Revitalization of Alleys

- creating safe, social and green networks in central Tucson

The University of Arizona, College of Architecture, Planning and Landscape Architecture, School of Landscape Architecture and Planning

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Revitalization of Alleys

creating safe, social and green networks in central Tucson

by
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Alleys are underutilized corridors that can potentially provide many valuable uses in cities. Alleys can be used for multiple purposes during the day and night: conventional functions, dog walking, water harvesting, art display and as renewable energy showcases, to name a few. In addition, they can become welcoming and popular linear gathering spaces. On a grander scale, they can be used as networks and connections between destinations. This project proposes to evaluate the current challenges and opportunities of alleys in central Tucson, to create multiple design templates for safe, social, and green alleys, and to enhance the connectivity to Tucson Modern Streetcar Areas.
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Background

Alleys are generally defined as narrow lanes which usually run between or behind continuous rows of buildings. They are often used by pedestrians and service vehicles, and typically permit access from the street to backyards, garages, and the backside of commercial properties. Alleys are small scale linear elements in urban design, which accommodate the human scale, allow easy access and provide connection.

Most people consider an alley as “a stinking strip of menace that was friendlier to rats and crime than to harmony life” (Nelson, 2011). Before the 1950s, alleys were built for service purposes in the United States. In some cities, alleys cover almost half as much spaces as all of the city’s parks, squares, and existing pedestrian-oriented streets. However, in other countries, people have different experiences with and perceptions of alleys. For example, in China and Europe, people use alleys as resources for social life and they are a significant part of city’s culture and history. Moreover, even in the U.S., some cities such as Seattle and Chicago are now redesigning and planning their alleys to turn them into livable, walkable, enjoyable, and friendly places within urban area.

Tucson is experiencing significant changing on population and geography, which brings pressure on the development of Tucson. Needs for green spaces or outdoor activity areas are increasing in newly developing as well as established areas. Instead of ceaselessly sprawling, what can we do to fulfill tremendous demands of outdoor activities? Alleys occupy a lot land in established urban areas and almost all of them are vacant with few functions. They can be asserts in urban development and park system, if they are well designed and implemented with multiple functions. Although the conditions of alleys in Tucson are not very pleasure and desirable from a pedestrian design standpoint, people who live or work around these spaces use them for walking and connecting to other areas. This project is creating design models to revitalize alleys in Tucson, which can provide opportunities to create safe, social, and green networks in Tucson, enhance connections, and meet some of users’ needs.
Research Questions

- What types of models can be designed for alley revitalization?
- How can safe, social and green networks be created in central Tucson?

Goals

1. Integrate conventional with new alley functions
2. Enhance green networks in central Tucson
3. Provide multi-purposed outdoor activity spaces

Objectives

- Promote walkability
- Increase safety night time using
- Create multiple function paths and trails
- Create green infrastructure
- Use native plants
- Promote recycling and reuse materials
- Create green networks and connections
- Celebrate art, history, and culture
- Create daily or weekly social activities
- Create commercial opportunities
- Offer opportunities for urban agricultural
Methods used in this report focus on a cycling process between identification, approach and application. The identification section includes a study of the existing situation, and aids in generation of research question(s), goals, objectives and other general research guidelines conducted during the research process. The approach section involves the process of reviewing existing theories and, projects, and specific analysis of site conditions and characteristics. The results of this process is a compilation of principles, methods and other design implications that are applied in the design section. In order to develop a through design project, goals, objectives and research questions were evaluated during the process of research and design. This evolving and cyclical process of analysis and design effects the conclusions.
I. Urban Design
• New Urbanism
• Livable City and Livable Community
• Temporary Space

II. Linear Space Design
• Street Design
• Historical Review of Alleys
• Walkability

III. Social Spaces
• Social Activities Spaces
• Sense of Place
• Crime Prevention through Environmental Design

IV. Environmental Sustainability
• Sustainability Development
• Green Infrastructure
• Sustainable Energy

Conclusion
The literature review section contains four general parts with several sub-topics. The first is urban design, which helps to identify the context of alleys. This is followed by linear space design, which focuses on street and linear spaces design and will discuss some basic guidelines for alley design. The third part focuses on the human social aspect relative to this project, including sense of place, safety and other ideas including human needs, the places humans prefer, and the creation of better spaces for socialization. The last part, environmental sustainability, focuses on sustainability, green infrastructure, and energy efficiency, which will help in the creation of green networks.
New urbanism is an urban design movement which promotes and focuses on sustainability, mixed-uses, connectivity, high density, walkability, green urban areas, multiple housing types, and job opportunities, to name a few. In the past, alleys are frequently seen only as the function for services, parking and vehicular access. The connection between urban spaces and/or buildings, the human scale in design and some other factors are sometimes ignored in some planning or design projects. It is important to realize that a city is experienced through its streets and public spaces. So, a process of ordering physical forms to achieve improved quality of the environment and its linkages is important. (Miles, Cook, Roberts, 1978)

Transit-Oriented-Development (TOD) is one important design perspective form New Urbanism which is accepted as a general guide and an approach to support human-scale communities, including:

1. Organize growth on a regional level so that it is compact and transit-supportive.
2. Locate commercial, housing, jobs, parks, and civic uses within walking distance of transit stops.
3. Design pedestrian-friendly street networks which directly connect local destinations.
4. Housing should be a mix of densities, tenure and cost.
5. Sensitive habitat, riparian zones, and high-quality open space should be preserved.
6. Public spaces should be the focus of building orientation and neighborhood activity.
7. Encourage infill and redevelopment along transit corridors within existing neighborhoods.  

(Katz, Scully, and Todd W. Bressi, 1994)
New urbanism is an urban design movement which promotes and focuses on sustainability, mixed-uses, connectivity, high density, walkability, green urban areas, multiple housing types, and job opportunities, to name a few. However, in the past, alleys have frequently been seen only as functioning for services, parking, and vehicular access. The following are highlighted alley and street characteristics or criteria from DuanyPlater-Zyberk& Company’s (DPZ) New Urbanism:

- Most of the dwellings are within a five-minute walk of the center, an average of roughly 0.25 miles (1,300 ft; 0.40 km).
- There are small playgrounds accessible to every dwelling — not more than a tenth of a mile away.
- Streets within the neighborhood form a connected network, which disperses traffic by providing a variety of pedestrian and vehicular routes to any destination.
- The streets are relatively narrow and shaded by rows of trees. This slows traffic, creating an environment suitable for pedestrians and bicycles.
- Parking lots and garage doors rarely front the street. Parking is relegated to the rear of buildings, usually accessed by alleys.
- Certain prominent sites at the termination of street vistas or in the neighborhood center are reserved for civic buildings. These provide sites for community meetings, education, and religious or cultural activities.

(Katz, Scully, and Bressi, 1994)

**Principles:**
- walkability
- connectivity
- mixed-use & diversity
- mixed housing
- quality architecture and urban design
- traditional neighborhood structure
- increased density
- green transportation
- sustainability
- quality of life
I. Urban Design

ii. Livable City and Livable Community

Livability refers to an urban system that contributes to the physical, social and mental well-being and personal development of all its inhabitants. Principles for the livable city include a good public realm, a focus on a human scale, multiple functions, and diverse needs. That being said, the public realm should include a multitude of activities, celebrations, and festivals that bring inhabitants together and offer opportunities for citizens to interact (Amsterdam, 2011).

A social public space needs to provide access for different groups of people that will orient people and facilitate for different activities, be designed in a way that is sensitive about personal feeling, generate a sense of belong, increase awareness, be facilitated to local residents, encourage exploration, create meaning and memory, to name a few (Amsterdam, 2011).

Designing for Active Living is a new approach to community design that aims to design communities for all users, not just vehicles, and involves creating safe access to transit, complete streets, bike share networks and stations, community trail networks, parks with exercise equipment, and community gardens. Complete streets are lined with trees, which clean air, reduce asthma rates during hotter months, and mitigate the urban heat island effect. More walking and biking means fewer car trips and less carbon dioxide added to the atmosphere. Community gardens can be designed to increase local biodiversity, creating food sources for people as well as wildlife. Alleys can provide opportunities for multiple uses (Amsterdam, 2011). Another important part of the development of a livable city is an incorporation of children’s spaces into the landscape. In Ford’s opinion, it is realistic and appropriate to design alleys as playgrounds which provide places for kids to experiment, play, and explore (Ford, 2000). Playing in alleys, kids may not be under their parents’ direct supervision but at the same time they will still be close at hand (Lennard, Ungernsternberg and Lennard, 1997).

Top 9 most livable cities in the world

- Auckland
- Berlin
- Ottawa
- Vancouver
- Bern
- Toronto
- Vienna
- Munich
- Wellington
iii. Temporary Space

Temporary spaces are spaces that are not occupied and/or used permanently or possibly not well designed and/or developed. In Temporary Urban Spaces, Haydn and Ternel (2006) define temporary use this way: “They want to prepare their location for something other that will last longer.” Temporarily activating the empty space with events and projects will promote connectivity between existing amenities, houses, and business; it will beautify the area and attract new residents and businesses, and encourage development of the lots. Moreover, a successful temporary space will inspire and encourage people to consider permanent action and/or promote the use of a space. Special events held every week, month or year will turn a relatively unused space into a temporary space (Haydn and Temel, 2006).

Function:
- promote connectivity
- encourage use and consideration
- potentially being permanent space
- create social activities
- provide economic opportunities

Types of Use:
- cultural
- entertainment
- political
- social
- recreational
- artistic
- commercial
- multiple
Imagining the city as a stage and the city development process as a drama, the main actors in the play will be streets, open spaces, and buildings. Jan Jacob stated: streets and sidewalks, the main public places of a city are its most vital organs (Jacobs, 1961). If a city’s streets look interesting, the city looks interesting, if they look dull, the city looks dull (Moughtin, 1999). Streets always make the first impression for people. Great streets make a community an identity.

There are at least three types of streets. The primary type, called an arterial, is the connection that provides access between cities. The secondary type is collector, which is the major street running through a city. The third type is local streets and considered the major access for a residential or commercial area, and other city land uses (Katz, Peter, Vincent Scully, and Todd W. Bressi, 1994). The hierarchy of streets would provide different experience for users, especially the human-scale street.

