The Revitalization of Benson, Arizona

By Rheana O’Sullivan

A Master’s Report Submitted to the Faculty of the
COLLEGE OF ARCHITECTURE, PLANNING &
LANDSCAPE ARCHITECTURE

In Partial Requirement for a Masters in Landscape Architecture

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My parents and my sister for their love and support.
Introduction
Benson’s History, Need for Revitalization, Research Goal and Methods

History:
In 1880, the mining town Benson, became the central location for the Southern Pacific Railroad for shipping supplies and ore. Soon Benson was established as a major railroad town for three major railroad companies; the Sonoran, Southwestern and Southern Pacific Railroad. Benson was in the era of prospering mining, and soon a roundhouse was built for spare engines. Along Main Street, new businesses were being established with a vibrant mixed population. This time of Benson’s growth continued until the Great Depression when the railroad business slowed. The railroad business picked back up with World War II. After the war, however, the major railroad companies sold out until only the Union Pacific came through. Part of this economic transition was due to the increased use of the automobile, now Amtrak passes through Benson twice a day; while freight trains pass in abundance but not for stopping. Main Street was still a major thoroughfare for trucks and transportation to Bisbee, Sierra Vista and Kartchner Caverns. However, with the construction of I-10 that bypasses Benson, the traffic has slowed decreasing business along Main Street. Now, Benson is a small town in desperate need for a boost to a declining economy.

Need for Revitalization:
Benson’s economy is suffering from the lack of business and corresponding low property values. The bare design of Main Street at the present moment is for moving cars swiftly through with little attraction for people to stop. Benson needs to re-establish itself as a destination instead of a thoroughfare. The economy can be stimulated by making Benson a beautiful place through landscaping which in turn would create new opportunities for businesses and raise the local property value. Benson has the San Pedro River which has great opportunities to become a destination place for eco-tourism with paths and outdoor activities. Using landscape architecture as a revitalization tool is one of the most economical way to boost the economy and give the community a sense of pride.

Benson offers little recreational activity and entertainment for school age children and retirees. Paths connecting to and from the schools with a skatepark and recreational center will give all age groups opportunity to enjoy the outdoors. Coyote Wash next to Safeway is a teenager hangout with an underground bridge that is covered in graffiti. This is an ideal place to connect the North and South neighborhoods with a safe passage for school kids going to the baseball field or to school. There is a need for retirement communities that would help boost Benson’s economy. A retirement community surrounding a golf course would increase property value and Main Street’s economy.

The San Pedro River has several dumping sites and an invasion of tamarisks that have inhibited the new growth of the native cottonwood. On the southern lower part of the San Pedro River near St. David there is a restoration committee that is restoring the river. There is great potential for Benson to become a part in the restoration process of the river. The economy would be boosted by eco-tourism with outdoor activities, a community gathering place and paths for hiking or biking. Birdwatchers and outdoor enthusiasts would visit local shops, hotels and restaurants.
Need for Revitalization:

Benson’s need for revitalization is based on the lack of the five main ingredients of success. These five ingredients: social culture, aesthetics, ecology, function and economics are the foundation of a successful revitalization project.

Social Culture:

Presently, Benson has very few outdoor or indoor gathering spaces. There is a Mexican influence in the local community that could be an influencing factor to the design. The need for recreational activities, paths and social interactive spaces is greatly needed.

Aesthetics:

Benson has a bare desolate look that lacks shade and color. Architecturally there are a few buildings of interest such as the newly renovated welcome center that is also the Chamber of Commerce building. A few of the local signs have tried to keep up with the historic signage.

Ecology:

Benson has very little vegetation and trees on Main Street. There is a need to reduce the reflective heat and provide shade on the sidewalks for pedestrians. The San Pedro River is invaded with the invasive tamarisks inhibiting natives species such as the cottonwood by lowering the water level. Revitalization of the San Pedro River could join the conservatory project in St. David, offering Benson an opportunity for eco-tourism.

Function:

There is little activity on Main Street and a need to increase economic opportunities. Trees and vegetation are needed to create pedestrian friendly pocket parks, shady sidewalks and paths. Sidewalks need to be widened and well-lit to entice evening activity.

Economics:

Since the construction of I-10, Benson’s economy has been on the down slide with little incentives for private investments. A retirement community is needed to boost the economy. Landscape architecture can increase new businesses and raise property values.
Introduction
Benson’s History, Need for Revitalization, Research Goal

Research Goal:

The revitalization of Main Street with landscape architecture will improve Benson’s economy and give Benson a signature environment. Researching the landscape architecture solutions that other small towns have done to revitalize their Main Street will provide a more solid foundation for Benson’s Main Street revitalization plan. The main goal is to explore these landscape architecture solutions and decide which would provide the best solution for the revitalization of Main Street of Benson.

Research Objective:

One of the landscape architecture solutions that will be used to revitalize Benson is to raise property values by landscaping Main Street and side streets. By landscaping Main Street with shady trees and colorful vegetation, pedestrian will be enticed to explore the small shops and restaurants. An alley path connecting pocket parks, neighborhoods, schools and businesses will provide a safe pedestrian route for all ages. Along with other paths that connect to the San Pedro River that provides outdoor recreational activities, community gathering spaces and eco-tourism opportunities, Benson will become an interesting town for retirees. These retirees will help increase the economic revenue base and increase the opportunities for private investments. The creation of different polar attractions on Main Street would pull traffic through both ends of the street and increase these business opportunities even more. These polar attractions would be achieved by the use of landscape architecture solutions that would be the most economical means to revitalization.

Research Method:

1.) Site analysis involved: land use, open space, vehicular traffic patterns, ecology, climate, views, and demographics analysis. Land use analysis involved how the open space was being used mainly as recreational by teenagers. Open space analysis was a study of open space that may be bought by the local government for park and conservatory purposes. Ecology analysis involved the condition of the San Pedro River. Climate analysis involved the study of wind, rain and sun conditions. Vehicular traffic patterns involved a study on the main roads, where stoplights and pedestrian crosswalks are needed. View analysis were the various views looking through, to and from Benson. Demographic analysis was growth indicators, labor force data and businesses under marketed. Each part of the site analysis was thoroughly gleaned for design implications.

2.) Literature reviews consisted of a variety of literature that involved other revitalization projects, storm water management, greenwalls, constructed wetlands, ecoroofs and streetscapes. The literature reviews also contained literature on small town planning and revitalization theory.

3.) Case reviews were town revitalizations and main street revitalizations. The study of different small town and main street revitalizations provide a solid base of solutions that can be utilized in Benson’s Main Street revitalization.
Site analysis is a very important research tool that directly influences the strategy and design of the landscape architecture solutions. Each section of the site analysis has an implication section which discusses how that particular information can be used for the landscape architecture solutions. At the end of this chapter is a table that summarizes the influence of the site analysis on the focus areas.
<table>
<thead>
<tr>
<th></th>
<th>Main Street Revitalization</th>
<th>Pedestrian Bridge</th>
<th>Adobe Plaza</th>
<th>Eco-Center</th>
<th>Golf Center</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Use</strong></td>
<td>area next to railroad and small plateau used for dirt bikes</td>
<td>buildings are dilapidated, land is vacated</td>
<td>land next to San Pedro used for recreation and dumping</td>
<td>land is being used now for dirt bikes</td>
<td></td>
</tr>
<tr>
<td><strong>Open Space</strong></td>
<td>railroad space and plateau</td>
<td>land surrounding jail</td>
<td>land surrounding the San Pedro</td>
<td>land behind Ocotillo Plaza and hospital</td>
<td></td>
</tr>
<tr>
<td><strong>Vehicular Traffic Patterns</strong></td>
<td>main traffic pattern is on Main Street, need for shade, stoplights and crosswalks</td>
<td>the bridge provides a safe route from traffic and the railroad</td>
<td>Benson needs activity and shops on the east side of town</td>
<td>the traffic would be pulled more through Benson if there was an attraction on the east side of the town, now many people just go to Safeway on the west side</td>
<td></td>
</tr>
<tr>
<td><strong>Walking Distances</strong></td>
<td>Main Street is an hour's walk</td>
<td>the bridge is within walking distance of Main Street and neighborhoods</td>
<td>is within 15 minute walking distance the Chamber of Commerce</td>
<td>the eco-center is not within walking distance but is with in biking distance</td>
<td></td>
</tr>
<tr>
<td><strong>Climate</strong></td>
<td>need for shade, especially on south western exposures</td>
<td>need for shade from the south west sun</td>
<td>need for shade, especially on south western exposures</td>
<td>need for shade, especially on south western exposures</td>
<td></td>
</tr>
<tr>
<td><strong>Views</strong></td>
<td>plateaus to the southeast and northwest</td>
<td>southeast plateaus, sunset</td>
<td>Main Street and the underpass is directly in front of the plaza</td>
<td>through and to the San Pedro is a beautiful riparian zone</td>
<td></td>
</tr>
<tr>
<td><strong>Ecology</strong></td>
<td>Benson has little vegetation and trees along Main Street and the side streets</td>
<td>plateau next to bridge has little vegetation and is eroding</td>
<td>several large tamarisks should be removed and replaced with native species</td>
<td>the San Pedro is filled with the invasive species tamarisks that lower the water level for native species</td>
<td></td>
</tr>
<tr>
<td><strong>Topography</strong></td>
<td>connects to the small plateau with the water tower</td>
<td></td>
<td></td>
<td>the plateaus provide rain water run off that supplements gray water usage in the summer</td>
<td></td>
</tr>
<tr>
<td><strong>Demographics</strong></td>
<td>shops under marketed are women's apparel, pets, optical and sporting goods</td>
<td>shops under marketed are women's apparel, pets, optical and sporting goods</td>
<td>shops under marketed are women's apparel, pets, optical and sporting goods</td>
<td>retirees would be attracted to a place that provides a practice course for beginners</td>
<td></td>
</tr>
</tbody>
</table>
Site Analysis
Ordering Systems

There are five ordering systems that relate directly to a revitalization. These ordering systems are derived from the site analysis and give a direction for landscape architecture solutions. The five ordering systems are the following:

**Social Culture:** Benson has a history of a mixed culture. There is less of that cultural mix due to Benson’s economic decline. Community interaction consists mainly of church, library meetings and some have participated in the City Council and Chamber Commerce meetings.

**Economics:** The construction of Interstate 10 has decreased the amount of traffic that was supporting Benson’s economy. The new Safeway shopping center has customers from the surrounding towns which could be attracted to Main Street if there were more shops and attractions.

**Aesthetics:** Benson has a barren desolate look. The buildings on Main Street have little aesthetic quality with the exception some small businesses and the Chamber of Commerce building.

**Ecology:** Benson has some dumping sites along the San Pedro River that need to be cleaned up. The invasion of tamarisks has inhibited growth of the native cottonwoods.

**Function:** Main Street functions solely as a thoroughfare which does not encourage pedestrians. Businesses along Main Street have no parking because the street is owned by ADOT.

Revitalization occurs when all five ordering systems are taken into consideration through the design process and completion.

**Implications**

These five ordering systems were instrumental in developing the strategy for Benson’s revitalization. There is a need for social gathering spaces where the community can come together for events and happenings. These happenings and gathering spaces could influence the economy by attracting tourists and new residences.

Since the economy is low, landscaping along Main Street and side streets would raise property value. The lack of an aesthetically pleasing environment would be greatly improved with streets lined by trees creating a pedestrian friendly environment. The function of Main Street would change by this encouraging of pedestrian with wider shady sidewalks and crosswalks.

Activities and gathering places along the San Pedro River would help stop the dumping and encourage the community to see the river as an valuable economic ecological resource. Restoring the riparian zone with native species would encourage wildlife and birds that could become part of an ecotourism experience. Ecotourism would be an economic boost for small businesses along Main Street.
Implications: Main Street is a straight thoroughfare that encourages cars to go fast. By installing stoplights on the major intersections, cars will slow down enabling passengers to be enticed by the new landscape and shops. A slower traffic pattern will also encourage pedestrians. Aesthetic signs along Interstate 10 with landscaping would entice travelers to visit Benson.

Walking Distances
Green stick with red tip = one mile
One Mile = 15 minutes walking

Implications: Benson is a perfect town for pedestrians. Everything is within walking distance which opens business opportunities for outdoor areas. Alley revitalization would create pedestrian pathways that lead to new storefronts.
Population: 4,697
The major trade routes near Benson are Interstate 10, Highway 90 U.S. 80 and the Union Pacific Railroad.

Benson is located:
156 miles from Phoenix
45 miles from Tucson
24 miles from Tombstone
35 miles from Willcox
48 miles from Bisbee

Noise Pollution: The railroad in Benson causes noise pollution. The railroad runs through the heart of Benson and splits the town in half. Interstate 10 affects the northern side of Benson.

Major/Historic Buildings: The major buildings in Benson are located on Ocotillo Road.
- The Chamber of Commerce is also a Welcome Center for tourists.
- The Old Jail is a historic adobe building. Safeway has customers from all of Benson’s surrounding towns.
- The Gas City is one of the major employers in Benson.
- Ocotillo Plaza is being revitalized into new shops.
- The Sports Fields have a variety of fields: baseball and soccer.

Implications
Benson is a small town with a several major and historic buildings which could be emphasized on for tourism. The railroad cuts the town in half and creates a large amount of noise pollution so landscape architecture solutions should attempt to connect the two halves of the town.

Interstate 10 causes noise and visual pollution which could be made more aesthetic by landscaping and signage that tells of Benson’s attractions.
Site Analysis
Demographics

Fourth Street Commercial
21 Store Fronts, 5 Vacancies

Shops under marketed: women’s apparel, pets, optical, sporting goods

Major Employers:
Public: City of Benson, Benson
Unified School
Private: AEPCO, SEABHS,
Apache Nitrogen, Gas City,
Benson Hospital

Cochese County employment number in:

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>1999</th>
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<tbody>
<tr>
<td>Agricultural Services, Forestry &amp; Fishing</td>
<td>59</td>
<td>0</td>
</tr>
<tr>
<td>Construction</td>
<td>0</td>
<td>2,000</td>
</tr>
<tr>
<td>FIRE</td>
<td>710</td>
<td>750</td>
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<tr>
<td>Manufacturing</td>
<td>1,034</td>
<td>1,300</td>
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<tr>
<td>Mining</td>
<td>160</td>
<td>0</td>
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<tr>
<td>Retail Trade</td>
<td>5,287</td>
<td>0</td>
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<tr>
<td>Services</td>
<td>5,543</td>
<td>8,125</td>
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<tr>
<td>TCPU</td>
<td>1,343</td>
<td>1,400</td>
</tr>
<tr>
<td>Trade</td>
<td>0</td>
<td>7,150</td>
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Sources: U.S. Census Bureau; Arizona Department of Economic Security

Labor Force Data

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<thead>
<tr>
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<th>1999</th>
</tr>
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<tbody>
<tr>
<td>Civilian Labor Force</td>
<td>1,387</td>
<td>1,424</td>
</tr>
<tr>
<td>Unemployed</td>
<td>109</td>
<td>94</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>7.9%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

Sources: Arizona Department of Revenue; Arizona State University

Growth Indicators

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>1998</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Assessed Valuation ($)</td>
<td>10,786,085</td>
<td>17,609,907</td>
<td>17,941,244</td>
</tr>
<tr>
<td>Taxable Sales ($)</td>
<td>32,545,650</td>
<td>60,022,600</td>
<td>56,165,880</td>
</tr>
<tr>
<td>New Building Permits</td>
<td>67</td>
<td>203</td>
<td>139</td>
</tr>
</tbody>
</table>

Sources: Arizona Department of Revenue; Arizona State University

Implications

Benson’s economy is funded on service and trade oriented fields. In nine years, the retail trade has declined. However, the surrounding towns come to Benson’s new Safeway to shop. The Eco-Center could provide sporting goods, nature stores and entertainment. This attraction would pull customers through Main Street which could offer a variety of restaurants, retail shops and boutique shops.
Climate: Maximum 79.8 F. Minimum 45.0 F.

