

TAHOE BASIN IMPERVIOUS SURFACE COVERAGE STUDY FINAL REPORT

Prepared by **Environmental Incentives, LLC**
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With contributions from



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The following staff made up the Land Coverage Study Agency Partners working group. This working group contributed to this study through assisting the project team in development of a comprehensive understanding of the existing policy and operations, identifying and vetting potential policy changes, and contributing to draft products and stakeholder engagements. The project team thanks these key stakeholders for all of their time and contributions.

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Tahoe Basin Impervious Surface Coverage Study Terms

The first use of a term that is in the Glossary is italicized and bold, and the definition is in the Key Terms text box on the right side of the page. Refer to Appendix VII: Glossary for a complete list of definitions.

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ACRONYMS AND ABBREVIATIONS

These acronyms and abbreviations are used to reduce space and increase the readability of this report. Most are commonly used by those familiar with the Tahoe Basin’s coverage policies. Acronyms and abbreviations are used after the first instance the terms they refer to occur in each section of the report.

AHP	Analytical Hierarchy Process
APN	Assessor Parcel Number
BMP	Best Management Practices
CFA	Commercial Floor Area
CICU	Commercial/Industrial/Communications/Utilities
CM	Conceptual Model
Code	Code of Ordinances
Coverage	Impervious surface land coverage
CTC	California Tahoe Conservancy
DCIA	Directly Connected Impervious Area
ECM	Excess Coverage Mitigation
EF	Evaluation Framework
EIP	Lake Tahoe Environmental Improvement Program
EIS	Environmental Impact Statement
FAR	Floor-Area-Ratio
FSP	Fine Sediment Particles
FTE	Full Time Employee
HSC	Hydrologic source control
HRA	Hydrologically Related Area
Indicator	TRPA Threshold indicator
IPES	Individual Parcel Evaluation Systems
Land bank	Land coverage bank
LID	Low Impact Development
LiDAR	Light Detection and Ranging
MFR	Mutli-Family Residential
MOU	Memorandum of Understanding
NDSL	Nevada Division of State Lands
NFS	National Forest Service
NRCS	National Resources Conservation Service
Policy Objectives	Coverage study policy objectives
PLRM	Pollutant Load Reduction Model
PSC	Pollutant source controls
PY	Person Year
Regional Plan	Regional Plan for Lake Tahoe Basin
RPU	Regional Plan Update
SEZ	Stream environment zone
SF	Square foot
SFR	Single Family Residential
Standard	TRPA Threshold Indicator Standard
TDR	Transferrable development right
Threshold	TRPA Environmental Threshold Carrying Capacities
TMDL	Total Maximum Daily Load
TMPO	Tahoe Metropolitan Planning Organization
TRPA	Tahoe Regional Planning Agency
USDA	United States Department of Agriculture

EXECUTIVE SUMMARY

The Tahoe Regional Planning Agency's 1978 Regional Plan passed monumental and progressive land use restrictions limiting the amount of impervious surface coverage (coverage) allowed on individual parcels to protect water quality and soil function. These environmentally protective land use policies effectively reduced the pace of environmental impact from development that occurred in the 1960s, 70s and early 80s. Further, these policies have limited encroachment on stream environment zones and limited development on low capability lands. These same policies, however, are cited as being a cause for the lack of redevelopment and urban renewal within the Tahoe Basin; leading to, the lake, the economy and local communities all suffering from the impacts of outdated commercial development and automobile centric land use.

TIMELY OPPORTUNITY

New context and scientific information result in a need to update the 1987 coverage policies.

- Since 1987 a significant portion of the vacant and developable parcels have been built out, while little redevelopment of the outdated commercial development has occurred.
- Restoration of coverage on low capability lands has not occurred at a pace to achieve the TRPA Soil Conservation Threshold within the foreseeable future.
- The Lake Tahoe Total Maximum Daily Load findings determined that urban areas contribute more than 70 percent of the pollutants that impair Lake Tahoe clarity.
- Community members widely recognized redevelopment of urban areas as a primary driver to achieve community, economic and environmental goals.

The California Tahoe Conservancy (Conservancy) saw the Regional Plan Update as a unique opportunity to improve the effectiveness of the coverage policies, and funded this study to identify a range of recommendations. The Conservancy's interest in coverage policy effectiveness is twofold, 1) the Conservancy serves as the land bank for the California portion of the Tahoe Basin and is exposed to a significant excess coverage mitigation (ECM) liability, and 2) the Conservancy is a partner in the Environmental Improvement Program, which funds restoration, erosion control and recreation capital projects that are influenced by the coverage policies.

APPROACH

This study recommends changes to improve the effectiveness of coverage policies and operation processes in order to enhance environmental, social and economic conditions in the Tahoe Basin. At the outset, this study reviewed the existing coverage policies in numerous Tahoe Regional Planning Agency policy documents, Memorandum of Understandings and land bank policy documents (summarized in Appendix I). This study engaged stakeholders and objectively analyzed relevant information to identify, evaluate, and refine policy and operational recommendations.

Stakeholder Engagement

The stakeholder engagement process included:

- Interviews of 7 agency staff and 30 diverse stakeholders to 1) inform the policy objectives used by this study, 2) define the need for change to the current policies, and 3) inform and vet potential recommendations.
- A charrette-style workshop to confirm the need to change coverage policies and the acceptability of the policy objectives defined through the stakeholder interviews. In addition, stakeholders evaluated and generated ideas for improving potential policy alternatives.
- A workshop to provide input and draft recommendations.

Analytical Approach

The analytical approach consisted of three primary elements described in Table ES-1.

Table ES-1: Approach Overview.

ELEMENT	METHOD	LOCATION
Define policy objectives that reflect the environmental and community priorities of the basin, and are directly influenced by coverage policies	Surveys and interviews with 7 agency staff and 30 key stakeholders	Table ES-2 lists the policy objectives and full descriptions can be found in the Policy Objectives & Sensitivity Analysis Results section of the report
Identify key factors relating coverage impact to the objectives, and develop a rigorous framework to evaluate the expected effectiveness of potential changes	Sensitivity analyses to determine magnitude of influence of factors related to objectives; define an evaluation framework that defines a consistent rating system to compare expected results from changes related to objectives	Table ES-2 shows the framework criteria and key factors; the entire framework including sensitivity analysis approach, results and model details are provided in Appendix II
Identify and evaluate potential changes to inform development of recommendations	Project potential outcomes resulting from recommendations and use the evaluation framework to determine a relative magnitude of change with respect to the objectives	The Recommendations section of the report includes descriptions of evaluation of the presented recommendations

The policy objectives, evaluation criteria and key factors influencing the policy objectives are summarized in the Table ES-2.

Table ES-2: Policy objectives with evaluation criteria and key factors.

	POLICY OBJECTIVE	FRAMEWORK CRITERIA	KEY FACTORS INFLUENCING POLICY OBJECTIVE
Environmental	Water Quality	<ul style="list-style-type: none"> Pollutant Loading to Surface Waters 	<ul style="list-style-type: none"> Meeting BMP requirements Location in high versus low precipitation zone Land Use Connectivity to surface water
	Riparian & Habitat Function	<ul style="list-style-type: none"> Watershed Disturbance & Floodplain Connectivity Habitat Quality & Quantity 	<ul style="list-style-type: none"> Ability to infiltrate in watershed Connectivity to surface water Sensitivity, existing disturbance and connectivity of habitat Surrounding land use
Socio-economic	Livable Communities	<ul style="list-style-type: none"> Land Use Efficiency Place Based Design Active Transportation 	<ul style="list-style-type: none"> Percent of site covered Number of floors Availability of shared or on-street parking
	Project Enablement	<ul style="list-style-type: none"> Direct Costs Indirect Costs Project Flexibility 	<ul style="list-style-type: none"> Coverage transfer price Excess coverage mitigation cost Commercial transfer ratio Complexity and duration of process
Policy Sustainability	Administrative Viability	<ul style="list-style-type: none"> Administrative Costs Policy Effectiveness 	<ul style="list-style-type: none"> Policy complexity & length of code Coverage transfer complexity Excess coverage mitigation complexity Administrative complexity Transaction volumes

FINDINGS

Findings are informed by (1) stakeholder input, (2) analysis of existing policies and conditions, (3) literature review, (4) sensitivity analyses revealing key factors influencing policy objectives, and (5) evaluation of policy alternatives. Table ES-3 below contains this study's findings described at length in the Findings section of this report along with related needs for change generated by stakeholders.

Table ES-3: Summary of findings with related needs for change.

FINDING	NEEDS FOR CHANGE
1 Coverage restrictions are an effective means of limiting the impact of development on water quality, and riparian and habitat function	<ul style="list-style-type: none"> ▪ Policies do not reflect recent science, and coverage is only indirectly linked to widely-held environmental issues
2 Restoration of coverage on sensitive lands and over-covered parcels needs to be accelerated to advance basin objectives	<ul style="list-style-type: none"> ▪ Policies do not sufficiently incentivize restoration of sensitive lands ▪ Land owners of over-covered parcels and coverage on sensitive lands are often reluctant to sell at market prices
3 Excess coverage mitigation policies need to be adjusted to more effectively contribute to coverage policy objectives	<ul style="list-style-type: none"> ▪ ECM fee structure does not cover the cost of retiring coverage ▪ HRA restriction for ECM, the foot for foot mitigation requirement and ECM fee levels limit the ability to use ECM funds ▪ ECM allows retirement of potential coverage to mitigate actual coverage
4 Coverage policies should be enhanced to incentivize redevelopment and innovative low-impact project design solutions	<ul style="list-style-type: none"> ▪ Policies do not incentivize compact and infill development or innovative designs ▪ Policies create costs that can make beneficial redevelopment infeasible ▪ HRA restriction inhibits beneficial projects from finding needed coverage
5 Coverage policies and operational processes are complicated, confusing and cause barriers to meeting basin-wide objectives	<ul style="list-style-type: none"> ▪ Policies are over-complicated, navigating processes requires consultants for residential projects and significant resources for commercial and public benefit projects ▪ Processes are subjective and tools are not standardized, resulting in uncertainty and lengthy processes that can inhibit beneficial projects
6 Complicated and subjective coverage policies, insufficient data, and a lack of tools create significant administrative burden for agencies and limit the ability to improve policy effectiveness	<ul style="list-style-type: none"> ▪ Insufficient data and reporting limits policy effectiveness and adaptive management ▪ Subjective and lengthy administrative processes require significant administrative time and resources ▪ Policies still using 1974 soil survey (land capability map) as opposed to updated 2007 soil survey
7 Restoration requirements associated with new coverage on sensitive lands increases the cost of projects with multiple public benefits	<ul style="list-style-type: none"> ▪ Policies create costs that make public benefit projects infeasible
8 The price of coverage and ECM fees creates a tension between the value of restoration and redevelopment projects	<ul style="list-style-type: none"> ▪ Policies do not incentivize compact and infill development or innovative design solutions
9 Coverage distribution is uneven across municipalities showing certain municipalities with a net excess of coverage	<ul style="list-style-type: none"> ▪ N/A – Data analysis finding
10 Stormwater treatment, coverage removal and private property BMP implementation are complimentary and needed to achieve policy objectives	<ul style="list-style-type: none"> ▪ Stormwater treatment technology is less expensive and replaces the need for coverage restrictions
11 Concentrating development and limiting the development footprint has the potential to reduce per capita and basin-wide environmental impact	<ul style="list-style-type: none"> ▪ Policies do not incentivize compact and infill development or innovative design solutions
12 Removing HRA restrictions for transfers of coverage without site-specific considerations for transfers will enable projects and reduce administrative burden, but may result in negative water quality impacts under certain scenarios	<ul style="list-style-type: none"> ▪ HRA restrictions create market inefficiencies and inhibit beneficial projects
13 Coverage used for commercial and residential parking is significant and can be used much more efficiently	<ul style="list-style-type: none"> ▪ Policies do not incentivize compact and infill development or innovative design solutions

STUDY RECOMMENDATIONS

This study's recommendations are summarized by the following themes

- Use a unit of measurement for coverage transfers and mitigation that reflects the impact of coverage rather than just the area of coverage.
- Create incentives to restore coverage in priority areas and redevelop high impact coverage to achieve water quality, riparian function and livable community objectives.
- Support effective private and public sector investments.
- Simplify operational processes and increase policy flexibility, transparency and accountability to reduce project costs that inhibit beneficial restoration and redevelopment projects, and to enable the policies to be administered at a reasonable cost.

The recommendations will be considered by relevant agencies and go through standard agency public review and comment processes before being adopted. Some of the recommendations may be appropriate for consideration with the current Regional Plan Update, while others identified as long-term changes will require additional research and development. Operational improvement recommendations can be incorporated by TRPA, land banks, or local jurisdiction without policy changes.

Seven Most Influential Policy Recommendations

Use site specific environmental characteristics to determine transfer and mitigation requirements

Develop a coverage impact credit system that defines an area-weighted coverage impact credit. Use this coverage impact credit as the basis for coverage transfers and excess coverage mitigation requirements. This is analogous to many wetland mitigation banking protocols used throughout the country.

Increase flexibility to effectively invest excess coverage mitigation fees, and provide alternative means for local jurisdictions to address excess coverage mitigation requirements

For existing excess coverage mitigation funds already collected, release the 1 square foot for 1 square foot and hydrologic related area requirement and use a reverse auction using criteria to maximize the environmental benefit of coverage acquired at the lowest cost. For future excess coverage mitigation funds collected, use the coverage impact credit system or specific types of coverage to be retired on a 1 square foot for 1 square foot basis, and release the hydrologic related area requirement. In addition, ensure the excess coverage mitigation fee sufficiently covers the actual cost of coverage retirement and require excess coverage mitigation for all projects with excess coverage as opposed to only those with structural changes. Lastly, provide local jurisdictions the option to mitigate excess coverage by raising funds to retire coverage using an ongoing parcel-based stormwater fee that incentivizes BMP compliance and mitigation of excess coverage.

Provide expedited review for projects with significant environmental benefits

Create additional expedited project review classifications for projects that provide significant environmental benefits such as restoration and retirement or transfer of a specified amount of existing coverage on 1B soils. Specify a maximum number of days that the project proponent can expect for each step in the expedited project review process.

Invest public funds to restore coverage on sensitive lands and increase the utilization of parking

Include coverage removal from sensitive lands in prioritization of public funding sources such as the Lake Tahoe Environmental Improvement Program and capital improvement budgets for large land owners such as the National Forest Service. Further, invest in podium and structured parking to encourage commercial property owners to remove coverage used for underutilized parking. For example, create a regional grant program for local jurisdictions to propose shared parking solutions and evaluate

proposals by the amount and land capability class of the coverage that will be restored as part of the proposal.

Create a low-priced pool of coverage to incentivize public and private sector projects that generate environmental and community benefits

Create low-priced pool of coverage for public and private sector projects using public and private sector funds. Use environmental and community benefit performance measures to prioritize projects requesting access to the low-priced coverage and identify projects to supply coverage.

Provide a means to connect willing sellers and interested buyers

Develop a web-based database to connect willing sellers and interested buyers in order to enable more projects that generate environmental and community benefits. A phased implementation approach is recommended that begins with a simple online database of willing sellers and interested buyers and can be enhanced to facilitate electronic coverage transfers and other transactions.

Land banks use reverse auctions and land acquisition criteria to maximize environmental benefit with available resources

Land banks should use reverse auctions to acquire coverage at the lowest possible prices with available resources, either ECM funds or land bank capital. Further, land banks should use a value-based pricing approach to maximize environmental benefit of coverage acquired because each square foot of coverage should be valued differently. The valued-based pricing approach can use the coverage impact credit system described in Recommendation #1.

Other Policy Recommendations

- Allow conversion of impervious coverage to other transferrable development rights
- Permanently retire impervious coverage in order to permit floors three and higher where allowed by zoning
- Allow relocation of existing coverage from commercial uses on 1B land capability parcels to high capability parcels in Town Centers and cover up to 80% of the receiving site
- Allow a 1:1 coverage transfer ratio for coverage from sensitive lands to Town Centers up to maximum allowed
- Allow soft coverage from sensitive lands to be transferred for commercial development in Town Centers
- Allow local jurisdictions to manage coverage at the Town Center scale
- Raise the maximum allowable coverage permitted to 70% for commercial, tourist accommodation and multi-residential uses on parcels with existing development
- Change the Impervious Cover Threshold to provide a more achievable target
- Allow coverage to be transferred and banked without a project permit or property ownership

Operational Process Recommendations

- Provide tools for project proponents to easily understand and fulfill coverage operational processes
- Use criteria to identify parcels that do not require field verifications and publish a map of parcels that do not require field verifications
- Use standardized land capability verification and site assessment processes, and a TRPA-certification for private and public entities to implement these processes
- Land banks offer coverage put and call options so project proponents can either lock in a sale of coverage before investing in a restoration project or lock in coverage without paying full coverage acquisition costs prior to project approval
- Use a standardized process and forms for tracking ECM in-lieu fees and reporting public entity coverage information

- Clarify and ensure coverage policies and operational processes are implemented consistently according to policy documentation

Publish Results and Improve the Effectiveness of Coverage Policies

Track activity, publish results and evaluate effectiveness of the coverage policies and make annual recommendations to improve coverage policy effectiveness. Continually improving coverage policies increases their effectiveness to achieve policy objectives and identifies opportunities to reduce administrative burden. An evaluation and reporting framework provides the information necessary for agency management to consistently, transparently and effectively improve policies.

The following are example coverage policy performance measures based on the evaluation framework developed and sensitivity analysis conducted by this study.

POLICY OBJECTIVE	EXAMPLE PERFORMANCE MEASURES
Water Quality	<ul style="list-style-type: none"> ▪ Coverage impact credit transferred <u>or</u> ▪ Change in per capita coverage utilization ▪ Change in BMP certifications ▪ Estimated load reduction from redevelopment projects involving coverage transfers
Riparian & Habitat Function	<ul style="list-style-type: none"> ▪ Coverage impact credits transferred <u>or</u> ▪ Change in per capita coverage utilization ▪ Change in acres of 1B or SEZ covered
Livable Communities	<ul style="list-style-type: none"> ▪ Change in Floor-Area-Ratio ▪ Change in parking spot utilization ▪ Change in shared/on-street parking spots
Project Enablement	<ul style="list-style-type: none"> ▪ Change in market price for coverage transfers ▪ Change in excess coverage mitigation in-lieu fee levels ▪ Change in average time to approve projects
Administrative Viability	<ul style="list-style-type: none"> ▪ Change in staff time to administer coverage policies ▪ Change in the length of Chapters 30 and 53 of the Code ▪ Reduction in the number of processes necessary to implement coverage transactions and administer the ECM program

STUDY OVERVIEW

Many of the Tahoe Basin’s developed areas, particularly its tourist and commercial areas, were constructed in the 1960s and 1970s. Much of this development is strip commercial and is neither compatible with today’s community sustainability objectives, nor our need to be more efficient with the use of land and supporting infrastructure. Further, much of this development is not compliant with parcel-scale water quality requirements however is a significant source of pollutant loading that impacts the clarity of Lake Tahoe. Current regulations and a lack of effective incentives result in investors not being willing to redevelop economically unproductive and environmentally damaging existing development. Current policy also restricts the use of the in lieu fees paid for *excess coverage mitigation* (ECM) to the point that these funds are not being used; as a result, the California and Nevada land coverage bank (*land banks*) are faced with an untenable situation and the mitigation funds are not resulting in environmental improvement.

Through the current update of the Tahoe Regional Planning Agency (TRPA) Regional Plan, the Tahoe basin has the unique opportunity to revise and update coverage transfer, excess coverage mitigation and related TRPA land use policies to more effectively drive environmental and community improvement. The California and Nevada land banks must change current policies and operations if they are to continue administering the excess coverage mitigation program. As with any change in the Tahoe Basin, policy adoption and implementation requires support from those who will be effected by and those who must administer the policies.

Key Terms

Excess coverage mitigation (ECM):

A TRPA program that requires project proponents to mitigate excess coverage on a parcel that is already covered beyond the amount allowed under the Regional Plan. Project proponents have several options, including on-site and off-site reduction in coverage and an in-lieu rehabilitation fee.

Land banks – Entities designated by TRPA to facilitate the elimination of excess land coverage and to provide transfer mechanisms. There are two land banks – Nevada Division of State Lands and California Tahoe Conservancy – and their duties, authorities and procedures are located in MOUs.

NEED FOR CHANGE

The existing Tahoe Basin impervious surface land coverage (coverage) policies were developed more than 20 years ago. The annual volume of transfers has decreased over time and land use priorities have changed in the Tahoe Basin. The land banks are not able to mitigate excess coverage and, because of the complexity of the coverage policies homeowners and developers routinely employ consultants to complete simple transactions. Further, restrictive regulations and high transaction costs inhibit environmentally and socio-economically beneficial coverage transactions from proceeding.

Needs for change were collected during this study’s stakeholder engagement processes to ground the project team and stakeholders in the elements of the coverage policy that are widely believed to need be addressed through the recommendations from this study. Table 1 below contains a synthesis of the issues that came up most frequently.

Table 1: Synthesis of most frequently provided needs for change issues.

BASE ALLOWABLE COVERAGE

Coverage policies do not reflect recent science, and coverage is only indirectly linked to accepted environmental and socio-economic issues

Complexity and subjectivity related to coverage policies results in inconsistent determinations from planners, which creates uncertainty and contributes to project delays and additional costs

COVERAGE TRANSFERS

Coverage transfer policies are complex to understand and costly to use, thus limiting environmental and socio-economic benefits

Coverage policies do not incentivize compact and infill development or innovation site design that could reduce the impact of coverage

Coverage policies inhibit **redevelopment** and public benefit projects that have environmental and socio-economic benefits

Hydrologic Related Area (HRA) restrictions create market inefficiencies and constrain the land banks' ability to enable projects

The TRPA **environmental threshold carrying capacity** (threshold) for Soil Conservation provides an incentive to cover less capable soils and is largely infeasible to achieve for the highest land capability classification

Coverage policy does not effectively incentivize restoration or protection of sensitive lands

EXCESS COVERAGE MITIGATION

Excess coverage mitigation (ECM) program is not effectively mitigating excess coverage, primarily because ECM fees do not cover the cost of retiring coverage, and potential coverage is retired to mitigate actual coverage

HRA restrictions, square-foot for square-foot mitigation requirements and fee levels limit the ability to use existing ECM funds

ADMINISTRATIVE OPERATIONS

Regulatory processes create significant transaction costs and inhibit beneficial projects

Insufficient coverage tracking and reporting limits policy effectiveness and inhibit market efficiencies

Lack of standard tools lead to inconsistent determinations by planners, increased project costs and reduced public confidence in the coverage policies

PURPOSE

The purpose of this study is to recommend policy changes that improve the effectiveness of coverage policies and land bank operations to enhance environmental and social conditions in the Lake Tahoe basin.

This study is funded by the California Tahoe Conservancy (CTC) to (1) address CTC and Nevada Division of State Lands (NDSL) land bank excess coverage mitigation liability concerns, and (2) enable TRPA coverage policies to facilitate Lake Tahoe Environmental Improvement Program (EIP) and redevelopment projects that result in environmental and community benefits.

The recommendations resulting from this study will be considered by relevant agencies and go through standard agency public review and comment processes before being adopted. Some of the recommendations may be appropriate for consideration with the current Regional Plan Update (RPU), while others may be used in TRPA, land bank or local jurisdiction operations, or future updates to the Regional Plan for the Lake Tahoe Basin (Regional Plan).

AUDIENCE

This report is intended to inform TRPA, CTC and NDSL staff intimately involved in the coverage policy and who must evaluate the recommendations and communicate them effectively to their executives, governing boards, and

Key Terms

Environmental threshold carrying capacity (threshold) – An environmental standard necessary to maintain a significant scenic, recreational, educational, scientific or natural value of the region or to maintain public health and safety within the region. Such standards shall include but not be limited to standards for air quality, water quality, soil conservation, vegetation preservation and noise.

Hydrologically Related Area (HRA) – A designated geographical area which incorporates one or more subwatersheds, and coverage transfers and excess coverage mitigation are restricted within an HRA under the current coverage policies. There are nine HRAs in the basin.

Redevelopment – Development on a parcel containing a structure or coverage. In some contexts the term is used to describe development in an area that contains infrastructure regardless if there is a structure or coverage on a specific parcel.

stakeholders. The report is structured to provide clear recommendations and supporting rationale.

Specific elements of this study were developed for broader audiences which were engaged to generate important input and produce broadly supported policy alternatives.

BACKGROUND

The existing impervious coverage policies in the Tahoe Basin were adopted in 1987. Since 1987, the built environment and land use priorities in the Tahoe basin have changed, yet the coverage policies have not been updated. In addition, existing coverage policies have been identified as ineffective at achieving perceived policy objectives.

Why was the coverage policy developed?

The 1987 TRPA Regional Plan passed monumental land use restrictions limiting the amount of impervious surface coverage allowed on individual parcels to protect water quality and soil function. The coverage transfer policy facilitated the passage of coverage restrictions by allowing flexibility of coverage placement and providing relief to land owners who owned *low capability land*.

Goals of the coverage policy are described in the Regional Plan Goals and Policies document, including

- Redirecting coverage away from sensitive lands
- Providing flexible placement of coverage
- Consolidating development
- Improving efficiency of transportation systems
- Ensuring social and economic well-being

What is the link between coverage and the environment?

Impervious surface coverage reduces the ability of water to infiltrate and increases the volume of runoff reaching streams during storms, which leads to unstable stream channels and impacts water quality. Low-impact development and stormwater treatment can improve infiltration. Impervious coverage also reduces riparian and terrestrial habitat that previously provided ecological value.

How does the coverage policy currently work?

The coverage policy can be broken into four primary elements.

Base Allowable Coverage: Each parcel is allocated a base amount of coverage determined by the parcel's land capability. Parcels with environmentally sensitive soils are allocated 1 to 5 percent allowable coverage, while relatively flat parcels with soils capable of infiltrating water are allocated up to 30 percent.

Coverage Transfers: Coverage can be transferred from one parcel to another pursuant to several land capability, project type and geographical provisions. The maximum allowable coverage on a parcel is dependent on land capability and land use (e.g. residential, commercial, etc.). Coverage transfer provisions include the retirement of coverage on sensitive lands, restriction of *soft coverage* for commercial uses, and restriction of coverage transfers across the nine hydrologically related areas (HRA), which are groups of subwatersheds.

Key Terms

Low capability land – Sensitive land designated by a low land capability score, normally accepted as land capability classes 1-3.

Soft coverage – Compacted areas without structures so used before February 10, 1972, for such uses as for the parking of cars and heavy and repeated pedestrian traffic that the soil is compacted so as to prevent substantial infiltration. A structure, improvement or covering shall not be considered as coverage if it permits at least 75 percent of normal precipitation directly to reach the ground and permits growth of vegetation on the approved species list.

Excess Coverage Mitigation: Parcels covered more than the base allowable amount prior to 1987 must meet excess coverage mitigation provisions in order for a new development permit to be approved. Multiple options are provided to land owners, including onsite and offsite physical removal of coverage, and an in-lieu fee which land banks then use to retire coverage.

Administrative Operations: The administrative operations of the coverage policy are carried out by several public entities. TRPA manages coverage policies and issues permits for commercial coverage transfers. Land banks operated by CTC and NDSL provide land owners access to coverage and retire excess coverage using in-lieu fees collected. *Local jurisdictions* issue permits for local residential coverage transfers.

A full summary of the existing coverage policies is provided in Appendix I: Existing Policy Summary.

This comprehensive summary is based on several policy documents ranging from the Tahoe Regional Plan Code of Ordinances (Code) to *Memorandum of Understandings* (MOUs) between TRPA and land banks and local jurisdictions.

What has the coverage policy accomplished since its inception?

The coverage transfer and banking policy served a notable role in enabling adoption of the 1987 Regional Plan and the environmentally protective land use policies therein. These environmentally protective land use policies have effectively reduced the pace of environmental impact from development that occurred in the 1960s, 70s and early 80s. Further, these policies have limited encroachment on *stream environment zones* (SEZs) and limited development on low capability lands. Some key statistics include:

- 1,215,000 ft² (or just under 28 acres) – coverage retired through ECM
- 67,472 ft² (or 1.55 acres) – average amount of coverage transferred annually by land banks between 2003 and 2010
- 82 projects – average number of projects enabled annually by land banks between 2003 and 2010
- 5 out of 9 *Bailey Land Classifications* in attainment of the Soil Conservation threshold (1A, 1B, 2 and 7 are not in attainment)

Key Terms

Bailey Land Classification System - A system for defined in “Land Capability Classifications of the Lake Tahoe Basin, Bailey, R. G. 1974” which outlines a system of land classification including land capability classes and coverage coefficients.

Local jurisdictions - Cities and counties with permitting authority granted through MOUs with TRPA. Local jurisdictions include City of South Lake Tahoe, Placer County, El Dorado County, and Washoe County.

Memorandum of Understanding (MOU) - A document describing a bilateral or multilateral agreement between parties.

Stream Environmental Zone (SEZ) - Generally an area which owes its biological and physical characteristics to the presence of surface or ground water. The precise definition is an area determined to be an SEZ by application of the criteria set forth in TRPA's Water Quality Management Plan for the Lake Tahoe Region, Volume III, SEZ Protection and Restoration Program, dated November, 1988. The criteria for identifying SEZs in Section 37.3 shall be used for purposes of implementing IPES.

APPROACH

Development of effective and broadly supported policy changes requires stakeholder engagement and evaluation of policy alternatives by their impact on defined policy objectives. This study used an extensive stakeholder engagement process to understand how existing coverage policies play out in practice, define coverage policy objectives and develop recommended coverage policy changes.

Figure 1 below illustrates the overall study approach and methods, and the relationships between work plan tasks. This study phases are on the left-hand side and the tasks are linked throughout.

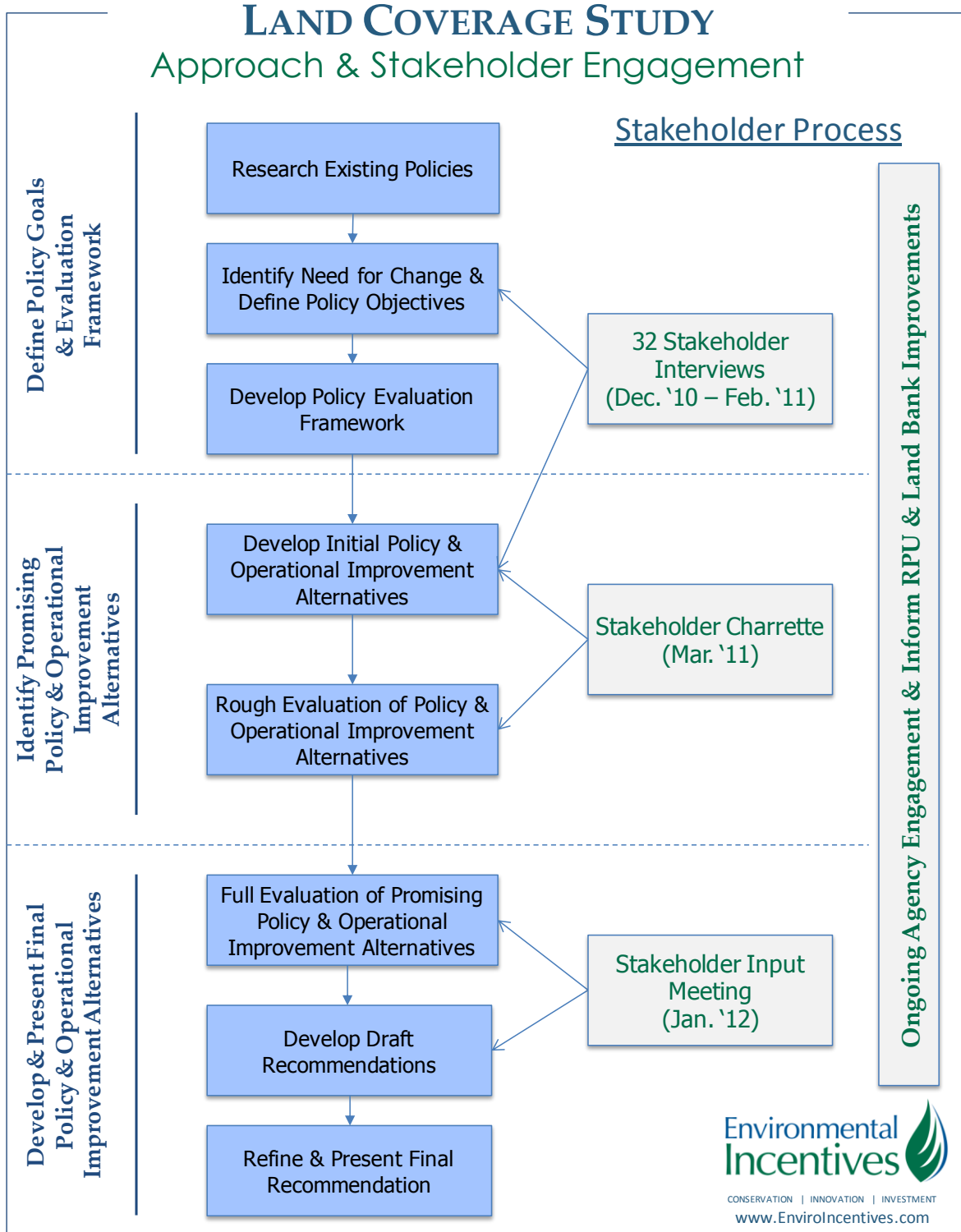


Figure 1: Project approach and stakeholder engagement process implemented by this study.

STUDY STAKEHOLDER ENGAGEMENT

More than 37 diverse stakeholders were engaged throughout this study to (1) inform the policy objectives used by this study, (2) define the need for change to the current policies, and (3) inform and vet potential policy recommendations.

The stakeholder engagement process began with individual interviews in the fall of 2010 to identify needs for change, potential policy objectives and policy alternatives. Stakeholders were convened at a charrette-style workshop in March 2011 to confirm the need to change coverage policies and the acceptability of the policy objectives defined through the stakeholder interviews. And stakeholders were reconvened in January 2012 to gain input on draft policy recommendations. Interview and workshop materials, and a list of participating stakeholders are provided in Appendix III: Stakeholder Engagement.

In addition, agency management and staff were engaged throughout this study to support adoption and implementation of recommended policy and operational improvements.

