



Climate Action Plan Social Equity Guidance and Metrics

Summary Report

Submitted by the
Multicultural Collaborative

March 12, 2014



Hacienda Community Development Corporation Climate Action Plan Social Equity Guidance and Metrics Applied to Affordable Housing Community Projects Summary Report

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Acknowledgements

We would like to first and foremost thank the residents of Villa de Clara Vista for taking the time to participate in three different community meetings and providing the project team with their insight on “details that matter” to their everyday life. Many of the recommendations were informed and reinforced by their insight. We would also like to thank the staff of Hacienda Community Development Corporation and the City of Portland for their continued support and investment in ensuring social equity as it relates, affects, and is affected by climate change.

Project Purpose

In 2013, the Bullitt Foundation awarded the City of Portland a grant for the Climate Action Plan (CAP) Social Equity Metrics Project. The Social Equity Project includes:

1. Develop metrics to establish equity impacts of carbon reduction impacts;
2. Select and refine climate actions to improve equity outcomes for the 2013 CAP;
3. In partnership with community development organizations and social networks, develop and implementation plan to integrate equity and carbon outcomes in construction projects in underserved neighborhoods;
4. Summarize climate equity metrics, findings and lessons learned to share with other jurisdictions and organizations working on climate action.

The City awarded Hacienda CDC a grant to develop an implementation plan for achieving equity and carbon outcomes with the redevelopment of the Villa de Clara Vista multi-family affordable housing project. Hacienda CDC will also identify environmental features, sources of revenue to install the features, youth education and workforce training opportunities for low-income residents to participate in the installation and maintenance of those features.

Hacienda CDC contracted with the Multicultural Collaborative, a consulting team of community development professionals to assist with the project. The project plan focused on engagement of the residents of the Villa de Clara Vista, along with culturally specific outreach to Latino, Somali and other Indigenous immigrant populations. The consulting team focused on outreach, language translation,

youth engagement and local knowledge and expertise within the Villa de Clara Vista resident population.

A special workshop, led by James Rojas, a nationally recognized urban planner and workshop specialist, provided two workshops; one for youth and one for adult residents. Details of the workshop are described below in Meeting # 2.

The purpose of this project is to elevate equity as a key outcome of a climate action plan. By conducting a thoughtful, collaborative process to develop equity metrics for a local climate plan, the project seeks to strengthen Portland's climate plan and improve the end outcomes locally through its implementation. Because Portland's climate plan is often referenced as a benchmark climate plan throughout North America, the project is also intended to inform other cities' climate planning efforts and help establish an expectation that equity issues are key considerations in local climate action plans. In short, the project is intended to advance equity outcomes in Portland while establishing a replicable approach for other cities across the continent.

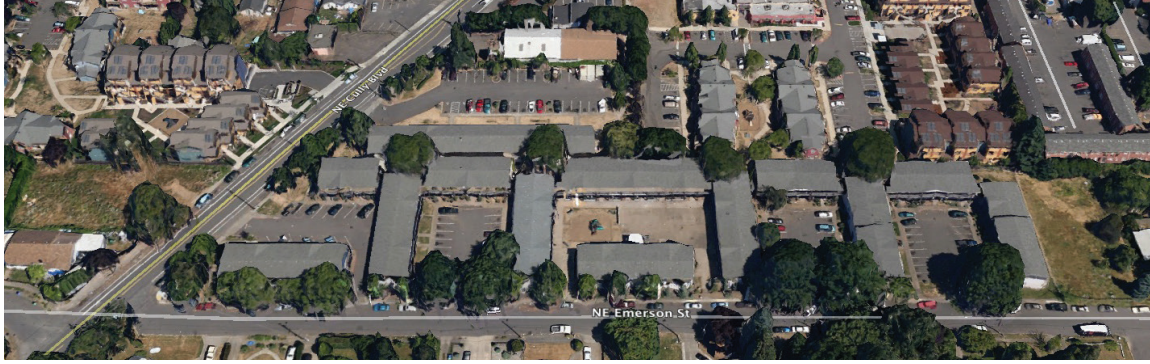
This report addresses:

- Tools to measure, evaluate, and prioritize carbon-reduction actions that advance equity
- The updated 2013 Portland/Multnomah County Climate Action Plan and the recently released. Climate Change Preparation Strategy that integrate equity outcomes with carbon reduction strategies.
- A detailed implementation plan for an expected priority action from the Climate.
- Action Plan to guide the re-construction of Hacienda CDC's Villa de Clara Vista multifamily and rental property – that exemplifies the opportunity to align carbon and equity outcomes.
- Continued strengthening of collaborative, long-lasting relationships between community organizations and local government agencies working to integrate sustainability and equity outcomes.

Project Methods

The Multicultural Collaborative coordinated by team member Kirstin Greene, Cogan Owens Cogan, LLC worked with the MCC expert team with experience in sustainability, green building, placemaking, and social equity to meet the special needs of this project. Members of the team included Anita Yap (facilitation/equity), Emily Hull (landscape design), Gauri Rajbaidya (architectural design) and Ronault Latang Sayang "Polo" Catalani (community health/climate change/multicultural engagement) in an advisory role. Kirstin Greene served as Project Manager.

Project team members conducted a literature review; sources are summarized in the bibliography at the end of this report. Findings from that review are distributed throughout this report. The bibliography is included as Appendix A.



Interviews were conducted with xxx individuals by the consulting team. A list of interviewees is included as Appendix B.

MCC team members and Hacienda project manager David Ruelas convened three focus groups of community residents. Each is summarized here; sign in sheets are included in Appendix C.

January 16, 2014

The first Community Meeting and Open House on Thursday, January 16 from 6 to 7:30 pm at the Ortiz Center at Villa de Clara Vista brought more than a dozen residents to provide their opinions and “Details that matter” to them. Spanish and Somali interpreters facilitated resident engagement. After a presentation of the redevelopment timeline and process, participants had the opportunity to ask Hacienda CDC staff and consultants any questions about the redevelopment. City of Portland staff then presented the Climate Action Plan, emphasizing the focus on equity. Team member Emily Hull gave an overview and “virtual tour” of the site and climate action opportunities. Residents were then invited to share details that matter for their home, life, and environment. MCC team members organized feedback into the four categories of indoor, outdoor, community and environment.