Average Temperature (F.) Average (Inches)

<table>
<thead>
<tr>
<th>Month</th>
<th>Daily Max.</th>
<th>Daily Min.</th>
<th>Total Precipitation</th>
</tr>
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<tbody>
<tr>
<td>January</td>
<td>61.8</td>
<td>29.5</td>
<td>.67</td>
</tr>
<tr>
<td>February</td>
<td>65.5</td>
<td>32.0</td>
<td>.53</td>
</tr>
<tr>
<td>March</td>
<td>70.5</td>
<td>36.0</td>
<td>.51</td>
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<tr>
<td>April</td>
<td>78.7</td>
<td>42.6</td>
<td>.25</td>
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<tr>
<td>May</td>
<td>87.5</td>
<td>49.7</td>
<td>.09</td>
</tr>
<tr>
<td>June</td>
<td>95.9</td>
<td>59.1</td>
<td>.31</td>
</tr>
<tr>
<td>July</td>
<td>96.4</td>
<td>66.5</td>
<td>2.86</td>
</tr>
<tr>
<td>August</td>
<td>93.2</td>
<td>65.3</td>
<td>3.16</td>
</tr>
<tr>
<td>September</td>
<td>91.2</td>
<td>58.0</td>
<td>1.22</td>
</tr>
<tr>
<td>October</td>
<td>82.5</td>
<td>45.9</td>
<td>.63</td>
</tr>
<tr>
<td>November</td>
<td>71.0</td>
<td>34.5</td>
<td>.41</td>
</tr>
<tr>
<td>YEAR</td>
<td>79.8</td>
<td>45.0</td>
<td>11.41</td>
</tr>
</tbody>
</table>

Wind: Mean Speed (m.p.h.) 8.3, Prevailing Direction SE  
Source: Arizona Department of Commerce

Implications

The weather in Benson allows for outdoor activity year round. This is a major selling point for retirement communities and new family developments. Also certain types of economic engines such as tours, golf, recreational facilities, and bird watching could easily be integrated into existing infrastructure.

The elevation of 3,685 feet affects the weather resulting in a moderate temperature of averaging 79 degrees. Set in a valley between two plateaus, Benson is a perfect town for rain harvesting.

Fourth Street has great potential for becoming an active street with a lot of events that will stimulate the economy. The addition of parallel or angled parking would help create easy access for customers. The bareness of the street could be eliminated by the placement of trees and medians with vegetation. The intersection of streets can be emphasized with pedestrian crosswalks. Stoplights should be considered at the intersections of Fourth Street and Patagonia, and also Fourth and San Pedro Street.

Trees planted on the southwest sides of buildings should have a dense canopy for shade in the summer. If these trees are deciduous then in the winter the buildings will benefit from solar insolation thereby decreasing heating costs. On the cool shady north facades, vegetation would give color and warmth in all seasons. The sun is the hottest in the summer from the late morning until late afternoon on the southwest side. The north facades of buildings have the most shade in the summer and are the coldest in the winter.
Benson is surrounded by plateaus and hills that create a valley like atmosphere. This view is from the north side near Octillo Road where the new golf course is located.

**Topography:** Elevation of 3,585' above sea level

**Implications**

The location of the views are inspirational to the Pedestrian park’s position. Pedestrians can see the plateaus in the distant. The golf course is situated right under the western plateaus. These plateaus are part of the landscape that gives Benson a unique presence. Therefore in order to preserve this unique presence, regulations against building should be placed and the area should become a preserve with trails for hikers.
**Land use**: These areas are being used for recreational land use such as dirt bike, trucking, bicycling, walking, hiking and horse back riding.

**Implications**: Pathways connecting these areas could provide a safer system for the children and teenagers that utilize these outdoor areas. A skate park, roller rink, public swimming pool and recreational center would provide all ages healthy community activities.

**Open Space**: Benson is surrounded by open space. Open space near Main Street consists mainly of the space beside the railroad. Along Interstate 10 there is a narrow band of open space that could landscaped to beautify the entrance to Benson.

**Implications**: Benson's open spaces can be connected with pocket parks, trails and a recreational center.
1. **Generalized Relief:** 3,685 feet in elevation
2. **Surface Rock Types:** Late Cenozoic and Recent Sediments
3. **Major Soil Groups:** Recent Alluvial Soils of Arid Areas
4. **Vegetation:** Desert Grass and Mesquite

*Map Source: Baker and McLennahan: An Arizona Economic and Historic Atlas; 1966*

Benson’s major area of ecological issues is the San Pedro River. There are some refuse heaps along the river which could pollute underground water supplies. There is also an invasion of tamarisks which lowers the water level which is needed for the germination of the native cottonwoods. The removal of tamarisks is an extremely difficult process that requires the complete removal of the tree and root system that is then followed a regular maintenance. Tamarisk removal is an time consuming and expensive process that could be aided by the development of a center that would collect money. The restoration efforts could also be part of a high school program where youth learn about the importance of riparian zones and ecology.

Restoration of the San Pedro is already underway in the southern town of St. David. If Benson participated in the restoration of the river, the ecological benefits could also become economical. Bird watching, horseback riding, environmental education, camping and hiking could bring in an ecotourist market that would boost the economy. The river could be revitalized with paths that connect to St. David that would be for cyclists and equestrians.

**Implications**

The Eco-Center is designed to be a recreational center that educates the community on the ecology of the San Pedro. The center could have a variety of stores that would donate a portion of their revenues to the San Pedro Restoration. The Eco-Center also has a small amphitheater for events. This center could also be the starting point for hiking and bird watching enthusiasts.
Users Group Analysis

Introduction

This section of users group analysis is information gleaned from a community workshop that asked a variety of questions. This project was part of the Tejido Group in which I was responsible for the collection of questions, analysis of the data and collection of anonymous community comments. This workshop gave me a direct insight to some of the needs and wants of this small town community.
Community workshops are a vital research method to gain insight into the community’s needs and desires. The success of Benson’s revitalization will be based on interaction with the community and the communication of all develop and cultural committees towards the main agenda; to help Benson’s economic structure which will create a better place to live. The community workshop questions were organized with four ‘ordering systems’ in mind; aesthetic, functional, socio-cultural, economic and environmental. These ordering systems were in turn, used to investigate the community’s thoughts and needs.

The introduction to the informal workshop was as follows:

“Students from the University of Arizona School of Landscape of Architecture are involved in a project to generate a conceptual master plan for the development and revitalization of central areas in Benson. This process will result in the generation of a master planning document that will be used to solicit federal, state and/or private funds for the eventual development and revitalization of Benson. In order to arrive at conceptual alternatives for the development of this master plan, it is necessary to assess the opinions of the community. Students from the University of Arizona School of Landscape Architecture will present this Likert scale questionnaire and may also request permission to audiotape answers to additional interview questions. The information collected will be compiled and used to generate design ideas. Participation is voluntary and very much appreciated.”

The workshop questions were distributed to various age groups and backgrounds to attain a more complete understanding of the community’s needs. These are direct quotes by the community that have helped me in designing the conceptual masterplan. I am extremely appreciative of all those who have given me their ideas and comments.

The community responded to the workshop with the following comments:

“An architectural committee needs to be created to oversee color and design. The new buildings at the junction of I-10 and 90 could reflect the desired flavor of Benson.”

“Needs a more inviting and attractive approach to Benson”

“The old western town (Trail Dust Town on Ocotillo Ave) would make a great recreation center with a theater, ice rink, bowling alley and hall for events.”

“The only thing stopping Benson from owning 4th Street is Benson. ADOT is trying to turn it over but Benson is worried about the cost of maintenance.”

“Let’s bring in some industry so that the local residents can earn a decent wage and have money to spend in the town.”

Community workshops allow the designer to understand what is important to a community and to design for those needs and desires. These workshops also provided an opportunity for me to interact and discuss ideas with the community individually. The personal connections established during this phase brought greater support from the community.
Users Group Analysis
Community Workshop

Implications

The community wants progress but not at the cost of losing its identity as a small town. One of the most important factors was to revitalize Fourth Street. Another factor was to provide the community's younger generation with forms of entertainment. There are very few job opportunities for Benson's teenagers and little to do especially in the summer. Benson's property value is very low so it was also important to the citizens to increase their property value which can be easily done through landscape via parks streetscapes and a connecting trail system. Increasing the town's economy and sense of place was an avenue that investigated different attractions for tourism. Benson has a historical past but little of that is still present, however those few remnants of Benson's past can be landmarks for the future.
The aesthetic 'ordering system' deals with the beauty and images which produce pleasant places for people to live. It addresses the design of architectural elements and the style of landscape desired within the community. The overall appearance of a community interplays with the economic structure by creating pleasant spaces for people to live and work, and often results in increased shopping, tourism and new business opportunities.

Comments from the Community

"I'd like to see Benson retain its "old western" look (rustic). Build and restore using an "old style" 1800's theme."

"Benson lies within the San Pedro valley which is one of Arizona's most beautiful valleys. This beauty is terribly marred by billboards. Getting rid of these billboards is an absolute necessity to making Benson attractive."

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Unsure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) The town of Benson is beautiful.</td>
<td>8</td>
<td>28</td>
<td>18</td>
<td>40</td>
</tr>
<tr>
<td>2.) There are interesting places to walk to in Benson.</td>
<td>7</td>
<td>43</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>3.) Benson needs a more positive town image.</td>
<td>71</td>
<td>36</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>4.) Benson needs more parks or 'green spaces'.</td>
<td>40</td>
<td>51</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>5.) Benson has adequate recreational opportunities.</td>
<td>6</td>
<td>14</td>
<td>18</td>
<td>55</td>
</tr>
<tr>
<td>6.) There are adequate community activities in Benson.</td>
<td>1</td>
<td>9</td>
<td>24</td>
<td>50</td>
</tr>
<tr>
<td>7.) Benson's history is a major part of the town image.</td>
<td>29</td>
<td>43</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>8.) The railway is an important part of the town image.</td>
<td>32</td>
<td>49</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>9.) The San Pedro River is an important part of the town image.</td>
<td>33</td>
<td>41</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>
Benson needs to create a positive sense of place. The community needs to have pride in its environment and places to interact. The railroad and San Pedro are key identifying features that the community feels represents their town’s image. These identities can be strengthened into elements for tourism. There can be a museum connecting to the Chamber of Commerce’s building that can provide a historical tour that includes Benson’s historical landmarks to other towns. The Arnold Hotel could be renovated to provide a historical initiation point for the tour. The concept of having Benson return to an “old style” 1800’s western look is a theme park concept, however by renovating the old as landmarks would establish the importance of Benson’s past while keeping the town’s eyes to the future.
The environmental issues regard sun/shade, weather, existing wildlife/plants and overall ecological concerns.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Unsure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) Benson has plenty of shaded areas to rest in when walking around town.</td>
<td>4</td>
<td>17</td>
<td>11</td>
<td>69</td>
</tr>
<tr>
<td>2.) Weather is not a problem in Benson.</td>
<td>27</td>
<td>71</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>3.) Benson should be a low-water-use town.</td>
<td>19</td>
<td>34</td>
<td>37</td>
<td>19</td>
</tr>
<tr>
<td>4.) Benson should use only native plant materials in planted areas.</td>
<td>22</td>
<td>38</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>5.) Benson has environmental concerns.</td>
<td>14</td>
<td>43</td>
<td>28</td>
<td>21</td>
</tr>
<tr>
<td>6.) The San Pedro River is considered a recreational area.</td>
<td>8</td>
<td>25</td>
<td>21</td>
<td>46</td>
</tr>
</tbody>
</table>

Implications

The community workshop question's results indicate that environmentally Benson needs more shady pedestrian paths. The San Pedro River is not used as a recreational area. This indicates that by designing the San Pedro as recreational area would be a community asset. Since the community views that part of Benson’s economy is based on tourism, this leads to also creating a tourist connection to any new developments. Retirement and infill housing would help Benson’s economy is a perspective that at least 60% believes in. A retirement community designed with the golf course would be beneficial to the economy.
“Fourth Street belongs to the state and the setbacks go right up to the buildings. Until the City of Benson takes responsibility for Fourth Street, nothing can be changed.”

The functional ‘ordering system’ for this study is concerned with the functional necessities of a community. This includes issues involving safety, maintenance, the transportation systems, infrastructure, street layout and overall convenience of facilities that are required to make a community work.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Unsure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) It is easy and pleasant to get around town.</td>
<td>9</td>
<td>66</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>2.) It is pleasant to ride a bicycle in town.</td>
<td>3</td>
<td>31</td>
<td>43</td>
<td>29</td>
</tr>
<tr>
<td>3.) I like walking around Benson.</td>
<td>7</td>
<td>48</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>4.) Parking is an issue for downtown Benson.</td>
<td>21</td>
<td>73</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>5.) The economic health of the downtown area is a major concern for the town of Benson.</td>
<td>16</td>
<td>60</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>6.) The economic health of downtown Benson can be revitalized with appropriate new businesses.</td>
<td>14</td>
<td>26</td>
<td>16</td>
<td>45</td>
</tr>
<tr>
<td>7.) A bypass at #306 will effect the economy with a negative impact.</td>
<td>56</td>
<td>48</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>8.) Benson is a safe town to be in.</td>
<td>2</td>
<td>29</td>
<td>19</td>
<td>53</td>
</tr>
<tr>
<td>9.) Trains are fun to be around and watch.</td>
<td>0</td>
<td>16</td>
<td>23</td>
<td>53</td>
</tr>
<tr>
<td>10.) The railway is a noisy, dangerous environmental problem.</td>
<td>43</td>
<td>43</td>
<td>9</td>
<td>14</td>
</tr>
</tbody>
</table>
11. Benson needs some nice new shops in the old downtown area.
   17  39  38  18  2

12. There are plenty of outdoor meeting places in Benson.
   15  44  28  17  6

13. There are plenty of indoor meeting places in Benson.
   8  39  22  42  2

14. Tourism is an important part of Benson’s economy.
   34  47  9  21  1

15. Benson will prosper from increasing infill housing in the downtown area.
   63  39  10  4  1

16. Benson will prosper from developing retirement communities within city limits.
   43  55  10  0  0

17. Benson has traffic circulation problems.
   16  7  36  18  31

Implications

These questions on function reflect on how the community perceives its environment and what areas need revitalization. The implications of these questions relate directly to design by influencing the direction of revitalization. The community workshop’s questions on function resulted in the need for:

- indoor community spaces
- new shops in the downtown area that would attract tourism
- an economic boost to the downtown area that can be created by landscape architecture
- safer environment that can be met with well lit streets
- creating a positive image of the railroad by the construction of a linear park along the railroad
- shady sidewalks and bike pathways
- attractions for a retirement community
The socio-cultural 'ordering system' is concerned with the community’s social and cultural structure as well as its architectural, landscape architectural and cultural identity.

Community comments:

"Create a working situation among the townspeople to discuss cultural, "Historical Theatre", music, dancers for entertainment"

"Needs: a youth center, community center, building for town meetings, plaza with gazebo, amphitheater, river park and nature trails."

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Unsure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) There is a strong sense of community in Benson.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>39</td>
<td>19</td>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>2.) The preservation of Benson’s historical image is important for Benson’s future.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>49</td>
<td>9</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>3.) The development on the outskirts of the town has benefited the people of Benson.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>41</td>
<td>20</td>
<td>32</td>
<td>5</td>
</tr>
<tr>
<td>4.) The younger people of Benson have adequate activates in town.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>9</td>
<td>39</td>
<td>53</td>
</tr>
<tr>
<td>5.) It is important for me to see and talk with my neighbors.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>52</td>
<td>10</td>
<td>14</td>
<td>5</td>
</tr>
</tbody>
</table>

Implications

The community workshop questions on the social cultural levels reflect that Benson has a strong sense of community. The Community needs places for the younger generations to socialize and places for neighbors to meet. Community gathering places that connect to a network of trails and green spaces would strengthen the community. The historical preservation of Benson is an important part of the community’s identity to the town. The preservation of still standing structures as part of Benson’s future should be part of the general plan. Incorporating these structures as vital landmarks to the history and future of Benson is an avenue to creating an historic tourism route. However, the replication of new buildings that reproduce the "historical architectural style" denies the importance of the pre-existing historical structures. Benson needs to preserve its past while creating a future that reflects a new era of revitalization.
Case and literature reviews are the foundation of research that directly influence design. The final design was inspired from the information gleaned from these reviews. A chart exhibits the direct influence of each review on each major design fraction that is part of the revitalization master plan. Each review has an implication section that reemphasizes its importance to the design process.
Case and literature reviews form part of the foundation for the design and strategy of the master plan. Each review has an design implication section that shows the connection of the research to the final master plan. The various reviews gave other strategies for small town and main street revitalizations that were incorporated into part of the final design. An example of how one of these reviews influenced the design is the case review of Nicolett Street. In this case review the strategy of curving the street to slow down traffic was used. The design implication was that the same strategy was applied to Main Street to slow the street along with stoplights and crosswalks. At the end of this chapter is a chart and map that shows how this research directly influenced the master plan design.
This chart shows the direct connection of influence the reviews had on the final master plan design.

