July 1, 1993

LCMR Final Status Report - Summary - Research
LCMR WORK PROGRAM 1991

I. Reclamation of Recreational Systems and Environmental Resources from Existing Urban/Suburban Neighborhoods -Recreation 35

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A. M.L. 91 Ch 254 Sec. 14 Subd: 3g

	LCMR Funds	Matching Funds
Appropriation:	$200,000	$50,000
Balance:	$ 0	$ 0

Environmental Resources: This appropriation is to the University of Minnesota, College of Architecture and Landscape Architecture, to investigate urban design strategies for enhancing recreational amenities in suburban areas. The investigation shall be done in cooperation with the metropolitan council. The legistative commission on Minnesota resources may convene a steering committee to ensure coordination and practical results.

B. Not applicable

C. Match Requirement: $50,000
Funds Raised to Date $50,000

Dayton Hudson Foundation has committed funds for this grant in the amount of the match requirement of $50,000.

II. Narrative

The LCMR funding will be used to investigate the potential for enhancing and enriching the open space and recreational amenities and overall physical quality of existing suburban

neighborhoods as part of future capital improvement programs to construct infrastructure projects. Using the Twin Cities metropolitan suburban community as a case study area, the program has three primary elements:

1. identification of existing recreational/environmental systems within the area.
2. development of alternative design proposals for the revitalization and expansion of the systems into neighborhoods.
3. development of a strategic plan and informational materials outlining design, finance and policy issues to implement the proposals.

Over one hundred years ago Minneapolis and Saint Paul laid the groundwork for the establishment of a visionary metropolitan park system. In retrospect, these park systems established an environmental tradition which:

- provides equal access by residents to the rich recreational and environmental resources of Minnesota;
- fosters environmental stewardship by creating an intimate relationship between parks, neighborhood and home; and
- achieves a sense of identity and place through the use of recreational and environmental resources existing within the communities.

The challenge is to now determine the best approach to reintroduce the "Park Tradition" into the development context of existing and emerging communities which lack these environmental amenities.

III. Objectives

A. Prepare an inventory of environmental systems and future infrastructure capital improvement plans for a specific geographic study area within the Twin Cities metropolitan area.

A.1. Narrative:
The identification and inventory of all publicly funded capital improvement projects at every level of government is essential to identify potential opportunities to enhance recreational and environmental resources. Mapping of the infrastructure project locations and the environmental resources within the area will identify opportunities to protect and/or enhance the state's natural resources.

A.2. Procedures:

A study area of the Twin Cities metropolitan suburban community will first be determined. The study area may involve multiple municipalities and may be composed of multiple locations selected for prototypical attributes.

Following determination of the study area, work will proceed with the assistance of the Metropolitan Council, and regional and local planning agencies to accomplish the following tasks: 1) Inventory and map all data necessary to identify significant environmental resources within the study area; 2) Inventory, list and map all ongoing and future plans for capital investments and annual maintenance related to infrastructure projects paid for by federal, state or local dollars.

A.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$40,000	$10,000
b. Balance:	$ 0	$ 0

A.4. Timeline for Products/Tasks

A4.1. *Identify geographic bounds of study area*
•Work in conjunction with Metropolitan Council to determine geographic bounds of study area. Study area is anticipated to cover multiple municipalities and need not be contiguous. Instead multiple locations within the metropolitan area may be selected for prototypical or special attributes such as a significant natural resource area or a major future capital improvement infrastructure project. Study areas will be sought in both urban and suburban situations. Criteria for selection will be developed by the principal researchers working in conjunction with the Metropolitan Council.

Schedule: July 1991 - October 1991

A.4.2. *Collect aerial photographs and maps, prepare base maps of study area*
Parallel to work task A.4.1. maps and aerial photos will be reviewed and collected as necessary to document potential study areas. All types of maps and aerial photos will be collected for the study areas including documents illustrating topographic and natural features, historic maps and contemporary documents. Primary sources for this information will be:
•Metropolitan Council archives
•Borchert Map Library, University of Minnesota
•Municipal departments

•County planning agencies

Schedule: July 1991 - October 1991

A.4.3. *Research and collect information on environmental systems of study area.*
•Once the initial, first-cut decisions have been made on the geographic study area, the study team will review available data on environmental systems. Specifically information will be sought on:
-lakes, rivers, streams, marshes, and watershed
-natural habitat areas
-soil and mineral resources
-forestry and agriculture
-slopes and significant land formations

The availability and quality of information on these environmental systems will be a deciding factor in the choice of final study areas. Information will be collected in cooperation with staff specialists at the Metropolitan Council from their archives. Information will also be sought from city, county and state planning agencies.

Schedule: August 1991 - January 1992

A.4.4. *Prepare set of maps of study area, each at the same scale, illustrating environmental systems within study area.*
•Information collected in work task A.4.3. will be used to map all environmental systems within selected study areas. Environmental systems will be mapped separately on base maps, prepared at the same scale to allow overlaying of maps for study and comparison.

Schedule: October 1991 - January 1992

A.4.5. *Prepare summary maps of environmental systems which illustrate environmental resource areas with significant opportunities for future development into open space and recreational amenities.*
•Using environmental resource maps prepared in work task A.4.4. the research team will conduct site visits to inspect the resource areas. These areas will be photographed and evaluated to determine which present the most significant opportunities for open space preservation and/or development into recreational amenities. Summary maps will be prepared to illustrate prime sites.

Schedule: January 1992 - March 1992

A.4.6. *Collect information, on all current and planned public infrastructure construction projects, within study areas.*

•Through interviews with responsible governmental unit representatives of local, state, and federal levels information will be collected on all possible present and future capital improvement projects. In local municipalities, for example, we will collect and review the Five Year Capital Improvement Program, which is the document used to set policy and budget priorities for municipal improvements. For example, the Minneapolis 1991-1995 Five Year Capital Improvement Program, which lists projects budgeted at $264 million to improve the city's infrastructure systems.

Schedule: September 1991 - January 1992

A.4.7. *Prepare set of composite maps of study area, at the same scale as environmental systems maps, illustrating public infrastructure projects by project type and by responsible governmental unit.*

•It is interesting to note that capital improvement plans rarely include maps locating the projects. In cases where maps are used they are highly diagrammatic and are segregated by project types. For example, sewer projects would be on one map and road projects on another. The principal investigators on this project were responsible for preparing the first composite maps of one billion capital infrastructure bonding plan for Phoenix, Arizona. These composite maps were enormously helpful to the mayor and planning staff in identifying areas of the city where public dollars were to be spent in order to maximize the benefit from these dollars.

•The infrastructure maps will be prepared at the same scale as the environmental systems maps described in work task A.4.4. for the purposes of overlay and comparison. Not only will this present opportunities for identifying possible enhancements to infrastructure projects, it is also likely to illustrate instances where planned projects will negatively impact environmental resources.

Schedule: October 1991 - April 1992

A.5. Status:

A.5.1. The City of Chanhassen was chosen as the first case study. Work with the community focused on the interrelationship of the planned Highway 5 corridor infrastructure improvements, the community, and the intersecting

environmental resource blocks and corridors. The goal of this first case study was to look at the following questions:

- •How can open space and environmental corridors be integrated and protected within the suburban framework?
- •How can access to these environmental corridors for wildlife and citizens be enhanced and strengthened?
- •What planning strategies and implementation strategies are necessary to (1) promote the protection and enhancement of open space and environmental corridors as recreational and environmental resources and (2) provide for policy link of infrastructure improvements and environmental resources.

a. Community members participated in a bus tour of the City of Chanhassen and two urban design workshops. Working documents (including resource inventory maps and design proposal/scenario drawings-see B.5.1.), slides, and overheads were prepared for use at both workshops. Participants included members of Chanhassen's city administration, city council, planning commission, housing redevelopment authority, and design center staff.

A.5.2. The second case study selected was the City of Maple Grove. Work for the community has focused on the relationship of the Maple Grove gravel mining area, the community, the linkages to environmental resource blocks and corridors, the potential urban development of a "downtown" area, the linkages to urban neighborhood blocks and street/road corridors, and infrastructure improvements to the gravel mining area. Secondary focus has been connecting community across the I-94 and I-694 corridor. The questions which were examined are:

- •How does urban, recreational, and ecological design take place on a site located over the city's drinking water aquifer?
- •What type of environmental design protects the city's aquifer while at the same time enhancing the recreational and ecological opportunities for Maple Grove citizens?

a. Community members participated in a bus tour of the City of Maple Grove and two urban design workshops. Working documents (including resource inventory maps and design proposal/scenario drawings-see B.5.2.), slides, and overheads were prepared for use at both workshops. Participants included members of Maple Grove's city administration, city council, planning commission, gravel mining area committee, transit commission, park board, economic development commission, land owners, community members, and design center staff.

A.5.3. The third case study selected has been the City of Farmington. Work for the community has focused on the city's natural resources, the land area along Highway 3 corridor, the existing neighborhood adjoining downtown and the Vermillion River corridor. This case study looks at the relationship of these community building blocks to a proposed subdivision expansion of the existing grid-style town plan on land presently in agriculture production. This type of design, rather than the cul-de-sac type, allows for pedestrian scale neighborhoods with connections to the downtown business district and the Vermillion River. The questions which were examined are:

- How does urban, recreational, and ecological design take place when it occurs over a portion of the Vermillion River ground water recharge area?
- What type of environmental design protects the ground water while at the same time enhancing the recreational and ecological opportunities for Farmington citizens?
- How can the design of ground water recharge areas and water control/collection areas be used as amenities in the Farmington civic landscape?

a. Community members participated in a walking tour of the City of Farmington and two urban design workshops. Working documents (including resource inventory maps and design proposal/scenario drawings-see B.5.3.), slides, and overheads were prepared for use at the workshops. Participants included members of Farmington's city administration, city council, planning commission, housing redevelopment authority, developer representatives, community members, and design center staff.

A.5.4. The fourth, and last, case study selected has been the Phalen Creek and Trout Brook within the City of Saint Paul. The entire Phalen Chain of Lakes Watershed empties into Phalen Creek where it becomes the responsibility of the City of Saint Paul. However most of the watershed lies within the boundaries of other municipalities. Increased pollution and runoff due to development in the watershed has become a concern for the City of Saint Paul and the State DNR. Concerns about the watershed and EPA storm water quality regulations have forced the city and state to look at other water cleansing alternatives. Within this context, work by the Design Center looks forward to the possibilities of "daylighting" all or portions of the stream systems as they might be integrated into Saint Paul's open space and recreational network.

a. The Design Center, building upon work of the University of Minnesota Landscape Architecture Department, MN Dept. of Natural Resources, and Saint Paul's Dept. of Planning and Economic Dev., has included within this case study the entire submerged portion of Phalen Creek as well as Trout Brook, the tributary Phalen meets before reaching the Mississippi River.

A.5.5. All four case study areas were mapped for the following attributes or layers of information: area base map, metropolitan context, environmental networks (hydrology, geology, existing vegetation, and public open space), significant topography and views (soils, views, features), transportation and movement corridors, developable land, natural and urban landmarks, districts or rooms defined by land uses and associated landscape patterns, and nodes or transition points within the community. Using this information mapped attributes or layers were overlayed and summary composite maps created. Resulting summary maps illustrate the significant environmental resource areas of the communities and provide the basis for an urban design analysis of the existing environmental and urban systems.

A.5.6. A previous study which mapped information on environmental systems, *An Ecological Study of the Twin Cities Metropolitan Area* by the planning firm of Wallace, McHarg, Roberts and Todd, was rediscovered in the Metropolitan Council library archives. The study, led by Ian McHarg and finished in 1969, mapped surficial geology, physiography, slope, hydrology, generialized soils, existing forest cover, existing vegetation, and land needing protection for the seven county metropolitan area. The study has provided mapped base data for the seven county metro area. Some of this information is the most current mapped information available.

The eight remaining original large scale McHarg maps are 6'-6.5" wide x 5'-10" tall, at the scale 1:62,500. These maps were reproduced by the DCAUL and the Metropolitan Council in color at 62.5% of the existing scale, resulting in copies of the maps at the scale 1:100,000 which corresponds to the US Geological Survey and MN Geological Survey's scale of 1:100,000. Because of the fragile nature of these historic maps, the work requires that the maps be copied on a glass top color copier in parts, then pieced together. These maps and the maps at the Metropolitan Council are now available for reference use. The original maps were delivered by the Met Council staff to the Minnesota Historical Society to be archived.