January 30, 2014

The second meeting was a Community Workshop led by urban planner, activist, and artist James Rojas, on Thursday, January 30 at the Ortiz Center at Villa de Clara Vista. About a dozen adult residents and over 30 children participated and Spanish interpreters facilitated resident engagement. Using “found objects”—materials like hair rollers, bottle caps, plastic toys, and other everyday items—he successfully engaged resident youth and adults in building their ideal home. The residents used

this as an opportunity to reflect on the built elements of their communities and homes that affect their everyday lives.

February 13, 2014

The third meeting provided residents an opportunity to see examples of indoor, outdoor, environmental, transportation, and engagement practices that may be possible for the redevelopment of Villa de Clara Vista. Residents had the opportunity to choose their preferences and speak more about details that matter. They also had an opportunity to engage with models to create their ideal homes and then their ideal community through a workshop led by team member Gauri Rajbaidya.



Based on interviews, the literature review, community meetings and our team's expertise, the following guidance is offered in considering climate change in development and management of affordable housing communities. We also added tenant engagement as a fifth area of opportunity, finding it prevalent in best practices research.

Context

The City of Portland was the first US City to adopt a Climate Action Plan and that plan was updated as of 2009 and a new plan is under development that will have significant attention to social equity measures. In addition, the City of Portland has currently released a public review draft of the Climate Change Preparation Strategy. In addition, in addition the city's adopted Green Building Policy requires all city owned facilities to adopt green building standards.

The consulting team incorporated these high level policy guidance into this report. Of special interest to this report is the city's expanded focus on social equity in the new Climate Change Preparation Strategy.

The report indicates we must meet the needs of vulnerable populations.

"Successful climate change preparation requires steps to understand how climate change may affect people most vulnerable to expected impacts, particularly heat, poor air quality and flooding. Portland and Multnomah County need to ensure that, where possible, climate change preparation actions are prioritized in areas facing current and historical disparities, including low income communities and communities of color."

The report indicates significant impacts on human communities that can be addressed:

- Heat related illness (heat stroke, heat exhaustion) and exacerbation of existing medical conditions.
- Increased demand for cooling centers, especially for vulnerable populations.
- Earlier and extended allergy seasons affecting those with asthma and respiratory disease.
- Higher electricity bills due to less hydropower available and increased need for air conditioning.

The following analysis and guidance addresses these and other social equity considerations in the indoor built environment, outdoor/campus built environment, community environmental quality, and transportation, and management and tenant engagement. Although the following is primarily focused on the elements of the physical environment we have included, where appropriate social and economic sustainability guidance.

1. Indoor Built Environment



Metrics:

From Portland 2013 Climate Action Plan Update

- Buildings and energy
 - Equitable provision of publicly-subsidized energy efficiency services
 - Improvements in home energy performance/energy savings by neighborhood
 - Improvements in indoor air quality/reduction in asthma morbidity rates
 - MWESB contracting goals for EE/RE programs
 - Underrepresented population hiring targets for EE/RE contractors

Our team agrees with the metrics presented in the Portland 2013 Climate Action Plan Update related to buildings and energy. Based on the teams research and subject-matter expertise, we recommend the following metrics be added:

- Number of residents with solar access
- Number of residents with view
- Building orientation provides optimal natural daylight
- Application of exterior insulation

A. Site Analysis

Site analysis is one of the first critical steps in sustainable design strategy. Due diligence must include geotechnical studies to understand site soil condition in order to locate the building and identify needed structural support. Site analysis is also important to understand the storm water condition and site drainage in order to design proper storm water management, which requires engineering consultation. Site analysis will also help with the resolution of building orientation. Building will be exposed to the microclimate of the site – the sun (heat), the wind and the light. The microclimate is affected by the micro context. Questions that should be considered include: What are the surrounding buildings? How tall are they? Do these block the sun, wind and the light?

RECOMMENDATION:

- Building orientation should be such that every resident has good solar access and access to view.

B. Heat Gain/Heat Loss

Heat gain and heat loss are the phenomena compensated for by using cooling and heating systems in buildings, which consequently uses energy. In order to reduce the energy use, heat gain and heat loss should be minimized, in a variety of ways.

RECOMMENDATIONS:

- a. The microclimate of the site should properly be understood in order to properly orient the building.
- b. Building orientation should provide optimal natural daylight and air movement for cross ventilation.
- c. Avoid orienting building elements such as windows towards the west where there is more solar heat gain.
- d. Because building design is not always presented with the luxury of having the most ideal orientation, the most optimal solution must be taken.
- e. When windows are oriented to the west, shading strategies should be considered.

C. Building Envelope

Heat transfer is the law of nature. The transfer will happen via conductive, convective and radiative means from the exposed surface of the element. The more the surfaces are exposed or are in contact with other elements, the more occurrences of heat transfer will occur. This means that a townhouse-type development will have more heat gain and heat loss because more envelope surfaces are exposed to outer elements. If the separate units are massed together the surface area of the building envelope exposed to the environment is minimized. This is what a row house type design would do. This, of course, would be done with the proper fire separation required per code between the houses. This type of row housing may also benefit from unitized building systems for heating, cooling, and air conditioning.

RECOMMENDATIONS:

- Proper insulation should be used to minimize heat transfer.
- The envelope should be framed and insulated to not only meet the 2010 Oregon Energy Efficiency Specialty Code, but also address the adaptive measures recommended in the Climate Action Plan for the City of Portland and Multnomah County. An advanced wood framing with 2X studs at 24 inch on center will allow for more in-cavity insulation.
- Continuous exterior insulation should be applied. The corners of the building envelope should be efficiently framed to allow for proper and adequate insulation.
- The cavity behind the window headers should be insulated as well. The 2010 Oregon Energy Efficiency Specialty Code requires a u-value (heat transmittance) of 0.051 for the wood framed wall assembly.
- The roof and attic should be insulated with R-38 insulation per 2010 Oregon Energy Efficiency Specialty Code or should attain the required u-value of 0.027 (502.2(1)).
- Another area of heat transfer is the concrete slab on grade. The perimeter heat loss (the f-factor) from the slab is required by code to be limited to 0.73 for unheated slab. Insulation of at least R-15 should be placed around the perimeter 24 inches below grade at the footing. In case of the row housing concept, radiant heating on the concrete slab on grade can be utilized.
- To address heat loss through air infiltration from the building, the building should be wrapped continuously with air barrier.

