November 12, 1993
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Introduced by: Barden

Proposed No.: 93-298

ORDINANCE NO. 11112

AN ORDINANCE adopting King County Flood Hazard Reduction policies, amplifying and augmenting the King County Comprehensive Plan, and adding a new section to K.C.C. 20.12.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

FINDINGS:

For the purpose of effective flood hazard reduction and flood plain management in King County, the county council makes the following legislative findings:

1. King County has experienced significant flooding in recent years, resulting in tens of millions of dollars in flood damages to public and private properties and causing the federal government to declare the county a flood disaster area seven times since 1979.

2. King County last completed and adopted a Comprehensive Plan for Flood Control in 1964. The 1964 plan is out of date in terms of its content and project recommendations, and is inconsistent with adopted environmental protection policies and regulations, and sound flood plain management principles.

3. Recent state-enacted growth management (RCW 36) and flood control legislation (RCW 86) requires counties to coordinate the adoption of comprehensive flood control management plans, policies and regulations with cities, towns, and special districts within the county.

4. King County's limited River Improvement Fund revenues are not sufficient to adequately respond to the extensive countywide need for flood reduction and river management services. Therefore, there is a need for adopted policies that are predictable, consistent, and direct county actions to the most important and cost-effective solutions first.

5. Controlling all flooding conditions in King County is not practical or financially feasible, therefore river management policies should be established with the intent of reducing flood-related hazards and damages, preventing new development that would be at risk to flood and erosion hazards, and reducing long-term public costs for flood control and flood plain management.

6. King County's rivers and flood plains provide not only scenic and recreation opportunities for its residents, but also habitat for fish and wildlife. River management policies are needed to direct the county to address the protection and enhancement of fisheries and environmental resources in concert with efforts to reduce flood damage.

11112

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

SECTION 1. There is hereby added to K.C.C. 20.12 a new section to read as follows:

The King County Flood Hazard Reduction Plan policies, as shown in Attachment A and incorporated herein by reference, are adopted as operating principles to guide King County's flood hazard reduction programs and to meet the intent of the water and natural resource policies of the King County Comprehensive Plan. As an amplification and augmentation of the King County Comprehensive Plan, the policies constitute official county policy with regard to flood hazard reduction and flood plain management in King County.

INTRODUCED AND READ for the first time this 23rd day of August, 1993.

PASSED this 15th day of November, 1993.

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

Audrey Gruger
Chair

ATTEST:

Gerald A. Peterson
Clerk of the Council

APPROVED this 24th day of NOVEMBER, 1993.

Gary Locke
King County Executive

Attachments:
A. King County Flood Hazard Reduction Plan Policies, as amended, dated November 12, 1993

3.0 INTRODUCTION

This section of the plan recommends policies to direct floodplain and watershed management activities within King County. The policies provide a set of operating principles to guide the County's flood hazard reduction efforts over the long term.

The policies are divided into seven ~~eight~~ categories: general policies; floodplain land use; watershed management; flood hazard reduction projects; river channel maintenance; flood warning, information, and education; and emergency response~~; and financing~~. Section 4 describes specific actions to implement these policies.

3.1 GENERAL POLICIES

The general policies listed below form a "mission statement" for the proposed River Management Program, providing general guidance for all its future activities. All other policies and recommendations in this plan are designed to fulfill one or more of these general policies.

The policies are based in part on adopted floodplain and water resource policies in the *King County Comprehensive Plan* (King County 1985), which directs land use and growth in unincorporated King County. However, the general policies listed here refine and expand those earlier policies using responses from cities, the public, and other agencies, and conclusions reached during preparation of this plan.

NATIONAL FLOOD INSURANCE PROGRAM

Issue:

The National Flood Insurance Program provides disaster assistance to public agencies and makes flood insurance available to private land owners. Communities must adopt regulations intended to reduce flood hazards in order to qualify residents for flood insurance. Communities can also qualify their residents for flood insurance premium discounts by adopting regulations that exceed federal minimum standards.

Policy G-1:

Communities should not only meet, but also exceed the federal minimum standards for National Flood Insurance Program Qualification in order to better protect public health and safety, and to achieve flood insurance premium discounts.

RESTRICTING NEW DEVELOPMENT IN HAZARDOUS AREAS

Issue:

New development in flood hazard areas increases risks to life, health and property. In some areas, the risks are so severe that no development at all should be allowed. In other areas, flood risks may be minor enough that development, built to certain standards, should be permitted. In either case, prevention of future problems through land-use planning and regulation is far more effective, permanent and less expensive than trying to correct problems after they have been created.

Policy G-2:

New subdivisions, residential and commercial development, and substantial redevelopment of residential structures should be prevented on lands where hazards associated with flooding (such as deep and fast flowing water, large debris, or rapid bank erosion and channel migration) would pose serious threats to life, health or property.

Policy G-3:

Development may be allowed in areas of lesser flood hazard (such as shallow, slow moving water) only if it can be built to withstand flooding without suffering significant damage.

REDUCING FLOOD IMPACTS TO EXISTING DEVELOPMENTS

Issue:

Even if new development and substantial improvements are designed to minimize the risk of flooding or bank erosion, many developments built in the past will continue to be subject to these hazards. Reducing flood-related problems thus requires not only prevention, but remedial action as well.

Policy G-4:

Jurisdictions in King County should seek to reduce the risk of severe flood hazards and damages experienced by existing public and private developments.

Policy G-5:

New development or other actions should not be allowed to increase flood risks to existing properties and development.

REDUCING LONG-TERM PUBLIC COSTS

Issue:

Reducing flood hazards to existing developments can be extremely expensive. This is especially true of projects that require ongoing, intensive maintenance, and projects that transfer flood and erosion problems to other sites, necessitating more projects elsewhere. Endangered properties need to be protected in ways that will not require ongoing, escalating expenditures for flood control.

Policy G-6:

Where possible, flood hazard reduction projects should be selected, designed, and implemented to be permanent or low-maintenance solutions to flood problems.

PROTECTING NATURAL RESOURCES AND FUNCTIONS

Issue:

Flood control projects built in the past often degraded natural resources and functions. For example, levees were typically placed right on riverbanks. As a result, the broad, natural floodplain was no longer available to store and convey floodwaters. Some of these levees also eliminated streamside wetlands by separating them from the river. Side channels, vital as rearing habitat for juvenile salmonids, were similarly cut off by both levees and revetments. Past maintenance practices added to these problems by requiring that both levees and revetments be kept bare of most vegetation, eliminating the natural riparian corridor that provides important fish and wildlife habitat.