A.5.7. Information has been collected on future infrastructure capital improvements and existing environmental resources for the metropolitan region from the

Metropolitan Council and the Minnesota DOT. In addition, Met Council is providing planning expertise in the areas of comprehensive planning, water resources, agricultural land preserves, transportation and railroads, recreation, and long-range planning. Aerial photographs of the metropolitan region have also been obtained. Other contacts for inventory/mapping information which were made over the course of the project were with the State Planning Agency (LMIC), the MN Dept. of Natural Resources, and the MN Dept. of Trade and Economic Development. Maps have been obtained from the U.S. Dept. of the Interior, Fish and Wildlife Service, Minnesota Valley National Wildlife Refuge. The DCAUL is continuing to collect information from local units of government.

A.5.8. Mapped information resulted in preliminary composite maps of metropolitan regional highways and bridges, and metro parks and trails capital improvements. Capital improvement information has been collected but not mapped of future metro waste control projects, airports, and transit facilities. Information still needs to be collected on county infrastructure capital improvements. This work is continuing with the Metropolitan Council.

A.6. Benefits:

In the next decade, communities in this state and across the nation will operate under tighter fiscal budgets. Funding for recreational and environmental resource development and planning will decrease, being pushed aside by rising public service costs and capital infrastructure replacement and development projects. Issues of water quality, waste removal, replacement of worn out systems etc. will dominate the fiscal budget agenda and as a result public dollars for amenity projects will continue to decrease as an overall percentage of municipal budgets. Advanced strategic planning which identifies early on and documents opportunities for creating recreational and environmental amenity as part of future infrastructure projects is the benefit of this objective.

B. Prepare a series of alternative design proposals illustrating ideas and recommendations for developing future public infrastructure projects which integrate natural resource systems to maximize development opportunities for recreational use and environmental enhancement.

B.1. Narrative:

Illustrating to key public policy decision makers, alternatives for the aesthetic and environmental enhancement of infrastructure projects is essential for demonstrating the range of possibilities inherent in these projects. The primary focus of this

objective will be to translate and interpret inventory information collected about environmental systems and capital improvement plans into alternative urban design scenarios in the form of drawings, models, and narrative descriptions.

B.2. Procedures:

The primary task will be to analyze the information collected as described in Objective A and using that analysis to develop design alternatives for future capital improvement projects. Design alternatives will be prepared for each category of infrastructure projects with overlays to illustrate each funding source and sponsoring agency. Following this a composite series of urban design scenarios will be prepared to illustrate proposals for developing recreational and environmental amenities parallel to and as part of future infrastructure projects.

B.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$60,000	$15,000
b. Balance:	$ 0	$ 0

B.4. Timeline for Products/Tasks

B.4.1. *Collect data and prepare cultural inventory maps.*

Within study area, data will be collected and maps prepared, illustrating location of: land uses by type; publicly owned buildings and property; and significant cultural resources. Data will be collected primarily from municipal assessors, planning departments and from state, county and local historical societies.

Schedule: August 1991 - January 1992

B.4.2. *Develop individual design proposals for all types and categories of infrastructure projects.*

It is anticipated that infrastructure projects will include the following: water supply and treatment, sewers and storm drainage, solid and hazardous waste, energy distribution, streets and bridges, rail/transit and buses, parks and recreation, public buildings, telecommunications.

First, each category of infrastructure project will be analyzed to identify and illustrate potential opportunities for aesthetic and environmental enhancement. Following this we will develop separate design alternatives and proposal ideas for all categories of public infrastructure projects within the study area.

Schedule: January 1992 - July 1992

B.4.3. *Refine design proposals to maximize environmental and recreational opportunities.*
We will reconsider, refine and test individual design proposals from an environmental and recreational viewpoint to maximize opportunities for the protection and creation of these amenities. In many cases we might find precious natural resources that are being lost by infrastructure development projects and recommended mitigation and alternatives.

Schedule: May 1992 - January 1993

B.4.4. *Develop alternative composite urban design proposals which include multiple categories of infrastructure projects.*
Based on information developed in the previous work task, the team will prepare a wide range of alternative proposals for the development of recreational and environmental enhancement projects considering all categories of infrastructure. The proposals developed in this work task will differ from earlier ones in that they will depict integrated composite proposals for the study area considering all possible categories of infrastructure within the context of existing land uses and natural resources. Proposals and recommendations will illustrate opportunities for the aesthetic and environmental enhancement of infrastructure projects within the study area.

Schedule: July 1992 - January 1993

B.5. Status

B.5.1. A design scenario and associated principles were developed for the City of Chanhassen based on the integration of the environmental systems/patterns, urban patterns, and relationship of Chanhassen to the southwest region and the metro area. The design proposal focused on the integration of natural systems with new community streets, roadways, bridges (the re-design of Highway 5), rail/transit stops, park and ride lots, and trail linkages to community and regional parks. Mapped data informing the design for Chanhassen included land uses, publicly owned buildings and property, and significant cultural resources.

B.5.2. Two design scenarios and associated principles were developed for the City of Maple Grove and the gravel mining area. The design proposal focused on the building of community within reclamation of the gravel mining area and its re-integration with the natural systems, new community streets, roadways, bridges, rail/transit stops, park and ride lots, storm water runoff collection, groundwater and aquifer protection, powerline corridor easements, and trail linkages to community and regional parks. Mapped data informing the design for Maple Grove included land uses, publicly owned buildings and property, and significant cultural resources.

B.5.3. A design scenario and associated principles are currently being developed for the City of Farmington based on the integration of the environmental systems/patterns, urban patterns, and relationship of Farmington to the Vermillion River watershed and the metro area. The design proposal focused on the integration of natural systems with new community streets, roadways, future transit stops, storm water runoff collection, groundwater and aquifer protection, and trail linkages to community and regional parks. Mapped data informing the design for Farmington included land uses, publicly owned buildings and property, and significant cultural resources.

B.5.4. Design opportunities were examined for the Phalen Creek and Trout Brook areas within the City of Saint Paul. The design opportunities focused on the daylighting of the Phalen creek and Trout Brook, the re-integration of the creeks with the natural systems, and the re-integration of the creeks with cultural and urban systems that intersect the creek corridors. In the report, physical and cultural features are presented as layers of graphic information that emphasize the form and structure of each topic. As a collection, the layers reveal the complexities inherent to urban corridors and the potential for re-integration of those rebuilt systems with natural systems. The geographic layers studied include the creeks and lakes before urbanization, surface and subsurface geology, storm-sewer systems and watersheds, plant communities, historic and cultural landmarks, open spaces, and wildlife patterns. While by no means a definative list, this set of topics begins to explore the complexity which can enrich the design of urban creek corridors. Information on various forms of day-lighting and storm water treatment systems were collected with regards to this case study, but were not included in the newsletter report.

B.5.5. Application of the case studies to the metropolitan area is synthesized in a report which outlines the community education process, design research methods, and design principles applicable to metropolitan urban areas (D.5.5.). The report focuses on the importance of community preplanning

and education of public decision makers, and the implications of integrating recreational, ecological, and urban infrastructure systems in the various geographic regions of the metropolitan area. The design center is currently working with the Metropolitan Council staff to explore the translation of these urban design methods and principles to metropolitan regional policy (see section C.5.7).

B.6. Benefits:

Design drawings, models and descriptive materials will illustrate opportunities for enhancing the aesthetic and environmental components of infrastructure projects to public policy makers. Design proposals will explore overlaps between recreational/environmental resources and infrastructure projects. This will, for example, show how the development of roads and water drainage systems is an opportunity to enhance recreational and environmental resources. If properly designed, roads and drainage systems can be a part of an environmental public domain which will provide a framework that links neighborhoods to each other and to local natural resources.

C. Evaluate and refine design proposals considering their implications from and for design standards, finance and funding, public policy and implementation.

C.1. Narrative:

Determining how to best implement the design proposals through a careful analysis of policy, finance and implementation considerations is essential for the viability of the proposals. Specific recommendations showing how design objectives can be achieved through a clear understanding and explanation of the process, players and future steps will increase the applicability of the proposals.

C.2. Procedures:

Innovative and strategic thinking is required to move design ideas from paper proposals to realizable projects. A working group of public policy experts will assist the design team in the refinement and testing of urban design scenarios. Scenarios will be presented to the entire team and discussed for their policy, funding and implementation implications . This information will be used first, to refine the design scenarios. Further research will be used to develop several urban design strategies for achieving design proposals. Finally, a strategic plan will be prepared with recommendations for how to implement the design proposals and a specific plan of action and responsibilities.

C.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$60,000	$15,000
b. Balance:	$ 0	$ 0

C.4. Timeline for Products/Tasks

C.4.1. *Research criteria for evaluation of infrastructure, recreation and design proposals.*

A key concern of this research is to not only develop innovative design proposals but to also demonstrate how these proposals can be achieved. Toward that goal, we will first research and document existing criteria and procedures used by local, regional and state agencies to plan, fund and implement these types of projects.

Schedule: April 1992 - July 1992

C.4.2. *Develop criteria to evaluate design proposals considering public policy (i.e. planning, environmental), funding and implementation objectives.*

A clearly articulated list of criteria will be developed to provide a standard for evaluating design proposals.

Schedule: April 1992 - July 1992

C.4.3 *Refine design proposals by testing against established criteria.*

With evaluation criteria in hand we first will test all design proposals. Evaluation will be used to then refine the design proposals searching for better fits between the criteria and the proposals. Refinements will be made wherever possible to the proposals.

Schedule: June 1992 - October 1992

C.4.4. *Develop a range of urban design implementation strategies.*

For this work task we will review all work developed to date and begin to generalize about ways that the information can be applied to the metropolitan area. Specifically, we will describe strategies for enhancing and enriching recreational amenities and environmental resources as part of infrastructure projects and normal community development. Implementation strategies and plans of action will be examined, considering a variety of players such as: a citizens group, local municipality, Metropolitan Council, a nonprofit group, etc.

Schedule: June 1992 - October 1992

C.4.5. *Refine strategies into single strategic plan and recommendations for action..* Information developed in previous work task will be presented to and reviewed by all relevant Metropolitan Council departments/divisions. It will also be presented to a wide range of local government officials, both at the elected and staff levels. Team members will then work to refine implementation strategies into a strategic master plan with recommendations for action at all appropriate levels of government and for the private sector.

Schedule: October 1992 - January 1993

C.5. Status:

C.5.1. Throughout the process of this project peer review work sessions have taken place at regular intervals, with qualified individuals and agencies, to evaluate design proposals relative to design, design principles, public policy, and funding implementation.

C.5.2. The first advisory committee meeting was held to review of our work to date, provide direction for the LCMR grant, and help the Design Center staff develop criteria, policy, and implementation strategies. The design scenario and associated principles developed for the City of Chanhassen were presented and discussed, the *Intermodal Surface Transportation Efficiency Act of 1991* legislation was discussed, and potential case studies were discussed. Professional advisors attending the meeting represented the Metropolitan Council staff; MN Department of Trade and Economic Development; MN Department of Natural Resources; MN Department of Transportation; University of Minnesota, College of Architecture and Landscape Architecture; and the design center staff.

C.5.3. Two follow-up advisory meetings have been held with the purpose to review our work to date, provide direction for the LCMR grant, and help the Design Center staff develop criteria, policy, and implementation strategies. The design scenario and associated principles developed for the City of Chanhassen were presented and the preliminary work completed for the City of Maple Grove were discussed. Professional advisors attending the meeting represented University of Minnesota, Department of Landscape Ecology and Animal Behavior; MN Department of Natural Resources; and the design center staff.

C.5.4. Two public lectures and peer review meetings have been held with Prof. Ian McHarg and Ms. Leslie Sauer, national experts on environmental design, urban design, and regional planning. The purpose of the meetings were to review our work to date, provide direction for the LCMR grant, and help the Design Center staff develop criteria, policy, and implementation strategies. Those attending the meetings were Prof. McHarg, Ms. Sauer, and design center staff. Attending the McHarg lecture were representatives of the Metropolitan Council and staff; University of Minnesota, College of Architecture and Landscape Architecture; Minneapolis Star Tribune; Architecture Minnesota Magazine; and design center staff. Attending the Sauer lecture were representatives of the University of Minnesota, College of Architecture and Landscape Architecture; Architecture Minnesota Magazine; and design center staff. In addition Prof. McHarg and Prof. Morrish participated in discussions on ecological design and urban design at the Metropolitan Council with the Council members and staff..