- Particular construction details at the critical joints should be illustrated for builder and contractors showing the proper and continuous sealing and insulation. Critical joints will occur at building penetrations for service vents and exhausts, at the eaves where the wall meets roof framing and at the base where the slab on grade meets the wall system etc.
- When possible, the envelope penetrations should be grouped together by using service chases.
- Proper damper should be used at kitchen and dryer exhausts vents to prevent air infiltration.
- It should be determined if the building envelope design could be improved further.

D. Materials

The quality of a building depends on what it is made up of. All the strategies discussed previously address different building components. Framing, insulation, weatherproofing, air barriers, windows, doors, interior paints and other finishes have an impact on the longevity of the building. These materials also have a direct impact on the health and wellbeing of the residents. A lot of the building components use or are treated with compounds and off-gassing from these components impacts the indoor air quality of the space. For this reason, the use of high VOC (Volatile Organic Compound) in paint, sealant and adhesives are not permissible under LEED requirements. By using materials that are locally harvested and products that are locally fabricated, local industries are supported and maintained. Minimizing the distance for the transportation of the materials also decreases the carbon emission. Communities of color and communities with less than the median income seek housing that is affordable. However, affordable apartments are often constructed at a lower cost with lower-quality materials. Lower quality materials negatively affect people's health and well-being, which prevents the development of strong and sustainable communities.

RECOMMENDATIONS:

- Consult LEED requirements and Materials Red List of the Living Building Challenge for a more extensive list of materials.
- Use materials that are locally harvested and products that are locally fabricated.
- Proper ventilation to bring in fresh air and the use of proper filters at the air supply ducts are important to create good environmental quality.
- Healthy living environments through high-quality building materials must be made accessible to lower income communities and communities of color.

E. Lighting

Proper daylighting design should mitigate the amount of energy spent in the electrical lighting. That said, a good lighting and lighting control design inside the building would help lower the energy consumption further. On the exterior of the building there are particular requirements per code for egress and safety requirements. There are also restrictions on the light pollution per LEED, should the design be pursued for LEED certification. A well-designed exterior lighting will make the place more inviting and community members are more inclined to step out of their dwellings and interact with each other to foster a stronger connection, which leads to a safer neighborhood. Even though building design

should utilize occupancy sensors wherever appropriate, it is critical to remember that buildings do not use energy, people do. It is up to the residents to turn off the lights when not needed. This, of course, requires training and outreach in the community before, during and after the building design to ensure that the sustainable systems in the building are properly utilized.

RECOMMENDATIONS:

- In the interior, the day light zones should have separate lights fixtures with separate controls, or if feasible daylight sensor controls. In this way, the light may be turned on only in the area where the daylight factor is less than optimal while relying on natural daylight where the daylight factor is adequate. As such the use of electrical lights in the day light zone is optimized.
- The lighting power density for multifamily housing is 0.58 per the 2010 Oregon Energy Efficiency Specialty Code, which requires use of energy efficient lighting.
- LED light fixtures should be considered as a solution to meet the lighting power density requirement set by the 2010 Oregon Energy Efficiency Specialty Code. Though the first cost of the LED lights are higher, these are more energy efficient and provide the appropriate brightness at a lower wattage.
- Provide training and outreach in the community before, during and after the building design to ensure that the sustainable systems in the building are properly utilized.



2. Outdoor/Campus Built Environment



The Portland 2013 Climate Action Plan Update did not include social equity metrics related to Outdoor/Campus Built Environment. We recommend the following metrics be included:

- Network of path connection to main street
- Use of most energy efficient windows
- Use of shading strategies to let in daylight
- Zoning strategies to respond to energy needs and best practices
- Equitable site design review

A. Accessibility

Ensuring equitable accessibility is not only part of sustainable design strategies, but it is also about building community.

RECOMMENDATIONS:

- Accessibility should be taken into account early on during site analysis.
- Site design must provide the most equitable experience for all the members of community of all varieties of abilities.
- Internal network of site path and open spaces should allow for the safety, accessibility, bike-ability, and enhanced communal interaction.
- The network of path should connect to the main street where a resident may most efficiently get to a transit stop or lead to a bike path for a bike commute.

B. Windows and Doors

Exterior windows are critical components of a building design, but are also the variable that can have both positive and negative effects in sustainable design strategies. Many of the participants in the workshops expressed that they wanted large windows. Large windows are great design features as they let a lot of natural daylight into the building spaces. However, windows are the openings in well-insulated building envelope systems. Even the most well insulated window still has greater transmittance (heat loss and heat gain) value than an insulated wall. Consequently, there is a great balancing act in designing and placing the windows properly. Windows are not only for daylighting and view. Windows can also provide the sense of safety and connection in the community. In a multifamily housing community, the parents need to feel safe about letting their kids play outside. While they work in the kitchen or the living room, the visual connection to the play area outdoors can create that overall sense of safety. This also enhances the interconnection and interaction among community members. This is not easily achieved in a design in which units are loaded on either side of an interior corridor.

RECOMMENDATIONS:

- 2010 Oregon Energy Efficiency Specialty Code requires that only 30% of the total building envelope be taken up by windows.
- The most energy efficient windows should be used. Double glazed windows of u-value of at least 0.35 should be used per the 2010 Oregon Energy Efficiency Specialty Code. If possible, should be upgraded to triple glazed – in order to be adaptive for the climate change of the next hundred years.
- The exterior windows should be properly sized to and located to bring in the natural daylight in the area of a building space that is most used – such as the living room or office / study or play area.
- Daylight windows should be closer to a wall that has a paint of high reflectivity. The reflected light from the wall brightens the room more and also gets rid of dark corners around the window.
- Daylight zone should cover more that 50% of the floor area.
- To reduce the energy used to condition a space (to cool a space heated by solar heat gain, use windows having the code required Solar Heat Gain Coefficient (SHGC) of 0.40.
- Creative shading strategies can be used to let in the daylight, but limit solar heat gain. The shading strategy will have to be different for facades of the building that have different orientation since the heat of the sun is not uniform at all sides.
- Shading strategy can be physical shades or use of trees as appropriate and allows for design statement.
- Skylights can be used within the minimum requirements of the 2010 Oregon Energy Efficiency Specialty Code to allow daylight while mitigating the solar heat gain. Some ideal places for skylights are over the kitchen and dining space. However, in the multistoried multifamily design designers must think how these strategies may be utilized the best.
- Daylight tube can be used to bring in light in the area that requires lesser light level. Feasibility of these strategies should be studied for multifamily housing design.
- Design strategies that allow for natural ventilation should be explored. Per 2010 Oregon Energy Efficiency Specialty Code doors should have at least the u-value of 0.20 if it is unglazed, and 0.40 for glazed door. Exterior doors should have weatherizing strip to prevent air infiltration.
- Rough openings for the windows and doors should be made slightly larger to allow for all waterproofing layers and easy adjustment and installation of the window and the door.
- After the installation of the proper waterproofing, flashing, and the window unit or the door, the space between the rough opening and the installed window or the door should be filled in foam in place insulation to prevent air infiltration and the to maintain the continuation of the insulation.

