The green alley project is a student lead initiative focused on implementing green alley re-designs that promote sustainability and neighborhood connectivity. This project address stormwater, walkable neighborhoods, and livability through site-specific designs and policy recommendations.

The purpose of this report is to facilitate conversations, inspire ideas, and serve as a foundation from which to initiate a green alley program in the city of Eugene. This report was specifically prepared for City of the Eugene with the hopes that within its pages they will find the inspiration to not only encourage the adoption of green infrastructure in neighborhood alleyways but to actively seek and help in its implementation.

What begin as a student project has captured the imagination of residents and businesses alike. Many of whom would like to see this project go from study to implementation.

The Green Alley Project has been proudly endorsed by the following local business:
## Section 1: Introduction

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Alleys have been a unique part of urban life for more than 2000 years providing a place for neighbors to interact, children to play, services to be located, rear access points, as well as a variety of other functions. Residential alleys were once commonplace across much of the urban American landscape where they provided for “untidy but routine service activities” such as coal delivery and chamber pot disposal. Alleys were an important component of the urban fabric serving a mainly functional role in the cities infrastructure. Yet, by 1825 the word alley concocted an image in people’s minds of the back alley, the street of poor people. Alleys had a bad reputation and became associated with inferior classes, criminal activity, and “breeding grounds of disease”.

The images on the left by Jacob Riis author of “How the other half lives” published in 1889 show the crowded alley tenements of New York City. Riis’ work was instrumental in improving the living conditions of the poor of New York. His image of the crowded, often squalor ridden alleys and the intimate portraits of the families, individuals, and orphaned children that called them home evoked a city wide effort to clean up the streets and more importantly the back alleys.

In the 1930s, the federal housing policy officially disapproved of alleys leading in 1934 to the Federal Housing Act that created the “Alley Dwelling Authority” which began eliminating poor African American communities from alley housing in Washington D.C. A nationwide effort ensued as cities across the United States started “cleaning up alleys” and by 1937 paving over alleys had become the nation’s new standard.
The perception of alleys as dark and dangerous areas has changed little over time. As one scholar has put it “Alleys are controversial. Because they have been systematically and articulately denigrated as wasteful and dangerous for so many decades…”1. As a result in a number of cities across the US alleys are often left over forgotten public space.

Alleys like streets are public right of ways and so maintenance responsibility is officially with the municipality. However, as alleys lost their relevance as local infrastructure many municipalities ceased routine maintenance or encouraged the legal abandonment of alleys.2 The result of which can lead to the further dereliction of alleys creating a self-fulfilling stereotype of the back alley.

However, a resurgence of alley revitalization has begun to sweep the nation as municipalities, citizens, designers, and planners recognize the inherent value of alleys. This alley revitalization aims to make alleys a vibrant component of communities improving accessibility, aesthetics, and green infrastructure.

The Montreal green alley program gives residents adjacent to alleys the opportunity to remove pavement in whole or part and plant native plants. The program is primarily funded by Environment Canada EcoAction a non-profit organization with municipal support. The popularity of the program has lead to the creation of more than two dozen green alleys.

In Detroit, a group of concerned citizens and businesses have banned together to create Detroit’s first green alley located in a mixed use alley in Midtown.

The project incorporates stormwater retention, native plants, historic pavers, and induction lighting.3 The creators of the alley hope that it will be the first of many green ribbons through the city.4
The living alley project developed by the City of San Francisco planning department is developing a community vision to make alleys “safe, enjoyable, and accessible to all”. The goal of the living alley project is to “enable residents to engage in place making -- to create a public realm that strengthens the community, creates a sense of identity, and makes a more useful, safe, and attractive neighborhood.”

As a number of cities are discovering redesigned green alleys can provide services such as park and recreation space, pedestrian linkages, usable social spaces, stormwater management, and reduced crime such as vandalism and illegal dumping. The cities that have adopted green alley programs have reported a number of ecological, social, and economic benefits.

This study begins by complying a list of best management practices for stormwater management how they are used, approximate cost, and maintenance needs.

These best management practices can be applied at a variety of different scales and have been used in a number of sustainable complete streets and green alley projects across North America.

The report then examines three different green alley programs in Chicago, Vancouver B.C., and Los Angeles and the lessons they learned. These case studies were chosen for the methods that were employed as well as for the availability of detailed information about the challenges, funding, maintenance, and cost of the programs.

In the following chapters this study will analyze the City of Eugene’s alleyways, specifically focusing on unimproved gravel alleys and the communities they impact. This analysis includes stormwater runoff, neighborhood alley types, public perception of alleys, and an examination of the impacts of poorly maintained alleys.

The report then introduces several green alley redesign concepts directly applicable to Eugene alleys and analyzes the associated social and environmental benefits.

The study concludes with recommendations on establishing a green alley program in the city of Eugene and outlines the next steps needed to establish a green alley pilot project.
## Best Management Practices