COVERAGE POLICY OBJECTIVE DEVELOPMENT

The coverage policy objectives were defined and ranked through the following steps:

- 1) **Determine and define draft coverage policy objectives** - An initial list of potential policy objectives was defined based on interviews with seven staff from TRPA, CTC and NDSL, an analysis of the existing coverage policies and professional judgment of the project team. The initial list of potential policy objectives was augmented based on formal interviews with over 29 stakeholders who were asked to provide potential policy objectives prior to and after reviewing the initial list.
- 2) **Rank draft coverage policy objectives** – Draft coverage policy objectives were ranked by 29 stakeholders during formal interviews using a defined 1-5 rating scale. These objectives were also ranked by seven staff from TRPA, CTC and NDSL using the Analytical Hierarchy Process, which is a robust and widely accepted multi-criteria decision analysis method. The results of these two ranking processes were combined as described in Appendix III: Stakeholder Engagement.
- 3) **Refine and confirm coverage policy objectives** – Draft coverage policy objectives including rankings were improved based on feedback and confirmed for acceptability by stakeholders and agency staff at the charrette-style workshop.

The materials used to engage stakeholders throughout the development of the coverage policy objectives are described in greater detail and presented in Appendix III: Stakeholder Engagement.

POLICY ALTERNATIVE EVALUATION AND SELECTION

Coverage Policy Evaluation Framework

This study developed a rigorous policy evaluation framework based on the stakeholder-defined policy objectives that defines specific evaluation criteria and tools to conduct evaluation of policy alternatives. A sensitivity analysis was conducted to identify the key factors that influence each policy objective and inform the evaluation of policy alternatives. The results of the sensitivity analysis are summarized in the Policy Objectives & Sensitivity Analysis Results section, and the sensitivity analysis approach, results and model details, as well as the entire evaluation framework are presented in Appendix II: Coverage Policy Evaluation Framework.

Transfer of Development Rights Success Factors

The Transfer of Development Rights (TDR) success factors below were used to screen policy alternatives, define policy alternatives to address factors not yet addressed, and develop this study's findings. The success factors were compiled based on literature review and project team experience.

- TDR policy is appropriately integrated with other policies designed to achieve the same goals.
- Project proponents (developers) demand the TDR.
- TDRs are transferred to areas where development is desired and can be supported.
- TDRs are transferred from areas where development is not desired.
- TDR policy is easily understood and easy to use.
- TDRs are clearly defined and easily transferred.

- Strong public support for TDR policy.

Policy Alternative Selection Table

The policy alternative selection table was created to organize the more than 150 policy alternatives generated by this study, and assist the project team in selection of recommendations. Policy alternatives are grouped in the table by the policy issues that each alternative attempts to address. The policy issues are further grouped by policy symptoms, which describe the desired outcomes not being met and what really matters. The policy issues were based on need for change issues collected during the stakeholder engagement process. The evaluation framework score for each policy alternative evaluated during the preliminary screen of policy alternatives is presented in the table to inform the comparison of policy alternatives and eventual selection of recommendations. The policy selection matrix is presented in Appendix V.

SCOPE

All public policy and internal agency operations related to impervious surface coverage in the Tahoe Basin were considered in the scope of this study. The relationship to other tradable development rights in the Tahoe Basin was considered and informed by the environmental analyses of the draft TDR Transfer Matrix that Environmental Incentives conducted and provided to TRPA in January 2012 as part of the Tahoe Sustainable Communities project.

POLICY OBJECTIVES & SENSITIVITY ANALYSIS RESULTS

This section defines the policy objectives defined for this study and the key factors that influence these objectives.

COVERAGE POLICY OBJECTIVES

The magnitude of influence that coverage policies have on progress toward achieving each TRPA environmental threshold carrying capacity (threshold) differs from threshold to threshold. In addition, there may be objectives of the coverage policies that are not directly measured by existing threshold indicators or are not measured by existing threshold *indicators* (indicators).

The coverage study policy objectives (policy objectives) guide the development of policy recommendations in this study in order to achieve relevant thresholds and community goals. Relevant thresholds include the Soil Conservation, Scenic and Transportation thresholds. Policy objectives are ranked based on their importance to stakeholders and the ability for coverage policies to influence the outcome of the objectives.

Table 2 presents the policy objectives listed in order of importance, and includes descriptions of each objective and the criteria used in the coverage policy evaluation framework. The coverage policy evaluation framework, including the Conceptual Model used to identify the evaluation criteria, is provided in Appendix II: Coverage Policy Evaluation Framework. The extensive stakeholder process that determined the policy objectives is described in Appendix III: Stakeholder Engagement.

Key Terms

Indicator – A measurable parameter or an index of multiple measurable parameters used to track progress toward achieving a Standard or Threshold. There is one or more indicators related to each Threshold and each change in response to human activity and can be used to assess the quality of resource or experience conditions.

Table 2: Policy objectives for evaluating coverage policies in the Tahoe Basin.

	POLICY OBJECTIVE	DESCRIPTION	CRITERIA
Environmental	Water Quality	To improve mid-lake clarity, increase transparency in nearshore waters, and improve the quality of water flowing in streams.	<ul style="list-style-type: none"> ▪ Pollutant Loading to Surface Waters
	Riparian & Habitat Function	To increase riparian and SEZ function, maintain resilient and dynamic geomorphic form of stream channels, improve ground water recharge for biological and human uses, support riparian flora and fauna, and filter fine sediment and nutrients.	<ul style="list-style-type: none"> ▪ Watershed Disturbance & Floodplain Connectivity ▪ Habitat Quality & Quantity
Socio-economic	Livable Communities	To have livable cities, towns and rural communities with geographically defined character, scenic viewsapes, economic sustainability, and high quality of life for their residents.	<ul style="list-style-type: none"> ▪ Land Use Efficiency ▪ Place Based Design ▪ Active Transportation
	Project Enablement	To increase the ability to implement restoration, public benefit, commercial and residential projects necessary to improve the environment and community.	<ul style="list-style-type: none"> ▪ Direct Costs ▪ Indirect Costs ▪ Project Flexibility
Policy Sustainability	Administrative Viability	To ensure sufficient administrative capacity is available, administrators are financially capable of implementing policies, and effectiveness is demonstrated in order to understand the effectiveness of policies and land bank programs at achieving the environmental and socio-economic objectives.	<ul style="list-style-type: none"> ▪ Administrative Costs ▪ Policy Effectiveness

KEY FACTORS INFLUENCING POLICY OBJECTIVES

The sensitivity analysis results presented in this section informed the identification, construction and evaluation of the recommendations. Sensitivity analyses were conducted to identify how coverage and the coverage policies influence the policy objectives. These sensitivities are the foundation of the evaluation framework defined in Appendix II. Appendix II also contains detailed descriptions of the policy objectives, the evaluation framework criteria, and the sensitivity analysis approach, results and model detail.

The sensitivity analyses conducted by this study revealed the factors that most significantly influence coverage policy objectives. The modeling results are presented in relative terms, the magnitude of change related to a fixed value based on changes to a specific factor with all else held equal. Table 3 below lists the evaluation criteria defined in the evaluation framework, as well as the key factors identified by the sensitivity analyses, for each coverage policy objective.

Table 3: Summary of key factors that influence each coverage policy objective.

	POLICY OBJECTIVE	CRITERIA	KEY FACTORS INFLUENCING POLICY OBJECTIVE
Environmental	Water Quality	<ul style="list-style-type: none"> Pollutant Loading to Surface Waters 	<ul style="list-style-type: none"> Meeting BMP requirements Location in high versus low precipitation zone Land Use Connectivity to surface water
	Riparian & Habitat Function	<ul style="list-style-type: none"> Watershed Disturbance & Floodplain Connectivity Habitat Quality & Quantity 	<ul style="list-style-type: none"> Ability to infiltrate in watershed Connectivity to surface waters Floodplain connectivity Surrounding land use
Socio-economic	Livable Communities	<ul style="list-style-type: none"> Land Use Efficiency Place Based Design Active Transportation 	<ul style="list-style-type: none"> Percent of site covered Number of floors Availability of shared or on-street parking
	Project Enablement	<ul style="list-style-type: none"> Direct Costs Indirect Costs Project Flexibility 	<ul style="list-style-type: none"> Coverage transfer price Excess coverage mitigation cost Commercial transfer ratio Complexity/duration of process
Policy Sustainability	Administrative Viability	<ul style="list-style-type: none"> Administrative Costs Policy Effectiveness 	<ul style="list-style-type: none"> Policy complexity & length of code Coverage transfer complexity Excess coverage mitigation complexity Administrative complexity Transaction volumes

WATER QUALITY SENSITIVITY ANALYSIS RESULTS

The Water Quality objective is related to three aspects; deep water clarity of Lake Tahoe, the transparency and algae abundance in nearshore waters, and the quality of water flowing in streams. Water Quality is primarily driven by the runoff volume and pollutant loading of fine sediment particles less than 16 micrometers in diameter (FSP) and nutrients. The results of the pollutant loading and runoff sensitivity analyses are summarized below and identify the key factors related to how impervious land coverage and coverage policies influence the Water Quality policy objective.

The relative runoff and loading from a series of Pollutant Load Reduction Model (PLRM) runs for different land uses with and without BMPs is presented in Figure 2 and Table 4 below. The amount of precipitation, soil type and other factors were held constant with changes only to represent typical residential or commercial settings. Table 4 identifies each model run number with details provided in the PLRM Scenario Results table in Appendix II.

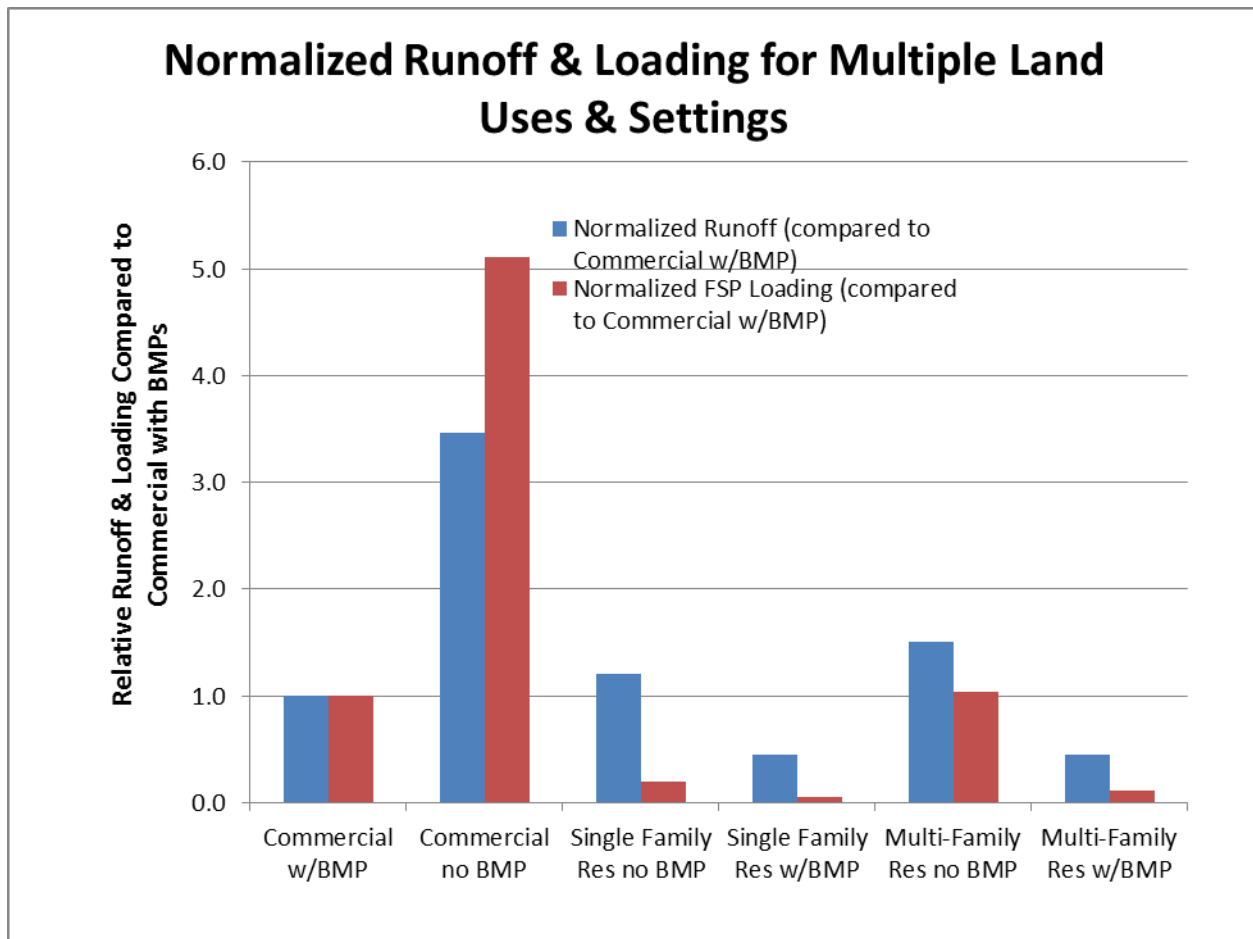


Figure 2: Relative runoff and loading for multiple land use and types of pollutant controls.

Table 4: Summary of Results of Comparative Land Uses with and without BMPs.

Setting	Runoff (ac-ft/yr/acre of coverage)	FSP Loading (lbs/yr/acre of coverage)	Normalized Runoff (compared to Commercial w/BMP)	Normalized FSP Loading (compared to Commercial w/BMP)	Run
Commercial w/BMP	0.6	222.6	1.0	1.0	55
Commercial no BMP	2.2	1137.8	3.5	5.1	52
Single Family Res no BMP	0.8	42.9	1.2	0.2	51
Single Family Res w/BMP	0.3	11.4	0.4	0.1	54
Multi-Family Res no BMP	1.0	230.6	1.5	1.0	69
Multi-Family Res w/BMP	0.3	25.6	0.4	0.1	70

Runoff Amount

Stormwater runoff volume is strongly affected by several factors. Highly sensitive factors identified through this analysis include:

Location in high versus low precipitation zone: The amount of precipitation in an area can have a significant influence on the amount of runoff from a parcel. Comparison model runs in the basin ranged from 18.7 to 34.0 inches of average annual precipitation per year (See PLRM Scenario Results Table in Appendix II runs 2, 11 and 14). The 139% increase in precipitation corresponded to a similar percent increase in runoff and loading in the model runs.

Meeting BMP requirements: Hydrologic source control (HSC), also known as structural BMPs in the Tahoe Basin, reduces runoff volumes and minimizes concentrated flows by intercepting and

infiltrating precipitation before it runs off. Table 4 and Figure 2 above show a 5 times increase in loading when comparing loading from commercial impervious surface without BMPs to commercial with BMPs.

Runoff Concentrations

Stormwater pollutant concentration is strongly affected by the following factors:

Meeting BMP requirements: Pollutant source controls (PSC), such as stabilizing steep banks, and vegetating and mulching disturbed soils, reduce the generation of pollutants of concern before they are capable of being mobilized and transported with runoff. Reducing the amount of fine sediment on impervious surfaces through reducing abrasive applications and sweeping are also effective PSCs. BMPs that reduce the amount of pollutants before they are mobilized can minimize the additional concentration to the point of having minimal additional loading.

Land Use: The intensity of use of a developed area, such as increasing the density of *residential units* from single family residential to multi-family residential, can change the concentration of pollutants in runoff from an area. This is expected to be, in part, explained by an associated increase in vehicular traffic that can increase the amount of road abrasives tracked onto the parcel, which can increase the concentration of pollutants in the stormwater runoff from the parcel. Table 4 and Figure 2 above show that loading from multi-family residential and single family residential with BMPs is 1/10th the loading of commercial with BMPs.

Key Terms

Residential Unit – One or more rooms containing one or more bedrooms, with not more than one kitchen, designed to be occupied permanently as an independent housekeeping unit by one family or one collective household with facilities for living, cooking, sleeping and eating.

Other Factors Not within the Parcel Boundaries

Other factors not within a parcel boundary significantly influence water quality:

Connectivity to surface water: The degree of Directly Connected Impervious Area (DCIA) between the site and the bottom of the catchment is a significant factor. The degree of connection between the outlet of the urban catchment and surface waters (referred to as catchment connectivity) is also important. Significant reductions in loading can be achieved by natural infiltration and treatment when water flows over undeveloped land without causing erosion, or when water flows through wetland complexes before reaching a surface water. The reduction in loading and flow has been estimated as 90 percent in certain instances, even for development within one-quarter mile of the lake.

RIPARIAN & HABITAT FUNCTION SENSITIVITY ANALYSIS RESULTS

The Riparian & Habitat Function policy objective represents the importance of increasing the riparian and SEZ function as related to the ability to dissipate high-flow stream energy, filter fine sediment and nutrients, improve ground water recharge, stabilize stream banks, and support riparian and sensitive flora and fauna. Riparian & Habitat Function is primarily driven by watershed disturbance and floodplain connectivity, and habitat quantity and quality. The results of the watershed function and habitat analyses are summarized below and identify the key factors related to how impervious land coverage and coverage policies influence the Riparian & Habitat Function policy objective.

Coverage can influence the hydrologic function of the watershed, increase the resiliency of riparian habitat and improve stream conditions. This has been shown through a body of literature synthesized by

the Center for Watershed Protection into the Impervious Coverage Model¹, which is illustrated in Figure 3 below.

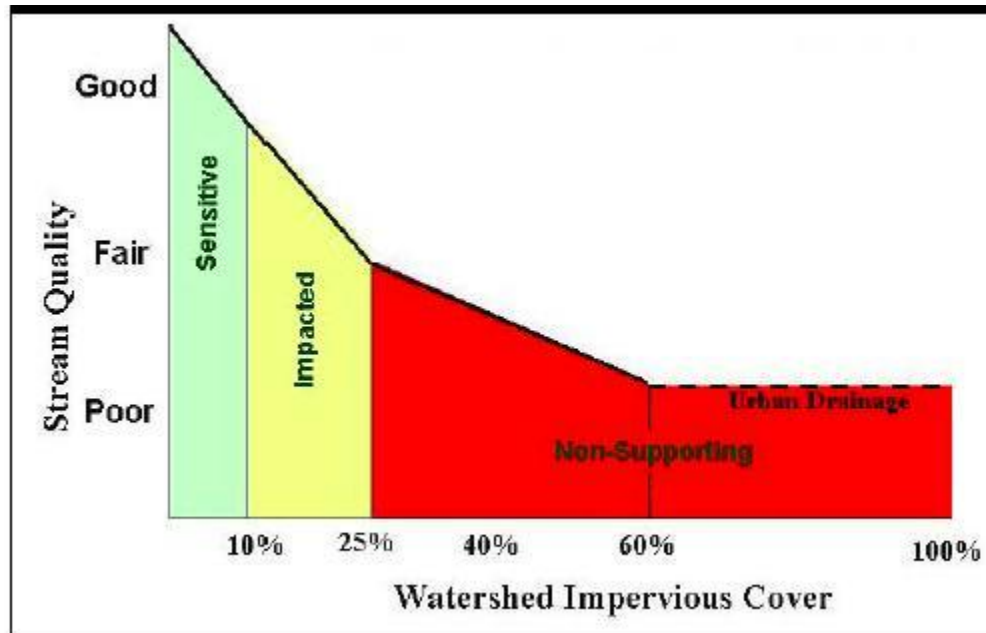


Figure 3: Impervious Coverage Model relating impervious coverage to potential stream quality.

Increasing the infiltration of stormwater from impervious surfaces using low impact development techniques that reduce runoff volume also improve riparian and habitat function and can improve the stream response to the degree of impervious surface in the watershed².

Hydrologic Function

Hydrologic function is strongly affected by the following factors:

Ability to infiltrate in watershed: Increasing infiltration and decreasing runoff restores hydrologic function including increasing shallow and deep groundwater recharge. These PLRM results show a 3.5 times decrease in runoff when comparing runoff from commercial impervious surface without BMPs to commercial with BMPs. It also shows that runoff from multi-family residential and single family residential with BMPs is 0.4 times the runoff of commercial with BMPs. DCIA and catchment connectivity, described above in the water quality discussion, is similarly important to increasing infiltration and reducing runoff during storm events.

Habitat Quality and Quantity

Habitat quality and resiliency, and stream conditions are strongly affected by the following factors:

Connectivity to surface waters: Improved hydrologic function increases the resiliency of riparian and wetland habitat. By increasing groundwater elevations and storing more water in groundwater versus allowing it to runoff during storm events, riparian plant communities can expand their range and withstand drought conditions. This is particularly important considering that riparian habitat is valuable for sensitive native flora and fauna, and that drought conditions are projected to increase in frequency and magnitude given climate change.

¹ Center for Watershed Protection. 2003. Watershed Protection Research Monograph No.1: Impacts of Impervious Cover on Aquatic Systems.

² Guo, et. al. 2010. Incentive Index Developed to Evaluate Storm-Water Low-Impact Designs. American Society of Civil Engineering, Journal of Environmental Engineering. Vol 136. No. 12. Pp 1341 - 1346. December

Surrounding land uses: Habitat quality is also expanded by reducing the pressure on natural areas from surrounding land uses. Thus, increasing contiguous habitat is considered more valuable than creating an island of habitat in the midst of a highly urbanized area. Further, eliminating impervious cover and intensive urban use on a parcel that is surrounded by otherwise natural vegetation would be more valuable than eliminating coverage in the middle of a subdivision.

Floodplain connectivity: Reducing the need to protect structures in riparian and wetland areas from flooding increases the opportunity to restore streams and SEZs. This increased flexibility allows for restoration projects to be implemented in critical areas that can increase stream to floodplain connectivity, which increases overall riparian and habitat function and improves water quality.

LIVABLE COMMUNITY SENSITIVITY ANALYSIS RESULTS

The Livable Communities policy objective is related to the community character, economic vitality and quality of life for Tahoe Basin communities. Livable communities are primarily driven by the efficient use of land, diverse land uses, and place based design. Other drivers of community vibrancy include the economic vitality of commercial areas, and appropriate mix of housing and mobility options. The results of the site design sensitivity analyses are summarized below and identify the key factors related to how impervious land coverage and coverage policies influence the Livable Community policy objective.

The relative impact of site design on land use efficiency, native vegetation and active transportation are presented in Figures 5, 6 and 8 below. The sensitivity analysis is based on a combination of site design illustrations and pro forma analysis using six different development and restoration project scenarios; the development scenarios included redevelopment and development of vacant lots for multi-acre projects. The red bars in all three figures reflect the potential negative impact on the output measure and black bars reflect the potential positive impact.

The pro formas and site design illustrations are based on the demonstration projects developed as part of the Tahoe Redevelopment Case Study: Feasibility Analysis commissioned by TRPA and vetted by more than 30 stakeholders. Site design illustrations for the two demonstration projects are presented in Figure 4 below.

KINGS BEACH CASE STUDY DEMONSTRATION PROJECT



SOUTH LAKE TAHOE CASE STUDY DEMONSTRATION PROJECT



Figure 4: Site design illustrations of demonstration projects used in pro forma and site design illustration analysis.

Land Use Efficiency

Land use efficiency is strongly affected by the factors shown in Figure 5 and described below. The sensitivity analysis is based on pro formas with unique project designs that represent economically viable projects. These project designs include two and three story structures so changes to Floor-Area-Ratio (FAR) are not linear.

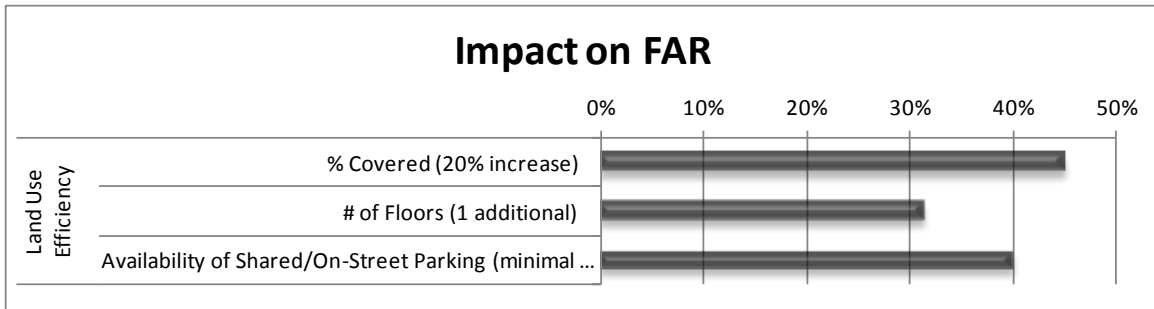


Figure 5: Potential site design impacts on land use efficiency measured by Floor-Area-Ratio (FAR).

Percent of Site Covered: The percent of site covered factor represents the scenario in which projects can cover up to 70% of the site for commercial, tourist and multi-residential projects. The ability to cover 70% of a site as opposed to 50% can increase FAR, which is measured by dividing the total floor area by the total area of the parcel, by as much as 45% (2 and 3 story buildings used in pro forma project design) because floor area can increase at a greater rate than coverage area for buildings with multiple floors.

Number of Floors: The number of floors factor represents the scenario in which projects can add additional floors without exceeding maximum height limitation. The ability to add one additional floor can increase FAR by as much as 31% per additional floor because most commercial buildings have at least two floors and each additional floor can significantly increase FAR. However, additional coverage is necessary to fulfill increased parking requirements and in order to keep the percent covered the same for comparing sensitivity results the site must be larger which offsets some of the increase in FAR from adding an additional floor.

Availability of Shared or On-Street Parking: The availability of shared or on-street parking factor represents the scenario in which projects can leverage shared and/or on-street parking to fulfill parking requirements as opposed to being required to build parking onsite as currently mandated by local code. The ability to use shared and/or on-street parking to fulfill most parking needs can increase FAR by as much as 40% for a specific project site because it allows coverage on each site to be economically more productive while shared and on-street parking is used by multiple commercial and residential facilities. The use of shared/on-street parking will increase FAR in the general area because a diversity of uses leveraging shared parking will reduce net parking requirements in the area. Additional coverage and wider roads are required for shared parking garages and on-street parking. This additional coverage may or may not directly impact the FAR of a specific site but will increase the coverage, which will partially offset the increase in FAR in the general area.

Native Vegetation

Native vegetation is strongly affected by the factors in Figure 6.

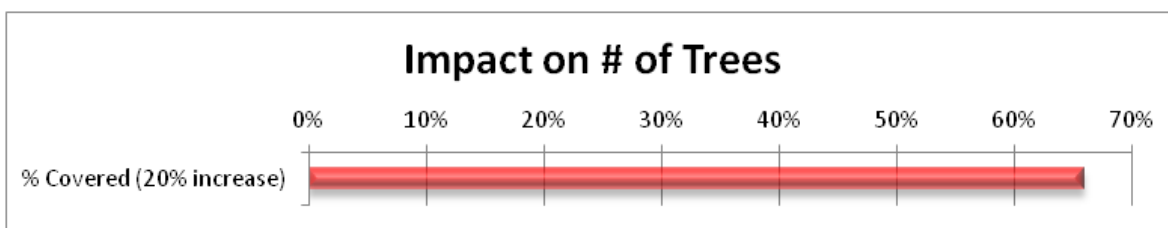


Figure 6: Potential site design impacts on native vegetation measured by # of Trees. Red bars indicate reduction in # of trees.

Percent of Site Covered: The percent of site covered factor represents the scenario in which projects can cover up to 70% of the site for commercial, tourist and multi-residential projects. The ability to cover 70% of a site as opposed to 50% may decrease the native vegetation, which is

measured by the number of trees, by as much as 66% because native vegetation requires naturally functioning soils and a buffer from pervious and impervious coverage. The site specific changes that generate the 66% decrease in native vegetation for the South Lake Tahoe demonstration project are presented in Figure 7 below.

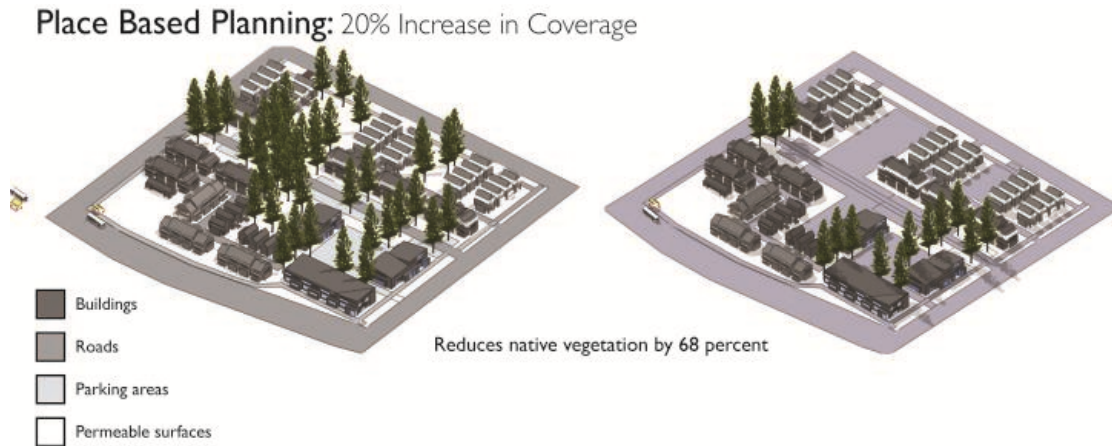


Figure 7: Before and after illustrations of South Lake Tahoe demonstration project depicting impact on native vegetation of increasing coverage by 20%.

Active Transportation

Active transportation is strongly affected by the following factors:

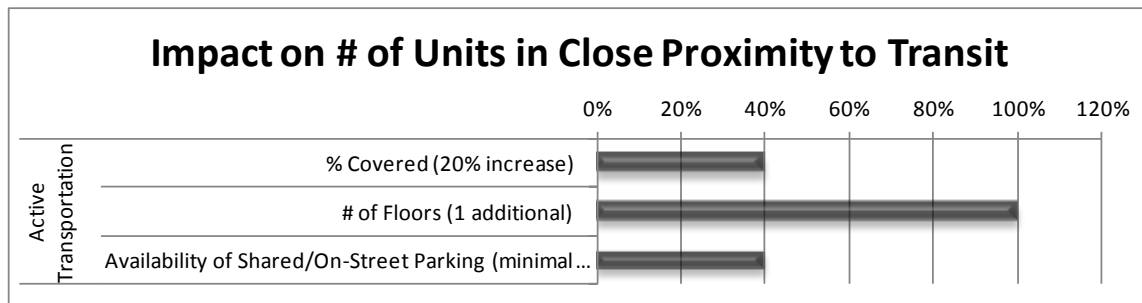


Figure 8: Potential site design impacts on active transportation measured by # of Units in Close Proximity to Transit.

Percent of Site Covered: The percent of site covered factor represents the scenario in which projects can cover up to 70% of the site for commercial, tourist and multi-residential projects. The ability to cover 70% of a site as opposed to 50% can increase the number of units in close proximity to transit by as much as 40% (2 and 3 story buildings used in pro forma project design) because floor area can increase at a greater rate than coverage area for buildings with multiple floors.

Number of Floors: The number of floors factor represents the scenario in which projects can add additional floors without exceeding maximum height limitation. The ability to add one additional floor can increase the number of units in close proximity to transit by as much as 100% per additional floor because mixed use buildings often have commercial uses on the first floor and residential or tourist accommodations on the other floors.

Availability of Shared or On-Street Parking: The availability of shared or on-street parking factor represents the scenario in which projects can leverage shared and/or on-street parking to fulfill parking requirements as opposed to being required to build parking onsite as currently mandated by local code. The ability to use shared and/or on-street parking to fulfill most parking needs can increase the number of units in close proximity to transit by as much as 40% because it

allows coverage on each site to be used for economic productive uses and shared and on-street parking to be used more efficiently by multiple commercial and residential facilities. However, additional coverage and wider roads are required for shared parking garages and on-street parking. This additional coverage may or may not directly impact the number of units on a specific site but will increase the coverage and decrease the number of unites in the general area.

PROJECT ENABLEMENT SENSITIVITY ANALYSIS RESULTS

The Project Enablement policy objective represents the desire to enable private and public, and residential and commercial projects necessary to achieve the other environmental and socio-economic policy objectives. Enabling a broad range of private and public projects, both restoration and development, requires projects to be financially feasible by reducing transaction costs and allowing flexibility in project designs. Transaction costs include direct costs such as the coverage price and mitigation costs, as well as indirect costs such as the time and consulting fees required to understand the coverage policy and confidently perform a coverage transaction. The results of the direct cost, indirect cost and project flexibility sensitivity analyses summarized below identify the key factors related to how coverage policies influence the Project Enablement policy objective.

The relative impacts different direct and indirect costs have on project feasibility are presented in Figure 7. The sensitivity analysis is based on pro forma analysis using six different development and restoration projects; the development scenarios included redevelopment and development of vacant lots for multi-acre projects. The red bars in Figure 7 reflect the potential negative impact on total project costs and black bars reflect the potential positive impact on project costs.

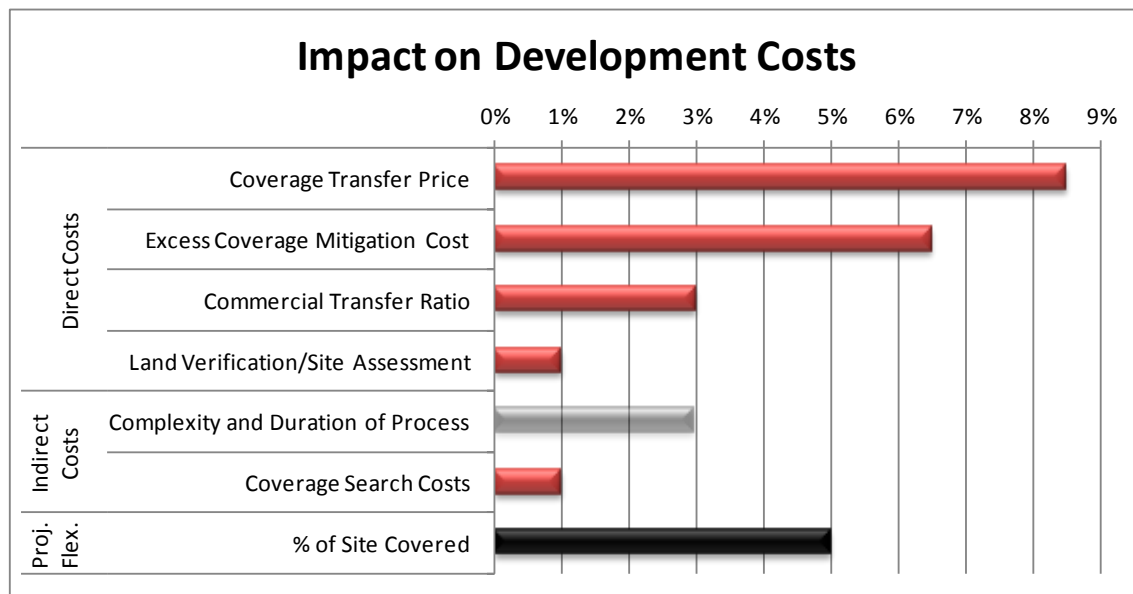


Figure 9: Potential coverage policy direct and indirect costs on total project costs. Red bars indicate increased costs, black indicates increased project value.