C. Heating and Cooling

For proper and efficient design and sizing of the heating and cooling system an HVAC engineer should be consulted. However, consideration should be given for using a unitized system. If the housing design is developed in a row housing style, a unitized system can work effectively. In a unitized system rather than supplying heating and cooling from a centralized system to all the units, the heating and cooling systems would be unitized for each unit just as in a single residential unit. Experts should be consulted on the advantage of doing this over using centralized system or using the district energy system. One

benefit of a unitized system is that each unit can then be metered separately thereby allowing each family to monitor and control their energy consumption. Furthermore, in case of system malfunction in a central system heating and cooling system all the tenants would be affected whereas in the unitized system only the one unit will be affected. The possibility of oversizing the system is lower in a unitized system. Installation and repair of the centralized heating and cooling system will require specialized skill. Smaller heating units (heat pumps) of the unitized system, however, can be installed and repaired by small-scale HVAC subcontractors, thereby creating a possibility of more jobs for small business.

RECOMMENDATIONS:

- Using a unitized system should be strongly considered.
- Equipment should meet the efficiency and performance standard per 2010 Oregon Energy Efficiency Specialty Code.
- All the ductwork should be well insulated per code to prevent heat transfer.
- Whenever possible zoning of the building programs based on the energy needs should be performed for better efficiency.
- HVAC engineer should be consulted to weigh energy benefits of using multi-split system, mini-split system, hydronic base board heaters, PTAC or PTHP.
- Appropriateness of the heat recovery system such as the drain heat exchange system should also be considered.
- Given the scale of the Clara Vista site, electricity generation from Photovoltaic Panels should also be considered.





3. Community Environmental Quality

Metrics:

From Portland 2013 Climate Action Plan Update

- Consumption and solid waste
 - Equitable utilization of recycling and composting services
 - Equitable siting/expansion of solid waste/recycling facilities (if relevant)
- Urban forestry and natural systems
 - Equitable provision of urban forestry investments
 - Reduction in neighborhood disparities in:
 - Tree canopy cover
 - Air quality
 - ER visits for respiratory distress
- Food and agriculture
 - Reduced neighborhood disparities in access to grocery store or fresh food sources
 - Share of SNAP (Oregon Trail) users participating in local farmer's markets, Community Supported Agriculture and food buying co-ops
 - Equitable access to community gardens/urban agriculture infrastructure

Our team commends the Portland 2013 Climate Action Plan Update's metrics regarding consumption and solid waste, as well as the urban forestry and natural systems, and food and agriculture metrics.

We propose these additional metrics to ensure maximum community environmental quality:

- Number of tree plantings
- Pounds waste reduction/group composting for Verde garden
- Crime prevention through environmental design (CPTED) and neighborhood crime prevention programs.
 - Include CPTED recommendations and monitor results: crime reduction, community involvement, and safety.
- Stormwater management and harvesting:
 - Installing stormwater methods on-site can development educational resources for residents to learn about processes.
 - On-site stormwater harvesting can reduce costs to water bill and saving can be passed on to residents.
- Outdoor programs and recreation locations that are relevant to the community:
 - Develop inclusive programs and activities that are cross-cultural and interesting to the community members.
 - Provide opportunities for community to design outdoor spaces.
 - Create and design culturally appropriate spaces that encourage outdoor activities and community gathering.

- Urban vegetation and urban forestry
 - Number of tree and vegetation plantings to increase % of existing canopy and landscape.
- Urban agriculture and community gardens
 - Pounds waste reduction/group composting for Verde gardens and Cully Park
 - Monitor and track local food/garden in production on site
 - OR Availability of local food (via Cully Garden included)
 - OR Number of pounds of food produced locally on site (opportunity to bring gardeners together to weigh and track food production)

A. Landscape

Opportunities exist throughout the Clara Vista Campus to allow for community open spaces, gathering locations, passive and active recreation. The addition of new parks and/or the formalization of existing community open spaces could provide balance and relief to the future Clara Vista Campus redevelopment. This could provide functional and measurable benefits, such as stormwater treatment, sound buffering, and wildlife habitat protection and conservation, as well as aesthetic and recreational benefits. Outdoor recreational opportunities provide tenants with options to exercise, walk, and get outdoor fresh air.

RECOMMENDATIONS:

- Consider organized recreation programs that are relevant to tenant's interests.
- When identifying landscape planting plans: choose native plants, appropriate maturity size for location and low maintenance or drought tolerant plants for future planting options. Identifying these characteristics early on can reduce costs associated with long-term maintenance and irrigation needs. Choosing native or drought tolerant plant materials can reduce human and animal exposure to harsh landscape chemicals and treatments used for soil, disease or bug control.
- Determine appropriate irrigation programs, rainwater harvesting methods or identify an EPA's Water Sense Partners. Water Sense Partners are irrigation professionals that are certified and committed to water efficiency and use of water-efficient irrigation practices.
- Connect gathering green spaces and playgrounds adjacent or visually connected to building uses that allow parents and guardians to be near-by. Developing a site plan lay-out that brings together youth and adults is beneficial by increasing safety and allowing families to be productive and efficient with their daily activities.
- Encourage local sourcing for plant nurseries and landscape contractors. Partner with existing organizations, like Verde LLC to develop workforce-training opportunities.
- Consider outreach to local landscape and nursery industries for job placement, recruitment and training programs.

B. Urban Agriculture/Community Garden

Urban agriculture and community gardening adjacent to multi-family housing can provide fresh, healthy, quality food, nutrition education, and community gathering opportunities. While not all dietary needs

can be met through community gardens, other programs can be put in place to allow residents to share gardening practices, nutrition courses, and seasonal food storage workshops. Providing opportunities for fresh produce from community gardens would reduce the exposure to pesticides and chemicals used for conventional vegetable and fruit production. Residents have the ability to cultivate and monitor their own garden, weed and pest control. Gardening and community plots have indicated positive resident engagement in the outdoors, environmental stewardship and community sense of place. There may be opportunities for more intensive urban agriculture including hydroponics and aquaponics.