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<tr>
<td><strong>Trees</strong></td>
<td>Trees slow down and capture rain with their leaves and branches. The soil absorbs additional runoff that is absorbed by the tree and released through Evapotranspiration. Runoff that isn’t absorbed is slowed down.</td>
<td>Cost varies with the size and type of tree. The general range for a sapling is $20-$100. Larger trees can cost as much as $2,000.</td>
<td>Selecting and appropriately siting trees can reduce maintenance needs and costs. Trees typically require more care and maintenance during their establishment periods. However routine maintenance would include raking, weeding, pruning, and controlling pests.</td>
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<tr>
<td><strong>Vegetated Swale</strong></td>
<td>Vegetated swales treat stormwater primarily through infiltration. The plants filter and slow stormwater helping to pull out pollutants and allowing sediment to settle. Stormwater that is not absorbed is slowed down before being conveyed downstream.</td>
<td>While cost vary swales are relatively inexpensive and can cost less than standard drainage systems.</td>
<td>Swales must be inspected periodically, especially after major storm events to remove sediment and trash and to repair inlets, curb cuts, check dams and outlets as need.</td>
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<tr>
<td><strong>Grass Swale</strong></td>
<td>Grass swales help slow stormwater runoff and facilitate infiltration. The reduced velocity helps sediment to settle before water is conveyed to a downstream discharge location</td>
<td>While cost vary swales are relatively inexpensive and can cost less than standard drainage systems.</td>
<td>Swales must be inspected periodically, especially after major storm events to remove sediment and trash and to repair inlets, curb cuts, check dams and outlets as need.</td>
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<tr>
<td><strong>Vegetated Infiltration Basin/Raingarden</strong></td>
<td>Vegetated infiltration basins or rain garden can dramatically reduce stormwater runoff. Designed primarily for infiltration they can filter out pollutants and can help recharge groundwater.</td>
<td>Cost vary with the size, site condition and type of vegetation used. However, costs compare with conventional stormwater systems.</td>
<td>Vegetation and structure must be inspected periodically especially after major storm events. Remove sediment, debris and trash and repair inlets, embankments, berms, dams, and outlets as needed.</td>
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<tr>
<td>Infiltration Planter</td>
<td>Infiltration planters reduce stormwater runoff flow rate and infiltration helping to recharge groundwater. They are especially suited to locations with limited space.</td>
<td>Costs vary on size and materials. For new development of redevelopment cost can be less than conventional stormwater treatment. Estimates range from $25/sf-$65/sf.</td>
<td>Plants and structural components must be checked periodically. Remove sediment, debris and trash from inlets and curb cuts as needed.</td>
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<tr>
<td>Flow Through Planter</td>
<td>Flow through planters are designed to detain and filter stormwater runoff before it is conveyed downstream. They filter water through plants and growing medium before excess water ultimately collects in a perforated pipe at the bottom of the container and is conveyed.</td>
<td>Costs vary on size and materials. For new development of redevelopment cost can be less than conventional stormwater treatment. Estimates range from $25/sf-$67/sf.</td>
<td>Plants and structural components must be checked periodically. Remove sediment, debris and trash from inlets and curb cuts and other features where debris may obstruct flow as needed.</td>
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<tr>
<td>Permeable Pavement</td>
<td>Permeable pavement is designed to allow water to filter through its surface to the sub grade below. It reduces runoff rates and increases infiltration helping to recharge ground water. In well draining soils permeable pavement can eliminate the need for underground drains.</td>
<td>Costs range depending on the size of the installation. Estimates range from $11/sf-$26/sf.</td>
<td>Pervious pavement needs different maintenance equipment than conventional pavement and it is important to prevent clogging and maintain permeability. Properly installed and maintained pervious</td>
</tr>
<tr>
<td>Permeable Pavers</td>
<td>similar to permeable pavement permeable pavers allow stormwater to flow through the surface to the sub grade below. Made up of individual pavers on a sand base the joints are filled with permeable materials reducing runoff rates, increasing filtration and helping to recharge ground water.</td>
<td>Costs range depending on the size of the installation. Estimates range from $5/sf-$26/sf.</td>
<td>Permeable pavers need to be maintained to prevent sedimentation and clogging. Annual vacuum sweeping along with occasional weeding or scorching.</td>
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### BMP Information Table

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<td><strong>Reinforced Grass Grid</strong></td>
<td>Similar in function to permeable pavers reinforced grass grid pavers provide the structural support of a landscape while providing the permeability of grass. They reduce runoff rates and volume while increasing infiltration.</td>
<td>Installation costs are higher than for conventional paving. Estimates range from $4/sf-$23/sf</td>
<td>Maintenance is similar to a regular lawn requiring mowing, irrigation, and occasional reseeding. Use of native grass can reduce maintenance needs. Measures to control sedimentation and soil compaction will prevent clogging and help maintain permeability.</td>
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<tr>
<td><strong>Infiltration Trench</strong></td>
<td>The infiltration trench is a long narrow trench that can be filled with rocks and sand. The trench can be open, covered by grating, vegetation, grass or sand. Infiltration trenches need to be properly installed and located to avoid polluting ground water supplies. However, proper use can reduce runoff and slow runoff rates.</td>
<td>Costs vary on size and materials. For new development of redevelopment cost can be less than conventional stormwater treatment. Estimates range from $14/sf-$43/sf.</td>
<td>Plants and structural components must be checked periodically. Remove sediment, debris and trash from inlets and curb cuts as needed.</td>
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<tr>
<td><strong>Drywell</strong></td>
<td>Drywells are modified catch basins that are perforated to allow stormwater infiltration into the ground. Drywells are a disposal only system and must be paired with water quality or pretreatment. Existing catch basins can be modified by drilling holes in them.</td>
<td>Drywells are available from numerous construction supply companies. Costs range from $1,200-$12,000 ea.</td>
<td>Maintenance requires controlling erosion, removing debris, and cleaning and repairing inlets and outlet pipes. Clogged drywells must be replaced. However, properly maintained drywells can last 30 years.</td>
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Best Management Practices were compiled from:

The city of Chicago has been the trendsetter for green alley programs across the country. The Chicago Green Alley Program won National ASLA Awards in 2007 and the green alleys themselves earned the Chicago Innovation Award, from The Chicago Sun Times and Kuczmarski & Associates (a Chicago based innovation consulting firm).

The Green Alley Program’s focus primarily lies with stormwater management in alleys without installing storm drains in alleys. However, the initiative took advantage of the redesign opportunity to reduce light pollution, mitigate the urban heat island effect, and use recyclable and sustainable materials.

Initial funding for the project, est. at $900,000, covered research and development of materials, 6 pilot projects, and the development of a handbook.

The incredible success of the pilot projects lead the program to expand to 32 alleys in its first year. By the projects 2nd year the Green Alley Program had become a line item in the city’s annual budget. The program has become an established element of the DOT and continues to grow in popularity.
Main purpose: Manage stormwater by installing green infrastructure in alleys

Additional objectives: Functional drainage, reduce heat island effect, incorporate recycled materials, reduce light pollution

Tools: Pitched and graded alley surface, permeable pavement, high albedo pavement, recycled construction materials, dark sky compliant light fixtures

Pilot(s): 6 pilots (2006 and 2007)

Maintenance: Funded by the Department of Transportation; alleys designed with minimal daily maintenance requirements

Funding: Alderman discretionary funds for capital improvement projects; Green Alley options were added to menu of options

Challenges: Skepticism “green” techniques would work; acquiring support and buy-in; no local or regional manufacturers of new materials; high labor and materials costs on first initial projects
The city of Vancouver, BC initiated dual programs in 2003 the Sustainable Streets programs and the Country Lanes program focused on alleys. The programs goals were stormwater management, salmon habitat, and street beautification. Chief amongst the cities rationale was to “provide a more aesthetically pleasing lane treatment that would encourage residents to take more ownership of the lane and help create a more livable community”.6

The initial attempt to implement the Country Lanes project through the Local Improvement Lane (a process that puts the burden of cost on adjacent landowners) process failed as many residents were reluctant to pay for a project with unknown costs and affects.7 However, the strong merits of the programs compelled the City Council to provide a budget of $225,000.