Figure 9 shows that several factors can individually have a significant impact on total project costs. This study considered any factor that impacts project costs by 3% or more as significant.

Direct Costs

Direct costs are strongly affected by the following factors:

Excess Coverage Mitigation Cost: The excess coverage mitigation (ECM) obligation for a redevelopment project with more coverage than allowed can be a significant barrier to redevelopment projects that generate environmental and community benefits. The ECM obligation can be fulfilled through several options, however the ECM in-lieu fee is the primary

option selected and the other options cost relatively the same as the ECM in-lieu fee to the project proponent. The ECM in-lieu fee can be as much as 6.5% of the total project costs, which is based on an ECM in-lieu fee of \$50/ft² of excess coverage. The ECM fee has never been as high as \$50/ft², however \$50/ft² is the actual cost to retire coverage in some HRAs under current policies.

Coverage Transfer Price: The cost of transferring coverage for a redevelopment or development project that requires more coverage than the base allowable coverage can be a significant barrier to projects that generate environmental and community benefits. There are examples of the coverage transfer price as high as \$100/ft² of coverage,³ however for this analyses the maximum coverage transfer price input into the model was \$50/ft² of coverage. The coverage transfer price can be as much as 8.5% of the total project costs.

Commercial Transfer Ratio: The cost of the commercial transfer ratio represents the added cost to transfer coverage needed to cover beyond 50% of the total project site. When transferring coverage needed to coverage between 50-70% of the total project site, a sliding scale retirement ratio is applied. The added cost of the retirement ratio can be as much as 3% of the total project cost.

Indirect Costs

Complexity and Duration of Process: The complexity and duration of operational processes represents scenarios in which redevelopment projects are delayed up to two years due to land capability verification and site assessment disputes. Carrying costs of early investment are likely to be less than 1% of the total project costs, however the opportunity cost of lost revenue can have up to a 3% impact on total project costs. The bar representing the potential project costs created by operational complexity and duration of operational processes in Figure 9 is partially transparent to reflect opportunity cost as opposed to real cost.

Project Flexibility

Percent of Site Covered: The percent of site covered factor represents the scenario in which projects can cover up to 70% of the site for commercial, tourist and multi-residential projects. The ability to cover 70% of a site as opposed to 50% can reduce total project costs by as much as 5% because lower land acquisition costs are necessary to develop the project and more economically productive structures can be placed on a parcel.

ADMINISTRATIVE VIABILITY SENSITIVITY ANALYSIS RESULTS

Administrative viability is not an objective for implementing coverage policies, but rather a necessary factor for success of the coverage policies. The more difficult a coverage policy is to consistently and cost-effectively implement, the less likely the policy is to achieve the environmental and socio-economic objectives of the coverage policies. Policies that cannot be reasonably administered either result in delays (costs to others) or lack of implementation and enforcement. While a policy may seem valuable it must also be practical, especially given tightening of agency general fund budgets or it should be reconsidered.

Administrative Viability is primarily driven by administrative costs and policy effectiveness. The results of the administrative costs and policy effectiveness sensitivity analyses summarized below identify the key factors related to how impervious land coverage and coverage policies influence the Administrative policy objective.

An estimated 12.33 Full Time Employee(FTE) is currently required basin-wide to administer the coverage policies and perform related operational processes, including operating both land banks and permitting projects with changes in coverage by local jurisdictions. The relative impacts of factors that influence

³ Provided by Bruce Eisner during phone conversation on February 13, 2012.

Administrative Viability are presented in Figure 10 below. The red bars reflect factors directly influenced by the policy and operational processes, and the black bars reflect factors influenced by transaction volumes.

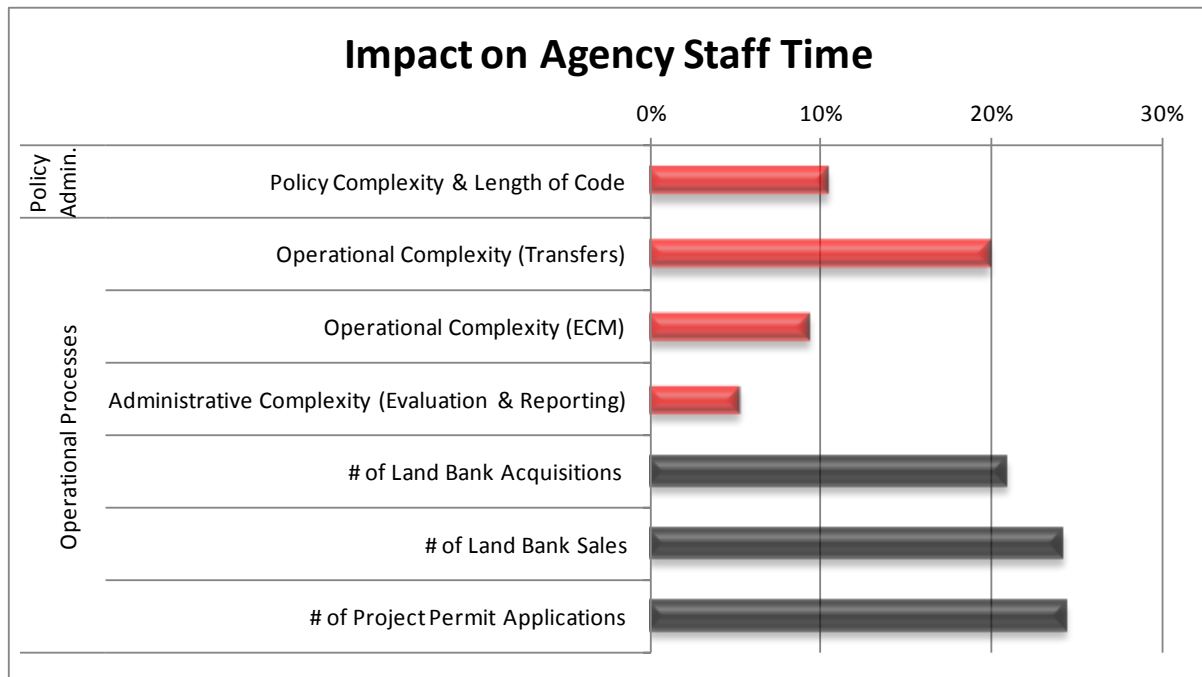


Figure 10: Factors that influence administrative costs and improve policy effectiveness. Red bars reflect policy and operational factors, black indicates transaction volumes.

Policy Administration

Policy administration is strongly affected by the following factors:

Policy Complexity & Length of Code: The complexity and length of the body of policy that guides the use of impervious land coverage has a significant impact on the effort required by agency staff to administer the coverage policies and perform operational processes. Significant agency staff time is required to ensure the large body of complex policy is interpreted correctly, implemented consistently, communicated accurately and understood by other parties. Reducing complexity by minimizing subjectivity in the policy can significantly reduce administrative costs. A clean, short and mechanical body of policy could reduce administrative costs by as much as 11%. This analysis does not include the impact the policy complexity and length has on training costs for new staff administrating the coverage policies and operational processes, which is significant for each transition.

Operational Processes

Operational processes are strongly affected by the following factors:

Coverage Transfer Complexity: The complexity of coverage transfer processes such as verifying land capability, determining the amount of existing soft coverage and finding willing buyers and sellers has a significant impact on the effort required by agency staff to administer the coverage policies and perform operational processes. Providing standard, objective and automated tools, and minimizing market fragmentation could reduce administrative costs by as much as 20%.

Excess Coverage Mitigation Complexity: The complexity of excess coverage mitigation processes such as verifying land capability, determining the amount of existing soft coverage and finding willing buyers and sellers has a significant impact on the effort required by agency staff to administer the coverage policies and perform operational processes. Providing standard,

objective and automated tools and minimizing market fragmentation could reduce administrative costs by as much as 10%. Currently land banks expend significant overhead to perform several small transactions due to the HRA coverage transfer and excess coverage mitigation restrictions, as opposed to fewer, larger transactions if those restrictions did not exist.

Administrative Complexity: The complexity of administrative processes such as evaluating and reporting policy effectiveness, and managing excess coverage mitigation liabilities has a significant impact on the effort required by agency staff to administer the coverage policies and perform operational processes. A lack of accessible and accurate data, and standard data management protocols are primary drivers of the complexity currently required of administrative processes. Standardized tools, accessible and accurate data, and minimizing market fragmentation could reduce administrative costs by as much as 6%.

Transaction volumes: The volume of coverage related transactions directly impacts the effort required by agency staff to administer the coverage policies and perform operational processes. Reducing transaction volumes for land bank acquisitions, land bank sales and project permitting by 25% can reduce administrative costs by nearly the same amount. Land bank acquisitions require substantial effort; acquiring *potential coverage* requires 7-8% of a person year (PY) and fee simple property acquisition requires 14-15% PY annually. Reducing land bank acquisitions would have a significantly greater impact if land banks were effectively mitigating excess coverage in all nine HRAs as opposed to today's one to two transactions across all nine HRAs per year. An active and liquid coverage market can increase coverage restoration and redevelopment, resulting in environmental and community benefits. Thus, reducing overall transaction volumes is likely not an effective strategy to achieve the policy objectives, however reducing the number of transactions with a public agency as a party may be effective.

Key Terms

Potential coverage – The coverage allowed as base coverage in TRPA Code of Ordinances Chapter 20 but which does not physically exist.

FINDINGS

This study's findings informed the identification, construction and evaluation of recommended policy changes. The findings are synthesized from (1) stakeholder interviews and group discussions, (2) an analysis of existing coverage policies, operations and accomplishments, (3) a literature review that revealed success factors for transferable development rights, (4) a sensitivity analysis that identified the relative impact of key factors on each policy objective, and (5) an evaluation of policy alternatives.

Table 5 lists all of the findings, and links several findings with the most frequently shared needs for change by stakeholders. Each finding is described with supporting data and rationale after the table. All needs for change collected through stakeholder interviews are presented in Appendix III: Stakeholder Engagement. The findings related to sensitivity analyses for each objective are presented in the previous section.

Table 5: Summary of findings with related needs for change.

	FINDING	NEEDS FOR CHANGE
1	Coverage restrictions are an effective means of limiting the impact of development on water quality, and riparian and habitat function	<ul style="list-style-type: none"> ▪ Policies do not reflect recent science, and coverage is only indirectly linked to widely-held environmental issues
2	Restoration of coverage on sensitive lands and over-covered parcels needs to be accelerated to advance basin objectives	<ul style="list-style-type: none"> ▪ Policies do not sufficiently incentivize restoration of sensitive lands ▪ Land owners of over-covered parcels and coverage on sensitive lands are often reluctant to sell at market prices
3	Excess coverage mitigation policies need to be adjusted to more effectively contribute to coverage policy objectives	<ul style="list-style-type: none"> ▪ ECM fee structure does not cover the cost of retiring coverage ▪ HRA restriction for ECM, the foot for foot mitigation requirement and ECM fee levels limit the ability to use ECM funds
4	Coverage policies should be enhanced to incentivize redevelopment and innovative low-impact project design solutions	<ul style="list-style-type: none"> ▪ Policies do not incentivize compact and infill development or innovative designs ▪ Policies create costs that can make beneficial redevelopment infeasible ▪ HRA restriction inhibits beneficial projects from finding needed coverage
5	Coverage policies and operational processes are complicated, confusing and cause barriers to meeting basin-wide objectives	<ul style="list-style-type: none"> ▪ Policies are over-complicated, navigating processes requires consultants for residential projects and significant resources for commercial and public benefit projects ▪ Processes are subjective and tools are not standardized, resulting in uncertainty and lengthy processes that can inhibit beneficial projects
6	Complicated and subjective coverage policies, insufficient data, and a lack of tools create significant administrative burden for agencies and limit the ability to improve policy effectiveness	<ul style="list-style-type: none"> ▪ Insufficient data and reporting limits policy effectiveness and adaptive management ▪ Subjective and lengthy administrative processes require significant administrative time and resources ▪ Policies still using 1974 soil survey (land capability map) as opposed to updated 2007 soil survey
7	Restoration requirements associated with new coverage on sensitive lands increases the cost of projects with multiple public benefits	<ul style="list-style-type: none"> ▪ Policies create costs that make public benefit projects infeasible
8	The price of coverage and ECM fees creates a tension between the value of restoration and redevelopment projects	<ul style="list-style-type: none"> ▪ Policies do not incentivize compact and infill development or innovative design solutions
9	Coverage distribution is uneven across municipalities showing certain municipalities with a net excess of coverage	<ul style="list-style-type: none"> ▪ N/A – Data analysis finding

10	Stormwater treatment, coverage removal and private property BMP implementation are complementary and needed to achieve policy objectives	<ul style="list-style-type: none"> Stormwater treatment technology is less expensive and replaces the need for coverage restrictions
11	Concentrating development and limiting the development footprint has the potential to reduce per capita and basin-wide environmental impact	<ul style="list-style-type: none"> Policies do not incentivize compact and infill development or innovative design solutions
12	Removing HRA restrictions for transfers of coverage without site-specific considerations for transfers will enable projects and reduce administrative burden, but may result in negative water quality impacts under certain scenarios	<ul style="list-style-type: none"> HRA restrictions create market inefficiencies and inhibit beneficial projects
13	Coverage used for commercial and residential parking is significant and can be used much more efficiently	<ul style="list-style-type: none"> Policies do not incentivize compact and infill development or innovative design solutions Land owners of over-covered parcels and coverage on sensitive lands are often reluctant to sell at market prices

Data sets used in the findings below are summarized in Appendix VI: Coverage Data Summary.

1) Coverage restrictions are an effective means of limiting the impact of development on water quality, riparian and habitat function

Several stakeholders suggested that coverage restrictions are outdated and ineffective at protecting the environment. This is contradictory to current best practices in the field of stormwater management and the analytical results from this study. In fact, “the lot-scale approach to managing imperviousness and stormwater quality is standard operating procedure across the country.”⁴

Literature Overview

There is a wealth of literature related to the impact of impervious surface coverage on water quality and stream quality. The Center for Watershed Protection performed a comprehensive review of this topic in Impacts of Impervious Cover on Aquatic Systems⁵ that provides evidence for coverage impact on water quality and stream quality. Impacts include:

- Increased runoff volume and peak discharge rate
- Decreased base flow in small streams
- Increased stream bank erosion and decreased bank stability
- Increased total suspended solid (sediment) and nutrient concentrations

The TRPA BMP Handbook states⁶

Rates and volumes of runoff are affected by urbanization through multiple mechanisms, but the most important of these are: 1) the conversion of vegetated or pervious surfaces to impervious surfaces such as roofs and pavement; and 2) the development of efficient drainage systems that connect these impervious surfaces to streams and other water bodies, thus increasing the rate of runoff and eliminating storage and infiltration that occurs along natural drainage paths.

Additional support for the impact of impervious coverage on water quality is provided in the discussion supporting the Incentive Index Developed to Evaluate Storm-Water Low-Impact Designs⁷ which cites a

⁴ Jacob, John S. 2011. Stormwater. Watersheds, Walkability, and Stormwater. Stormwater. January/February 2011. Col. 12, No. 1. Pages 32 to 40. Quote from page 34.

⁵ Center for Watershed Protection. 2003. Watershed Protection Research Monograph No.1: Impacts of Impervious Cover on Aquatic Systems.

⁶ TRPA BMP Handbook – Final Draft. June 2011. Downloaded from www.tahoebmp.org. Page 1-4.

⁷ Guo, et. al. 2010. Incentive Index Developed to Evaluate Storm-Water Low-Impact Designs. American Society of Civil Engineering, Journal of Environmental Engineering. Vol 136. No. 12. Pp 1341 - 1346. December.

number of additional studies supporting this conclusion. These references build a case for looking at coverage not on a simple area basis, but determining the “effective coverage” of surfaces considering effectiveness of low impact development approaches that increase infiltration and reduce the runoff from impervious surfaces.

Tahoe Coverage Context

Impervious surface coverage policies and vacant lot retirement programs are two fundamental and effective approaches that have restricted the impact of development on Lake Tahoe clarity and other natural functions. Specific accomplishments of the coverage policies include:

- Served a notable role in enabling adoption of the 1987 Regional Plan and the environmentally protective land use policies therein.
- Effectively reduced the pace of environmental impact from development that occurred in the 1960s, 70s and early 80s.
- Limited encroachment on stream environment zones (SEZs) and limited development on low capability lands.
- Mitigated more than 28 acres of excess coverage using in-lieu fees, primarily through retirement of potential coverage.
- Enabled on average 82 projects annually through land bank transfers which likely installed BMPs on parcels previously without BMPs.

The complete elimination of coverage restrictions would require the creation of a new body of policy to ensure environmental protection. This would be technically and politically complex and no alternative approach has been identified that holds promise to significantly improve the ability to achieve policy objectives.

Summary

Coverage restrictions are an effective means of limiting the impact of development on water quality, riparian and habitat function. Coverage and the concept of effective coverage are being used more frequently in stormwater permits throughout the country. Improvement in the alignment between development restrictions and environmental impact can be achieved by modifying the current coverage policies, as per this study’s recommendations. Modifying the current coverage policies will avoid the need for major policy change and the associated political and scientific uncertainty.

2) Restoration of coverage on sensitive lands and over-covered parcels needs to be accelerated to advance basin objectives

Several stakeholders pointed out that significant restoration of land capability class 1B lands is needed to achieve the Soil Conservation-1 threshold, and suggested that policies do motivate land owners to restore and transfer coverage from sensitive lands.

Policy Overview

The coverage policies effectively reduced the pace of environmental impact compared to development that occurred prior to the adoption of the 1987 Regional Plan. These policies limited encroachment on stream environment zones and development on sensitive lands. However, the Land Coverage threshold is currently out of attainment for 4 out of the 9 land capability classes, 3 of which are considered “sensitive lands.” Land capability class 1B is the most sensitive and fragile soil type, and is more over-covered relative to the threshold target than any other land capability class.

TRPA’s 2006 Threshold Evaluation reported 1,211 acres of land capability class 1B lands are covered in the basin, which equates to 4.3% of the total acres of 1B lands. Existing coverage presented in the 2006 Threshold Evaluation did not include soft coverage so the 1B deficit is more severe than reported. The

Soil Conservation *threshold indicator standard* (standard) for 1B lands is 1% or 280 acres, so more than 931 acres of coverage on 1B lands needs to be restored to achieve the threshold standard for 1B lands.

Restoring existing coverage on sensitive lands is a very effective strategy to improve water quality and riparian and habitat function since 1) the sites are unlikely to have BMPs installed, and 2) many opportunities exist to restore parcels adjacent to fully functioning and highly valuable habitat.

Key Terms

Threshold indicator standard (standard): A numeric target related to an indicator that defines successful achievement of a desired condition.

Data Analysis

The total 1B coverage associated to developed parcels (non-roads) is approximately 714 acres with the remaining 1B coverage primarily consisting of roads⁸. Thus, achieving the 1B Threshold would require removal of coverage from the majority of roads, commercial areas and residences on 1B soils types.

Several of the primary commercial and transportation hubs in the basin have significant impervious coverage on 1B lands as presented in Table 6 below. Many of the proposed Regional Plan Update changes are intended to incentivize redevelopment and further concentration of development in these existing commercial areas. There are many transit, community and economic benefits of dense development in existing commercial areas. However, redevelopment in these commercial areas will increase the commercial viability of and community reliance on the coverage in these areas, creating a greater impediment to removing a significant amount of coverage from these areas in the relevant future. While some incremental reduction in coverage is expected as over covered parcels in existing commercial areas are redeveloped, the reduction in coverage is not expected to approach the 931 acres of coverage removal needed to achieve the 1B Threshold standard.

Table 6: Plan Area Statements with significant land capability 1B coverage.

PLAN AREA STATEMENT	PARCEL 1B COVERAGE (ACRES)
Tahoe Keys	93
SLT Airport	78
Lake Side Park (Stateline)	66
South "Y"	45
Tahoe Island (Near Y)	42
Tahoe City	37
Tahoe Valley/Verde	36
Washoe Meadows (Meyers)	24
Bijou/Al Tahoe	17
Kings Beach Commercial	17
Bijou/Ski Run Blvd.	16
Pioneer/East Ski Run Blvd.	15
Lake Forest Glen	15
Glenwood/SW Ski Run Blvd.	15
Oliver Park/Kalye Dr.	13
Fallen Leaf North	13
SLT Industrial Tract	11
Meyers Commercial	11
TOTAL	561

⁸ Data sources and analysis method are described in Appendix VI: Coverage Data Summary.

Summary

Sensitive lands, in particular land capability class 1B lands, in the Tahoe Basin are significantly over-covered when compared to the existing Threshold. Achievement of the 1B Threshold would require restoring coverage in the majority of the primary commercial nodes, high and low density residential areas on 1B soils, and roads on 1B soils. However, restoring all of these covered areas is unlikely, so achieving the 1B Threshold standard is unattainable from a practical perspective. Current policies and this study's recommendations have the potential to incrementally reduce the coverage on sensitive lands and significantly improve water quality.

3) Excess coverage mitigation policies need to be adjusted to more effectively contribute to coverage policy objectives

Stakeholders shared frustration that the ECM in-lieu fee program is not providing the environmental benefit originally expected.

Policy Overview

The ECM coverage policies were designed to mitigate the coverage in excess of the maximum allowed coverage on existing developed parcels. Land owners of these over-covered parcels are required to mitigate a portion of the excess coverage in order to gain approval of a new project permit. The portion of excess coverage that must be mitigated is determined using a complex equation based on the project costs allocated to structural changes. Mitigation can be achieved through one of several methods including on-site coverage reduction, off-site coverage reduction and paying an in-lieu fee. ECM in-lieu fees are collected on a square foot of coverage basis. The land banks, CTC for California and NDSL for Nevada portions of the basin, are responsible for mitigating one square foot of coverage for each square foot of fee collected. Land banks are also required to acquire coverage from within the same HRA from which the fees were collected. A summary of the ECM coverage policies is provided in Appendix I: Existing Policy Summary.

Since the ECM coverage policies were enacted more than two decades ago, the ECM in-lieu fees have been used to retire approximately 28 acres of coverage. However, ECM in-lieu fees have been primarily used to retire potential coverage which does not provide an immediate environmental benefit. In addition, the land banks have increasingly had difficulty retiring coverage using the ECM in-lieu fees which is demonstrated by the more than \$3.5 million in ECM in-lieu fees collected that the land banks have been unable to use to retire coverage as of 2011. The \$3.5 million in ECM in-lieu fees collected requires approximately 15 acres of coverage to be mitigated.

ECM In-lieu Fee Utilization Analysis

Our analysis concludes the HRA restriction limits the land banks ability to use in-lieu fees by:

- Creating nine isolated geographical markets, several of which contain limited transaction opportunity sets that result in supply constraints in multiple HRAs. Land banks are unable to find coverage in several HRAs to mitigate at the current fee levels, which range from \$8.50 to \$25 for each square foot depending on the HRA. The market price of coverage is as high as \$100 per sq. ft. in some HRAs.⁹
- Requiring land banks to expend significant resources searching for coverage supply in HRAs with limited supply and minimal coverage pricing information, as opposed to using those resources to acquire and retire coverage.
- Restricting the ability to concentrate available resources on large and effective transactions. This limits the potential coverage opportunities to small projects which do not benefit from economies

⁹ Provided by Bruce Eisner during phone conversation on February 13, 2012.

of scale. The administrative cost of locating, negotiating and acquiring many small coverage transfers is much higher than the cost of executing fewer larger transactions. Further, larger projects can be strategically targeted to sites with greater environmental benefit, including sensitive lands adjacent to functioning riparian areas and commercial properties that, in general, can result in greater water quality improvement.

In addition, our analysis concludes that the actual cost of coverage is on average greater than the current ECM in-lieu fee in most HRAs. The actual cost to retire hard or soft coverage, including land acquisition and coverage restoration, ranges between \$25/ft² and \$60/ft² based on recent land bank transactions and pro forma analyses. There are instances of land banks finding below market opportunities such as acquisitions matched by donations, however, these opportunities are more and more rare and cannot be expected to address ongoing coverage mitigation needs.

Policy Alternative Analysis

Several policy alternatives were analyzed to address the issues identified:

- Increasing excess coverage mitigation in-lieu fees to the market price of coverage in each HRA would increase the ability to actually mitigate coverage. This, however, would result in a significant financial burden on redevelopment projects that could limit or eliminate opportunities for redevelopment in HRAs with high coverage prices. At a price of \$100 per square foot the excess coverage mitigation costs can be greater than 10% of total project cost. As described in the Finding #4, restricting redevelopment forgoes benefits to water quality and riparian and habitat function related to both having the benefits on redevelopment site from meeting water quality standards, and from restoration of coverage offsite using the ECM in-lieu fees collected. Thus, keeping a reasonable excess coverage mitigation price should keep the price from inhibiting viable redevelopment projects.
- Removing the fixed square foot for square foot requirement for the use of ECM in-lieu fees collected would allow land banks to target high value mitigation projects and create a larger transaction opportunity set. However, some system of accountability is necessary to ensure the nexus between the coverage impact and the use of in-lieu fees collected. Further, the HRA restriction will continue to create significant search and inflated coverage market prices.
- Removing the HRA restrictions for the use of excess coverage mitigation in-lieu fees would allow in-lieu fee prices to be sufficiently low basin-wide that they do not significantly increase the costs of redevelopment projects, thus enabling redevelopment to reduce the impact of the most impactful over-covered commercial sites. Further, land banks will be able to pool fees collected and leverage economies of scale to use resources more efficiently and focus ECM fees to strategically restore coverage that provides the most environmental benefit, as opposed to search extensively for coverage in each HRA and retire the lowest cost coverage available in each HRA.

Property title can be the largest portion of the cost to retire coverage. Using ECM funds to acquire coverage without property title will reduce the square foot ECM fee levels required. Since the land banks were developed, NDSL has acquired more coverage without property title while CTC has acquired more coverage with property title. Only acquiring coverage without property title may limit the opportunity set for the land banks; however other funding sources that would benefit from public ownership of the land could be used to fund the property title portion of the coverage acquisition cost.

Summary

Fractionating ECM in-lieu fees collected into nine isolated geographical markets and ECM in-lieu fees lower than actual coverage retirement costs inhibit land banks from effectively mitigating excess coverage.

4) Coverage policies should be enhanced to incentivize redevelopment and innovative low-impact project design solutions

Stakeholders emphasized coverage policies are a barrier to redevelopment and innovative low-impact project design solutions that provide water quality and community benefits.

Tahoe Context

The Lake Tahoe Total Maximum Daily Load (TMDL) identifies urban stormwater as the largest source (72%) of fine sediment deposition into Lake Tahoe and over-covered parcels lacking BMPs are a major contributor. Most of the coverage in the basin (approximately 2/3rds of the parcels) was developed before the 1980's, when BMPs were required and coverage restrictions were adopted. As identified in the water quality sensitivity analysis discussion, redeveloping over-covered parcels that lack proper BMPs and installing BMPs required under today's regulations can make significant contributions towards TMDL pollutant reduction goals. Redeveloping Town Centers also improves community character and increases active transportation and mobility options, which support the Livable Community policy objective.

Low Impact Development and Site Considerations Influence Coverage Impact

There is a major push in California and the rest of the country to use Low Impact Development (LID) to minimize water quality impacts for both hydrologic modification and water quality. This trend comes from the finding that strategic placement of on-site controls is capable of significantly reducing the amount of runoff and delaying the timing of runoff to approach pre-development hydrology¹⁰. With these hydrologic benefits come water quality benefits.

The water quality and riparian and habitat function sensitivity analyses describe how the same amount of runoff and loading from a site can have different impacts on water quality, riparian and habitat function. For instance, runoff that is routed to the bottom of an urban catchment and into a surface waterbody has a significantly greater impact than runoff that infiltrates into the surrounding landscape.

The combination of these factors indicates that the same amount of coverage, even on similar land capability types, does not result in an equivalent amount of impact. This is not reflected in the current coverage policies which treat all coverage on similar land capability types as equal.

Water Quality and Riparian & Habitat Function Analysis Results

TRPA policy requires new development and redevelopment to implement BMPs to treat the 20-year 1-hour storm. By meeting this requirement, both new development and redevelopment contribute significantly less loading and runoff than development that does not meet these requirements. Using the data presented in the water quality sensitivity analysis discussion above shows:

- Converting 1 acre of Commercial without BMPs to 1 acre of Commercial meeting BMP requirements results in a 1.6 acre-feet per year reduction in annual average runoff (71%) and a 915 pound per year reduction in annual average Fine Sediment Particles (FSP) loading (80%).
- Converting 1 acre of Multi-Family Residential (MFR) without BMPs to 1 acre of MFR meeting BMP requirements results in a 0.7 acre-feet per year reduction in annual average runoff (70%) and a 205 pound per year reduction in annual average FSP loading (89%).

This predicted FSP load reduction from the 1 acre of Commercial/Industrial/Communications/Utilities (CICU) is equivalent to approximately four Lake Clarity Credits. This is a meaningful amount of progress toward the 15 year Clarity Challenge target for any of the municipalities. For comparison, this would constitute approximately 2% of the City of South Lake Tahoe's 5-year credit target (assuming the catchment connectivity for the urban catchment was 100%). While redevelopment alone is unlikely to

¹⁰ Guo, et. al. 2010. Incentive Index Developed to Evaluate Storm-Water Low-Impact Designs. American Society of Civil Engineering, Journal of Environmental Engineering. Vol 136. No. 12. Pp 1341 - 1346. December.

lead to meeting the lake clarity goals, it can have a meaningful contribution and is likely to be primarily privately funded.

Beyond the direct water quality improvement, increased infiltration can contribute to improvements to the hydrologic function of the watershed, increase the resiliency of riparian habitat and improve stream conditions.

Further, transfers of coverage and the use of excess coverage mitigation in-lieu fees for commercial redevelopment are expected to result in removal of coverage from parcels that do not have BMPs. A great majority of transfers are expected to be from sending sites that do not meet current private property BMP requirements. The average percent of water quality BMP certifications for different development types is 30 percent, showing that a minority of properties in the basin do meet current BMP requirements. Further, cost effective sending sites for coverage transfers are expected to have low current economic value. New homes and properties that have received sufficient re-investment to meet current BMP requirements are expected to have relatively high economic value compared to older structures that have not been upgraded.

Lack of Incentives for Redevelopment

Current coverage policies impose greater costs on redevelopment projects compared to vacant parcel development. The cost to transfer coverage can have a slightly greater impact on development costs than ECM costs; however, redevelopment can only develop up to 50% of a parcel for commercial use while vacant lots can be developed up to 70%, this significantly decreases the economic productivity of redevelopment projects. As there is no material incentive for redevelopment over developing vacant parcels, new environmental impacts are imposed instead of redevelopment that provides environmental benefits.

Summary

Redevelopment that meets the requirements to treat the 20-year 1-hour storm can meaningfully improve water quality and riparian and habitat function. Thus, coverage policies should ensure they do not impose a material impact on the redevelopment of the built infrastructure in the basin. Further, the impact of coverage on water quality, riparian and habitat function is sensitive to the surrounding landscape characteristics that should be considered in the coverage policies as possible.

5) Coverage policies and operational processes are complicated, confusing and cause barriers to meeting basin-wide objectives

Stakeholders overwhelmingly described the coverage policy as complicated and operational processes as a greater barrier to beneficial public and private sector projects than the direct costs imposed by the coverage policy.

Policy Complexity

The coverage related Code and project review processes require significant time to confidently understand and successfully navigate. The body of policy related to coverage is vast. Two chapters (30 and 53) of TRPA's Code of Ordinances effective March 1, 2012 are dedicated to impervious land coverage and total a combined 68 pages. Impervious land coverage policies can be found in other chapters of the Code and these policies are in addition to the normal permissible use and project design policies that project proponents must understand and navigate to receive approval for a project. Further, several Memorandums of Understanding (MOUs) and internal policy documents used by TRPA and the land banks guide the coverage policies.

Coverage Policy Tools Analysis

There is a lack of standardized tools and operational processes contain subjective elements that create significant costs for project proponents. For example, project proponents are required to provide a coverage table to document existing coverage, proposed coverage and coverage transfer or excess coverage mitigation needs for a proposed project. Different planners require the use of different Excel tables and using Excel tables created by others can create a sizable and frustrating learning curve. Further, there is no system for willing buyers and sellers of coverage to find each other. Land banks carry inventories of coverage; however, land banks only carry coverage for some land capabilities in some HRAs, and often land bank inventories are insufficient to fulfill the coverage needs of large projects.

Several coverage-related processes require site-specific information based on an analysis of the existing site. A lack for administrative and user tools requires administrative staff to visit sites and make determinations based on subjective inputs. For example, a site assessment is required before the review of a new project on a single-family parcel with existing coverage in order to determine the portion of the parcel already covered. This process requires the project proponent to wait until a visit to the parcel by TRPA staff can be scheduled, which can normally only be done between May and October due to snow covering the parcel. In addition, existing coverage evaluated may include soft coverage, which is defined as compacted areas that permit less than 75% infiltration. Stakeholders shared several anecdotes where amounts of soft coverage estimated by consultants did not equal the amount of soft coverage determined by TRPA. Further, there were instances where it took TRPA several months to make determinations related to soft coverage on large complex projects. Soft coverage determinations create significant uncertainty and draw out project review processes for project proponents.

Coverage Policy Indirect Cost Analysis

Sensitivity analysis conducted by this study revealed indirect costs can have a significant impact on small and large projects. Indirect costs such as understanding the coverage policies, determining proposed coverage transfer and ECM requirements, and finding willing coverage sellers or buyers can have up to a 1% impact on total development costs for small projects, which is in addition to direct costs related to coverage policies and permitting. These indirect costs also impact large projects but the impact is significantly smaller due to the total cost of large projects. The indirect costs related to the delay of projects due to operational processes are the most significant and the opportunity costs can be as much as 3% of the total development costs. Operational processes that delay projects include land capability verifications and site assessments, which have been reported to take as long as 3 years due to disagreements about soft coverage amounts. Project delays and the uncertainty related to other project permitting processes contribute to an overall reluctance of many land developers to initiate projects in the Lake Tahoe basin.