C.5.5. A peer review of preliminary findings: *Reclamation of Recreational Systems and Environmental Resources from Existing Urban/ Suburban Neighborhoods* was held with several Metropolitan Council staff, Saint Paul, Minnesota. The presentation focused on the case studies, their metropolitan implications, and possible future research directions with council staff: Ms. Sharon Klumpp, Executive Directer; Ms. Barbara Senness, Planning Coordinator, Comprehensive Planning and Local Assistance Division; and Mr. Marcel Jouseau, Manager, Natural Resources and Parks Division.

C.5.6. Additional peer review meetings and discussions have been held with Ms. Nancy Connery, a national expert on infrastructure public policy and municipal finance, and Ms. Janine Benyus, a national expert in wildlife biology. These meetings and discussions have been to provide information and direction for the LCMR grant, review our work, and help the Design Center staff develop criteria, policy, and implementation strategies.

C.5.7. Post project technical assisstance has been provided to the cities of Chanhassen, Maple Grove, and Farmington. The purpose has been to assist directly with design, suggest possible consultants as well as expand the role of consultants in communtiy projects, and monitor community progress and projects resulting from the case studies. The assistance has focused on evaluation of consultant and developer design proposals relative to the city's goals for their community, public policy stratagies for accomplishing

community and case study goals, and funding implementation stratagies for public projects.

a. Post project assistance with the city of Chanhassen has been ongoing since completion of the case study newsletter (D.5.1.). Assistance has been in the form of project and design review, site design workshops, and advising on the selection of consultants. The design center followed up the first case study by participating in several workshops and presentations focusing on the design of entrances to the downtown district of Chanhassen and other development project reviews.

b. Post project assistance with the city of Maple Grove were meetings with the city council and city manager to outline a long-term development strategy incorporating the urban design principles defined in the case study newsletter (D.5.2.).

c. Post project assistance with the city of Farmington has been ongoing since completion of the case study newsletter (D.5.3.). Design center staff have participated in two workshop sessions, the first a day-long visioning workshop with city staff, council members, and planning commission members; and the second a low-density housing workshop with planning staff, council members, and planning commission members. Additional advise has been provided on the selection of consultants for the design of community projects which were identified as part of the case study.

d. Post project assistance with the Metropolitan Council began after the initial presentations of preliminary findings to staff and council members (C.5.5. and D.5.5.k.). Design center staff will assist council staff with translating principles developed in this LCMR project to a revision of the Metropolitan Development Investment Framework and visualizing the result of council policy on the natural environment and landscape of the metropolitan area. Initially, work will begin with new ways of seeing and mapping the metropolitan landscape and adjusting metro council policy to diverse individual regions of the metropolitan area.

C.6. Benefits:

As a strategic plan for implementation is developed many policy objectives can be explored in more detail. Policy makers can examine ways that a variety of design options can explore the implications of policy goals. For example:

- How capital improvement can utilize the same dollar for two purposes-infrastructure and recreation?
- How equal access can be provided for broad public use for recreational and natural resources?
- How to expand recreational and environmental resources within existing suburban neighborhoods?
- How the public policies of the Metropolitan Council can be translated into urban design solutions which address specific local concerns for a sense of place and identity?

A clear strategic plan accompanied with extensive visual materials illustrating design proposals will be an effective tool in transforming visionary ideas from "pretty drawings" to doable projects.

D. Produce informational materials describing goals, principles, design proposals and implementation steps for distribution to public officials, municipal staff, professionals and citizens.

D.1. Narrative:

Development of a variety of educational materials is needed to illustrate and explain both the methodology and findings of the study. This information should be organized and presented in a variety of formats depending on the audience.

D.2. Procedures:

A multi-media presentation will be prepared to demonstrate key principles for developing aesthetic, recreational and environmental amenities in communities. The project team will work with consultants in public information and graphic design to develop a specific package of educational materials. This is likely to include the following: 1) A brochure and related slide show with taped narration for presentation to citizen groups 2) A longer slide show with taped narration presenting more technical information for public policy planners, and interested citizens 3) A handbook presenting urban design scenarios and strategies for creating and enhancing environmental amenity in Twin Cities Metropolitan Communities.

D.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$40,000	$10,000

b. Balance: $ 0 $ 0

D.4. Timeline for Products/Tasks

D.4.1. *Develop materials that explain methodology, design proposals and strategies.*
Detailed documentation will be prepared to explain the process that the study team followed and the resultant findings. This documentation will be of special interest to design professionals, planners and researchers. Specific emphasis will be given to explaining how the methodology can be adapted by local planners along with strategies for implementation.

Schedule: August 1992 - March 1993

D.4.2. *Develop public informational materials.*
Informational materials for citizens and public officials will be prepared. These materials will be less technical and tailored to a lay audience. It is envisioned that the following products will be produced: brochure, handbook, and slide show with taped narration.

Schedule: August 1992 - March 1993

D.4.3. *Develop a plan for dissemination of materials.*
Working with advisors from Metropolitan Council, University Public Relations and experts in marketing and graphic design, we will devise a plan for distributing the informational materials in the most effective manner to public officials, municipal staff, professionals and citizens.

Schedule: August 1992 - June 1993

D.4.4. *Produce informational materials*
A graphic/communication design team will be retained to produce in conjunction with the study team all public information materials.

Schedule: December 1992 - July 1993

D.5. Status:

D.5.1. Work for the City of Chanhassen culminated with the publication Building Community Across the Corridor: A New Parkway Model For Chanhassen, MN which outlines the research methodology and design principles for integration of environmental systems and urban highway infrastructure. The

community has used this document to begin to inform planning decisions and determine necessary community and highway corridor studies. The city requested 550 copies which they are distributing to the community. The design center has distributed copies to other community groups, public officials, and private organizations.

D.5.2. Work for the City of Maple Grove culminated with the publication Enriching the Community Landscape: Maple Grove, Minnesota envisions an ecological downtown to reclaim a gravel mining area. The publication outlines the research methodology and design principles for a pedestrian downtown, reclamation of environmental systems in a gravel mining area, and integration of ecological systems and urban infrastructure systems over the city's aquifer recharge area. The city has distributed copies of the newsletter to the city council, planning commission, and administrative staff. The design center has distributed copies to other community groups, public officials, and private organizations.

D.5.3. Work for the City of Farmington culminated with the publication Building within the Community Watershed: Designing waterways as an environmental framework for development in Farmington, Minnesota. The publication outlines the research methodology and design principles for a pedestrian downtown, reclamation and design of environmental systems along a roadway corridor, and integration of ecological systems and urban infrastructure systems in a new subdivision addition to downtown. The city has requested 200 copies which they are distributing to Farmington citizens and to administrative staff of surrounding municipalities. The design center has distributed copies to other community groups, public officials, and private organizations.

D.5.4. Work for the City of Saint Paul's Phalen Creek Neighborhood culminated with the report Tracing the Community Connections of Phalen Creek and Trout Brook: A reexamination of the central valleys of Saint Paul, Minnesota. The report outlines the urban design research methodology and opportunities for reclamation of buried environmental systems in an existing urban neighborhood, and integration of ecological systems and urban infrastructure systems.

D.5.5. The total work of this LCMR project is synthesized in a document entitled Summary Report: Reclamation of Recreational Systems and Environmental Resources from Existing Urban/ Suburban Neighborhoods. The report outlines the community education process, urban design research methods,

and design principles applicable to metropolitan urban areas for integrating ecological systems and urban infrastructure systems. Copies of this report will be made available to the public at the Architecture library, College of Architecture and Landscape Architecture, University of Minnesota and Metropolitan Council library, Mears Park Centre, Saint Paul, MN.

D.5.6. Educational coursework and instructional material for the first professional degree programs in architecture and landscape architecture have been prepared by Prof. Morrish based on the results of the case studies and summary report.

a. September 1992, Prof. Morrish with Prof. Julie Bargmann conducted a joint urban design studio for the College of Architecture and Landscape Architecture, at the University of Minnesota, which studied the design of an ecological downtown for Maple Grove. Students used the newsletter as the basis for downtown design explorations which preserved and enhanced the ecological function of the site, designed a downtown core for the community which functioned for pedestrians ans well as automobiles, and linked recreational trail and storm-water drainage systems with the existing community.

b. September 1993, Prof. Morrish will be teaching Arch. 5137, *Elements of the Urban Landscape*. The instructional materials for this course are based upon the summary report of this LCMR project (D.5.3).

D.5.7. The case studies for the Cities of Chanhassen, Maple Grove, Farmington, and Phalen Creek have been presented at the following community education lectures, professional seminars, and workshops:

a. Mayors Institute on City Design - Midwest, Minneapolis, Minnesota: "Lessons Learned from the Chanhassen Case Study"

b. 1992 Upper Midwest Regional Planning Conference, Saint Paul, Minnesota: "Urban Design as a Decision Making Tool"

c. Minnesota Society of the American Institute of Architects (MSAIA) Summer Design Series, Walker Art Center, Minneapolis, Minnesota: "Summer Design Series - Edge Cities"

d. Rochester-Olmsted Planning Department, Rochester, Minnesota: "City Meets the Countryside"

e. Twelfth Annual Star Program Conference, Minnesota Department of Trade and Economic Development, Minnetonka, Minnesota, keynote address: "Issues of Expanding Twin City Urbanization upon Small Communities within and around the Metro Area"

f. Metropolitan Council, Saint Paul, Minnesota: "Metro 2015-Vision and Goals; Quality of Life Visioning Discussion Group"

g. Metropolitan Council, Saint Paul, Minnesota: "Eden Prairie and Development of the Minnesota River Bluffs"

h. Commission on Engineering and Technology Systems of the National Research Council, Washington D.C.: "Community and Structure"

i. Minnesota Association of Urban Management Assistants (MAUMA) Professional Development Seminar, Eden Prairie, Minnesota: "What is Your Community's Image of Itself - Socially and Physically?"

j. Metropolitan Council, Saint Paul, Minnesota: Participated in "Metropolitan Development Investment Framework" (MDIF) planning forums. Introduced ideas developed from the LCMR project as part of round table discussions on the future of the MDIF.

k. Metropolitan Council, Saint Paul, Minnesota: "Preliminary Findings: Reclamation of Recreational Systems and Environmental Resources from Existing Urban/ Suburban Neighborhoods." A presentation of the case studies and their metropolitan implications to Metropolitan Council members and staff.

l. Fourth Annual Transportation Research Conference, Center for Transportation Studies, University of Minnesota, Minneapolis, Minnesota: "Land Use Planning - Shaping Land Use to Decrease Metropolitan Travel." The design center presented the case studies and their metropolitan implications as one of three presentations in the panel discussion session noted above.

D.5.8. The case studies and work from this project have been referenced in the following publications and newspaper articles available to the public:

a. Architecture Minnesota. July/August 1992. Looking at edge cities: A conversation with William Morrish and Catherine Brown. Written by Adelheid Fischer.

b. Architecture Minnesota. March/April 1993. Design with nature: The next generation - Designers at the University of Minnesota build upon the principles of landscape ecology guru Ian McHarg. Written by Adelheid Fischer.

c. Utne Reader. July/August 1993. Ecological by Design - Landscape designers are crafting beautiful solutions to ugly development problems. Written by Adelheid Fischer.

d. Minneapolis Star-Tribune. June 10, 1992. Land-use guru's 1969 plan works with nature. Written by Linda Mack.

e. Minneapolis Star-Tribune. May 26, 1992. Planners seek links for area's natural features - unification would mimic Minneapolis' 'Grand Round'. Written by Peter Leyten.

D.5.9. Video tapes of the public lectures by Prof. Ian McHarg, Univ. of Pennsylvania and Leslie Sauer, Andropogon Assoc. are available for public viewing at the Architecture Library and the Design Center for American Urban Landscape, College of Architecture and Landscape Architecture, Univ. of Minnesota.

D.5.10. The DCAUL is investigating the potential use of personal computers applied to urban design as a communication and education tool for community staff and officials. At present the Design Center has experimented with three approaches to applying this digital technology to urban design.

a. The City of Maple Grove design proposal/scenario was used to explore the digitizing of three dimensional urban spaces (digitizing process). This technique involves actually representing the world around us with objects using x, y, and z coordinate system allowing the data to be manipulated to any vantage point by a computer system. The goal was to quickly input the data to help city representatives visualize the urban design within its landscape context.

b. The City of Farmington design proposal/scenario was used to explore the imaging of urban space two dimensionally. Two dimensional imaging (also known as image capture) involves using photographic images of existing urban spaces and designs. Images are scanned at high resolutions, then collage image pieces are added to the original image

within the graphics software to represent a potential urban or environmental design idea.

c. The City of Farmington design proposal/scenario was also used to explore the opportunities of combining digitizing process and image capture process. This exploration uses the two dimensional image as a background image, overlaying three dimensional modeling information on the background image. High resolution aerial scans provide a detailed background context while three dimensional information is then overlaid and matched to several photographic vantage points.