While funds to continue the project have been an issue the initial pilot project have been judged a success winning the Technical Innovation Award from the American Public Works Association and an honourable Environmental Award from the Canadian Association of Municipal Administrators in 2003. According to the City the projects has also been an “overwhelming success in terms of community involvement and education Resident feedback suggests the majority of residents are happy with their Country Lanes. In fact, in a follow-up questionnaire, 52% of respondents stated that they would be prepared to pay an extra 50% to have a Country Lane rather than a full width asphalt lane.” 8
Shown above and below the popularity of country lanes has lead to wide spread adoption.

**Program:** Country Lanes, Sustainable Streets

**Main Purposes:** Storm water management, salmon habitat, and street beautification

**Additional objectives:** Manage stormwater, improve natural environment and urban sustainability

**Tools:** Reduce impervious surface, increase tree and shrub plantings, esp. native species; install bioswales, and landscaping and repaving

**Pilot(s):** Three Country Lane pilot projects; one sustainable street pilot

**Maintenance:** City’s responsibility; mostly necessary due to poor performance of grid products

**Funding:** Pilots funded by City and grant from the Federation of Canadian Municipalities; program will be funded by local improvements program

**Challenges:** Higher cost than standard paving, poor performance of materials, finding residential groups willing and able to fund projects.

In 2008, the city of Los Angeles began looking into Green Alleys after a combination of university of community led initiatives helped build broad support for the project. The Los Angeles green alley program is unique in that it seeks to not only address stormwater and public safety issues but has recognized that the deterioration of alleys and lack of public parks in less affluent neighborhoods raises a social justice issue. As such the city has embraced green alley programs as a way to increase urban green infrastructure, to improve social equity, and encourage economic development.

While the project remains in its early stages, the city has developed a design guide book and partnered with a local NGO the Neighborhood Land Trust to identify and fund pilot projects. In Fall of 2012, The City of Los Angeles Community Redevelopment Agency in partnership with the Trust for Public Land, California State Polytechnic University, and Jefferson High School Green Academy sought a $271,000 grant from the state to create the South Los Angeles Green Alleys Master Plan.9

Green Alley Scenario 1

Green Alley Scenario 2

Green Alley Scenario 3

All images are taken from the City of Los Angeles’ Green Street & Green Alleys Design Guidelines Standards 1st Edition September 4, 2009.
Green Alley Scenario 4

Program: South Los Angeles Green Alleys Plan

Main Purpose: Creating recreational opportunities, encouraging neighborhood walkability and connectivity, greening the urban matrix, reducing crime, social equity, and economic development

Additional objectives: Improving water quality and supply

Tools: Local interagency, NGO, and university cooperation

Pilot(s): In progress

Maintenance: Unavailable

Funding: Sustainable Communities Planning Grant, Donations

Challenges: Due to the preoccupations with alley safety and sanitation and to high residential turnover (a large proportion of residents are renters), it has been challenging to involve residents in the design phase.

Green Alley Scenario 5

Green Alley Scenario 6
The City of Eugene is approximately 44.6 square miles in size. Within city limits there are 712 miles of roads and 45 miles of alleys.\(^1\) By comparison the city of Portland is 145.6 square miles in size has nearly 2,600 miles of roads and 76 miles of alleys.\(^2\) The city of Salem is 48.5 square miles with 688 mile of roads and 37 miles of alleys.\(^3\) The city of Eugene, 1/3 the size of Oregon’s largest city, has more than half as many alleys giving the city of Eugene the highest concentration of alleys per mile in the state.

Of Eugene’s alleyways 26 miles are unpaved gravel alleys\(^4\) in various conditions ranging from completely overgrown, to dilapidated and in ill repair, to decent quality and repair. The vast majority of these alleys are residential alleys giving them a special distinction as neighborhood or community alleys.

In 1995, then university of Oregon landscape architecture graduate student Michael Martin wrote his master’s thesis “Learning from Alleys” of Eugene’s alleys he wrote:

“Eugene, Oregon is fairly typical of municipalities which still contain unpaved alleys within their confines. While virtually all of Eugene’s truly urban alleys were paved in concrete years ago, the remaining gravel alleys in the residential neighborhoods chronically suffer from the absence of maintenance. Potholes abound, and the only remedy is resident-initiated repairs or resident-financed paving.”\(^5\)

As party of this study I extensively surveyed the gravel alleys of the Friendly and Whiteaker neighborhoods that together account for nearly 10 miles of gravel alleys.

My direct observation of those alleys is similar to those of Martin’s nearly 20 years before me. Many of the alleys I surveyed are improperly graded for drainage, overgrown with invasive plants, or are places that encourage crime and drug use.
Within them I found graffiti, evidence of drug and alcohol use, pots holes and puddles large enough to eliminate pedestrian traffic, areas so over grown as to be completely impassable, and alleys claimed as private space.

Through my journeys and conversations I also discovered that alleys are lived in active spaces that make them unique cultural components of the neighborhood. Whether it is a pleasant off street walk or a dark wet alley to be avoided, neighborhood alleys are an imbedded special element of many residential neighborhoods.
What makes alleys unique is their unofficial character, their hiddeness. As Kevin Lynch writes “Alleys and backsides expose a rich collage of unwanted and recycled things. The landscape is untended and follows its own course, revealing much about the life of its inhabitants.” Alleys are appreciated because they fall out of the normal well kempt upkeep routinely applied to street fronts. Martin says this “Alleys are appreciated for the fact that they are not maintained, and because the ‘rules’ don’t apply here. They are a relief from the official landscape and from the domain of official control.”

However, the very character trait that in balance makes alleys appealing when unbalanced is what makes alleys disagreeable and unattractive.