Policy G-7:

The existing flood storage and conveyance functions and ecological values of floodplains, wetlands, and riparian corridors should be protected and, where possible, enhanced or restored.

MULTI-OBJECTIVE MANAGEMENT OF WATER RESOURCES

Issue:

Rivers, streams, floodplains, wetlands, and ~~the~~ riparian corridors~~corridor~~--as well as the fish and wildlife that use them--are public resources. Any projects or programs affecting them therefore need to consider these ~~balance many~~ competing public resources~~benefits~~.

Policy G-8:

Floodplains, rivers, streams, and other water resources should be managed for multiple uses--including flood and erosion hazard reduction, fish and wildlife habitat, agriculture, open space, recreation, and, where appropriate, water supply and hydropower.

PLANNING WITH A WATERSHED PERSPECTIVE

Issue:

Watershed land use changes such as clearing and urbanization can increase downstream flows and thereby exacerbate flooding and erosion problems. Changes in the channel and floodplain itself can also impact other parts of the stream system. Confining the channel with levees, for example, can create backwater flooding upstream, increased erosion downstream, and greater sedimentation in the channel itself. Dredging river channels can lead to increased erosion downstream in both the river's mainstem and its tributaries. In other words, few actions in a watershed are without consequences for other parts of the drainage system.

Policy G-9:

Flood reduction plans and projects should be developed in a basinwide context, recognizing that the watershed and drainage network function as an interdependent system.

INTERGOVERNMENTAL COORDINATION AND COOPERATION

Issue:

Watersheds do not follow jurisdictional boundaries. Actions taken by one city or county in one part of a drainage basin--whether it be a land-use plan, development permit, or capital improvement project--can affect flood and erosion problems experienced by other jurisdictions within the watershed.

Policy G-10:

King County's floodplain and watershed management activities should be planned and implemented in close cooperation with cities, counties, tribes, and other agencies sharing jurisdiction in each basin.

COMPLIANCE WITH STATE CONSISTENCY REQUIREMENTS

Issue:

RCW 86~~ (as amended by the Flood Bill)~~ specifies that County comprehensive flood control management plans are binding on each jurisdiction and special district located within the area included in the plan within 120 days of the County's adoption of the plan. In the event that the city or town does not adopt the plan in 120 days, the statute provides for an arbitration process on issue(s) of dispute. The legislation ~~Flood Bill~~ does not, however, provide clear standards for determining compliance with the adoption requirements or specifics concerning the arbitration process.

King County recognizes that adoption ~~word for word~~ of a set of flood hazard reduction policies identical to the County's is not appropriate ~~not necessary to meet the intent of the policies.~~ for each city in King County. Cities have widely ranging levels of development, types of flood hazard, and capacities to impact flooding in neighboring jurisdictions.

~~At the same time, h~~However, because actions in one jurisdiction have the potential to exacerbate flooding and erosion problems or to adversely impact important natural resources in other jurisdictions, ~~consistent standards~~ clear guidelines are needed to ~~determine whether other jurisdictions' floodplain management policies are consistent with the intent of the County's.~~ define for which cities this consistency is important, and how a city's consistency with these policies should be determined.

Policy G-11:

Cities with no jurisdiction in any of the six major river basins (the South Fork Skykomish, Snoqualmie, Cedar, Green, White, or Sammamish) will not be evaluated for consistency with the FHRP policies. If a portion of a city's existing boundary or proposed annexation area is located within any of the six major river basins, then the city's policies and regulations will be evaluated for consistency with the FHRP.

Policy G-12:

The policies and regulations of cities within the six major river basins will be evaluated for their overall impacts on the following factors: protection of flood storage, conveyance, and natural resources of the floodplain; and control of stormwater runoff impacts on the floodplain. City consistency with the FHRP policies will be determined by considering whether the city's regulations effectively prevent significant adverse impacts on flooding, erosion, and natural resources in floodplains outside their jurisdiction.

Policy G-13:

The evaluation of city policies and regulations for consistency with the FHRP should be conducted jointly by affected cities and the county. Where a city and the county are unable to reach agreement regarding consistency, the dispute should be forwarded to the state for arbitration, as specified by RCW 86.12.210. The timing of the consistency evaluation should be coordinated as much as possible with revisions to comprehensive plans and critical areas regulations being carried out by cities and the county in accordance with the state Growth Management Act.

~~In accordance with RCW 86, jurisdictions in King County should adopt floodplain management policies that are consistent with the policies of the King County *Flood Hazard Reduction Plan.*~~

~~Other jurisdictions' floodplain management policies will be considered to be consistent with those adopted by the County provided that the policies are equally effective in:~~

- ~~Protecting and preserving the floodplain's capacity to store and convey floodwaters;~~
- ~~Minimizing risk to life, limb and public health due to the development or other use of flood prone lands; and~~
- ~~Preventing irreparable harm to regionally significant ecological resources of the floodplain.~~

~~King County will evaluate floodplain management policies adopted by other jurisdictions and make a finding of consistency based on the criteria above. The county will provide its finding to the jurisdiction for its review and comment. King County's finding will then be forwarded along with the affected jurisdiction's response to the County Council for a final determination of consistency.~~

3.2 FLOODPLAIN LAND USE POLICIES

Development in the floodplain creates two types of problems. First, because of its location in a hazardous area, the development itself is at risk from inundation and/or erosion. Second, such development can increase risks to neighboring properties by creating a barrier to the conveyance of floodwaters (thus causing backwater flooding upstream) and reducing the area available to store and slowly release floodwaters (thus increasing velocities and erosion downstream).

This sub-section contains policies to guide land-use planning and development regulations in floodplains. The goal of these policies, which incorporate floodplain restrictions already adopted in King County's *Sensitive Areas Ordinance*, is to reduce flood risks to future developments and prevent them from increasing risks to surrounding properties.

FUTURE CONDITIONS FLOODPLAIN

Issue:

Historically, King County floodplain regulations have been applied within the 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA). FEMA's maps are based on current or historic land use in the basin. As basins develop, however, the rate and volume of runoff reaching rivers and streams can increase. The boundaries of the 100-year floodplain may thus expand, inundating properties not currently mapped as in the FEMA floodplain. The depth of the 100-year flood may also increase (Figure 12).