<table>
<thead>
<tr>
<th>Case and Literature Reviews</th>
<th>Eco-Center</th>
<th>Golf Center</th>
<th>Main Street Revitalization</th>
<th>Pedestrian Bridge</th>
<th>Adobe Plaza</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 The Storm Water Garden of Portland</td>
<td>• spiral embankments function as part of filtration process</td>
<td>• integration of ecological processes as design elements</td>
<td>• terms define a checklist for creating economic opportunities</td>
<td>• terms define a checklist for creating economic opportunities</td>
<td>• terms define a checklist for creating economic opportunities</td>
</tr>
<tr>
<td>2 Urban and Suburban Solutions</td>
<td>• terms define a checklist for creating economic opportunities</td>
<td>• terms define a checklist for creating economic opportunities</td>
<td>• terms define a checklist for creating economic opportunities</td>
<td>• terms define a checklist for creating economic opportunities</td>
<td>• terms define a checklist for creating economic opportunities</td>
</tr>
<tr>
<td>3 New Towns in the Country</td>
<td>• ingredients of success</td>
<td>• ingredients of success</td>
<td>• ingredients of success</td>
<td>• ingredients of success</td>
<td>• ingredients of success</td>
</tr>
<tr>
<td>4 Park and Playground Solutions</td>
<td>• the concept of “happenings”</td>
<td>• Minneapolis Park incorporates a golf course</td>
<td>• parks raise property values</td>
<td>• the concept of “happenings”</td>
<td>• the concept of “happenings”</td>
</tr>
<tr>
<td>5 Cultural Space and the Senses</td>
<td>• spatial considerations in cultures</td>
<td>• spatial considerations in cultures</td>
<td>• spatial considerations in cultures</td>
<td>• spatial considerations in cultures</td>
<td>• spatial considerations in cultures</td>
</tr>
<tr>
<td>6 The Use of Space in Public and Private</td>
<td>• spatial differences on physical and psychological levels</td>
<td>• spatial differences on physical and psychological levels</td>
<td>• spatial differences on physical and psychological levels</td>
<td>• spatial differences on physical and psychological levels</td>
<td>• spatial differences on physical and psychological levels</td>
</tr>
<tr>
<td>7 Precepts for Biological Design</td>
<td>• “The Environment and Design Can Be Coevolutionary”</td>
<td>• “Commitment to Ecology Can Inspire Design”</td>
<td>• “Biological Equity Determines Design”</td>
<td>• “Biological Equity Determines Design”</td>
<td>• “Biological Equity Determines Design”</td>
</tr>
<tr>
<td>8 Open Space and Pedestrians</td>
<td>• importance of open space</td>
<td>• importance of urban open space to the pedestrian</td>
<td>• importance of urban open space to the pedestrian</td>
<td>• importance of urban open space to the pedestrian</td>
<td>• to create retail opportunities</td>
</tr>
<tr>
<td>9 Nicolett Mall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Restoring Zion Canyon’s Ecosystem</td>
<td>• importance of native vegetation and flood control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 The San Pedro River</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Rain Harvesting</td>
<td>• benefits of collecting rain water</td>
<td>• benefits of collecting rain water</td>
<td>• benefits of collecting rain water in parking lots</td>
<td>• benefits of collecting rain water</td>
<td>• benefits of collecting rain water</td>
</tr>
<tr>
<td>13 Streetscapes</td>
<td></td>
<td>• widening sidewalks, narrowing streets to slow traffic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Vienna, Austria</td>
<td></td>
<td>• concept of pedestrian zoning</td>
<td></td>
<td></td>
<td>• “street happenings”</td>
</tr>
<tr>
<td>15 Aspects of Storm Water Management</td>
<td>• flood retention basin</td>
<td>• flood retention basin</td>
<td>• flood retention basin</td>
<td>• flood retention basin</td>
<td>• flood retention basin</td>
</tr>
<tr>
<td>16 Constructed Wetlands</td>
<td>• gross pollutant trap</td>
<td>• gross pollutant trap</td>
<td>• gross pollutant trap</td>
<td>• gross pollutant trap</td>
<td>• gross pollutant trap</td>
</tr>
<tr>
<td>17 Greenwalls</td>
<td>• Block design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 Ecoroofs</td>
<td>• benefits of ecoroofs</td>
<td></td>
<td></td>
<td></td>
<td>• benefits of ecoroofs</td>
</tr>
<tr>
<td>19 Highway Beautification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• “a new character for the road will emerge”</td>
</tr>
</tbody>
</table>
Benson is a town with the population of 4,000, but with a much greater population immediately surrounding the city limits. Some estimates by local businesses put this population figure at closer to 17,000. Benson developed in the 1900’s as the demand for silver and copper grew. Forty years after the completion of the Southern Pacific Railroad, in 1924, the City of Benson was incorporated. Benson was named after a friend of the railroad, Judge William B. Benson. The town has now become an intersection hub for commerce and tourism. In Benson several different committees have started revitalization projects. The general plan committee has three plans that are currently being developed:

1) General Development Plan. 2) 4th Street Revitalization Plan 3) Main Street Plan.

These three plans are to be integrated into the present general development plan. One of the committee members, Larry Dempster thought that the Main Street Program could become an umbrella plan that would incorporate and interrelate the other plans. For the city to acquire funds from the federal government, the town needs to be proactive. The act of developing downtown revitalization plans, and in the process coalescing public opinion into design and planning directives, is in itself impressive to potential funding agencies. It is hoped that this document will not only provide developmental direction, but also offer itself as a form of “marketing” device in the solicitation of outside funding. Main Street development is absolutely crucial to the revitalization process. It is key to initiating economic momentum. One of the dilemmas regarding Main Street is that it is owned by ADOT and needs to be acquired by the city. Presently Main Street has no parking and is a major throughway zone that needs to establish pedestrian crosswalks. Possibilities for conservation are the San Pedro River that is to the west side of the town. If this river was restored and zoned properly it could provide Benson with an economic tourism-based engine. Already most of the land along the San Pedro is in private ownership, and there has been talk of another golf course located next to the river. It would be part of this revitalization plan to research case studies where a river is conserved and developed in an effective manner that is beneficial to both the environment and to the economy of the town. The planning process becomes a vital part in the success of a revitalization project. By studying various case studies that relate to the process of small town revitalizations, a more thorough approach to Benson’s revitalization planning process can be established.

One of the main ingredients to the success of the revitalization of Benson will be the element of sustain ability. Sustain ability can be measured along several different variables: economics, cultural attributes, environmental issues, and functional issues. All variables need the ability to effectively interact and endure through the passage of time. Some guidelines to a sustainable community are the following:

a) Working to live within physical and biological limits
b) Reduce the exposure of people and property to natural hazards
c) Seek to reduce air and water pollution and the consumption of nonrenewable resources
d) Lessen the wasteful consumption of land by promoting more compact and contiguous development patterns, for example encouraging infill development
e) Promote a sense of place
f) Promote a suitably human scale and the integration of activates and uses, for example the ability to walk to shopping and schools
g) Promote safety through land-use patterns that lesson opportunities for crime and through community policing
h) Provide housing opportunities for all residents
i) Democratic with consideration for the interest of all groups and hearing of all voices in the community”

("Sustainability Comes to Main Street” by Timothy Beatly and David J. Brower, AICP: Planning May 1993 page 17-19)

These guidelines for sustainability are important to consider during the planning process. The likelihood of a successful implementation of a revitalization strategy would incorporate these issues. Part of the revitalization of Benson will be identifying and developing Benson’s sense of place along Fourth Street. This sense of place is a vital part of the economic engine that will increase business and provide further employment. A pedestrian friendly atmosphere can be achieved through providing trees for shade and landscaping elements for seating or visual interest. Some aspects of Main Street to consider are to create “a low profile to various street elements so that shop windows get center stage.” Another idea is to create a “cultural” or historical tour that implements tourism. Keeping the street alive after hours keeps safety issues in check and also creates further opportunities for the local businesses. The State Street design team for Chicago created “a series of colorful enameled signs that feature historic postcards and photographs”. Signs for the local businesses should adhere to design guidelines that respond to the street’s sense of place. Another concept is to use certain sites for mixed-used purposes that could be applied to any street pocket parks. Public and business sectors should be participatory in the design; this gives the community a sense of ownership. This will in turn, aid the community in establishing an effective maintenance program that will keep the streets beautiful.

In “Small Town Survival Strategies” by Frank Jossi, some concepts to strategies are examined. According to Craig Schroeder, “Strong business and civic leadership have created an environment in Cambridge, Nebraska that encourages business expansion.” The departure of the younger generation from their rural communities, leaves the small towns with an aging population that decreases the town’s survival rate. Some factors that help determine a small town’s life expectancy is adjacency to major metropolitan areas and natural attractions. Small town revitalization strategies can incorporate the “lone eagles”. This term created by the Center for the New West, is a definition to apply to the new development of workers who can live anywhere due to telecommunications technology. However, all plans for revitalization should involve several avenues of economic substance. Multibusiness avenues will provide a stable infrastructure for the town. The fast evolving structures of high technology industries should be balanced out with stable industries such as processing plants or slaughterhouses that would increase job opportunities and ensure a stronger tax base. Another concept discussed in this article by Frank Josse, is the “value of thinking ahead”. The one of their case studies given as an example is Menahga, Minnesota. When local businesses expressed interest in expanding, the local government saw an opportunity for increasing their town’s economic structure. They applied and won a $1.9 million grant to build a 24-unit assisted living complex, and got $5.9 million in federal money for sewer and water lines.
"You need to have some good team players that can represent the community and are willing to jump through some hoops." says Charleen West.

Once a railroad hub and mining center, Magdalena, New Mexico, used a new plan as a "secret weapon". The community wanted to see streets in the town’s subdivisions paved and connected, the local railroad depot restored and jobs created for the local youth. The plan’s strategy was acquiring an abandoned Indian boarding school for commercial purposes, teaching entrepreneurship to residents and encouraging the opening of small shops and linking into the telecommunications system as a call center. In Jonathan Barnett’s article “How Wildwood, Missouri Took Hold of its Future”, he describes the process of developing a plan based on the gathering of information from professional consultants in environmental, traffic and zoning. By restructuring land-use laws, linking new development with “strong internal street systems”, and providing safety improvements on pre-existing roads were a few aspects of the new plan. However, it is interesting to note that Wildwood’s largest challenge is the pressure to widen Highway 109 through the city and link it across the Missouri River to Interstate 70. The community has already once defeated this idea in the early 1900’s. If this bypass is developed, there will be potential for urban development, which may drain the economy of Wildwood. The local community is opposed to it, however like Wildwood, further growth will create pressure on the highway that will eventually need a resolution.

In Lemoore’s downtown revitalization plan (AIP Journal-Jan '77, M.Gallagher, pg. 11.), a thorough market and real estate analysis was documented into a “user-friendly document”. A sense of place was a vital part of the downtown that started off as a railroad town. The plan designed by Brady and Associates and Bay area economics focused on land use, design and marketing. Some of the plan’s recommendations were to develop entertainment, recreation and specialty retail for the downtown; have mixed-use development and housing built downtown “to enliven the streets after dark and create a market for local shops and services.”

In the article “Small Town Revitalization Planning: Case Studies and a Critique” by Richard A. Cohen, he analyzes the various planning structures. One of the misconceptions of some planners is to recognize small towns as little cities. This misconception displaces the sense of place that create a small town. The sense of place that is the blood of small towns is the historical development that created the community. The “natural economic forces occurring regardless of consciously directed human will-have created present conditions as a result of their own momentum.” Small town planning emphasis is “on trend as the equivalent to destiny”(Williams 1974,p.18). Streton’s four factors that affect the failure of an economic plan are:

1) One factor analysis- “one central factor that is used to explain present small town conditions”
2) Automatic mutates mutandis- “revitalization would occur in response to the opening of a particular industrial park site, or upon the activation of a particular factory, regardless of the state of the other factors that constrain revitalization”
3) Illegitimate isolation- the “treatment of the community’s problems as isolable subsystems”
4) Misplaced aggregation- "An increase in a town’s per capita income tells nothing about where new monies are flowing, who is bearing the burden of the reallocation of resources, and what the increase means beyond the growth of the statistical indicator.” (Streeton, Paul. 1970, “The teaching of development economics, ed). Martin and Knapp. Chicago: Aldine)

Historic buildings were designated for restoration and a design code for new buildings was developed to integrate the historic precedent. To launch the revitalization $300,000 was appropriated for the following: hiring a part-time downtown coordinator, construction of the downtown plaza, and a façade improvement plan.

For a successful revitalization project these four factors should be avoided. Building blocks that consist of the “community understanding, participation, and backing are necessary to ensure the longevity to the proposed development”. Part of the community understanding involves education on the grant application and administration procedures that are required to appropriate federal money and grants. Plans and recommendations that are not implemented give the community an insecure base for future planning. Solutions to planning should be defined on a scale that represents the town’s needs.

Another important factor in the planning process is the “social distance” that affects the communication process. The social distance is the physical and psychological separation of the planner in terms of beliefs, values and lifestyles from the client. The participation of the community with the planning process is a very important aspect to maintain. The whole community needs to be taken into account so that no part of the community is displaced.

Small town revitalization strategies can incorporate the “lone eagles”. This term created by the Center for the New West, defines the new development of workers who can live anywhere due to telecommunications technology. However, all plans for revitalization should involve several avenues of economic substance. Diverse sources of income and employment will provide a more stable infrastructure for the town. The fast evolving structures of high technology industries should be balanced out with stable industries such as processing plants or agricultural endeavors that would increase job opportunities and ensure a stronger tax base.

Another concept discussed in this article by Frank Josse, is the “value of thinking ahead”. One of their case studies discusses Menahga, Minnesota. When local businesses expressed interest in expanding, the local government saw an opportunity for increasing their town’s economic structure. They applied and received a $1.9 million grant to build a 24-unit assisted living complex, and also received $5.9 million in federal money for sewer and water lines. “You need to have some good team players that can represent the community and are willing to jump through some hoops.” says Charleen West. In another case study, Magdalena, New Mexico, once a railroad hub and mining center, developed an innovative plan as their “secret weapon”. The community wanted to see streets in the town’s subdivisions paved and connected, the local railroad depot restored and jobs created for the local youth.
Benson’s revitalization plan has to take these many facets of planning into account to have a successful plan that will be implemented. A logo design could be designed for Benson’s revitalization as a symbol of Benson’s future. Tourism is to be taken into account with the local economic structure and the development of incentives for small business in the downtown district will create an economic engine. There is a large amount of motor homes and RV parks that could be beautified with landscaping. Also the need to provide a lower income housing for new families and a retirement community is to be taken into account. There is an issue with connecting the neighborhoods on the opposite side of the railroad tracks with the rest of the community. Next to the water tower on Fourth St., an outdoor amphitheatre can be built for outdoor performances, this would connect to the railroad park. A park beside the railroad could provide an urban trail system that connects to a visitor’s center, historic railroad depot, and the downtown commercial district. Children need safe green bike and pedestrian lanes to interconnect the school district to the neighborhoods and park system. Benson’s presence on the highway could be signed and landscaped to create a desirable place for tourists to stop. If the San Pedro was restored to a more ecological state it would continue the restoration project that has already started in the neighboring counties. The construction of the San Pedro Shopping Center that is designed to educate people on the restoration project of the San Pedro and boast the economy by providing a pull of traffic along Fourth Street. San Pedro Shopping Center introduces the concept of rain harvesting and restoration of the San Pedro. The restoration of the river would provide a recreational oasis setting for the community while increasing local land values. If these considerations are taken into account in the planning process with the community as part of the design process, the revitalization of Benson will become a reality.
The storm water garden and catchment basin at the Portland Water Pollution Control Laboratory was designed by Murase Associates to filter the adjoining neighborhood storm water runoff before it reaches the Willamette River. This storm water garden illuminates the hydrologic process in an ecor revelatory functional sculptural form. The design incorporates rock filled swales with specialized native and exotic wetland plants that filter out pollutants in the retaining pond. The retaining pond was designed to retain water year-around, however during the summer the pond became anaerobic, had high levels of bacteria and attracted unintended wildlife. Maintenance issues proved that some factors were overlooked which "makes it clear that the design of storm water gardens is very much an emerging art". Richard Hanson observes, "There are many folks who are struggling to make a seamless weave between ecology and sensuous form-making. I think separating the pragmatic and the poetic, as we have done with storm water, is dangerous for any culture. Sometimes these early attempts to weave together a sculptural presence and an ecological process come out awkwardly, but they hold a strong portent for the future."

This design integrates ecological processes as a function of the design. The concept of combining these elements into a storm water garden is a new experimental concept. The concept of filtration of the neighborhood storm water runoff into the site is taking the environment as a whole process instead of individual landscapes.