Within the city of Eugene alleys are officially considered public right of ways. However, in practice alleys are quasi-public domain in which the public has access and use rights, yet the burden of maintenance and improvement rests with the adjacent landowners. While this is also true of streets the vast majority of streets have been improved to meet city standards and have become the responsibility of the city.

According to the city improved streets “provide safer traveling surfaces, reduce wear and tear on vehicles, improve drainage, decrease dust, and generally reduce the long-term maintenance costs for the City’s road network.” However, the city recognizes that cost is typically the deciding factor in landowners deciding whether or not to improve their alley. For this reason the city has created a subsidy program to help adjacent landowners pay for improvements to alleys based upon their income. While this policy can help home owners, it does little to address the needs of renters who have little control over what improvements landlords choose to make.

At present the city defines an improved alley as one that “has an asphalt or concrete surface built to accommodate the traffic load and has been designed to handle stormwater runoff.” While this type of improvement can reduce dust and alleviate on site drainage issues stormwater runoff from the alley actually increases and still drains untreated into local waterways.
Studies have shown that gravel alleys with regular vehicle use can have unhealthy levels of heavy metal and other pollution from vehicles’ brake pads, engine oil leaks, and incompletely burned exhaust. Heavy metals bond with soil and can get kicked up in dust, when it rains heavy metals become water-soluble and drain to the lowest point. In improperly drained alleys the lowest point can be huge potholes or low areas. Over time, these heavy metal and hydrocarbon pollutions can accumulate to unhealthy levels. As a 2008 study in Los Angeles found 3 out of 10 alleys tested had heavy metal and hydrocarbon pollution beyond health limits and would require some remediation.

In addition to potential harmful affects on humans, heavy metals, even in small doses, that are washed into waterways with stormwater have been shown to negatively affect Salmon and other fish species.

The city of Eugene’s 26 miles of gravel alleys vary in width from 12-20’ depending on adjacencies and use. For the purposes of stormwater calculations 5 random alleys were selected in GIS and their average width calculated. Using this method the average width was determined to be 16 feet. The width was then multiplied by the total length of alleys in feet (137,043) and converted to acreage. Eugene’s gravel alley thus account for approximately 50 acres of land. A runoff coefficient of .70 was used for gravel alleys (Oregon Dept. of Transportation Uses .85). During a 1 in. rain event 27,154 gallons of water falls on one acre of land. That means that during a 1 in. rain event nearly 1 million gallons of untreated stormwater runoff from gravel alleys flows directly into local waterways. With an annual average rainfall of 46.1 inches that’s over 43 million gallons of untreated stormwater a year flowing into the Willamette River and Amazon Creek. That is enough stormwater to fill 66 Olympic size swimming pools.

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HEAVY METALS IN CARS

**Lead:** tire wear, lubricating oil and grease, bearing wear  
**Zinc:** tire wear, motor oil, grease, brake emissions, corrosion of galvanized parts  
**Iron:** auto body rust, engine parts  
**Copper:** bearing wear, engine parts, brake emissions  
**Cadmium:** tire wear, fuel burning, batteries  
**Chromium:** air conditioning coolants, engine parts, brake emissions  
**Nickel:** diesel fuel and gasoline, lubricating oil, brake emissions  
**Aluminum:** auto body corrosion

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http://www.fairfaxcounty.gov
The images on the opposite page show the levels of stormwater runoff under current conditions and 3 scenarios that use 3 of the best management practices for stormwater: Turf Block, Permeable Paving, and 6'' Rain Basins.

The graphs show the amount of surface area of a given material in square feet. All stormwater runoff is calculated in gallons. The corresponding diagram shows a graphic representation of this process as applied to a single alley. The diagram also shows the additional runoff from adjacent properties that drain into alleys (This runoff is not calculated).

Figure 4.1 shows the current runoff condition for Eugene’s gravel alleys.

Figure 4.2 shows the runoff reduction that could be achieved if 10% of alley surface was comprised of Turf Block, 10% Permeable Paving, and 5% 6'' rain basins. By implementing green infrastructure in just 25% of gravel alleys stormwater runoff can be reduced by more than half to 471,122 gallons.

Figure 4.3 shows the amount of runoff that could be reduced if gravel alley surface area was replaced by 50% Turf Block and 50% Permeable paving. Stormwater runoff can be reduced even further to 373,368 gallons. This level of reduction, however, would require application to all 26 miles of current gravel alleys.

Figure 4.4 shows that alley runoff could be eliminated if 25% of surface area was Turf Block, 25% Permeable paving, and 10% 6'' rain basins. The implementation of this combination of green infrastructure could accommodate an additional 236,240 gallons of stormwater runoff from adjacent properties with application to 60% of gravel alleys.

While these calculations only take into account 3 kinds of stormwater treatment options they clearly show that even the addition of a little green infrastructure can have a dramatic impact on stormwater runoff from gravel alleys.
Figure 4.1 Current Alley Runoff.

Figure 4.2 Runoff with 25% Mixed Green Infrastructure.

Figure 4.3 Runoff with 100% Permeable Surface Area.

Figure 4.4 Runoff with 60% Mixed Green Infrastructure.
The Friendly Area Neighbors (FAN) neighborhood is located in south central Eugene. This vibrant community is home to 7,011 people. The majority of the neighborhood is composed of low-density residential housing with a peppering of high density housing and commercial property along the Willamette St. corridor.

The FAN neighborhood with 6.9 miles of unpaved/gravel alleys has the highest concentration of unimproved alleys in Eugene. The alley system is oriented North/South with alleys interspersed between most streets.

In the City of Eugene’s 2012 Draft on Potential Alley lots the FAN neighborhood was identified as having one of the highest numbers of lots meeting eligibility requirements for Accessory Dwelling Unit (ADU) development with an estimate that 25% of eligible lots would develop ADUs in the future. At present the neighborhood layout already means many lots are adjacent to an alley and any such new development would likely increase the already high level of alley use.

FAN’s neighborhood demographics indicate that nearly half of all residents are renters. Of which, 39% spend more than half of their income on rent. Of FAN neighborhood respondents 3 indicated that they rented and lived on an alley. 2 said that they were somewhat dissatisfied with their alley.

While the majority of resident owners paid less than 30% of income on housing costs 13% of owners pay more than 50% of income on housing. Of FAN neighborhood respondents 9 indicated that they owned and lived on an alley. 8 said that they were somewhat to very dissatisfied with their alley.