Summary

The existing body of policy related to impervious coverage and the related operational processes can create significant costs and uncertainty for project proponents. In most cases, project proponents hire consultants with extensive coverage policy experience to navigate the project review process. The additional cost for consultants to assist project proponents is marginal for large projects with consultants already involved in site design and permitting; however, the additional cost and complexity can be significant for a small residential project such as building a deck or porch. Policy and operational improvements and incentives can facilitate beneficial restoration and redevelopment projects by increasing regulatory predictability and reducing project costs.

6) Complicated and subjective coverage policies, insufficient data, and a lack of tools create significant administrative burden for agencies and limit the ability to improve policy effectiveness

Agency staff expressed coverage related administrative processes create significant administrative burdens that consume staff resources and reduce the effectiveness of the coverage policies.

Policy Complexity

As described in Finding #5, the vast and complex body of policy related to coverage causes project proponents to hire consultants to understand and navigated the project review process. Similarly, a significant investment in time is required for agency staff to understand and effectively administer the coverage policies. This causes several agency staff to be involved in specific project review steps and creates significant costs related to staff turnover.

Coverage Policy Tools Analysis

There is a lack of standard tools which creates significant administrative burden for TRPA, land banks and local jurisdictions. For example, ECM in-lieu fees are collected by each of the local jurisdictions with permitting authority and TRPA. Each entity tracks ECM in-lieu using different methods ranging from Excel spreadsheets to hand written notes. Often information related to projects paying ECM in-lieu fees is incomplete which creates significant effort for TRPA and land banks to reconcile since they are responsible to mitigate using ECM in-lieu fees depending on the land capability, type and location of the project.

TRPA has a parcel tracking system (Accela); however, it cannot be leveraged to efficiently access banked coverage and coverage transfers related to each parcel, or evaluated coverage transfers in aggregate, because the coverage related data is not sufficiently accurate in the system. Banked coverage and coverage transfers from before the Accela system was implement are not in the system. Further, banked coverage and coverage transfers since the Accela system was implemented are not accurate because there is no quality assurance process to ensure new banked coverage and coverage transfer data in Accela is dependable. Thus, planners must access physical files for each parcel during the project review process to understand previous coverage related transactions related to a parcel.

Further, the use of ECM in-lieu fees is not tracked in a way that allows the effectiveness of the use of those fees to be evaluated.

As described in Finding #5, soft coverage determinations are subjective and create significant administrative burden. Without a standard tool that produces repeatable results, soft coverage determinations can require significant agency resources when there is a difference between a project proponents expectations and agency assessment on a large project.

Coverage Data Analysis

The project team is using two data sets to analyze existing coverage in the basin. The first contains existing coverage by *assessor parcel number* (APN) and is based on the IKONOS satellite imagery performed in 2002. The accuracy assessment of the IKONOS satellite imagery study estimated the accuracy of the data is 92%. Additionally, the existing coverage layer does not include soft coverage or road coverage, and more than 2% of the parcel related coverage is not assigned a Plan Area Statement or Hydrologically Related Area (HRA). The second data set contains the roads in the basin; however the coverage associated to each road is not available and must be calculated using the length of each road section. Further, this dataset does not include soft coverage such as dirt roads in Washoe Meadows State Park and does not distinguish different types of roads (e.g. 2

Key Terms

Assessor Parcel Number (APN) - A number assigned to parcels of real property by the tax assessor of a particular jurisdiction for purposes of identification and record-keeping. The assigned number is unique within the particular jurisdiction.

lanes vs. 5 lanes). Working with the Tahoe Metropolitan Planning Organization (TMPO), the project team is using an average road width for different types of roads to estimate road coverage. The total coverage calculated from these two datasets using the said assumptions makes up only 90% (6,152 out of 6,849 acres) of the existing coverage presented in TRPA’s 2006 Threshold Evaluation report, and soft coverage is not included in the Threshold Evaluation report. The incomplete and inaccurate data available make it difficult to evaluate current and proposed coverage policies.

TRPA, in partnership with the U.S. Geological Survey, used funding from the Southern Nevada Public Lands Management Act to collect state-of-the-art high-resolution eight-band multispectral satellite imagery and high-resolution LiDAR (Light Detection and Ranging) airborne imagery of the entire Lake Tahoe Basin. The LiDAR data set provides an opportunity to use more accurate data in the evaluation and implementation of impervious coverage policies.

TRPA’s land capability map layer, which reflects the land capability classification system defined in the Land-Capability Classification of the Lake Tahoe Basin, California-Nevada: A Guide to Planning by Robert G. Bailey in 1974 (Bailey, 1974), is low resolution and site assessments have demonstrated the actual land capability is often very different than the land capability illustrated on these map layers. For instance, the planned Sierra Colina development is shown on the soils map as approximately 70% 1A and 20% 1B, however, the project team has been told a significant portion of this area has been reclassified through a site assessment as a high capability soil type. The coarseness of data and lack of integrating site assessment results into maps introduces potentially significant error into the analysis of existing coverage conditions related to land capability. Further, the inaccuracy of these maps inhibits maps to be used instead of on-site assessments.

Further, United States Department of Agriculture (USDA) and National Resources Conservation Service (NRCS) generated an updated soil survey of the Tahoe basin in 2006, and NRCS correlated the updated soil survey with the tables and appendices contained with the 1974 Bailey report. Findings from this technical analysis could improve the accuracy of TRPA’s land capability map layer but have not been incorporated.

Summary

The complexity of the coverage policies and lack of standard, efficient tools creates significant administrative burden that increase administrative costs and decreases the effectiveness of the coverage policies. Operational improvements can reduce the coverage policy administrative costs and allow a greater portion of the ECM in-lieu fees collected to be used to mitigate excess coverage as opposed to administrating the land banks. Lastly, improved data on the current conditions and coverage transactions can simplify processes and enable effective evaluation of coverage policies.

7) Restoration requirements associated with new coverage on sensitive lands increases the cost of projects with multiple public benefits

Federal, state and local agency staff emphasized coverage policies create additional costs and complexity to public benefit projects such as hiking trails, bike paths and water quality treatment facilities.

Policy Overview

Coverage policies and related operational processes are generally the same for public benefit projects as for any other type of project. Public benefit projects must have a land verification completed prior to project review and transfer coverage when more coverage than the base allowable is needed. Further, *restoration credits* are required for any impacts to SEZs. These processes and commodity requirements can significantly increase the cost and delay the implementation of public benefit projects.

Key Terms

Restoration credits – Rights to develop or earned by restoration of coverage on environmentally sensitive lands such as SEZs.

Policy Objective Analysis

Public benefit projects such as hiking trails and bike trails can advance environmental thresholds related to transportation and recreation, but may also negatively impact water quality and riparian and habitat function. There are instances when the coverage policies are important to protect environmental thresholds and other policy objectives from public benefit projects through influencing project designs and requiring mitigation. However, there are also instances when public projects create coverage that has very little negative impact, such as hiking trails and bike trails that are not connected to surface water and remove very little habitat. For these instances, the added cost and time required by the coverage policies significantly restrict that ability to implement projects that can benefit environmental thresholds without material impact to other environmental thresholds.

Summary

The cost and complexity of certain public benefit projects, such as bike paths, can be significantly increased by the sensitive land restoration requirement related to new coverage on sensitive lands. This complicates the efforts to achieve other environmental thresholds related to transportation and recreation, and increases the administrative costs for public entities. However, any allowances for these public benefit projects must protect other environmental thresholds by evaluating the overall environmental impact or benefit from the project.

8) The price of coverage and ECM fees creates a tension between the value of restoration and redevelopment projects

Stakeholders emphasized that the current ECM in-lieu fees are below the actual cost of restoring coverage in most HRAs. Stakeholders contended ECM in-lieu fees should be used to restore environmentally damaging, yet costly, coverage, rather than used to reduce a specific area of coverage independent of environmental quality. Stakeholders also emphasized the impediment to redevelopment projects that coverage policies inflict on redevelopment of over-covered parcels.

Mitigation Cost Analysis

The cost to acquire and restore coverage from the perspective of the land banks or private buyers varies significantly around the basin. The primary factors that drive the cost of acquiring and restoring coverage from a parcel include:

Hydrologic Related Area – The cost of coverage can be 10 times more costly in one HRA compared to another with all else equal. This is due to some HRAs containing only a few willing sellers of coverage, and additional restrictions on sensitive land capability coverage types. Without competition, these few willing sellers can demand high prices. Private market transactions since 2006 shared with the project team include sales in South Stateline and Upper Truckee under \$6/ft² and sales in Emerald Bay over \$95/ft². The California Tahoe Conservancy has been quoted prices as high as \$100/ft² to acquire low capability coverage in supply constrained HRAs.¹¹

Property Market Value – Property market value is often the most significant factor in the cost of coverage. This makes sense based on per square foot land values typically being much higher than per square foot restoration costs or any other cost driver. Property market value in particular explains why the cost is high for coverage on economically productive parcels such as Grocery Outlet or Meek's Lumber and Hardware. Further, property market value is also a factor influencing the cost disparity between with north and south shores, with coverage restoration costs being higher in the north shore.

¹¹ Provided by Bruce Eisner during phone conversation on February 13, 2012.

Land Capability – Low capability coverage (land capability classes 1a, 1b, 1c, 2 and 3) is typically more expensive than high capability coverage (land capability classes 4, 5, 6 and 7) because a) restoring low capability land to naturally functioning state is more expensive, and b) low capability coverage is perceived as becoming ever more scarce due to coverage policies that allow transfer of low capability coverage to high capability parcels but not vice versa. Presumably, low capability coverage would be less valuable than high capability coverage because of the development restrictions on low capability lands; however, there is also material demand for permissible uses on low capability lands including public benefit projects, single-family projects in jurisdictions with an *Individual Parcel Evaluation System* (IPES) line equal to 1, and sensitive land relocation and mitigation projects that require 1.5:1 transfers. Based on land bank price sheets in 2010 and 2011, the market value of land coverage appraisal prepared by Lynn Barnett¹², and private market transactions shared with the project team, low capability coverage can cost between 100% and 600% more than the high capability coverage in a given HRA.

Type of Coverage – The cost of hard, soft and potential coverage can vary depending on the HRA. The cost of hard and soft coverage is typically fairly similar. The cost of *hard coverage* has been observed to be as much as 50% higher than that of soft coverage, which aligns with the potential increase in cost to restore hard coverage compared to soft coverage. Conversely, the cost of potential coverage compared to the cost of existing coverage varies significantly and inconsistently around the basin. Theoretically the cost of existing coverage should be materially higher than the cost of potential coverage since the restoration costs required of existing coverage should be reflected in the price of existing coverage. However, land banks list existing coverage in some HRAs that was acquired before real estate values escalated in the early 21st century and this suppresses the market price for existing coverage in some HRAs.

The land banks have acquired coverage over the past 25 years through numerous transactions. NDSL used ECM in-lieu fees to acquire and retire coverage through 12 projects since 1999 that ranged from \$10 to \$30/ft² with an average estimated total cost (acquisition, demolition and restoration) of \$20.14/ft². However, most of the transactions occurred before the real estate market run in the early 2000's. Ten of the twelve projects retired potential coverage, so there were no demolition and restoration costs in those transactions. Further, several parcels were acquired using other funding sources so there were no land acquisition costs, and administrative overhead costs were not included in those transactions.

CTC estimates the average total cost to acquire and restore coverage in 2004 was \$23.37/ft². However, this estimate was based primarily on transactions that occurred before the real estate market run-up in the early 2000's, or the decline starting in 2008, and a majority of the projects retired potential coverage only, so demolition and restoration costs were not included in those transactions. The last three SEZ restoration projects ranged from \$29.24 to \$33.06/ft². The low cost coverage acquisition opportunities are nearly exhausted so future transactions are likely to be more costly than they were in the past.

Key Terms

Hard coverage – A man-made structure, improvement or covering, either created before February 10, 1972 or created after February 10, 1972 pursuant to either TRPA Ordinance No. 4, as amended, or other TRPA approval, that prevents normal precipitation from directly reaching the surface of the land underlying the structure, improvement or covering. Such structures, improvements and coverings include but are not limited to roofs, decks, surfaces that are paved with asphalt, concrete or stone, roads, streets, sidewalks, driveways, parking lots, tennis courts, and patios.

Individual Parcel Evaluation Systems (IPES): The system used to classify vacant lots and described in detail in Chapter 37 of the TRPA Code of Ordinances.

¹² Barnett, Lynn. December 31, 2009. "A summary appraisal addressing the Market Value of Land Coverage and the Cost to Acquire and Restore Land Coverage located in the Lake Tahoe Basin". Prepared for the Tahoe Regional Planning Agency.

The market value of land coverage appraisal prepared by Lynn Barnett in 2009 reported that the cost to acquire coverage ranges from \$17.50 to \$85.00/ft² depending on HRA, land capability and type of coverage.¹³

Coverage Price Impact on Projects

The cost of coverage, either coverage transfers or ECM in-lieu fees, on a large development or redevelopment project depends on the coverage price or ECM in-lieu fee. As described in the project enablement sensitivity analysis above, the cost of transferred coverage on development projects can range from 0 to 8.5% of the total development costs based on the amount of coverage transferred and a price of coverage ranging from \$10 to \$50/ft². The cost of coverage on redevelopment projects can range from 0 to 6.5% of total redevelopment costs based on the amount of excess coverage mitigated and an ECM in-lieu fee ranging from \$8.50 and \$50/ft².

The price of coverage determines if it is better for land owners to restore coverage or hold onto coverage for future use or sale. A low coverage price does not motivate land owners to restore coverage, which would likely be coverage without BMPs or in sensitive lands with restricted redevelopment opportunity. While a high coverage process makes restoration is a good business decision.

Summary

Our analysis identified the clear tension between a coverage price that enables and motivates restoration, while not decreasing redevelopment. The price of coverage and ECM fee levels are key factors influencing the cost of redevelopment, which is necessary to achieve the Water Quality, Riparian & Habitat Function and Livable Communities objectives. High coverage prices increase the incentive for landowners with existing coverage to sell and restore coverage. However, high coverage prices reduce the feasibility of redevelopment projects. Similarly, high ECM fees enable land banks to mitigate excess coverage while limiting the feasibility of redevelopment projects that reduce the impact of existing coverage and provide other community benefits.

9) Coverage distribution is uneven across municipalities showing certain municipalities with a net excess of coverage

Stakeholders expressed an uneven distribution of existing coverage across municipalities and suggested municipality scale coverage management solutions should be considered.

Coverage Data Analysis

The table 7 below illustrates the City of South Lake Tahoe contains a significantly greater percent impervious coverage than the other jurisdictions. Within the City of South Lake Tahoe, impervious cover makes up 20% of land area with defined parcel numbers, which excludes roads and right-of-ways, and exceeds the sum of all base allowable coverage on parcels within the City. The jurisdiction with the next highest coverage coefficient is Washoe County with 4% impervious coverage.

¹³ Barnett, Lynn. December 31, 2009. "A summary appraisal addressing the Market Value of Land Coverage and the Cost to Acquire and Restore Land Coverage located in the Lake Tahoe Basin". Prepared for the Tahoe Regional Planning Agency.

Table 7: Parcel Coverage Distribution by Municipality.

	Parcel Coverage (Acres)	Parcel Coverage Allowed (%)	Parcel Coverage (%)	Parcel Coverage Allowed Less Covered Balance (Acres)
Carson City	16	2%	0%	73
City of SLT	1,196	13%	20%	(422)
Douglas Co.	582	3%	3%	133
El Dorado Co.	831	4%	1%	2,611
Placer Co.	929	10%	2%	3,529
Washoe Co.	690	4%	4%	46
	4,243			

Road coverage is not included in this table because 1) road coverage estimates are based on significant assumptions, and 2) road coverage is unlikely to change significantly unless entire development zones are restored. The aggregate base allowable coverage on parcels is within 25% of current coverage amounts for Douglas and Washoe Counties. When coverage from roads is added to the analysis, the City of South Lake Tahoe, and Douglas and Washoe Counties are expected to exceed total base allowable coverage.

Policy Alternatives Evaluated

Stakeholders and project team members generated policy alternatives to manage coverage at larger scales than the current parcel-scale coverage policies. One such alternative was municipal scale coverage management which would use municipal scale targets and trading options to motivate reductions in coverage for large scale planning and generate more innovative uses of coverage. These alternatives were all considered, however many are not recommended based on the evaluation results. For example, municipal scale coverage management was deemed infeasible due to the complexity of the property right being owned by individual land-owners and municipalities not having control over the individual property owner's use of that coverage.

Summary

Existing coverage in the basin is unevenly distributed by jurisdiction and the current coverage in several jurisdictions is greater than the aggregate base allowable coverage. However, it is not deemed feasible to develop municipal targets for coverage reductions for each municipality.

10) Stormwater treatment, coverage removal and private property BMP implementation are complimentary and needed to achieve policy objectives

Many stakeholders suggested that engineered stormwater treatment solutions may be more cost-effective than restricting allowable coverage and purchasing coverage as pollutant load reduction strategy.

Stormwater Treatment and Coverage Restoration Effectiveness

Stormwater treatment, such as constructed dry and wet basins or filtration devices, can reduce runoff and pollutant loading when properly sized and maintained. Stormwater treatment is a necessary pollutant control option in areas where coverage density is high and the infiltration capacity of local soils is low. Stormwater treatment is especially important when coverage is directly connected to surface waters through stormwater conveyance systems.

Stormwater treatment, however, should not be considered in isolation.

- The ongoing maintenance requirement of stormwater treatment systems is costly, and has historically been neglected or inconsistent.

- Stormwater treatment that treats, but does not infiltrate water, impacts the natural hydrologic function within a catchment. Even when flow-through devices remove pollutants, the water flows to surface waters rather than recharging groundwater.
- On-site BMPs and infiltration resulting from routing stormwater to vegetated areas reduces both the volume of stormwater and the concentration of pollutants in runoff that must be treated by stormwater treatment systems. Thus, the stormwater treatment systems can be smaller and require less frequent maintenance to maintain functionality. Both factors reduce the costs of stormwater treatment.
- Removing coverage can be an effective means of controlling stormwater in specific settings. Strategically removing coverage reduces the amount of runoff and can reduce the degree of directly connected impervious area within a catchment, and can reduce the catchment connectivity between the outflow of a stormwater conveyance system and a surface waterbody. Properly stabilized infiltration areas that do not erode require minimal ongoing maintenance. Coverage removal can also increase the area of available habitat and improve stream conditions when in riparian areas connected to natural habitat. However, removing coverage from areas where runoff infiltrates on-site or near the parcel may have little benefit to water quality and hydrologic function in the catchment.

Stormwater Treatment and Coverage Restoration Cost

Stormwater treatment addressing runoff from private property and roads range from \$40,600 to \$213,400 per acre based on pollution control options, concentration of coverage and slope.¹⁴ The cost of constructing and maintaining stormwater treatment systems is frequently the responsibility of municipalities and public entities, rather than project developers; thus transferring the cost of treating runoff from private parcels to public entities.

The cost of private property BMPs, including planning, design and 20 years of operations and maintenance, range from \$27,200 and \$80,000 per acre depending on land use type.¹⁵ These costs are borne by the landowner.

As described in greater detail in Finding #8, the cost to acquire and restore coverage currently ranges from \$10 to \$985 per square foot of coverage if inflated market prices are excluded. Using these costs, removing the coverage from one acre of land with 46%¹⁶ coverage would cost between \$200,000 and \$1,700,000. Strategic removal of coverage may be employed as a pollutant control strategy by either public or private entities.

Summary

Stormwater treatment may be necessary and practical in many settings, especially those with concentrated development. Even when stormwater treatment is necessary onsite BMPs and natural infiltration before stormwater flows are routed to a conveyance system reduce the cost of stormwater treatment facilities and improve the natural hydrologic function in the catchment. Strategic removal of coverage in advantageous locations can reduce runoff and pollutant loading while increasing habitat and improving stream conditions. Private property BMPs are the lowest cost per acre and are borne by the property owner deriving the economic benefit from the property. Stormwater treatment and the strategic removal of coverage may also be cost effective depending on the setting and constraints within the catchment.

¹⁴ Lahontan Regional Water Quality Control Board (LRWQCB) and Nevada Division of Environmental Protection (NDEP). 2008b. Lake Tahoe TMDL Pollutant Reduction Opportunity report v2.0. March 2008.

¹⁵ 2NDNature, Northwest Hydraulic Consultants (NHC), Environmental Incentives and Geosyntec Consultants. 2011. Placer County Stormwater TMDL Strategy. Prepared for US Army Corps of Engineers, Sacramento District, and County of Placer, State of California.

¹⁶ The 15 most covered Plan Area Statements have 46% or greater percent coverage.

11) Concentrating development and limiting the development footprint has the potential to reduce per capita and basin-wide environmental impact

Concentrating development density in Town Centers is a proposed approach to meet livable community objectives and encourage redevelopment.

Policy Context

Current and proposed TRPA policy allows for greater maximum allowable percentage coverage on multi-residential, commercial and tourist accommodation parcels than on single-family residential parcels. This increased density is deemed necessary to enable projects to be economically viable, encourage redevelopment and enable Town Centers to be walkable.

As described in the Appendix I: Existing Impervious Coverage Policy Summary, new coverage over the base allowable must transfer coverage from another area to the project site. A transfer ratio based on a sliding scale, which starts with 1 square foot of removal for every 1 square foot of new coverage and ends with 2 square foot of removal for every 1 square foot of new coverage, determines the coverage transfer requirements for development of coverage in excess of 50% of the parcel areas. This transfer ratio results in a net decrease in coverage.

Redevelopment of parcels with unmitigated or transferred existing coverage above the base allowable requires the excess coverage to be mitigated by way of several options, including payment of the ECM in-lieu fee.

Water Quality and Riparian & Habitat Function Impact

As described in the water quality sensitivity analysis of this report, increasing the intensity of use on a fixed area of coverage can increase pollutant concentrations and loading. By increasing the allowable area covered, runoff is also likely to increase, further increasing loads. However, given the policies in place that require any new development to meet BMP requirements and the coverage transfer policies, concentration of development is expected to result in a net reduction in pollutant loading. The following example uses the per acre loading data presented in the water quality sensitivity analysis. Modeling run numbers refer to the PLRM Scenario Results Table in Appendix II.

Redevelopment Examples

The ideal redevelopment scenario results in the restoration of an unproductive commercial area that is in an SEZ and directly connected to a stream, and the redevelopment of a commercial area on *high capability land*. An example of this type of transfer could involve redeveloping an existing commercial site with 1 acre of coverage and expanding the coverage to 2 acres by transferring 1 acre of coverage from another commercial site that is restored. The result of this transfer would be:

- Restoring 1 acre of commercial coverage without BMPs (run 52) and converting it to 1 acre of undeveloped land (run 79) resulting in a 2.2 acre-feet per year reduction in annual average runoff and a 1,138 pound per year reduction in annual average FSP loading.
- Redeveloping 1 acre of commercial coverage without BMPs (run 55) and expanding the coverage to 2 acres of commercial that meets BMP requirements (run 52) resulting in a 1.0 acre-feet per year reduction in annual average runoff and a 693 pound per year reduction in annual average FSP loading.
- The combination of the restoration and redevelopment would result in a 3.2 acre-feet per year reduction in annual average runoff and a 1,831 pound per year reduction in annual average FSP loading.

Key Terms

High capability land – Non-sensitive land designated by a high land capability score, normally accepted as land capability classes 4-7.

Residential development rights - The right to potential residential use that is attached to certain parcels in the region in accordance with Section 50.3. A development right is not a vested right.

Redevelopment could also involve the transfer of *residential development rights* and coverage to commercial properties. The results presented in the water quality sensitivity analysis show that transferring coverage from Single Family Residential (SFR) with no BMPs (run 51) to Commercial with BMPs (run 55) can result in a potentially slight decrease in runoff, but a significant relative increase in FSP loading. Using the absolute values from these runs shows a change in FSP loading from 43 pounds of FSP per year per acres of SFR coverage without BMPs to 223 pounds of FSP per year per acre of Commercial coverage with BMPs. This is a 180 pound per year per acre increase in average annual FSP loading. While the potential for a direct transfer of coverage from a residential area to a commercial area might result in a load increase, the transfer of coverage from residential areas to commercial areas should be considered in light of the overall redevelopment scenario in the Lake Tahoe Basin. This context includes the assumption that parcels targeted for redevelopment are expected to not meet current BMP requirements.

Consider a redevelopment scenario similar to the one described above, but with the coverage being transferred from SFR rather than a commercial site. The result of this transfer would be:

- Restoring 1 acre of SFR coverage without BMPs (run 51) and converting it to 1 acre of undeveloped land (run 79) resulting in a 0.8 acre-feet per year reduction in annual average runoff and a 43 pound per year reduction in annual average FSP loading.
- Redeveloping 1 acre of commercial coverage without BMPs (run 55) and expanding the coverage to 2 acres of commercial that meets BMP requirements (run 52) resulting in a 1.0 acre-feet per year reduction in annual average runoff and a 693 pound per year reduction in annual average FSP loading.
- The combination of the restoration and redevelopment would result in a 1.8 acre-feet per year reduction in annual average runoff and a 736 pound per year reduction in annual average FSP loading.

Both of these examples result in a net reduction in loading and an increase in infiltration from redevelopment activities, without consideration of coverage transfer ratios.

Per Capita Water Quality Consideration

While concentrating development may increase the loading from a single developed site, reducing the number of sites developed can result in benefits. A per capita analysis of loading comparing single family residential to varying levels of high density residential development in Austin, Texas showed a 50% per capita load reduction of total suspended solids as the number of dwelling units per acre was increased from 4 to 16 units per acre¹⁷. This reduction in per capita loading continued to increase as housing density increased.

Given the restriction on the total allowable number of residential units in the Lake Tahoe Basin, there is significant potential benefit from concentrating development on fewer parcels. Using the results presented in the water quality sensitivity analysis, the conversion of an acre of coverage from single family residential with BMPs to multi-family residential with BMPs is expected to result in a negligible loading and runoff increase. Yet, the increased density of housing and the associated transfer of development rights would lead to a reduction in per residential unit loading. For instance:

- 1 acre of single family residential coverage may support 10 units (assuming ¼ acre lots with 40% coverage) and results in 11.4 pounds per year of FSP. The per residential unit loading is 1.1 pounds per year of FSP.

¹⁷ Jacob, John S. 2011. Watershed, Walkability, and Stormwater the role of density. Stormwater. Vol. 12, No. 1. Pp 32 – 40. January/February.

- 1 acre of multi-family residential coverage may support 26 units (assuming 16 units per acre with 60% coverage) and results in 25.6 pounds per year of FSP. The per residential unit loading is 1.0 pounds per year of FSP.

This example illustrates a slight decrease in per unit loading that could be expected to increase more dramatically with higher density housing. Further, these benefits could be increased significantly by combining appropriate site selection and implementation of effective BMPs on the multi-family residential site, especially considering the high likelihood that the restored coverage would not have met BMP requirements.

Summary

Given the policy and water quality context in the Lake Tahoe Basin, increasing development density has the potential to reduce pollutant loading and increase riparian and habitat function through increased infiltration. If this increased density results in redevelopment of existing parcels without BMPs, the improvements can be significant. Per capita coverage utilization may be an effective approach and performance measure for the coverage policies.

12) Removing HRA restrictions for transfers of coverage without site-specific considerations for transfers will enable projects and reduce administrative burden, but may result in negative water quality impacts under certain scenarios

Stakeholders frequently stated that supply constraints resulting from fragmented markets for specific coverage types within unique HRAs impede redevelopment projects that provide water quality benefits and restoration of high impact coverage in *priority areas*.

HRA Coverage Transfer Restriction Impact on Watersheds

Restricting coverage transfers to be within specific HRAs is intended to prevent watersheds from becoming impaired by exceeding the total base-allowable coverage within an HRA. This concept is supported by the Center for Watershed Protection's finding that most stream quality indicators decline when watershed impervious cover exceeds 10%, with severe degradation expected beyond 25%¹⁸. The impervious coverage relationship to water quality is relevant at the watershed scale, however the nine HRAs in the basin encompass all 63 unique watersheds. Thus, the HRA coverage transfer restriction does not strongly influence the amount of coverage transferred into a specific watershed, and does not prevent over-coverage within a specific watershed.

The HRA coverage transfer restriction strongly influences the amount of development and restoration of coverage in an HRA by

- Creating nine isolated geographical markets with limited accessible supply in multiple HRAs. Supply can be so constrained such that the only willing sellers can ask for coverage prices as high as \$100 per sq. ft., which is likely more than 10% of the overall project costs for large projects based on pro forma analyses and even higher for small residential projects.

Key Terms

Priority Area - An area where coverage has a high environmental impact due some combination of the following factors:

- Important location for habitat corridors
- Fragments otherwise intact habitat
- Located in otherwise roadless areas
- Highly disruptive to hydrologic function due to the degree of directly connected impervious area or the ability to disconnect significant upslope sections of impervious coverage
- Drains directly to a surface waterbody
- Located on uniquely productive soil types essential to support natural functions in the watershed

¹⁸ Center for Watershed Protection. 2003. Watershed Protection Research Monograph No.1: Impacts of Impervious Cover on Aquatic Systems.

- Requiring project proponents to expend significant resources searching for coverage supply in HRAs with limited supply and coverage pricing information, as opposed to investing those resources in environmentally and socially beneficial projects.

Regional Water Quality Impact of Removing the HRA Coverage Transfer Restriction for Different Types of Transfers

There are four primary types of coverage transfers that should be considered when evaluating the regional water quality impact of removing the HRA coverage transfer restriction. The following three key elements must be considered in evaluation of the water quality impact of each scenario

- a) The impact of restoration and transfer of development from eligible sending areas
- b) The impact of redevelopment and new development within eligible receiving areas, and
- c) The impact related to transfer ratios.

Table 9 below summarizes the projected impacts of these coverage transfers.

Classification of Results

This analysis is intended to determine if the removal of the HRA coverage transfer restriction is expected to lead to regional water quality improvement or impact. It is neither the intent, nor an option given the scope of this analysis, to arrive at an absolute value of benefit or impact from removing the HRA coverage transfer restriction. Expected results from removing the HRA coverage transfer restriction for each of the different types of coverage transfers are classified according to the descriptions presented in Table 8 below.

Table 8: Classifications for describing the projected water quality impacts of different types of coverage transfers.

CLASSIFICATION	DESCRIPTION
Highly likely regional improvement	Overall basin-wide improvement is expected. Most transfers are expected to result in water quality benefit. Few transfers are expected to result in any water quality impact, and any potential water quality impact is expected to be no greater than the water quality benefit from the majority of transfers.
Potential regional improvement	Overall basin-wide improvement is possible. Many to most transfers will result in some water quality benefit. Few transfers are expected to result in any potential water quality impact, and any potential impact is expected to be no greater than the water quality benefit from the majority of transfers.
No regional change	No expected change in basin-wide conditions. Transfers are not expected to have any real water quality influence. Or, water quality benefits are generally expected to balance water quality impacts (only used in combined ratings when there is no expected water quality impact on any criteria).
Unlikely regional improvement	No overall basin-wide improvement is expected with potential for moderate net negative impact. Some to many transfers will result in some water quality benefit. Some to many transfers are expected to result in water quality impact with the potential for some to have water quality impacts greater than the water quality improvement for the majority of transfers.
Expected regional impact	Overall basin-wide negative impact is expected. Most transfers will result in some water quality impact. Or, some to most transfers will result in some water quality benefit, but the potential water quality impact from some is expected to be greater than the expected water quality benefit from the majority of beneficial transfers.

Table 9: Summary of the projected water quality impacts of the four primary types of coverage transfers that should be considered when evaluating the removal of the HRA coverage transfer restriction.