**Implications**

Combining sculpture with ecological processes is a new concept for creating functional landscapes that heal the environment. The elements of the design such as the spiral embankments function as part of the filtration process as well as providing a sculptural space. This project was one of the first that initially sparked my inspiration in understanding how the role of landscape architecture can be applied in an artistic manner with a ecologically functional philosophy. This is the beginning of a new emergence of ecology, art and the landscape.
Urban planning can only be considered successful when public action creates a private market interest. The importance to creating a private market is in getting people to invest in revitalization efforts that will increase the property value and be beneficial to community life. Through strategic public investment, regulation, and incentives in combination with design, location, market, financing, entrepreneurship, time and government interaction, a revitalization effort can be sustained. These terms are defined by Alexander Garvin as:

- **Strategic public investment**: “routine capital spending that sparks further investment by private business, financial institutions, property owners, and developers.”
- **Regulation**: “is used to alter the size and character of the market and the design of the site”
- **Incentive**: “Tax incentives can completely alter the climate for investment in existing buildings.”
- **Design**: “Design is not just a matter of architectural style. Styles go in and out of fashion; successful planning has to survive for decades. Other more enduring aspects of design are more important. They include the arrangements of project components, and their character. Each element affects a project’s utility, cost and attractiveness. When they are organized in a mutually supportive manner, the result is an identifiable site that provides an auspicious place for activities occurring there.”
- **Location**: What is the site’s character? How close is it to other locations and activities?
- **Market**: What is the market’s demand and supply? What are the demands of the user population? What is the competition, what is available, what could become available?
- **Financing**: Is it public financing? Is the public ready to commit to higher taxes and issue bonds to improve the city? Is the private sector able to afford the initial capital for investment?
- **Entrepreneurship**: What is the risk involved compared to the financial gain? The role of the entrepreneur is vital to the success of a project. If public and private entrepreneurs work side by side the project has a higher chance of survival.
- **Time**: There are three different time sequences:
  a) the spatial time of a person passing through a space
  b) the cyclic time of day, a week, a month, a season, a year
  c) the time of political, financial and population change
- **Government interaction**: “In many instances government need only guarantee two things: intelligent spending on capital improvements and regulatory policies that provide stability and encourage market demand.”


When private developers fill a market demand that will foster more economic opportunities to the surrounding communities and businesses, it benefits the success of the project on all levels. By planning what the project will not satisfy, the market demand creates a spillover of its customers to the adjacent areas.
These terms described by Alexander Garvin help to provide a checklist for the revitalization design of Benson. There are several major private investors who have showed previous interest in the revitalization efforts. This investors need to incorporate into the revitalization efforts and new investors need to be recruited. Smaller corporations should be given tax incentives to move headquarters to Benson this would provide an economic base to the town. The type of small business and corporations should be regulated, this keeps the market from overdeveloping in one area. Regulation in the set of design guidelines may be applied as to the character of the buildings. Commercial zones should have design guidelines so that Benson does not lose its sense of place. Incentives can be given for new development, restoration of historic buildings and to private investors.

Benson needs a modern architectural statement that compliments Benson’s historical architecture. These new architectural statements will act as an attraction for tourists by having a unique environment that is only found in Benson. The location of these new attractions which are the golf course and the ecocenter is extremely important, so they are sited to provide support to Main Street by pulling traffic through both ends of the street.

Market research on any new business ideas is a valuable source to insure future prospects. Is the public ready to give public financing to improving their environment. The public financing directly effects the revitalization efforts that will take place on Main Street. Main Street is owned by ADOT. The town needs to decide if they want to take the responsibility of owning the street and maintenance costs. Benson has several private entrepreneurs that should be working with public entrepreneurs in helping to create substantial markets that will improve private and public interests. Revitalization projects are over a duration of time, efforts to keep the project surviving through political, financial and population change should be preplanned. By constantly keeping in check with these terms, a revitalization project can be successful.
In Garvin’s book, The American City, he dedicates one chapter to the topic “new-towns-in-the-country”. This concept of “new-towns-in-the-country” applies to Benson in a very direct manner, many of the residents in Benson are commuting to jobs in Tucson or other areas. Why do they travel a great deal of distance to live in Benson? What does living in Benson offer them that Tucson doesn’t supply? Is it the small town mentality of home and connections to their community? Is it the wild beauty of the landscape free of the modular houses of suburbia? How do you revitalize a town of Benson’s nature while keeping the true essence of why people live there now? According to Garvin, there are several ingredients of success that make a new town survive.

- **Market:** “Market income is as important as market size.” What is the competition? What can this town offer that other towns do not have? Does the pace of development match cash flow? Can the development and financing respond to the periodic changes of supply and demand?
- **Location:** What are the site characteristics? What is the location close to?
- **Design:** By using ball fields, jogging trails, swimming pools and open space that interacts with the community enables design to endure.
- **Financing:** Developers need to devise ways to reduce debt service, while residents need long term mortgages to finance their new home.
- **Entrepreneurship:** New developers must have a very clear vision of the development of the small town, be willing to invest time, coordination and risk their capital.
- **Time:** Towns are to provide for their residents needs all the time, suburban subdivisions do not have to encompass this arena. It takes decades for a new town to fully develop and struggle through the changes of business cycles.


“Preserve country towns where they exist; and encourage the growth of new self-contained towns, with populations between 500 and 10,000, entirely surrounded by open countryside and at least 10 miles from neighboring towns. Make it the region’s collective concern to give each town the wherewithal it needs to build a base of local industry, so that these towns are not dormitories for people who work in other places, but real towns—able to sustain the whole of life.”

(Source: Christopher Alexander, Sara Ishikawa, and Murray Silverstein, A Pattern Language, Oxford University Press, New York, 1977, pg. 35.)

**Implications**

The concept of “new-towns-in-the-country” opens new questions about what the community is looking for that moves to or stays in small towns like Benson. What keeps the economy of a small town in balance? These questions frame the network of strategies for a revitalization project. The growth of a small town’s economy takes time and cycles of environmental, political and market change.
The concept of nature having restorative qualities is historically a traditional viewpoint that has been used to validate the development of parks and recreation areas. Jane Addams further contributes to this perspective by stating, "To fail to provide for the recreation of youth, is not only to deprive all of them of their natural form of expression, but it certainly to subject some of them to the overwhelming temptation of illicit and soul destroying pleasures." Parks and recreation areas are enjoyed by all ages, by changing the view of a park as a "setting for popular culture" the park becomes a place where "happenings" take place. Example of such "happenings" are outdoor movies, band concerts, skate parks, festivals and dances. The community needs to be involved in the soul of the park, as Robert Nichols stated, "Big city playgrounds...do not work; so long as vast numbers of kids desert them for the street; so long as the functionaries who service are behind a wall, isolated from the community; so long as there are insurmountable vandalism and maintenance problems; so long as the communities around them do not reach out their hands and help them because they have no stake in them."

An example of a park that has survived the changes of time is Central Park in New York. Central Park has gone through hard times when there was not political support for financial assistance. The park flourished under entrepreneurial management by such superintendents such as Olmsted(1857-1862), Moses(1934-1960), and Rogers(1979-present). Central Park stimulates private investment in local neighborhoods by increasing property value. Another example is Regent’s Park in London designed by Sir John Nash. The design concept that Nash used was to create an environment that gave an "illusion of great wealth and nobility". "Opposite the park, Nash designed monumental residential structures, which the English called terraces. From within the park these terraces appear to be sumptuous palaces rather than middle class residences they in fact are. From the terrace windows, the park appears to be the resident's own landscaped estate. By creating these twin illusions, the design transformed a large amount of crown property into fashionable sites that could command high rents and attract further development to less attractive adjacent land."

Parks have also been used to initiate urbanization. Prospect Park designed by Olmsted and Vaux, is created to spur development by providing a refuge from the city. Parkways were designed to connect to the park so that local residents had a leisurely stroll through a prelude of trees that lead to a green haven.

Land use patterns can be changed through the use of parks. An example of this is an abandoned riverfront in San Antonio, Texas that was converted into a park that became a tourist attraction. The park attracted developers that revived the surrounding business district.

One of the best samples of how a park system can change a city is the Minneapolis Park. It is a 6380 acres that are organized around 22 lakes with parkways, golf courses, recreation centers, supervised playgrounds and swimming pools, bird sanctuaries, historic structures, bike and walking paths. The whole park system is interconnected so that one can visit any part of the park without ever leaving the park system. The Minneapolis Commission stated, "Do not be appalled at the thought of appropriating lands which seem now too costly, simply because they are far out of proportion to your present wants...Look forward for a century, to a time when the city has a population of a million, and think of what will be their want. They will have wealth enough to purchase all that money can buy, but all their wealth cannot
purchase lost opportunity, or restore natural features...which would then possess priceless value and which you can preserve...from destruction which certainly awaits them.” The park is administrated under the Park and Recreation Board that owns the land. The board establishes the budget, supervises maintenance and recreation programs, has the power to levy taxes, can issue bonds for acquisition and development. This plan of administration has enabled the Minneapolis Park to be the best designed, maintained, located, financed park in America. (Source: Garvin, Alexander, The American City, What works, What Doesn’t, McGraw-Hill, New York: 1996)

Implications

According to the community survey, 53% of the community agreed that Benson did not have adequate recreational facilities for the younger generations. This inadequate recreational activities for the young reflects in cult manifestations. The spaces that are being misused are places where parks could be established. The community would serve better as a whole to have parks with ‘happenings’, public recreational facilities, fund skateboard parks and biking paths. Interconnected pathways that connect different neighborhoods, the school system and the commercial zone would increase community interaction. To change the present condition of hidden activities, theses sites could be sought out and established as major link ways with commercial activities such as kiosks and social events. One such site is the Coyote Wash bridges, these bridges could become major pedestrian underpasses. If designed with night lighting and social events the safety factors of the area would increase.
In Edward T. Hall’s book “The Hidden Dimension”, he contemplates the use of space in anthropologist’s eyes. The importance of this work is the impact of spatial relationships to the well-being of a society and cultural implications. “The relationship between man and the cultural dimension is one in which both the man and his environment participate in the molding of each other.”

As designers, we are designing for the interaction of humans with the environment and with each other. The response of a person to their environment is the result of multi-sensory and cultural interpretations, the awareness of these results can assist the designer in purposefully creating environments that respond to the needs of a society.

The beginnings of the experiments of space and health relationships were first discovered by John Calhoun in 1947. Through Calhoun’s studies with Norway rats, he termed a result of overcrowded conditions as a behavioral sink that resulted in lower birth rates, violence and a higher mortality rate. This experiment exhibited a vital importance to the biochemistry of overcrowding, it was found that overcrowded conditions caused stress which overworks the adrenal glands producing violent behavioral sink. In determining spaces such as parks, in urban highly dense areas, open space is not just an amenity but should be a requirement. Open space gives the individual a place to breathe and relax from the everyday stresses of life.

The different senses have different responses to various distances, these distances relate directly to the feeling of having enough space. Also, each culture responds to different spaces differently. An example would be that the Japanese ignore certain auditory sounds due to having screen walls, while Germans need complete silence and thick doors for concentration. The Arab culture “recognizes a relationship between disposition and smell”, closely interacting so one can smell the other’s breathe is part of the culture, while Americans are uncomfortable with being in the olfactory distance of people, they are not on intimate terms with. Each culture screens out various bits of information that may be vital to other cultural interactions, recognizing this differences lead designers in understanding the various spaces we design how we can create opportunities for a richer environment.

**Auditory space** = up to 20 feet hearing is very clear, at 100 feet one-direction vocal communication is possible, however beyond 100 feet the auditory senses deteriorate, at 0 degree Celsius, sea level sound waves travel 1100 feet a second, with frequencies of 15,000 cycles per sec.

**Visual space** = 100 yard radius the eye is highly efficient light travels 186,000 miles a second, is visible at frequencies of 10,000,000,000,000,000 cycles per second

**Olfactory space** = “In the use of the olfactory apparatus Americans are culturally under developed. This blandness makes for undifferentiated spaces and deprives us of the richness and variety of our life. It also obscures memories, because smell evokes much deeper memories than either vision or sound.”
The understanding of the interaction of culture and space is paramount to the landscape designer. Benson is a multi-cultural town with Chinese, Mexican and Indian cultures. Space and culture is united in designing environments that promote a sense of place and the spirit of community gathering. The designer aware of creating multi-spatial designs that respond to different cultures is engaging all aspects of a community. Other factors that need to be considered in the design process is age. This research lead to ask questions about space and how people respond to space. What type of space do older people need? younger people? children? How does a Chinese family relate to a park environment vs a Mexican family? The various differences is auditory, visual and olfactory space is part of landscape design. However, the concept of designing for these experiences to create a physical and emotional reaction is part of the design that designers overlook. Designers create spaces that effect our communities on all levels. We, as designers can only create landscapes that are effective by consistently asking questions about our design on multi-sensory and multi-cultural levels.
The differences in space related to the human dimension is a culturally relative, however there are four major distance patterns and the distance related to these four are based on the northeastern middle-class men and women from the United States. In creating spaces for the public, we need to understand how we relate to each other. If we create public spaces that are ignore the need for intimate smaller spaces then we are ignoring the initial reason why some may seek to go to our designed environment in the first place. There are two mistaken notions that contribute to the failure of understanding man's sense of space. The first notion is that for every effect there is only one cause, the other notion is that "man's boundary begins and ends with his skin". According to Hall, "If we can rid ourselves of the need for a single explanation, and if we can think of man as surrounded by a series of expanding and contracting fields which provide information of many kinds, we shall begin to see him in an entirely different light." (pg. 115)

1. Intimate distance
   a. Close phase: inside the olfactory and heat radiation bubble
      vision can see fine detail,
      maximum contact phase of skin
      vocalization has minor part in communication phase
   b. Far phase: (distance: 6-18")
      clear vision- 15 degrees
      peripheral vision- 30-180 degrees
      vocal level low, whispering
      intimate relationships encounter this zone, forbidden to strangers

2. Personal distance
   a. Close phase: (distance: 1.5-2')
      three-dimensional perspective is sharpened
      surface textures are clearly differentiated
      inside olfactory and heat radiation bubble
   b. Far phase: (distance: 2.5-4')
      arm distance
      "Foveal vision covers only an area the size of the tip of the nose or one eye, so that the gaze must wander around the face (where the eye is directed is strictly a matter of cultural conditioning)." pg. 120
      olfactory bubble of breathe or cologne present at this phase
      voice level moderate

3. Social distance
   a. Close phase: (distance: 4-7')
      casual social gathering distance, impersonal business distance
      Americans shift gaze from eye to eye or from eyes to mouth
b. Far phase: (distance: 7-12')

60 degree glance encompasses the full figure in space
distance used to screen people from each other
to stand and look down at someone sitting has dominating effect at this distance
vocal level increased

4. Public distance

a. Close phase: (distance: 12-25')

distance for evasive or defensive action
word choice, phrasing of sentences, grammatical or syntactic shifts occur

"15-degree lozenge-shaped area of clear vision covers the faces of two people at 12 feet, while 60-degree scanning includes the whole body with a little space around it. Other persons present can be seen peripherally." (pg. 124)

Implications

The different distances that effect humans on physical and psychological levels are part of the landscape's design. By designing for these different distances, the landscape can fulfill the communities different needs. Landscape design has the ability to promote a sense of connection to the community by outdoor theatres or create personal spaces that evoke reflection by small gardens with single sitting places. It is in the awareness of the how humans interrelated to each other and to different distances in space that makes a design successful.
Nine precepts have emerged from the Todds’ study of biological design:

1. “Design is Derived From the Matrix of the Living World”

According to Dr. Lynn Margulis of Boston University and James Lovelock of England, the Gaia hypothesis suggests that the earth is a whole entity within itself. A whole entity as a living organism that need to maintain homeostatic conditions to retain living as earth. As cells exist by the regulatory physiologic processes of our bodies, we exist by maintaining the homeostasis of our environment, our earth. This perspective of maintaining the earth’s homeostasis as part of our own existence changes the way we view the disposable materialism of modern society. If we see the pollutants of our waste as pollutants within our own bloodstream, suddenly the view that we are separate entities disappears. “The importance of the Gaia hypothesis to a science of design lies not as a precise tool, or a blueprint, but as a profound multidimensional paradigm for the designs, a meta-model, a basis for thinking about how the world works within which to frame more concrete questions about design.” (pg.22.)

2. “Design Should Follow, Not Oppose the Laws of Life”

In this precept, the value of using “biology as a model for design” enables the designer to consider the factors of the succession of time and the symbiotic evolution of nature. Nature changes and evolves with the landscape becoming more stable and diverse.

“In contrast more humanly derived systems, most of our towns and cities for example, indicate a frame of mind that could be called early successional. Structural relationships are defined and fixed at the outset and the pattern is hard to change as the conditions change. We tend to build, destroy, rebuild, destroy and rebuild again. Too often we lock ourselves into inflexible designs which inhibit the maturation in a given society or community.” (pg.26.)

3. “Biological Equity Determines Design”

How does the design affect the poorest people? How does the design affect the areas in the greatest need for revitalization? If design took into consideration the poorest areas initially then with the succession of economics and time, improvement can occur. The poorest areas can also be population age groups overlooked. Are the elderly and teenagers provided for in the design?