RECOMMENDATION:

- Provide food access on-site to reduce out of pocket costs by: decreasing the amount of items purchased at grocery stores, transportation costs, and reduction of child care need to perform daily activities.

C. Water

Water conservation is a critical aspect of the sustainable design. Waste of hot domestic hot water translates directly to waste of energy and also the waste of a valuable resource – water. Many of the participants from the workshop were displeased with the fact that the hot water ran out after one or two showers. Providing adequately sized water heaters that meet the minimum efficiency requirement set by 2010 Oregon Energy Efficiency Specialty Code should be ensured. Solar water heater or tank-less water heater may also be another alternative worth considering. For proper design parameters and for other innovative technology a plumbing engineer should be consulted. However, Just like buildings do not use energy, it would be true to say that buildings do not use water, the tenants and occupants do.

Stormwater processes can be integrated into the design of the Clara Vista Campus in a variety of ways. For example, streetscapes and green spaces, could include bioswales, filtration strips, and other linear detention facilities. These methods are typically used to clean stormwater run-off or slow down the run-off from nearby impervious surfaces. Biofiltration is the process through which stormwater receives filtration through physical, chemical or biological interaction with vegetation and the soil surface. Bioswales are typically shallow and wide, designed to accumulate stormwater from nearby impermeable surfaces where it can then be absorbed slowly by the vegetation in the swale. Stormwater collected in these swales is then filtered of pollutants. Filtration strips also incorporate vegetation to slow stormwater from entering nearby streams and rivers. The strips offer some of the filtration that is found in swales, however, they are usually used to slow the progress of stormwater to a detention basin or other retention structure where the stormwater is then relieved of pollutants.

RECOMMENDATIONS:

- Low flow shower heads and low flow faucets should be used
- In the water closet, an appropriate solution from dual flush toilets, pressure flush toilets, low flush toilets should be used.
- Efficient washer and dryer should be used.

- Tenant outreach and education is critical in water conservation strategies.
- Residents should be taught not to run water while they brush, to use the dual flush toilets properly, and to take quick showers or take a long bath.
- The ducts carrying hot water for both the domestic use and for utility purpose should be well insulated to prevent heat loss. Insulation for piping is critical to prevent water freeze and damage to the duct during freezing temperatures and the 2010 Oregon Energy Efficiency Specialty Code has requirements regarding this.
- Stormwater harvesting can occur at a building scale by centralized collection or rain gardens.
- At a site scale harvested rainwater can be collected in an outdoor pond or underground storage.
- The harvested stormwater can then be used for irrigation and flushing toilets by increasing the grey water supply. City of Portland's Bureau of Environmental Services (BES) and the Bureau of Development (BED) have more detailed information on sustainable stormwater management and best management practices (BMP).
- Other considerations for metric and measurement should be identified as the campus is redeveloped. Water Environment Research Foundation (WERF.org) discusses how collection data can be organized and how to develop a plan to measure system performance in, "Using Rainwater to Grow Livable Communities."
- For proper piping and equipment to utilize grey water a plumbing engineer should be consulted.

D. Amenities/Signage (i.e. Lighting, seating, bike storage, recreation)

Amenities are integral to connecting pedestrians, bicyclists, and vehicle users to and from their destination. Clara Vista campus has the opportunity to design elements into the redevelopment that can achieve an overall desired character and function for the campus. The items listed in Figure 2: Cone of Experience when combined will have a greater overall effect than the sum of its parts. Various elements can be integrated over time, but it is important to develop a plan and prioritize based on community input. Including these elements can build community moral and ownership of place.

RECOMMENDATIONS:

- Gateways: Major entry points into campus should have a unique and identifiable characteristic that indicates arrival, has clear sight lines from the street and sidewalk and celebrate a meaningful message of the residents that live there.
- Signage: Express and celebrate the community with multi-lingual messaging or strong visual imagery. Location of signage should be in obvious, high-traffic, multi-modal intersections to help users find their destination. Signage can announce significant places or interpret the history and current activities within the campus.
- Street trees: Urban forestry can significantly influence human health and environmental quality with in urban and urbanizing environments. Trees provide shade and shelter from harsh environmental conditions. Positive results have been seen in residents living in highly planted areas by offering visual relief to concrete/asphalt conditions, improving air and water quality, and moderating temperatures. The US Department of Agriculture (USDA) has partnered with cities to research and

monitor the environmental and health impacts of urban forestry/vegetation. A program developed by the USDA, Urban Forest Effects Model (UFORE) helps researchers calculate forest functions and values related to tree effects on: air pollution, greenhouse gases and global warming, and building energy use.

- Sculpture/artwork/installations: Expressive items like sculpture and artwork help to celebrate community identity with each other and visitors to the campus. Hiring local or resident artist to contribute to developing concept and artwork. These items should be placed in a highly visible and well traveled areas of the campus.
- Shelters and overhangs: Provide relief from harsh weather conditions. Shelters and overhangs can be used in areas where people gather. Colorful materials and signage can contribute to the overall signage and wayfinding used on the campus.
- Building frontage: Building main entrances and windows should orient towards the street or areas that have high pedestrian activity. Eyes on the neighborhood help with security and safety.
- Seating: Opportunities to sit and rest are helpful for children and elderly passing through the campus. Outdoor seating should be placed in active locations that support socializing and passive locations that allow for quiet, restful moments.
- Planters: The use of planters can build on the overall aesthetic of the campus using similar colors or materials. Planter plantings have more flexibility and can be seasonally changed or relocated depending on size. Accents planters can punctuate main entrances or special spaces.
- Bike storage and parking: With increasing numbers in bicyclists, storage and parking are in higher demand. Centralized bike parking can provide additional safety measures. Enclosed storage or individual lockers can reduce stolen property. Integrating storage with on-site cycling center can employee residents to oversee cycle repair, cycle programs and cycle surveillance.
- Sidewalk/Paving Patterns: Choose colors, materials and patterns that help pedestrians to identify clear routes to and from major destinations (i.e. schools, daycare, churches, community centers, etc.). Materials used should be smooth and ease the use of wheeled accessories.