*Mosborough Master Plan: macro and micro scale permutations.*
Traditions of a high-density public life lived primarily in the street, the square, and the park. Streets are multi-functional urban patterns. Street provide accesses to buildings or spaces; they are sometimes where commercial or business activities happen; it allows people to go outside and meet others; it is also used for public showcases and is barring of private spaces (Jacobs, 1993). Streets are significant places where all kinds of urban activities have happened (Marshall, 2005). Streets are the social bonds of a city, which will identify who are using them, when and how users use and maintain them. They should also be designed with safety and comfort considerations (Moughtin, 1992). If they are physically comfortable and safe, they will encourage participation and will be remembered (Jacobs, 1993). A great pedestrian environment is far more important than simply aesthetic appeal (Cooper and Francis, 1998). Beautiful streets might attract people at first, but active streets could make people stay there.

One of the essential ways to achieve a pleasant street is that everything should be on a human scale and related in character. It needs to be well maintained, furnished, signed, attractive and pedestrian friendly (Design Council, 1979). Streetscapes can also be used to tell stories. They should be lively, kinetic, an animated presentation of a place, a people, a time and a way of life (Pegler and Retail Reporting Corporation, 1998). The design strategies will change based on the type of streets, users, locations and activities.

Multi-functional of street:
- passage & accessible
- meet people & social bond
- commercial & business
- public showcases
- buffering private spaces

“A great street should help make community; they are physically comfortable and safe; they encourage participation; and also, they can be remembered.”
ii. Historical Review of Alleys

The word alley from French allee, came to be synonymous with the underside of life and was used as a rather derogative prefix for everything from cats to brawls (Ford, 2000). Alleys were not common during the earliest development of American towns and cities. However, the need for alleys was evident in many cities after nineteenth century, and served as access, storage and delivery (Ford, 2000). In the traditional urban design or planning, alleys are kept informal. They are usually combined with fences, walls, or bushes on the perimeter of the lot – they give residents privacy in their backyard (Katz, Peter, Vincent Scully, and Todd W. Bressi, 1994). The rear or back side of buildings and houses historically were considered as invisible spots in cities. They are still considered as mostly hidden from view, however, this does not mean they are entirely avoided. Perforating a street or the discontinuation of a building or house can expose alleys to passages. Visual and physical accessibility of the back of buildings will create the “eye on the street”, which can, somehow, increase the safety of alleys, and consequently, the community and the city (Ford, 2000). The conventional alleys’ functions make alleys fading people’s sight and becoming lost spaces.

Why Alleys?
- they provide quiet retreats
- they are in cozy scales
- they are occupying amount number of land, but they are vacant
There are innumerable alleys in other countries around world. They also mean narrow streets between buildings. However, the services or designed functions for alleys are not necessarily appealing situations in United States. In fact, alleys in other countries are usually welcoming. They are used for outdoor cafes, restaurants, community activities, and other events. Instead of competing with vehicular access, alleys offer quiet retreats and a cozy scale, which is more suitable for human use (Ford, 2000). So the revitalization of alley could potentially bring people to use these spaces.

Functions:
- green space
- events space
- social space
- commercial opportunities
- dog walk
- water management
- heat reduction
- material recycling
- energy conservation
ii. Historical Review of Alleys

Recently, the functions of backyards have begun changing. From the Ford’s stated in the spaces between buildings that the backyard has developed to accommodate much of the activity that once took place in front of houses (Ford, 2000). As a result, the functions of alleys will be also changed in a way. It is clearer in the City Comfort: “An alley is more than an alley; it is a thoroughfare all its own” (Sucher, 2003). A similar statement was made by Clare Cooper Marcus and Carolyn Francis: “Places have their own rights that they should be or potentially be used as multiple functions. The major purpose must be serving people for different social activities” (Cooper and Francis, 1998). Alleys are not occupied or used for conventional functions all the time. In New Urbanism, the goal is to increase density and mixed-use in urban areas. A successful New Urbanism project should use the vacant and/or unused land rather than urban sprawl (Katz, Peter, Vincent Scully, and Todd W. Bressi, 1994). Temporary use, such as casual activities and events, can be introduced to most alleys. Along the alley, activities of daily living should take place as much as possible.

In Chicago Green Alley project, “alleys provide a great benefit for the city, but like all infrastructure, they also require maintenance and periodic reconstruction” (Green Alley Handbook, 2010). The large number of permeable surface of alleys can provide opportunities for better management and usage in our environment. These potential opportunities include flood control, stormwater management, heat reduction, material recycling, energy conservation and glare reduction, to name a few. The city development should be committed to creating a greener and more sustainable environment by using best management practices in alley improvements and constructions.

“Alley is more than alley; it is a thoroughfare all its own.” (David Sucher and Kevin Kane, City Comfort)
Cliff Moughtin stated that a street is a road in a town or village, comparatively wide as opposed to a lane or alley. The streets and alleys, as linear or network parcels and design elements, cannot be separated as legislated zoning spaces (Moughtin, 1999). There are different types of alleys, which can be seen in most American cities, including Tucson. The potential design implementations may include:

**Commercial area:** An alley could be used as the outdoor room for many retail spaces, while some shops could have permits to front their businesses on the alley. At the same time, well-designed alleys would be used for deliveries without interfering with pedestrians.

**Residential areas’ safety and financial purpose:** Well organized alley-house relationships can increase safety to the alleys, and also increase the housing, property and/or land values, as it brings opportunities for secondary dwellings (Sucher and Kane, 1995).
iii. Walkability

In a context-sensitive design concept, New Urbanists have been trying to approve walkability elements, including narrower and slower-moving streets. Considerable progress has been made toward this goal, which is central to the development of sociable, human-scale communities (Sucher and Kane, 1995). Even the smallest scale - local streets - ignores walkability (Katz, Peter, Vincent Scully, and Todd W. Bressi, 1994).

Human-scale leads all the principles. A walkable distance is 1/4 miles or 5 minutes of walking. The second consideration is the connection, not only connecting to the destinations or public transportation, but also creating a great amount of street networks from one pattern to another. The others are the safety of the streets and the comfort and interest to the pedestrian (Katz, Scully, and Bressi, 1994). Focused on users’ needs will help to create welcoming spaces.

Richard Bernhardt proposed seven principles for creating walkability:

1. The basic building block of a community is the village or a small town. A cluster of neighborhoods forms a bigger town. Clusters of many neighborhoods make up a city.
2. The neighborhood is limited in physical size, which a well-defined edge and a center. Neighborhoods have a fine-grained mix of land uses, providing opportunities for young and old to find places to live, work, shop, and be entertained.
3. Corridors form the boundaries between neighborhoods – both connecting and defining the neighborhoods. Corridors can incorporate natural features. They may take the form of parks, natural preserves, travel paths, railroad lines, or a combination. A corridor may also be a district.
4. Human scale sets the standard for proportion in building.
5. Treating a range of transportation options as important is fundamental.
6. The street pattern is conceived as a network to create the greatest number of alternative routes from one part of the neighborhood to another.
7. Civic buildings belong on preferred site.

(Katz, Scully, and Bressi, 1994)
Walkability has also been linked to increases in home values in the US cities. By the Walk Score measure, walkability is a direct function of how many destinations are located within a short distance. For example, the convenience and proximity of having shopping and cultural activities close at hand, as well as the value households attached to mixed-use neighborhoods. Improving walkability by alley revitalization would most likely increase house and land value (Deehr and Shumann, 2009). Walkability is the foundation of sustainability and essential measurement for human-scale. Connections of walkable streets, alleys and areas will eventually create great networks.

What makes a neighborhood walkable?
- Contains a center: Walkable neighborhoods have a center, whether it’s a main street or a public space.
- People: Enough people for businesses to flourish and for public transit to run frequently.
- Mixed use: Affordable housing located near businesses.
- Parks and public space: Plenty of public places to gather and play.
- Pedestrian design: Buildings are close to the street, parking lots are relegated to the back.
- Schools and workplaces: Close enough that most residents can walk from their homes.
- Complete streets: Streets designed for bicyclists, pedestrians, and transit.
III. Social Activity Space Design

i. Social Spaces

William Whyte set up the Street Life Project, which evaluates the urban spaces values and design principles to improve future and further design by observing the uses and users in urban spaces, including urban plazas, parks, and streets. He said, “when we think of cities and the people in them, we have been too much inclined to forget the smile altogether. There are happy people in cities. There are healthy places that people like in cities, places that contribute to happiness, places that can bring out that smile.” He asserts that people always see what they want to see. Therefore, when we see kids playing on streets, we think they do not have spaces to play, however, we do not realize that they play there because they like playing there. He also mentions that good urban space will create demand. They will be sociable places, “with a higher proportion of couples than you find in less-used places, more people in groups, more people meeting people, or exchanging goodbyes” (Whyte, 1980). Highly active spaces will bring people together, and eventually, become welcoming social spaces.

The idea that encourages people getting out from their cars and walking to their destinations will contribute to people’s sense of community and quality of life (Katz, Peter, Vincent Scully, and Todd W. Bressi, 1994 ). People are the major factor that attracts people (Whyte, 1980). People all love well-defined places which provide them sense of spaces and enjoy sociable places which give them sense of belonging.

In Diana Schumacher’s book Small is Beauty, there are some ideas applied to urban physical dilemma. The primary is that small is beauty. People would like to stay in a small group, for social reasons. A small or appropriate scale should be defined for every activity (The Green City, pxi). A small scale makes things easier and more feasible. Starting with small can eventually bring big. So, begin with pilots alley site will finally create networks.
ii. Sense of Place

Genius loci:
A genius loci was the protective spirit of a place.

A people place should be easily accessible, readable, furnished, beautiful, safe, health, multi-functional, physically comfortable, and easily maintained, to name a few. Although streets provide as much service as plazas, squares, parks or others urban place, street designs lack attention (Cooper and Francis, 1998). Applying the people place standards to streets and alleys design can make streets and alleys lively.