Policy FP-1:

Wherever future conditions flows have been modeled and adopted by the County and affected cities as part of a basin plan, they should be used to define ~~King County land use policies and flood hazard regulations should apply to~~ the 100-year, future-conditions floodplain (i.e., the 100-year floodplain expected under buildout of current land-use plans and regulations for the basin). In these basins, land use policies and flood hazard

regulations should apply to the 100-year future conditions floodplain.~~wherever future conditions flows have been modeled and adopted as part of a basin plan.~~

DEVELOPMENT IN THE FEMA FLOODWAY

Issue:

FEMA designates a portion of the 100-year floodplain as a "floodway" (see Figure 8 in Section 2). The floodway is generally mapped as being immediately adjacent to the channel, and is often associated with deep, rapidly moving water. A minimum requirement for communities wishing to participate in the National Flood Insurance Program (NFIP) is that development within the 100-year floodway not cause any rise in the elevation of the 100-year flood. (The NFIP enables residents of eligible communities to obtain federally backed flood insurance and disaster assistance.) The State of Washington has taken this a step further, prohibiting residential development in the FEMA floodway. These restrictions also apply to "substantial improvements"--defined as reconstruction or improvement of an existing structure in which the work equals or exceeds 50 percent of the structure's value before it was improved.

Policy FP-2:

New subdivisions, residential and commercial development, and substantial improvements to residential structures should be prohibited within the one-foot floodway delineated on the Flood Insurance Rate Maps produced by the Federal Emergency Management Agency.

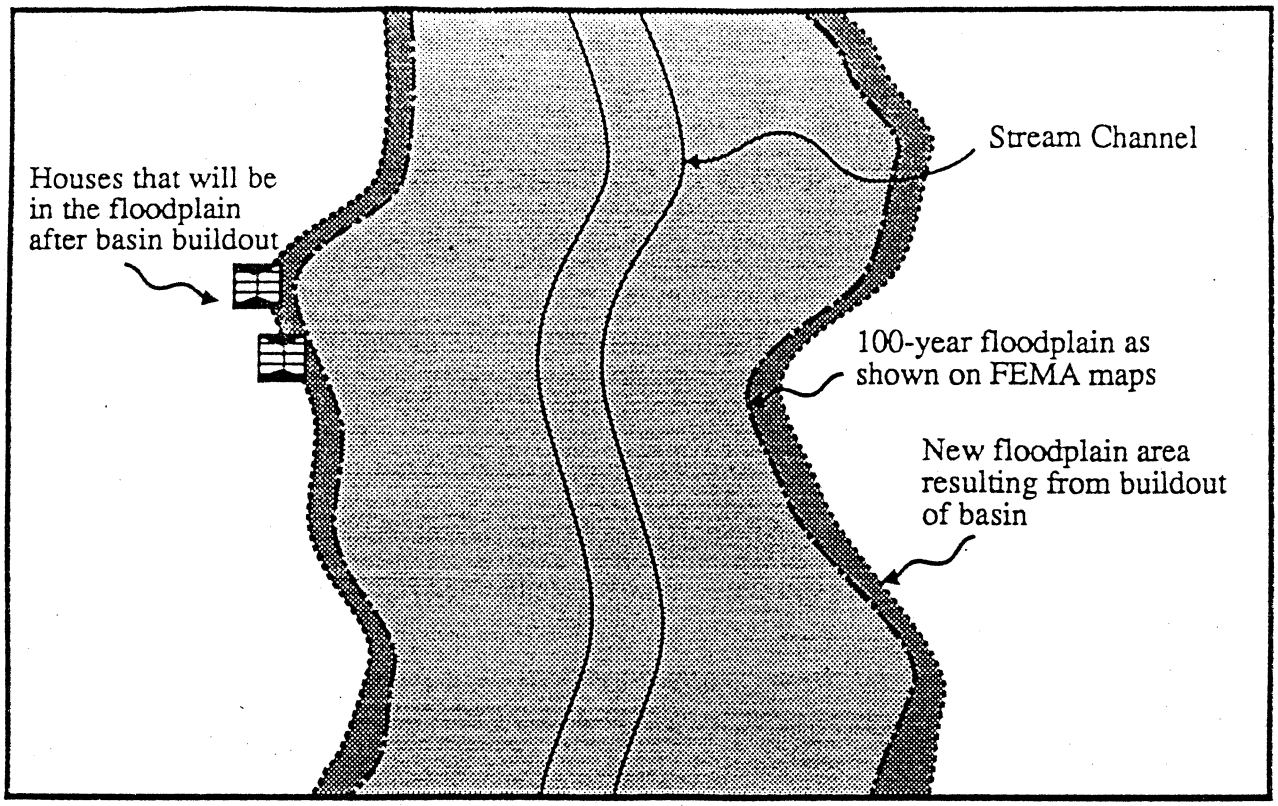
ZERO-RISE FLOODWAY

Issue:

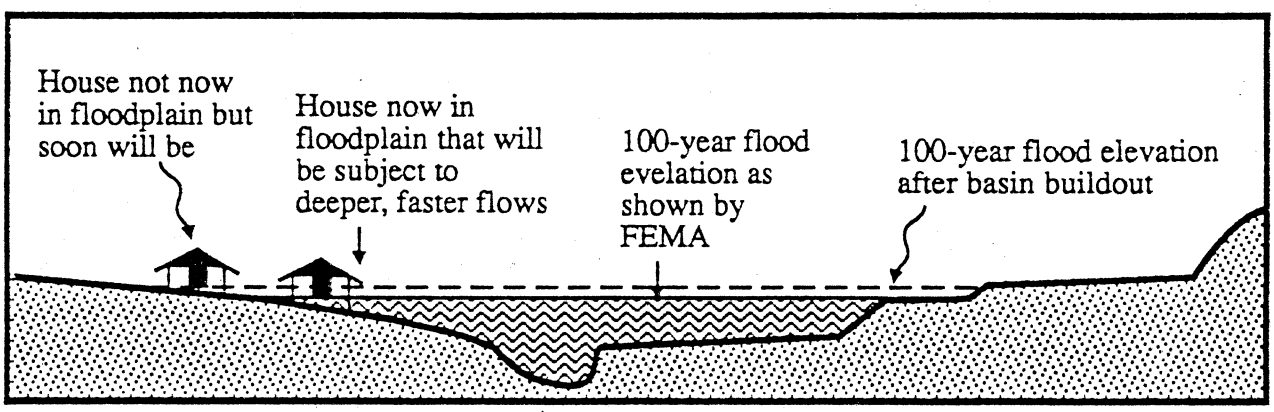
Structures and fill in the floodplain create barriers to flood flow. As a result, flows "back up" during a flood, increasing flood depths on upstream properties. Federal regulations allow encroachment on the floodplain to increase the elevation of the 100-year flood by as much as one foot. However, increases of this magnitude can significantly increase flood damages to neighboring properties.