There are 73 acres of open space located within the FAN neighborhood. Residents have access to 4 parks. The largest, Amazon Park, is a destination park measuring nearly 100ac that straddles several neighborhoods.
Unimproved alleys account for 14.9 acres of the neighborhood, if alleys were open space they would be the neighborhoods 3rd largest park.

The majority of FAN neighborhood alleys are used by vehicles for parking, utilities/services access, or through ways. The condition of these alleys varies from potholed and over grown to well maintained. At present there are approximately 184 vehicle access points to garages, driveways, backyards, or accessory dwelling units (ADU) in these gravel alleys.

However, a significant number of FAN neighborhood alleys have gone unmaintained to the point of being inaccessible to vehicles. The majority of these alleys have high use trails through them indicating their popularity with pedestrians.
Many of these alleys already serve as de facto pedestrian greenways. Some of these alleys are used for compost bins or to store firewood. Yet, in others there is evidence of alcohol use and dumping. In many of these alleys how they are maintained corresponds with how they are used. The alleys that show signs of use by neighbors typically have less signs of vandalism or dumping. However, the vegetation in these alleys is largely made up of invasive plants that are easily established in disturbed areas. Which invasives become established can determine how and if an alley gets used.

In figure 5.1 we see an alley overgrown with invasive blackberry vines and ivy making an impenetrable barrier. The other end of this alley shown in figure 5.2 appears to have planted with invasive Laurel Cherry in an effort to close the alley off. The plants in this alley effectively eliminate all uses and users from this alley. By contrast, the alley in figure 5.3 and figure 5.4 has been overgrown by invasive grasses and Japanese Knotweed creating a completely different aesthetic. This alley gets regular use by all appearances with its trail, compost, and other signs of use.

The alley pictured in Figure 5.5 has lost all vehicle right of way due to overgrown vegetation. However, the established trail demonstrates the popularity of this alley with pedestrians.

As we see in Figure 5.6 and Figure 5.7 overgrown alleys that are navigable by pedestrians quickly become favorites for walkers. These alleys provide a secluded park-like feel that many find a welcome refuge from cars and the urban environment. However, these overgrown alleys can also serve to obscure poor social behavior and crime.

While vegetation in alleys is largely fortuitous. These examples show that alley vegetation is important in both establishing the characteristics of an alley as well as its uses.
Figure 5.1

Figure 5.2

Figure 5.3

Figure 5.4

Figure 5.5

Figure 5.6
The alley seen in Figure 5.8 is the same alley shown in Figure 5.7. However, from this vantage point we can see that this portion of the alley serves as a private driveway for the accessory dwelling unit located in this alley. The alley’s lack of overall maintenance allows this user to treat the alley as private property.

The alley shown in Figure 5.9 is used for limited vehicle access, garbage pick up and pedestrian use. Adjacent residences appear to use the alley in a similar fashion to the street with door and windows that open up to the alley. Rich gardens, trees, and flower beds line the sides of this moderately over-grown alley giving the alley a pleasant rural aesthetic that shows signs of care and maintenance.

Figure 5.10 is an alley in the beginning stages of dilapidation. The alley shows evidence of semi-regular vehicle use, however, the ruts indicate that vehicles may have difficulty when the alley is wet. While photographing this alley I observed both a cyclist and pedestrian using it as a through way.

The vegetation along the sides of this alley is predominately made up of blackberry. If this vegetation is left unchecked it is only a matter of time before this alley becomes overgrown and impassible to vehicles and potentially pedestrians. As we have seen in other examples.

The alley shown in Figure 5.11 has many similarities to the previous example. Here regular vehicle use has carved muddy ruts that make navigating the alley as a pedestrian near impossible even weeks after a rain event. The continued vehicle use of this alley will eventually deteriorate this grass and dirt alley into an alley that is inaccessible to vehicles.

Figure 5.12 most accurately portrays the idyllic image a gravel and grass alley. While both ivy and blackberry are present along one side of the alley the alley remains clear and accessible to both vehicle and pedestrians users. Like many alleys the further into it one travels the more messy the alley becomes which may ultimately lead to this alley becoming more of a nuisance than an amenity.
The Whiteaker Community Council (WCC) neighborhood is located in central Eugene. This vibrant community is home to 4,531 people.1 The WCC is a mixed use neighborhood that includes residential, commercial and light industrial areas. The majority of housing is medium to high density with some low density housing in the North and West. Much of the medium and high density housing is located adjacent to alleys.

The WCC neighborhood has 3 miles of unimproved gravel alleys. The majority of alleys are located in the south half of the neighborhood with an East/West orientation. There is also a small grouping of North/South alleys located in the Northeastern section of the neighborhood.

The WCC neighborhood demographics show that 4/5 of neighborhood residents are renters.2 Of which, 17% spend more than half of their income on rent.3 Of WCC neighborhood respondents 3 indicated that they rented and lived on an alley. All said that they were somewhat dissatisfied to dissatisfied with their alley.

Home owners account for 18% of neighborhood residents. Of which, only 9% pay more than half their income on housing costs.4 Of WCC neighborhood respondents 13 indicated that they owned and lived on an alley. All said that they were somewhat dissatisfied to very dissatisfied with their alley.

The WCC neighborhood has 7 parks (many along the south river bank) totaling 158 acres of open space making the WCC neighborhood one of the most park rich neighborhoods in the city.

Unimproved alleys account for approximately 6.4 acres of land. The vast majority of alleys are used for parking. There are approximately 143 vehicle access points the majority of which are access to multi car parking for medium and high density housing. The amount of parking located in these gravel alleys makes them among the most heavily used unimproved vehicle alleys in Eugene.
The vast majority of these gravel alleyways are in poor condition with severe drainage issues. That issue is compounded by the fact that the majority of parking lots adjacent to the alleys drain directly into the alleyway. Due to the combination of heavy vehicle use and poor drainage in the gravel alleys the soil should be tested for contaminants.

The poor condition of these alleys makes many of them inaccessible to pedestrians during and after rainstorms. This point is illustrated most dramatically in Figure 5.13 and Figure 5.14 both of the same alley. The alley runs adjacent to high and medium density housing on the immediate edge of the Whiteaker’s popular historic district. Here the puddles are so numerous and deep that after a rain storm a pedestrian or cyclist would be unable to navigate them without getting wet.
The improper grading and poor maintenance keep water from flowing to the stormwater drain located at the end of the alley.