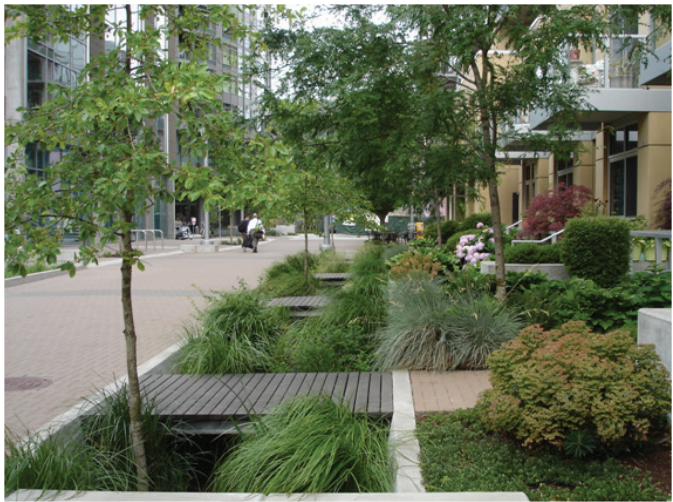




Central playground and community garden



Stormwater swale experience



Cone of Experience



Crime Prevention through Environmental Design (CPTED) is a design methodology that focuses on reducing opportunities for crime and mitigating fear of crime to improve quality of life factors. Community Based Crime prevention programs such as Neighborhood Watch, Weed and Seed, and community policing; in conjunction with CPTED principles have proven to be an effective methods to reduce crime, build community moral and develop better interactions between police and residents. The outcomes vary based on level of participation and program implementation. Clara Vista Campus would benefit from more detailed evaluation of environmental safety concerns and consider implementing a program that fits the needs of residents. Bureau of Justice Assistance provides online information for program evaluation and performance measurements related to crime prevention programs. Through the design and management of the physical environment and an increase in public safety and education, CPTED programs have increased community security. The recommendations include four basic principles of CPTED that should be considered during site planning and design of public spaces include:

- Territoriality: involves designing physical attributes that express ownership, such as fencing, signage, landscaping, and pavement treatments. Physical elements can extend an area of territorial influence and cause potential offenders to perceive that area as undesirable. A well maintained home, building or community creates a sense of ownership, which helps to deter criminals.
- Natural Surveillance: is the placement of physical features, activities and people in such a way as to maximize visibility. A potential criminal is less likely to attempt a crime if he or she is at risk of being observed. At the same time, we are likely to feel safer when we can see others and be seen. Use physical features, activities, and people in ways that maximize the ability to see. This will help discourage undesired behavior. The use of vegetation heights, street furniture, and building layout

can help increase eyes on the activities. Design security zones that respond to the building and site relationships. The focus is on creating natural surveillance solutions from the street to the building façade.

- Access Control: reduces the opportunity and accessibility for crime. The physical guidance of people coming and going from a space by the appropriate placement of entrances, exits, fencing, landscaping and lighting denies a criminal's access to potential victims. Access control methods should be designed to create the perception of risk to potential offenders.
- PlaceMaking: This approach to design carefully looks at the communities' needs and interests to develop strategies to increase resource awareness, provide access to multi-modal transportation options, promote community inclusion and improve quality of life. In addition to direct community engagement, the following is essential to creating meaningful spaces: uses and activities, comfort and image, access and linkage, sociability and maintenance.

RECOMMENDATIONS:

- Provide clear border definition of controlled space. There are several ways this can be achieved including fences, plantings, lawn, tactile surfaces etc. These types of boundaries allow people to recognize that they are transitioning from public to private space. Creating a sense of ownership or defensible space is encouraged to deter undesired behavior.
- Provide clearly marked transitional zones. Identify public, semi-public, semi-private and private spaces. Controlled space must be demarcated in order to move users through the environment. Design building and site to encourage interaction. This will provide opportunities for the community to become more familiar with their environment and help build a sense of ownership.
- Clearly identify buildings, open space, and major circulation paths (bike path, crosswalks, etc.) using signage and markers that are easily observed from the street. This will identify areas and there programmed uses.
- Improve sightlines. There should be clear views of surrounding areas. Design permeable barriers that do not restrict vision. Avoid features (tall vegetation, fences, etc.) that block sightlines and major access points.
- Lighting design must be incorporated into developments to ensure safety and security.
- Placement of lighting is critical to pedestrian pathways, roads, and potential entrapment spaces.
- Locate open spaces and recreational areas so they are visible. Formally designate gathering or congregating areas. These areas should be in locations that are well lit and encourage gathering opportunities that are within sightline of residential and commercial activity.
- Land-use and activity mix. A variety of uses should be developed to encourage informal surveillance during the day and evening.
- Overcome distance and isolation. Entrances and exits points to buildings and public uses (telephone, restroom, etc.) should be designed with increased convenience to major circulation patterns.
- Place safe activities in unsafe locations. Safe activities serve as magnets for normal users and discourage undesirable activities.

- Improve scheduling of space. Productive uses of spaces reduce the risk of attracting undesirable activities. Designed spaces and uses can improve productivity while increasing the control of behavior.
- Discourage cut through paths and high-speed traffic. Design streets and pedestrian paths to control circulation patterns and reduce vehicular speed. Vegetation, paving elements and signs can help increase community safety.
- Security screening devices and surveillance. Organizing community watch programs and increased policing can reduce potential crime offenders. Pro-active involvement will reinforce the priority of safety.
- Physically compact in design. Development of PlaceMaking concepts lends itself to natural surveillance. Eyes on the street and connectivity can be achieved with special attention to building layout and circulation patterns.
- Create centers of mixed-use developments near a variety of residential densities. This encourages more pedestrian travel and active areas near neighborhood. Design uses that create activity during day and night hours. Mixing commercial, retail, education and recreation with housing allows for people to satisfy daily needs without having to travel far distances. These centers become a more lively and safe environment.
- A network for a variety of modes of transportation. Walkways, bicycle paths, and street connectivity encourages non-auto travel by offering alternative routes that connect to housing, employment, commercial services, schools, parks, and public transportation.
- Design pedestrian scaled environments. Development should be designed to the comfort and scale of people. Vegetation, street furniture, lighting and other elements can be used to enhance a pedestrian environment. These design features can also reinforce a community's identity and history.
- Maintenance program must be designed into a project and visited on a routine basis. A successful component of PlaceMaking is to insure that a program is implemented and is successfully managed beyond the design phase for future generations to enjoy.
- Education and community engagement is critical in the success of redevelopment. Culturally appropriate outreach meetings should be integrated into the design process to develop analysis of users and potential solutions. Residents should form neighborhood committees to insure continued interest once the implementation strategies have been established.
- While considering the above principles, apply them to the built environment zones noted below in Figure 1. These zones help indicate the priority areas where crime prevention methods can be most effective.