Policy FP-3:

The placement of structures and/or fill in the floodplain should not cause any increase in the elevation of the 100-year flood (see Figure 9 in Section 2 for an illustration of the "zero-rise" floodway).



PLAN VIEW



CROSS SECTION VIEW

FIGURE 12

FUTURE CONDITIONS FLOODPLAIN

COMPENSATORY STORAGE

Issue:

Structures and fill in the floodplain reduce the area available to store floodwaters. As a result, the floodplain's ability to hold and slowly release floodwater~~floodwaters~~ is diminished, increasing downstream velocities and peak flows. These downstream problems can be prevented by excavation that~~which~~ replaces any storage volume filled by new development. When excavation is made at the same elevations as the fill, the floodplain's storage function is not materially altered by the project.

Policy FP-4:

Structures and fill placed in the floodplain should be compensated for by excavation of equivalent volumes at equivalent elevations (see Figure 10 in Section 2).

FLOOD PROTECTION CONSTRUCTION STANDARDS

Issue:

In areas of lesser flood hazard (e.g., areas of shallow and/or slow-moving water), floodplain structures can be protected from serious inundation damage by using special construction techniques. For example, homes can be elevated above flood levels and built so they allow floodwaters to pass through the foundation and lower, uninhabited floors. The NFIP requires that new and substantially improved homes be elevated "to or above" the 100-year flood elevation and be built to allow for the entry and exit of floodwaters; the State of Washington recommends that homes be built so that the lowest floor is one foot above the 100-year flood elevation.

Policy FP-5:

New development and substantial improvements in the floodplain should be constructed so that they can withstand the 100-year flood without sustaining significant damage. They should, at a minimum, be built so that the lowest finished floor is one foot above the 100-year flood elevation. Areas below the lowest finished floor of residential structures should be designed to allow for the entry and exit of floodwaters (see Figure 11 in Section 2).

FLOODPLAIN LAND USES

Issue:

Much of King County's floodplain area has experienced only low-density development. In these areas, floodplain land use regulations and plans can be used as an effective tool for preventing new at-risk development. Certain types of land uses are more compatible with flooding than others. Land uses that leave wide areas of the floodplain open will help preserve its storage and conveyance functions, minimizing flooding and erosion impacts to neighboring properties. Also, the fewer structures in the floodplain, the lower the potential for damage.

Policy FP-6:

In ~~rural~~ areas designated "rural" in the King County Comprehensive Plan (i.e., areas outside the urban-rural boundary line and outside of existing cities and towns), land uses which preserve the natural flood storage and conveyance functions of the floodplain--such as agriculture, open space, fish and wildlife habitat, and recreation--are preferred within the floodplain.

Policy FP-7:

Critical facilities and land uses which would present special risks--such as hazardous waste storage facilities, hospitals, schools, nursing homes, and police and fire stations--should not be built ~~allowed~~ in the floodplain unless no reasonable alternative is available. If located in the floodplain, these facilities and the access routes needed for their operation~~,~~ should be built in a manner that protects public health and safety during at least the 100-year flood. In addition, special measures should be taken to ensure that hazardous or toxic substances are not released into flood waters.

MIGRATING RIVERS

Issue:

Some rivers in King County "migrate" laterally, endangering properties along their banks. Areas that are at risk due to channel migration are sometimes outside the mapped floodplain, so that residents may not be aware of the risk (see Figure 6 in Section 2). Attempts to control channel migration through structural means, such as revetments, are costly and are not always effective along very unstable rivers. Prevention through land-use regulation is often a more cost-effective solution.

Policy FP-8:

Channel migration hazard areas should be identified through geomorphologic analyses and review of historic channel migration patterns and rates. Land-use regulations should be adopted and applied in order to preclude unsafe development in these areas.

3.3 WATERSHED MANAGEMENT POLICIES

A comprehensive analysis of flooding problems and solutions must look not only at the floodplain, but at the entire watershed that drains to the floodplain. Watershed features that influence the volume and rate of flow in large rivers include climate, topography, geology and soils, land cover, and the presence of major dams. Of these features, only two--land cover and major dams--can be affected by County action. This section proposes policies to direct watershed land-use decisions and dam operations in the large river basins.

IMPACTS OF BASINWIDE LAND USES ON FLOODING

Issue:

Development and clearing in a basin can increase both the peak rate and volume of runoff reaching rivers and streams. As noted earlier, this can increase the depth and extent of flooding downstream. It can also intensify erosion, especially during small- to moderate-size events (e.g., 2-and 10-year flows). The *King County Surface Water Design Manual* includes specific guidance for minimizing downstream problems that would otherwise be caused by upland development.

Policy WM-1:

New development and other land use practices should meet or exceed the performance standards of the *King County Surface Water Design Manual.*~~not increase the pre-development peak rate of runoff resulting from the 2 , 10 , and 100 year storms.~~

Policy WM-2:

Basin plans should estimate the downstream effects of the increased runoff volumes caused when development is designed for rate control (see Figure 13 for an explanation of why runoff volumes can increase even when runoff rates are controlled).~~.)~~

Policy WM-3:

Where significant downstream impacts will result from increased runoff volumes, new upland land uses should be required to either control runoff volumes or to ~~contribute to the protection of~~ incorporate other equally effective measures to protect downstream properties.

MULTI-OBJECTIVE DAM OPERATIONS

Issue:

The design and operation of major dams, which are often intended for a single or narrow range of uses (such as water supply or hydropower), can have significant impacts on other aspects of a river system such as flooding, fisheries, and recreation.

Policy WM-4:

To the extent possible, major dams should be designed and operated to meet multiple objectives, which could include flood control, water supply, power generation, water quality, recreation, and fisheries protection.

Impervious surfaces and clearing associated with land development decrease soil infiltration, increase runoff volume, and speed up runoff rates. The King County Surface Water Design Manual requires that the peak **rate** of runoff not exceed pre-developed rates. However, because there is more runoff from the developed site, the rate occurs for a longer period, resulting in a greater **volume** of runoff.