TRANSFER ACTIVITY	SITE IMPACT & MAGNITUDE		CHANGE IN TRANSFER ACTIVITY FREQUENCY	NET IMPACT
	SENDING SITE	RECEIVING SITE		
Redevelopment of Over-Covered Commercial Parcels	<p>Highly Likely Beneficial</p> <p>Coverage transferred for commercial excess coverage liability (as opposed to paying ECM in-lieu fees) provides significant water quality benefits since</p> <p>(1) coverage transferred must be restored existing coverage, however restored coverage from residential sites as opposed to commercial sites provides less value due to higher loading from commercial sites,</p> <p>(2) site is highly unlikely to have existing BMPs, and</p> <p>(3) coverage may come from sensitive land that is permanently retired from the sending site</p>	<p>Highly Likely Beneficial</p> <p>Redevelopment of an over-covered commercial site is likely to provide significant water quality benefits since</p> <p>(1) commercial sites create significant loading, and</p> <p>(2) BMPs will be installed on a site that most likely currently does not have BMPs</p>	<p>Marginal Increase</p> <p>Coverage transfer demand from commercial redevelopment of over-covered parcels is likely to increase marginally since</p> <p>(1) a basin-wide price is likely to be less than the current average price due to a reduction in transaction costs and significantly less than the current coverage price (and ECM in-lieu fee) in a few HRAs, however</p> <p>(2) project proponents with an excess coverage liability are likely to continue to predominantly pay the ECM in-lieu fee as opposed to transferring coverage, if the ECM fee is maintained at a lower than market price</p>	<p>Highly Likely Regional Improvement</p>
Redevelopment of Over-Covered Residential Parcels	<p>Expected Benefit</p> <p>Coverage transferred for residential excess coverage liability (as opposed to paying ECM in-lieu fees) provides minimal water quality benefits since coverage transferred is likely to be potential coverage, although it could be restored existing coverage or potential coverage from sensitive lands (and permanently retired from the sending site) or areas without roads and other public infrastructure (and help avoid the need for additional coverage for roads, which make up approximately 38% of the coverage in the basin and increases connectivity that drives runoff volumes)</p>	<p>Expected Benefit</p> <p>Redevelopment of an over-covered residential site is likely to provide water quality benefits since BMPs will likely be installed on a site that currently does not have BMPs</p>	<p>Marginal Increase</p> <p>Coverage transfer demand from residential redevelopment of over-covered parcels is likely to increase marginally since</p> <p>(1) a basin-wide price is likely to be less than the current average price due to a reduction in transaction costs and significantly less than the current coverage price (and ECM in-lieu fee) in a few HRAs, however</p> <p>(2) project proponents with an excess coverage liability are likely to continue to predominantly pay the ECM in-lieu fee as opposed to transferring coverage due to lower transaction costs required to pay the ECM in-lieu fee, and</p> <p>(3) land banks have potential coverage inventories in 5 of 9 HRAs as well as the CA portion of the Agate Bay and SSL HRAs, and the other 2 HRAs (Marlette & Cave Rock) have minimal theoretical demand due to relatively few over-covered parcels</p>	<p>Potential Regional Improvement</p>

TRANSFER ACTIVITY	SITE IMPACT & MAGNITUDE		CHANGE IN TRANSFER ACTIVITY FREQUENCY	NET IMPACT
	SENDING SITE	RECEIVING SITE		
<p>Development of Commercial Parcels without Excess Coverage</p>	<p>Highly Likely Beneficial</p> <p>Coverage transferred for new development beyond base allowable for a commercial use provides significant water quality benefits since</p> <ul style="list-style-type: none"> (1) coverage transferred must be restored existing coverage, however restored coverage from residential sites as opposed to commercial sites provides less value due to higher loading from commercial sites, (2) site is highly unlikely to previously have BMPs, (3) coverage may come from sensitive land (and permanently retired from the sending site), and (4) coverage is retired at a ratio between 1.05:1 and 2:1 for coverage over 50% of the site 	<p>Potential Impact</p> <p>New development beyond base allowable for commercial use has the potential to create water quality impacts since some pollutant loading occurs on sites even with BMPs, and particularly in areas highly connected to surface waterbodies and that receive high levels of precipitation; however the potential impact is limited, and these sites may be developed with current HRA restrictions</p>	<p>Material Increase</p> <p>Coverage transfer demand from new commercial development beyond base allowable is likely to increase since</p> <ul style="list-style-type: none"> (1) a basin-wide price is likely to be less than the current average price due to a reduction in transaction costs and significantly less than the current coverage price in a few HRAs, (2) maximum coverage allowed for commercial parcels is significantly greater than the base allowable, and (3) there is no land bank inventory of existing coverage in 5 out of 9 HRAs as well as the CA portion of the Agate Bay HRA, and less than an acre in the other HRAs other than the Upper Truckee HRA, however (4) large development projects are unlikely to increase because they currently can acquire land and restore coverage for their project within any HRA, and (5) minimal additional demand is expected to be met because HRAs with high land values and low inventories such as Marlette and Cave Rock have relatively few undeveloped non-sensitive parcels 	<p>Potential Regional Improvement</p>
<p>Development of Residential Parcels without Excess Coverage</p>	<p>Expected Benefit</p> <p>Coverage transferred for new development beyond base allowable for a residential use provides a limited amount of water quality benefits since coverage transferred is likely potential coverage, although it could be restored existing coverage or potential coverage from sensitive lands (and permanently retired from the sending site) or roadless areas (and help avoid the need for additional coverage for roads, which make up approximately 38% of the coverage in the basin and increases connectivity that drives runoff volumes)</p>	<p>Potential Impact</p> <p>New development beyond base allowable for residential use has the potential to create water quality impacts since some pollutant loading occurs on sites even with BMPs, and particularly in areas highly connected to surface waterbodies and that receive high levels of precipitation; however the potential impact is limited, and these sites may be developed with current HRA restrictions</p>	<p>Marginal Increase</p> <p>Coverage transfer demand from residential redevelopment of over-covered parcels is likely to increase marginally since</p> <ul style="list-style-type: none"> (1) a basin-wide price is likely to be less than the current average price due to a reduction in transaction costs and significantly less than the current coverage price (and ECM in-lieu fee) in a few HRAs, however (2) maximum coverage allowed for residential parcels is only greater than the base allowable for parcels when the parcel is on high capability lands (4-7) and less than 13% of an acre in size, or the parcel is on low capability lands (1a-3) and less than 9 acres in size but there are relatively few undeveloped residential parcels on sensitive lands, (3) land banks have potential coverage inventories in 5 of 9 HRAs as well as the CA portion of the Agate Bay and SSL HRAs, and (4) minimal additional demand is expected be met because HRAs with high land values and low inventories have relatively few undeveloped non-sensitive parcels 	<p>Potential Regional Improvement</p>

At the regional scale, removing the HRA coverage transfer restriction has the potential for regional improvement or is highly likely to provide regional improvement to the environment for each of the four types of coverage transfers. However, there are specific transfer scenarios within two types of coverage transfers that have the potential to create negative water quality impacts. These scenarios are specific to transfers of coverage for development of parcels without excess coverage (the 3rd and 4th scenarios in Table 9 above), and limited to specific watersheds that are particularly sensitive due to characteristics described below. These watershed specific issues, described in greater detail below, occur today with the HRA coverage transfer restriction in place but will potentially increase in frequency if the HRA coverage transfer restriction is lifted.

Watershed Specific Considerations from Removal of HRA Coverage Transfer Restrictions

Removing the HRA coverage transfer restriction excludes subregional characteristics. These characteristics include:

- Average annual precipitation - coverage transfers from an area with low precipitation to area with high precipitation can significantly increase loading.
- Site constraints – certain areas within the basin have a higher density of parcels with site constraints that may reduce the ability to control stormwater. The Tahoe City downtown, for example, is likely to have more site constraints than the South Shore urban areas because of its dense development with little separation from the lake shore on relatively steeper slopes and with less pervious soil types.
- Other factors including soil type and the overall amount of effective imperviousness in a watershed may differ between watersheds, causing certain watershed to be more sensitive than others.

When any or multiple of these issues disproportionately occur in a receiving watershed there is an increased potential for environmental impact from the transfer. This may be the case in certain areas of the Northwestern portion of the basin.

While certain watershed characteristics may increase the likelihood of impact when transferring across current HRAs, site conditions and constraints on *receiving parcels* also increase the impact of transfers within any HRA. Some of these factors may be more significant than the watershed specific

considerations addressed above. Important factors include, the degree of directly connected impervious area between the site and the other impervious surfaces within an urban catchment, the degree of catchment connectivity to a surface waterbody, and site constraints that prevent infiltration of the 20-year 1-hour storm and thus flow-through stormwater treatment devices are used. These issues can be addressed through an assessment of the environmental impact of coverage on a site that considers site-specific, catchment and watershed characteristics, as recommended in Recommendation #1 of this study.

Key Terms

Receiving Parcel: An eligible parcel that coverage can be transferred to in a coverage transaction.

Finding

Removing the HRA coverage transfer restriction has the potential for regional improvement or is highly likely to provide regional improvement to the environment at the regional scale for each of the four types of coverage transfers. Further, enabling development and restoration projects currently impeded due to coverage supply constraints and market pricing is highly likely to provide regional and local economic and community benefits. However, the removal of the HRA coverage transfer restriction is likely to increase the frequency of specific coverage transfer scenarios that may create negative water quality impacts.

The HRA coverage transfer restriction protects the environment from impacts due to subregional characteristics such as differences in precipitation. However, the HRA restriction does not protect the

environment from impacts due to site-specific characteristics such as connectivity to surface waters and site constraints that limit the effectiveness of BMPs that are important drivers of water quality impact from coverage. The use of site, catchment and watershed-specific characteristics to determine transfer ratios for all coverage transfers would better address the need to limit the environmental impact of coverage in sensitive watersheds than the use of HRAs restrictions.

13) Coverage used for commercial and residential parking is significant and can be used much more efficiently

Stakeholders expressed that a substantial amount of coverage is used for vehicle parking and they very rarely find it difficult to find parking, even in popular destinations and during peak visitor times.

Parking Coverage Data Analysis

Approximately 1,025 acres, or 14%, of the 7,250 total acres of hard coverage in the Tahoe Basin is used for parking. Table 10 contains the number spaces and amount of coverage for different types of parking spaces in the Tahoe Basin. The data excludes parking spaces in garages and the standard sf multipliers used to estimate the amount of coverage in Table 10 includes the area required to access parking spaces.

Table 10: Parking spaces and coverage amount used by each parking type.

PARKING TYPES	SPACES	STANDARD SF MULTIPLIER	TOTAL SQ. FT	TOTAL ACRES
Residential Off-Street	92,700	350	32,445,000	745
Commercial On-Street	1,470	270	396,900	9
Commercial Off-street	33,700	350	11,795,000	271
TOTAL	127,870	-	44,636,900	1,025

There are fewer than 60,000 cars in the Tahoe Basin, while there are approximately 128,000 parking spaces outside of garages and another approximately 10,800 in garages based on surveys of community plan areas.

Parking Demand Trends

According to TMPO's Regional Transportation Plan, parking demand has declined over the past decade. This decline is primarily due to a struggling gaming industry and is illustrated by a 44% decline in the number of rooms rented in the City of South Lake Tahoe in fiscal year 2010-2011 compared to fiscal year 2000-2001.

Literature Review

A review of literature was conducted to identify the percentage of coverage used for parking in comparable communities in order to better understand the hypothesized over supply of parking in the basin. Unfortunately comparable percentages of coverage used for parking were not identified.

Land Use Efficiency and Parking Design

Shared parking solutions that replace underutilized vehicle parking associated to specific commercial facilities allow coverage to be used for more economically productive uses. Coverage currently used for underutilized parking can be used for housing, retail and jobs that increase the vibrancy of communities and the mix of uses in Town Centers. Further, a significant portion of the underutilized parking spaces in the Tahoe Basin are on parcels without BMPs and generate considerable pollutant loading, as described in the sensitivity analysis results.

Innovative parking designs for residential, mixed-use and commercial projects can also reduce the amount of coverage necessary to park cars. Two example designs include at grade parking garages and half underground podium parking, which are illustrated in Figure 11 below. Both designs tuck parking

below other uses, ranging from decks for residential single-family homes to multiple floors for mixed-use and commercial uses.

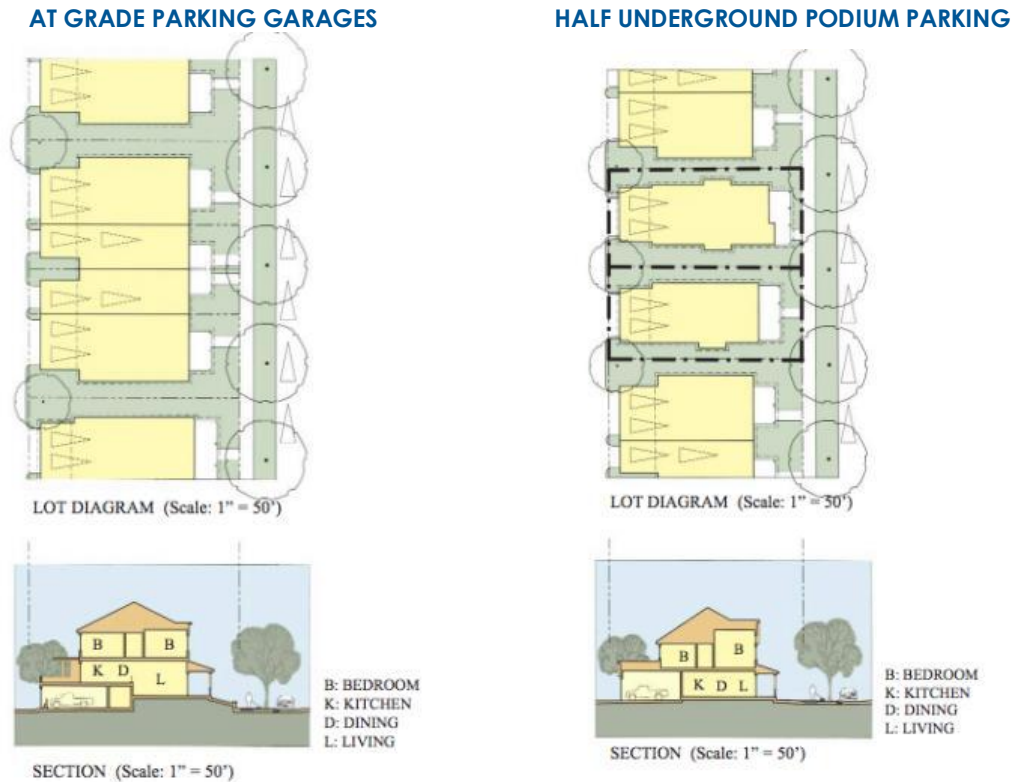


Figure 11: Illustrations of two types of coverage efficient parking solutions - at grade parking garage and half underground podium parking.

Policy Analysis

The TMPO and local jurisdictions are moving towards demand management as a parking management strategy that includes shared parking solutions and the provision of off-site/on-street parking. These parking solutions will take time to implement and involve working with multiple agencies to see results implemented on the ground.

Summary

The design and location of parking has a large impact on the demand for coverage for parking spaces and the economic productivity of coverage in commercial uses. Shared parking solutions in commercial areas, and other innovative parking designs such as at grade parking garages and half underground podium parking can avoid the need for a substantial amount of coverage used for parking in the Tahoe Basin.

Setting basin-wide and jurisdiction-specific parking coverage reduction targets is likely to increase the focus on the need for innovative parking solutions by multi-agency collaborative processes. A basin-wide 8 percent reduction in parking coverage would reduce roughly 80 acres of coverage used by parking. Identifying comparable percentages of coverage used for parking in similar communities would greatly inform the need and importance of policy to address the hypothesized underutilization of parking coverage in the Tahoe Basin.

RECOMMENDATIONS

The recommendations in this section have the potential to improve the effectiveness of the coverage policies in achieving the coverage policy objectives. The recommendations are grouped by the following themes:

- Use a unit of measurement for coverage transfers and mitigation that reflects the impact of coverage rather than just the area of coverage.
- Create incentives to restore coverage in priority areas and redevelop high impact coverage to achieve water quality, riparian function and livable community objectives.
- Support effective private and public sector investments.
- Simplify operational processes and increase policy flexibility, transparency and accountability to reduce the project costs that inhibit beneficial restoration and redevelopment projects, and to enable the policies to be administered at a reasonable cost.

USE ENVIRONMENTAL BENEFIT RATHER THAN TO SQUARE FOOT OF COVERAGE

1) Use site-specific environmental characteristics to determine transfer and mitigation requirements

Implementation Timeframe: Long-term

Implementation Parties: TRPA

Needs for Change Addressed

The current approach to accounting for coverage only considers land capability, and misses other factors that significantly influence the environmental impact of coverage. The current policy does not provide an incentive to

- Restore coverage from sensitive lands instead of holding onto the commodity with the expectation that the coverage value will increase as the limited pool of coverage on low capability land will become more scarce.
- Restore coverage that has significant impacts due to lack of BMPs or being located in a priority areas.
- Place new coverage in a manner that minimizes impact beyond meeting construction requirements.
- Use permeable surfaces when they provide environmental benefits beyond the use of standard BMPs alone.

Further, the current coverage policies are confusing and require understanding multiple elements of Code to determine the appropriate requirements of any transfer or development scenario. Current policies can also impede potentially beneficial projects by limiting the market for available coverage transfers through limitations on transfers within HRAs.

Policy Recommendation Description

Develop a *coverage impact credit system* that defines an area-weighted *coverage impact credit*.¹⁹ Use this coverage impact credit as the basis for coverage transfers and ECM requirements. This is analogous to many wetland mitigation banking protocols

Key Terms

Coverage Impact Credit – Unit of measurement used to bank, transfer, mitigate and account for the environmental impact associated to impervious coverage in the Tahoe Basin.

Coverage Impact Credit System – Set of factors and procedure to determine the impact of coverage based on site-specific environmental characteristics.

¹⁹ Environmental markets use several terms to describe a unit of measurement that incorporates both area and change in environmental quality, including credit, unit and commodity.

used throughout the country.

The coverage impact credit system could be implemented as a coverage impact checklist that clearly defines how to rate important site factors to determine the impact of the coverage on a parcel (see illustration of checklist in Discussion & Illustration section below). The coverage impact credit system would be used in the following ways:

- To remove existing coverage, multiply the area of coverage removed by the *coverage impact score* to determine the amount of coverage impact credit banked.
- To place new coverage, multiply the area of coverage developed by the coverage impact score to determine the amount of coverage impact credit required.
- To fulfill ECM requirements, multiply the area of excess coverage by the coverage impact score to determine the coverage impact credit to mitigate. Table 30.6.1-2: Excess Coverage Reduction Sq. Ft. Factor will need to provide the Reduction % Factor based on coverage impact credit as opposed to square feet.
- To mitigate coverage using ECM in-lieu fees collected, multiply the area of coverage removed by the coverage impact score to determine the amount of coverage impact credit mitigated.

Key Terms

Coverage Impact Score – The quantified change in environmental function from removing or placing new sq. ft. of coverage on a specific site.

Do not restrict use of a coverage impact credit to HRAs, and instead factor in the relative sensitivity between watersheds in the coverage impact checklist.

Discussion & Illustration

A clearly defined checklist can enable a significant portion of the existing coverage policies to be delivered in a format that a developer can easily understand and efficiently employ. Using a form or worksheet to determine coverage transfer or mitigation requirements operationalizes the coverage policies, which reduces or eliminates the need for each project proponent and project review planner to evaluate the applicability of many different elements of code.

Figure 12 is an illustration to demonstrate how a checklist could be delivered. It is **not** a proposal for the factors or actual scores that should be used as an actual coverage impact calculation. Any checklist developed must be supported by very clear definitions of each rating factor, such that multiple independent parties will arrive at the same evaluation of coverage impact.

Criteria and Site Characteristic Options (choose most representative for each site)		Impact Factors	Site Characteristic	Site Factor
Soil Type	1B land capability class	1.0		
	1A, 1C, 2 or 3 land capability class	0.7	X	0.70
	4, 5, 6 or 7 land capability class	0.0		
Coverage Type	Hard or soft coverage	0.5	X	0.50
	Potential coverage	0.0		
Connection to Surface Waterbody	Connects >1 acre of offsite directly connected coverage	0.5		
	Connects between 1/10 and 1 acre of offsite directly connected coverage	0.2	X	0.20
	Does not change amount of offsite directly connected coverage	0.0		
Watershed Priority	Priority One watershed <u>and</u> mean annual rainfall > 40 inches	0.5		
	Priority One watershed <u>or</u> mean annual rainfall > 40 inches	0.4		
	Priority Two watershed <u>or</u> mean annual rainfall > 35 inches	0.2	X	0.20
	Priority Three watershed <u>and</u> mean annual rainfall <= 35 inches	0.0		
Surrounding Land Use	>60% undeveloped	0.5		
	>35% undeveloped	0.2		
	<10% undeveloped	0.0	X	0.00
Coverage Impact Score (Σ)				1.60

Figure 12: Illustration of example coverage impact credit system checklist.

In this example, the coverage impact would be determined by multiplying the area covered by the coverage impact score. Thus, restoring 1,000 square feet of coverage with an impact score of 1.6 would generate 1,600 coverage impact credits. Alternatively, developing 1,000 square feet of new coverage with an impact score of 1.6 would require 1,600 coverage impact credits.

The analysis to determine the most important coverage impact factors, and their relative importance to each other will require significant study and stakeholder engagement. Additional consideration must be given to the incentives created by these factors to ensure perverse incentives are not provided for property owners. For example, BMP implementation was considered for the example coverage impact credit checklist above because coverage on a site without BMPs installed is likely to have a greater water quality impact. However, providing additional value for coverage without BMPs could become a perverse incentive for land owners to not install BMPs.

The factors that go into the coverage impact determination can be limited to water quality, and riparian and habitat function, or expanded to include air quality, transportation and community livability.

A checklist based on site-specific characteristics including watershed condition will provide an incentive to reduce coverage from sensitive watersheds. As opposed to current HRA restrictions which provide an incentive for land owners to hold onto coverage, rather than restore and transfer it, as a potentially valuable commodity in these watersheds. Further, removing HRA restrictions will eliminate supply constraints for beneficial redevelopment projects and reduce land bank overhead to carry coverage inventories to fulfill coverage demand for beneficial projects.

If the coverage impact checklist cannot be sufficiently simple for use by an informed local developer, it may be beneficial to create a simple checklist, or map-based approach that can be used to assess coverage impact from small projects unlikely to result in a significant environmental impact. Conservative assumptions built into this approach should ensure the amount of coverage impact credit determined using this simple approach is equivalent to or greater than the amount required from using a more detailed analysis. When the amount of coverage impact (and area) is limited, this increase in amount of coverage impact credit may pose less of a cost impact than hiring a consultant to perform the evaluation or paying the necessary fee for a site assessment by a qualified planner.

Analysis of Policy Objectives

This recommendation was analyzed assuming only water quality and riparian and habitat function factors are included in the checklist and that those factors adequately address the most critical factors to create incentives for beneficial coverage transfers and high leverage mitigation to occur.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Significant increase in removal of coverage from sensitive lands and over-covered parcels without BMPs Potential for moderate increase in net coverage on low sensitivity lands due to new development in low environmental impact areas to cover more surface area than the area transferred from high impact areas, however offset by transfer and retirement ratio Potential for moderate increase in use of permeable surfaces and other measures that provide water quality benefits beyond standard BMPs
	Riparian & Habitat Function		<ul style="list-style-type: none"> Significant increase in removal of coverage from SEZ floodplains and connected habitat Create disincentive to cover area with hydrologic or habitat features critical to watershed function
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Moderate increase in Town Center FAR and residential density as redevelopment and restoration of over-covered parcels is incentivized, and supply constraints are removed Moderate increase in viewscales and native vegetation as existing coverage connected to streams is restored Moderate increase in density near transit routes as coverage is restored in areas without sufficient infrastructure
	Project Enablement		<ul style="list-style-type: none"> Moderate decrease in cost for redevelopment and development on non-sensitive lands Simplified policy due to checklist reducing the need to understand and analyze sections of existing lengthy and dispersed policies Increase project flexibility with ability to design to minimize coverage impact
	Administrative Viability		<ul style="list-style-type: none"> Simplified policy due to checklist operationalizing sections of existing lengthy and dispersed policies Improved trust by public as policies are based on coverage impact and adaptive management is more feasible Increases options for land banks to meeting ECM equivalency requirements

Implementation Actions

The implementation of this recommendation requires development of a system for evaluating the impact of coverage in a specific location, including a form with supporting guidance that is easy for project proponents to use and consistently generate accurate results.

Development of a system for evaluating the impact of coverage will require the following actions:

- 1) Designate a lead to develop a coverage impact credit system.
- 2) Assemble a technical committee to review and contribute to the development of the system. The committee should contain hydrology, soil, habitat and land use experts with knowledge of the Tahoe Basin.
- 3) Define a set of factors to determine the impact of coverage on a specific site. The Individual Parcel Evaluation System (IPES) should be the starting point for development of these factors. Proximity to Lake Tahoe is currently a criterion in the IPES system and replacing this criterion with a criterion that evaluates the site's connectivity to surface waterbodies should be considered since connectivity more accurately reflects the likelihood that a site's pollutant loading will reach Lake Tahoe and considers the water quality of other waterbodies such as streams.
- 4) Commission an external expert review of the coverage impact factors.

Development of the form and supporting guidance for determining the impact of coverage using the factors developed will require the following actions:

- 1) Develop draft form and guidance for project proponents to determine the coverage impact of a specific site. The form and guidance must be easy to understand and generate consistent and repeatable results.
- 2) Augment the technical committee with land use and development experts, and policy administrators with knowledge of the Tahoe Basin with the charge of ensuring the form and guidance are practical for use by project proponents and planners.
- 3) Test the form and guidance on past and current projects to identify and resolve potential issues and ensure consistent results across sites and repeatable results between different users.
- 4) Update Chapter 30 of the Code of Ordinances (Code) to include the use of the form and coverage impact credit for determining coverage transfer requirements. Significant portions of existing code may be removed since the concepts will be imbedded in the form and guidance. For example, land capability class will be imbedded in the form so the requirement of transferring less or equally sensitive coverage for residential transfers may no longer be needed.
- 5) Publish the form and guidance on TRPA's website.
- 6) Develop an annual process to evaluate and improve the usability and effectiveness of the form based on use over the previous year.

USE INCENTIVES TO RESTORE HIGH IMPACT COVERAGE

2) Increase flexibility to effectively invest excess coverage mitigation fees, and provide alternative means for local jurisdictions to address excess coverage mitigation requirements**Implementation Timeframe:** Short-term and long-term**Implementation Parties:** TRPA, CTC & NDSLNeeds for Change Addressed

The excess coverage mitigation in-lieu fee program is not effectively mitigating coverage because:

- 1) Not all collected fees have been used and thus complete mitigation is not occurring at this time.
 - ECM in-lieu fees are lower than the cost of purchasing and restoring existing coverage.
 - The requirement to mitigate 1 square foot (sf) of coverage for each 1 sf of mitigation fee collected within each hydrologically related area (HRA) creates a liability for land banks, especially in HRAs with limited available coverage supply.
- 2) Sensitive lands are not being restored with ECM fees.
 - Most ECM in-lieu fees are used to retire potential coverage.
 - There is no requirement or incentive for ECM fees to restore coverage on sensitive lands, and coverage on sensitive lands is typically more costly to retire than coverage on high capability land.
- 3) Project proponents mostly choose to pay in-lieu fees instead of mitigating on-site or off-site
 - The ECM in-lieu fee levels are significantly low and do not incentivize on-site and off-site mitigation.

Further, excess coverage exists on many privately owned parcels in the basin, and primarily on parcels that have not received recent investment and do not have BMPs because:

- 1) The project approval process is sufficiently cumbersome and costly.
 - It can take several months, or even years, to receive a permit for project.
- 2) Excess coverage must be mitigated to redevelop a parcel, however ECM is a deterrent to redevelopment projects
 - The cost of ECM can be as much as 6.5% of the total project costs and creates a barrier for redevelopment necessary to reduce the impacts of existing coverage.
 - ECM only applies to permits for structural building changes, so land owners are more likely to implement cosmetic changes that do not include LID practices.
- 3) Enforcement of BMPs has not been politically or financially practical, as demonstrated by a meager BMP compliance level of less than 30 percent basin-wide.

Policy Recommendation Description

For existing ECM funds already collected

- Release sf for sf requirement and invest available funds to restore sensitive lands deemed environmentally beneficial anywhere in the basin.
- Use a reverse auction to ensure at least a majority of unspent funds are invested by end of 2013.

For future ECM funds collected

- Retire coverage on a 1 sf for 1 sf basis anywhere in the basin (remove current HRA restriction), and retire one of the specific types of coverage listed below. If Recommendation #1 is implemented, use the coverage impact credit system to determine mitigation requirements as opposed to the 1 sf for 1 sf basis and specific types of coverage.

- Existing coverage from any land capability class.
 - Potential coverage from low land capability classes.
 - Existing or potential coverage from privately owned and developable areas without roads or other public infrastructure.
- Ensure ECM in-lieu fee is set to sufficiently cover actual costs of mitigation and administration, potentially set by land banks, or set by TRPA with agreement from land banks that the fee is sufficient to acquire and retire environmentally equivalent benefits.
 - The next fee increase should be published 6 months in advance of the fee increase date in order to motivate short-term mitigation.
 - Property rights often make the largest portion of the cost to acquire and retire coverage. If the opportunity set of coverage without property rights exists, then in-lieu fees may need to be based on and used to acquire coverage without property rights. Other pools of funds such as other land bank program areas could provide funding to acquire property rights with coverage only sold with property rights since acquiring the property rights may fulfill the objectives of other pools of funds.
- Require ECM for any project permit, not just structural change, and reduce the ECM requirement based on the total project cost.

Provide local jurisdictions with an alternative to meet excess coverage mitigation requirements within their jurisdiction. The alternative requires the local jurisdiction to collect a stormwater fee from parcels within their jurisdiction that are not compliant with BMP requirements and/or have not mitigated all excess coverage onsite, and then the funds collected must be used to restore and retire coverage.

- The BMP compliance element of the fee should be based on the size of the parcel. The BMP certification database can be used to determine if a fee applies to the parcel, and the fee should be reduced but not eliminated if BMPS are installed but a BMP certification cannot be achieved for the parcel due to site characteristics.
- The excess coverage mitigation element of the fee should be based on the amount of unmitigated excess coverage. Determining the existence of excess coverage will require past coverage transfers and excess coverage mitigation to be accessible and compared to current impervious coverage. Current coverage can be determined using the LiDAR dataset.
- A minimum fee for BMP non-compliance and/or unmitigated excess coverage must fund existing coverage removal using the existing land bank process or an alternative method. The local jurisdiction can add to the minimum fee to generate revenue for internal uses such as implementing stormwater treatment measures.

Discussion & illustration

Need to Keep ECM Policies

A fundamental question posed by many who have been frustrated by the ECM policies is “should the ECM policies be eliminated all together?” In particular, the disincentive that the ECM policies create for development projects that provide environmental and community benefits is suggested as a reason in of its self to eliminate the ECM policy. As described in Finding #1 above, impervious surface coverage can create significant environmental impacts, especially when parcels are substantially covered and do not have BMPs installed. The ECM policies create an economic incentive that encourages project developers to reduce excess coverage onsite and ECM fees raise funds that are used by the land banks to eliminate high impact coverage. Thus, an ECM program that yields actions that reduce coverage, and most likely high impact coverage, is very useful in achieving the basin’s water quality and habitat objectives.

Excess Coverage Mitigation In-lieu Fee Program Effectiveness

Limiting the use of ECM in-lieu fees to the three types of coverage listed above requires ECM in-lieu fees to be used to provide direct environmental benefits or avoid potential development with significant

environmental impact. Limiting the use of ECM in-lieu fees further, to existing 1B coverage for example, would constrain the opportunity set and a similar situation as today with the HRA restrictions should be expected. The few willing sellers of 1B coverage could demand per sf prices that would require ECM in-lieu fees that would become a barrier to redevelopment.

Limiting the use of ECM in-lieu fees to existing coverage from sensitive land capability classes is another option, however land capability classes 1a and 1c consist of steep mountainous terrain and mountainous uplands respectively. Thus, it is expected the views are excellent from these areas so high property values would require high coverage retirement costs and environmental benefit is reduced due to high-end homes with BMPs installed. Further, over 50% of the coverage in these two land capability classes consists of roads which are unlikely to be removed. Lastly, criteria recommended in Recommendation #22 should be used to compare and prioritize coverage retirement opportunities that will prioritize 1B and other priority coverage.

Potential coverage in sensitive land capability classes, and privately owned and developable areas without roads or other public infrastructure, is a recommended option for ECM in-lieu fee use in order to avoid future new development. New development creates environmental impacts and may delay the benefits of redeveloping Town Centers. The environmental benefit is indirect and delayed, however material. Roads make up approximately 1/3rd of the coverage in the basin so retiring coverage in an undeveloped but developable area can avoid the installation of the coverage retired as well as the coverage needed for roads to access the new development. Further, undeveloped areas are likely to be highly functioning and connected habitat, and avoiding development of the area preserves this habitat. Retiring potential coverage in sensitive land capability classes also preserves habitat that is likely to be highly functioning and connected since surrounding areas are likely to be undeveloped, and near streams or other waterbodies.

Eliminating HRA restrictions for the use of excess coverage mitigation fees will result in environmental improvements by:

- Retiring coverage closer to fee collection due to a greater opportunity set and lower search costs.
- Enabling viable redevelopment projects throughout the basin that provide environmental improvements to the project site, while setting an excess coverage mitigation price that covers the actual cost to retire coverage.
- Retiring more impactful coverage at a lower cost through consolidation of fees collected across HRAs for large transactions, such as rundown commercial properties with excess coverage.
- Reducing administrative costs required to find willing sellers at reasonable prices in supply constrained HRAs and reducing the need to negotiate a large volume of smaller deals.

Land banks should evaluate potential coverage acquisitions using the coverage impact credit system, or a similar set of criteria as described in context of a reverse auction in Recommendation #22. After limiting the use of ECM in-lieu fees to specific types of coverage, as listed in the Policy Recommendation Description above, there are still significant differences in environmental return on investment between different potential coverage acquisitions. See recommendation #22 for additional context.

ECM In-Lieu Fee Level

ECM in-lieu fee level(s) must equal the actual cost to acquire and restore coverage. Eliminating the HRA restriction related to use of ECM in-lieu fees will significantly increase the opportunity set and allow funds to be pooled, allowing land banks to identify lower cost opportunities and reduce administrative costs. The reduction in coverage acquisition costs will enable an ECM in-lieu fee level that does not inhibit development projects that require mitigation of excess coverage. Further, acquiring property title with the coverage rights significantly increases the cost of mitigation, so prioritizing acquisition of coverage without property title will decrease the necessary mitigation fee level.

Projecting the cost of coverage is difficult due to several dynamic factors including the real estate market conditions. One method to address this challenge is for land banks to raise seed capital for an initial coverage acquisition. Then set the ECM in-lieu fee level to cover this initial coverage acquisition, including administrative costs. After fees are collected and land banks make another coverage acquisition, the ECM in-lieu fee level should be adjusted to coverage this next coverage acquisition.

Another opportunity for market price discovery is the implementation of a reverse auction.

Stormwater Fee Alternative to Meet ECM Requirements

The current excess coverage mitigation policies penalize land owners with excess coverage who redevelop their properties and provide environmental benefits. While land owners who do not have BMPs on their property or have unmitigated excess coverage and do nothing are not penalized. Replacing the existing ECM policies with a stormwater fee a) removes a significant barrier to redevelopment, b) incentivizes land owners to install BMPs and mitigate excess coverage, and c) collects funds to mitigate excess coverage.

Implementing a stormwater fee will be challenging. However, jurisdictions should be interested in removing a major barrier to redevelopment within their community and incentivizing the installation of BMPs to help reach their water quality goals. It may be helpful for jurisdictions to bundle the fee with existing fees or titled using more effective language such as a stormwater investment fund.

The stormwater fee should have two components, one based on the amount of excess coverage and the other based on BMP compliance. An analysis should be conducted to identify the total amount of excess coverage and the number of parcels that are not compliant with BMPs. Then both components should be priced in order to raise approximately the same amount of funds that the ECM program is currently raising each year, which is approximately \$500,000. Five case studies in the Guidance for Municipal Stormwater Funding revealed stormwater fees for private properties range from \$1.36 to \$20/parcel/month.²⁰

Philadelphia, Pennsylvania uses a stormwater fees based on the impervious coverage on the parcel and provides credits for property owners that install best management practices. Philadelphia uses GIS imaging to determine the impervious coverage on a parcel.

Analysis of Policy Objectives

The recommended changes to the ECM in-lieu fee program and the stormwater fee alternative to meet ECM requirements are evaluated separately below.