D.6. Benefits:

Informational materials will provide policy makers with a methodology and a series of case studies demonstrating strategies for introducing more environmental amenity into the urban landscape. These same materials will also benefit university students when used as an educational tool in policy, planning and urban design studies.

Public information materials will provide the interested citizen with a range of options and an increased awareness of how environmental amenity can be introduced within existing communities.

IV. Evaluation

For the FY 92-93 biennium the program can be evaluated by its ability to: 1) identify underutilized environmental resources which can be reclaimed, developed or conserved as environmental amenities for existing urban and suburban neighborhoods; 2) assess the strengths and weakness from an environmental resource standpoint of the capital improvement program plans and their preparation; 3) identify opportunities for increasing overall environmental amenity of projected capital improvement projects; 4) provide community public policy makers with a methodology for and examples of reclamation, conservation and development of underutilized environmental amenities.

In the long term, evaluation of this project's success will be the development and utilization of a new resource management, planning and funding strategy within the Twin Cities metropolitan area as evidenced by the policy directives of Metropolitan Council and independent units of city government. We will be successful if public policy makers adopt new methods for conceptualizing and planning capital improvement projects in a manner that maximizes environmental amenity for every public dollar spent.

V. Context

A. The scope and design of infrastructure projects has focused primarily on the fulfillment of technical criteria through engineered solutions. The design and implementation of environmental amenity projects has occurred separate from infrastructure projects. With limited future dollars for environmental amenity projects available, new methods and policies are needed to insure that future infrastructure projects will be conceived, designed and engineered to include environmental amenity.

B. To date work on "environmentally-sensitive" infrastructure has focused primarily on enhancing existing plans or projects often in response to environmental impact statements or public controversy. The majority of work has been focused on specific projects rather than on a methodology for insuring that all capital construction projects paid for by public dollars provide not only the required functional needs but also environmental amenity. Leadership organizations such as the Metropolitan Council have no technical assistance information to provide to city governments illustrating how capital improvement projects can be conceived, planned, budgeted and executed in a way that both provides needed infrastructure and environmental amenity.

The current project will address these problems by: demonstrating a methodology for inventorying and identifying resource and infrastructure potential projects; illustrating examples of these projects; and recommending steps and strategies for implementing this approach within existing city government procedures.

C. LCMR has not previously funded work on this topic. The intent of this project is to establish a methodology for developing recreational and environmental amenities in suburban areas. It is anticipated that funding beyond the FY 92-93 biennium will be sought from LCMR.

D. Not applicable

E. FY 92-93 Biennial Budget System Program Title and Budget: Not available at this time.

VI. Qualifications

1. Program Manager:

William Rees Morrish

Director, Design Center for American Urban Landscape
Associate Professor, College of Architecture and Landscape Architecture
M. Arch in Urban Design, Harvard University, 1978
B. A. Architecture, University of California, Berkeley, 1971

Professor Morrish is the Director of the Design Center for American Urban Landscape and holds the Dayton Hudson chair in urban design. Under his leadership, the Design Center is developing a research center on issues of urban design practice and education. Mr. Morrish, a founding principal in the urban design firm CITYWEST has twenty years of professional experience as an architect andurban designer working on community design issues. He has authored or co-authored several publications including the recent book, *Civilizing Terrains,* about geomorphology and urban form. Mr. Morrish's primary role will be as program manager for all project objectives.

2. Major Cooperators

A. Catherine R. Brown
Research Fellow, Design Center for American Urban Landscape

M. Landscape Architecture in Urban Design, Harvard University, 1978
B.A. Landscape Architecture, Louisiana State University, 1973

Ms. Brown, Coordinator of Special Projects at the Design Center, is a founding principal in the urban design firm CITYWEST and has worked extensively with complex multi-use development projects and reuse feasibility studies with clients including cultural and educational organizations, local governments, private developers and citizen groups. Among the CITYWEST projects she directed was the Phoenix Public Arts Plan, which established the organizing structure for the aesthetic enhancement of a one billion dollar capitol improvment plan for the city. She was the project director and the author of *Building for the Arts: A Guidebook for the Design and Planning of Cultural Facilities.* Ms. Brown's primary role will be as project coordinator and to prepare work under all objectives.

B. Patrick M. Condon
Associate Professor, Department of Landscape Architecture
University of Minnesota

M. Landscape Architecture, University of Massachusetts, 1980

Professor Condon is the past Director of Community Development and Planning for the City of Westfield, Massachusetts for downtown Westfield. He has focused his

research on the importance of articulating space and urban design. He is the author of several journal articles on the subject including "The Street, What Are We Talking About?" and "Cubist Space, Volumetric Space and Landscape Architecture". He has also developed a basis in theory for land planning and design in his National Endowment for the Arts sponsored work: A Desi*gned Landscape Space Typology.* Mr. Condon's role will be to participate in the review of objectives A and C and to prepare design proposals for objective B.

C. Robert D. Sykes
Associate Professor, Department of Landscape Architecture
University of Minnesota

M. Landscape Architecture, Harvard University, 1979
B. Landscape Architecture, University of Minnesota, 1973

Professor Sykes has conducted extensive research on aesthetic and functional issues in infrastructure design. Research publications include *Handbook of Channel Design for Site Stormwater Management;* "Building Systems Integration Theory and Its Potential for Application in Landscape Construction Technology" and "Local Standards and Water Quality". Mr. Sykes' role will be to participate in the review of objectives A and C and to prepare design proposals for objective B.

D. Lance M. Neckar
Assistant Professor, Department of Landscape Architecture
University of Minnesota

M. Landscape Architecture in Urban Design, Harvard University, 1981
M. Landscape Architecture, University of Wisconsin, 1982
B.A. European History, Cornell College, 1969

Professor Neckar has written and lectured extensively on the history of landscape architecture, focusing most recently on issues related to the modern conditions of the discipline of landscape architecture. Current research on theoretical development of the profession from the eighteenth century forward has examined and documented the work of the landscape architects most responsible for the conceptual design of the Twin Cities original park system, Warren H. Manning and Horace W. S. Cleveland. Mr. Neckar's role will be to participate in the review of objectives A and C and to prepare design proposals for objective B.

E. John R. Tester
Professor, Department of Ecology, Evolution and Behavior, University of Minnesota

Director, Cedar Creek Natural History Area

Ph.D. in Wildlife Ecology, University of Minnesota, 1960
M.S. in Forestry - Wildlife, Colorado State University, 1953
B.S. in Agriculture, University of Minnesota, 1951

Dr. Tester's research interests include evaluation of land management practices, especially prescribed burning on native prairie and savannah, ecology and behavior of birds and mammals, and development of telemetry techniques to monitor wild animals living under natural conditions. Prior to joining the University of Minnesota Bell Museum of Natural History as an ecologist in 1956, Dr. Tester served as a biologist with the Section of Research and Planning, Minnesota Department of Natural Resources. He is a Fellow of the American Association for the Advancement of Science, an Honorary Research Fellow of Aberdeen University, Scotland, and is a member of numerous scientific societies. He has published over 90 papers in scientific books and journals. Dr. Tester's primary role will be to participate in the accomplishment of the environmental systems component of objectives A and B.

3. <u>Project Advisors:</u>

A. Nancy Rutledge Connery

Ms. Connery served from 1985-1988 as executive director of the National Council on Public Works Improvement, a joint Presidential-Congressional study commission established by the Congress. She is principal author of *Fragile Foundations*, the Council's final policy report which offers recommendations to guide public works investment at all levels of government. Ms. Connery served for three years as manager of the Public Works Project at the Washington State Department of Community Development. During this time she designed and developed a statewide inventory of state and local infrastructure needs and funding shortfalls and a permanent Public Works Trust Fund which was subsequently enacted by the state legislature. Currently, she is a research associate at the Department of Civil Engineering at the Massachusetts Institute of Technology. She is also advisory editor and contributor to *The Public's Capital*, an infrastructure newsletter published jointly by Harvard University and the University of Colorado, Denver.

B. Charles E. Little, Director
Land Resources Conservation Council

Charles Little directs the Land Resources and Conservation Council which advises organizations and municipalities on strategic planning for the preservation,

conservation and provision of open space for public purpose. Based in Washington, D.C., he has authored a number of books on American life and history, including *Challenge of the Land* and *Green Fields Forever*. He is editor of the Johns Hopkins University Press series *American Land Classics*. For his most recent book *Greenways for America*, he interviewed individuals in 23 states to prepare a series of 16 exemplary case studies of open space systems.

4. Institutional Cooperators

A. Metropolitan Council
St. Paul, Minnesota

The Council coordinates the planning and development of the seven-county Metropolitan area. The Council is authorized by state and federal laws to plan for infrastructure projects including highways and transit, sewers, parks and open space, airports, land use and air and water quality.

Metropolitan Council department representatives under the coordination of Chief Planner Michael Munson will review and assess our process and products. Our effort will be timely and complementary to Met Council's updating of the Development Framework Plan. Met Council staff will be contributing data and reviewing results for objectives A and B. They will be most actively involved in objective C and will advise on objective D.

VII. Reporting Requirements

Semiannual status reports will be submitted not later than January 1, 1992; July 1, 1992; January 1, 1993 and a final status report by June 30, 1993.

July 1, 1993

LCMR Final Status Report - Detailed for Peer Review - Research
LCMR WORK PROGRAM 1991

I. Reclamation of Recreational Systems and Environmental Resources from Existing Urban/Suburban Neighborhoods -Recreation 35

Program Manager: William R. Morrish, Director
Design Center for American Urban Landscape
320 Wulling Hall
86 Pleasant Street S.E.
College of Architecture and Landscape Architecture
University of Minnesota
Minneapolis, MN 55455
(612) 626-0333

A. M.L. 91 Ch 254 Sec. 14 Subd: 3g

	LCMR Funds	Matching Funds
Appropriation:	$200,000	$50,000
Balance:	$ 0	$ 0

Environmental Resources: This appropriation is to the University of Minnesota, College of Architecture and Landscape Architecture, to investigate urban design strategies for enhancing recreational amenities in suburban areas. The investigation shall be done in cooperation with the metropolitan council. The legistative commission on Minnesota resources may convene a steering committee to ensure coordination and practical results.

B. Not applicable

C. Match Requirement: $50,000
Funds Raised to Date $50,000

Dayton Hudson Foundation has committed funds for this grant in the amount of the match requirement of $50,000.

II. Narrative

The LCMR funding will be used to investigate the potential for enhancing and enriching the open space and recreational amenities and overall physical quality of existing suburban

neighborhoods as part of future capital improvement programs to construct infrastructure projects. Using the Twin Cities metropolitan suburban community as a case study area, the program has three primary elements:

1. identification of existing recreational/environmental systems within the area.
2. development of alternative design proposals for the revitalization and expansion of the systems into neighborhoods.
3. development of a strategic plan and informational materials outlining design, finance and policy issues to implement the proposals.

Over one hundred years ago Minneapolis and Saint Paul laid the groundwork for the establishment of a visionary metropolitan park system. In retrospect, these park systems established an environmental tradition which:

- provides equal access by residents to the rich recreational and environmental resources of Minnesota;
- fosters environmental stewardship by creating an intimate relationship between parks, neighborhood and home; and
- achieves a sense of identity and place through the use of recreational and environmental resources existing within the communities.

The challenge is to now determine the best approach to reintroduce the "Park Tradition" into the development context of existing and emerging communities which lack these environmental amenities.

III. Objectives

A. Prepare an inventory of environmental systems and future infrastructure capital improvement plans for a specific geographic study area within the Twin Cities metropolitan area.

A.1. Narrative:
The identification and inventory of all publicly funded capital improvement projects at every level of government is essential to identify potential opportunities to enhance recreational and environmental resources. Mapping of the infrastructure project locations and the environmental resources within the area will identify opportunities to protect and/or enhance the state's natural resources.

A.2. Procedures:

A study area of the Twin Cities metropolitan suburban community will first be determined. The study area may involve multiple municipalities and may be composed of multiple locations selected for prototypical attributes.