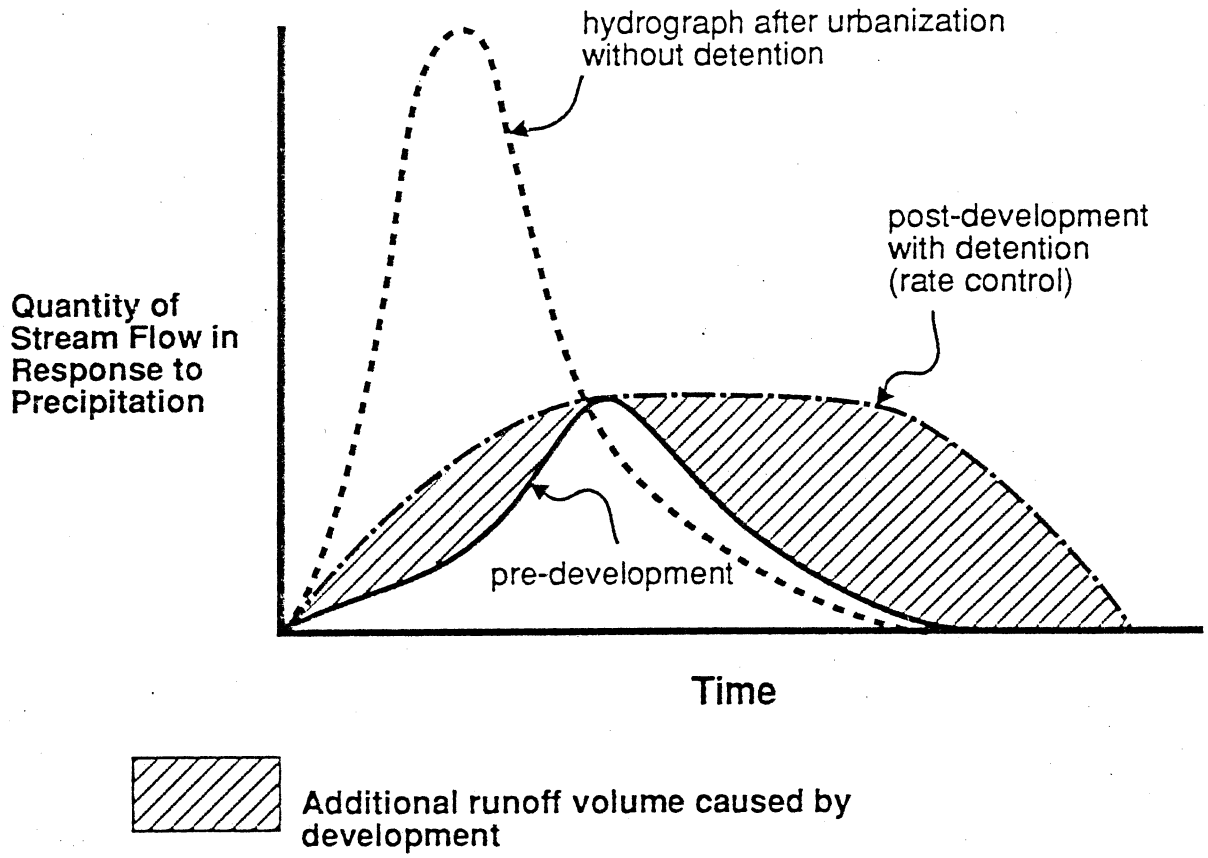


FIGURE 13

WHY RUNOFF VOLUMES INCREASE WHEN ONLY RUNOFF RATE IS CONTROLLED

3.4 FLOOD HAZARD REDUCTION PROJECT POLICIES

King County has built or sponsored numerous capital improvement projects (CIP) for flood control along the major rivers. These CIPs~~CIP~~ consist primarily of revetments, levees, and structures associated with levees--i.e., pump plants and flap gates (see Figure 7 in Section 2). At present, very little new construction of these types of projects is being done by King County; the majority of the County's flood control efforts focus on maintenance of projects built in the 1960s and 1970s.

This section recommends policies to guide a new, comprehensive program that can implement a range of "flood hazard reduction projects," not just traditional CIP. These projects include, for example, innovative types of projects such as setback levees and soil biostabilization bank protection; relocation, acquisition, and elevation of flood-prone homes; and redesign or removal of existing river facilities that are susceptible to damage or causing significant impacts to other sites.

The policies are listed in the approximate order of the decisions that have to be made in developing a project. They address the selection, design and implementation of new projects as well as the maintenance of existing and future projects.

PROBLEMS ADDRESSED BY THE RIVER MANAGEMENT PROGRAM

Issue:

Floods damage many different types of property and create a variety of hazards. Spending public funds for flood protection may be more appropriate for some types of properties and problems than others. For example, County facilities like roads, bridges, and parks represent a taxpayer investment and an important part of the public infrastructure. Expenditure~~Expenditures~~ of public funds to reduce flood hazards to these properties is appropriate. However, whether or not the County should spend its funds to protect other property is currently clear.

Policy FHR-1:

The following types of properties and problems should be eligible for protection:

1. there is an imminent threat to public health or safety;

2. King County has a written maintenance agreement or other legal obligation to protect the site;

3. King County property (such as a road, bridge, or park) is endangered;

4. public property (such as a road, bridge, or park) of a city within King County is endangered;

5. a County action caused or contributed to the problem;

6. property for which the County has acquired development rights (e.g., agricultural land) is endangered;

7. there is a threat of severe damage to private homes or businesses.

The following types of properties and problems should be ineligible for project assistance from King County:

1. undeveloped private land (e.g., a lawn, private forest land, etc.) is eroding or inundated, with no imminent and severe threat to public or private structures;

2. federal and/or state property alone is endangered;

3. future development potential is precluded (e.g., a property cannot be issued a development permit because of a flood-related problem);

4. private roads and bridges are endangered, with no imminent threat to public health and safety.

PROBLEM PRIORITIZATION

Issue:

Hundreds of public and private properties in King County experience flood related hazards and damages. Neither the funding nor the staff will be available to address all these

problem sites at once, or perhaps ever. To ensure that new projects are implemented to address the most important problems first, a defensible policy is needed to prioritize problems.

Policy FHR-2:

In determining the priority of a problem, the following factors should be taken into consideration: consequences, urgency, responsibility, and opportunity. These factors are described below.