Excess Coverage Mitigation In-lieu Fee Program

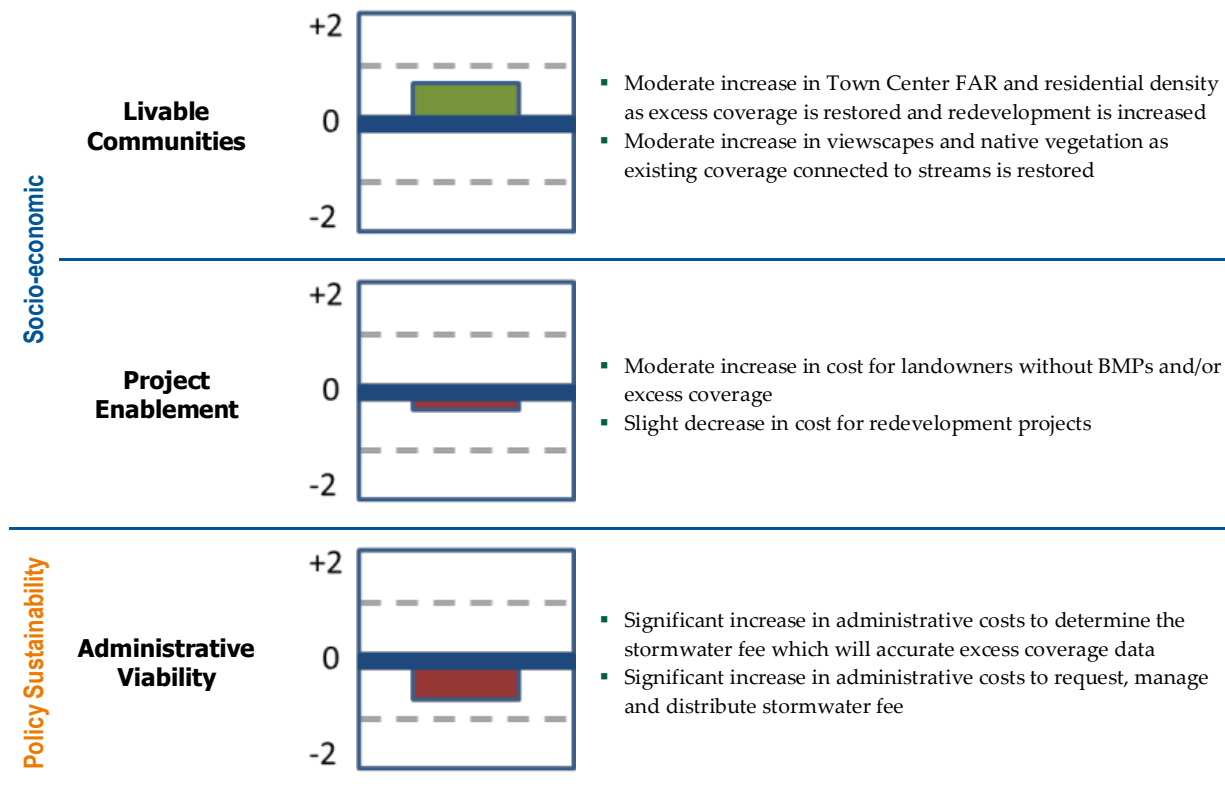
	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality	<p>A vertical scale with tick marks at -2, 0, and +2. A green rectangular bar is positioned between the 0 and +2 marks, indicating a positive impact on water quality.</p>	<ul style="list-style-type: none"> ▪ Direct removal of hard and soft coverage on sensitive soils and over-covered parcels without BMPs and connected to streams, as opposed to primarily potential coverage ▪ Moderate increase in removal of coverage on over-covered parcels as redevelopment projects choose more onsite mitigation

²⁰ Tucker, et al. 2006. Guidance for Municipal Stormwater Funding. Prepared by National Association of Flood and Stormwater Management Agencies.

Socio-economic	Riparian & Habitat Function		<ul style="list-style-type: none"> Moderate increase in land bank restoration of SEZ floodplains and connected habitat Ability to target restoration of development that is critical to increase infiltration capability in watershed and reduce connectivity to surface waters
	Livable Communities		<ul style="list-style-type: none"> Moderate increase in Town Center FAR and residential density as existing coverage are retired as opposed to potential coverage Potential decrease in redevelopment projects due to potential ECM fee increase in some HRAs Potential increase in parking utilization as existing over-covered parcels are restored Moderate increase in viewscales and native vegetation as existing coverage connected to streams is restored
	Project Enablement		<ul style="list-style-type: none"> Potential increase in cost for residential redevelopment due to ECM fee increase in some HRAs Potential increase in residential development due to less pressure on potential coverage supply Potential increase in cost for redevelopment projects in some HRAs Potential increase in private restoration projects to mitigate redevelopment projects instead of paying the ECM fee
	Administrative Viability		<ul style="list-style-type: none"> Significant reduction in search and overhead costs as land banks pursue fewer, larger coverage acquisitions with ECM funds Eliminates unfunded liability for land banks Simplified accounting and reporting Unlock opportunities for fees in HRAs with little supply Creates flexibility to match actual cost to fee Provides accountability for new fees

Stormwater Fee Alternative to Meet ECM Requirements

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Significant increase in restoration and retirement of existing coverage, including coverage on 1B and sensitive soils, and parcels without BMPs due to negative financial incentive Significant decrease in net coverage basin-wide as existing coverage is restored Significant decrease in FSP loading from private parcels as excess coverage is restored and BMPs are installed Moderate increase in stormwater treatment in Town Centers as local jurisdictions receive fees to install treatment facilities Slight increase in redevelopment that installs BMPs since the impact of ECM costs on total project costs will be reduced
	Riparian & Habitat Function		<ul style="list-style-type: none"> Moderate increase in restoration of coverage in SEZ floodplains and connected habitat as excess coverage is restored Significant decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and BMP installations



Implementation Actions

Existing ECM funds already collected

Using ECM funds already collected to achieve maximum environmental benefit will require the following actions:

- 1) Determine the terms and clearly define criteria for rating the value of proposals for a reverse auction run simultaneously in California and Nevada, or run as a single reverse auction. The criteria should be informed by those defined in Recommendation #22.
- 2) Determine the last date current ECM fee levels will be applied, publish sunset date and new fee level(s) 6 months in advance and include this policy change in Chapter 30 of the Code.
- 3) Determine the total ECM funds available for the reverse auction(s).
- 4) Implement reverse auction(s) using the Implementation Actions detailed in Recommendation #22.

Future ECM funds

Implementing the recommended changes for use of future ECM funds will require the following actions:

- 1) Determine the date that a basin-wide or state-specific ECM fees will replace the existing HRA specific ECM fees.
- 2) Update section 30.6 of the Code
 - a. New ECM fee level(s).
 - b. ECM applies to any project permit, not just structural changes.
 - c. Reduce the Excess Coverage Reduction SF Factor for all Square Feet of Excess Coverage amounts by a specific % to reduce cost for structural redevelopment since non-structural redevelopment will now be contributing to mitigation funds.

- 3) Update the MOUs between TRPA and the CTC and NDSL land banks with
 - a. ECM in-lieu fees collected can be used basin-wide.
 - b. ECM in-lieu fees can be used to retire specific types of coverage defined in Policy Recommendation Description section above.
- 4) Establish a protocol for setting ECM fee increases that requires the land banks to project expected costs for mitigation. Update section 30.5 of the Code to reflect the new ECM fees and the process to change ECM fees in the future.
- 5) Aggressively publish the date the new ECM fee(s) will be applied and the new fee level(s) to be transparent and motivate immediate mitigation of excess coverage before any fees increase. Also provide sufficient lead-time so that mitigation can be undertaken or vested under the then existing fee schedule.

Stormwater Fee Alternative to Meet ECM Requirements

Implementing the stormwater fee option will require the following actions (local jurisdiction actions are excluded):

- 1) Develop a database with accurate excess coverage data for each parcel in the basin by APN.
- 2) Determine the minimum per parcel stormwater fee required by local jurisdictions and the mechanism for requesting, collecting, managing and distributing stormwater fees collected for coverage reduction.
 - a. Determine the minimum stormwater fee per parcel without BMPs. The stormwater fee should create an incentive to install BMPs.
 - b. Define and document the processes related to requesting, collecting, managing and distributing stormwater feeds collected for coverage reduction.
 - c. Share the documented process with all local jurisdictions and request feedback for improving the efficiency and effectiveness of the process.
- 3) Update section 3.6 of the Code to reduce the Mitigation Amount for redevelopment projects.
- 4) Develop a simple annual process to audit jurisdictions to ensure the appropriate funds are collected and coverage is restored.
 - a. Document the annual audit process, including the source and equations to determine the BMP compliance and excess coverage mitigation elements of the fund, and the method to document the status of each annual audit.
 - b. Share annual audit process with all local jurisdictions and request feedback for improving the efficiency and effectiveness of the process.
 - c. Assign the annual audit responsibility to a staff member.

3) Allow conversion of impervious coverage to other transferrable development rights

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policies do not effectively

- Incentivize restoration and retirement of coverage, especially on sensitive lands, at a pace to achieve significant environmental improvement and make progress towards achievement of the Impervious Cover threshold.
- Incentivize redevelopment of existing coverage without BMPs and commercial use sites with excess coverage producing significant FSP loading.

- Incentivize compact and infill development necessary to achieve environmental and community goals.

Further, there are few willing sellers and a high cost of acquisition of transferrable development rights, especially for project proponents that are not working with the few consultants in the basin that understand the system and have relationships with the few willing sellers.

Policy Recommendation Description

Allow coverage to be converted to other transferrable development rights using defined ratios based on a coverage benefit or square feet of different types of coverage. Each transferrable development right creates different environmental impacts so a unique ratio should exist for each commodity. The bonus pool should provide transferrable development rights allocated so that commodity-specific capacity ceilings for the Tahoe Basin evaluated in Regional Plan Update Environmental Impact Statement (EIS) are not compromised.

Two options for setting conversion ratios are listed below. The first requires the adoption of the coverage impact credit described in recommendation #1.

- 1) Set a coverage impact credit conversion amount that is equivalent to a single unit of each transferrable development right commodity.
- 2) Set a square foot impervious coverage amount for each type of coverage that is equivalent to a single unit of each transferrable development right.

Discussion & Illustration

Land owners should be able to restore, retire and convert coverage without a project application so that coverage retirement can occur directly from a project permit or indirectly if the land owner wants to sell the commodity on the market.

The conversion amounts should incentivize restoration and retirement of coverage and provide project proponents added flexibility when the market is in short supply of transferrable development rights.

Coverage restored and retired for conservation is likely to be coverage without BMPs and thus resulting in a significant environmental benefit.

Option 1: A single coverage impact credit conversion amount for each transferrable development right commodity, as opposed to square foot values for different types of coverage for each commodity, can be used since the benefit conversion value encompasses the land capability and type of coverage as well as other key factors that influence the impact of the coverage.

Option 2: A square foot impervious coverage conversion amount for each transferrable development right commodity (*Commercial Floor Area, Existing Residential Unit, Tourist Accommodation Units and Residential Development Right*) should incentivize retirement of sensitive lands by providing more attractive ratios for sensitive lands. The following table illustrates this concept.

Key Terms

Commercial Floor Area (CFA): The gross square footage of floor area within the outer wall of a commercial building, not including stairwells and airshafts. The square footage of other facilities relating to such building, including but not limited to decks that are designated for commercial use under a permit, shall be considered commercial floor area.

Existing Residential Unit (ERU): The combined value of a building allocation and a residential development right.

Tourist Accommodation Unit (TAU): One bedroom, or a group of two or more rooms with a bedroom, with or without cooking facilities, primarily designed to be rented by the day or week and occupied on a temporary basis.

Residential Development Right (RDR): The right to potential residential use that is attached to certain parcels in the region in accordance with Section 50.3. A development right is not a vested right.

COMMODITY (SINGLE UNIT)	IMPERVIOUS COVERAGE CONVERSION AMOUNT
1 Square Foot of Commercial Floor Area (CFA)	<ul style="list-style-type: none"> ▪ 2 ft² of potential coverage ▪ .5 ft² of existing 1B coverage ▪ 1 ft² of existing sensitive coverage ▪ 1.5 ft² of existing non-sensitive coverage
Existing Residential Unit (ERU)	<ul style="list-style-type: none"> ▪ 1,000 ft² of potential coverage ▪ 350 ft² of existing 1B coverage ▪ 450 ft² of existing sensitive coverage ▪ 550 ft² of existing non-sensitive coverage
Tourist Accommodation Units (TAU)	<ul style="list-style-type: none"> ▪ 1,000 ft² of potential coverage ▪ 350 ft² of existing 1B coverage ▪ 450 ft² of existing sensitive coverage ▪ 550 ft² of existing non-sensitive coverage
Residential Development Right (RDR)	<ul style="list-style-type: none"> ▪ 75 ft² of potential coverage ▪ 25 ft² of existing 1B coverage ▪ 35 ft² of existing sensitive coverage ▪ 45 ft² of existing non-sensitive coverage

Square foot coverage conversion amounts in the above table were determined by dividing the lowest identified market price for each transferrable development right commodity by the high end of expected basin-wide market price for each type of coverage. Market data sources include private market data supplied to this study, the Tahoe Basin Marketable Rights Transfer Program Assessment by the Solimar Research Group in 2003²¹, and land bank coverage and TDR pricing sheets between 2010 and 2011. Further, conversion amounts were adjusted to reflect the relative environmental impact for each type of transferrable development right commodity. These conversion amounts are only **examples** and **need to be vetted** thoroughly based on all changes to the coverage and TDR policies included in the RPU.

Analysis of Policy Objectives

The following analysis is based on the assumption that the coverage conversion amounts make coverage restoration and retirement a less or equally expensive option than the market price for commodities under average market conditions.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> ▪ Significant increase in restoration and retirement of existing and potential coverage, including coverage on 1B and sensitive soils, and primarily over-covered parcels without BMPs ▪ Moderate increase redevelopment, primarily in commercial areas, due to increased access to lower cost commodities; however water quality requirements will limit impacts ▪ Moderate decrease in net coverage basin-wide as net coverage supply decreases as coverage is converted to commodities
	Riparian & Habitat Function		<ul style="list-style-type: none"> ▪ Moderate increase in restoration of SEZ floodplains and connected habitat ▪ Slight decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs

²¹ Solimar Research Group, 2003. Tahoe Basin Marketable Rights Transfer Program Assessment. Prepared for The League to Save Lake Tahoe with funding from The David and Lucile Packard Foundation and the William and Flora Hewlett Foundation.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Moderate increase in Town Center FAR and residential density as existing coverage is retired and redevelopment is increased Slight increase in viewscales and native vegetation as existing coverage connected to streams is restored Slight increase in active transportation due to increase in residential and tourist units in close proximity to transit
	Project Enablement		<ul style="list-style-type: none"> Slight decrease in cost for commercial, tourist accommodation and multi-residential development, especially in HRAs with commodity supply shortages Slight increase in private restoration projects to convert coverage for redevelopment projects Slight increase in cost of coverage as net coverage supply decreases over time
Policy Sustainability	Administrative Viability		<ul style="list-style-type: none"> Slight increase in administrative costs to administrate additional coverage policy, track use of the incentive and adapt conversion values over time Slight increase in policy adaptability with ability to use data to adjust conversion ratios and achieve desired outcomes

Implementation Actions

Implementing this new coverage retirement incentive will require the following actions:

- 1) Update Chapter 6 of the Code to include this incentive using a table similar to the example provided in the Discussion & Illustration section above.
- 2) Develop an accounting system to track the use of this incentive in order to evaluate the use of the incentive and calibrate conversion ratios over time.
 - The type of coverage converted and commodity received must be tracked in order to calibrate specific conversion amounts. The tracking accounting system can be as simple as a spreadsheet.
- 3) Define a recurrent process to evaluate and adjust the conversion amounts to ensure amounts provide project proponents an attractive alternative to securing commodities while maximizing the environmental benefit of retiring coverage. This process will be especially important in the first few years after implementing the policy as each ratio needs to be calibrated.

4) Permanently retire impervious coverage in order to permit floors three and higher where allowed by zoning

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policies do not effectively incentivize restoration and retirement of coverage, especially on sensitive lands, at a pace to achieve significant environmental improvement and make progress towards achievement of the Impervious Cover threshold.

Policy Recommendation Description

Require permanent coverage retirement for projects to build each floor three and higher where existing zoning policies allow more than two floors. Retirement of excess coverage on the project site applies towards the retirement amount. Each floor starting at the 3rd floor requires a defined amount of each type of coverage to be retired.

Two options for setting retirement ratios are listed below. The first requires the adoption of the coverage impact credit described above in recommendation #1.

- 1) Set a coverage impact credit retirement amount that is equivalent to a single new floor.
- 2) Set a square foot impervious coverage amount for each type of coverage that is equivalent to a single new floor.

Discussion & Illustration

Project proponents must show proof of coverage retirement by presenting deed restrictions for the sending and receiving sites that demonstrate permanent retirement of the coverage from the sending site and do not increase the coverage on the receiving site.

The coverage retirement amounts should be minimal so to add no material impact to project costs, which would function as a disincentive to redevelopment. However, each additional building floor significantly increases FAR and economic feasibility for the project so a minimal cost is easily offset by this opportunity for increased revenue generation.

Transaction costs, such as search costs, to acquire coverage are currently material and must be included in the net impact to project costs. If transaction costs are reduced due to operational improvements such as creation of a mechanism for interested buyers and willing sellers to find each other recommended below, then retirement amounts can be increased.

A single set of coverage retirement amount for each type of coverage should be used due the varying environmental benefit and cost of each type of coverage. The following table illustrates this concept.

ADDITIONAL FLOOR	IMPERVIOUS COVERAGE RETIREMENT AMOUNT
1 Floor	<ul style="list-style-type: none"> ▪ 150 ft² of potential coverage ▪ 40 ft² of existing 1B coverage ▪ 55 ft² of existing sensitive coverage ▪ 70 ft² of existing non-sensitive coverage

Square foot coverage retirement amounts in the above table were determined by dividing \$2,500 by the high end of expected basin-wide market price for each type of coverage. Coverage market prices were informed by private market data supplied to this study, market data published in the Tahoe Basin Marketable Rights Transfer Program Assessment by the Solimar Research Group in 2003²², and land bank coverage pricing sheets between 2010 and 2011. These conversion amounts are **examples** and **need to be vetted** thoroughly based on all changes to the coverage and TDR policies included in the RPU.

²² Solimar Research Group, 2003. Tahoe Basin Marketable Rights Transfer Program Assessment. Prepared for The League to Save Lake Tahoe with funding from The David and Lucile Packard Foundation and the William and Flora Hewlett Foundation.

Analysis of Policy Objectives

The following analysis is based on the assumption that the coverage retirement amounts do not create additional material costs to redevelopment projects under any market conditions.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Slight increase in restoration and retirement of existing and potential coverage, including coverage on 1B and sensitive soils, and over-covered parcels without BMPs Slight decrease in net coverage basin-wide as net coverage supply decreases as coverage is converted to develop higher than two floors
	Riparian & Habitat Function		<ul style="list-style-type: none"> Slight increase in restoration of SEZ floodplains and connected habitat Slight decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Moderate increase in Town Center FAR and residential density as existing coverage is retired and additional floors are utilized Slight increase in viewscales and native vegetation as existing coverage connected to streams is restored, however some viewscape improvement will be offset by additional floors
	Project Enablement		<ul style="list-style-type: none"> Slight increase in cost for commercial, tourist accommodation and multi-residential development Slight increase in private restoration projects to convert coverage for redevelopment projects greater than two floors Significant increase in project flexibility if additional floors were not otherwise permitted
Policy Sustainability	Administrative Viability		<ul style="list-style-type: none"> Slight increase in administrative costs to administer additional coverage policy

Implementation Actions

Implementing this new coverage retirement incentive will require the following actions:

- 1) Update Chapter 6 of the Code to include this incentive using a table like the example provided in the Discussion & Illustration section above.

5) Allow relocation of existing coverage from commercial uses on 1B land capability parcels to high capability parcels in Town Centers and cover up to 80% of the receiving site

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Restoration of existing coverage, especially over-covered commercial parcels, in 1B lands is critical to achieving the Impervious Cover threshold. Coverage policies allow noncontiguous parcels to be combined when defining the project area for a new project, which creates an incentive for restoration of sensitive lands by allowing maximum coverage on the project site to be based on the total project area. However, since the base allowable coverage on 1B lands is 1% the increase in maximum allowable coverage on the project site is increased by only 1% if the site with existing coverage is on 1B lands which does not create the incentive needed to restore 1B lands.

Policy Recommendation Description

Allow relocation of coverage from parcels on 1B lands to coverage up to 80% of the project site as long as a) 80% of the receiving site is less than or equal to 70% of the total project area that includes both noncontiguous sites, and b) the receiving site can infiltrate the 20-year 1-hour storm before reaching a surface waterbody per existing BMP requirements. All coverage on the sending site is required to be restored and permanently retired. Restored coverage on the sending site not needed by the project can be transferred for sale as long as the coverage is transferred to high capability lands.

Discussion & Illustration

The Water Quality Management Plan for the Lake Tahoe Region prepared by TRPA under section 208 of the federal Clean Water Act prohibits more than 70% coverage on a project site. The 80% maximum allowed coverage on the receiving site element of this recommendation is permissible since the sending site is included in the total project area, and 80% of the receiving site is less than or equal to 70% of the total project area that includes both noncontiguous sites assuming the entire sending site is restored.

Analysis of Policy Objectives

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Slight increase in restoration of existing coverage on 1B soils, and primarily over-covered parcels without BMPs Potential increase in redevelopment of over-covered sites without BMPs
	Riparian & Habitat Function		<ul style="list-style-type: none"> Slight increase in restoration of SEZ floodplains and connected habitat Slight decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Slight increase in Town Center FAR and residential density as existing coverage is retired, redevelopment is increased and maximum allowed coverage on receiving site is increased Slight increase in viewscales and native vegetation as existing coverage connected to streams is restored Slight increase in active transportation due to increase in residential and tourist units in close proximity to transit
	Project Enablement		<ul style="list-style-type: none"> Significant decrease in cost for projects that utilize incentive as 100% of coverage from sending site can be transferred or sold Moderate increase in project flexibility for projects that utilize incentive due to increase in maximum allowed coverage on receiving site increasing revenue opportunity for land area
Policy Sustainability	Administrative Viability		<ul style="list-style-type: none"> Slight increase in administrative costs due to added complexity of policy; however, this is expanding existing policy and not creating a new policy, and will be utilized by few projects

Implementation Actions

Implementing this expansion of the noncontiguous parcel will require the following actions:

- 1) Update section 30.4.1.C.2.a.v of the Code to include: The maximum allowable coverage on the receiving site is 80% or 70% of the total project area if a) the sending site is on 1B lands, b) the receiving site is on high capability lands in a Town Center, and c) 100% of the coverage on the sending site is restored and permanently retired from the sending site.
- 2) Publish this policy change and ensure priority property owners are aware of the policy.

6) Allow a 1:1 coverage transfer ratio for coverage from sensitive lands to Town Centers up to maximum allowed

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policies do not effectively

- Incentivize restoration and retirement of coverage on sensitive lands at a pace to achieve significant environmental improvement and make progress towards achievement of the Impervious Cover threshold.
- Incentivize redevelopment of existing coverage without BMPs and commercial use sites with excess coverage producing significant FSP loading.
- Incentivize compact and infill development necessary to achieve environmental and community goals.

Policy Recommendation Description

Eliminate this retirement ratio for soft or hard coverage transferred from sensitive lands to cover above 50% of the project site so that all coverage transferred to cover above 50% of the project site is transferred 1 square foot for 1 square foot.

Discussion & Illustration

Currently only hard coverage can be transferred for commercial uses and coverage transfer retirement ratio applies to the transfer of coverage above 50% for land uses that can cover up to 70% of the project site. This policy would make an exception for transfer of existing coverage, either soft or hard, from sensitive lands. Recommendation #7 recommends soft coverage from sensitive lands to be transferred for commercial uses.

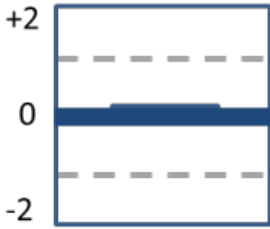
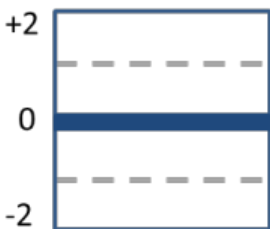
All new projects must comply with BMP requirements which require that the 20-year 1-hour storm be infiltrated before reaching a surface waterbody. Although there are project sites that are unable to infiltrate 20-year 1-hour storm due to site restraints, those sites still create minimal water quality impacts while restoration of existing coverage on sensitive lands is likely to generate significant water quality benefits because those sites are likely without BMPs, plus restoration of sensitive lands provides significant riparian and habitat function benefits.

This policy recommendation applies to redevelopment and development of vacant parcels. Recommendation #10 recommends both redevelopment and development of vacant parcels be allowed to cover up to 70% for allowable land uses.

Analysis of Policy Objectives

The following analysis is based on the assumption that the market price of existing coverage sensitive lands is expected to be more than double the price of existing coverage from high capability lands and therefore there are likely a limited number of instances when this policy would be utilized.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Slight increase in restoration and retirement of existing coverage on 1B and sensitive soils, and primarily over-covered parcels without BMPs Slight increase redevelopment, primarily in commercial areas, due to increased access to lower cost coverage
	Riparian & Habitat Function		<ul style="list-style-type: none"> Slight increase in restoration of SEZ floodplains and connected habitat Slight decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Slight increase in Town Center FAR and residential density as existing coverage is retired and redevelopment is increased Slight increase in viewsapes and native vegetation as existing coverage connected to streams is restored

OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
<p>Project Enablement</p>		<ul style="list-style-type: none"> ▪ Slight decrease in cost for commercial, tourist accommodation and multi-residential development, especially in HRAs with coverage supply shortages ▪ Slight increase in private restoration projects to convert coverage for redevelopment projects
<p>Administrative Viability</p>		<ul style="list-style-type: none"> ▪ Slight increase in administrative costs to administer modified coverage policy

Implementation Actions

Implementing this modification to the retirement ratio for transferring coverage to coverage more than 50% of a parcel will require the following actions:

- 1) Update section 30.4.4.A.2 of the Code to include: Existing coverage, either soft or hard coverage, can be transferred to cover more than 50% of the project site at a ratio of 1:1 if the coverage is from land capability classes 1A, 1B, 1C, 2 or 3.

7) Allow soft coverage to be transferred for commercial development in Town Centers

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policies do not effectively

- Incentivize restoration and retirement of coverage on sensitive lands at a pace to achieve significant environmental improvement and make progress towards achievement of the Impervious Cover threshold.
- Incentivize redevelopment of existing coverage without BMPs and commercial use sites with excess coverage that produce significant FSP loading.
- Incentivize compact and infill development necessary to achieve environmental and community goals.

Policy Recommendation Description

Allow soft coverage from sensitive lands to be transferred for commercial development in adopted Town Centers.

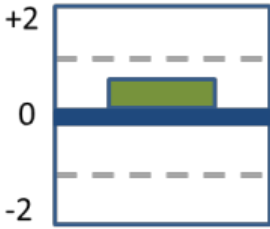
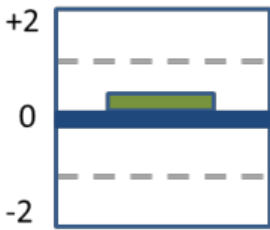
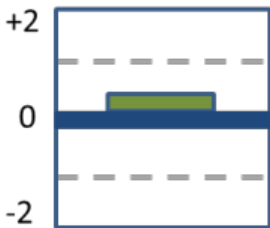
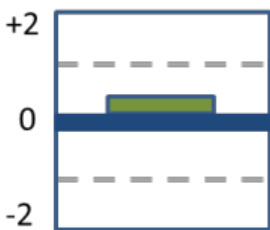
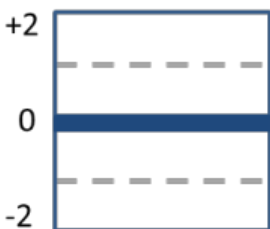
Discussion & Illustration

Currently only hard coverage can be transferred for commercial uses. This policy would make an exception for transfer of existing soft coverage from sensitive lands.

The difference in relative water quality and habitat function impact between hard and soft is uncertain and very dependent on context. Soft coverage can have less or greater impact than hard coverage depending on the site. Due to this uncertainty, it is recommended to allow soft coverage to be transferred to commercial sites to increase the restoration of coverage and enable redevelopment which is likely to

provide environmental benefits. In addition, this recommendation simplifies the coverage policy by eliminating the unique uses of soft and hard coverage for commercial uses.

Analysis of Policy Objectives

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Slight increase in restoration and retirement of existing soft coverage on 1B and sensitive soils Slight increase redevelopment, primarily in commercial areas, due to increased access to lower cost coverage
	Riparian & Habitat Function		<ul style="list-style-type: none"> Slight increase in restoration of SEZ floodplains and connected habitat Slight decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Slight increase in Town Center FAR and residential density as existing coverage is restored and redevelopment is increased Slight increase in viewsapes and native vegetation as existing coverage connected to streams is restored
	Project Enablement		<ul style="list-style-type: none"> Slight decrease in cost for commercial, tourist accommodation and multi-residential development, especially in HRAs with coverage supply shortages Slight increase in private restoration projects to convert coverage for redevelopment projects
Policy Sustainability	Administrative Viability		<ul style="list-style-type: none"> No material change in administrative costs

Implementation Actions

Implementing this modification to the existing permissible coverage transfers for commercial uses will require the following actions:

- 1) Update section 30.4.4.B.2 of the Code so that soft land coverage may be transferred in all cases.

8) Provide expedited review for projects with significant environmental benefits

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policies do not effectively

- Incentivize restoration and retirement of coverage on 1B soils at a pace to achieve significant environmental improvement and make progress towards achievement of the Impervious Cover threshold.

Beneficial projects are inhibited because

- There is significant uncertainty in the length of time required to secure a project permit which impacts the uncertainty of the overall project returns.
- It can take a significant amount of time to secure a project permit and the carrying costs incurred can cause a project to no longer pencil out. Stakeholders shared examples of projects that do not require Environmental Impact Statement (EIS) level review that took four years to get a permit, which is extremely expensive if commodities and other costs are required early on in the project review process.²³

Policy Recommendation Description

Create additional expedited project review classifications for projects that provide significant environmental benefits. The restoration and retirement or transfer of existing coverage on 1B soils should be the first project review classification considered. For a project to earn an expedited review, a required amount of 1B coverage would need to be retired or transferred. Transferring 1B existing coverage requires a greater amount of coverage and the receiving site must be high capability lands.

Projects that require EIS level review do not apply due to factors that require significant time and are difficult to anticipate.

A maximum number of days that the project proponent can expect for each step in the expedited project review process should be specified in order to increase certainty for the project proponent and make the coverage retirement incentive attractive. This puts an upper limit on time commitment and controls project costs.

Discussion & Illustration

Project proponents must show proof of coverage retirement by presenting deed restrictions for the sending and receiving sites that demonstrate permanent retirement of coverage from the sending site, and either no increase in coverage on the receiving site, or coverage was transferred to high capability lands.

The coverage retirement or transfer amount should not create a significant impact on project costs. The coverage retirement or transfer amount should scale to project size since larger projects have proportionally greater resources available and this incentive should be attractive to projects of all sizes. An example amount of 1B coverage that could be required to be restored and retired is 0.5% (or 218 square feet per acre) of the new project area, or to be transferred is 1% (or 436 square feet per acre) new project area. Under current market conditions, 218 square feet of 1B coverage costs between \$6,000 and \$13,000 in most HRAs.

The maximum number of days for the permitting authority to commit to specific steps in the project review process may be different for different expedited project review classifications; however, differentiating maximum numbers of days does increase the complexity and thus likelihood of missing

²³ An example provided by Nick Exline (Midkiff & Associates, Inc.) in email received April 17, 2012.

deadlines for the permitting authority. An example maximum number of days for the permitting authority to commit to for specific steps in the project review process for expedited projects include

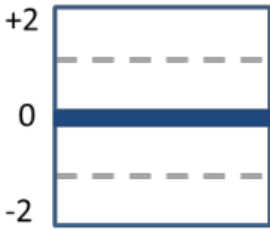
- 30 days to complete project review and send a notice of completion or request for additional information
- 30 days to review additional information provided and issue the permit

Other potential project classifications that arose during this study and should be considered include bike or pedestrian trails and affordable housing projects because of the environmental and community benefits that each provide.

Analysis of Policy Objectives

The following analysis is based on the assumption that the cost of coverage retirement or transfer value is worth the increased certainty and reduced length of time for project review, and that project proponents have confidence in the expedited project review process.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> ▪ Moderate increase in restoration and retirement of existing coverage on 1B, and primarily over-covered parcels without BMPs ▪ Slight increase redevelopment, primarily in commercial areas, due to increased certainty and reduced carrying costs for projects that utilize the incentive
	Riparian & Habitat Function		<ul style="list-style-type: none"> ▪ Moderate increase in restoration of SEZ floodplains and connected habitat ▪ Moderate decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs
Socio-economic	Livable Communities		<ul style="list-style-type: none"> ▪ Slight increase in Town Center FAR and residential density as existing coverage is retired and redevelopment is increased ▪ Slight increase in viewsapes and native vegetation as existing coverage connected to streams is restored
	Project Enablement		<ul style="list-style-type: none"> ▪ Slight decrease in cost for commercial, tourist accommodation and multi-residential development, especially in HRAs with coverage supply shortages ▪ Moderate increase in private restoration projects to convert coverage for redevelopment projects

OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
<p style="color: orange; font-weight: bold;">Policy Sustainability</p> <p style="font-weight: bold;">Administrative Viability</p>		<ul style="list-style-type: none"> No material change to administrative costs as increase in time to prioritize and expedite project review will be offset by reduction in review time due to increased focus during project review

Implementation Actions

Implementing this additional classification for expedited project review and providing more certainty in the project review process will require the following actions:

- 1) Add the retirement or transfer of existing 1B coverage expected project classification to the existing classifications in the Expedited Review Project Application Assignment Guidelines. Include the existing 1B coverage retirement amount required, and the transfer to high capability requirement amount.
- 2) Add the maximum number of days that the project proponent can expect for each step in the project review process for eligible projects to the Expedited Review Project Application Assignment Guidelines.

9) Allow local jurisdictions to manage coverage at the Town Center scale

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policies do not effectively

- Incentivize compact and infill development that can reduce the impact of underutilized coverage.
- Incentivize innovative multi-parcel design solutions that can reduce the impact of poorly designed sites and buildings.
- Incentivize restoration and redevelopment of coverage on commercial sites without BMPs and are among the largest source of FSP loading to surface waterbodies.
- Encourage shared parking solutions in commercial and mixed-use areas.