Following determination of the study area, work will proceed with the assistance of the Metropolitan Council, and regional and local planning agencies to accomplish the following tasks: 1) Inventory and map all data necessary to identify significant environmental resources within the study area; 2) Inventory, list and map all ongoing and future plans for capital investments and annual maintenance related to infrastructure projects paid for by federal, state or local dollars.

A.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$40,000	$10,000
b. Balance:	$ 0	$ 0

A.4. Timeline for Products/Tasks

A4.1. *Identify geographic bounds of study area*
•Work in conjunction with Metropolitan Council to determine geographic bounds of study area. Study area is anticipated to cover multiple municipalities and need not be contiguous. Instead multiple locations within the metropolitan area may be selected for prototypical or special attributes such as a significant natural resource area or a major future capital improvement infrastructure project. Study areas will be sought in both urban and suburban situations. Criteria for selection will be developed by the principal researchers working in conjunction with the Metropolitan Council.

Schedule: July 1991 - October 1991

A.4.2. *Collect aerial photographs and maps, prepare base maps of study area*
Parallel to work task A.4.1. maps and aerial photos will be reviewed and collected as necessary to document potential study areas. All types of maps and aerial photos will be collected for the study areas including documents illustrating topographic and natural features, historic maps and contemporary documents. Primary sources for this information will be:
•Metropolitan Council archives
•Borchert Map Library, University of Minnesota
•Municipal departments

•County planning agencies

Schedule: July 1991 - October 1991

A.4.3. *Research and collect information on environmental systems of study area.*
•Once the initial, first-cut decisions have been made on the geographic study area, the study team will review available data on environmental systems. Specifically information will be sought on:
-lakes, rivers, streams, marshes, and watershed
-natural habitat areas
-soil and mineral resources
-forestry and agriculture
-slopes and significant land formations

The availability and quality of information on these environmental systems will be a deciding factor in the choice of final study areas. Information will be collected in cooperation with staff specialists at the Metropolitan Council from their archives. Information will also be sought from city, county and state planning agencies.

Schedule: August 1991 - January 1992

A.4.4. *Prepare set of maps of study area, each at the same scale, illustrating environmental systems within study area.*
•Information collected in work task A.4.3. will be used to map all environmental systems within selected study areas. Environmental systems will be mapped separately on base maps, prepared at the same scale to allow overlaying of maps for study and comparison.

Schedule: October 1991 - January 1992

A.4.5. *Prepare summary maps of environmental systems which illustrate environmental resource areas with significant opportunities for future development into open space and recreational amenities.*
•Using environmental resource maps prepared in work task A.4.4. the research team will conduct site visits to inspect the resource areas. These areas will be photographed and evaluated to determine which present the most significant opportunities for open space preservation and/or development into recreational amenities. Summary maps will be prepared to illustrate prime sites.

Schedule: January 1992 - March 1992

A.4.6. *Collect information, on all current and planned public infrastructure construction projects, within study areas.*
•Through interviews with responsible governmental unit representatives of local, state, and federal levels information will be collected on all possible present and future capital improvement projects. In local municipalities, for example, we will collect and review the Five Year Capital Improvement Program, which is the document used to set policy and budget priorities for municipal improvements. For example, the Minneapolis 1991-1995 Five Year Capital Improvement Program, which lists projects budgeted at $264 million to improve the city's infrastructure systems.

Schedule: September 1991 - January 1992

A.4.7. *Prepare set of composite maps of study area, at the same scale as environmental systems maps, illustrating public infrastructure projects by project type and by responsible governmental unit.*
•It is interesting to note that capital improvement plans rarely include maps locating the projects. In cases where maps are used they are highly diagrammatic and are segregated by project types. For example, sewer projects would be on one map and road projects on another. The principal investigators on this project were responsible for preparing the first composite maps of one billion capital infrastructure bonding plan for Phoenix, Arizona. These composite maps were enormously helpful to the mayor and planning staff in identifying areas of the city where public dollars were to be spent in order to maximize the benefit from these dollars.

•The infrastructure maps will be prepared at the same scale as the environmental systems maps described in work task A.4.4. for the purposes of overlay and comparison. Not only will this present opportunities for identifying possible enhancements to infrastructure projects, it is also likely to illustrate instances where planned projects will negatively impact environmental resources.

Schedule: October 1991 - April 1992

A.5. Status:

A.5.1. The City of Chanhassen was chosen as the first case study. Work with the community focused on the interrelationship of the planned Highway 5 corridor infrastructure improvements, the community, and the intersecting

environmental resource blocks and corridors. The goal of this first case study was to look at the following questions:
•How can open space and environmental corridors be integrated and protected within the suburban framework?
•How can access to these environmental corridors for wildlife and citizens be enhanced and strengthened?
•What planning strategies and implementation strategies are necessary to (1) promote the protection and enhancement of open space and environmental corridors as recreational and environmental resources and (2) provide for policy link of infrastructure improvements and environmental resources.

a. Community members participated in a bus tour of the City of Chanhassen and two urban design workshops. Working documents (including resource inventory maps and design proposal/scenario drawings-see B.5.1.), slides, and overheads were prepared for use at both workshops. Participants included members of Chanhassen's city administration, city council, planning commission, housing redevelopment authority, and design center staff.

A.5.2. The second case study selected was the City of Maple Grove. Work for the community has focused on the relationship of the Maple Grove gravel mining area, the community, the linkages to environmental resource blocks and corridors, the potential urban development of a "downtown" area, the linkages to urban neighborhood blocks and street/road corridors, and infrastructure improvements to the gravel mining area. Secondary focus has been connecting community across the I-94 and I-694 corridor. The questions which were examined are:
•How does urban, recreational, and ecological design take place on a site located over the city's drinking water aquifer?
•What type of environmental design protects the city's aquifer while at the same time enhancing the recreational and ecological opportunities for Maple Grove citizens?

a. Community members participated in a bus tour of the City of Maple Grove and two urban design workshops. Working documents (including resource inventory maps and design proposal/scenario drawings-see B.5.2.), slides, and overheads were prepared for use at both workshops. Participants included members of Maple Grove's city administration, city council, planning commission, gravel mining area committee, transit commission, park board, economic development commission, land owners, community members, and design center staff.

A.5.3. The third case study selected has been the City of Farmington. Work for the community has focused on the city's natural resources, the land area along Highway 3 corridor, the existing neighborhood adjoining downtown and the Vermillion River corridor. This case study looks at the relationship of these community building blocks to a proposed subdivision expansion of the existing grid-style town plan on land presently in agriculture production. This type of design, rather than the cul-de-sac type, allows for pedestrian scale neighborhoods with connections to the downtown business district and the Vermillion River. The questions which were examined are:

- How does urban, recreational, and ecological design take place when it occurs over a portion of the Vermillion River ground water recharge area?
- What type of environmental design protects the ground water while at the same time enhancing the recreational and ecological opportunities for Farmington citizens?
- How can the design of ground water recharge areas and water control/collection areas be used as amenities in the Farmington civic landscape?

a. Community members participated in a walking tour of the City of Farmington and two urban design workshops. Working documents (including resource inventory maps and design proposal/scenario drawings-see B.5.3.), slides, and overheads were prepared for use at the workshops. Participants included members of Farmington's city administration, city council, planning commission, housing redevelopment authority, developer representatives, community members, and design center staff.

A.5.4. The fourth, and last, case study selected has been the Phalen Creek and Trout Brook within the City of Saint Paul. The entire Phalen Chain of Lakes Watershed empties into Phalen Creek where it becomes the responsibility of the City of Saint Paul. However most of the watershed lies within the boundaries of other municipalities. Increased pollution and runoff due to development in the watershed has become a concern for the City of Saint Paul and the State DNR. Concerns about the watershed and EPA storm water quality regulations have forced the city and state to look at other water cleansing alternatives. Within this context, work by the Design Center looks forward to the possibilities of "daylighting" all or portions of the stream systems as they might be integrated into Saint Paul's open space and recreational network.

a. The Design Center, building upon work of the University of Minnesota Landscape Architecture Department, MN Dept. of Natural Resources, and Saint Paul's Dept. of Planning and Economic Dev., has included within this case study the entire submerged portion of Phalen Creek as well as Trout Brook, the tributary Phalen meets before reaching the Mississippi River.

A.5.5. All four case study areas were mapped for the following attributes or layers of information: area base map, metropolitan context, environmental networks (hydrology, geology, existing vegetation, and public open space), significant topography and views (soils, views, features), transportation and movement corridors, developable land, natural and urban landmarks, districts or rooms defined by land uses and associated landscape patterns, and nodes or transition points within the community. Using this information mapped attributes or layers were overlayed and summary composite maps created. Resulting summary maps illustrate the significant environmental resource areas of the communities and provide the basis for an urban design analysis of the existing environmental and urban systems.

A.5.6. A previous study which mapped information on environmental systems, *An Ecological Study of the Twin Cities Metropolitan Area* by the planning firm of Wallace, McHarg, Roberts and Todd, was rediscovered in the Metropolitan Council library archives. The study, led by Ian McHarg and finished in 1969, mapped surficial geology, physiography, slope, hydrology, generialized soils, existing forest cover, existing vegetation, and land needing protection for the seven county metropolitan area. The study has provided mapped base data for the seven county metro area. Some of this information is the most current mapped information available.

The eight remaining original large scale McHarg maps are 6'-6.5" wide x 5'-10" tall, at the scale 1:62,500. These maps were reproduced by the DCAUL and the Metropolitan Council in color at 62.5% of the existing scale, resulting in copies of the maps at the scale 1:100,000 which corresponds to the US Geological Survey and MN Geological Survey's scale of 1:100,000. Because of the fragile nature of these historic maps, the work requires that the maps be copied on a glass top color copier in parts, then pieced together. These maps and the maps at the Metropolitan Council are now available for reference use. The original maps were delivered by the Met Council staff to the Minnesota Historical Society to be archived.

A.5.7. Information has been collected on future infrastructure capital improvements and existing environmental resources for the metropolitan region from the

Metropolitan Council and the Minnesota DOT. In addition, Met Council is providing planning expertise in the areas of comprehensive planning, water resources, agricultural land preserves, transportation and railroads, recreation, and long-range planning. Aerial photographs of the metropolitan region have also been obtained. Other contacts for inventory/mapping information which were made over the course of the project were with the State Planning Agency (LMIC), the MN Dept. of Natural Resources, and the MN Dept. of Trade and Economic Development. Maps have been obtained from the U.S. Dept. of the Interior, Fish and Wildlife Service, Minnesota Valley National Wildlife Refuge. The DCAUL is continuing to collect information from local units of government.

A.5.8. Mapped information resulted in preliminary composite maps of metropolitan regional highways and bridges, and metro parks and trails capital improvements. Capital improvement information has been collected but not mapped of future metro waste control projects, airports, and transit facilities. Information still needs to be collected on county infrastructure capital improvements. This work is continuing with the Metropolitan Council.

A.6. Benefits:

In the next decade, communities in this state and across the nation will operate under tighter fiscal budgets. Funding for recreational and environmental resource development and planning will decrease, being pushed aside by rising public service costs and capital infrastructure replacement and development projects. Issues of water quality, waste removal, replacement of worn out systems etc. will dominate the fiscal budget agenda and as a result public dollars for amenity projects will continue to decrease as an overall percentage of municipal budgets. Advanced strategic planning which identifies early on and documents opportunities for creating recreational and environmental amenity as part of future infrastructure projects is the benefit of this objective.

B. Prepare a series of alternative design proposals illustrating ideas and recommendations for developing future public infrastructure projects which integrate natural resource systems to maximize development opportunities for recreational use and environmental enhancement.

B.1. Narrative:

Illustrating to key public policy decision makers, alternatives for the aesthetic and environmental enhancement of infrastructure projects is essential for demonstrating the range of possibilities inherent in these projects. The primary focus of this

objective will be to translate and interpret inventory information collected about environmental systems and capital improvement plans into alternative urban design scenarios in the form of drawings, models, and narrative descriptions.

B.2. Procedures:

The primary task will be to analyze the information collected as described in Objective A and using that analysis to develop design alternatives for future capital improvement projects. Design alternatives will be prepared for each category of infrastructure projects with overlays to illustrate each funding source and sponsoring agency. Following this a composite series of urban design scenarios will be prepared to illustrate proposals for developing recreational and environmental amenities parallel to and as part of future infrastructure projects.