Consequences:

The primary determinant of a problem's priority is the consequences that would result if no project is implemented. Consequences should generally be prioritized in the following order:

1. Threats to public health and safety

   Threats to public health and safety include threats to critical facilities (e.g., hospitals, schools, nursing homes, and emergency response facilities) and/or health-related infrastructure (e.g., water supply systems, sewer lines). The presence of deep, high-velocity flows carrying debris through populated areas also constitutes a threat to life and limb.

2. Damage to public infrastructure and developed public property

   Public infrastructure and developed public property includes, but is not limited to, roads, bridges, utility systems, public buildings, and parks.

3. Damage to private structures

   Private residential structures should receive higher priority than non-residential structures.

4. Damage to significant natural resources

   Significant natural resources are defined to include fish and wildlife species and their habitats that are considered regionally significant to the lower Puget Sound Region.

5. Damage to undeveloped public land

   Undeveloped public land refers to both publicly-owned open space and land for which development rights have been purchased, such as agricultural land.

Urgency:

Urgency is a measure of how quickly action needs to be taken in order to prevent a problem from growing worse and requiring an increasingly costly solution. For example, the magnitude of an erosion-related problem will generally increase over time if not addressed. In comparing problems where equal consequences would result if no action were taken, the most urgent problem should be addressed first.

Responsibility:

Another important factor is whether the problem is related to a County facility that King County has a legal commitment to maintain. In comparing problem sites with comparable consequences and urgency, those associated with facilities that King County has a legal commitment to maintain should be a higher priority than sites where no such commitment exists.

Opportunity:

Although consequences, urgency, and responsibility are the primary factors in determining problem priorities, projects can sometimes present opportunities for meeting multiple objectives. Examples include projects that enhance ecological resources, provide public access to the river system, and/or provide opportunities to cooperate with private land owners or other jurisdictions in funding and implementation of the project. The prioritization procedures should allow flexibility to give higher priority to projects that ~~which~~ meet multiple objectives.

MODIFICATIONS TO PROBLEM PRIORITIZATION CRITERIA

Issue:

The problem prioritization criteria described in Policy FHR-2 are intended to provide general guidance in prioritizing flood-hazard related problem sites throughout the County. However, detailed basin plans are being prepared for many of King County's stream and river basins. In many cases, the detailed information compiled for a basin plan indicates the need for prioritization policies that are tailored to the specific conditions in the basin.

Policy FHR-3:

Basin-specific modifications to the Problem Prioritization Policy (Policy FHR-2) may be made in accordance with the recommendations of adopted basin plans.

ALTERNATIVE EVALUATION AND SELECTION

Issue:

When developing solutions for each problem site, a number of alternatives will likely be available. Moreover, while a problem may be deemed a high priority because of its consequences, the alternatives available for solving it may be prohibitively expensive or create unwanted impacts. King County needs a consistent, clear and objective method for comparing and selecting alternatives to ensure that public funds are spent wisely.

Policy FHR-4:

Project alternatives should be evaluated according to the following criteria:

1. *Risks to life and limb.* The effect of the project on public health and safety should be evaluated both upstream and downstream of the site. The project should have a beneficial or negligible impact on public health and safety.

2. *Benefits versus costs.* Benefits are measured as the effect on flood damages over the entire river or stream system; costs are measured as public and private costs for implementing and maintaining the solution over the long term. Flood damage reduction benefits over the entire river or stream system should exceed long-term costs.

3. *Environmental impacts.* The environmental impacts of the project include its effect on fish and wildlife habitat, wetlands, water quality, and other elements prescribed in the State Environmental Policy Act guidelines. Impacts should be evaluated both upstream and downstream of the project site. The net environmental impacts of the project (plus any mitigation measures) over the long term should be positive or negligible.

4. *Consistency with applicable land-use plans and regulations.* The project should be consistent with land-use plans for the area and should not conflict with regulations governing activities in the floodplain and riparian corridor (e.g., zero-rise floodway, compensatory storage, stream buffers), unless the project benefits justify seeking an exception from applicable regulations.

Figure 14 shows how these criteria should be applied.

VOLUNTARY ACQUISITION VERSUS CONDEMNATION

Issue:

One alternative for reducing flood hazards is the relocation or acquisition of flood-prone structures. However, if acquisition of threatened buildings is selected as the preferred solution (using the criteria listed above), some property owners may be unwilling to sell. If this is the case, the county will need to decide whether to condemn the property, or allow the property owner to remain.

Policy FHR-5:

Except under very limited circumstances, county acquisition of threatened buildings should be voluntary on the part of the property owner. Condemnation should be considered only under the following circumstances: 1) federal, state and/or local regulations prohibit reconstruction of the building; 2) the property in question is causing significant flood damage to other properties; 3) a property owner refuses to sell a portion of an area in which the majority of property owners have agreed to sell to the county, or 4) a property owner refuses to sell an area needed to complete an approved capital improvement project.