Policy Recommendation Description

Allow local jurisdictions to manage coverage at Town Center scale as opposed to the current parcel-scale regulations. Allow coverage to be placed anywhere up to 70% maximum coverage for the entire Town Center. Existing parcel-scale restrictions and coefficients apply to sensitive lands (1a-3). Coverage must be transferred from another parcel if more coverage than the base allowable amount on a receiving parcel is needed. If more than 70% coverage is permitted on a specific parcel, then a deed restriction is required on another parcel that prohibits more than the difference of 70% coverage and the square foot of coverage over 70% on the project site.

The local jurisdiction in which the Town Center resides is responsible for maintaining the 70% maximum allowable coverage and conformance to the coefficients for sensitive lands. Local jurisdictions will lead collaboration among property owners while property owners must approve all restrictions on their property beyond those applied by the existing coverage policies. Each local jurisdiction that chooses to manage coverage at the Town Center scale must report use of coverage on an annual basis and TRPA reserves the right to retract this policy for specific Town Centers or local jurisdictions if a) use of coverage

is not reported annually and accurately, or b) use of coverage does not conform to the 70% maximum allowable coverage and sensitive lands coefficients.

Discussion & Illustration

Additional Project Flexibility

Current coverage regulations allow:

- 1) Coverage can be managed in designated redevelopment areas across non-contiguous parcels, but redevelopment agencies must own land (Ch. 13 of Code).
- 2) Coverage can be managed on contiguous parcels that are owned by different land owners if there is a joint project (project area defined in Ch. 30 of Code).

This policy provides additional flexibility for the use of coverage in Town Centers to create better designed projects on individual parcels and across multiple parcels that reduce impacts to sensitive lands and increase economic productivity of the projects. Projects on contiguous or non-contiguous parcels in Town Centers that a) are not owned by redevelopment agencies or the same private party, and b) are on different timelines, can facilitate beneficial projects that provide environmental and community benefits.

As described in Finding #13, approximately 14% of the coverage in the basin is used for vehicle parking and a significant portion of the parking is underutilized. Shared parking solutions should be a priority for communities that want to increase the economic productivity of the coverage in their commercial areas and this policy recommendation adds flexibility that facilitates shared parking solutions.

Offset Increased Coverage on Other Parcels

Restrictions to private or publicly owned parcels beyond those restrictions applied by the existing coverage policies must be approved by the land owner. The primary additional parcel-scale restriction that may be applied due to this policy is the prohibition of more coverage than a threshold less than 70% to offset more than 70% coverage allowed on another parcel.

Public sector land owners in Town Centers that own parcels that will not be developed due to containing sensitive lands, or providing public services such as parks can play a major role in the implementation of this policy. When another parcel wishes to cover more than 70% of the parcel, public sector land owners can offer to offset the additional coverage allowed on other parcels by restricting the maximum allowed on their parcels. In addition, local jurisdictions and land banks can provide low-price coverage to enable beneficial projects in Town Centers that need to transfer coverage.

Over-covered Town Centers

If the high capability lands in a Town Center are already over 70% covered in aggregate, then coverage beyond 70% is not permitted on any parcel, even if another parcel within the Town Center is less than 70% covered and willing to reduce the maximum allowed on the parcel. Based on the 2002 IKONOS data set containing hard coverage only, there are currently no Plan Area Statements over 70% covered. The Nevada South Stateline Resort Area is the most covered Plan Area Statement with 66% coverage.

Policy Implementation

This policy facilitates proactive and holistic Town Center planning. Planning related stormwater management, landscape and lighting, and shared parking could be incorporated into this Town Center scale approach to achieve other community objectives. Further, partnering with public sector implementation tools such as the EIP can facilitate this holistic planning approach.

Local jurisdictions currently manage business improvement districts, tax increment finance districts, landscape and lighting districts, stormwater districts, etc. A local jurisdiction may be able to combine the management of coverage with these existing management structures.

Proactive planning is most effective when local jurisdictions have the information necessary to support the most beneficial projects and make quality long-term planning decisions. Developing a map for each Town Center containing existing coverage, land capabilities classes at a high resolution, and past and potential private and public sector projects (e.g. EIP projects) to identify opportunities to improve coverage efficiency and reduction strategies is suggested.

Deed restrictions are necessary to decrease the maximum allowable coverage on parcels that offset the increase of maximum allowable coverage on other parcels. Acceptable template deed restriction language should be developed and made accessible to local jurisdictions and land owners to ensure appropriate deed restrictions are used and to reduce the cost of individual projects.

Local jurisdictions that choose to leverage this policy option must report the use of this policy on an annual basis. A standard reporting format should be created to reduce the cost for each local jurisdiction to report use and ensure completeness and consistency in reporting to TRPA.

The Portland Sustainability Institute is a leader in the development of district-scale planning.²⁴ Their research and implementation tools, including a management structure and performance metrics for managing and tracking progress towards objectives, are a valuable resource for expanding this Town Center scale planning approach.

Pilot Projects

Local jurisdictions should be proactively engaged to identify pilot projects to further develop the management structure and leverage the additional flexibility in the placement of coverage within Town Centers. TRPA and land banks should provide assistance in the implementation of pilot projects. Further, TRPA should leverage pilot projects to identify barriers and improve this policy.

Analysis of Policy Objectives

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Moderate increase in restoration and retirement of existing coverage from outlying areas likely without BMPs to supply additional demand and steep coverage retirement ratio Slight increase in redevelopment in commercial areas, including over-covered parcels without BMPs Potential increase in FSP loading due to allowing greater than 70% coverage on a specific parcel with site constraints that limit the effectiveness of BMPs
	Riparian & Habitat Function		<ul style="list-style-type: none"> Slight increase in restoration of SEZ floodplains and connected habitat, especially urban stream reaches that are over-covered and limit a community to leverage this policy Moderate decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs

²⁴ Portland Sustainability Institute EcoDistricts <http://www.pdxinstitute.org/index.php/ecodistricts>

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Moderate increase in Town Center FAR and residential density as compact redevelopment and innovative site designs are increased and existing coverage is retired via the coverage retirement ratio Slight increase in parking efficiency as landowners collaborate on parking solutions Slight increase in viewscales and native vegetation as existing coverage connected to streams is restored Moderate increase in active transportation due to highly compact and smart redevelopment and ability to plan trails into significantly reconfigured Town Centers
	Project Enablement		<ul style="list-style-type: none"> No material change in coverage transfer or ECM costs Slight increase in operational complexity to define and implement land owner agreements facilitated by local jurisdiction Significant increase in project flexibility as a single parcel in a Town Center can be covered greater than 70%
Policy Sustainability	Administrative Viability		<ul style="list-style-type: none"> Moderate increase in administrative costs as local jurisdictions facilitate multi-parcel agreements; however partially offset by a slight decrease in costs as fewer larger scale coverage solutions replace more parcel scale transactions Slight increase in transparency and ability to adapt policy over time as standard reporting increases data available for policy evaluation Slight increase in legal liability as greater municipality and landowner cooperation required

Implementation Actions

Implementing Town Center scale coverage management will require the following actions:

- 1) Update Chapter 30 of the Code with the policy recommendation described above.
- 2) Develop a management structure and tools for local jurisdictions and land owners, including a standard report format and template deed restrictions for decreasing the maximum allowable coverage on a parcel.
- 3) Engage local jurisdictions to create a pilot program and provide support to facilitate implementation of the policy. Use pilot programs to identify barriers to implementation and improve the policy, management structure and tools.

10) Raise the maximum allowable coverage permitted to 70% for commercial, tourist accommodation and multi-residential uses on parcels with existing development

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

The maximum allowable coverage on a site has a significant impact on the potential FAR and revenue potential of a site. Coverage policies currently allow vacant lots to be covered up to 70% for commercial, tourist accommodation and multi-residential uses but redevelopment of sites with existing coverage to cover up to only 50%. The currently policy creates a disincentive to redevelop sites, and sites ripe for redevelopment likely do not have BMPs and are potentially over-covered.

Policy Recommendation Description

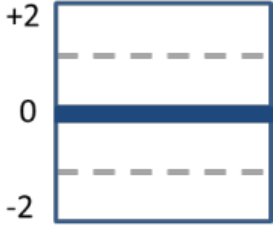
Raise the maximum allowable coverage (base allowable plus transferred) permitted to 70% for commercial, tourist accommodation and multi-residential uses on parcels with existing coverage.

Discussion & Illustration

Developable parcels in areas where commercial, tourist accommodation and multi-residential uses are permitted are often surrounded by development and provide little to no functional habitat value. Thus, concentrating coverage in these areas and transferring coverage from less economically valuable areas is beneficial. Further, since coverage transferred beyond 50% requires a retirement ratio that reduces net coverage in the basin which provides additional environmental benefits.

Analysis of Policy Objectives

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> ▪ Significant increase in restoration and retirement of existing coverage, and primarily over-covered parcels without BMPs, due to increased demand and steep coverage retirement ratio ▪ Significant increase redevelopment, primarily in commercial areas, due to increase in maximum allowable coverage on parcels with existing coverage
	Riparian & Habitat Function		<ul style="list-style-type: none"> ▪ Slight increase in restoration of SEZ floodplains and connected habitat ▪ Significant decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs
Socio-economic	Livable Communities		<ul style="list-style-type: none"> ▪ Significant increase in Town Center FAR and residential density as existing coverage is retired and redevelopment is increased ▪ Slight increase in viewscales and native vegetation as existing coverage connected to streams is restored
	Project Enablement		<ul style="list-style-type: none"> ▪ No material impact to coverage costs; however significant increase in revenue potential for redevelopment projects ▪ Slight increase in private restoration projects to transfer coverage for redevelopment projects

OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
<p>Policy Sustainability</p> <p>Administrative Viability</p>		<ul style="list-style-type: none"> No material impact to administrative costs

Implementation Actions

Implementing this modification to the maximum allowable coverage for redevelopment projects will require the following actions:

- 1) Update section 30.4.2.B.2 of the Code to make the maximum allowable coverage for redevelopment projects to be 70 percent.

SUPPORT EFFECTIVE PRIVATE AND PUBLIC SECTOR INVESTMENTS

11) Change the Impervious Cover Threshold**Implementation Timeframe:** Short-term or long-term**Implementation Parties:** TRPANeeds for Change Addressed

The current Impervious Cover threshold allows basin-wide impervious coverage up to a standard, or specific coefficient, for the total land classified under nine unique land capability classes; however

- Coefficients associated to land capability classes such as land capability class 1B, which requires more than 931 acres of coverage retired as illustrated in Finding #2, are unrealistic to achieve in any relevant timeframe.
- Regional and local land use goals and policies are not achieving the considerable restoration of developed areas that would be required to achieve the coefficients, and instead encourage new investment in these areas with coverage on over-covered soil types. For example, several commercial and transportation hubs reside on 1B lands and regional and local policies encourage transfer of development into these areas to achieve other environmental and community goals.
- Coverage policies direct impervious coverage to be transferred to higher capability lands; however, the highest capability land class (land capability class 7) is not in attainment.
- Unachievable goals do not motivate action necessary to achieve the environmental and community goals of the basin. When no feasible set of actions can be developed to achieve a goal, the goal does not provide an effective incentive.

Policy Recommendation Description

Two options for changing the Impervious Coverage threshold are listed below. The first requires adoption of the coverage change described above in Recommendation #1.

- 1) Replace the Impervious Coverage threshold by accounting for net increases in coverage impact benefit on a project-by-project basis. Define intermediate and long-term targets of coverage impact benefit that are realistic but aspirational. Pegging environmental impact to base-allowable coverage impacts for typical development is an option to explore.
- 2) Make the following set of changes so that the Impervious Coverage threshold standard is achievable and drives restoration of desired land capability classes.
 - a. Eliminate the distracting attainment issue on high capability lands to focus policy-makers and other stakeholders on environmentally sensitive lands 1B and 2. This can be most realistically implemented by changing the accounting for non-sensitive lands by summing the allowable coverage on soil classes 6 and 7.
 - b. Establish 5-year interim targets that provide an aspirational, but achievable level of coverage reduction for over-covered land classes. Track cumulative impervious coverage changes (e.g. project-by-project accounting) of 1B and 2 land classes, like is done for SEZ restoration, and report progress towards threshold standards on an annual basis.
 - c. Update land capability class specific standards, or coefficients, based on the 2006 NRCS Soils map and soil capability evaluations to more accurately align standards with a more accurate assessment of land capability acreage in the Tahoe Basin.

Discussion & Illustration***Recommendation Option #1***

Improving the threshold based on the effectiveness of coverage suggested in the first recommended option is dependent on the implementation of Recommendation #1 of this study.

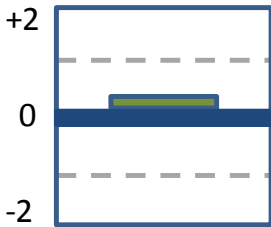
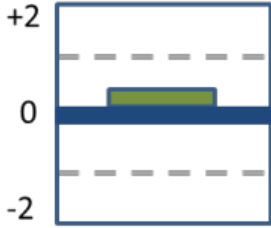
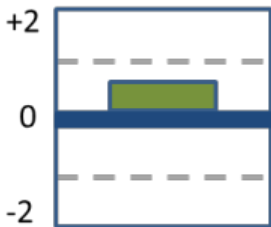
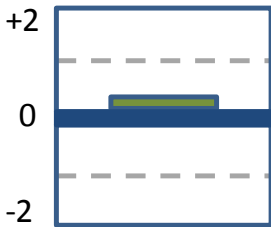
Recommendation Option #2

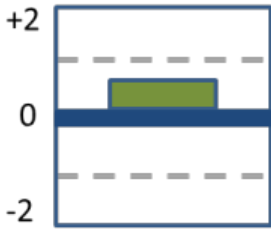
Establishing interim-targets is only motivating if they can be achieved and only meaningful if they are set at an aspirational level that inspires focused action. The RPU and additional improvements to the coverage policies would likely increase the pace of restoration of sensitive lands. Two potential methods for setting appropriate interim-targets for restoration of coverage on 1B and 2 soils include 1) increase the pace of past changes, or 2) project expected changes due to anticipated redevelopment and restoration activity.

Setting an interim target of double the pace of the restoration achieved in the past 5 years may be an appropriate initial 5-year target. This may be especially aspirational given that less public funding is likely to be available for restoration during the next 5 years as compared to the past 5 years.

Setting an interim target that extrapolates the redevelopment activity anticipated in the RPU may be established by using assumptions consistent with the environmental analysis of the RPU.

Analysis of Policy Objectives

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Decrease in coverage on the highest impact lands if coverage impact credit system is implemented, or on land capability class 1B and 2 lands, due to more focused public and private investment
	Riparian & Habitat Function		<ul style="list-style-type: none"> Decrease in coverage from sensitive lands adjacent to highly functioning areas, and particularly if the coverage impact credit system is implemented since actual function will be considered
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Increase in Town Center FAR and residential density, and density near transit routes due to increase in restoration of coverage in high impact areas outside of Town Centers Increase in viewscales and native vegetation as high impact coverage adjacent to streams is restored, particularly if coverage impact credit system is implemented
	Project Enablement		<ul style="list-style-type: none"> Increase in demand for restoration of coverage in sensitive lands will facilitate restoration projects Increase in redevelopment projects that restore coverage in sensitive lands

OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
<p style="color: orange; font-weight: bold;">Policy Sustainability</p> <p style="font-weight: bold;">Administrative Viability</p>		<ul style="list-style-type: none"> ▪ Increase in policy effectiveness and decrease in legal vulnerability due to increased reporting and improved progress towards thresholds

Implementation Actions

Recommendation Option #1

Changing the threshold based on recommendation option #1 will require the following actions:

- 1) Implementation of Recommendation #1 of this study.
- 2) Define intermediate and long-term targets of coverage impact benefit. The interim targets should be realistic but aspirational.
 - The coverage impact score should include a coverage impact benefit for every transfer of coverage. This coverage impact benefit can be multiplied by the annual average volume of coverage transfers to determine the annual environmental benefit based on past project permit trends. This average annual coverage impact benefit can be modified based on expected future changes in project permit volume.
- 3) Develop an accounting system that tracks the coverage impact benefit for each permitted project in order to report and evaluate progress toward achieving the new threshold standard.
 - The tracking and accounting system can be a simple spreadsheet, or be integrated into permit tracking systems such as TRPA's parcel tracking system (Accela).
- 4) Adopt the new threshold through the standard process for changing TRPA thresholds.

Recommendation Option #2

Changing the threshold using the existing square foot of coverage accounting system will require the following actions:

- 1) Define threshold changes that track non-sensitive land by summing the allowable coverage on soils 6 and 7.
- 2) Define intermediate and long-term targets of coverage reduction. The interim targets should be realistic but aspirational.
 - The average annual coverage reduction from 1B and 2 land capability class lands over the past 10 years will provide a baseline for determining the desired annual coverage reduction in 1B and 2 land capability class lands. This annual average reduction of coverage can be modified based on expected future changes in project permit volume.
- 3) Adopt the new threshold, intermediate and long-term targets, through the standard process for changing TRPA thresholds.

12) Invest public funds to restore coverage in sensitive lands and increase the utilization of parking spots

Implementation Timeframe: Short-term

Implementation Parties: EIP Partners, TRPA, TMPO

Needs for Change Addressed

Coverage policies do not effectively incentivize restoration and retirement of coverage on sensitive lands at a pace to achieve significant environmental improvement and make progress towards achievement of the Impervious Cover threshold. Public sector projects often restore and retire coverage; however, coverage reductions from sensitive lands achieved are rarely factors in the decision to fund projects.

As described in Finding #13, parking lots are underutilized throughout the basin and are often significant sources of FSP loading because they are over-covered and without BMPs. Coverage used for parking compromises the FAR and revenue opportunity of commercial uses, and the walkability of Town Centers. Further, parking lots enable automobile-centric transportation that contributes to greenhouse gas emissions and discourages walking and bicycling in commercial areas where more pedestrian and bicycle traffic would boost economic conditions, public health and community character.

Policy Recommendation Description

Environmental Improvement Program Investment Prioritization

The public sector should invest in projects that restore coverage from sensitive lands. Coverage removal from sensitive lands should be a factor in the prioritization of public funding sources such as the Lake Tahoe Environmental Improvement Program (EIP), and capital improvement budgets for large land owners such as the National Forest Service. For example, the EIP could use the already defined Impervious Coverage Retired performance measure to prioritize funding, which would influence project designs and increase coverage removal.

Shared Parking Investments

The public sector should invest in shared podium and structured parking in commercial areas to encourage commercial property owners to remove coverage used for parking. In addition, private sector capital should be encouraged to match public sector funding since parking directly benefits commercial uses by allowing customers to access sites and business owners to increase their commercial floor area.

Projects should be exempt from minimum parking requirements, or not allowed to create onsite parking, if shared parking facilities are available within close proximity of the project site. A maximum parking threshold for an area would be another approach. Further, measuring and tracking parking utilization by Town Center or smaller areas would be useful in targeting investments.

Discussion & Illustration

Environmental Improvement Program Investment Prioritization

Coverage used for parking is frequently on over-covered parcels without BMPs, and the additional coverage for parking is a disincentive to redevelop the parcel. In addition, most parking spots in the basin are often used very inefficiently. Using less coverage for parking frees up coverage for more economically and socially beneficial uses.

Shared Parking Investments

Minimum parking requirements and a lack of shared parking solutions in commercial areas have caused a significant amount of coverage basin-wide to be dedicated to parking lots that are frequently used very inefficiently. Public sector investments in shared podium and structured parking in desired receiving areas would encourage commercial property owners to remove over-covered parking lots without BMPs. An example investment strategy could be a regional grant program for local jurisdictions to propose shared parking solutions. Primary proposal evaluation criteria should be the amount and land capability

class (or environmental benefit) of coverage that is removed from existing parking and private capital contribution.

Analysis of Policy Objectives

The following analysis is based on the assumption that both coverage removal influences EIP project selection and multiple significant shared parking investments are completed.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Significant increase in restoration and retirement of existing coverage, and primarily over-covered parcels without BMPs, due to less coverage dependent EIP project designs and shared parking solutions replacing distributed parking lots Significant increase in redevelopment that installs BMPs in commercial areas due to opportunity to use existing parking spaces for more economically and socially beneficial uses
	Riparian & Habitat Function		<ul style="list-style-type: none"> Significant increase in restoration of SEZ floodplains and connected habitat as EIP project designs use less coverage and existing parking spaces on sensitive lands are restored Significant decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Significant increase in Town Center FAR as existing parking spaces are restored and replaced with economically productive uses Moderate increase in viewscales and native vegetation as existing parking spaces connected to streams are restored Significant increase in active transportation as parking in commercial areas facilitate an increase in park-and-walk transport, and parking spaces are replaced with pedestrian and bicycle paths
	Project Enablement		<ul style="list-style-type: none"> Significant decrease in cost for commercial, tourist accommodation and multi-residential development, that no longer need to build onsite parking space and can use coverage for more economically productive uses Moderate increase in private restoration projects to supply coverage for redevelopment projects Significant increase in project design flexibility as minimum parking requirements are exempt in some Town Centers Moderate increase in community economic activity as visitors walk to destinations as opposed to driving directly to the destination
Policy Sustainability	Administrative Viability		<ul style="list-style-type: none"> Slight increase in administrative costs to evaluate coverage removal in EIP project selection processes Moderate increase in administrative costs to oversee shared investments such as parking grant program

Implementation Actions

Environmental Improvement Program Investment Prioritization

Including coverage removal in the prioritization of EIP projects will require the following actions:

- 1) Confirm that the Impervious Coverage Retired performance measure is the performance measure to collect expected coverage removal for proposed projects and verify that actual coverage removal after project is complete.
- 2) Create guidance for prioritizing EIP projects that define the specific criteria, including qualitative criteria, which informs the prioritization process and the overall process performed to prioritize projects.
 - The expected coverage removed should be compared to actual coverage removed, and project proponents should be penalized if actual coverage removed is significantly less than expected. One of the criteria for prioritizing EIP projects can be the accuracy of past expected PM results relative to actual PM results so future projects are impacted if PMs are not estimated accurately.
- 3) Evaluate actual PM results with expected PM results for completed EIP projects on an annual basis.
- 4) Publish proposed, not-yet funded EIP projects on an annual basis by prioritization and present data for all criteria.

Shared Parking Investments

Implementing public sector investments in shared parking solutions will require the following actions:

- 1) Determine the most effective regional shared parking investment strategies with input from businesses and local jurisdictions using evaluation criteria that reflect defined parking policy objectives.
- 2) Define guidelines for investing in shared parking solutions (e.g. grant program guidelines).
- 3) Implement shared parking investment strategies.

13) Create a low-priced pool of coverage to incentivize public and private sector projects that generate environmental and community benefits

Implementation Timeframe: Short-term

Implementation Parties: TRPA, land banks and private funding sources

Needs for Change Addressed

The cost of transferring coverage for a public or private sector project can have a significant impact on total project cost, especially on sensitive lands and in HRAs with limited coverage supply. The cost of transferring coverage can be as much as 8.5% of total project costs for large redevelopment projects, and inhibits projects that provide significant environmental and community benefits.

Policy Recommendation Description

Create low-priced pool of coverage for public and private sector projects using public and private sector funds. Use environmental and community benefit performance measures to prioritize projects requesting access to the low-priced coverage and identify projects to supply coverage.

Discussion & Illustration

A low-priced pool of coverage will require initial seed capital and a continuous infusion of capital to maintain a pool for predictable *allocations* of coverage. Potential funding sources include public

agencies, stormwater mitigation fees and private funding sources. Public and private sector sources should be encouraged to match funds. Developing the criteria for allocating the pool of coverage should be considered before raising capital because the criteria will help build confidence in potential funding sources.

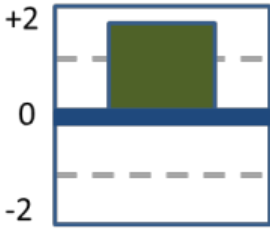
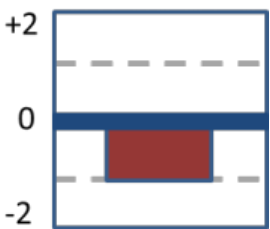
The CTC generated a similar pool of low-cost coverage when the CTC land bank was originally established. An initial infusion of State of California funds was used to acquire coverage for the land bank inventory and the allocation of the pool was prioritized to first meet ECM obligations, then public service project needs and lastly, private sector transfers. Uniform pricing was applied to all buyers and the purchase of significant low-priced coverage is partially responsible for ECM fees remaining relatively low for so long in the California portion of the basin. Most of this initial pool of low-cost coverage has been sold and the CTC land bank is now unable to fulfill some ECM liabilities. This recommendation suggests the generation of a similar pool; however, the use of performance measures to allocate coverage to projects that directly contribute to environmental and community goals, and the development of a finance strategy is recommended to increase the effectiveness and long-term sustainability of the pool.

Criteria for allocating projects should include well-defined, easily provided and verifiable performance measures. Performance measures developed for the EIP Program should be considered. EIP performance measures are broadly-supported, well-defined and it is likely projects requesting low-priced coverage will already be required to complete the EIP performance measures.

Analysis of Policy Objectives

The following analysis is based on the assumption that a large enough low-priced pool of coverage is created to influence project designs and enable projects that would not have been completed or at least considerably delayed.

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> ▪ Significant increase in restoration of existing coverage, including coverage on 1B and sensitive soils, and primarily parcels without BMPs to populate and maintain pool of coverage ▪ Slight decrease in net coverage basin-wide as existing coverage is restored and steep retirement ratio for redevelopment projects ▪ Moderate decrease in FSP loading from restoration of existing coverage, installation of BMPs on redevelopment sites and installation of stormwater treatment in commercial areas by local jurisdictions
	Riparian & Habitat Function		<ul style="list-style-type: none"> ▪ Moderate increase in restoration of coverage in SEZ floodplains and connected habitat to populate and maintain pool of coverage ▪ Significant decrease in stormwater runoff that contributes to watershed hydrologic impacts from increase in coverage restoration and BMP installations
Socio-economic	Livable Communities		<ul style="list-style-type: none"> ▪ Moderate increase in Town Center FAR and residential density as coverage is restored and redevelopment is increased ▪ Moderate increase in viewscales and native vegetation as coverage connected to streams is restored ▪ Moderate increase in active transportation as pedestrian and bicycle paths are enabled by supplying low-priced coverage

OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
<p>Project Enablement</p>		<ul style="list-style-type: none"> ▪ Significant decrease in cost public and private sector projects that provide environmental and community benefits
<p>Administrative Viability</p>		<ul style="list-style-type: none"> ▪ Moderate increase in administrative costs to raise initial capital and consistent infusions of capital to maintain the pool of coverage ▪ Moderate increase in administrative costs to request, evaluate and select projects to supply low-priced coverage each year

Implementation Actions

Creating a pool of low-cost coverage for beneficial private and public sector projects will require the following actions:

- 1) Develop a finance strategy that includes the initial infusion of capital as well as the long-term pricing and funding necessary to sustain the low-cost coverage pool.
- 2) Develop criteria for allocating a pool of low-priced coverage to projects that provide environmental and community benefits. Consider different price levels for different types of projects, or based on performance measures.
- 3) Raise initial seed capital to acquire coverage to populate the pool.
- 4) Request project proposals with data necessary to evaluate projects using defined criteria.

14) Allow coverage to be transferred and banked without a project permit or property ownership

Implementation Timeframe: Short-term
Implementation Parties: TRPA or land banks

Needs for Change Addressed

Severe supply shortages in several HRAs inhibit projects that provide environmental and community benefits. Land banks do not carry sufficient coverage inventories in most HRAs, and there is no mechanism for buyers to find private sellers. This creates significant transaction costs and inhibits projects. Limited transparency in several HRAs also inhibits price discovery and price signals needed to reduce transaction costs for the land banks and private sector.

Policy Recommendation Description

Provide a mechanism for coverage to be transferred and banked without a project permit or property ownership.

Discussion & Illustration

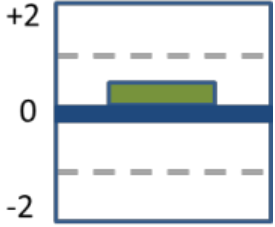
Currently a project permit is required to transfer and bank coverage on a different parcel of land. There is one exception, Douglas County offers landowners within the county the ability to hold coverage in the Douglas County land bank if landowners do not wish to bank coverage on their property or cannot

transfer coverage to their parcel because they are not permitting a project that will use the transferred coverage.

Allowing coverage to be transferred and banked without a project permit or property ownership will facilitate project proponents and speculators that wish to act as bankers in the market to fulfill expected future unmet demand. Frequently there are concerns that allowing coverage to be transferred without a project permit will enable individual parties to monopolize the market. In a review of existing TDR markets that allow rights to transferred without a project permit, there are no examples where this concern was realized. TDR markets typically have a large number of rights and most rights are tied to existing developments so controlling a material portion of the market is extremely difficult, if not impossible.

Analysis of Policy Objectives

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Moderate increase in restoration and retirement of existing coverage on 1B, and primarily over-covered parcels without BMPs, as private market supplies unmet demand Moderate increase redevelopment, primarily in commercial areas, which will install BMPs due to increased access to coverage supply
	Riparian & Habitat Function		<ul style="list-style-type: none"> Slight increase in restoration of SEZ floodplains and connected habitat as private market supplies unmet demand Significant decrease in stormwater runoff that contributes to watershed hydrologic impacts from increased coverage restoration and redevelopment with BMPs
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Moderate increase in Town Center FAR and residential density as existing coverage is retired and redevelopment is increased Slight increase in viewsapes and native vegetation as existing coverage connected to streams is restored
	Project Enablement		<ul style="list-style-type: none"> Moderate decrease in cost for public and private sector projects, especially in HRAs with coverage supply shortages Moderate increase in private restoration projects to supply unmet demand Slight decrease in cost to accumulate coverage from multiple sources for a specific project

OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
<p style="color: orange; font-weight: bold;">Policy Sustainability</p> <p style="font-weight: bold;">Administrative Viability</p>		<ul style="list-style-type: none"> ▪ Slight increase in administrative costs to bank coverage without a project permit or property ownership ▪ Slight decrease in administrative costs for land banks to find willing sellers as private market becomes more liquid ▪ Slight increase in policy effectiveness due to access to additional market data

Implementation Actions

Implementing a system to allow coverage to be transferred and banked without a project permit or property ownership will require the following actions

- 1) Determine agency(s) to administer mechanism to transfer and bank coverage without a project permit or property ownership.
- 2) Develop a tracking system to easily track deposits and withdrawals of coverage.
- 3) Develop process to submit request to deposits and withdrawals of coverage, which must demonstrate proof of permanent retirement from the sending site.

15) Exempt public agency projects on large parcels and not on 1B lands from coverage regulations and processes

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policies do not effectively incentivize development and improvements to pedestrian and bicycle trails that provide environmental and community benefits.

Policy Recommendation Description

Exempt projects on publicly owned lands that are greater than 25 acres, not on 1B lands and meet the 20-year 1-hour storm from coverage regulations. Each public agency that uses coverage that conforms to these requirements should be required to report use of coverage on an annual basis and TRPA reserves the right to retract this policy for specific public agencies if a) use of coverage is not reported annually and accurately, or b) use of coverage is deemed to have significant environmental impacts.

Discussion & Illustration

Coverage is primarily used in publicly owned lands greater than 25 acres for parking, roads and trails. Currently, coverage on National Forest Service (NFS) and other large public agency lands is somewhat irrelevant because the project boundary is developed to accommodate coverage in project development and the coverage is typically very disconnected from surface waters. Coverage from NFS lands and other public agencies also cannot be purchased or transferred to other owners. Coverage regulations on NFS lands do not result in additional environmental benefit than already provided by LID designs that are required by public land owner and TRPA policies, so coverage regulations cause confusion, project delays, and additional project costs with minimal to no environmental benefit. Further, projects on public lands must be accompanied by state and federal environmental impact analyses, and public comment periods, which provide opportunities for TRPA and the general public to comment on and influence project designs through other avenues.

Analysis of Policy Objectives

	OBJECTIVE	CRITERIA	EXPECTED OUTCOMES
Environmental	Water Quality		<ul style="list-style-type: none"> Slight increase in coverage for pedestrian and bicycle trails that create negligible water quality impacts due to lack of connectivity to surface waters and LID techniques
	Riparian & Habitat Function		<ul style="list-style-type: none"> Slight increase in coverage in connected habitat that create negligible habitat impacts
Socio-economic	Livable Communities		<ul style="list-style-type: none"> Slight increase in active transportation due to increase in pedestrian and bicycle trails
	Project Enablement		<ul style="list-style-type: none"> Moderate decrease in indirect costs necessary to develop pedestrian and bicycle trails
Policy Sustainability	Administrative Viability		<ul style="list-style-type: none"> Moderate decrease in administrative costs as public agencies no longer must get approval for use of coverage; however partially offset by administration of annual reports of coverage use

Implementation Actions

Implementing public agency coverage exemption will require the following actions

- 1) Update Chapter 30 of the Code with the policy recommendation described above.
- 2) Develop standard report format for all public agencies to report coverage use on an annual basis.

IMPROVE OPERATIONAL PROCESSES TO ACHIEVE ENVIRONMENTAL BENEFITS

Operational processes indirectly impact Water Quality, Riparian & Habitat Function and Livable Community policy objectives; however, primary impacts are to the Project Enablement and Administrative Viability policy objectives. The analysis of operational process recommendations below focuses on the impacts to the Project Enablement and Administrative Viability policy objectives.

16) Continually improve and publish the benefits of the coverage policies

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

A policy goal and objectives for the original coverage policy was not found by the project team and does not exist to the best of the knowledge of the agency staff interviewed and engaged throughout the development of the coverage policy. To the knowledge of the project team, coverage policy accomplishments have never been published, even though a substantial portion of the stakeholders interviewed questioned the accomplishments of the coverage policies. Lastly, very few coverage policies have been improved since their inception even though there are known ambiguities in the code and documented needs for change.

Policy Recommendation Description

Track activity, publish results, evaluate coverage policy effectiveness, and make annual recommendations for improvements to coverage policies. Continually improving coverage policies increases their effectiveness to achieve objectives and identifies opportunities to reduce administrative burden. An evaluation and reporting framework provides the information necessary for agency management to consistently, transparently and effectively improve policies.