In Kevin Lynch’s book Image of the City, a street is considered a Path, one of the key elements of cities. The method Lynch created is important, as “paths are the channels along which the observer customarily, occasionally, or potentially moves... For many people, these are the predominant elements in their image. People observe the city while moving through it, and along these paths the other environmental elements are arranged and related” (Lynch, 1960). As mentioned above, great streets make community. Memorable streets can make cities impressive.
iii. Crime Prevention through Environmental Design

From the New Urbanism view, two broad approaches can create safe places. First is the opposite approach, adding more connecting streets, creating smaller blocks and creating accessibility to the outside world. The other is defining private and public spaces, ensuring informal surveillance of streets, encouraging social interaction, and other techniques (Katz, Peter, Vincent Scully, and Todd W. Bressi, 1994). In The Death and Life of Great American Cities Jane Jacobs mentioned that new forms of design break down many of the traditional controls on criminal behavior; residents’ ability to watch the street and the presence of people using the street both night and day (Jacobs, 1960). A similar idea is mentioned in Barry Poyner’s book Design against crime: beyond defensible space (1983), which relates to keeping visual access to different public patterns including residential, commercial, street, schools and public transportation. However, in his theory, the alley should not be used by the public and it should include view barriers (Poyner, 1983). Hidden alleys could make them even more unsafe. Inviting people to use alleys will increase “eyes on streets”, which can potentially decrease criminals.

The fear of crime is often associated with fear for one’s personal safety, particularly safety from violent crime and harassment in public when travelling alone, especially after dark. It is a substantial barrier to participation in the public life of the city (Wekerle and Whitzman, 1995). Poor lighting, places that are isolated and places where there are no access to other people are some specific things make people feel unsafe. Understanding these factors can help to create safe spaces, especially lighting. Wekerle and Whitzman (1995) discuss the need and strategies for improving lighting in cities: contributes to a sense of personal security, and is often low cost. The level of lighting in public spaces must be adequate to have a good look at another person. They should be consistency, cannot be overused, inappropriate used or glaring.

The principles of designing a safe city include: (Wekerle and Whitzman, 1995)
1. Design for pedestrians to easily move about – and wide – circulation routes that reflect existing patterns of movement.
2. Consider safety of people and property together rather than separately.
3. Use opportunities for enhancing natural surveillance.
4. Good maintenance.
5. Make sure solutions to one problem don’t create another.
Example of a Transit Facility Designed with Safety in Mind

LEGEND

1. Lighting is critical to ensure safety for users and transit operators.
2. Provide clearly defined routes with no obstructions or barriers to and from station.
3. Ground floor transparency and building frontages offer active uses near and around transit.
4. Transit facilities should be well maintained and monitored to deter loitering and undesirable activities. Street furniture, lighting, clear sight lines can help create a sense of ownership.
5. Landscaping must be maintained to provide clear sight lines for pedestrians, bicyclist and vehicles.
A generally accepted definition of sustainable development, and a good point to begin with an exploration of this concept, is taken from the Brundtland Report: “Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). The pursuit of a sustainable future for the human race in an environment of quality will require the design of effective policies and programs which directly address the related problems of unsustainable activities and environmental degradation. They must also be politically acceptable in the jurisdiction where they are proposed (Moughtin and Shirley, 2005).

Definitions of sustainable development are built on a premise that recognizes the virtue and necessity of grassroots community activity in the development process. The matrix of open spaces performs many such functions for both people and wildlife with its vegetation, permeability and varying degrees of connectedness and isolation within the town, and between the town and the open countryside. These functions include flood defense, improving air quality, providing shelter and shade, places for recreation and wildlife habitats, and enhancing property values (Moughtin and Shirley, 2005).
The degree to which a city is sustainable is affected both by the form of the urban street block and also by the composition of the activities it accommodates. The traditional city with residential and commercial accommodation arranged over ground floor shopping is often cited as a model arrangement for a lifestyle which is not dependent upon high levels of mobility. It is also argued that a city with a fine grain of land use, rather than the homogeneous zones of residential commercial or industrial uses, common in modern metropolitan areas, is more likely to reduce the need for travel, and, incidentally, also be more likely to create an interesting and livable environment (Moughtin and Shirley, 2005).

The Sustainable Sites Initiative (SITES™) is a new term in the sustainable development which is created to promote sustainable land development and management practices that apply to open spaces and sites with buildings (THE SUSTAINABLE SITES INITIATIVE, 2009). No matter where the site is, the Sustainable Sites Initiative is an important guideline for designers, which holds the potential both to improve and regenerate the natural benefits and services provided by ecosystems in their undeveloped state. Considering the specific situation and linear shape of alley, evaluations should include hydrology, soils, vegetation, material, human health and well-being, and urban climate, to name a few.
ii. Green Infrastructure

A general definition of green infrastructure is that it is a concept originating in the United States in the mid-1990s that highlights the importance of the natural environment in decisions about land-use planning. This concept emphasizes the life support functions provided by a network of natural ecosystems, with an emphasis on interconnectivity to support long-term sustainability. The United States Environmental Protection Agency (EPA) has extended the concept to apply to the management of stormwater runoff at the local level through the use of natural systems, or engineered systems that mimic natural systems, to treat polluted runoff (EPA United Stated Environmental Protection Agency, 2012). Providing stormwater management and stormwater treatment is the foundation to create green networks.

Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up and storing water. Green streets and alleys apply green infrastructure elements into the street and/or alley design to store, infiltrate, evapotranspire stormwater, save energy, help health, improve habitat and habitat connectivity, to name a few (EPA United Stated Environmental Protection Agency, 2012). Permeable pavement, bioswales, planter boxes, and trees are among the many green infrastructure features that may be woven into street or alley design.

Benefits of Green Infrastructure:
- store, infiltrate, evapotranspire storm water
- improve air quality
- save energy
- help health
- improve habitat and habitat connectivity
- create jobs, cost effective and protect local economy

Green Infrastructure Principles:
- should be the framework for conservation and development
- functions across multiple jurisdictions and at different scales
- is a critical public investments
- involves diverse stakeholders
- design and plan green infrastructure before development
- linkage is key
- is grounded in sound science and land-use planning theories and practice
iii. Energy Efficiency

The “energy footprint” uses the analogy of the building footprint, and extends the concept to include the energy necessary to sustain a structure throughout its life. It includes the following components (Moughtin, 2005):

• The environmental capital inherent in the construction – that is, the energy and resources expended in the manufacture and transportation of the materials, the energy required to prepare and service the site, and then construct the building.

• The energy used to sustain and maintain the development and its daily service requirements once it is occupied. This energy which Vale and Vale (1991) call “revenue energy”, may be as much as three times the energy used in construction, the “capital energy”.

• The energy that the occupants expend in moving between the development and the rest of the city, together with the energy required to feed the occupants.

• The energy required to demolish the development and clean the site once it has reached the end of its useful life.

In the New Urbanism energy efficiency tips, the narrow and planted street is one recommendation for city planning. Treeless urban areas negatively affect climate, environmental and community health, and also exacerbate energy efficiency. A small piece of green space can be used to dramatically reduce energy usage in side homes, but a well-designed alley network in not mentioned. A large number of alleys can provide opportunities for green network. Renewable energy strategy, such as solar and/or wind energy, can provide an approach for saving or generating energy, so that green and safe alley networks can be created. In landscapes, energy efficiency can concentrate on creating comfortable microclimate and reducing energy consumption.

Energy Efficiency:

• reduce the amount of energy required to provide products and services
• slow the energy demand growth

Renewable Energy:

• hydropower
• wind power
• geothermal electricity
• solar energy
• biomass
• biofuel
• geothermal energy
Generally, there is not a lot of existing theories, principles or criteria, to support the redevelopment or redesign of alleys. However, the way people develop cities as livable and streets as walkable places that are safe and comfortable, can be applied to revitalizing alleys. Urban design provides information about New Urbanism, which will lead to the sustainable livable and walkability cities and communities. The linear spaces can function similar to other open spaces. A physically and mentally comfortable linear space is a basic need for city socialization. The sustainability strategies can be the methods used to support a successful green network. Nine essential factors are summarized from the literature review, and are used as the guidelines to evaluate case studies in the next section.

- **Shared use** means alleys can be used by multiple users, for instance, pedestrians, bicycles, and others.

- **Connectivity** considers the connection between alleys and destinations.

- **Conventional function** is the traditional uses of alleys, such as trash picking, services, maintenance, vehicular access, to name a few.

- **Economic** is one of important aspects in the sustainability and new urbanism, which suggests different ways to increase local economic opportunities, for example outdoor cafe, restaurant, farmer’s market, to name a few.

- **Art** focus on the public art display, like art implementation and art display.

- **Social spaces** are places where people can meet others and where activities can take place.

- **Storm water management** is a major component in environmental sustainability and green infrastructure.

- **Recycling** is for material reuse on-site.

- **Green space** brings green and nature back to urban spaces by variety methods and scales.
Urban Design
  +
Linear Space Design
  +
Social Activity Spaces Design
  +
Environmental Sustainability

- shared use
- connectivity
- conventional function
- economic aspect
- art
- social space
- storm water management
- recycling
- green space
CASE REVIEWS

Introduction

I. Green Networks
- Chicago Green Alley

II. Mixed Use Alleys
- Seattle Nord Alley
- Melbourne Hosier Lane
- Vancouver Livable Laneways

III. Residential Alleys
- Los Angeles North Hollywood Alley
- San Francisco Linden Living Alley

IV. Historical Alleys
- Seattle Post Alley
- San Francisco Chinatown Alleys

Design Implications
Eight alley projects are reviewed in the following section. Based on the types and functions of the alleys and/or the surrounding context, they can be divided into four kinds: green networks, mixed use alleys, residential alleys and historical alleys. Each project is evaluated based on the criteria from literature review (showing in the chart on the next two page). Four aspects: environment, socialization, economy, and function, are used to assess strengths and weaknesses of each projects, and design implications were extracted from them.
**Green networks**

The Chicago green alley project is an ASLA award project, which is an environment oriented and establishes several design guidelines for green alleys.

**Mixed use alley**

Seattle Nord Alley and Melbourne Hosier Lane are surrounded by mixed use buildings, especially several art galleries. They are treated uniquely with public art. Livable laneway is a mixed use alley in Vancouver. The outstanding supports from the neighborhood make this place full of interests. Diversity events attract people to enjoy these places and make these places livable and welcoming.