This drainage issue is not an isolated condition but a consistent theme across WCC alleys. Figure 5.15 shows a large puddle in front of an accessory dwelling unit. Both the home and the driveway open on to the alley. It is predicted that future urban in fill will create more ADUs\(^5\) similar to this one leading to increased use and potentially compounding current alley issues.

Figure 5.16 shows a typical alley adjacent to high and medium density housing. The image shows the three parking lots that are accessed via the alley. The puddles near the dumpster are likely a result of garbage trucks that are too heavy to use the gravel alley without damaging it.

Figure 5.17 and Figure 5.18 show two of the parking lots that connect to the above alley. The former is comprised of asphalt with a center drain keeping stormwater runoff from entering the alley. The latter is a gravel parking lot on grade with the alley.

Figure 5.19 and 5.20 show the typical drainage pattern for WCC alleys. Stormwater from the parking lot and alley flows directly into the street drainage system contributing to localized flooding during rain events.

Figure 5.21 shows a two lane alley adjacent to high density housing. Stormwater from the roof of the covered parking and the gravel parking lot drains into the alley.

The graffiti shown in Figure 5.22 and Figure 5.23 is common in many WCC alleys. The few adjacencies that have painted murals on their alley facing walls have largely avoided all vandalism.

Figure 5.24 is an example of one of the few low density residential alleys found in the WCC. This alley has all the signs of regular use and maintenance.
Figure 5.13

Figure 5.14

Figure 5.15

Figure 5.16

Figure 5.17

Figure 5.18
As part of the analysis process I drove, walked, or biked all the alleys mapped in the Whiteaker and Friendly Neighborhoods. During these explorations I identified 3 basic alley types: “High Density Auto” alleys that are characterized by high and medium density adjacencies with heavy vehicle use; “Low Density Auto” alleys characterized by low density adjacencies with regular vehicle use; and “Low Density Pedestrian” alleys characterized by low density adjacencies with limited or no vehicle access. These three alley types can be further divided into six subclasses*.

High Density Auto (Figure 5.25)
Class 1- is a one-lane alley characterized by high and medium density adjacencies with heavy vehicle use and parking. Trash service is accessed via the alley. The heavy vehicle use combined with poor maintenance has resulted in numerous large potholes and drainage issues that make the alley unfriendly to pedestrians in wet weather.

Class 2- is a two-lane alley characterized by high and medium density adjacencies with heavy vehicle use and parking. Trash service is accessed via the alley. While heavily used by vehicles the width of the alley has spread vehicle impact out, resulting in a slight reduction in the number of potholes.

Low Density Auto (Figure 5.26)
Class 3- is a one-lane unimproved alley with low density adjacencies. The alley is used regularly by vehicles to access garage and alley parking in addition to accessing ADUs located on the alley. The regular use

*All alleys have utility poles located along their fence line, these poles are not shown in the diagrams for visual clarity.
by vehicles has resulted in mud ruts that in certain conditions can become impassable by both vehicles and pedestrians.

Class 4- is a one-lane gravel alley with low density adjacencies used regularly by vehicles to access garage parking or ADUs. Maintenance conditions vary, however, the majority of alleys in this typology had one or more drainage issues from large potholes to improper grading for drainage.

Low Density Pedestrian (Figure 5.27)
Class 5 - is a one-lane pedestrian alley with low density adjacencies. This typology gives all appearance of no vehicle use or ability for vehicles to access the alley. It is characterized by pedestrian trails through various vegetation (mostly invasive). A number of backyard fences are low enough to see over or are chain link reducing backyard privacy.

Class 6- is a one-lane pedestrian alley with low density adjacencies. Vegetation has become so thick in the alley that vehicle access is impossible. The over grown vegetation obscures most backyard fences and views and in areas becomes impassible even to pedestrians. Passable alleys typically have pedestrian trails through them.

While every alley is unique the majority of alleys found within the Friendly and Whiteaker area neighborhoods fit within one of these six classes. This may or may not be true of alleys found within other neighborhoods of Eugene.
In September 2013 I contacted the FAN area board to discuss the Green Alley Project with them while the project was still in its infancy. I was invited to give a presentation to the board where I outlined my neighborhood analysis of alleys and the goals and objectives of the Green Alley Project. The FAN Board invited me to write an article for the neighborhood newsletter as well as give a brief presentation at the October general meeting. The October presentation generated good dialogue and support for the project.

In December, the project held a green alley workshop at the Washington Park Center in the Friendly Neighborhood. Unfortunately, due to severe weather the workshop only had 6 attendees. However, the conversations that ensued helped to identify a number of concerns about the condition of the neighborhoods alleys, how they were used, and what people would change if they could.

The conversations at the workshop became a catalyst for the creation of an online survey and Facebook page to engage a wider public about the perception of Eugene Alleys. The survey and the Facebook page were announced in the FAN Newsletter and in the Eugene Weekly.

In January 2014, I presented the Green Alley Project to the Monthly meeting of the Whiteaker Community Council. The project was well received and supported by the Council Board members present. The Board announced the project, the survey, and the Facebook page to its email list encouraging people to support the project and take the survey. In addition, the Board hung the Green Alley Project poster in their community space.

There were 95 people who responded to the survey with 18 responses from the Friendly neighborhood and 26 responses from the Whiteaker neighborhood (see Figure 5.28). The majority of responses were from young people in their 20-30s, however, a substantial number of survey takers were 58 and older.
The survey received a nearly equal number of responses from renters and homeowners with 49 responses from renters and 46 responses from homeowners. Of survey takers, 61 indicated that they lived on an alley, with 41 people indicating that their alley was gravel or unimproved.

Individuals who replied that they lived adjacent to an alley were asked to rank their satisfaction with their alley’s current condition from Very Dissatisfied, Somewhat Dissatisfied, Satisfied, and Very Satisfied. Out of 59 responses only 11 indicated that they were satisfied with their alleys condition. 20 people indicated that they were somewhat dissatisfied, 12 that they were dissatisfied, and 16 that they were very dissatisfied. Responses are shown in Figure 5.29.

