe Valley Station</td>
<td>Full</td>
<td>Brescali Bay Rd.</td>
<td>5</td>
<td>1200</td>
<td>3300</td>
<td>Yes</td>
<td>95731</td>
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<tr>
<td>Bijou Station</td>
<td>Full</td>
<td>Sandy Way</td>
<td>3</td>
<td>900</td>
<td>1603</td>
<td>Yes</td>
<td>95705</td>
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<tr>
<td>Stateline Station</td>
<td>Full</td>
<td>Park Ave.</td>
<td>3</td>
<td>1400</td>
<td>2443</td>
<td>Yes</td>
<td>95729</td>
</tr>
<tr>
<td>Tahoe Paradise Station</td>
<td>Full</td>
<td>Meyers</td>
<td>1</td>
<td>250</td>
<td>768</td>
<td>Yes</td>
<td>95708</td>
</tr>
<tr>
<td>Fallen Leaf CFO</td>
<td>Full Seasonal</td>
<td>Fallen Leaf</td>
<td>1</td>
<td>80</td>
<td>100</td>
<td>No</td>
<td>95716</td>
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<td>Eloise</td>
<td>NDC</td>
<td>Tahoe Key Blvd.</td>
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<td>Yes</td>
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<td>0</td>
<td>0</td>
<td>800</td>
<td>Yes</td>
<td>95761</td>
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<td><strong>TOTAL</strong></td>
<td></td>
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<td>5930</td>
<td>15512</td>
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<tr>
<td>FACILITY</td>
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<td>GENERAL DELIVERY</td>
<td>P. O. BOXES</td>
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<td>------------------</td>
<td>------------------</td>
<td>-------------</td>
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<td>----------</td>
</tr>
<tr>
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<td>Tahoe Paradise</td>
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<td>Meyers</td>
<td>3</td>
<td>300</td>
<td>3000</td>
<td>Yes</td>
<td>95708</td>
</tr>
<tr>
<td>Station</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallen Leaf CFO</td>
<td>Full</td>
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<td></td>
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</tr>
<tr>
<td>Eloise</td>
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<td>1440</td>
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<td>Lakeside</td>
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<td>0</td>
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<td>680</td>
<td>11400</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**CURRENT:**

|                  | 9            | 19                  | 5930             | 15512           | 8           |

**PROPOSED:**

|                  | 6            | 10                  | 6880             | 11400           | 5           |

**PROJECTED CHANGE:**

|                  | -3           | -9                 | -5250            | -4112           | -3          |