**Residential alley**

Los Angeles North Hollywood alley and San Francisco Linden living alley are new sustainable street projects in residential areas. They serve maintenance, service and people socialization needs at the same time.

**Historical alley**

Seattle Post alley and Chinatown alleys in San Francisco are in historical districts with long history. They were not designed to be service-purpose at the first place. High density and mixed use of the surrounding contexts make these two alleys succeeded.
<table>
<thead>
<tr>
<th>City/Location</th>
<th>Storm Water Management</th>
<th>Recycling</th>
<th>Green Space</th>
<th>Social Space</th>
<th>Art</th>
<th>Shared Use</th>
<th>Connectivity</th>
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I. Project Background

Chicago was built on a former wetland at the confluence of the Chicago River and Lake Michigan and has always suffered from drainage problems. In the late 1970s the city initiated a $3.4 billion Tunnel and Reservoir plan. The “deep tunnel” project, due for completion in 2019, is designed to reduce the incidence of sewers overflowing because of heavy rainfall. Even with this major investment, the global climate change indicates that without further intervention, Chicago’s sewers would overflow with increasing frequency.

There are more than 1,300 alleys and 1,900 miles of alleys in Chicago, which is the largest amount of any city in the world. Twenty percent of the current alleys are unpaved and 3,500 acres are impermeable surfaces, without constructed or designed drainage system. The stormwater will cause flooding issues.

The Green Alley program aims to stop polluted rainwater in the city’s alleyways, and meanwhile, to create environmentally friendly urban area. The Chicago Green Alley project is a 2007 ASLA Professional Awards project. It is also chosen by many cities and organizations as case study project. The pilot program has three main focus points which include using permeable pavements to reduce stormwater runoff, high albedo pavements to reduce urban heat island effect and using recycled material such as concrete aggregate, slag and recycled tire rubber. After several pilot locations implementation, this project can infill the city wide alleys. This project began at 2006 as a pilot study. Local officials decided that from January 2008 every alley in Chicago will be refurbished with the Green Alley model. And through 2010, more than 100 Green Alleys have been installed. Starting with the pavement, the alleys are being resurfaced with concrete, asphalt or paving stones that are permeable. Six pilot locations and over forty planned locations citywide are chosen to be the beginning of the whole project. Maintenance includes determining owner needs, evaluating life cycle costs and specification development.
II. Project Assessment
• **Environmental Aspect**
The Green Alley project will bring environment friendly spaces back to residents. By repaving with permeable pavement, the Green Alley project in Chicago is helping stormwater management. The permeable pavement can also help fertilizing soil. Water going underground will help to recharge aquifer. The lighter-color of pavement can also decrease the reflection and then reduce urban heat island. Recycling materials are used in pavement to reduce. Using white LED lighting in proper height will reduce lighting using and make energy efficiency, and the same time, reduce lighting pollution and preserving dark sky.

• **Social Aspect**
This is an opportunity for residents to contribute to the health of the urban ecosystem by implementing best management practices like using native landscaping, building rain gardens, installing rain barrels, composting and, no surprise, considering green roofs.

• **Economic Aspect**
Instead of investing more money to redesign and reconstruct sewer system in the city, the Green Alley Project is only repaving with recycling materials.

• **Functional Aspect**
Instead of putting more water into the existing full sewer system and reconstructing, the Green Alley project is using new methods to deal with stormwater.

III. Approaches/Strategies
• Storm water management
• Green pavement materials with conventional drainage
• Alley infiltration using permeable pavement
• Recycled materials
• Glare reduction and dark sky preservation
• Energy efficiency and energy conservation

IV. Design Implications
• Impermeable pavement to help dealing with stormwater management
• Using recycling materials
• Reducing urban heat island by paving lighter-color pavement
• Engaging local residents to participating in the eco-friendly urban space maintenance
• Considering sustainable solutions for adjacent properties
• Setting proper lighting to create safety space meanwhile reducing glare pollution
II. Mixed Use Alleys

i. Seattle Nord Alley

1. Project Summary
Nord Alley is a small lane in the Pioneer Square neighborhood, framed by two rows of 3 to 4 stories mixed use buildings, including, art galleries, entertainment, retail and restaurants. The Pioneer Square has been designated as a “Clear Alleys Project” business district, beginning on March 30, 2009. Nord Alley is located between 1st Ave. S. and Occidental Ave S., and connects S. Jackson St. and S. Main Street. The north end is adjacent to Occidental Park. Nord alley was used for storing dumpsters and it was just another rainy and dark alley in Seattle which was friendlier to rats and crime, like many alleys in the US.

A non-profit organization based in Seattle, International Sustainability Institute, has been the lead organization behind the alley activation projects. The mission of this organization is “to bring world-wide sustainability to the Puget Sound” (http://www.isiseattle.org/). It has been leading an effort with countless neighbors, businesses, colleagues and community groups to transform Pioneer Square’s alleys into one of its unrivaled assets. After first party in Nord Alley in 2008, neighborhood residents and businesses recognized the potential of alleys for open space. Nord Alley has held nearly 100 events with more than 5,000 people in attendance from that time. Nord Alley becomes the pioneer study and example of alley project in Seattle. It enhances the walkability, connectivity and sociality of the Pioneer Square neighborhood. It promotes the study of downtown Seattle’s alley, walkability and potential spaces, although the weather will limit the outdoor events in Seattle. Transformation of Nord Alley could be such an important glimpse of the future: such workaday alleys have huge potential. Across the urban Northwest and beyond areas, neighbors are beginning to reclaim their lanes, turning them into pedestrian passages, marketplaces, and even gathering places—car-free, human-scaled, interesting and intimate. Tyler Falk said in his article: “The possibilities of these neglected urban courtyards are ample, and city-makers are taking note (http://www.smartplanet.com/blog/cities/transforming-urban-alleys-into-great-urban-spaces/828).” It is possible to create pedestrian friendly green network by reclaiming and using these paces.
II. Project Assessment

• **Environmental Aspect**
  Planters hanging in the wall and along alley will become green connection to the Occidental park.

• **Social Aspect**
  The Nord Alleys events, especially Thursday parties offer great opportunities for Pioneer Square to boost healthy activity on its streets and feed its vibrant arts culture.

• **Economic Aspect**
  By leveraging funds from government, private foundations, and local businesses and tying together a wide variety of people-public space experts, community organizers, marketing professionals and students - Pioneer Square is working together to create great public spaces. The art installations and exhibition in Nord Alley will somehow attract people to visit, activate and buy artwork from local artists.

• **Functional Aspect**
  The clean, green, and nighttime using will create great walking paths. The dumpsters are relocated in certain area for trash truck picking up within limitation time.

III. Approaches & Strategies:

• Moving the dumpsters to clean-up alley, removing the boards from the windows, and buying some yard furniture and plants
• Installing artwork (glass and metal sculpture over the Nord Alley) and planting to beautify the alley.
• Arranging some special events weekly or monthly to activate (monthly parties and art walk)

IV. Design Implications

• Blue-Green Lungs: considering stormwater management and green space
• Cleaning it up
• Cooperating with public and existing services and projects
• Bring people into this forgotten place by diverse activities
• Meeting people’s needs by programmed activities relating to surrounding building and land use
I. Project Summary
Melbourne, Australia, a city that has been working for two decades to create a pedestrian-friendly downtown. Melbourne’s laneways are at the heart of the effort. The central city is built on a grid of large blocks about 600-foot-long, and alleys were not part of the city’s original 1837 grid plan. Alleys cut the blocks up into pedestrian-scaled pieces. These places were neglected and full of crime like many American alleys. The city of Melbourne is an incredible collection of alley activities. Its initiative has advanced far beyond the plants-and-street-furniture phase. It has not only permitted but encouraged the remodeling of its alleys into outdoor cafés, marketplaces, and other pedestrian Meccas.
Rob Adams, Melbourne’s director of city design, says “the change occurred as Melbourne began to require that every development in the city take a careful look at how buildings meet the street” (http://daily.sightline.org/2011/08/26/alley-alley-in-come-free-2/).

The key to thriving pedestrian places, he says, is in the details of urban life, like the traffic-blocking bollards below in Melbourne’s Hosier Alley. It is in the quality of the public art and paving, rather than on big architectural projects. Public space was at the forefront of their agenda, and rather than being seen as places for garbage, the laneways were treated as a unique form of urban space that needed to be embraced and improved. The city began supporting businesses willing to start shops in alleys and the arts and cultural arm of the city council created the Laneway Commissions, a curated art festival in downtown alleys now running its eleventh year. In the past, the lane was part of a thriving clothing manufacturing industry. This industry has long gone through the area is still the center of the fashion industry. Hosier Lane is one of Melbourne’s most obvious attractions. The adjacent buildings include restaurants, retails, and mixed-use. Unlike many of the city’s hidden or long-reaching laneways, Hosier provides an easily accessible example of how the council allows Melbourne’s minds to wander. It has become such a signature part of Melbourne’s downtown, which are a nice gesture but never seem to match the quality of the historic spaces that make this city one of the most unique grids.
II. Project Assessment
• **Economic Aspect**
Hosier Lane is one of Melbourne’s most obvious attractions. The increasing populations of this area will increase the number of visitors and tourists, which will be the opportunity to encourage local business.

• **Social Aspect**
The city planning department calls these phenomena “micro-cultures” and whole-heartedly embraces them. Since the laneways and other forms of public space have been at the forefront of Melbourne’s city council, the downtown has seen an immense population growth that continues to climb today. Street art encourages people to stay, watch, communicate and meet with other people. The street art project is also introducing pedestrian friendly and people’s place for residents.

III. Approaches & Strategies
• public art implementation
• government supports business

IV. Design Implications
• Street art will encourage the use of the street and create social place
• Public art showcases decorate the street
I. Project Summary
Livable laneways Vancouver is a non-profit organization dedicated to transforming the overlooked laneways and alleys of Vancouver into pedestrian-friendly civic spaces. The beginning of this project was not very successful. However, it got the support by the VIVA Vancouver Program, which is transforming street spaces into people places and giving extra space to walk, bike, dance, skate, sit, hang out with friends and meet your neighbors.