USING LAND CREATED BY RELOCATION OR ACQUISITION

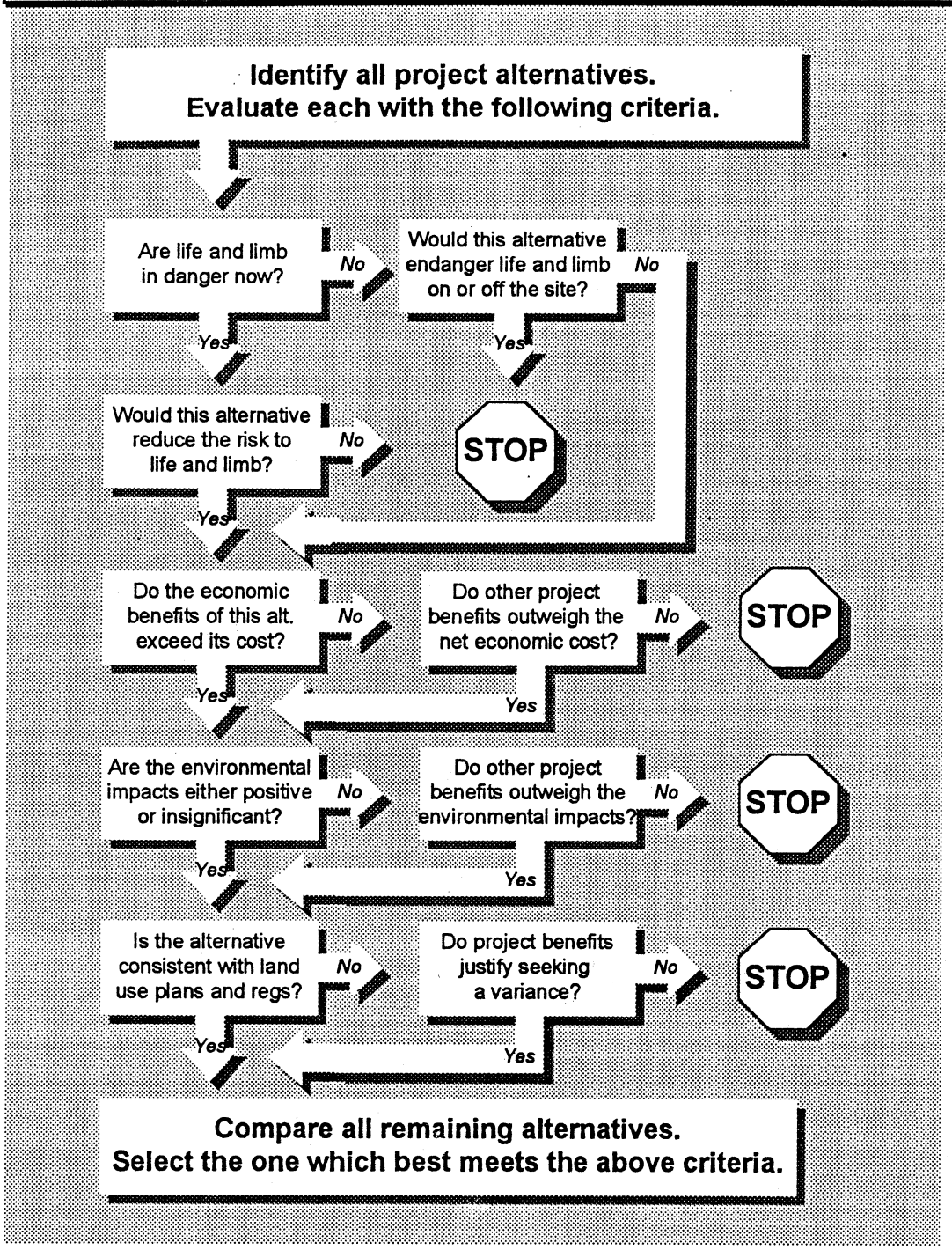
Issue:

If structures are relocated or acquired and demolished by the County, vacant land will be created. Much of this land, because it is along major rivers, will have value as open space, habitat, parks, or agricultural land.

Policy FHR-6:

Open land created by the relocation or acquisition of structures should become either a County easement (if the structure is relocated to another site on the same lot) or be owned and managed by King County as open space, riparian corridor, agriculture or a recreation area.

Replace Figure 14 with the following:



ALTERNATIVE EVALUATION AND SELECTION CRITERIA

LEVEL OF PROTECTION

Issue:

Projects (such as levees) built to protect property from inundation are usually designed for a certain magnitude of flood event. Events that exceed this "designed level of protection" will overtop the project; lesser events should be contained by the project. In the past, many residents of levee-protected areas have assumed they had protection from the 100-year event, when this was not always the case. King County currently maintains many levees that provide less than 100-year protection; it may also build new levees under the proposed River Management Program. Clear guidelines are needed on what level of protection existing and new projects should provide.

Policy FHR-7:

New flood hazard reduction projects, whether protecting new or existing development, should seek to provide protection from the 100-year, future conditions flood, plus a margin of safety. When new projects are being built to protect existing development, lesser protection may be provided where 100-year protection is not practical. Existing flood hazard reduction projects protecting existing developments should be maintained at their current level of protection unless the alternatives evaluation shows that a different level of protection is warranted. ~~These requirements are summarized in Table 9.~~

MULTI-OBJECTIVE FLOOD HAZARD REDUCTION PROJECTS

Issue:

Because they occur in the floodplain and riparian corridor, flood hazard reduction projects can impact fish and wildlife habitat, wetlands, and important open space and recreation opportunities.

Policy FHR-8:

King County should, wherever reasonable, design flood hazard reduction projects to include preservation or creation of wetlands and fish habitat areas, and to be compatible with open space and recreation opportunities.

~~TABLE 9~~

~~LEVEL OF PROTECTION POLICY~~

Project	Development	
	New	Existing
New	100-year, future condition plus margin of safety (developer responsibility)	100-year future condition plus margin of safety
Existing	Maintain at current level unless higher level justified by alternatives analysis (developer respon-sibility if justified)	Maintain at current level unless different level justified by alternatives analysis

(Graphic to be deleted)

DESIGNING FOR LOW MAINTENANCE

Issue:

Project designs can have a large impact on future maintenance needs. For example, if the riverward slope of a levee or bank stabilization project is too steep, and/or the base of the project is not supported by large "toe rock," the project will tend to be undercut by the river and continuously slough into the channel. Placing projects right on the banks can also increase maintenance needs by concentrating the force of flows. Finally, the materials used to build a project (e.g., soil~~soils~~, rip rap, vegetation) and the way they are placed can have a large impact on the stability of the project and thus its future maintenance needs.

Policy FHR-9:

King County should, wherever possible, design projects in ways that require minimal or no maintenance over the long term. Levees and bank stabilization projects should include, where possible, toe rock, setback areas, vegetated stream banks~~streambanks~~, gentle riverward slopes, and materials and placement methods that provide long-term stability to the interior and face of the project.

APPLYING COUNTY STANDARDS TO NON-COUNTY PROJECTS

Issue:

Federal and state agencies sometimes seek county participation in designing, implementing and/or maintaining projects that may not be consistent with new King County policies and standards. These cooperative projects can be a significant source of funds to complete work the County might not be able to fund on its own. However, the standards applied by other agencies may be inconsistent with King County's policies and standards for flood hazard protection projects.

Policy FHR-10:

If another agency seeks King County's participation in developing a flood hazard reduction project, the county should work with the lead agency to incorporate King County flood hazard reduction policies and standards into the project. King County should not act as a sponsor for a flood hazard reduction project unless the project is consistent with or exceeds county flood hazard reduction policies and standards.

ALTERNATIVES TO MAINTENANCE

Issue:

Current County maintenance standards require returning damaged projects to their original design or as-built condition. In some cases, however, the original design of the project contributes to repetitive damage of the project. For example, the riverward face of the project may be too steep, causing it to be unstable and slough into the river. These types of problems contribute to higher maintenance costs.