Tools and processes should be developed to continually evaluate, improve and publish coverage policy achievements:

- Develop quantifiable goals for the coverage policy such as basin-wide goals, jurisdiction and Town Center specific goals, land bank objectives, and coverage related impact on the Lake Tahoe TMDL impact.
- Define performance measures and develop a tracking and accounting system to continually measure and consistently report coverage activity, in order to a) include data in the evaluation of policy effectiveness, b) report progress with respect to coverage policy goals and c) increase public understanding of the benefits of the coverage policies.
- Identify an individual on an environmental redevelopment design team to focus on coverage policy effectiveness and annually propose coverage policy improvements.
- Incorporate coverage reduction effectiveness into water quality and wildlife monitoring programs and require specific findings with respect to coverage in agency commissioned monitoring grants in order to have the data necessary to improve coverage policies over time.
- Define and implement a structured process to ensure continual improvement of the coverage policies and facilitate greater achievement of coverage policy objectives.

Discussion & Illustration

This study defined coverage policy objectives through an extensive stakeholder engagement process described in Appendix III: Stakeholder Engagement. The coverage policy objectives defined by this study and the process for developing the policy objectives, in particular the use of the Analytical Hierarchy Process, should be considered when developing policy objectives.

Performance measures will need to be developed in order to track and evaluate effectiveness of coverage policies. The following are example coverage policy performance measures based on the evaluation framework developed and sensitivity analysis conducted by this study.

POLICY OBJECTIVE	EXAMPLE PERFORMANCE MEASURES
Water Quality	<ul style="list-style-type: none"> ▪ Coverage impact credit transferred <li style="text-align: center;">or ▪ Change in per capita coverage utilization ▪ Change in BMP certifications ▪ Estimated load reduction from redevelopment projects involving coverage transfers
Riparian & Habitat Function	<ul style="list-style-type: none"> ▪ Coverage impact credits transferred <li style="text-align: center;">or ▪ Change in per capita coverage utilization ▪ Change in acres of 1B or SEZ covered
Livable Communities	<ul style="list-style-type: none"> ▪ Change in Floor-Area-Ratio ▪ Change in parking spot utilization ▪ Change in shared/on-street parking spots
Project Enablement	<ul style="list-style-type: none"> ▪ Change in market price for coverage transfers ▪ Change in excess coverage mitigation in-lieu fee levels ▪ Change in average time to approve projects
Administrative Viability	<ul style="list-style-type: none"> ▪ Change in staff time to administer coverage policies ▪ Change in the length of Chapters 30 and 53 of the Code ▪ Reduction in the number of processes necessary to implement coverage transactions and administer the ECM program

A structured process is necessary to ensure a program is planned appropriately, does the right things, checks achievement relative to expectations and acts on new information in order to improve the effectiveness of the program. A streamlined version of the management system framework developed for the Tahoe Basin and defined in the General Management System Manual²⁵ guidance document is a good starting point.

This study defined a policy evaluation framework to identify policy alternatives that most influence the coverage policy objectives. This policy evaluation framework should be used to evaluate the effectiveness of future policy alternatives considered. The structured program evaluation process should incorporate regular policy evaluation framework updates to reflect changes of coverage policy objectives and recent analysis.

Analysis of Policy Objectives

The development of quantifiable coverage policy goals, a consistent reporting and evaluation process, and a structured process to regularly improve coverage policies will provide environmental and community benefits by

- a) Significantly improving effectiveness of coverage policies in achievement of quantified policy goals.
- b) Reducing administrative burden by simplifying policy and operational processes, focusing discussions on policy effectiveness performance measures and regularly reporting progress towards achievement of policy goals.

Implementation Actions

Defining quantifiable coverage policy goals and a structured process to ensure improved policy effectiveness will require the following actions:

²⁵ Sokulsky, J. and T. Beierle. 2007. Management System Design: Generalized Management System Design Manual. Prepared by Environmental Incentives, LLC for the Tahoe Regional Planning Agency. Stateline, NV. Available at www.tiims.org.

- 1) Define quantifiable coverage policy objectives.
- 2) Defined structured process to ensure continual improvement of coverage policies.
- 3) Implement structured process on a regular basis.

17) Provide tools for project proponents to easily understand and fulfill coverage operational processes

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Coverage policy and operational process complexity create significant transaction costs and uncertainty for project proponents that inhibit projects that provide environmental and community benefits. Coverage policies are difficult to understand and operational processes require significant resources, frequently requiring consultants to navigate basic transactions.

Policy Recommendation Description

Several tools should be developed to assist project proponents and reduce administrative burden:

- **Operational Flow Charts** - Provide online flow charts that identify each person and form in the processes to clearly describe coverage operational processes, provide links to documents and show status of any application.
- **Conceptual Project Approval Process** - Develop a conceptual project approval process for coverage requirements that increases certainty for project proponent early on during project design and planning.
- **Coverage Table** - Create a standard and automated online coverage table with easy to use instructions and allows users to play with coverage amounts to make project work for the site.
- **Land Capability Map** - Create an accessible parcel-scale land capability map to inform property owners of the expected land capability of their parcel and the parcels nearby that have been verified.
- **Single Point of Contact** - Assign a single point of contact for each project proponent to assist with coverage and all other aspects of the permitting process.

Discussion & Illustration

The body of policy related to coverage is lengthy and complex. Two chapters (30 and 53) of the Code are dedicated to land coverage and total a combined 68 pages, and coverage policies can also be found in other chapters of the Code. Simple, visual tools such as flow charts that illustrate operational processes based on the policies will assist project proponents in gaining understanding and reduce transaction costs. Further, a conceptual project approval process for coverage requirements will increase certainty and reduce costs for project proponents. Guidelines will be necessary to ensure the process is efficient for TRPA and provide project proponents with the certainty needed to make the process valuable. For example, project designs and coverage tables must be provided at a minimal level of completeness so that TRPA staff can provide feedback and contingent approval as opposed to designing the project for the project proponent.

A lack of standard tools to navigate operational processes increases transaction costs for project proponents. For projects, TRPA and local jurisdiction planners require different coverage table formats to document existing and needed coverage. Large projects are often assigned different planners for different aspects of a project. Developing a standard and automated online coverage table will reduce the cost of providing coverage information during project review. It will also reduce the opportunity for error caused by using different Excel based formats created by a range of planners. These standardized tools

will also reduce administrative costs. Project proponents assigned to a single TRPA point of contact will have lower costs because they will not need to communicate and learn to work with multiple planners.

Providing greater access to more information necessary to submit a project permit request, such as a more granular land capability class map and parcel-based coverage data, will reduce transaction costs for project proponents.

Developing variations of tools for different types of projects should be considered when defining the specifications of any tools. For example, a process or tool may be able to be simplified for projects that generate limited impacts such as single-family residents in high capability land classifications, whereas for larger projects more information can be required especially if the information must be generated for other reasons such as CEQA review.

Analysis of Policy Objectives

The recommended tools above will enable more projects which will provide environmental and community benefits by

- a) Significantly improving Project Enablement through reducing indirect costs to request a project permit, which will increase redevelopment that installs BMPs and creates demand for coverage restoration, and
- b) Significantly improving Administrative Viability through reducing administrative costs and increasing policy effectiveness.

Implementation Actions

Specific guidance for implementing the recommended operational tools are provided below

- **Operational Flow Charts** – Use flow chart software such as Microsoft Visio, Microsoft PowerPoint or Tufts University free Visual Understanding Environment to illustrate steps in the process and different paths based on primary decisions.
- **Conceptual Project Approval Process** – Define guidelines and a basic process so that project proponent requirements and overall process is clear to all parties and a conceptual approval can be provided efficiently.
- **Coverage Table** - Create an interactive webpage that allows project proponents to input existing coverage and coverage needs based on project designs that is easy to use, ensures calculations are accurate and can be printed or emailed in a standard format.
- **Land Capability Map** – Update the land capability map with parcel specific land capability results from land capability verifications and site assessments and make it accessible online so project proponents can better understand the likely land capability of their site before commissioning a land capability verification or site assessment.
- **Single Point of Contact** – Create a policy that a single point of contact will be assigned to each project proponent.

18) Provide a means to connect willing sellers and interested buyers

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Redevelopment projects that provide environmental and community benefits are often inhibited because needed coverage for transfer cannot be located. In addition, significant transaction costs are required for private sector restoration projects for sale of coverage because willing buyers cannot be easily located.

Currently land banks are the primary source for interested buyers that need coverage. However, land banks do not carry inventories of all types of coverage in each HRA, and carry very few inventories of any type of coverage in any HRA that can fulfill the requirements of large projects. Finding willing private sellers requires significant effort and often willing private sellers are not able to be found for a specific type of coverage needed in some HRAs.

Policy Recommendation Description

Develop a web-based database to connect willing sellers and interested buyers. Publish seller or buyer contact information, date published and location, type and land capability associated with the coverage to facilitate a transfer, and optionally the offer price.

Discussion & Illustration

Willing sellers and interested buyers, which can include land banks, and land owners who need to mitigate excess coverage, can use this mechanism to find supply or demand.

Low capability coverage is perceived as becoming ever more scarce due to coverage policies that allow transfer of low capability coverage to high capability parcels but not vice versa. Further, stakeholders believe land owner’s are likely to be less willing to sell low capability coverage as low capability coverage becomes more valuable due to incentives targeted to increase restoration of low capability coverage. Providing a means to connect willing sellers and interested buyers will reduce the cost to sale coverage, which will increase the accessible supply of low capability coverage.

The following is an example of the data related to each supply or demand posting that needs to be captured to facilitate a transfer. To be easily be screened by the user, separate listings should be created for supply and demand, and for each land capability classification.

NAME (FIRST, LAST)	PREFERRED METHOD OF CONTACT (PHONE #/ EMAIL)	DATE PUBLISHED	HRA	LAND CAPABILITY	POTENTIAL/ SOFT/ HARD	FT ²	OFFER PRICE (OPTIONAL)
					P / S / H		
					P / S / H		

Analysis of Policy Objectives

The implementation of a web-based database to connect willing sellers and interested buyers will provide environmental and community benefits by

- a) Significantly improving Project Enablement through reducing search costs to connect willing sellers and interested buyers, which will increase coverage restoration and redevelopment that installs BMPs, and
- b) Moderately improving Administrative Viability through reducing search costs for land banks to find willing sellers and interested buyers.

Implementation Actions

A web-based application to connect willing sellers and interested buyers, complete transfers electronically and allow interested buyers to acquire coverage from restoration projects prior to restoration would provide the most operational benefits. However, as with any technology solution, a phased implementation is recommended so that the most valuable features are provided quickly at a lower cost, and greater functionality can be provided after gaining experience from initial implementation. The following is the recommended high-level implementation phases:

- 1) Create a basic web-based database for willing sellers and interested buyers to publish and search available supply and demand in real-time from any location. A simple user interface is necessary

to collect available supply and demand, and a simple reporting screen with the ability to screen entries is necessary to find viable supply or demand.

- 2) Create a web-based application that allows willing sellers and interested buyers to complete transactions electronically. Workflow technology is required so that TRPA can electronically approve transfers based on sending and receiving parcel information, and other requirements such as uploaded deed restrictions. The application should track transaction history so TRPA can update their internal systems with approved transactions and data can inform the evaluation of the effectiveness of the coverage policies.
- 3) Enhance the web-based application to allow willing private and public sellers to publish restoration projects that have not yet been started and allow buyers to fund restoration projects prior to commencing restoration. The application will create a contract between both parties that obligates the interested seller to the purchase, so long as the restoration project delivers on the expected restored coverage.

19) Use criteria to identify parcels that do not require field verifications and publish a map of parcels that do not require field verifications

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Currently field verifications are required for all redevelopment projects and development of vacant parcels that do not have an IPES score. Field verifications create significant administrative costs and delay projects, especially since field verifications cannot be conducted when the site is covered with snow.

Policy Recommendation Description

Use criteria to identify parcels that do not require field verification and publish a map of parcels that do not require field verifications. Develop a map that identifies areas with low connectivity to surface waters and not adjacent to moderately functioning habitat would. Do not require field verifications for parcels in land capability classes 4-7, in low connectivity to surface water areas and not adjacent to moderately functioning habitat.

Update the land capability map after completing each field verification. Publish a parcel scale map that provides the status of each criterion for each parcel.

Discussion & Illustration

No additional discussion is necessary.

Analysis of Policy Objectives

The recommended criteria for exempting field verifications for specific parcels and publishing a map of parcels that do not require field verifications will provide environmental and community benefits by

- a) Significantly improving Project Enablement through reducing indirect and direct costs to commission a field verification, which will increase redevelopment that installs BMPs and creates demand for coverage restoration, and
- b) Significantly improving Administrative Viability through reducing administrative costs to conduct field verifications and increasing policy effectiveness.

Implementation Actions

Developing criteria to exempt field verifications for specific parcels and publishing a map of parcels that do not require field verifications will require the following actions:

- 1) Define field verification exemption criteria and update section 30.3.3 of the Code.
- 2) Develop and publish a map online with parcel-scale map with the status of each criterion for each parcel and that is dynamically updated as field verifications are completed.

20) Use standardized land capability verification and site assessment processes, and a TRPA-certification for private and public entities to implement these processes

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

Currently field verifications are required for all redevelopment projects and development of vacant parcels that do not have an IPES score. Field verifications create significant administrative costs and delay projects.

Policy Recommendation Description

Develop standardized land capability verification and site assessment processes, and a TRPA-certification for private and public entities so other entities can conduct these processes. Define a structured annual audit process for TRPA to sample verifications and assessments conducted by other entities to confirm accuracy and renew certifications.

Develop an objective system for determining soft coverage that produces consistent results regardless of the individual conducting the field verification.

Discussion & Illustration

Field verifications require significant public sector resources and can cause project delays when resources are constrained. Allowing private and public entities to earn a TRPA-certification for conducting field verifications will provide private sector jobs, reduce public sector effort and allow TRPA to concentrate on policy effectiveness rather than operation processes.

Analysis of Policy Objectives

The use of standardized land capability verification and site assessment processes, and a TRPA-certification for private and public entities to implement these processes, will provide environmental and community benefits by

- a) Moderately improving Project Enablement through increasing the certainty and potentially avoiding project delays caused by field verifications, which will increase redevelopment that installs BMPs and creates demand coverage restoration, and
- b) Significantly improving Administrative Viability, through reducing effort to conduct field verifications and soft coverage determinations.

Implementation Actions

Developing standardized land capability verification and site assessment processes, and a TRPA-certification for private and public entities to implement these processes, will require the following actions:

- 1) Define reproducible land capability verification and site assessment processes that produce consistent results.
- 2) Develop an existing, vetted, objective system for determining soft coverage that produces consistent results. Leveraging an existing system that is continually improved by another entity is preferred.

- 3) Define a TRPA-certification that allows private and public entities to conduct land capability verifications and site assessments. The certification should include a training program with an exam that includes simulated land capability verifications and site assessments that is required in order to receive the certification and renew the certification on a defined schedule.
- 4) Define a structured audit process that TRPA will conduct on a defined schedule for each certified entity.

21) Land banks offer coverage put and call options so project proponents can either lock in a sale of coverage before investing in a restoration project or lock in coverage without paying full coverage acquisition costs prior to project approval

Implementation Timeframe: Short-term

Implementation Parties: TRPA

Needs for Change Addressed

The project review process can take months or even years. The carrying costs can be significant if project proponents acquire coverage early on during the project review process, and project proponents take on significant risk since the project may not be approved.

Restoration projects require significant investments and include significant uncertainty related to the potential sale price for the restored coverage.

Policy Recommendation Description

Land banks offer call options so redevelopment project proponents can lock in coverage early on in the project review process without paying full coverage acquisition costs prior to project approval.

Land banks offer put options so restoration project proponents can lock in a sale of coverage before investing in a restoration project.

Discussion & Illustration

Land banks have provided put and call option contracts in the past on an adhoc basis. The CTC has provided call options for projects that have submitted a project for a permit, and also reserved inventory for planned public service projects. Further, the CTC has provided put options labeled “options to acquire” on a few occasions. Options have not been a standard or published service by land banks in the past.

Coverage Put Option Definition

A coverage put option is a contract between a restoration project proponent and a land bank to exchange coverage, at a specified price, by a predetermined date. The restoration project proponent, the buyer of the put, has the right, but not an obligation, to sell the coverage at the strike price by the future date, while the land bank, the seller of the put, has the obligation to buy the coverage at the strike price if the buyer exercises the option.

Coverage Call Option Definition

A coverage call option is a contract between a development project proponent and a land bank to exchange coverage, at a specified price, by a predetermined date. The development project proponent, the buyer of the call, has the right, but not an obligation, to buy the coverage at the strike price by the future date, while the land bank, the seller of the call, has the obligation to sell the coverage at the strike price if the buyer exercises the option.

Analysis of Policy Objectives

Land banks offering coverage put and call options will provide environmental and community benefits by

- a) Moderately improving Project Enablement through reducing the direct costs for redevelopment project proponents early on in the project review process when there is uncertainty related to approval of the project and carrying costs or reducing the uncertainty for restoration project proponents before investing in a restoration project, which will increase redevelopment that installs BMPs and restoration of coverage, and
- b) Improving Administrative Viability through accessing additional coverage sale and acquisition opportunities.

Implementation Actions

The following actions will be required for land banks to offer coverage put and call options:

- 1) Develop standard coverage call and put option contracts, and internal guidelines related to the scopes of contracts that will be accepted.
- 2) Publish and market the offering of coverage call and put options so that potential redevelopment and restoration project proponents are aware of the offerings and associated benefits.

22) Land banks use reverse auctions and land acquisition criteria to maximize environmental benefit with available resources

Implementation Timeframe: Short-term

Implementation Parties: CTC, NDSL

Needs for Change Addressed

Land banks have difficulty finding supply to facilitate coverage transfers and mitigate excess coverage liabilities. As of January 2011, ECM funds collected have accumulated to more than \$3.5 million.

Policy Recommendation Description

Land banks should use reverse auctions to acquire coverage at the lowest possible prices with available resources, either ECM funds or land bank capital. Further, land banks should use criteria to maximize environmental benefit of coverage acquired.

Discussion & Illustration

Reverse Auction Definition

A reverse auction is a type of auction in which the roles of buyer and seller are reversed. In an ordinary auction, buyers compete to obtain a good or service by offering increasingly higher prices. In a reverse auction, the sellers compete to obtain business from the buyer and prices typically decrease as the sellers undercut each other.

ECM Fund Accessibility

TRPA manages funds until they are provided to land banks. Extensive processes can be required for land banks to access funds including gaining land bank board approval to receive spending authority and then to receive funds through annual State budgeting processes. Thus alternative methods of accessing funds may be necessary, such as TRPA paying auction winners directly.

Value-Based Pricing Approach

A standard reverse auction approach would select the bids that provide coverage at the lowest price, independent of the environmental impact of coverage. This could be expedient to meet the current requirements that specify the need for coverage within HRAs and of defined types of coverage. However,

restoring a square foot of existing 1B coverage adjacent to a stream without BMPs is significantly more environmentally beneficial than restoring a square foot of existing 1B coverage with BMPs installed surrounded by development.

In order to maximize the environmental benefit of coverage acquisitions, each square foot of coverage should be valued differently and compared using an adjusted price. A system for adjusting the offer price to a comparative price based on the environmental benefit of the specific square foot of coverage allows a unique square foot of coverage to be compared using a single adjusted price. A system such as the coverage impact credit system described in Recommendation #1 can be used to determine an adjusted price to facilitate comparing different potential coverage acquisition opportunities. The example coverage impact credit system can be used as a starting point but needs to be vetted by stakeholders and technical experts before being included in a solicitation for coverage.

A comparable price that incorporates the actual environmental value of each unique bid can be generated using the coverage impact credit system by determining the coverage impact score for each bid, and then dividing the offer price by 1 + the coverage impact score. This concept is illustrated below for three example bids:

Commercial Facility Adjacent to Stream

- Hard coverage on land capability class 1B soil
- Existing coverage directly connects several acres of offsite coverage to stream
- Watershed Priority Two & 28 inch mean annual rainfall
- Five of eight adjacent parcels are undeveloped

Vacant Lot at South Y

- Potential coverage on land capability class 1B soil
- New coverage would not directly connect existing offsite coverage to surface waterbody
- Watershed Priority Two & 31 inch mean annual rainfall
- No adjacent parcels are undeveloped

Residential Country Home

- Hard and soft coverage on land capability class 7 soil
- Existing coverage does not directly connect offsite coverage to a surface waterbody
- Watershed Priority Two & 35 inch mean annual rainfall
- No adjacent parcels are undeveloped

For each of the example bids, an offer price is listed in the table along with the coverage impact score and resulting value-based price that can be used to compare bids. For example, the offer price presented by the example bid “commercial facility adjacent to stream” is \$100/ft². The coverage impact score for this bid is 3.10 and the resulting value-based price is $\$100/(1+3.1)$, or \$24. The following table contains the offer price, coverage credit impact score and resulting value-based price for the three example bids.

Criteria	Commercial Facility Adjacent to Stream	Vacant Lot at South Y	Residential Country Home
Ft ² Offer Price	\$100	\$65	\$50
Soil Type	1.00	1.00	0.00
Coverage Type	0.50	0.00	0.50
Connection to Surface Waterbody	0.50	0.00	0.00
Watershed Priority	0.20	0.20	0.20
Surrounding Land Use	0.50	0.00	0.00
Coverage Impact Score	2.70	1.20	0.70
Net Value-Based Price (Offer Price/1+Coverage Impact Score)	\$27	\$30	\$29

The results based on the three examples show the bid “commercial facility adjacent to stream” to be the lowest value-based coverage compared to the other two examples, even though the \$100/ft² offer price was the highest of the three examples.

Land banks may need to consider additional criteria that are appropriately not included in the coverage impact credit system. One obvious criterion is the inclusion or exclusion of the property title with the coverage offered. Property title inclusion is likely to increase the offer price. Although higher offer prices will reduce the amount of coverage that can be acquired with funds available, prohibiting sellers only interested in selling the property right with the coverage may substantially reduce the opportunity set for the land banks. In the case of an increased offer price for the property right, land banks should consider using funds from other program areas that will benefit from land bank ownership of the property.

Once the net value-based price is calculated for each bid, bids can be ranked low to high based on the net value-based price and selected. The number of bids awarded is based on the amount of coverage offered by each bid and the total amount of funds available. Starting with the lowest value-based price, bids are selected until the total funds are used.

The reverse auction bid instructions should describe how the value-based price will be generated and used in the selection process to inform potential sellers how bids will be evaluated and selected.

Demand for Reverse Auction

A successful reverse auction requires several participating willing sellers. Demand to sell coverage may be limited. Much of the general public is unlikely to be holding coverage for sale, no less restoring coverage with the desire to sell the coverage. Developers may also be reserving coverage for future projects.

In order for several willing sellers to participate in a reverse auction, a well-coordinated, effectively-marketed and well-articulated reverse auction is necessary. Land banks will need to create materials that clearly describe the process and funds available. Further, the auction will need to be broadly marketed. Land banks will need assistance by local jurisdictions and other organizations with direct access to potential willing sellers.

Analysis of Policy Objectives

Land banks use of reverse auctions to acquire coverage will provide environmental and community benefits by

- a) Improving Project Enablement through providing willing sellers a venue to sell coverage, which will increase coverage restoration, and
- b) Significantly improving Administrative Viability through providing a single acquisition process to acquire coverage at the lowest possible prices and maximize environmental benefit.

Implementation Actions

Implementing a reverse auction and creating criteria to maximize environmental benefit will require the following actions:

- 1) Define coverage value-based price adjustment system.
- 2) Define and document reverse auction procedures, including coverage value-based price adjustment system and summary so that potential sellers understand how different types of coverage will be evaluated.
- 3) Ensure ECM funds collected are accessible.
- 4) Schedule and broadly advertise reverse auction, including funds available, date and summary of how different types of coverage will be evaluated to generate more acquisition opportunities.
- 5) Require bids to be submitted with enough time prior to auction to do quick field verifications to collect information necessary for the value-based price adjustment system.
- 6) Conduct pilot reverse auction.

23) Use a standardized process and forms for tracking ECM in-lieu fees collected and reporting public entity coverage information

Implementation Timeframe: Short-term

Implementation Parties: TRPA, CTC, NDSL

Needs for Change Addressed

ECM In-lieu Fee Collection

TRPA and local jurisdictions collect ECM in-lieu fees, but each tracks and reports them using different formats. It takes significant effort to aggregate data in different formats and to reconcile incomplete data.

Public Land Owner Coverage Reporting

Land banks carry inventories of coverage and conduct dozens of coverage transactions annually. Further, other public agencies such as the Lake Tahoe Basin Management Unity own significant land in the basin and manage coverage internally. However, only land banks report any information on their coverage related transactions and uses to TRPA, and the land banks use different formats containing different information.

Policy Recommendation Description

ECM In-lieu Fee Collection

Develop a standard format to track and report ECM in-lieu fees that ensures completeness, timely reporting and consistency of data necessary for land banks to easily understand how fees need to be expended.

Public Land Owner Coverage Reporting

Create a consistent reporting process and data schema for land banks, and other public agencies that manage large inventories of coverage across multiple and sizeable land parcels, to report coverage inventories and uses annually. This would give TRPA the data necessary to evaluate and improve the coverage policies that impact land banks and other large public land owners.

Discussion & Illustration

ECM In-lieu Fee Collection

It can take upwards of .5 full person month each year for CTC to reconcile different data formats and inaccurate data provided by local jurisdictions.²⁶ A web form or basic spreadsheet with a standard format for local jurisdictions to provide required information related to each ECM in-lieu fee transaction can save significant administrative costs.

In previous attempts to standardize and simplify this process, technology barriers have been an issue such as some local jurisdictions not having access to Microsoft Excel on their local computers or not having access to a computer at all. Different technologies, including paper forms, can be used however they will create additional effort on the receiving end of the process.

Public Land Owner Coverage Reporting

MOUs between TRPA and CTC, and TRPA and NDSL state that CTC and NDSL shall report the use of all ECM in-lieu fees to TRPA annually and make other information available on request, such as the inventory of coverage in the bank. MOUs between TRPA and public landowners such as USDA Forest Service (Appendix E – Section V) and California state Parks Department (Appendix D – Section V) state that each agency “will report to the Executive Director of TRPA annually at the end of each calendar year on all activities resulting in a change in coverage or land coverage transactions”.

Analysis of Policy Objectives

ECM In-lieu Fee Collection

Using a standard form and process for local jurisdictions to share ECM in-lieu fee information with land banks will provide environmental and community benefits by significantly improving Administrative Viability through

- a) Providing TRPA and local jurisdictions a form that only captures the necessary information and is easy to use, and limiting the effort required of local jurisdictions to assist TRPA and land banks during the reconciliation process when data issues exist, and
- b) Providing land banks all ECM in-lieu fee information collected by TRPA and local jurisdictions using a form that ensures accurate and consistent data, which will avoid the significant effort annually required to reconcile ECM in-lieu fee information collected.

Public Land Owner Coverage Reporting

Using a standard form and process for public land owners to share coverage inventories and uses with TRPA on an annual basis will provide environmental and community benefits by significantly improving Administrative Viability through

- a) Providing land banks and other public land owners with a form that only captures the necessary information and is easy to use, and improving the coverage policies that impact public land owners over time, and
- b) Providing TRPA with the public land owner coverage information necessary to evaluate and improve coverage policies that impact public land owners.

²⁶ This estimate was provided by Bruce Eisner, Gerry Willmetts and Amy Cecchetti during a meeting on February 7, 2012.

Implementation Actions

ECM In-lieu Fee Collection

Using a standard form and process for local jurisdictions to share ECM in-lieu fee information with land banks will require the following actions:

- 1) Determine the specific data (e.g. APN, land capability, land use, etc.) that TRPA and local jurisdictions will be required to provide.
- 2) Determine the platform for local jurisdictions to provide the information. The following platforms should be considered in the order listed.
 - A basic web form that allows local jurisdictions to submit new entries and edit existing entries is ideal because there would be a single database as opposed to different files for each local jurisdiction, and potentially different files within a local jurisdiction. A basic web form would require little effort to develop; however local jurisdictions would need to have internet access to use the form.
 - An online, multi-user spreadsheet like Google Spreadsheet and would also save effort and reduce confusion by all jurisdictions using a single database; however, there will be less control of the integrity of the data input and data could easily be deleted without any way to recover previous versions unlike a transactional database.
 - Desktop spreadsheet software like Microsoft Excel will allow users to use a consistent format but without the need for internet access. Data integrity and losing data are weaknesses of this solution.

Public Land Owner Coverage Reporting

Using a standard form and process for public land owners to share coverage information with TRPA will require the following actions:

- 1) Determine specific types of data (e.g. existing and potential coverage associated to parcels, changes in existing and potential coverage, project types that used coverage) that TRPA will use to evaluate coverage policies. Specific uses of each type of data must be documented and provided to public land owners so that they understand why the data is requested and can provide feedback on how to assist TRPA further to achieve their objective.
- 2) Determine the specific data (e.g. land owner, APN, land capability, etc.) for each type of data that public land owners will be required to provide.
- 3) Develop a standard format and easy to use software (e.g. Microsoft Excel) for public land owners to provide data and TRPA to aggregate and evaluate data
- 4) Define a process and schedule for providing the data to TRPA.
- 5) Define a process for TRPA to evaluate the data provided and report findings to inform improvements to the coverage policies.

24) Clarify and ensure coverage policies and operational processes are implemented consistently according to policy documentation

Implementation Timeframe: Short-term

Implementation Parties: TRPA, CTC & NDSL

Needs for Change Addressed

There are several instances of different interpretations of coverage policies and differences between policy documentation (e.g. Code and MOUs) and actual implementation by TRPA and the land banks.

- The Code and MOUs between TRPA and CTC, and TRPA and NDSL, do not specify how ECM in-lieu fees should be utilized depending on the source of the fees or if ECM in-lieu fees must be utilized within the HRA collected. CTC and NDSL have used ECM in-lieu fees differently and TRPA and the land banks have had numerous conversations over the years discussing the same ambiguity in the policy documentation.
- The Code specifies ECM in-lieu fees should reflect the land bank's cost to acquire and restore land coverage under this program. However, the ECM in-lieu fees are significantly below market value in most HRAs.
- The Code states that for parcels in private ownership, a deed restriction, or other covenants running with the land, must be used to permanently retire coverage from a sending site after coverage is transferred. NDSL follows this policy, however, CTC has never permanently retired coverage transferred from a parcel using a deed restriction because CTC assumed they would never sell the parcels and the cost to create deed restrictions for each of the several dozen transactions each year would add up quickly. If CTC were sell parcels to raise funds or were forced to liquidate assets by the State of California, it would be possible that the retired coverage could re-enter the market.
- The Code specifies coverage transferred for residential use must transferred from a less or equally sensitive land capability. However, CTC has managed land bank inventories in the past by 1B, sensitive and non-sensitive coverage. This has created instances when coverage has been transferred from higher land capability lands to low land capability land.

Policy Recommendation Description

Currently known ambiguity in the policy documentation and differences between policy documentation and actual implementation needs to be addressed. The list of needs for change above should be included in a near-term review of policy documentation ambiguity and differences between policy documentation and actual implementation.

- Regarding the deed restriction issue described above, land banks should be given the flexibility to generate deed restrictions using a batch process within 12 months of transferring coverage from any specific parcel. This improvement to the existing policy will significantly reduce administrative costs for the land banks.

Processes should be implemented to continuously clarify ambiguities in policy documentation and ensure policies are implemented correctly and consistently. For example, simple annual audits should be conducted such as:

- Request each land bank to provide a copy of the deed restriction for at least one parcel that coverage was transferred from between 12 and 24 months before the audit. The transfer should have occurred more than 12 months ago because land banks should be given the flexibility to generate deed restrictions using a batch process within 12 months of transferring coverage from any specific parcel.
- Request each land bank to provide updated coverage inventories and coverage sales documentation that demonstrate the relative sensitivity policy was followed for all residential coverage transfers.

Discussion & Illustration

Deed Restriction to Permanently Retire Coverage Transferred

NDSL has created deed restrictions for all coverage transfers from NDSL owned and managed (Incline Village General Improvement District) parcels. However, NDSL's low transaction volume relative to CTC's substantial transaction volume makes the net transaction costs for NDSL less of a barrier.

Allowing land banks to batch process deed restrictions instead of per coverage transfer transaction will not only reduce overhead costs but reduce the number of deed restrictions required. Frequently land banks transfer several small blocks of coverage from a single parcel over a year, and instead of creating several deed restrictions during the year, only a single deed restriction should be required each year per parcel.

Rule of Relative Sensitivity for Residential Transfers

If the parcel is zoned for residential use, land banks need to transfer coverage from a *sending parcel* as environmentally sensitive as, or more environmentally sensitive than, the receiving parcel. This is the currently policy for land banks and all market participants, however the CTC has not managed inventories by land capability, but rather 1B, sensitive (1a, 1c-3) and non-sensitive (4-7) which has impeded their ability to comply with this policy. CTC is currently improving their internal tracking systems to comply with this recommendation.

Key Term

Sending parcel: An eligible parcel that coverage can be transferred from in a coverage transaction.

Analysis of Policy Objectives

Continuously clarifying and ensuring policy documentation and actual implementation are consistent will provide environmental and community benefits by significantly improving Administrative Viability through improving policy effectiveness and reducing legal vulnerability.

Implementation Actions

Implementation actions related to issues listed in the Needs for Change Addressed section above include:

- Eliminating ambiguity related to the acceptable land bank uses of ECM in-lieu fees will require clearly specifying the acceptable land bank uses of ECM in-lieu fees in MOUs between TRPA and each land bank.
- Changing ECM in-lieu fees to reflect actual cost to acquire and restore coverage will require a defined process for determining the appropriate ECM in-lieu fee level(s), consistently evaluating and proposing ECM in-lieu fee level changes each year, and publishing changes to ECM in-lieu fee levels 6 months in advance of the change.
- Ensuring coverage transferred from land bank owned lands is permanently retired will require TRPA to audit land banks annually to ensure deed restrictions exist for all coverage transferred, which will require the following actions
 - 1) Define and document the annual audit process, including the source and process for determining the parcel to request proof of deed restriction, and the method to document the status of each annual audit.
 - 2) Share annual audit process with land banks and request feedback for improving the efficiency and effectiveness of the process.
 - 3) Assign the annual audit responsibility to a staff member.
- Ensuring coverage transferred from land bank owned lands is transferred to less or equally sensitive land capability parcels will require TRPA to audit land banks annually, which will require the following actions

- 4) Define and document the annual audit process, including the source and process for determining the parcel to request proof that the rule of relative sensitivity was fulfilled, and the method to document the status of each annual audit.
- 5) Share annual audit process with land banks and request feedback for improving the efficiency and effectiveness of the process.
- 6) Assign the annual audit responsibility to a staff member.