Zone 1: Inside Building-layout should encourage active uses near windows to provide eyes on the street.

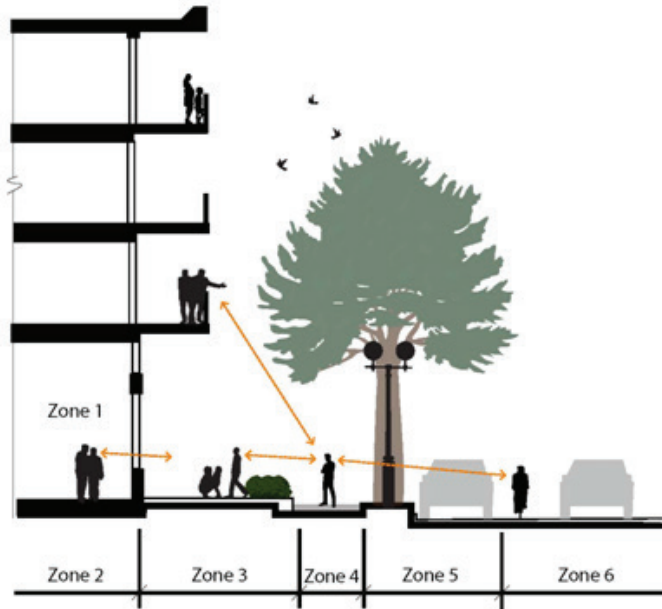
Zone 2: Outside Building-Access and Windows should orient toward the street and major pedestrian paths.

Zone 3: Outside Yard-Raised planters, low wall or fences provide additional security barrier.

Zone 4: Sidewalk-Trees, planters and other elements should not block visibility to street or building. Promote active pedestrian zones.

Zone 5: Curb Lane-This zone can be designed for on-street parking, drop-off/pick-up area to encourage active street zones.

Zone 6: Street-Design appropriate lane widths to accommodate safe vehicle speed. Potential bike line option.





4. Transportation

Metrics:

From Portland 2013 Climate Action Plan Update

- Urban form and mobility
 - Equitable provision of transportation and transit infrastructure and safety improvements
 - Reduction in neighborhood disparities in “completeness,” transit access, pedestrian safety, walkability, bikability
 - Changes in bike counts by neighborhood, or other measures of active transportation utilization

Our team agrees with the Portland 2013 Climate Action Plan Updates related to urban form and mobility, listed above. We suggest incorporating the metrics below to the measures of active transportation utilization:

- Bike Counts
- Transit Rider Counts
- Origin/Destination Surveys

A. Access Management

Access management is important, particularly on high volume roadways such as Cully Blvd and N. Killingsworth Ave. for maintaining traffic flows, mobility, and safety. Numerous driveways, curb cuts, or street intersections increase the number of conflicts and potential for accidents, and decrease mobility and traffic flow.

RECOMMENDATION:

- Reduce the conflict areas to provide better traffic and pedestrian flow in and around the campus.

B. Multi-modal options

Transit, pedestrian and bicycle improvements throughout the campus should be considered to connect tenants to existing transit and multi-modal options for transportation, which include biking and pedestrian access. The Clara Vista campus should have a balanced, multi-modal program for the community. When considering truly multimodal options, integrated bicycle and pedestrian mobility requirements need to be prioritized to a level comparable to requirements for cars and transit. To encourage multi-modal options bikes and pedestrians are elevated to a level of priority in certain areas of the campus. This will offer a significantly improved non-motorized environment. Partnership can also be fostered with the Community Cycling Center to establish a bike repair miniature satellite center at the Clara Vista community where youths and adults from the community can learn and teach others bicycle repair and maintenance.

RECOMMENDATIONS:

- Bicycle and pedestrian improvements should be integrated into the overall circulation concept for the campus and extend into the surrounding neighborhoods.
- Improved conditions for walking should include adding sidewalks and pathways and improving the quality of pedestrian crossings at intersections.
- Bike improvements should include adding designated bike lanes and off-road bike paths.
- Pedestrian and bike improvements should be networked to link key destinations such as schools, natural areas, parks, and transit stations to the Clara Vista Campus. The proposed network should aim to create an interconnected system of opportunities for non-motorized travel within the campus.
- Building on Hacienda's existing bike programs, including bike share and bike workshops could encourage job opportunities in the growing cycling community and reduce use and cost associated with the automobile.
- The site and parking design should allow incentives for car shares.
- Hacienda CDC should consider provision to accommodate electric vehicle on site.
- Hacienda CDC could also subsidize rent to the families in the car share program or to the families who own fuel efficient vehicle if applicable.

C. Connectivity Context

The Clara Vista Campus and the City should consider off-site connectivity and access to a mix of uses. This will be important for the increasing number of residents on Clara Vista Campus. Appropriate resources should be consulted to understand broader community initiatives relevant to Cully Neighborhood, including the "Cully Pedestrian Safe Access Project" and "Not in Cully: Anti-Displacement Strategies for Cully Neighborhood."

RECOMMENDATIONS:

- Transit, pedestrian and bike access connections to future small retail, micro-business start-ups, community centers, parks and community garden should be considered and identified in participation with City plan and goals.
- New development that occurs within the neighborhood should be culturally appropriate and in alignment with community needs.
- Hacienda should work with Trimet to obtain a residential group pass program



5. Management and Tenant Engagement

Metrics:

From Portland 2013 Climate Action Plan Update

- Community engagement
 - Equitable representation of high-need and vulnerable communities in CAP development and implementation process
 - Reduced disparities in participation of high-need and vulnerable communities in CAP-related outreach and education events
- Climate change preparation
 - Reduced neighborhood disparities in Green Infrastructure access
 - Reduced disparities in heat island effect impacts
 - Reduced disparities in heat related illnesses
 - Equitable distribution of emergency preparedness infrastructure (e.g., cooling centers)

Our team agrees that community engagement that focuses on equitable representation from high-need and vulnerable communities is necessary to elevate equity as a key outcome of a climate action plan.