Located in between Broadway and East 8th off Main Street, the Livable Laneways alley is running through an area, which is multi-use, including commercial, residential, retails and restaurants, and medium to high density buildings (1, 3 and more story), in the city’s Mount Pleasant neighborhood. Sutherland finds his paint-jobs repeatedly sprayed over by taggers and the alley has long been a dumping ground for old furniture and household trash that reappears in the alley just after a cleanup crew has finished working. The city of Vancouver is looking at this initiative as a pilot project that can be replicated in other parts of the city if it is successful. Reimer said that the city was trying to think of novel ways to reduce waste so that they could reduce back alley dumpsters and potentially open up more public space.
II. Project Assessment

• **Social Aspect**
  Events, night-time events, public gathering, local art showcase

• **Economic Aspect**
  Market (including farmer’s market and art market), live music, fashion show, local business

III. Approaches/Strategies

Scheduled multiple events, including night events, to encourage people to use the forgotten and previously unpleasant spaces.

IV. Design Implications:

- Multiple events scheduled
- Street art installation
III. Residential Alleys

i. Los Angeles North Hollywood Alley

I. Project Summary
There are 900 miles of alleys in Los Angeles. The whole size of the alleys is twice the size of the New York’s Central Park. Scattered throughout the city in neighborhoods, commercial zones, downtown, and Los Angeles’s industrial areas, the alleys, for the most part, are ignored. They are used as trash pickup, loading and garage access; they are considered as dark and often dangerous spots. The City of Los Angeles has embarked on a journey to transform streets and alleys from their current state of unsightly, urban heat islands to green passage ways that not only serve as a means for transportation but also as a path to preserving environment and natural resources. Meanwhile, the Community Redevelopment Agency of the City of Los Angeles is beginning a new kind of community health project—clean up the dirty and dangerous alleys that surround the apartment complexes throughout South East LA and turn them into safe, usable spaces for residents to exercise and grow gardens.

The North Hollywood Alley Retrofit Project is chosen by above project teams to become a leading project for showcase. It is proposed to help improve water quality in the Los Angeles River, alleviate local flooding, and recharge the San Fernando Groundwater Basin. The improvements will also aesthetically enhance the neighborhood. Using funds from both the Departments of Public Works and Water and Power, the $800,000 this project will improve four contiguous alleyway segments by installing permeable pavers to capture storm water runoff, to reduce local flooding and infiltrate it into underground aquifers for recharging purposes. The project will improve a total of 1,075 feet of alleys and will install catch basins, which will divert polluted urban runoff from the adjacent streets into the alley where it will then permeate into the ground. This project is a component of the City’s larger Green Streets Program, a new and growing program within Los Angeles that works to develop and implement new and sustainable solutions for managing storm water. It’s a pioneering way of dealing with rainwater, one of most precious resources, and one that will help to transform Los Angeles into a true present-day emerald city. The shortage of money to fix or rebuild these will restrict the development of the city wide alley revitalization. However, the adjacent users would be a great treasure, not only in investment, also in maintenance.

II. Project Assessment

• **Environmental Aspect**
Vertical gardens and vegetation on alley walls will potentially create more green spaces, which will also introduce effective microclimate into alleys. Permeable pavement and storing basin will help to save water. And all factors will help to reduce urban heat island.

• **Social Aspect**
New alleys will be a pedestrian friendly space. They will be playing places for kids. Increasing use will bring more people – eyes- on street, which will enhance safety. It will be more accessible to backside of commercial buildings, retails and restaurants.
• **Economic Aspect**
The idea is to allow dual access to the shops and restaurants by turning the alleyways into a European-style pedestrian thoroughfare with terrace seating at cafés and restaurants along the way. The business owners recognized the potential benefits of pedestrian space and agreed to a new tax assessment that would direct money into a fund to clean up and redesign the neglected alleyways.

• **Functional Aspect**
After the clean up, new lights and permeable roads will be installed. And then the alleys will become a safe and walkable lane. In additional street furniture and planting will encourage people to use alleys.

III. Approaches/Strategies
Increasing green space, encouraging walking and playing, cooling the neighborhood, saving water, avoiding expensive water treatment, and reducing crime and build communities by providing safe community spaces.

- Light colored paving to reduce the heat island effect;
- Cross walk striping, lights, and signage to encourage pedestrian use and increase workability;
- Native and drought tolerant planting to help green and beautify the neighborhood;
- A host of innovative techniques to capture and infiltrate storm water from nearby alleys and streets.

IV. Design Implications
- The trash pickup spots should be convenient and accessible for residents and also trash truck.
- Increasing vertical use will help to bring more green spaces into alleys.
- Proper pavement and water collection and storage will deal with stormwater issues.
I. Project Summary
There are 300 blocks on Linden Street in San Francisco, and none of them ever looked better. A café called Blue Bottle turned an alley into a scene, which invites customs to use the alley as an outdoor cafe place. It encouraged the owner and landlord to think about reclaiming the alley. In a city that pays endless service to street life, this 100-foot-long strip where Linden meets Gough Street hints of a future that might or might not come to pass. It shows that lasting design can resonate, striking an attractive balance between those of us in automobiles and those of us on foot. The idea was to blur the line between sidewalk and street, but the design had to be open for fire trucks to race through if need be. Linden Living Alley is a non-profit that specializes in designing streets for diverse public uses. This project takes four and a half year to complete. Before sending out a cadre of workers to go rework our alleys, however, the plan calls for the city government to establish a process for the remakes, first developing a “prototype” and then creating a process through which residents can suggest their own improvements.

II. Project Assessment
• Environmental Aspect
By introducing more planting, this linear space is becoming a green corridor. The permeable pavement will help stormwater management.
• Social Aspect
This alley becomes an intimate social setting for people to linger and relax. The project seeks to inspire local residents to transform other Hayes valley alleys to form a pedestrian network.
• Economic Aspect
Creating additional spaces for adjacent restaurants and commercial area.
• Functional Aspect
In a neighborhood under served by parks and gridded with high-volume traffic corridors, the conversion of this portion of Linden alley is creating a pedestrian-friendly, “green” street creates. The raised roadbed slows traffic, while putting people on the same footing as cars. Paved with a uniform permeable material, the widened sidewalks are separated and defined from the lane by planting and granite curbstone seating.
III. Approaches/Strategies
In a neighborhood under served by parks and gridded with high-volume traffic corridors, the conversion of this portion of Linden alley into a pedestrian-friendly, “green” street creates an intimate social setting for people to linger and relax. The raised roadbed slows traffic, while putting people on the same footing as cars. Paved with a uniform permeable material, the widened sidewalks are separated and defined from the lane by planting and granite curbstone seating. The project seeks to inspire local residents to transform other Hayes valley alleys to form a pedestrian network.

IV. Design Implications
• Separation of vehicle and pedestrian circulation
• Planting will be great treasures in this linear space
• Moveable and casual street furniture will create wonderful outdoor gathering spaces.
I. Project Summary
Post Alley is located between Western Ave. and 1st Ave., and Pike St. and University St. The adjacent buildings are mixed type, from 3 stories to high-rise and mixed use, including retails, cafes, restaurants, food services, market, theater, residential, office, commercial, parking garage, etc. This alley is considered as two parts: upper and lower. The upper alley connects to the Pike Place Market. The success of Pipe Market attracts more people to come to visit this place and use the Post Alley as circulation. The Post Alley is a great example to show how a small lane can be successful. The surrounding environment will support the activities in the alley. The Post Alley is related to tourism, as it is adjacent to Pike Place Market, which increase the alley usage but may also limit it. The capacity will be a significant restriction of the usage.

II. Project Assessment
• Social Aspect
  Multi use of the Post Alley will provide diversity.
• Economic Aspect
  Outdoor café, restaurant and other type of business will activate this enclosure space.
• Functional Aspect
  The Post Alley services as traditional function for delivery and vehicular access. Because of adjacent to Pike Place Market, the major function for Post Alley is connection to the destination.

IV. Historical Alleys

i. Seattle Post Alley
III. Approaches & Strategies
- outdoor cafes and restaurants
- tourism site

IV. Design Implications
- Destinations connectivity
- Outdoor activities
- Multiple uses
I. Project Summary
There are a lot interesting views about San Francisco, and one of them is: “One of San Francisco’s lure is its labyrinth of back alleys, those mysterious midblock detours that seem to offer, in equal doses, the promise of discovery and the slightly scary possibility of getting lost — really lost (http://travel.nytimes.com/2008/03/30/travel/30springbreak.html?pagewanted=all&_r=0).” Nearly 30 percent of urban space is given to streets, including alleys. Unlike many cities that have built over or ignored their old service streets, San Francisco has embraced them, with tourist-friendly spots.

San Francisco’s Chinatown is the largest Chinatown in US, and also the oldest, which is full of secrets and back-alleys. Neighborhood in this Chinatown is one the most densely in the United States. In 1998, San Francisco approved for Chinatown the only alley master plan, called Chinatown Alleyway Renovation Program then in force in the United States. The plan calls for renovating 31 alleys. The prime movers behind the plan were Department of Public Works (DPW) and the non-profit Chinatown Development Commission, which saw reviving alleys as a way to reclaim community assets. The alleyway renovation projects were designed to reduce illegal parking and vehicular access, in order to improve pedestrian safety, mandate access improvements for the disabled and elderly, reduce illegal dumping through the consolidation of dumpster areas, create open space through the installation of landscape features and seating where appropriate, provide attractive and safe secondary streets for tourists and visitors, resulting in economic vitality for Chinatown, and improve the overall quality of life for Chinatown residents. The Adopt-An-Alleyway Youth Empowerment Project is a non-profit project of the Chinatown Community Development Center that is based in the San Francisco Chinatown area. Volunteers clean the alleyways of San Francisco’s Chinatown, organize monthly programs for seniors and children, and provide tours with Chinatown Alleyway Tours. This volunteer group helps to introduce the culture, history and life in Chinatown to tourists, which helps to propel the Chinatown alley project.