Individuals who responded that they lived on an alley were then asked if they would want their alleys improved. 51 people responded that they would want their alley improved if it cost them nothing, with 28 responding that they would want their alley improved even if they incurred cost.

All survey takers were asked if they used alleys and if so to identify how. Respondents were given the option to choose all that apply: Access Garage/Parking, Drive through, Bicycle, Walk, Other—Please Specify.

“Walk” received the most responses with 69, followed by bicycle with 44. “Access” and “Drive through” received a combined 60 responses. And “other” received 15 responses with the majority indicating that they picked blackberries in alleys.

Out of the 11 respondents who replied that they did not use alleys, nearly all identified that personal safety was the primary reason they avoided alley use.

Respondents were asked to list up to 5 concerns they had about alleys. Drainage or potholes were listed a combined 55 times. Crime, safety, and security were the next most common responses with 28. Other responses included graffiti, speeding cars, and a lack of lighting.

Respondents were then asked to list up to 5 things they thought were important about alleys. Access either to garages, homes, or backyards was the most common listed response occurring 45 times. Lighting was mentioned 29 times followed by safety with 25. Pedestrian or cycling use was mentioned 20 times. Other responses included slower traffic than roads, aesthetics, and maintenance.

Respondents were then asked to list up to 5 improvements they thought alleys should have. Lighting was the most commonly listed improvement with 41 responses. The next most commonly listed improvement were plantings of various types mentioned 36 times. Drainage, Seating, and trees were all mentioned 11 times each.

Finally, respondents were shown a poster (see figure 5.30) of elements and activities that could be in alleys and asked to choose their top three. Responses can be seen in Figure 5.31.
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<td>Santa Clara Community Organization</td>
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Figure 5.28 Survey Respondents By Neighborhood.

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<th>#</th>
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<th>Somewhat Dissatisfied</th>
<th>Satisfied</th>
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<th>Response</th>
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<td>12</td>
<td>20</td>
<td>11</td>
<td>-</td>
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Figure 5.29 Alley Satisfaction.
### Village Improvement Elements & Activities Poster

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<th>Responses</th>
<th>%</th>
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<tr>
<td>Ground Lights</td>
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<td>7</td>
<td>8.54%</td>
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<tr>
<td>Old Fashion Street light</td>
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<td>7</td>
<td>8.54%</td>
</tr>
<tr>
<td>LED Street light</td>
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<td>13</td>
<td>15.85%</td>
</tr>
<tr>
<td>Ornamental Plants</td>
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<td>1.22%</td>
</tr>
<tr>
<td>Native Plants</td>
<td></td>
<td>18</td>
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</tr>
<tr>
<td>Community Garden</td>
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<td>18.29%</td>
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<tr>
<td>Fruit/Nut Trees</td>
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<tr>
<td>Raingarden/bioswale</td>
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<td>19.51%</td>
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<td>1.22%</td>
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*Figure 5.30 (Left) Alley Improvement Elements & Activities Poster.*

*Figure 5.31 (Below) Alley Improvement Elements & Activities Poster.*

**Neighborhood Analysis**
Through the meetings, workshop, survey, conversations and site visits I learned many things about Eugene’s unimproved alleys and the people who love or hate them.

Alleys are public right of way that many people feel ownership over whether they live adjoining one or not. However, people with alley adjacencies feel a particular sense of possession. For these people the alley represents something entirely different from the street side of their homes. For some it is a partial extension of their private space: a place to garden, compost, store firewood. For others it is a way access to their home, yard, or garage. And for others it is simply a constant worry.

A number of Eugene’s gravel alleys have deteriorated to the point of being more of a liability than an asset due to poor drainage and a lack of maintenance others have over grown to the point of providing de facto green space and trails through neighborhoods. While still others maintain both functional use and a pleasant rural aesthetic.

What is true of all these alleys is that they are part of a disappearing landscape. In an age of urban densification these gravel alley backways are a throw back to a different era, a refreshing break from the asphalt and concrete streets and paths of an urban city. Gravel alleys that have been well maintained have a rural aesthetic that many find pleasant. However, gravel alleys that are dilapidated or in poor repair are often perceived as a nuisance or blight.

What is seemingly universal of people’s perceptions of alleys is that they are something inherently different from a street and should remain as such. Some people want alleys to be vibrant community oriented lived in spaces, while other would like alleys to remain quasi-private quiet spaces. Yet, to one degree or another all people want alleys to be pedestrian friendly spaces that can still accommodate the occasional vehicle, while reducing runoff and increasing vegetation. What people want is for their alleys to be a source of neighborhood pride.

The design concepts that follow are based on alleys located in the Friendly and Whiteaker neighborhoods. While the discerning eye will notice some elements have been moved or changed for graphic clarity all concepts are designed to meet current Eugene standards for alley width and emergency vehicle access unless otherwise noted.

The concepts are based upon conversations, survey responses, and my own sense of these alleys. The designs are intended to facilitate conversations, inspire ideas, and serve as a point of beginning.
1. High albedo concrete with recycled materials.
2. Permeable pavement material (permeable pavers, concrete or asphalt).
3. Dark Sky Compliant LED lighting.
4. Optional inlet structure with perforated pipe.

Section
1. Permeable pavement material (permeable pavers, concrete or asphalt).
2. Native plants
3. Dark sky compliant LED lighting.
4. Optional inlet structure with perforated pipe.
Before

After: Green Alley Redesign with Permeable Pavers & Native Plants
**HIGH DENSITY AUTO ALLEY 2**

28’ Wide Alley with High & Medium Density Adjacencies.

**OPTION 1**
CONVENTIONAL DRAINAGE WITH INFILTRATION PLANTERS

1. High albedo concrete with recycled materials.
2. Permeable pavement material (permeable pavers, concrete or asphalt).
3. Infiltration planter with native plants.

**OPTION 2**
PERMEABLE PAVING WITH BIOSWALE

1. Permeable pavement material (permeable pavers, concrete or asphalt).
2. Bioswale with native plants.

---

**Plan**

- **OPTION 1**
- **OPTION 2**

**Section**

1. High albedo concrete with recycled materials.
2. Curb cuts to allow water flow.
3. Infiltration planter with native plants.
Before

After: Green Alley Redesign with Permeable Pavers & Infiltration Planter
LOW DENSITY AUTO ALLEY

16’ Wide Alley with Low Density Adjacencies.