We recommend the following metrics be added to ensure this desired outcome:

- Annual Emergency Preparedness Drill
- Local government operations
 - MWESB goals for public contracts related to greening government operations
 - Number of local hires within ½ mile of construction sites
 - Number of contractors with Culturally and Linguistically Appropriate Services (CLAS) training and plan

A. Design

Pilot projects and studies have demonstrated that when provided with the support and opportunity to make a difference, tenants can contribute to significant energy savings through behavior changes at home and in their community. When done well, the engagement of tenants in a culturally and linguistically appropriate manner not only has a positive effect on the development of the community, but also results in a reduction of energy use and utility savings. It can also lead to an increase in overall satisfaction of managers and tenants and a higher sense of community. In order to be successful, the engagement of tenants should take a capacity building approach over a “need-based” approach. The Integral Capacity Building Framework draws on and considers the psychological capacity, cultural capacity, behavioral capacity, and structural and systems capacity of tenants, as demonstrated in the recommendations below.

RECOMMENDATIONS:

- An initiative should be developed from the beginning of the design phase that links tenant engagement with reduced utility costs and energy savings.
- The engagement of tenants should be culturally and linguistically appropriate and should take on a capacity building approach over a “need-based” approach. The use of the Integral Capacity Building Framework should be used, including:
 - Interior/Individual: Psychological Capacity (Confidence, Agency, Awareness, Trust)
 - Interior Collective: Cultural Capacity (Social Norms, Social Networks, Shared Values)
 - Exterior/Individual: Behavioral Capacity (Conserve heat, conserve hot water, Recycle)
 - Exterior/Collective: Structural and Systems Capacity (Tenant recreational programs, Efficient heating/cooling)
- Engage and build partnerships with Climate Justice groups that focus on community engagement and empowerment

B. Construction

The construction phase of development presents unique challenges and opportunities to engage residents and community members. As part of effort to facilitate respectful communication with residents, Toronto Community Housing (TCH) conducted “sensitivity” workshops for contractors during the rehabilitation of its housing. Sessions sought to dispel negative stereotypes about social housing residents, while presenting a realistic picture of challenges staff would encounter. The formation of Community Design Teams present a structure through which residents are provided with opportunities to become leaders, receive conservation education, engaged in joint decision-making with housing staff about renewal measures, and kept informed about rehab process.

RECOMMENDATIONS:

- Conduct cultural awareness and CLAS standards workshops for contractors during rehabilitation
- Develop a Contractor Code of Conduct in collaboration with tenants
- Form and support Community Design Teams that provide residents with opportunities to become leaders, receive conservation education, engaged in joint decision-making with housing staff about renewal measures, and kept informed about rehab process
- Ensure interpreters and translation of documents are available when needed
- Provide culturally appropriate refreshments at community meetings
- Provide childcare services to increase attendance
- Conduct conservation-related raffle prizes as an incentive to participate
- Institute Safety Teams through the construction phase, which may be planned and managed by leaders from the Community Design Team
- Designate a part of the budget for culturally and linguistically appropriate engagement of tenants through the construction phase, including the support of Community Design Teams and Safety Teams

C. Ongoing

Considerations in engaging tenants traditionally focus on building managers and owners because they “control” the buildings. Tenants are often thought of as harder to reach, often because they are a more diverse group. However, tenants impact energy use directly and indirectly, and are the population that is primarily and most directly affected by any changes. Because tenants have differing needs, schedules, cultural preferences, and schedules, it is difficult to design “one-size-fits-all” programs to support/incentivize tenants. A variety of methods should be applied in ongoing engagement efforts. It is important to keep in mind that the social, physical, and emotional needs of tenants will impact the type and level of engagement that is appropriate. Therefore, opportunities at different levels of engagement should be provided.

RECOMMENDATIONS:

- Design and carry out Energy Efficiency Building Competitions
 - Incent a floor by floor competition to reduce electrical consumption and measure results
 - Offer prizes such as T-shirts, Switch Covers, Posters, etc.
 - Recognize, Reward, and Reinforce
 - Energy Challenges and Personal Pledges
- Create a Green Options Menu for residents
 - A Green Lease Guide can help tenants select green options for their tenancy, and the Greenhouse Guarantee that gives tenants a risk-free and cost-effective way to lower their energy consumption.
 - Offer tips on sustainability practices that can be implemented by tenants, such as free light bulbs and special communications devices targeted to property occupants.
 - Offer a sustainable tenant improvement guide that promotes energy conservation through outreach activities
- Waste reduction and recycling programs can also be used as an educational opportunity for youth and kids. Eligible youth can earn some perks for their work in community recycling effort and waste audit at the Clara Vista community.

D. Evaluation/Improvements

- The Livegreen Tenant Engagement on Sustainability Guide differentiates between “process indicators,” which measure what is being strived for in the process and “outcome indicators,” which measure the level and type of changes is hoped for as a result of the process. Process indicators can include how many tenants you hope to reach (e.g. 60%) and how many energy challenges you want to run over a year (e.g. three). Examples of outcome indicators include: a 5% reduction in energy use, or an increase in tenant knowledge about energy conservation. Other evaluation methods include evaluation through public display methods. Examples of this include Ed McNamara’s Pearl Family Housing project, which include dashboard meters in one floor of the development so tenants can see, in dollars as well as kilowatts, how much energy they consume daily. That data is compared to energy usage on floors without dashboard meters. The Oregon Sustainability Center considered

including rules regarding temperature ranges and per-capita energy and water budgets for each tenant. A large reader board displaying the center’s energy stats in real time could potentially be installed on the outside of the building.

RECOMMENDATIONS:

- Develop a combination of “process indicators” and “outcome indicators” as described above
- Identify energy-saving opportunities and monitor energy performance for each site
- Use ongoing surveys to assess tenant satisfaction with conservation programs and activities
- Consider possible evaluation through public display methods, placing utmost consideration to what would be culturally appropriate
- Hacienda should work with the City of Portland to develop a culturally appropriate emergency preparedness plan
- The City of Portland should change contracting awards to include additional points and awards for MWESB to include local hires (underrepresented residents within ½ mile of projects) and/or if cannot recruit qualified hires, recruit and train at least 5% of total contractors in an apprentice program
- The City of Portland should require all contractors undergo training in culturally and linguistically appropriate services and require an implementation plan



Appendices

A. Literature Review

B. Interviewees

C. PowerPoint Meeting #1

D. PowerPoint Meeting #2

E. Meeting Flyers

F. Context Maps

G. Flipchart Notes