Design and construction work for Phase One started in 1999. Since the adoption of the Chinatown Alleyway Master Plan, four phases of alleyway renovation projects have been completed to date. The alleys renovated include Jack Kerouac, Waverly Place, John, Commercial, Ross, Cordelia and Hang Ah. The last phase, phase five: Beckett, Wentworth and Cooper alleyways will be completed in 2010. So far, San Francisco has updated almost a dozen of Chinatown’s alleys, installing new paving, street furniture, stormwater features, vegetation and public art. The alley tours become the most popular and top 10 experiences in San Francisco. After the earthquake the rebuild process of the whole city was a big promotion. Chinese culture and the high density of this place make alleys popular. Making this place as a real living community rather than a tourism spot is important.
II. Project Assessment

• **Social Aspect**
As part of Chinese culture, the alleys in San Francisco’s Chinatown are preserved. They are used by residents about their daily lives. Alleys are places where people hang out together and meet each other. It creates open space through the installation of landscape features and seating where appropriate, provide attractive and safe secondary streets for tourists and visitors, and improve the overall quality of life for Chinatown residents.

• **Economic Aspect**
Alleys are the additional outdoor spaces for surrounding commercial and residential buildings. They are the accesses to the street shops. The Chinatown Alleyway Tours creates job opportunities while it introduces the culture, history and habits of Chinatown alleys.

• **Functional Aspect**
Access to the adjacent buildings are preserved. This project is trying to reduce illegal parking and vehicular access, in order to improve pedestrian safety, mandate access improvements for the disabled and elderly, reduce illegal dumping through the consolidation of dumpster areas.

III. Approaches & Strategies

• clean up spaces
• events scheduled

IV. Design Implications

• The success of the Chinatown Alleys is not only about the surrounding context, including high density, but also the full understand of the culture and usage of these areas.
• Reducing cars, including access and parking.
• Installing landscape, such as streetscape, street furniture, planting, painting and more.
Design Implications

**Chicago Green Alley**
- Impermeable pavement to help dealing with stormwater management
- Using recycling materials
- Reducing urban heat island by paving lighter-color pavement
- Engaging local residents to participating in the eco-friendly urban space maintenance
- Considering sustainable solutions for adjacent properties, such as recycling, composting, permeable pavement, energy efficient, naturalized detention, bioswales and vegetated swales, planting trees, using native landscape, designing rain garden and rain barrel/cistern, and green roof
- Setting proper lighting to create safety space meanwhile reducing glare pollution

**Seattle Nord Alley**
- Blue-Green Lungs: considering stormwater management and green space
- Cleaning it up
- Cooperating with public and existing services and projects
- Bring people into this forgotten place by multi-activities
- Meeting people’s needs by programmed activities relating to surrounding building and land use

**Melbourne Hosier Lane**
- Street art will encourage the use of the street and create social place
- Public art showcases decorate the street

**Vancouver Livable Laneways**
- Multiple events scheduled
- Street art installation
Los Angeles North Hollywood Alley
- Cleanup the alleys
- The trash pickup spots should be convenient and accessible for residents and also trash truck.
- Increasing vertical use will help to bring more green spaces into alleys.
- Proper pavement and water collection and storage will deal with stormwater issues.

San Francisco Liden Alley
- Separation of vehicle and pedestrian circulation
- Planting will be great treasures in this linear space
- Moveable and casual street furniture will create wonderful outdoor gathering spaces.

Seattle Post Alley
- Destinations connectivity
- Outdoor activities
- Multiple uses

San Francisco Chinatown
- Reducing cars, including access and parking.
- Installing landscape, such as streetscape, street furniture, planting, painting and more.
ANALYSIS

I. Location

II. Site Conditions
- Climate
- Streetcar & Bike Friendly street
- Events
- Green Newworks

III. Three Sites
- Introduction
- Mixed Use Alleys
- Residential Alleys
- University Alleys
This section illustrates some of the general facts of the City of Tucson, the study area and looks more specifically at climate, social context and other important facts of three typical alleys. The synthesis of each site aided in development of programming for particular alley type and design for the users.
The study area is located in the central Tucson. The map on the next page shows the study area within the blue-purple line. It is a walkable distance - 1/4 mile - from the streetcar line. This area is the heart of Tucson. There are two major activity areas within this study area: downtown and the University of Arizona. The City of Tucson Parks and Recreation Department said in its mission statement in 2006: “To provide a park system offering high quality facilities, programs and services for Tucsonans of all ages and abilities.” And, the Regional Transportation Plan have plan for 2030: “…an inclusive, people-focused plan to create an efficiently linked variety of transportation choices in a regional system that serves all people.” The existing alleys are fragmental, cut by big blocks and other physical barriers. In order to create green networks in the future, alleys should be considered to connect with the existing and developing green spaces, green streets and other destinations. However, they can also be the other dimension and level to create pedestrian, bicycle and people-friendly transportation and green networks.
Site Conditions

General Facts

- Tucson is the second-largest populated city in Arizona, and the 33rd largest city and the 52nd largest metropolitan area in the United States.
- Tucson is located in the Sonoran Desert, one of the hottest deserts in North America.
- According to 2010 United States Census, the City of Tucson’ population is at 520,116.
- The average elevation in the city is 2,389 ft., and it is surrounded by five mountain ranges: the Tucson, Santa Catalina, Rincon, Santa Rita, and Tortolitas.

Temperature & Precipitation

- The average temperature in Tucson is 68 °F.
- Tucson receives on average 10.9 in of precipitation annually or 0.9 in each month.
- Mean relative humidity for an average year is recorded as 29.2% and on a monthly basis it ranges from 16% in May to 40% in January.
- Hours of sunshine range between 8.4 hours per day in January and 13.1 hours per day in June. On average there are 3,852 sunshine hours annually and approximately 10.6 sunlight hours for each day.

http://www.tucson.climatemps.com/

Land use Types

Land use in the study area are generally divided into six types. They are green areas, including parks and other major green spaces; residential areas; University of Arizona; mixed use areas, including commercial and other mixed use areas; industrial areas and government usage areas. Alleys are located mostly within mixed us, residential and university areas.
The streetcar project in Tucson provides potential transit solutions connecting major activity centers in the central core, including downtown Tucson, Río Nuevo, the 4th Avenue/Main Gate business districts, the University of Arizona, and the Arizona Health Sciences Center. The overall long-range transportation goal is to provide a safe, efficient, economical, attractive, and integrated transit connection that offers convenient, accessible, and affordable mobility within this area.

General goals of Streetcar Project:
- Connect Major Activity Centers
- Economic Development
- Population and Employment Growth
- Improve Transit Service
- Reduce parking
The Regional Transportation Authority’s (RTA) goal is to increase mobility and accessibility for all travel modes throughout the region. Bicycle travel will benefit substantially as more than 550 miles of bicycle lanes (two way) and shared-use paths will be constructed over the 20-year term of the RTA Plan (July 1, 2006 - June 30, 2025). The vision for bicycling in the Pima Association of Governments’ region has long been one of providing for and facilitating more and safer bicycle travel on a region-wide basis. Achieving this vision will allow bicyclists to ride to activity areas, transit stops, schools, parks, natural resources areas, and employment areas, using a safer, continuous, and connected system of bikeways.
Site Conditions

Events

Tucson Meet Yourself
The mission of Tucson Meet Yourself is “to research, document, interpret and present the living traditional arts and expressions of everyday life of the folk and ethnic communities of the multi-national Arizona-Sonora region.” Over hundreds of food vendors are assembled in the downtown area, and they represent different cultures and countries. Live performances and shows introduce multiple culture. (http://www.tucsonmeetyourself.org/)

All Souls Procession
The All Souls Procession, and now the entire All Souls Weekend, is a celebration and mourning of the lives of our loved ones who have passed. It is one of the most important, inclusive and authentic public ceremonies in North America today. (http://www.allsoulsprocession.org)
Second Saturdays
Tucson offers plenty of activities and events for families, and downtown Second Saturday is one of them. Free, live music and entertainment and more than hundreds of vendors are there on 4th Avenue. This event brings downtown back to life. (http://www.2ndsaturdaysdowntown.com/)

Tucson Gem and Mineral Show
The Tucson Gem and Mineral Show is held every year on the second full weekend of February. It has set the standard for gem and mineral shows around the world, and is now the largest gem and mineral show in the United States. Proceeds from the Show remain in the Tucson economy and are used to support mineral knowledge and appreciation. (http://www.tgms.org/)
Site Conditions

Green Networks

Green spaces within the study area are segmental. Major green spaces are A-moutain, riparian spaces along Santa Cruz River, Arroyo Chico Wash, University of Arizona and others. Major greenway and green street are El Paso & Southwestern Greenway, Scott Avenue, University Avenue and others.

The map on the right page shows potentials of green networks along streetcar within the study area by connecting revitalized alleys with pedestrian and bike friendly streets, existing green spaces and other amenities and destinations.
Based on the different land use types in study area, three representative alleys are chosen to be the design models. The first one is a mixed use alley in the downtown area, called Arizona Avenue and located between Congress Street and Broadway Boulevard. The second one is Bean Avenue between University Boulevard and 4th Street and is considered as a residential alley. The last one is within the University of Arizona, west of Mountain Avenue, between Speedway Boulevard and 2nd Street.
Residential Area

- Chose residential site
- Green Network
- Street Car Line
- 1/4 Mile Distance from Street Car

Residential alleys are continuously running through residential area.

University Area

- Chose university site
- Green Network
- Street Car Line
- 1/4 Mile Distance from Street Car

University alleys are discontinuous, mostly limited vehicular access and used by pedestrian.
I. Mixed Use Alley

Location
Arizona Avenue, between Congress Street & Broadway Boulevard

Users
Downtown staff and visitors, public & services

Size
220 feet long and 22 feet wide

Context
This alley has strong connection with public transportation. It connects to the streetcar at both ends. At the north side of the alley, across Congress Street, is the Ronstadt Transit Center, which is the major public transportation hub in downtown Tucson. Located in a mixed use area, this alley is surrounded by one to three stories high building, including: Shot in the Dark Cafe, HUB Restaurant, Playground Bar & Lounge, Buffalo Exchange, Jonny Gibson Gym Equipment Company, Bellovin & Karnas, Pc: David Karnas Attorney at Law, art gallery and others. At the center of the alley are two parking lots. It runs north to south getting shade most of the time. Elevation slightly runs down from 2,394 ft. at the south to 2,392 ft. at the north.