B.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$60,000	$15,000
b. Balance:	$ 0	$ 0

B.4. Timeline for Products/Tasks

B.4.1. *Collect data and prepare cultural inventory maps.*

Within study area, data will be collected and maps prepared, illustrating location of: land uses by type; publicly owned buildings and property; and significant cultural resources. Data will be collected primarily from municipal assessors, planning departments and from state, county and local historical societies.

Schedule: August 1991 - January 1992

B.4.2. *Develop individual design proposals for all types and categories of infrastructure projects.*

It is anticipated that infrastructure projects will include the following: water supply and treatment, sewers and storm drainage, solid and hazardous waste, energy distribution, streets and bridges, rail/transit and buses, parks and recreation, public buildings, telecommunications.

First, each category of infrastructure project will be analyzed to identify and illustrate potential opportunities for aesthetic and environmental enhancement. Following this we will develop separate design alternatives and proposal ideas for all categories of public infrastructure projects within the study area.

Schedule: January 1992 - July 1992

B.4.3. *Refine design proposals to maximize environmental and recreational opportunities.*
We will reconsider, refine and test individual design proposals from an environmental and recreational viewpoint to maximize opportunities for the protection and creation of these amenities. In many cases we might find precious natural resources that are being lost by infrastructure development projects and recommended mitigation and alternatives.

Schedule: May 1992 - January 1993

B.4.4. *Develop alternative composite urban design proposals which include multiple categories of infrastructure projects.*
Based on information developed in the previous work task, the team will prepare a wide range of alternative proposals for the development of recreational and environmental enhancement projects considering all categories of infrastructure. The proposals developed in this work task will differ from earlier ones in that they will depict integrated composite proposals for the study area considering all possible categories of infrastructure within the context of existing land uses and natural resources. Proposals and recommendations will illustrate opportunities for the aesthetic and environmental enhancement of infrastructure projects within the study area.

Schedule: July 1992 - January 1993

B.5. Status

B.5.1. A design scenario and associated principles were developed for the City of Chanhassen based on the integration of the environmental systems/patterns, urban patterns, and relationship of Chanhassen to the southwest region and the metro area. The design proposal focused on the integration of natural systems with new community streets, roadways, bridges (the re-design of Highway 5), rail/transit stops, park and ride lots, and trail linkages to community and regional parks. Mapped data informing the design for Chanhassen included land uses, publicly owned buildings and property, and significant cultural resources.

B.5.2. Two design scenarios and associated principles were developed for the City of Maple Grove and the gravel mining area. The design proposal focused on the building of community within reclamation of the gravel mining area and its re-integration with the natural systems, new community streets, roadways, bridges, rail/transit stops, park and ride lots, storm water runoff collection, groundwater and aquifer protection, powerline corridor easements, and trail linkages to community and regional parks. Mapped data informing the design for Maple Grove included land uses, publicly owned buildings and property, and significant cultural resources.

B.5.3. A design scenario and associated principles are currently being developed for the City of Farmington based on the integration of the environmental systems/patterns, urban patterns, and relationship of Farmington to the Vermillion River watershed and the metro area. The design proposal focused on the integration of natural systems with new community streets, roadways, future transit stops, storm water runoff collection, groundwater and aquifer protection, and trail linkages to community and regional parks. Mapped data informing the design for Farmington included land uses, publicly owned buildings and property, and significant cultural resources.

B.5.3.1. The working relationship with the City of Farmington Planning staff and Public Works staff has been exceptional. They participated in all aspects of the design process, including interactive sessions at the Design Center and providing feedback and design ideas of their own. In addition, regional MNDOT staff have provided positive feedback on the Hwy. 3 design ideas which were worked out with the city staff. The following is a synopsis of meetings held to date with the city staff and other groups or agencies:

July 1992: Design Center staff met with Planning Study Committee of Farmington to discuss the scope of the project, take a walking tour of the city and introduce the panoramic photography exercise.

September 1992: Design Center staff met to discuss with the Planning Study Committee of Farmington the findings from the panoramic photography exercise, the analysis on the city's existing natural environmental systems and the critical aspects of the existing infrastructure which forms the armature of the city.

October 1992: Design Center staff presented proposals to the committee for changes to the Highway 3 corridor drainage system and a greenbelt system for the eastern edge of the proposed Sienna Corporation addition. This proposed greenbelt would serve as a link between the existing recreation and storm water management systems of the Vermillion River watershed area in Farmington, Castle Rock and Empire Township as well as a demarcation between the city of Farmington and the agricultural fields of Empire Township.

October 1992: Design Center staff presented alternative proposals for changes to the Highway 3 corridor roadway, drainage system, and adjoining parkway to the MNDOT regional engineers and committee members.

November 1992: Design Center staff met with the Empire Township Board to discuss the proposed greenbelt, the opportunity to develop a link between the existing recreation and storm water management systems of the Vermillion River watershed area in Farmington, Castle Rock and Empire Township, the possibility the greenbelt wetlands could serve as a storm water cleansing location for the new subdivision, and the opportunity for the greenbelt to serve as a demarcation between the city of Farmington and the agricultural fields of Empire Township.

November 1992: Design Center staff met with the developer and developer's staff to work out new subdivision connections to the the city's existing natural systems and the city's existing infrastructure which will form the environmental armature of the city.

B.5.4. Design opportunities were examined for the Phalen Creek and Trout Brook areas within the City of Saint Paul. The design opportunities focused on the daylighting of the Phalen creek and Trout Brook, the re-integration of the creeks with the natural systems, and the re-integration of the creeks with cultural and urban systems that intersect the creek corridors. In the report, physical and cultural features are presented as layers of graphic information that emphasize the form and structure of each topic. As a collection, the layers reveal the complexities inherent to urban corridors and the potential for re-integration of those rebuilt systems with natural systems. The

geographic layers studied include the creeks and lakes before urbanization, surface and subsurface geology, storm-sewer systems and watersheds, plant communities, historic and cultural landmarks, open spaces, and wildlife patterns. While by no means a definative list, this set of topics begins to explore the complexity which can enrich the design of urban creek corridors. Information on various forms of day-lighting and storm water treatment systems were collected with regards to this case study, but were not included in the newsletter report.

B.5.5. Application of the case studies to the metropolitan area is synthesized in a report which outlines the community education process, design research methods, and design principles applicable to metropolitan urban areas (D.5.5.). The report focuses on the importance of community preplanning and education of public decision makers, and the implications of integrating recreational, ecological, and urban infrastructure systems in the various geographic regions of the metropolitan area. The design center is currently working with the Metropolitan Council staff to explore the translation of these urban design methods and principles to metropolitan regional policy (see section C.5.7).

B.6. Benefits:
Design drawings, models and descriptive materials will illustrate opportunities for enhancing the aesthetic and environmental components of infrastructure projects to public policy makers. Design proposals will explore overlaps between recreational/environmental resources and infrastructure projects. This will, for example, show how the development of roads and water drainage systems is an opportunity to enhance recreational and environmental resources. If properly designed, roads and drainage systems can be a part of an environmental public domain which will provide a framework that links neighborhoods to each other and to local natural resources.

C. Evaluate and refine design proposals considering their implications from and for design standards, finance and funding, public policy and implementation.

C.1. Narrative:
Determining how to best implement the design proposals through a careful analysis of policy, finance and implementation considerations is essential for the viability of the proposals. Specific recommendations showing how design objectives can be

achieved through a clear understanding and explanation of the process, players and future steps will increase the applicability of the proposals.

C.2. Procedures:

Innovative and strategic thinking is required to move design ideas from paper proposals to realizable projects. A working group of public policy experts will assist the design team in the refinement and testing of urban design scenarios. Scenarios will be presented to the entire team and discussed for their policy, funding and implementation implications . This information will be used first, to refine the design scenarios. Further research will be used to develop several urban design strategies for achieving design proposals. Finally, a strategic plan will be prepared with recommendations for how to implement the design proposals and a specific plan of action and responsibilities.

C.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$60,000	$15,000
b. Balance:	$ 0	$ 0

C.4. Timeline for Products/Tasks

C.4.1. *Research criteria for evaluation of infrastructure, recreation and design proposals.*
A key concern of this research is to not only develop innovative design proposals but to also demonstrate how these proposals can be achieved. Toward that goal, we will first research and document existing criteria and procedures used by local, regional and state agencies to plan, fund and implement these types of projects.

Schedule: April 1992 - July 1992

C.4.2. *Develop criteria to evaluate design proposals considering public policy (i.e. planning, environmental), funding and implementation objectives.*
A clearly articulated list of criteria will be developed to provide a standard for evaluating design proposals.

Schedule: April 1992 - July 1992

C.4.3 *Refine design proposals by testing against established criteria.*
With evaluation criteria in hand we first will test all design proposals. Evaluation will be used to then refine the design proposals searching for

better fits between the criteria and the proposals. Refinements will be made wherever possible to the proposals.

Schedule: June 1992 - October 1992

C.4.4. *Develop a range of urban design implementation strategies.*
For this work task we will review all work developed to date and begin to generalize about ways that the information can be applied to the metropolitan area. Specifically, we will describe strategies for enhancing and enriching recreational amenities and environmental resources as part of infrastructure projects and normal community development. Implementation strategies and plans of action will be examined, considering a variety of players such as: a citizens group, local municipality, Metropolitan Council, a nonprofit group, etc.

Schedule: June 1992 - October 1992

C.4.5. *Refine strategies into single strategic plan and recommendations for action..*
Information developed in previous work task will be presented to and reviewed by all relevant Metropolitan Council departments/divisions. It will also be presented to a wide range of local government officials, both at the elected and staff levels. Team members will then work to refine implementation strategies into a strategic master plan with recommendations for action at all appropriate levels of government and for the private sector.

Schedule: October 1992 - January 1993

C.5. Status:

C.5.1. Throughout the process of this project peer review work sessions have taken place at regular intervals, with qualified individuals and agencies, to evaluate design proposals relative to design, design principles, public policy, and funding implementation.

C.5.2. The first advisory committee meeting was held to review of our work to date, provide direction for the LCMR grant, and help the Design Center staff develop criteria, policy, and implementation strategies. The design scenario and associated principles developed for the City of Chanhassen were presented and discussed, the *Intermodal Surface Transportation Efficiency Act of 1991* legislation was discussed, and potential case studies were discussed. Those attending the advisory committee meeting were:

•Metropolitan Council
Michael Munson, Research
Barbara Senness, Comprehensive Planning
Connie Kozlak, Transportation
Jack Frost, Natural Resource
Jack Mauritz, Parks
Darell Washington, Solid Waste

•MN Dept. of Trade & Econ. Dev.
Wayne Sames, Outdoor Recreation Grant Program

•MN Dept. of Natural Resources
Ceil Strauss, Hydrologist Metro Region

•MN Dept. of Transportation
Jim Reierson
Jeff Erickson

•University of Minnesota
Robert Sykes, Dept. of Landscape Arch.
Harrison Fraker, Dean, College of Architecture and Landscape Architecture (CALA)
Roger Clemence, Assoc. Dean, CALA
Mary Vogel, Research Coordinator, CALA
Will Craig, Asst. Dir., Center for Urban and Regional Affairs

•DCAUL Participants
William Morrish, Director
Catherine Brown, Special Projects Coordinator
Tom Hammerberg, Research Fellow
Gina Bonsignore, Research Fellow
Betsy Fitzsimons, Research Assistant

C.5.3. Two follow-up advisory meetings have been held with the purpose to review our work to date, provide direction for the LCMR grant, and help the Design Center staff develop criteria, policy, and implementation strategies. The design scenario and associated principles developed for the City of Chanhassen were presented and the preliminary work completed for the City of Maple Grove were discussed. Those attending meetings were:

•University of Minnesota
John Tester, Landscape Ecology and Animal Behavior

•MN Department of Natural Resources
Tom Hovey, Hydrologist Metro Region

•DCAUL Participants
Tom Hammerberg, Research Fellow
Gina Bonsignore, Research Fellow
Betsy Fitzsimons, Research Assistant

C.5.4. Two public lectures and peer review meetings have been held with Prof. Ian McHarg and Ms. Leslie Sauer, national experts on environmental design and urban design, to review our work to date, provide direction for the LCMR grant, and help the Design Center staff develop criteria, policy, and implementation strategies.