Policy FHR-11:

King County should evaluate alternatives to returning an existing project to its pre-damage condition when the original design appears to: 1) contribute to high maintenance costs, 2) provide inadequate protection from inundation and erosion hazards, 3) transfer problems to other sites, 4) degrade riparian habitat or 5) provide an opportunity for habitat enhancement. This evaluation should occur on an ongoing basis. Alternative recommendations should be incorporated into the responsible jurisdiction or agency's maintenance and/or capital improvement priorities. This policy is not intended to prevent emergency repairs necessary to address extreme threats to public health and safety.

MAINTENANCE VERSUS NEW PROJECT

Issue:

Maintenance of river facilities, which typically involves the repair of a facility to its pre-damage condition, is generally performed without detailed analysis or design. However, if more substantial changes to an existing project are considered, the impacts of those changes on flood elevations and other aspects of the river system should be considered.

Policy FHR-12:

Any project that~~which~~ significantly changes the cross-section geometry or length of an existing flood- or erosion-control facility should be considered a new project, and should be analyzed, prioritized and implemented as such. Projects that~~which~~ do not significantly change the cross-section geometry or length of an existing facility should be implemented as part of the maintenance program.

PUBLIC ACCESS TO COUNTY-FUNDED PROJECTS

Issue:

Under the Washington State Constitution, if public funds are used to build a project, some public benefit must result. Access to King County's major rivers is a valuable public amenity that could be increased by allowing access to publicly funded projects such as levees and revetments.

Policy FHR-13:

The public should be granted access to new flood hazard reduction projects built with public funds. This access should be limited to passive uses such as fishing and hiking which do not require any additional right-of-way or design modifications to the project and which will not increase the risk of structural damage to the facility.

3.5 RIVER CHANNEL MAINTENANCE POLICIES

River and stream channels are dynamic systems that continuously transport logs, sediments and other debris from their upper reaches to lower elevations. These materials are integral parts of the natural ecology and geomorphology of the stream, and are particularly vital in

the life cycle of salmon and trout. However, in some circumstances, large accumulations of these materials can increase flooding or erosion risks to bridges, roads and riverside properties. For this reason, King County has sometimes removed large logjams and dredged sediments from river channels.

This section recommends policies to direct future channel maintenance activities undertaken by King County. The policies seek a balance between resource concerns and the protection of public property and private structures.

LOGJAM REMOVAL

Issue:

Under what circumstances and in what manner should ~~King County remove~~ large woody debris be removed from rivers and streams?

Policy RCM-1:

~~King County should remove or dislodge a~~Accumulations of large woody debris should be removed or dislodged only if they pose a direct ~~and imminent~~ threat to properties eligible for protection under Policy FHR-1, and can be removed without endangering ~~County~~ personnel or equipment. Logjam removal should be prioritized along with other ~~County~~ project needs according to the criteria in Policy FHR-2. Logjams that~~which~~ do not pose a direct ~~or imminent~~ threat to eligible properties should not be disturbed~~ by King County.~~

Policy RCM-2:

If large woody debris must be moved, it should be either dislodged so it can continue down through the system, or removed and put back into the system at the next available downstream location. If it is not practical or reasonable to return the materials to the channel, they should be incorporated into the adjacent riparian corridor, if possible. When woody debris is replaced in the river channel or corridor, its placement should not create new direct ~~or imminent~~ threats to other properties.

11112

DREDGING

Issue:

Under what circumstances and in what manner should ~~King County perform~~ dredging or gravel bar scalping of rivers, streams, and deltas be performed for flood or erosion control purposes?

Policy RCM-3:

~~King County should remove g~~Gravels should be removed from river and stream channels only if their presence poses a direct ~~and imminent~~ threat to properties eligible for protection under Policy FHR-1, and where such activity is determined to be the best flood damage reduction alternative available (using the criteria in Policy FHR-3). Dredging should be prioritized along with other County project needs according to the criteria in Policy FHR-2.

3.6 FLOOD WARNING, INFORMATION AND EDUCATION POLICIES

PUBLIC AWARENESS OF FLOOD HAZARDS

Issue:

Many current and prospective residents of flood- and erosion-prone areas are unaware of either the hazards associated with the property, King County regulations that limit development in these areas, what they should do in a flood emergency, or what forms of disaster assistance are available. King County could serve a role in improving awareness of these issues and thereby reducing the likelihood of injuries and damages in these areas.

Policy E-1:

King County should make the following information available to current and prospective residents and landowners in flood hazard areas: 1) the known flood risks to their property and safety; 2) steps they can take to protect themselves and their belongings from flooding; 3) regulations affecting floodplain development activities; and 4) types of disaster assistance available. This information should be provided in advance of flood emergencies, during the emergency itself (through the King County Flood Warning System), and after the emergency has passed.

TECHNICAL ASSISTANCE ~~EDUCATION AND TRAINING~~ FOR OTHER JURISDICTIONS

Issue:

Numerous local governments and agencies share jurisdiction over flooding and other issues in the County's large river basins. Solutions to flood problems will in some cases be more effective if implemented on a watershed-wide basis. However, many local governments lack the staff and resources to develop new flood hazard regulations and programs.

Policy E-2:

King County should assist other jurisdictions with which it shares jurisdiction of the major river basins in developing and adopting floodplain policies, regulations, and standards that are consistent with King County's.

3.7 EMERGENCY RESPONSE POLICIES

KING COUNTY'S ROLE IN RESPONDING TO FLOOD EMERGENCIES

Issue:

Many different agencies and jurisdictions play a role in responding to flood emergencies. The specific responsibilities of each of these agencies must be clear to avoid confusion or miscommunication during the emergency. King County's role relative to other jurisdictions during flood emergencies needs to be clearly understood.

Policy ER-1:

King County should be the lead jurisdiction in managing and coordinating emergency public health, safety and welfare services before, during and after flood emergencies within the County. King County should coordinate emergency preparedness and response with all other agencies and jurisdictions who have a role in responding to flood emergencies.

SANDBAG DISTRIBUTION

Issue:

During flood emergencies, many citizens call King County agencies seeking sandbags and sand to protect their property. In the past, King County has not provided this service because it benefits primarily private property.

Policy ER-2:

King County should provide a limited supply of sand and sandbags for private property owners during flood emergencies. Citizens should be responsible for requesting, picking up, filling and placing sandbags, as well as cleaning up sandbags and sand on their property after floods. Sandbags should be placed as close as possible to the foundation of the structure being protected.