Pros and Cons
Pros:
multiple pavers, community chalk board, few seats and tables for outdoor cafe and restaurants, decorations on walls
Cons:
utility lines, trash cans, barely maintenance, downspouts
Synthesis

Spaces/Elements

- entry with signage
- multi-function trail and path
- connect to destinations
- public outdoor events area
- outdoor cafe & restaurant
- farmer’s market
- green space
- bike storage
- movable planter
- shade
- art display
- history and culture display
- lighting
- street furniture
- water harvesting
- renewable energy showcase
- service accessibility

- circulation
- pedestrian circulation
- green spaces
- art or public showcase
- social spaces
- parking
- entrance
- water flow
II. Residential Alley

Location
Bean Avenue, between 4th Street & University Boulevard

Users
residents & services

Size
200 feet long and 18 feet wide

Context
Bean Avenue is a narrow street and serves the same functions as other alleys: trash cans are scattered everywhere, utility lines line both sides, there are few accesses for adjacent properties and parking along one side. This particular section is north-south oriented and crossed by two other unnamed west-east alleys. The Streetcar runs at the north end of this alley on University Boulevard that is also a bike friendly street. One of Tucson’s bike boulevards, 4th Avenue is a block west, and the University of Arizona is two blocks east. The alley gets shades from the adjacent building and canopy trees. Elevation generally goes down from 2,400 ft. at the northwest to 2,406 ft. at the southeast. But the highest point is in the center, which provides water harvesting opportunities. Several accesses for buildings, garages and yards are located in the alley. Existing yards provide green spaces, but are mostly blocked by walls and fences.

Pros and Cons
Pros:
residential yards, diverse materials and colors
Cons:
unpaved surface, utility lines, trash cans, fences & walls
Synthesis

Spaces/Elements

- community outdoor events area
- green space
- community garden / sharing garden
- connect to desirable spaces and/or other destinations
- low water use native plants
- shade
- recreational spaces
- kids area
- lighting
- residents’ art showcase
- street furniture
- water harvesting
- renewable energy showcase
- recycling materials
- service vehicular accessibility

- circulation
- pedestrian circulation
- green spaces
- art or public showcase
- social spaces
- parking
- entrance
- water flow
III. University Alley

Location
between Speedway Boulevard & 2nd Street, west of Mountain Avenue

Users
students, faculties & services

Size
700 feet long and 18 feet wide

Context
This alley is unique as it is located in the University of Arizona and surrounded by both academic and campus life buildings. It connects to the Streetcar at south end on Second Street. The student union and major university activity places are 300 ft. south of this alley. About 40 parking spots are along the alley and most of them are service parking with limited time. Two parking lots are located at the north end and the middle of the alley. The alley is oriented north and south and is shaded in most of the time. A narrow lane crosses the alley in the middle and connects to academic buildings and a parking lot at the west, and to the Mountain Avenue and 1st Street at east. Elevation changes in the middle providing opportunities for water harvesting.

Pros and Cons
Pros:
Oy Vey Cafe, on-ground painting, water harvesting features, green spaces, signage
Cons:
utility lines, trash cans, parking
Academic building
Limited green space
Utility lines
Trash can
Limited parking
Impervious paving
Undefined entry
Students’ campus life
Synthesis

Spaces/Elements

- multi-function trail and path
- connect to destinations
- public outdoor events area
- outdoor classroom
- academic space
- educational space
- green space
- bike storage
- shade
- art display
- history and culture display
- lighting
- street furniture
- water harvesting
- renewable energy showcase
- service vehicular accessibility

- circulation
- pedestrian circulation
- green spaces
- art or public showcase
- social spaces
- parking
- entrance
- water flow
DESIGN

Program

I. Mixed Use Area
   • Plan
   • Perspective

II. Residential Area
   • Plan
   • Perspective

III. University Area
   • Plan
   • Perspective
Following is an expanded description of the concepts for each site, site plans with labeled features, applications, as well as perspectives, detailed design and design elements to help illustrate the design and function of each site.
### Objectives

- Promote walkability
- Increase safety night time using
- Create multiple function path and trail
- Create green infrastructure
- Promote recycling and reuse materials
- Create green network and connection
- Celebrate history and culture
- Create daily or weekly social activities
- Use artworks to attract people
- Create commercial opportunities

### Functions

- shared use
- connectivity
- conventional function
- economic aspect
- art
- social space
- storm water management
- recycling
- green space
### Programming

- Increasing more outdoor spaces in urban area;
- Create identified spaces to increase safety;
- Adding green spaces;
- Introducing places to explore, gathering and other activities;
- Providing art and community program opportunities.

### Space/Element

<table>
<thead>
<tr>
<th>Types</th>
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<tbody>
<tr>
<td>accessibility</td>
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<tr>
<td>history and culture display</td>
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<td>street furniture</td>
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<td>signage</td>
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<tr>
<td>recycling materials</td>
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<tr>
<td>low water use planting</td>
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<tr>
<td>water harvesting</td>
</tr>
<tr>
<td>safety</td>
</tr>
</tbody>
</table>

### Types

- mixed use alleys
- residential alleys
- university alleys
Program

- conventional function
- multi-use path
- connectivity
- gathering space
- events (day & night)

5. morning pick-up and delivery
6. multi-use path
7. start school & work
8. office meeting
9. coffee and breakfast
10. recreation
11. lunch
12. outdoor events
ROUTINE MAINTENANCE

LOADING AND UNLOADING

OFF SCHOOL & WORK

DINNER

HAPPY HOUR

EVENING EVENTS
In order to attract people to this alley, both entrances are highlighted by paving changing and extending across the major city street. Different paving materials are used to identify different spaces.

Vehicular circulation should be limited not only on time but also physical accesses, especially in those highly active places. However, services for loading, trash pick-up and maintenance are necessary. In this plan, trash picking areas are moved to the north-central area, and service vehicles have access to the north part of the alley. The south part of the alley is only for pedestrians or bikes, but planters are movable when an emergency happens. The whole alley is accessible and friendly to pedestrians and bikes by using permeable paving to be distinguished from circulation.

Adjacent vacant lots or parking lots should be used for alley events temporarily. In this case, parking lots in the central part are paved and can be used for farmers’ markets and other public events.

The alley’s function should associate with adjacent building uses. In this particular alley, nearby uses include an outdoor cafe at the south entry, restaurants and bars in the middle, retail stores at the north entry.

Movable planters are the primary green elements for mixed use or commercial use alleys. In addition, rain gardens and other green space should also be considered while there are enough spaces. Rain gardens in this alley can combine with downspouts from buildings, and they will work for water harvesting.
I. Mixed Use Alley

The bird’s eye view shows a clearer spatial relationship. From both entrances the curvilinear paving will lead people into this alley. The major gathering space will be in the center.

Roof run-off will be collected by downspout and then go into the adjacent rain gardens and/or drainage system. Pavement will be pervious in the alley, which will collect stormwater. The overflow and collected stormwater will be stored in an underground cistern.
I. Mixed Use Alley

North Entry

Spaces/Elements

- entry with signage
- multi-function trail and path
- connect to destinations
- green space
- bike storage
- shade
- art display
- history and culture display
- lighting
- street furniture
- water harvesting
- service vehicular accessibility

Description

A branch shaped arch will be built at the north entry, bringing nature back to the urban context. It will be over 18’ high for access. Green space is along the east side. It will provide shade for adjacent buildings in the afternoon, one method to make the area energy efficient. It can be used for water harvesting. Several benches will be placed along the green space, under the canopy trees. The existing community chalk board is on the east side building wall and painted by local artists. The west building wall is also used for public art showcase like mosaic and others. Lights in this area will hang on the walls, providing appropriate lighting and on the ground with curved linear shape leading people to explore this alley.

Program Relationship

- shared use
- conventional function
- connectivity
- recycling
- green space
- art
- social space
- storm water management

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I. Mixed Use Alley

Outdoor Cafe

Spaces/Elements

- entry with signage
- multi-function trail and path
- connect to destinations
- outdoor cafe & restaurant
- green space
- bike storage
- movable planter
- shade
- art display
- lighting
- street furniture
- water harvesting
- renewable energy showcase

Description

A cafe is at the south entry, where there are some outdoor seats and a bike parking rack. To extend these existing features will be the easiest way to bring people to use this alley. More seats, tables and umbrellas will be put at the other side of the cafe in the alley, which will create a corner cafe. Additional bike parking will be on the east side of this entry. This part of the alley will be closed by installing movable planters. However, those planters can be moved for emergency. The rain garden and green space will be designed to connect with building downspouts for water harvesting purpose. Signs and paintings on the wall will be public art showcase to attract people. Overhead lights will make this place a unique nighttime event area. The trash area behind this entrance will be fenced.

Program Relationship

- social space
- economic aspect
- art
- green space
- recycling
- storm water management
- shared use
Pavements will change and extend to connect the other alleys at each entrance, where signs will be used as safety caution and attraction. A woonerf with minimum 15’ feet wide will be created in order to calm traffic and be accessible for services on Bean Avenue. Four trash pick-up areas will be located in the major alley. The other two crossing alleys will be narrowed to 12’ wide by greening spaces on both sides and limiting service vehicles. These narrower alleys will be designed to be kid or dog friendly alleys.

Two crossings will be highlighted as major gathering spaces by pavement changing in addition street furniture. Green spaces will include sharing garden, rain garden, native planting area, and movable planters. They will be suggested to connect with residential yards. The blending of green spaces will blur the boundary between public and private and create cozy semi-public spaces, eventually, generating strong community sense.

Different height lights will be used to increase diversity in scale. Lights on Bean Avenue will be the highest and use wind and solar power.
II. Residential Alley

Bird’s Eye View

The bird’s eye view shows the relationship between these three alleys. The crossings will be used as major gathering spaces for temporary community events.

The major alley will be a woonerf and stormwater will be collected in adjacent green spaces.
II. Residential Alley

Sharing Garden

Spaces/Elements
- community outdoor events area
- green space
- community garden / sharing garden
- low water use native plants
- shade
- kids area
- lighting
- residents’ art showcase
- street furniture
- water harvesting
- renewable energy showcase
- recycling materials
- service vehicular accessibility

Description
The sharing garden will be a place where people can share tasks and other sources, thereby growing food together and sharing food produced. This will be a great way to create residents’ responsibility for their community. People will get together at those wide or open spaces to share their life with their neighbors. Vertical plants will be suggested for some places as green visual amenities and additional green space, instead of blank unappealing fences and walls. Solar power lights will be used in the major alley as a green energy showcase.