4. “Design Reflects Bioregionality”

Bioregionalism is defined as “a cluster of ecosystems arranged topographically and climatically so as to delineate a distinct region.” According to Jim Dodge of the Coevolution Quarterly, “a bioregion includes biotic shift, meaning the percentage change in plant and animal species composition from one region to another; watershed or system of river damage, land form or topography; the culture, perception, and behavior of the human population; elevation or altitude, and the force spirit or over-riding essence of the place itself.” (pg.27)

5. “Renewable Energy Sources Should Be the Foundation of the Project”

The concept behind renewable energy sources is finding new ways to design that incorporate the use of renewable resources by recycling waste, harnessing wind, solar and water energy. “The implementation of renewable energy strategies and sustainable design concepts into the practice of mainstream and large-scale architecture-- the building of such monuments of unsustainability as office buildings and
shopping centers—has been slow but there are signs that this important integration is being made. Time Magazine in April 1993 announced the coming of age of “green architecture”, stating that environmentally sound buildings “are cheaper to operate and offer a healthier environment for workers”, in addition to their ecological and energy use advantages.” (pg.27)
(Source: Todd, Nancy and John, From Eco-Cities to Living Machines. North Atlantic Books, Berkley, Ca.1994.)

6. “Sustainability in Design Can Be Achieved through the Integration of Living Systems”

This concept has been carefully attained on several small farms in Java, Indonesia. The partnership of the people and the land was a sustainable relationship that enabled the farm to flourish. By tracing the flow of water from an aqueduct entering the farm, the water is charged with nutrients by passing directly under the household latrine and the animal sheds where then it is aerated by passing over a small waterfall that then enters into deep channels between raised beds where it is absorbed laterally into the beds. The water was filtered by the gardens then it formed a channel where it flowed into ponds for fish, the fish ponds are filled with nutrients that then flow into rice paddies. The water drains from the rice paddies into larger pond where sediment is transported to fertilize soils at higher levels of the landscape. Locally in the Gila River Valley, AZ, farmers have introduced tilapia and catfish into their irrigation canals for the nitrogen-rich fish waste as fertilizer, which has reduced their fertilizing needs by twenty percent.


By incorporating science and biological technology to find new ways to restore soil conditions and purify wastewater, restorative science can recreate the healing natural processes of the earth. According to Dr. Mumford of The Pentagon Powers, “If we are to prevent megatechnics from further controlling and aid of a radically different model derived directly, not from machines, but from living thorough the process of living—and so is part of even the humblest of organisms—must be added to all the other aspects that can be observed, abstracted, measured.”

8. “Restorative Design as a Strategy”

One of the concepts for a restorative plan would be to pump sea water with the use of windmills to create salt marshes in low-lying valleys. These marshes would then be filled with a variety of salt tolerant plants and organisms. During the strategy is the construction of distilling sea water bioshelters that are combined with solar-algae tanks that sweat fresh water from the temperature change, which would also cause condensation to form on the inside of bioshelter that would “rain” on the vegetation. “Once their roots were established and compost-rich soils created, the protective embryo of the bioshelter could be lifted off and taken to a new site to repeat the process, leaving behind the newly liberated ecosystem.”


Acrosanti, a city designed by Paolo Soleri, is the manifestation of a “commitment to a sacred ecology.” Soleri describes his city in the book, The Omega Seed, as, “the progressive interiorization, urbanization, of the mass-energy universe, initially deploying itself in space-time and eventually recollecting itself, through the transfigurative process of evolution, into spirit.”
Soleri’s vision of the convergence of architecture and ecology has been termed as arcology. Arcology in a compact community emerges as a concept of self-sufficiency in both food and energy. Arcosanti is a model for high density planning that reflects a new vision of understanding the need for a carefully structured society that becomes integrated with the processes of ecology. The city has become a living organism that merges with its environment without becoming a parasite of self-destruction.

These precepts are the foundation for the beginnings of redesigning communities. The history and bioregion must be carefully understood by taking a compilation of the past and present history to create an accurate picture of the structure the community has been built on. The creation of neighborhood-owned solar sewage treatment and water purification centers would begin the process of a sustainable community. Urban agriculture, new orientations to transportation, energy sources and economic prosperity are needed to redesign a community into a living organism of self-sufficiency.

Implications

These nine precepts for biological design are concept strategies for sustainable designs. The revitalization design reaches into these precepts as the foundation of its existence. The design applies the elements of biological design as part of the strategy of the revitalization itself. The strategy of using the elements of storm water purification as elements of the design is a method of letting the environment and design be coevolutionary. Street revitalization designs are multipurpose based on the collection and purification of storm water while create environmental pockets for commerce and meeting places. The commitment to ecology is one of the inspiring principles that underlie the foundation for the design of Ecocenter.
How much urban space is needed by an pedestrian? The amount of land that is considered as a habitable portion is 2.5 acres (1 ha) each.

In the Regional Survey of New York and Its Environs, (vol.5, Public Recreation, New York: Regional Plan of New York and Its Environs, 1928. pp. 115-133, 153-156.) research was based on the needs of children’s recreational space. These needs were founded on the frequency of use, nature of activity, average duration and the access distance. The importance of these needs were then reapplied to a study of the crowding on beaches on Coney Island and Rockaway beaches in August of 1926, results of the survey showed that three times the amount of space per a bather which was less than 50 sq. ft, was a “comfortable standard”. In 1971, the same survey was repeated at the same allocated beaches, the minimum amount of space per a person was 110 sq. ft. This increase of space needed by a bather is indicative of the preference for more open space and the study resulted in a broader demand for more urban open space. Since this study was done in the changing times of population density in the urban city of NewYork, the amount of open space would increase with population demands.

According to Pushkarev’s study, “We should stress that the existence of regional open space, important as it is on ecological grounds or for weekend outings, is rarely perceived by the urban or suburban resident in his daily path, unless he happens to live right next to it.” (p.8).

The cost of walking remains high due to the inconvenience and physical effort required. The benefits of walking are opportunities for socialization, minimum ecological impact, exercise and esthetic pleasure. Regardless of these benefits, “journeys on foot are shorter than those by any other mode.” (p67).

(Source: Pushkarev, Boris S., Urban Space For Pedestrians, The MIT Press, MA, 1975.)

Implications

How does this information apply to us as designers? We must recognize the essence of our era, open space is needed in our towns, however the location and integration of the open space to neighborhoods and normal activities is essential. We need to integrate nature into our parking lots where the average person spends walking. By integrating nature and pathways into everyday activities, we are supplying the need for open space, increasing the desire for people to walk and creating a more ecological environment.
In Minneapolis, Minnesota, a highly publicized downtown revitalization project of Nicollet Mall was designed to establish Nicollet as a “specialized street” that would strengthen the entire downtown area. “The planning objectives were:

1. To improve pedestrian circulation in terms of efficiency (increasing the size of walking routes) and comfort (minimizing hazards and creating a more pleasant environment).

2. To improve access and encourage mass transportation usage by making transit more attractive, by relocating bus lines to provide more direct service to the retail area, by creating good pedestrian access to parking facilities, and by generally reducing traffic congestion.

3. To create opportunities for promotion of the retail area and the central business district by building up the image of Nicollet Avenue as the prime retail center of the Upper Midwest and strengthening this identity by making the street more attractive and exciting.

4. To encourage private investment by creating a stable environment for retail business and other central area commercial activity.” (pg 130)

These objectives were achieved by the undulating roadway that is designed for the pedestrian and to slow traffic down. The Nicolett’s landscape architect, Lawrence Halprin wanting to enhance Nicolett Avenue’s sense of place, said, “We wanted the new elements to relate, to feel as if they grew into the street in a natural way, not as a superimposed design.” (p. 132). Some designed factors that were major considerations are the position of the lamp posts to enhance the curves of the street, lighting is designed to intensify the store windows, banners and exhibitions add color, plants are in containers for seasonal change and easy removal. The impact of the street’s revitalization is the increase of sales up 14%, civic pride, reduction of noise pollution and the popularity of downtown as a destination place. The end cost of the mall was $3,874,000. Since Nicolett is a mall, not a street, the maintenance costs in 1970 were $24,000 instead of a regular street maintenance properties cost of $230,000. (Source: Brambilla, Roberto and Longo, Gianni, For Pedestrians Only, Whitney Library of Design, NY, 1977.)

Implications

Nicolett Mall is an innovative street revitalization project. The curvilinear aspects that the new design introduced was an aesthetic improvement as well as a safety feature in slowing down the traffic. Fourth Street could use this design strategy in slowing down the traffic to improve safety and visual aesthetics. Slower traffic would also imply more opportunity for the traffic to see the stores and shopping opportunities Fourth Street has to offer. The curvilinear aspects would also create pockets for pedestrians, musicians, street fair events and vegetation.
In Zion Canyon, Utah, human manipulation of the Virgin River has affected the river’s ecological health. During the 1930’s, a series of stone levees that were reinforced with wire were built to protect the infrastructure of the park’s facilities and roads from flood damage. However, because the river no longer reaches its original flood plain due to these revetments, the river’s riparian and aquatic systems have been placed in a fragile coexistence. Before the revetments construction, the flooding of the Virgin River left nutrients and sediments that were essential to cottonwood seed germination. The revetments increase the water’s flow by decreasing the sediment levels, this in turn results in a lower absorption rate, therefore a drop in the water table. The lowered water table has affected the established cottonwood’s life span.

According to the chief resource manager, Jeff Bradybuagh, “We have an aging forest that is gradually going to die. In 30 to 60 years, there will be very few if any cottonwoods trees in the canyon.” Restoration of the Virgin river’s original flood plain is estimated at $5 million. The restoration would entail the removal of the 1930’s revetments and the reconstruction of the river’s natural bed, which may mean the reallocation of some of the park’s facilities. At the moment, the park is gathering research and public input, to enable a formal proposal to be made in a year’s time.

Implications
River restoration is an ongoing science. The once considered ecological use of revetments to establish the boundaries of a river’s flood plain can have long lasting impacts on the fragile river ecosystem. Our future is highly dependent on these studies of river restoration and watershed management, we must preserve these ecosystems by research, education and preservation. This article exhibits the finely tuned role of river ecosystems and human interventions.
In Cochise County, Arizona, a conservation area consists of 58,000 acres of public land located between St. David, Arizona and the Mexican border. The San Pedro River runs for forty miles through this beautiful desert riparian ecosystem. Many recreational opportunities are offered for locals and tourists alike. Hiking, camping, birdwatching, photography, wildlife viewing, seasonal hunting, horseback riding, and environmental education are some of the most popular activities. There are also many exciting archaeological sites to explore left behind from the prehistoric Clovis people. Historic ruins are also found from the Spanish, Mexican, and Anglo settlers. San Pedro River National Conservation Area benefits:

- Incorporate San Pedro River into a greenway around Benson
- Increased property values
- Increased tourism
- Use of greenways produces ecotourism benefits
- Economic boost from money made in food, lodging, and recreation


Implications

The San Pedro area could become an recreational area that combines ecological conservation while providing for tourism to help Benson’s economy. Such ideas for recreational activities could be: horse trails, bike/jogging paths, camping and birdwatching.

(Photos: National Geographic, April 2000, Vol. 197, No.4 pg. 80, “San Pedro River”)
The benefits of collecting rainwater can be maximized by using several approaches. Bioswales are used to collect runoff from parking lots and streets. This water needs to be cleansed before it soaks into the ground. This is achieved by the use of various plants that filter the water. An example of a bioswale is the OMSI parking lot in Portland, Oregon designed by Murase Associates. “An encouraging fact is that the design saved $78,000, compared to a conventional parking lot with expensive catch basins and drainage system.”, says Bob Murase, the director of the project.

(Source: Thompson, L. William, “Let That Soak In”, Landscape Architecture, Nov 1996, pg.60.)

Implications

- Benson’s yearly average precipitation is 11.41 inches.
- Rainfall occurs mainly during the summer, which brings heavy rain and flooding. If this rain was captured and directed to Benson’s beautification plantings, it would decrease reliance on irrigation.
- Design Guidelines could be created that required all downtown greening projects to incorporate some form of rain harvesting.

The downtown recovery plan for Santa Cruz, California was designed by Roma to create a, “social gathering place that also functions in terms of commercial services.” Original street trees had obscured the storefronts, so the new trees such as London plane trees, cherry trees and white birches were planted keeping the storefronts more visible. To create economic growth, kiosks were installed for smaller businesses. A new movie theater increased activity after dark. Business increased 25% after the renovation.

- Design criteria required high visibility of storefronts creating security
- Sculptures by local artist create cultural identity and liven sidewalks with visual interest
- Planters for trees function as seats
- Kiosks act as accent points
- Sidewalks were widened producing a narrower lane of traffic with parallel parking that slowed traffic making the street more pedestrian friendly. In the Tarboro, North Carolina revitalization project designed by McNeely Associates, PA, the historic flavor of the town was kept by keeping the facades of the buildings and retaining parallel parking.
- Tarboro’s first electric streetlight was recast and used in the design
- Used parallel parking as a buffer between moving traffic and pedestrians
- Transformed through facades

(Source:: “Reviving the CBD”. Landscape Architecture. Feb. ’90)

Implications

Through the use of streetscaping details, Benson can transform its streets into memorable pedestrian and vehicular experiences. Street beautification provides a fast visual improvement and increases the local property value while creating more economic opportunities for small businesses.
UDOT, the State of Utah Department of Transportation developed a study to create urban and landscape design guidelines that would “fully integrate aesthetic considerations into the I-15 Corridor Project”. According to UDOT Project Manager David Downs, the guidelines were developed to “...upgrade and enhance the overall image of the I-15 Corridor to both visitors and communities in the Salt Lake Valley”. Based on an analysis of the state’s existing physical landscape and Right of Way conditions, the recommendations were “followed by a series of interactive workshops with Landscape Architects, engineers, urban designers and UDOT on matters of aesthetics, cost maintenance, and safety”.

The goals for this project were:

“to preserve and accentuate positive visual qualities throughout the I-15 Corridor while screening negative visual qualities”

“to create an image unique to the Salt Lake Valley that draws from the region’s history of agriculture, pioneer and Native American culture”

“to provide a sustainable landscape that responds to aesthetic, maintenance, safety and cost considerations”

“The landscape will never completely recreate the character of the roadway, but the planting will, with time, soften the impacts of the new highway. As plantings mature, the road corridor will appear narrower and a new character for the road will emerge.”

**Implications**

Visually Benson’s portion of I-10 does very little to induce the traffic to stop in the town. Regulations on the billboard size, location and quality would reduce the visual pollution. If vegetation and signs demarking restaurants, and shopping opportunities, traffic would think of Benson as a destination place. Using the landscape to create “viewports” into the town with signs that advertises ‘happenings’ in Benson would increase the tourist economy.

Vienna is the capital of Austria. One of the major problems that the increase of traffic was strangling the city’s economy. A pedestrian zone was implemented by the introduction of a new subway system and creating a downtown pedestrian zone in Vienna’s inner city center. In order to bring in pedestrian traffic, a series of street happenings was devised. A Christmas Promenade was one of the first street happenings that had several inexpensive strategies:

"Illuminating all the facades on the streets with flood lights mounted on wooden towers.
Installing loudspeakers for music, information, and announcements of events. No advertising was allowed.
Putting up a tent in the street for small dramatic and musical events.
Placing colorful balls, 12 feet/4 meters in diameter, for pedestrians to move around and play with.
Setting up a ‘school for walking’ created to stimulate series of unusual situations—undulating floors, soft surfaces, hanging plastic strips and rotating rollers— to which pedestrians were to react."


Implications

Vienna’s strategy of using “happenings” as a method to stimulate pedestrian traffic and booster the downtown economy is an idea that Benson could use. These “happenings” could be created by high school students. There could be music and art competitions. Plays could happen in the new outdoor theater where donations could fund new projects to revitalize downtown. The revitalization of the San Pedro could become a “happening” where the community comes together to work. The new trail system along the railroad could be the place for a “walk-a-thon happening”. Another idea could be in the creation of an outdoor miniature railroad track that would simulate the 1920’s era when Benson was the railroad hub. The outdoor railroad could be a tourist attraction for families that would go to Benson to do the outdoor railroad and Kretchner Caverns. Benson would then become a stopping point instead of a thoroughfare.
"...several trends were noted. First, constructed systems were generally found to have a higher average removal performance than natural systems, with less variability; and second, larger wetlands as compared to watershed size also showed the same trend, a higher average removal performance, with less variability; and second, larger wetlands as compared to watershed size also showed the same, a higher average removal performance, with less variability."