C.5.4.1. The first lecture and meeting was with Prof. Ian McHarg, University of Pennsylvania, Philadelphia, PA. The lecture centered on his previous metropolitan work completed in 1969, *An Ecological Study of the Twin Cities Metropolitan Area*, while he was with the planning firm of Wallace, McHarg, Roberts and Todd. The advisory meeting focused on the design scenarios and associated principles developed for the cities of Chanhassen and Maple Grove and provided an evaluation of the ecological design principles which were being developed. In addition Prof. McHarg and Prof. Morrish participated in discussions on ecological design and urban design at the Metropolitan Council with the Council members and staff. Those attending meetings were:

•Metropolitan Council
Mary Anderson, Chairperson
Liz Anderson, Council Member
Bonnie Featherstone, Council Member
Michael Munson, Research
Barbara Senness, Comprehensive Planning
Connie Kozlak, Transportation
Jack Frost, Natural Resource
Jack Mauritz, Parks

•University of Minnesota
Harrison Fraker, Dean, CALA
Roger Clemence, Assoc. Dean, CALA
Joan Nassauer, Dept. Head, Landscape Architecture
Roger Martin, Landscape Architecture
Mary Vogel, Research Coordinator, CALA
Will Craig, Asst. Dir., CURA, G.I.S. Specialist
Robert McMaster, Geography, G.I.S. Specialist

•Mpls. Star and Tribune Newspaper
Linda Mack, Reporter
Peter Leyton, Reporter

•Architecture Minnesota Magazine
Adelheid Fischer, Writer

•DCAUL Participants
William Morrish, Director
Catherine Brown, Special Projects Coordinator

Tom Hammerberg, Research Fellow
Gina Bonsignore, Research Fellow
Betsy Fitzsimons, Research Assistant

C.5.4.2. The second lecture and meeting was with Ms. Leslie Sauer, Andropogon Associates, Philadelphia, PA. The lecture centered on the work of her firm, *Andropogon Associates*, and the firm's premise that ecological design can and does need to be accomplished at all scales of design. The advisory meeting focused on the design scenarios and associated principles developed for the cities of Chanhassen, Maple Grove, Farmington, and Phalen Creek, Saint Paul and provided an evaluation of the ecological design principles which were being developed. Ms. Sauer reviewed all LCMR projects completed to date. Upon her return to Andropogon Assoc. she prepared a summary memo and a bibliographic packet of materials to supplement the work done to date specifically on the areas of natural vegetation, wildlife habitat, and restoration. Those attending meetings were:

•University of Minnesota
Harrison Fraker, Dean, CALA
Joan Nassauer, Dept. Head, Landscape Architecture
Mary Vogel, Research Coordinator, CALA

•Architecture Minnesota Magazine
Adelheid Fischer, Writer

•DCAUL Participants
William Morrish, Director
Catherine Brown, Special Projects Coordinator
Tom Hammerberg, Research Fellow
Gina Bonsignore, Research Fellow
Betsy Fitzsimons, Research Assistant

C.5.5. A peer review of preliminary findings: *Reclamation of Recreational Systems and Environmental Resources from Existing Urban/ Suburban Neighborhoods* was held with several Metropolitan Council staff, Saint Paul, Minnesota. The presentation focused on the case studies, their metropolitan implications, and possible future research directions with council staff: Ms. Sharon Klumpp, Executive Directer; Ms. Barbara Senness, Planning Coordinator, Comprehensive Planning and Local

Assistance Division; and Mr. Marcel Jouseau, Manager, Natural Resources and Parks Division.

C.5.6. Additional peer review meetings and discussions have been held with Ms. Nancy Connery, a national expert on infrastructure public policy and municipal finance, and Ms. Janine Benyus, a national expert in wildlife biology. These meetings and discussions have been to provide information and direction for the LCMR grant, review our work, and help the Design Center staff develop criteria, policy, and implementation strategies.

C.5.7. Post project technical assisstance has been provided to the cities of Chanhassen, Maple Grove, and Farmington. The purpose has been to assist directly with design, suggest possible consultants as well as expand the role of consultants in communtiy projects, and monitor community progress and projects resulting from the case studies. The assistance has focused on evaluation of consultant and developer design proposals relative to the city's goals for their community, public policy stratagies for accomplishing community and case study goals, and funding implementation stratagies for public projects.

a. Post project assistance with the city of Chanhassen has been ongoing since completion of the case study newsletter (D.5.1.). Assistance has been in the form of project and design review, site design workshops, and advising on the selection of consultants. The design center followed up the first case study by participating in several workshops and presentations focusing on the design of entrances to the downtown district of Chanhassen and other development project reviews.

b. Post project assistance with the city of Maple Grove were meetings with the city council and city manager to outline a long-term development strategy incorporating the urban design principles defined in the case study newsletter (D.5.2.).

c. Post project assistance with the city of Farmington has been ongoing since completion of the case study newsletter (D.5.3.). Design center staff have participated in two workshop sessions, the first a day-long visioning workshop with city staff, council members, and planning commission members; and the second a low-density housing workshop with planning staff, council members, and planning commission members. Additional advise has been provided on the selection of consultants for the design of community projects which were identified as part of the case study.

d. Post project assistance with the Metropolitan Council began after the initial presentations of preliminary findings to staff and council members (C.5.5. and D.5.5.k.). Design center staff will assist council staff with translating principles developed in this LCMR project to a revision of the Metropolitan Development Investment Framework and visualizing the result of council policy on the natural environment and landscape of the metropolitan area. Initially, work will begin with new ways of seeing and mapping the metropolitan landscape and adjusting metro council policy to diverse individual regions of the metropolitan area.

C.6. Benefits:

As a strategic plan for implementation is developed many policy objectives can be explored in more detail. Policy makers can examine ways that a variety of design options can explore the implications of policy goals. For example:

- How capital improvement can utilize the same dollar for two purposes-infrastructure and recreation?
- How equal access can be provided for broad public use for recreational and natural resources?
- How to expand recreational and environmental resources within existing suburban neighborhoods?
- How the public policies of the Metropolitan Council can be translated into urban design solutions which address specific local concerns for a sense of place and identity?

A clear strategic plan accompanied with extensive visual materials illustrating design proposals will be an effective tool in transforming visionary ideas from "pretty drawings" to doable projects.

D. Produce informational materials describing goals, principles, design proposals and implementation steps for distribution to public officials, municipal staff, professionals and citizens.

D.1. Narrative:

Development of a variety of educational materials is needed to illustrate and explain both the methodology and findings of the study. This information should be organized and presented in a variety of formats depending on the audience.

D.2. Procedures:

A multi-media presentation will be prepared to demonstrate key principles for developing aesthetic, recreational and environmental amenities in communities. The project team will work with consultants in public information and graphic design to develop a specific package of educational materials. This is likely to include the following: 1) A brochure and related slide show with taped narration for presentation to citizen groups 2) A longer slide show with taped narration presenting more technical information for public policy planners, and interested citizens 3) A handbook presenting urban design scenarios and strategies for creating and enhancing environmental amenity in Twin Cities Metropolitan Communities.

D.3. Budget

	LCMR Funds	Matching Funds
a. Amount Budgeted:	$40,000	$10,000
b. Balance:	$ 0	$ 0

D.4. Timeline for Products/Tasks

D.4.1. *Develop materials that explain methodology, design proposals and strategies.*

Detailed documentation will be prepared to explain the process that the study team followed and the resultant findings. This documentation will be of special interest to design professionals, planners and researchers. Specific emphasis will be given to explaining how the methodology can be adapted by local planners along with strategies for implementation.

Schedule: August 1992 - March 1993

D.4.2. *Develop public informational materials.*

Informational materials for citizens and public officials will be prepared. These materials will be less technical and tailored to a lay audience. It is envisioned that the following products will be produced: brochure, handbook, and slide show with taped narration.

Schedule: August 1992 - March 1993

D.4.3. *Develop a plan for dissemination of materials.*

Working with advisors from Metropolitan Council, University Public Relations and experts in marketing and graphic design, we will devise a plan

for distributing the informational materials in the most effective manner to public officials, municipal staff, professionals and citizens.

Schedule: August 1992 - June 1993

D.4.4. *Produce informational materials*
A graphic/communication design team will be retained to produce in conjunction with the study team all public information materials.

Schedule: December 1992 - July 1993

D.5. Status:

D.5.1. Work for the City of Chanhassen culminated with the publication Building Community Across the Corridor: A New Parkway Model For Chanhassen, MN which outlines the research methodology and design principles for integration of environmental systems and urban highway infrastructure. The community has used this document to begin to inform planning decisions and determine necessary community and highway corridor studies. The city requested 550 copies which they are distributing to the community. The design center has distributed copies to other community groups, public officials, and private organizations.

D.5.2. Work for the City of Maple Grove culminated with the publication Enriching the Community Landscape: Maple Grove, Minnesota envisions an ecological downtown to reclaim a gravel mining area. The publication outlines the research methodology and design principles for a pedestrian downtown, reclamation of environmental systems in a gravel mining area, and integration of ecological systems and urban infrastructure systems over the city's aquifer recharge area. The city has distributed copies of the newsletter to the city council, planning commission, and administrative staff. The design center has distributed copies to other community groups, public officials, and private organizations.

D.5.3. Work for the City of Farmington culminated with the publication Building within the Community Watershed: Designing waterways as an environmental framework for development in Farmington, Minnesota. The publication outlines the research methodology and design principles for a pedestrian downtown, reclamation and design of environmental systems along a roadway corridor, and integration of ecological systems and urban infrastructure systems in a new subdivision addition to downtown. The city

has requested 200 copies which they are distributing to Farmington citizens and to administrative staff of surrounding municipalities. The design center has distributed copies to other community groups, public officials, and private organizations.

D.5.4. Work for the City of Saint Paul's Phalen Creek Neighborhood culminated with the report Tracing the Community Connections of Phalen Creek and Trout Brook: A reexamination of the central valleys of Saint Paul, Minnesota. The report outlines the urban design research methodology and opportunities for reclamation of buried environmental systems in an existing urban neighborhood, and integration of ecological systems and urban infrastructure systems.

D.5.5. The total work of this LCMR project is synthesized in a document entitled Summary Report: Reclamation of Recreational Systems and Environmental Resources from Existing Urban/ Suburban Neighborhoods. The report outlines the community education process, urban design research methods, and design principles applicable to metropolitan urban areas for integrating ecological systems and urban infrastructure systems. Copies of this report will be made available to the public at the Architecture library, College of Architecture and Landscape Architecture, University of Minnesota and Metropolitan Council library, Mears Park Centre, Saint Paul, MN.

D.5.6. Educational coursework and instructional material for the first professional degree programs in architecture and landscape architecture have been prepared by Prof. Morrish based on the results of the case studies and summary report.

a. September 1992, Prof. Morrish with Prof. Julie Bargmann conducted a joint urban design studio for the College of Architecture and Landscape Architecture, at the University of Minnesota, which studied the design of an ecological downtown for Maple Grove. Students used the newsletter as the basis for downtown design explorations which preserved and enhanced the ecological function of the site, designed a downtown core for the community which functioned for pedestrians ans well as automobiles, and linked recreational trail and storm-water drainage systems with the existing community.

b. September 1993, Prof. Morrish will be teaching Arch. 5137, *Elements of the Urban Landscape*. The instructional materials for this course are based upon the summary report of this LCMR project (D.5.3).

D.5.7. The case studies for the Cities of Chanhassen, Maple Grove, Farmington, and Phalen Creek have been presented at the following community education lectures, professional seminars, and workshops:

a. Mayors Institute on City Design - Midwest, Minneapolis, Minnesota: "Lessons Learned from the Chanhassen Case Study"

b. 1992 Upper Midwest Regional Planning Conference, Saint Paul, Minnesota: "Urban Design as a Decision Making Tool"

c. Minnesota Society of the American Institute of Architects (MSAIA) Summer Design Series, Walker Art Center, Minneapolis, Minnesota: "Summer Design Series - Edge Cities"

d. Rochester-Olmsted Planning Department, Rochester, Minnesota: "City Meets the Countryside"

e. Twelfth Annual Star Program Conference, Minnesota Department of Trade and Economic Development, Minnetonka, Minnesota, keynote address: "Issues of Expanding Twin City Urbanization upon Small Communities within and around the Metro Area"

f. Metropolitan Council, Saint Paul, Minnesota: "Metro 2015-Vision and Goals; Quality of Life Visioning Discussion Group"

g. Metropolitan Council, Saint Paul, Minnesota: "Eden Prairie and Development of the Minnesota River Bluffs"

h. Commission on Engineering and Technology Systems of the National Research Council, Washington D.C.: "Community and Structure"

i. Minnesota Association of Urban Management Assistants (MAUMA) Professional Development Seminar, Eden Prairie, Minnesota: "What is Your Community's Image of Itself - Socially and Physically?"

j. Metropolitan Council, Saint Paul, Minnesota: Participated in "Metropolitan Development Investment Framework" (MDIF) planning forums. Introduced ideas developed from the LCMR project as part of round table discussions on the future of the MDIF.

k. Metropolitan Council, Saint Paul, Minnesota: "Preliminary Findings: Reclamation of Recreational Systems and Environmental Resources from

Existing Urban/ Suburban Neighborhoods." A presentation of the case studies and their metropolitan implications to Metropolitan Council members and staff.

l. Fourth Annual Transportation Research Conference, Center for Transportation Studies, University of Minnesota, Minneapolis, Minnesota: "Land Use Planning - Shaping Land Use to Decrease Metropolitan Travel." The design center presented the case studies and their metropolitan implications as one of three presentations in the panel discussion session noted above.