Program Relationship
II. Residential Alley

Dog Friendly Alley

Spaces/Elements

- community outdoor events area
- green space
- connect to desirable spaces and/or other destinations
- low water use native plants
- shade
- recreational spaces
- lighting
- furniture
- water harvesting
- renewable energy showcase
- recycling materials
- service vehicular accessibility

Description

Alleys in residential area should meet residents’ daily use needs. Dog walking will be one of them. This dog friendly alley will be partially closed for vehicular circulation at certain times, so people can walk their dogs leisurely. There will be dog stations, so people can discard dog waste and have a place for dogs to drink. Lights will align at the wall at appropriate height and in the green space to lead the direction. Paving will be pervious and constructed for water harvesting.

Program Relationship
Alleys in university areas are unique, because they have access, maintenance and service functions, as well as academic and educational purposes. The University of Arizona is a great pedestrian and bicycle friendly campus, which also has diverse public transportation services. This particular alley services academic buildings as well as student campus life. It has traffic pressure at rush hours, because of conflicts between pedestrian, bike and vehicles. Separation of service and non-service vehicular circulation will be important. By pavement changing, people will walk there easily and safely. Parking in the alley will be limited and be relocated, in some cases to adjacent parking lots and garages. Few service parking will be changed into green parking with pervious paving and green space.

Four gathering spaces will be identified. One will be at the south entry, where there will be a turf area. Suggesting low water use, low cost and low maintenance landscape, this turf area is changed to decomposed granite (DG) with planting spaces and seating areas. It will be used as a study area and outdoor food area. Two smaller ones will be redesigned and occupied existing parking spaces. They will be meant to be used by students who live in the adjacent dorms for outdoor events. The major gathering space will be in the center. It will be a transition area from academic to student living, and it will connect academic buildings to Mountain Avenue and 1st Street. Installing seats, tables, more plants and other features within existing green spaces will encourage people to use and gather in this space. Elevations change dramatically at this area, which will be graded appropriately for water harvesting. Rain gardens will be designed adjacent to downspouts, parking and low elevation areas. Green walls will be another dimension of green spaces.
public art wall

gathering
academic space
seats and tables
south entrance

gathering space
green parking
water harvesting
green space
(rain garden)

north entrance
pedestrian path
Min. 15’ wide
(service access)

seats and tables
gathering academic space
gathering space
movable planter

seats and tables
south entrance
III. University Alley

Bird’s Eye View

The bird’s eye view shows the spatial relationship: two small lanes connect at the center creating a major gathering and transition areas.

Roof run-off will be collected by downspout and then go into the rain adjacent rain gardens, bioswale, landscape areas and/or drainage system. Pavement is pervious in the alley and parking lot, which will collect stormwater. The overflow and collected stormwater will be stored in underground cistern.
III. University Alley

South Entry

Spaces/Elements

- multi-function trail and path
- connect to destinations
- public outdoor events area
- outdoor cafe
- academic space
- educational space
- green space
- bike storage
- shade
- art display
- lighting
- street furniture
- water harvesting
- renewable energy showcase
- service vehicular accessibility

Description

Oy Vey cafe is at the southeast entry corner within the Hillel Building, which serves a Jewish community in University of Arizona. An existing food shack will be reopened and provide opportunities for people to meet others. The other side of the entry will be an academic building providing great shade. Changing and reducing half existing turf landscape into decomposed granite (DG), planting spaces, seats and tables will decrease water, money and maintenance, and meanwhile let people really use this space. Green walls will not only used to increase green areas, but also will provide research opportunities. Alley’s paving will be changed to pervious.

Program Relationship

- connectivity
- social space
- economic aspect
- green space
- storm water management
- recycling
- art
- shared use
III. University Alley

Academic Gathering Space

Spaces/Elements

- multi-function trail and path
- connect to destinations
- public outdoor events area
- outdoor classroom
- academic space
- educational space
- green space
- bike storage
- shade
- art display
- lighting
- street furniture
- water harvesting
- renewable energy showcase
- service vehicular accessibility

Description

Two small lanes connect to this alley in the center. This area will be considered as a major gathering space for academic and student living. The west one is between two academic buildings and will have great green spaces with water harvesting. Adding seats, tables and other features will bring people to active this place. The east one runs to Mountain Avenue and connects to 1st Street. This major gathering area will be considered as a transition area. Elevations change dramatically here, but after appropriately grading, it will be effectively used for water harvesting. Parking spaces along the student dorms will be changed to green parking with pervious paving and planting area.
Alley Design Elements

- Circulation
- Stormwater Management
- Lights
- Trash Pick-up
- Sign
Followings are major alley design alternative elements for different alley types. They are circulation, stormwater management, lights, trash pick-up and signs. They should be chose upon the specific alley’s conditions.
Circulation

pedestrian and non-service vehicular access
This type alley is accessible to non-service vehicles, pedestrians and bikes. It should be at minimum 12’ wide. They can also serve to outdoor cafes, restaurants and other types of events.
multi-use path
This type of alley is accessible to almost all types of circulations. It should be at minimum 15’ wide.

separation of vehicles and pedestrians
This type of alley is accessible to vehicular circulation at minimum 15’ and to pedestrian at minimum 6’ wide.
Stormwater management

A rain garden is a planted depression or a hole that allows rainwater runoff from impervious urban areas, like roofs, driveways, walkways, parking lots, and compacted lawn areas, the opportunity to be absorbed. Rain gardens can cut down on the amount of pollution reaching creeks and streams by up to 30%. Rain gardens are fairly simple to care for and initially create. Even a small rain garden helps prevent stormwater pollution entering our water resources.

Permeable paving is a range of sustainable materials and techniques for permeable pavements with a base and subbase that allow the movement of stormwater through the surface. In addition to reducing runoff, this effectively traps suspended solids and filters pollutants from the water. The goal is to control stormwater at the source, reduce runoff and improve water quality by filtering pollutants in the substrata layers.
Infiltration planters are structures or containers with open bottoms to allow stormwater to slowly infiltrate into the ground. They contain a layer of gravel, soil, and vegetation. Stormwater runoff temporarily pools on top of the soil, and then slowly infiltrates through the planter into the ground. Infiltration planters come in many sizes and shapes, and are made of stone, concrete, brick, plastic lumber, or wood. Infiltration planters are not recommended for soils that don’t drain well. Use flow-through planters instead.

A permeable paver system is a self-draining system. The voids in the surface of the paving allow water to drain through and into the soil beneath. Permeable pavers are a great solution to this ever-present environmental issue, for they allow the rainwater to percolate into the soils, rather than becoming a runoff issue.
General Design Principles:

1. Subtle but recognizable distinctions can be made between major and minor roads, paths, and use areas by varying the distribution and brightness of the light, and the height, spacing, and color of lamps.

2. Clear lighting patterns reinforce the direction of circulation, delineate intersections, and provide a visual cue to what conditions may lie ahead.

3. Glare from exposed light sources and under lighting are major safety concerns. Luminaires location and mounting height, fixture type, and lamp intensity must be carefully selected to optimize light distribution and minimize glare.

4. Security is not necessarily enhanced by increasing illuminance levels on the ground; consider peripheral lighting, vertical illuminance levels, and good color-rendering sources as well.

5. Color differentiation, unobtrusive illumination of background spaces, and bright illumination of objects of interest are common approaches for articulation landscape character.

(Harris and Dines, 1976)

Lights on traffic routes perform a dual function. They provide lighting not only to enable the pedestrian to walk safely but also to enable vehicular traffic to be driven safely. The height of this light should be a minimum of 20' to 30'. Using solar and wind energy can reduce energy consumption.
Vertical lights distribution over walkway areas should cover or overlap at a height of 7' so that visual recognition of other pedestrians is maintained. But these lights will be designed to direct light downward to reduce lighting pollution and glaring.

These fixtures are nearly always used to light vertical surfaces. Therefore, photometrics will be presented on a vertical plane with the fixture set at an optimum distance. Glare must be controlled.

Uplights for all-around viewing are designed to direct pedestrian and to light the surrounding environment. Trees next to these light will be evergreen and places will be closed for vehicles.

Low-level landscape lights will be usually 6” to 10” high. They will potentially offer finite light patterns, with directing capabilities. They will be usually below eye level, so glare must be controlled.
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Alley Design Elements

Trash pickup

1. waste sorting and recycling

Recycling products like glass, plastic, and metal containers through the Tucson Blue Bag Recycling Program is a simple and inexpensive way to reduce waste hauled to landfills, while saving energy and natural resources.

2. trash center station

Instead of picking up at dispersed locations, trash can be gathered at one spot within a certain distance. This would be easier for maintenance and less impact on surrounding uses.

3. garbage enclosure

Garbage areas should be enclosed with fences, walls or green spaces. They should be placed in private properties, not public streets and alleys. They are easy to maintain and have less impact than the traditional way.

4. multiple times daily pickup

Instead of picking up few days per week, trash trucks can service several times per day to pick up trash. People will deliver their garbage at that time. This will reduce the oversize trash cans impact.
Signs

Placement and height of signage is important. Signage for sighted people is most easily seen at approximately eye level, at an angle perpendicular to the path of travel or within a 30 degree angle to the center line of the sign. Reading distance determines where it should be placed. Signs should not be obscured or confused with other graphics and should be easily recognized for what they represent. Signage intended for those with visual impairments should be well lit and/or located for easy access and touch (Harris and Dines, 1976).

multiple sign styles

dog friendly  pedestrian friendly  kid friendly
Conclusion

I hope through this report the importance of sometimes forgotten small urban spaces can be emphasized. Specifically, three distinguished alley designs can serve as examples and design models for different alley types. On a grand scale green networks can be created by alleys, green streets and other green spaces.
Literature Sources

LITERATURE REVIEWS


Case Reviews


DESIGN
Image Sources

Image citations are listed by page number, from left to right and top to bottom. All images not cited here are worked by author.

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