There are several different aspects of a storm water management system:

- **Gross pollutant trap (GPT)** - traps gravel, sand, artificial and natural litter
- **Pollution control pond/ constructed wetland inlet zone** - traps silt, sand improving water quality, has aesthetic and flow attenuation benefits
- **Macrophyte zone** - this zone contains plants such as sedges, rushes and reeds, traps fine particles and soluble pollutants, provides wildlife habitat, flow attenuation. Lake/island - provides wildlife habitat, attenuate flow, recreational and landscape aesthetics
- **Flood retention basin** - controls hydrology and downstream sites from potential flooding

How does the constructed wetlands function to reduce nonpoint source treatment? Designed for storing runoff water within the basins, the wetlands act as a sponge that allows the slow infiltration of surface water into the ground table. The velocity of the water is reduced by spreading out over the wetland and by the vegetation. The reduction of the water's velocity enables for nutrients (e.g., Phosphorus, nitrogen) and sediment retention. By decreasing runoff volume, the wetlands reduce peak discharges that cause erosion and flooding downstream.

How can the function of a constructed wetland be enhanced?

- **Loading rate:** size of the constructed wetland should be 1-5% of the size of its drainage area, the size of the wetland effects the impact of phosphorus removal efficiency which is related to the absorption rate and biotic assimilation capacity.
- **Hydraulic retention time:** the proper size of the wetland effects the retention level, a longer retention time increases the absorption, sedimentation, nutrients and biotic processes.
- **Water velocity:** Flow velocities should be less than 0.6 fps and not exceed 1.5 fps, due to erosion, relocation of deposited sediments, and destruction of vegetation.
- **Soils:** highly organic composite soils and fine-particle led clays have a higher retention of nutrients and absorption rate. Phosphorus reactions with precipitation are increased with iron, calcium, and aluminum.
- **Water depth:** Ideal water depth for aquatic vegetation is less than forty inches. Deeper pools provide winter fish habitat and sediment deposition.

"The preferred depth ranges are for:

- emergent plants = 0-1 ft. of water
- rooted surface plants = 1-2 ft. of water
- rooted submersed plants = 1.5-6.5 ft. of water" (pg.4)

**Maximize edge:** The lake or retention pond should have sinuous edges that allow for more edge habitat and resistance to flow. Islands provide aesthetic focal points and refuge for birds.
Minimize edge slope: The emerging edge of a lake or retention pond should have a gradual slope. This allows the presence of emergent species that help prevent erosion and traps sediment.

Persistent emergent species: Year around emergent species provide resistance to water flow and erosion. Some examples of these species are:

- black willow (Salix nigra), buttonbush (Cephalanthus occidentalis), alder (Alnus sp.), cattail (Typha sp.), reedgrass (Calamagrostis sp.), sawgrass (Cladium jamaicense), switchgrass (Panicum virgatum) and rush (Juncus sp.).

Implications

The components of a storm water management facilities can be reinterpreted into landscape planning for neighborhoods and street runoff. Incorporating these factors will benefit the regional watershed and local water preservation for the future. The revitalization design use these factors as part of the design’s strategy. Neighborhoods and streets can be designed to have storm water runoff into gross pollutant traps that then filter into retention basins that are multipurpose in design as picnic areas, dog runs or bike paths.
Constructed wetlands require long-term maintenance. Long-term maintenance is needed for periodic removal of debris, occasional dredging to remove accumulated deposits and the care, removal and control of plant species. There are several orders of sequence for the treatment train of the storm water. The most effective has been the marsh-pond-meadow system and the Max-Planck-Institute Process. Both are defined by Berezosky of Boojum Technologies Ltd., Toronto as:

**The marsh-pond-meadow system:** This consists of (1) a bar screen and aeration cell using a floating surface aerator, (2) a lateral-flow marsh planted with cattails in a sand medium, (3) a pond with aquatic macrophytes and herbivorous fish, (4) a meadow planted with red canary grass, and (5) a chlorination chamber. The removal efficiency is reported to be 77% for ammonia nitrogen and 82% for total phosphorus.

**The Max-Planck-Institute Process:** This design is used in France and was a model for a system implemented in Oaklands Park, United Kingdom. The system consists of four or five stages in cascade, each with several basins laid out in parallel and planted with emergent macrophytes in gravel. The flow pattern in the first two stages is vertical, while the final ones have horizontal flow. In the French system, removal of suspended solids and biochemical oxygen demand (BOD) is good, but with poor results for nitrogen and phosphorus, perhaps because of high loading rates. (pg. 6)

These case histories in this article reference that “wet” ponds are more effective than “dry” ponds. The data collected on the Shop Creek Project, Colorado by Urbanos and Ruzzo, formulated the following design parameters based on Denver’s rain characteristics:

“Provide a detention volume equal to 12.7 mm. of run off from the impervious surfaces in the watershed. Provide an outlet to drain the detention volume in approximately 40 hours and use a perforated riser pipe for an outlet. Provide a follow-up sand filter (masonry sand graduation) with underdrains. The surface area of the filter bed is to be based on a maximum hydraulic loading of .61 m3/sec/ha. Allow both wet and dry ponds, but encourage wet ponds. Require the pond length to be at least twice the pond width to reduce short circuiting. Provide a baffle structure near the inflow point to diffuse the inflow currents. Permit the water quality enhancement facilities to be a part of on-site or regional storm water quantity management ponds.” (pg. 7, 8)

Considerations for the design of the storm water pond include:

1) Permanent storage ponds are the most effective when they can hold runoff from a 1.5 inch storm. A pond this size with the depth between 3 to 8 feet deep will remove 80% of total suspended solids from the runoff. However, if the depth exceeds 8 feet, there will be thermal stratification that will result in the bottom water being cooler without oxygen. Oxygen is needed to break down the pollutants, such as phosphorus, rendering the pond useless in storm water purification.

2) The definition of the water’s edge designed with native grasses and persistent emergent vegetation instead of a well-cropped lawn leading to the edge is important as a deterrent to
Canadian geese. According to a study on Green Lake, Seattle, 52% of the annual phosphorus was due to Canadian geese droppings.

**Implications**

Constructed wetlands are one of the most effective methods for the treatment of storm water. These wetlands can be constructed into a golf course or be part of the healing process of the San Pedro River. Incorporating effective storm water purification is paramount to future generations. It was interesting to note the problems of phosphorus and Canadian geese. This investigation lead to understanding the treatment train process that can be interpreted into the design process, understanding maintenance and obstacles that could effect the storm water process.
Greenwalls offer an environmentally rich alternative to concrete, metal or wood construction. Greenwalls are also highly effective for slope retention. There are several main concepts that underlie greenwall structural systems. These include the following:

**Block:** engineered with gaps where plants root through the wall

**Crib wall:** concrete or wood elements stacked log-cabin style. A related stackable unit looks like giant jacks from a child’s game.

**Frame:** interlocking circle or diamond shaped units stacked like masonry (mostly in Europe and Japan). Also used flat to “blanket” water channels. For parking Grass-crete is a similar concept.

**Trough:** stackable soil-filled tubs (retaining or freestanding)

**Gabion:** wire baskets filled with stones to provide a strong but permeable wall or dam.

**Mesh:** like mini-gabions, holding a thin layer of soil to a surface.

**Cell:** flexible, strong honeycombs filled with soil. Closely related are plastic turf support systems like Grasspave.

**Sandbag:** geotextiles wrapped around soil, formally called “vegetated geogrid.”


There are several design choices to considered when deciding on the greenwall’s structure. These design choices that need to be carefully considered are: irrigation, maintenance, soil and plant selection and microclimate.

**Implications**

“Ample evidence suggests that there is no longer any excuse in landscape construction for impervious, monolithic retaining walls of concrete or any other material.” (pg. 107).

These structures can be interpreted in a eco-friendly designed landscape instead of the traditional walls of our past. A place in Benson where such construction would aesthetically pleasing is on the underpass which now is a solid concrete construction devoid of any personality. The San Pedro River and the washes that feed into the river can have the embankments reinforced with these measures. The Coyote Wash that is diverts into two streams are engineered concrete embankments that could be redesigned using the greenwall concept.
Ecoroofs are nature’s prayer to the salvation of reducing the severe microclimate produced by our impervious construction methods. Corneila Oberlander says, “If we are to survive in our cities...we need roof gardens.” “Every square foot of sterile roof corresponds to a square foot of life missing from the ground surface.” (pg. 111) The benefits of the ecoroof to the environment are:

- Improves the building’s thermal insulation. Reduces the urban “heat island” effect, by absorbing less heat.
- Stores carbon. Provides wildlife habitat, especially birds.
- Absorbs up to 75% of rain falling on it, thus slowing storm water runoff. (pg. 113)

The ecoroof is a new version of an centuries-old tradition in Scandinavia, the sod roof. However the modern version is light weight and requires little additional load-bearing capacity. Traditionally ecoroofs like roof gardens are on flat roofs, however they can also be built on a roof with up to a thirty degree slope. The elements that are need to construct an ecoroof are the following: “a waterproof membrane, a layer of insulation, a drainage layer, and a substrate.” (pg.114) (Source: pg.106, Thompson, William and Sorvig, Kim. Sustainable Landscape Construction. Island Press: Washington D.C., 2000.)

Implications

Does architecture style or use need to be confined by culture? Ecoroofs have not developed in the United States. We live in a culture where land is abundant, misused and taken for granted. If one studied the amount of outdoor space the average American uses, we would undoubtedly discover that much of the design of our neighborhoods have wasted land. Front yards are a perfect example of this. A front yard is a cultural identity. It is our expression to the community of our relation to the landscape, yet it remains a showplace piece of land unused by humans other than visually. What if the showplace of our culture became our roofs? What if the roofs became a visual landscape that we could use? Some say the economic costs of building structures with ecoroofs would be too expensive. What is the price of the future water shortages? What is the emotional, physical price our islands of neighborhoods have on the environment? Ecoroofs represent a concept that our developers need to incorporate into their projects. The benefits of the ecoroof are insulating abilities, storm water absorption and control, environmental improvements on air, visual and noise qualities. It is these benefits gained by careful design and planning that will be expensive in the short term but, priceless to the future.
Case and Literature Reviews

Summary

This diagram shows how the case reviews directly influenced the design for the conceptual plan of Benson.

**Pedestrian Bridge**
These case reviews directly influenced the design:
- 6-Cultural Space and the Senses
- 7-Precepts For Biological Design
- 8-Open Space and Pedestrians

**Main Street Revitalization**
These cases reviews directly influenced the design:
- 2-Urban and Suburban Solutions in America
- 4-Park and Playground Solutions in America
- 6-The Use of Space in Public and Private
- 8-Open Space and Pedestrians
- 9-Nicolett Mall
- 13-Streetscapes

**Eco-Center**
These case reviews directly influenced the design:
- 1-The Storm Water Garden of the Portland
- 7-Precepts For Biological Design
- 10-Restoring Zion Canyon’s Ecosystem
- 11-The San Pedro River
- 12-Rain Harvesting
- 15-Aspects of Storm Water Management
- 16-Constructed Wetlands
- 17-Greenwalls
- 18-Ecoroofs

**Golf Center**
These case reviews directly influenced the design:
- 1-The Storm Water Garden of Portland
- 7-Precepts for Biological Design
- 15-Aspects of Storm Water Management
- 16-Constructed Wetlands
The master plan was derived from the site analysis, user group analysis, various case and literature reviews. The master plan confronts the five ingredients of revitalization success which are social culture, economics, aesthetics, ecology and function.
The master plan concept is to have Main Street become an attractive destination which will increase Benson’s economy. The main strategy of creating new business opportunities and attractions on both ends of the street, which will pull potential customers through the middle zone of small businesses. The East Attraction is a combination of the Pedestrian Bridge, the Adobe Plaza and the Eco-Center. These attractions on the east end of Main Street offer unique recreational activities, shopping is a historic district and entertainment. The West Attraction is the revitalized Safeway shopping center that is connected with pathways and a golf course with a retirement community. All of these new features are connected with paths and green linkages for biking and pedestrians.

New spots for parking and a trail beside the railroad inspires outdoor recreational activity that connect to the San Pedro River. The stoplight and crosswalk on the intersection of Main Street and San Pedro Street will slow down the traffic and encourage pedestrians. The Pedestrian Bridge creates a unique feature to the street by the development of a visual and physical connection to both halves of Benson separated by the railroad. It also offers an outdoor amphitheater, a recreational facility and small business opportunities of kiosks.

Another design feature to slow down traffic was derived from the case review of Nicolett Mall. In the case review of Nicolett Mall, the strategy of adding curves to the street was to slow traffic down therefore making a more pleasant pedestrian experience. In Benson, there are two slight curves to the street which widens the sidewalk near the businesses for landscaping and resting spots. Another concept is the creation of pocket parks that connect to the south back alley of Main Street enabling for another pathway system and openings for new buildings.
The ingredients of success are these five ordering systems. Each of these ordering systems were confronted in each part of the master plan of Benson. The master plan of Benson uses these ingredients to formulate successful landscape architectural solutions for revitalization.

Social Culture:

The social culture of Benson is a culturally mixed society that needs places for community gatherings. The Eco-Center and Adobe Plaza encourages the community activity with outdoor recreational activities, an outdoor amphitheater and a local courtyard with a café. Landscaping along Main Street with colorful vegetation and shady trees create a pleasant atmosphere for street events and strolling. The Pedestrian Bridge is a visual element that connects the two halves of the town, provides a safe route for crossing the railroad and offers an excellent spot for train and sunset watching. The Golf Center inspires outdoor recreation for all ages and has a developed retirement community that increases the economic revenue of the town.

Economics:

Benson has a declining economy that is in desperate need for revitalization. Therefore, the main concept behind the master plan is to revitalize Benson’s economy. Main Street revitalization uses landscape architecture that will raise local property values. The Eco-Center, the Pedestrian Bridge and Adobe Plaza are east end attractions that will pull traffic through to the east end of Main Street. The west end attractions are the Safeway shopping plaza and the Golf Center will pull traffic through to the west end of Main Street. These two polar sets of attractions will increase business opportunities along the middle part of Main Street. The Golf Center will also increase property value by establishing a retirement community and giving Benson an extra family attraction.

Aesthetics:

Benson has a barren empty Main Street that needs exciting aesthetics. This master plan design puts Benson in the 21st century with innovative design using landscape architecture solutions. Street lights with colorful banners and shady trees transform Main Street into a beautiful pedestrian friendly environment. The Pedestrian Bridge with its distinct architectural features provide a unique interest to Main Street. The Eco-Center has a simplified aesthetic of nature and architecture merging into one construction that catches rainwater into a water feature that flows into a creek merging with the San Pedro. The San Pedro is created into an aesthetic environment by educating the community against dumping and encouraging outdoor recreational activities. Another outdoor recreational activity is the golf course which provides a serene aesthetic environment for the hospital and retirement community.
Ecology:

Ecology is one of the most important ingredients for a successful revitalization strategy because a eco-friendly plan will be conserve our environment for future generations. The beautification of Main Street into a pedestrian friendly zone with shady trees and vegetation, will decrease noise and car pollution. The master plan include many designs that incorporate and feature the combination of ecology with architecture by using rain harvesting techniques that are sensitive to the environment. Streets are convex slightly so that storm water runs off into vegetation patches that have grasses to clean the water. Another storm water collection feature is in the golf course which supplements its’ gray water supply with rain water. The Eco-Center also has this feature of rain water collection that feeds into the San Pedro River and is educational on the revitalization efforts of the San Pedro River project. The interpretation of ecoroofs and designing for the collection of storm water is a new ecological attribute that foresees the future planning requirements of eco-friendly landscapes.

Function:

The new revitalization plan will boast the economic growth of the town by raising property values and giving Benson a unique atmosphere which will in turn attract tourists. The main strategy is the unique polar attractions on the east and west end of Main Street that create better business opportunities. The east end attractions are the Pedestrian Bridge, the Eco-Center and the Adobe Plaza. These two sets of unique polar attractions will pull traffic through Main Street therefore increasing economic opportunities. The west end attractions are the Safeway shopping center and the golf course with a retirement community. Another strategy is slowing down traffic by the two slight curves that provide pockets for trees and creates a more pedestrian friendly environment.
The master plan consists of several different important focus areas that are vital to Benson’s revitalization. These focus areas provide Benson with attractions that will interest in customers, retirees and tourists. The development of these focus areas will also give the community a sense of community pride as they enjoy higher property values, pedestrian pathways and unique gathering spaces.
The Eco-Center is part of the east end attraction that pulls traffic along Main Street. The development for this design went through several different stages until it was simplified into the final design. The main ideas underlying this design was the integration of landscape, ecology and architecture into a unique place that would attract tourism, eco-tourism and provide the community an entertainment center. The Eco-Center is also an educational facility for the revitalization efforts of the San Pedro. Paths connect to the San Pedro River for biking, hiking and horse riding. Bird watching is also another activity this center could foster. The outdoor amphitheater could be a place where the community meets for fund raising events or educational seminars on nature. The Eco-Center is a vital part of the revitalization master plan that would incorporated into the final phase of construction.
The initial concept design was derived from a series of abstract conceptual sketches that analyzed the spatial elements of the design. A process of visualization occurs through a series of working sketches that humanizes the abstract conceptions. This process recycles itself throughout the design until a "eureka moment" occurs. The "eureka moment" is the distillation of the design from all elements of facts produced from literature research, site analysis, spatial analysis and scale relations. The underlying concept of these drawings is the creation of a commercial eco-center that utilizes the parking lot as a filtering device that educates the consumer on the revitalization efforts of the San Pedro and collects donations, volunteers initiate further progress. The center is a combination of an ecology education center, a commercial zone with recreational and entertainment facilities. Some ideas for the entertainment commercial activities are a bowling alley, a movie theatre, skating rink and the sports equipment stores.