**OPTION 1** CONCRETE DRIVE STRIPS W/ TURF BLOCK & PERMEABLE PAVING

1. High albedo concrete with recycled materials.
2. Turf Block grass paver.
3. Permeable pavement material (permeable pavers, concrete or asphalt).

**OPTION 2** PERMEABLE PAVING & TURF BLOCK WITH TREES & PLANTS

1. Permeable pavement material (permeable pavers, concrete or asphalt).
2. Turf Block grass paver.
3. Trees and native plantings

---

**Plan**

1. High albedo concrete with recycled materials.
2. Turf Block grass paver.
3. Permeable pavement material (permeable pavers, concrete or asphalt).

**Section**

1. High albedo concrete with recycled materials.
2. Turf Block grass paver.
3. Permeable pavement material (permeable pavers, concrete or asphalt).
Before: Green Alley Redesign with Permeable Pavers, Turf Block, Trees, and Native Plantings.

After: Green Alley Redesign with Permeable Pavers, Turf Block, Trees, and Native Plantings.
Plan
1. Mown grass path.
2. Path lights.
3. Native or ornamental plantings.

Section
1. Mown grass path.
2. Path lights.
3. Native or ornamental plantings.

Plan
1. Bollard to block non-emergency vehicle access.
2. Bench on permeable paver pad
3. Permeable pavement material (permeable pavers, concrete or asphalt).
4. Drywell.
5. Fruit trees and native berry plantings.

Section
1. Bench on permeable paver pad
2. Permeable pavement material (permeable pavers, concrete or asphalt).
3. Drywell.
4. Fruit trees and native berry plantings.
Before

After: Green Alley Redesign with mown grass path, path lights, and ornamental and native plantings
Conclusion
This project began as a small idea and a series of conversations with Eugene residents. In a short amount of time it has grown into something much bigger. Support for the Green Alley Project continues to grow on a daily basis and the project has been endorsed by a number of local businesses.

The next step is to identify suitable sites for a pilot project and funding for implementation. To that end the following recommendations are suggested.

Policy
The Eugene/Springfield area is projected to grow to more than 300,000 people by 2035. The city of Eugene is currently proposing that new infill development be allowed in alleys presumably to help accommodate growth. This new development increases the likelihood that gravel alleys will be improved to accommodate access.

It is in the cities best interest to develop alley improvement policies that promote green infrastructure, stormwater treatment, and encourage neighborhood connectivity and pedestrian paths.

Pilot Project
The strong interest in green alleys and the potential benefits demonstrated in this study and in the case studies warrants a pilot project. The Whiteaker and Friendly neighborhoods could both benefit from such a pilot project. Further outreach and analysis needs to be conducted to locate a suitable alley and support from adjacent property owners.

The pilot project should be measured against current improved alleys for a period of time in order to identify strengths or weaknesses.

Funding
Current alley improvement policy requires that adjacent property owners fund alley improvement. However, grants may be available to the city from State or Federal Agencies for stormwater mitigation or community development. Additionally, local business that support green alleys may be willing to help fund a pilot project.

Partnership
The city of Eugene is home to a number of local and state non-profit organizations a number of which have mission statements and goals that are compatible with the green alley project. Outreach to these organization may result in collaborative efforts to implement and maintain green alley development.

The city is also home to the University of Oregon’s Architecture and Allied Arts School which was ranked #1 in sustainable design in 2012. The city should consider partnering with advanced design and planning studios that could conduct research and develop site designs for green alleys.

Maintenance
Present Eugene policy states that the city will be responsible for maintenance of alleys that are improved to city standards where
funding allows. Understandably, the city may have hesitations about accepting responsibility for maintenance of unproven green alleys. However, green alleys can be designed to require minimal maintenance needs. In addition, green alley designs have been shown to improve neighborhood livability and aesthetics making it likely that neighbors would help maintain green alleys as a source of neighborhood pride.

Maintenance needs could also be meet through partnerships with local non-profits, schools, and community groups.

Testing
While none of the alleys in this study have been tested for containments given a number of alleys high vehicle use and parking combined with years of poor drainage the author believes that it is likely that some alleys may be contaminated beyond Oregon health and safety standards and further investigation is recommended.
I would like to extend a very special thank you to all the people that helped make this project what it is:

Andrew Fisher
Rachel Burr
Emily Proudfoot
Damon Joyner
T.J Ames
Stacey Ripp
Mackenzie Walker
Mandy Shold
Sarah Holcombe
Robert Melnick
Anne Godfrey
Leo Yui
Deni Ruggeri
Liska Chan
Rob Ribe
Roxy Thoren
Kathryn Kuttis
Lilia Letsch

Don Rickman
Duncan Rhodes
Dennis Ramsey
The Friendly Area Neighbors
The Whiteaker Community Council
Alley Allies
Falling Sky
Ninkasi
Hop Valley
Growler Guys
Sweet Life
Izakaya Meiji Company
Red 5 Hotdog Company
Whiteaker Tattoo Collective
Everyone who took the survey
University of Oregon
Landscape Architecture Department

Thank You!
Introduction


3. Martin ibid

4. Martin ibid


7. Wolch ibid.


10. Martin ibid

11. Wolch ibid

Back Alleys To Green Alleys


Case Studies


3. Cassidy ibid

4. Cassidy ibid

5. Cassidy ibid


7. Country Lanes ibid

8. Country Lanes ibid


City of Eugene

1. GIS Data Files from Lane Council of Governments (LCOG)


4. GIS LCOG ibid


7. Martin (learning..) ibid.


Stormwater


2. Fairfax County. “Heavy Metal Pollution is More Common Than You Think”. http://www.fairfaxcounty.gov/nvswcd/newsletter/heavymetal.htm


7. USGS http://ga.water.usgs.gov/edu/earthrain.html


Friendly Area


3. Eugene “Friendly Area Neighbors” ibid

4. Eugene “Friendly Area Neighbors” ibid

5. Eugene “Friendly Area Neighbors” ibid

6. See stormwater calculation methods pg. 18
Whiteaker Community

2. City of Eugene “Whiteaker Community Council” ibid
3. City of Eugene “Whiteaker Community Council” ibid
4. City of Eugene “Whiteaker Community Council” ibid

Conclusion

6. City of Eugene ibid.