D.5.8. The case studies and work from this project have been referenced in the following publications and newspaper articles available to the public:

a. Architecture Minnesota. July/August 1992. Looking at edge cities: A conversation with William Morrish and Catherine Brown. Written by Adelheid Fischer.

b. Architecture Minnesota. March/April 1993. Design with nature: The next generation - Designers at the University of Minnesota build upon the principles of landscape ecology guru Ian McHarg. Written by Adelheid Fischer.

c. Utne Reader. July/August 1993. Ecological by Design - Landscape designers are crafting beautiful solutions to ugly development problems. Written by Adelheid Fischer.

d. Minneapolis Star-Tribune. June 10, 1992. Land-use guru's 1969 plan works with nature. Written by Linda Mack.

e. Minneapolis Star-Tribune. May 26, 1992. Planners seek links for area's natural features - unification would mimic Minneapolis' 'Grand Round'. Written by Peter Leyten.

D.5.9. Video tapes of the public lectures by Prof. Ian McHarg, Univ. of Pennsylvania and Leslie Sauer, Andropogon Assoc. are available for public viewing at the Architecture Library and the Design Center for American Urban Landscape, College of Architecture and Landscape Architecture, Univ. of Minnesota.

D.5.10. The DCAUL is investigating the potential use of personal computers applied to urban design as a communication and education tool for

community staff and officials. At present the Design Center has experimented with three approaches to applying this digital technology to urban design.

a. The City of Maple Grove design proposal/scenario was used to explore the digitizing of three dimensional urban spaces (digitizing process). This technique involves actually representing the world around us with objects using x, y, and z coordinate system allowing the data to be manipulated to any vantage point by a computer system. The goal was to quickly input the data to help city representatives visualize the urban design within its landscape context.

b. The City of Farmington design proposal/scenario was used to explore the imaging of urban space two dimensionally. Two dimensional imaging (also known as image capture) involves using photographic images of existing urban spaces and designs. Images are scanned at high resolutions, then collage image pieces are added to the original image within the graphics software to represent a potential urban or environmental design idea.

c. The City of Farmington design proposal/scenario was also used to explore the opportunities of combining digitizing process and image capture process. This exploration uses the two dimensional image as a background image, overlaying three dimensional modeling information on the background image. High resolution aerial scans provide a detailed background context while three dimensional information is then overlaid and matched to several photographic vantage points.

D.6. Benefits:

Informational materials will provide policy makers with a methodology and a series of case studies demonstrating strategies for introducing more environmental amenity into the urban landscape. These same materials will also benefit university students when used as an educational tool in policy, planning and urban design studies.

Public information materials will provide the interested citizen with a range of options and an increased awareness of how environmental amenity can be introduced within existing communities.

IV. Evaluation

For the FY 92-93 biennium the program can be evaluated by its ability to: 1) identify underutilized environmental resources which can be reclaimed, developed or conserved as environmental amenities for existing urban and suburban neighborhoods; 2) assess the strengths and weakness from an environmental resource standpoint of the capital improvement program plans and their preparation; 3) identify opportunities for increasing overall environmental amenity of projected capital improvement projects; 4) provide community public policy makers with a methodology for and examples of reclamation, conservation and development of underutilized environmental amenities.

In the long term, evaluation of this project's success will be the development and utilization of a new resource management, planning and funding strategy within the Twin Cities metropolitan area as evidenced by the policy directives of Metropolitan Council and independent units of city government. We will be successful if public policy makers adopt new methods for conceptualizing and planning capital improvement projects in a manner that maximizes environmental amenity for every public dollar spent.

V. Context

A. The scope and design of infrastructure projects has focused primarily on the fulfillment of technical criteria through engineered solutions. The design and implementation of environmental amenity projects has occurred separate from infrastructure projects. With limited future dollars for environmental amenity projects available, new methods and policies are needed to insure that future infrastructure projects will be conceived, designed and engineered to include environmental amenity.

B. To date work on "environmentally-sensitive" infrastructure has focused primarily on enhancing existing plans or projects often in response to environmental impact statements or public controversy. The majority of work has been focused on specific projects rather than on a methodology for insuring that all capital construction projects paid for by public dollars provide not only the required functional needs but also environmental amenity. Leadership organizations such as the Metropolitan Council have no technical assistance information to provide to city governments illustrating how capital improvement projects can be conceived, planned, budgeted and executed in a way that both provides needed infrastructure and environmental amenity.

The current project will address these problems by: demonstrating a methodology for inventorying and identifying resource and infrastructure potential projects;

illustrating examples of these projects; and recommending steps and strategies for implementing this approach within existing city government procedures.

C. LCMR has not previously funded work on this topic. The intent of this project is to establish a methodology for developing recreational and environmental amenities in suburban areas. It is anticipated that funding beyond the FY 92-93 biennium will be sought from LCMR.

D. Not applicable

E. FY 92-93 Biennial Budget System Program Title and Budget: Not available at this time.

VI. Qualifications

1. Program Manager:

William Rees Morrish
Director, Design Center for American Urban Landscape
Associate Professor, College of Architecture and Landscape Architecture
M. Arch in Urban Design, Harvard University, 1978
B. A. Architecture, University of California, Berkeley, 1971

Professor Morrish is the Director of the Design Center for American Urban Landscape and holds the Dayton Hudson chair in urban design. Under his leadership, the Design Center is developing a research center on issues of urban design practice and education. Mr. Morrish, a founding principal in the urban design firm CITYWEST has twenty years of professional experience as an architect andurban designer working on community design issues. He has authored or co-authored several publications including the recent book, *Civilizing Terrains*, about geomorphology and urban form. Mr. Morrish's primary role will be as program manager for all project objectives.

2. Major Cooperators

A. Catherine R. Brown
Research Fellow, Design Center for American Urban Landscape

M. Landscape Architecture in Urban Design, Harvard University, 1978
B.A. Landscape Architecture, Louisiana State University, 1973

Ms. Brown, Coordinator of Special Projects at the Design Center, is a founding principal in the urban design firm CITYWEST and has worked extensively with complex multi-use development projects and reuse feasibility studies with clients including cultural and educational organizations, local governments, private developers and citizen groups. Among the CITYWEST projects she directed was the Phoenix Public Arts Plan, which established the organizing structure for the aesthetic enhancement of a one billion dollar capitol improvment plan for the city. She was the project director and the author of *Building for the Arts: A Guidebook for the Design and Planning of Cultural Facilities.* Ms. Brown's primary role will be as project coordinator and to prepare work under all objectives.

B. Patrick M. Condon
Associate Professor, Department of Landscape Architecture
University of Minnesota

M. Landscape Architecture, University of Massachusetts, 1980

Professor Condon is the past Director of Community Development and Planning for the City of Westfield, Massachusetts for downtown Westfield. He has focused his research on the importance of articulating space and urban design. He is the author of several journal articles on the subject including "The Street, What Are We Talking About?" and "Cubist Space, Volumetric Space and Landscape Architecture". He has also developed a basis in theory for land planning and design in his National Endowment for the Arts sponsored work: A Desi*gned Landscape Space Typology.* Mr. Condon's role will be to participate in the review of objectives A and C and to prepare design proposals for objective B.

C. Robert D. Sykes
Associate Professor, Department of Landscape Architecture
University of Minnesota

M. Landscape Architecture, Harvard University, 1979
B. Landscape Architecture, University of Minnesota, 1973

Professor Sykes has conducted extensive research on aesthetic and functional issues in infrastructure design. Research publications include *Handbook of Channel Design for Site Stormwater Management;* "Building Systems Integration Theory and Its Potential for Application in Landscape Construction Technology" and "Local Standards and Water Quality". Mr. Sykes' role will be to participate in the review of objectives A and C and to prepare design proposals for objective B.

D. Lance M. Neckar
Assistant Professor, Department of Landscape Architecture
University of Minnesota

M. Landscape Architecture in Urban Design, Harvard University, 1981
M. Landscape Architecture, University of Wisconsin, 1982
B.A. European History, Cornell College, 1969

Professor Neckar has written and lectured extensively on the history of landscape architecture, focusing most recently on issues related to the modern conditions of the discipline of landscape architecture. Current research on theoretical development of the profession from the eighteenth century forward has examined and documented the work of the landscape architects most responsible for the conceptual design of the Twin Cities original park system, Warren H. Manning and Horace W. S. Cleveland. Mr. Neckar's role will be to participate in the review of objectives A and C and to prepare design proposals for objective B.

E. John R. Tester
Professor, Department of Ecology, Evolution and Behavior, University of Minnesota
Director, Cedar Creek Natural History Area

Ph.D. in Wildlife Ecology, University of Minnesota, 1960
M.S. in Forestry - Wildlife, Colorado State University, 1953
B.S. in Agriculture, University of Minnesota, 1951

Dr. Tester's research interests include evaluation of land management practices, especially prescribed burning on native prairie and savannah, ecology and behavior of birds and mammals, and development of telemetry techniques to monitor wild animals living under natural conditions. Prior to joining the University of Minnesota Bell Museum of Natural History as an ecologist in 1956, Dr. Tester served as a biologist with the Section of Research and Planning, Minnesota Department of Natural Resources. He is a Fellow of the American Association for the Advancement of Science, an Honorary Research Fellow of Aberdeen University, Scotland, and is a member of numerous scientific societies. He has published over 90 papers in scientific books and journals. Dr. Tester's primary role will be to participate in the accomplishment of the environmental systems component of objectives A and B.

3. Project Advisors:

A. Nancy Rutledge Connery

Ms. Connery served from 1985-1988 as executive director of the National Council on Public Works Improvement, a joint Presidential-Congressional study commission established by the Congress. She is principal author of *Fragile Foundations*, the Council's final policy report which offers recommendations to guide public works investment at all levels of government. Ms. Connery served for three years as manager of the Public Works Project at the Washington State Department of Community Development. During this time she designed and developed a statewide inventory of state and local infrastructure needs and funding shortfalls and a permanent Public Works Trust Fund which was subsequently enacted by the state legislature. Currently, she is a research associate at the Department of Civil Engineering at the Massachusetts Institute of Technology. She is also advisory editor and contributor to *The Public's Capital*, an infrastructure newsletter published jointly by Harvard University and the University of Colorado, Denver.

B. Charles E. Little, Director
Land Resources Conservation Council

Charles Little directs the Land Resources and Conservation Council which advises organizations and municipalities on strategic planning for the preservation, conservation and provision of open space for public purpose. Based in Washington, D.C., he has authored a number of books on American life and history, including *Challenge of the Land* and *Green Fields Forever*. He is editor of the Johns Hopkins University Press series *American Land Classics*. For his most recent book *Greenways for America*, he interviewed individuals in 23 states to prepare a series of 16 exemplary case studies of open space systems.

4. Institutional Cooperators

A. Metropolitan Council
St. Paul, Minnesota

The Council coordinates the planning and development of the seven-county Metropolitan area. The Council is authorized by state and federal laws to plan for infrastructure projects including highways and transit, sewers, parks and open space, airports, land use and air and water quality.

Metropolitan Council department representatives under the coordination of Chief Planner Michael Munson will review and assess our process and products. Our effort will be timely and complementary to Met Council's updating of the Development Framework Plan. Met Council staff will be contributing data and reviewing results for objectives A and B. They will be most actively involved in objective C and will advise on objective D.

VII. Reporting Requirements

Semiannual status reports will be submitted not later than January 1, 1992; July 1, 1992; January 1, 1993 and a final status report by June 30, 1993.