One of the key concepts to this design was using storm water runoff as a visual element that shows the process of recycling and purifying the water from the parking lot. Using the information gathered from research, a storm water treatment train would be part of the design of the parking lot. Terracing is designed to show the change in vegetation from invasive species with information posts, (to explain the origination and problems that occur with the invasive species) into a natural riparian zone. The riparian zone will foster cottonwood trees return to the river.
One of the objects of the revitalization of Main Street was to create interest in both ends of the street. Similar to the power of a magnet, strong commercial development on both the east and west side of the street would increase the economic revenue of the town. The east side of Main Street is intersected by the San Pedro River. The establishment of an Eco-Center which is designed to stimulate interest in the revitalization of the San Pedro and have a commercial side with outdoor recreational businesses such as a sporting goods store, hiking and bird watching store and an organic food market. The design of the building and landscape needed to reflect harmony and respect for the natural environment. The first design strategy attempted to create this harmony by the design of a eco-friendly parking lot that collects storm water run off into a filtering spiral that meanders into a stream bed that feeds into the San Pedro. Selected native plants would be integrated into the stream bed along with the reestablishment of cottonwoods. An information booth could be located in the building for education and donation funding for the revitalization of the San Pedro. The next design development of the Eco-Center was the interpretation of the landscape with the architecture. The building rises from the landscape then feeds storm water off of the roof into a pool that winds back into a streambed connecting to the San Pedro. This design has an amphitheater structure for outdoor events.
This design is the concept of the Eco-Center in its final form. The architecture reflects a simple pure correlation with the landscape. The use of an ecoroof that merges into the land instills the concept of harmony with the environment. A poetic gesture of water harvesting is created by a pipe that collects storm water funneling it into a collection pool. There are two ideas for parking: one as above ground with the principles of the first design using storm water runoff and the second as underground parking that hides the ugliness of a parking lot. The reemergence of the streambed as a trail to the San Pedro offers a glimpse of a commercial enterprise that converses with nature. The spiral design element similar to the pattern of water in a drain also refers to the emergence of a architecture from the landscape.

Landscape and architecture become an harmonic environment that complement each other in aesthetics and function. The case review of “From Eco-Cities to Living Machines” gave inspiration to the design of the Eco-Center from the nine precepts for biological design. Two of the precepts pertain to this design: “The Environment and Design Can Be Coevolutionary” and “A Commitment to Ecology Inspires Design.”
Main Street revitalization is the landscaping of the Main Street and the major side streets which would encourage pedestrians. Presently, Benson’s Main Street has little shade in the hot sun. Trees would create a cooler microclimate for pedestrians and would also reduce air conditioning costs in the summer. Street lights with colorful banners would create a friendly and safe environment especially at night. Two slight curves on Main Street would widen the sidewalk for trees and slow traffic down. New stoplights and crosswalks would also participate in this endeavor in making a more pedestrian friendly environment.

A town center along with new parking would give the community a place to gather for public meetings or fund raising events. The new town center provides the community with a central location that incorporates both the Chamber of Commerce and the City Council.
The case study of Nicolett Mall in Minneapolis provided a highly successful downtown revitalization project that uses the curvilinear street design element. Adding a graceful curve to Main Street would slow down traffic and create a more pleasing atmosphere for pedestrians. Storm water runoff would collect to the landscape plantings of native grasses and trees. Crosswalks are defined by a brick path. Night lighting is a very important feature that will enable customers to visit businesses during extended hours. Stoplights would be added as a safety measure and to slow traffic to view the commercial opportunities. Benson has a strong need for a community gathering place where the different political factions can come together for a common cause. By using an architectural axis and creating a visual path between the Chamber of Commerce building and the town center, the community has stronger sense of place in working together. The strategy of opening up a pathway directly in front of the Chamber of Commerce allows more commercial opportunities to businesses. By creating a visual through way to the alley, a new path that connects the business to the neighborhoods is formed. The alley path also opens the way to connecting businesses along the backside of buildings along Main Street and along side streets.
The town square is designed to spatially connect the City Hall building, the Chamber of Commerce building and the Museum of History. Presently on this site, there is a VFW building that could be either incorporated in these concepts or replaced by new buildings that keeps to the historic design features of the Chamber Commerce building. Incentives could be offered to VHF for the relocation to another site which may be the Ocotillo Shopping Center located next to the hospital on Ocotillo Avenue. This connection also extends across the railroad to the historic depot district. This would benefit from revitalization and be used a historic tourism lever.

This design for the town center explores an open plan with more traditional courtyards. The Courtyards would provide space for cafes, outdoor dining, performances and community gatherings. The City Hall building is designed with a niche that may be used as a stage facing out onto traditional green lawns.

This design for the town is based on creating a promenade of trees that lead the visitor into a performance courtyard. The angled buildings are designed to embrace the landscape providing spaces for outdoor dining and cafes. The angled walls of the buildings will aid with acoustics.

Courtyards and cafes create inviting spaces where spaces where people can sit in the shade, converse and watch the trains while drinking coffee. The north side of the Main Street is a prime spot for additional parking and new commercial buildings. A linear park could be designed using the train as a backdrop. The planting of more trees and the use of berms would create visual interest as well as start to provide sound barriers. Another idea is to use a wall that visually and acoustically blocks the train from certain views and opens to other views. A simple iron fence can also be used to prevent children from running onto the tracks, but also allows visual access.
Main Street has many opportunities to become an economic engine for Benson. What creates a lasting impression for the visitor? Landscaping with trees that frame and provide clear visual lines to store signs and business facades, as well as provide shade for pedestrians in the hot summer. Lighting has many characteristics that create a very special ambiance for a street. Street lights can have banners that become an array of color that catch the eye and inform the public on the latest towns events. Street events that include local artists and merchant participation could also create an active environment.

This design explores the creation of a linear park that exists on the both sides of the railroad tracks. The property value of adjacent land to this park would increase. Designed with berms, the linear park would decrease the acoustic and visual noise of the train while beautifying the town. Parking hidden behind the berms could preserve the “greening” of Main Street. A trail extending the length of the park would provide a place for people to stroll or jog. Crosswalks and a stoplight at the intersection of San Pedro and Main Street would increase pedestrian and vehicular safety. This plan may be more viable option for Benson to consider if Main Street is still going to be continued to be owned by ADOT.
The Adobe Plaza is a renovated plaza of historic Mexican adobe buildings that have been developed into new small shops. The new shops could be a cafe, ice cream shop, optical or ladies apparel. A historic jail serves as a focal point with a reflective garden. The Adobe Plaza is part of the east end attractions that pull traffic along Main Street. The plaza is also connect to Main Street via an alley path that encourages pedestrians.
The Adobe Plaza concept is based on the restoration of historic buildings along Fifth Avenue and the historic jail. This concept ties in the primary idea of the historic trail. There is also a drop-off and pick up point for the horse and carriage tour located at the intersection of the alley path and Gila Street. If open space was created around the jail as a courtyard, the visual access would be improved from Main Street. Berms covered in native grasses are used throughout the design to provide rainwater opportunities and also provide a sound barrier for Main Street’s traffic.

Opportunities for the restoration of beautiful historic adobe buildings into small businesses exist as one Benson’s strengths. The reflection garden and courtyard has the “room” garden concept. However the walls are also retaining walls for berms that create the “room” with an envelope of nature. These berms planted with native grasses and red yucca, will also provide storm water run-off for the trees. Low water usage trees are suggested tree palette for this design, examples are mesquite and palo brea.
The Pedestrian Bridge is part of the east end attractions that pull traffic along Main Street. The bridge is also a strong visual connection between the two halves of the town and provides a safe pedestrian passage across the railroad. From the bridge, pedestrians can watch incoming trains or an evening sunset. Both buildings that connect the bridge offer unique opportunities for recreational facilities, a town center with the bridge joining the Chamber of Commerce building and City Council in a strong gesture of consolidation. There are also spaces for small businesses such as a farmer market or kiosks.
The need for a town center with a visible connection between the City Hall building and the Chamber of Commerce was the inspiration for this design. These two buildings are connected with bridge and a park. Keeping with the language of design used on the Eco-Center, this design uses berms and retaining walls as water harvesting opportunities along with a graceful arched walkway for the disabled and bikes. In a symbolic gesture this design makes a safe trail that connects Benson where the railroad once dived.

The north building could also function as a recreational facility that has either a pond or swimming pool and a restaurant.
Native species of plants and grasses provide the landscape once barren alive with color. The bridge itself also provides a cool spot from the sun where kiosks could offer different services. Night lighting on the bridge and under would create a safe place to cross over to the amphitheatre.

"We must create alternative images of a better life to guide our actions, if we do not wish to perpetuate present conditions. I believe that any architectural project which does not attempt to propose new or better modes of existence is immoral. This task may stagger the imagination and paralyze hope but we cannot avoid it." (Source: "Emilio Ambasz: Words & Projects," L'Architettura, November, 1991.)
There are several recommendations that will help the phasing process. Two commissions should be delegated:

1) would provide research for funding sources and apply to the various sources
2) would develop design guidelines for landscape and architectural revitalizations, this commission would also develop a maintenance plan and enforce its standards

These two commissions would be a support framework for the revitalization efforts and would work closely together to ensure progress during the phasing.

Phasing is an important part of revitalization by distributing finances and efforts to the most important aspects of the program first. Phasing is separated into three distinct phases.

The first phase involves the most economical means of revitalization through landscaping. Trees and vegetation will provide shade and vibrancy of color to Main Street. Landscaping offers immediate change and improves property value which will attract investors for the Third Phase.

First Phase:

1.) Landscaping Main Street with shady trees and colorful vegetation.
2.) Designated crosswalks and stoplights making the town more pedestrian friendly.
3.) Designated parking lot and parking spaces.
4.) Start publicity on Main Street events, San Pedro hikes and outdoor recreational activities
5.) New streetlights with banners and site furnishings invite people to explore Main Street and creates a safer place for evening activities with the night lighting.
The second phase is the development of new businesses, the extension of green corridors and the search for investors for the Pedestrian Bridge, golf course and Eco-Center.

**Second Phase:**

1. Finding investors that will finance the new construction of Main Street attractions such as the Pedestrian Bridge, the golf course and the Eco-Center.
2. Extend landscaping along side streets creating green corridors for pedestrians and bicyclists.
3. Start creating pocket parks such as the Adobe Plaza and connecting them to the pedestrian paths.
4. Create new business opportunities on Main Street by the development of a pedestrian path in the alley that is a safe and shady place to walk or ride bikes.
5. Construction of the Pedestrian Bridge.
The third phase is the most expensive phase but it is also creates Benson into a unique town with entertainment and outdoor attractions. This phase will boost the economy by attracting the retirement community that will spend money in the shops along Main Street. These attractions will also have activities for the younger generation and families making Benson a great place to live.

Third Phase:

1.) Development and construction of the golf course and Eco-Center.
2.) Retirement community developed around golf course.
3.) Continued maintenance of all newly developed landscapes.
4.) Development and preservation of open space, particular San Pedro River and surrounding plateaus.
5.) Revitalization of the San Pedro River.
6.) Landscape the I-10 corridor, take down billboards and replace with simple conservative signs that tout Benson’s events, small shops, restaurants and activities.
When a vocabulary of common landscape elements is used throughout a design, a visual language is established. Landscape elements can be used to define various spaces such as public versus private or pedestrian versus vehicular. Landscape elements also can give a landscape a more personal uniqueness. This uniqueness with landscape elements can be one of the attributes of a town that attracts tourists and gives the community a sense of pride in their town.

Landscape elements such as site furnishings is one set of elements that can create a unique atmosphere. The watch tower is a functional sculptural element that adds a European flavor to a space. Another site furnishing are signs made with a simple elegant design or a simple banner that announces events and happenings. Benches and planters are other site furnishings that can create a personal space for pedestrian to rest. Using these different elements in the design for Main Street revitalization will allow Benson to create a distinct environment.
One of the most important elements in the landscape is the lighting. Lighting affects the visual and physical safety of a space. Night lighting transforms an ordinary space into a magical setting. Street lighting can greatly enhance a street’s appeal by providing a unique light with banners that add color and tell of street events. Benson’s Main Street needs lighting that has banners on it for added color to the street fronts.
Landscape Elements: Trees and Plants

Trees and plants are one of the most economical landscape elements available. Trees provide shade and reduce pollution while increasing property values by making the environment more aesthetic. The following trees and vegetation are selected for their tolerance of desert water conditions and temperatures. Most of the plants selected are native to the Southwest.

Shrubs provide a colorful element that can be used to create private spaces while creating habitat for birds and lizards.

<table>
<thead>
<tr>
<th>Shrubs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agave parryi</td>
<td>Parry Agave</td>
</tr>
<tr>
<td>Albizia julibrissin</td>
<td>Mimosa</td>
</tr>
<tr>
<td>Atriplex canescens</td>
<td>Four Wing Salt Bush</td>
</tr>
<tr>
<td>Alcea rosea</td>
<td>Holleyhocks</td>
</tr>
<tr>
<td>Anisacanthus quad. v. brevilobus</td>
<td>Mountain Flame</td>
</tr>
<tr>
<td>Anisacanthus quad. v. wrightii</td>
<td>Mexican Flame</td>
</tr>
<tr>
<td>Artemesia ludoviciana</td>
<td>Prarie Sagebrush</td>
</tr>
<tr>
<td>Budlea davidii</td>
<td>Butterfly Bush</td>
</tr>
<tr>
<td>Caelsalpinia species</td>
<td>Bird of Paradise</td>
</tr>
<tr>
<td>Calliandra eriophylla</td>
<td>Pink Fairy Duster</td>
</tr>
<tr>
<td>Chaenomeles species</td>
<td>Flowering Quince</td>
</tr>
<tr>
<td>Chrysothamnus nauseosus</td>
<td>Chamisa, Rabbitbrush</td>
</tr>
<tr>
<td>Cortaderia selloana</td>
<td>Pampas Grass</td>
</tr>
<tr>
<td>Dalea frutescens</td>
<td>Back Dalea</td>
</tr>
<tr>
<td>Dalea pulchra</td>
<td>Indigo Bush</td>
</tr>
<tr>
<td>Ericameria laricifolia</td>
<td>Turpentine Bush</td>
</tr>
<tr>
<td>Eriogonum wrightii</td>
<td>Wright’s Buckwheat</td>
</tr>
<tr>
<td>Fallugia paradoxa</td>
<td>Apache Plume</td>
</tr>
<tr>
<td>Gutierrezia sarothrae</td>
<td>Snakeweed</td>
</tr>
<tr>
<td>Lantana species</td>
<td>Lantana</td>
</tr>
<tr>
<td>Lavendula angustifolia</td>
<td>Lavendar</td>
</tr>
<tr>
<td>Lingustrum lucidum</td>
<td>Privet</td>
</tr>
<tr>
<td>Nandiana domestica</td>
<td>Heavenly Bamboo</td>
</tr>
<tr>
<td>Nerium oleander</td>
<td>Oleander</td>
</tr>
<tr>
<td>Rhus microphylla</td>
<td>Littleleaf Sumac</td>
</tr>
<tr>
<td>Rhus trilobata</td>
<td>Three Leaf Sumac</td>
</tr>
<tr>
<td>Rosmarinus officinalis</td>
<td>Rosemary</td>
</tr>
<tr>
<td>Salvia dorrii v. dorrri</td>
<td>Desert Sage</td>
</tr>
<tr>
<td>Yucca recurvifolia</td>
<td>Pendulous Yucca</td>
</tr>
</tbody>
</table>
Trees are one of the most important landscape architecture features by providing shade that lowers heat reflection and makes streets more pedestrian friendly that in turn raises property values. Here is a list of some trees that have a variety of uses providing shade, creating a distinct environment and giving vibrant color.

**Trees**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedrus deodara</td>
<td>Deodar Cedar</td>
</tr>
<tr>
<td>Chilopsis linearis</td>
<td>Desert Willow</td>
</tr>
<tr>
<td>Celtis reticulata</td>
<td>Canyon Hackberry</td>
</tr>
<tr>
<td>Cupressus sempervirens</td>
<td>Italian Cypress</td>
</tr>
<tr>
<td>Cupressus arizonica</td>
<td>Arizona Cypress</td>
</tr>
<tr>
<td>Ficus carica</td>
<td>Edible fig</td>
</tr>
<tr>
<td>Fraxinus velutina</td>
<td>Arizona Ash</td>
</tr>
<tr>
<td>Juniperus deppeana</td>
<td>Alligator juniper</td>
</tr>
<tr>
<td>Juglans major</td>
<td>Arizona Walnut</td>
</tr>
<tr>
<td>Lagerstroemia indica</td>
<td>Crape Myrtle</td>
</tr>
<tr>
<td>Melia azedarach</td>
<td>Chinaberry</td>
</tr>
<tr>
<td>Morus alba</td>
<td>Mulberry</td>
</tr>
<tr>
<td>Pinus brutia</td>
<td>Mondel Pine</td>
</tr>
<tr>
<td>Pinus edulis</td>
<td>Pinon Pine</td>
</tr>
<tr>
<td>Pinus halepensis</td>
<td>Aleppo Pine</td>
</tr>
<tr>
<td>Plantanus acerifolia</td>
<td>London Plane</td>
</tr>
<tr>
<td>Platanus wrightii</td>
<td>Sycamore</td>
</tr>
<tr>
<td>Prosopis velutina</td>
<td>Mesquite</td>
</tr>
<tr>
<td>Prosopis buckleyi</td>
<td>Texas Red Oak</td>
</tr>
<tr>
<td>Populus fremontii</td>
<td>Cottonwood</td>
</tr>
<tr>
<td>Punica granatum</td>
<td>Pomegranite</td>
</tr>
<tr>
<td>Pyrus kawakamii</td>
<td>Evergreen Pear</td>
</tr>
<tr>
<td>Pyrus species</td>
<td>Bradford Pear</td>
</tr>
<tr>
<td>Quercus emoryi</td>
<td>Emory Oak</td>
</tr>
<tr>
<td>Quercus gambelii</td>
<td>Gambel Oak</td>
</tr>
<tr>
<td>Salix nigra</td>
<td>Willow</td>
</tr>
<tr>
<td>Salix babylonica</td>
<td>Weeping Willow</td>
</tr>
<tr>
<td>Vitex agnus-castus</td>
<td>Monk's Pepper</td>
</tr>
</tbody>
</table>
Ground covers, accent plants and grasses create a unique lower colorful interest to the landscape while providing habitat for various species. Ground covers also work well with areas that have problems with erosion such as the sides of plateaus. Accent plants are used as a focal point for a particular space. Grasses have soften the sharp edges of a space and are a great filtering plant for storm water.

**Ground Covers**
- *Artemisia ludoviciana*
- *Lantana montevidensis*
- *Verbena rigida*
- *Oenothera campestris*

**Accent Plants**
- *Agave parryi*
- *Dasylirion wheeleri*
- *Ephedra viridis*
- *Opuntia santa-rita*
- *Yucca baccata*
- *Yucca elata*
- *Yucca schottii*

**Grasses**
- *Aristida purpurea*
- *Nolina microcarpa*
- *Muhlenbergia cappillaris*
- *Muhlenbergia lindheimeri*
- *Muhlenbergia rigens*
- *Muhlenbergia rigida*
There are various sources for funding that can be used for the construction of the revitalization plan of Benson. A commission could be delegated to provide the research and applications to these sources. Below is a list of some funding resources, this list however is only a small faction of possible funding sources.

**State Sources:**

Community Assistance Division, Arizona Department of Commerce:

@ www.commerce.state.az.us/comasst

Arizona Commission on the Arts:

@ www.state.az.us/arts

**Design Grants:**

Arizona Preserve Initiative, Arizona State Land Department:

@ www.land.state.az.us/asld

The Historic Preservation Heritage Fund:

602/542-7131

The Trail Heritage Fund:

602/542-7130

The Local, Regional and State Parks Heritage Fund:

602/542-7129

The State Historic Preservation Office (SHPO):

602/542-4009

**Federal Sources:**

National Endowment for the Arts:

@ www.arts.endow.gov

Transportation Equity Act of 1998-TEA-21

@ www.fhwa.dot.gov

@ www.transact.org

@ www.tea21.org
The idea of using a golf course as part of Benson’s economic engine is based on creating a new residential area which increases property value and attracts a retirement community. By attracting a retirement community, the small shops on Main Street would get a new customer base that boosts the economy.

First, the concept of a golf course among my contemporaries is considered as a landscape “faux pas”. However, the concept of designing a golf course as a biofilter is a new emerging bioscience that benefits the economy and the environment. Can a golf course be convincingly created as an ecological benefit, sustainable, economy building landscape project? Research was showing several different approaches that golf course architects were taking to try to change the cultural bias towards golf courses. Dr. Hurdzan designed the Widow’s Peak, one of the first ecological friendly courses. Then the case review of Lansing’s Groesbeck Municipal Golf Course designed as a biofilter for storm water runoff inspired research into storm water management and purification processes. The combination of using a golf course as a biofilter for storm water set my research further into the depths of golf course architecture. In the research of golf course architecture, a new frontier was beckoning my study. I explored the nature of golf course design, construction, irrigation, maintenance and philosophy. The new frontier was enticing in the realms of creative design possibilities with the sculptural aspects of landform vs the game, learning methods of using slopes to drain the greens and finding new ways to interpret native vegetation into the landscape. Yet, the “faux pas” of the golf course architecture loomed over the research. Historically, golf courses were as earlier mentioned designed on the natural links lands in Scotsland. These natural links land had native vegetation and native grasses. The game of golf has developed over the years, originally the game was played as a game of luck, short distances, good puts, chips and wise strategy. Due to technology, the game has evolved to long distance shots, less strategy and higher penalty that reduce the lucky factor. So, the design of golf courses have changed over time due to the use of faster balls, smoother grasses, and lighter aerodynamic clubs. The game has evolved to the pure physical ability of the player and how far, how straight, and how much control the player has over their shot.

Courses are designed with higher penalties and fewer recoverable balls for the average player. How does this effect golf course design? Golf courses are culturally related. Courses are designed to be green year around for professional tournaments. The public views these tournaments on television and expect the beautiful emerald green of the tournament course at their local course. However, nature is not green year-round. Native grasses, which Dr. Hurdzan is introducing into his courses have natural cycles. The leaf structure on these native species are not as smooth as the newer genetic fescues, this implies slower balls. How does the cultural formation change with a game? How does the “faux pas” bias of golf courses change? Change occurs only with time. The process is a cultural change of attitudes and openness to new ideas. So, the golf course remains in planning for Benson’s revitalization as an epitome for change as a means of progress on the economic scale and environmentally.
The site for the golf course is located next to the hospital on Octillo Road. This site was chosen for its location next to plateau range and for its relative flatness. The initial concept was to design a nine-hole golf course for beginners and as model for the storm water biofilter design. The course’s location next to the hospital and the mental institution will provide beautiful views and pathways for the patients. The Octillo Shopping center could also have a golf equipment shop. The golf course provides an opportunity to increase property value and incorporate a retirement community.

There are retention basins that collect stormwater off of the plateau range and from the surrounding neighborhood. This stormwater is then biofiltered and recycled along with gray water for the course.

The course is vegetated with various native grasses and vegetation. The drainage pattern for the course interpretes creek beds that lead into a storm water treatment train.
The golf course is created to be a practice course. The holes are created with strategic design.
Golf Course: Maintenance Notes

Appendix

Maintenance Notes:

A weed map is recommended for a regular maintenance schedule. Golf courses need to use various strategies to maintain the green grass. Part of the overuse of insecticides and fertilizers is due to society's concept of what a golf course looks like. The society’s concept of a golf course is that it is always green, but natural cycles are not always green. If society realizes that a brown yard is as beautiful as a green lawn then the use of pesticides and fertilizers would be cut in half. Another strategy is to use different grasses within the same course so that if a weed or insect problem occurs it will not spread to the entire course because different grasses have higher resistance to the various maintenance issues. The course is designed to have the water runoff into filtering areas with grasses and sedges that clean the water, the issue of toxicity would be decreased.
Irrigation Notes:

A complete packaged pump station is recommended to eliminate problems caused by mismatched pieces. It is highly recommended to use recycled or effluent water. After the irrigation system is completely installed a 24-hour pressure test is required to test leaks. Also the use of soil moisture sensors, weather stations and a low volume, low-pressure design that uses many small heads in place of one larger head would be a water-saving method worth investing in.
Appendix
Golf Course: Irrigation Notes

100% Dia. = 0 Precipitation
~ 80% Dia. = Approx. 25% Depth
60-65% Dia. = Approx. 50% Depth
50% Dia. = Approx. 75% Depth
25-30% Dia. = Approx. 100% Depth

Zone
Uniform
Water Dist.

Effective Root Zone Depth

<table>
<thead>
<tr>
<th>Moisture Used</th>
<th>25%</th>
<th>40% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

These are several different items to consider when irrigating.

Figure 13.40. Guide for use of spun, bonded nylon fabric to protect corrugated drainage tubing.
In Lansing, Ingham County, Michigan, Groesbeck Golf Course was developed as a filtering unit for storm water from more than 500 Lansing Township homes. Seven areas of wetland ponds create a natural cleaning process for the water and retains the water from flooding for water in the golf course. In turn this stabilizes the local water table. These wetland ponds are functional as part of the natural ecology process and as part of the game of golf as hazards. Ingham County Drain Commissioner Patrick Lindemann was trying to find a solution to the problem of piping storm water to the Grand River that would have raised the residents taxes to help cover $25 to $30 million in piping charges. “We tried to assess the need for that muskrat over there to have a house and join it with the need for the golfers over there to hit a golf ball.”, said Lindemann. “Tying in the golf course element has to my knowledge never been tried before,” said a local resident and manager of environmental affairs for Michigan Municipal League, Don Stypula. The U.S. Environmental Protection Agency’s Chicago office, Ernie Lopez said, “It’s innovative, its water reuse- one of the goals of the agency.” (Source: Delgado, Vincent. “Stonn water becomes asset to golf course”, Lansing State Journal, 1999, 1998, Michigan, Press Association)

‘Environmentally sensitive’ golf course design

There is a movement afoot (spurred by the golfing industry, its clientele and “environmentalist”) for new golf courses to be environmentally sensitive, and for existing golf courses to embrace some of the same concepts.” Embracing this concept is the Wolf Run Golf in Zionsville, Ind. An environmentally sensitive approach to golf courses is the first step in the trend to renovating pre-existing golf courses. By careful and thoughtful maintenance practices, superintendents can began a new direction for the future. The importance of wetlands in the design and maintenance of the golf course is an vital component to developing the integration of natural processes into a man-made landscape. (Source: Roche, Jerry. Landscape Management, “An ‘environmentally sensitive’ approach to golf courses” June 1992, pgs. 11-14)

Drought Tolerant Grass

Originated from South Africa and Australia, paspalum requires fewer nutrients and has few problems with diseases and pests. However, the major obstacle with paspalum is that it will not grow in other areas other than the Southern transition zone. Needing full sun and being able to withstand stressed environments like a golf course, gives paspalum the cutting edge over the bermudas in the south. The Old Collier Golf Club has planted its entire course with paspalum vaginatum. According to Dr. Ronny Duncan, a professor of turf grass breeding at the University of Georgia-Griffin, “Paspalum has drought tolerance that is equal to, if not better than the bermudas if managed correctly. It has more stress tolerance. You can inundate the grass with ocean water for two weeks and it will still live. You do that with bennuda grass and all you have is dead grass.” Paspalum is a grass that will become the cutting edge of drought tolerance species. Turf grass breeding is indicating the new trend to create and specialize more eco-friendly grasses that require less water and less pesticides. The data on this grass is still in its learning curve as we are seeing how paspalum stands the test of time on the course. (Source: Walters, Tim. “A Turf From the Salt of the Earth”, Golf Journal, May 2001, pg.34.)
There is a new trend in the design and construction of environmentally friendly golf courses. These golf architects are changing and evolving new methods of irrigation, different approaches to turf management, designing for storm water and gray water usage. Golf courses are part of landscape architecture and these new approaches to solving some of the issues that oppose golf course design should be embraced as a new emerging science. The following courses are examples of how this new approach is making headway in the cause for an environmentally friendly design.

In Anaconda, Montana, the Old Works Golf Course designed by Jack Nicklaus and Bruce Borland, is the U.S. Environmental Protection Agency’s Superfund success story. The abandoned copper smelter site with contaminated soil was bought by Atlantic Richfield (ARCO). Looking for a way to reuse the land, ARCO considered several methods to transforming the damaged land. Hauling away the slag, rubble and contaminated soil was a huge expensive. However, the process of capping the soil with two inches of lime rock and 16 inches of clay soil, then 6-8 inches of topsoil and turf to make a golf course was the least expensive method. "Golf courses are becoming the makeup that covers a multitude of environmental sins, popping up on top of old landfills, helping to protect shorelines and providing a solution to storm water problems. The fact that they also provide a reliable revenue stream is icing on the cake.", writes Ward. Bill Love, the environmental chairman for the American Society of Golf Course Architects, says, “Environmental stewardship is the responsibility of every governing body. Golf courses represent great opportunities to practice it.”

Another golf course that has turned devastated land into an environmental friendly course is Widow’s Walk in Scituate, Mass. Designed by Mike Hurdzan, Widow’s Walk was created on the city’s 500 acres that was used as a dumping ground, next to a landfill. "Environmental concern is not going to go away. When you are thinking of building a golf course, it has to be part of the planning process." "Widow’s Walk was built to survive with less water and fewer herbicides and pesticides than most courses. It is has three different greens, that the average golfer wouldn’t tell the difference. The course also makes use of recycled asphalt for its cart paths and recycled carpet for its bunkers.", writes Ward. Hurdzan says, “The grass is not green all year long. We try to use less than half the amount of pesticides you would use on a normal golf course. That means the course will go through more natural cycles. It’s not going to be a classic golf course mowed from fence row to fence row. There’s going to be some slow play, some lost balls." The result of this is the course is rich in wildlife habitat. There is a “corridor of mixed habitats including open ponds, wetlands, vegetated streams, woods, open grassy areas and vernal pools. The course is irrigated with water from abandoned drinking wells that no longer meet EPA standards, making it somewhat of a biofilter." (pg.3)
Golf Course: A New Trend of Environmentally Friendly Golf Courses

In Lansing, Mich. Groesbeck Municipal Golf course was renovated with a design to collect the city’s storm water. The building of retaining ponds was less expensive than to run a line to the river. "The course is now part of a 30-acre wetlands system that can handle 10 million gallons of water per day, the equivalent of that dumped in back-to-back 25 year storms. Additionally, the ponds provide irrigation for the entire 18-hole course through operation of an underground recirculating system that exchanges the water in the ponds every 24 hours." (pg. 5) The city’s golf maintenance supervisor, John Johnson says, "My father was a soil conservationist. When I speak to groups, I can spot people right away who have a chip on their shoulders about golf courses. I tell them I use less pesticides per acre than most homeowners use on their lawns."

The harmony of golf courses into the environment is not a passing fad, according to Mike Hurdzan. "Technology is helping, with the development of newer grasses that use less water and fertilizer, organic approaches to turf care and the use of compost and effluent water." Designers like Hurdzan are “aware that there will always be those who are opposed to golf courses as a matter of principle. However, they are equally convinced that most golf course opponents will become advocates once they are presented with reliable information." (pg.6) (Source: Ward, Janet. "From tee to greenspace", American City and County, Oct. 1, 2000)

Golf courses are part of the evolving field of landscape architecture. Opposing views on the environmental impacts of golf courses should not be avoided but confronted in creating new approaches in development of turf technology, rainwater harvesting, interpreting edge habitat into a controlled landscape and developing new strategies for fertilizing and pesticide regime. Fortunately, there are some like Dr. Hurdzan that see the future of golf courses as a potential element in the landscape as an economic engine for small town revitalization and as part of an environmental friendly open space. Unfortunately, the major designers of these golf courses are not landscape architects, who are more sensitive to environmental issues but golfers, themselves who design for purely the game’s strategy.

Environmental friendly golf courses are a recent trend in golf course design however, it is really an old trend revisited. The oldest courses such as the Old Course at St. Andrews in Scotland, were originally designed by nature, in a sense the trend is actually a revisitation of golf’s true roots in the harmony with nature.