Housing Conditions, Sustainability and Self Help in Rancho Vista and Redwood Informal Homestead Subdivisions in Central Texas.

A Final Report and Database for the Community Residents and for the Community Development Clinic of the UT Law School (Director Professor Heather Way JD)

Prepared by:

Professor Peter M. Ward, PhD (LBJ School of Public Affairs and Department of Sociology, UT-Austin)

> Mr. Carlos Olmedo (LBJ School of Public Affairs) Ms. Danielle Rojas (LLILAS & CRP programs) Ms. Esther Sullivan (Dept. of Sociology)

In collaboration with the following graduate student members of the Spring 2010 semester LBJ/CRP class: "Urban Sustainability and Renewable Energy Applications for *Colonia*-Type Housing in the Southern US":

Leticia Aparicio Soriano, Dana Campos, Lauren Flemister, Sherief Gaber, Karina Mallaupoma Povez, Daniela Ochoa González, Christeen Pusch, Danielle Rojas, Jacob Steubing, and Elizabeth Walsh.

© Dr. Peter M. Ward

We are especially indebted to community organizer Ms Ruby Roa, and to the following leaders and community residents of Rancho Vista and Redwood for their participation and support: Luz Arismendez; Consuleo Antú; Raymunda Bolaños; Juan Estrada; Marina Garza; Rosa Martínez; Josefina Piñeda; Otila Puga; Arturo Rodríguez; Luz Alismendez; Sergio Ruiz; Marina Vallejo; and Gloria Castillo. They were especially helpful in the distribution of flyers explaining the objectives of the survey and in introducing us to residents. Special thanks are due to Karen Paup of the Texas Low Income Housing Information Service, and to the following students for their fieldwork participation to conduct questionnaire surveys and for coding and data preparation: Leticia Aparicio Soriano; Alexa Bertinelli; Dana Campos; Patrick Chapman; Lauren Flemister; Erika Grajeda; Hyoung Jo Kwon; Karina Mallaupoma Povez; Christeen Pusch; Danielle Rojas; Esther Sullivan; and Jorge Vela.

Readers may be in interested in reviewing a companion report "Urban Sustainability and Renewable Energy Applications for *Colonia*-Type Housing in the Southern US" copies of which are available on the Latin American Housing Network website <u>www.lahn.utexas.org</u> (see "Texas Colonias Studies" button on the website dashboard). Both reports were produced through a spring 2010 semester graduate class -- "Urban Sustainability and Renewable Energy Applications for *Colonia*-Type Housing in the Southern US", and were supported by a 2009-10 grant from the Policy Research Institute to Professor Ward at the Lyndon B. Johnson School of Public Affairs, it was offered as part of the "Sustainable Cities" interdisciplinary doctoral program in the School of Architecture (Community & Regional Planning.

Housing Conditions, Sustainability and Self Help in Rancho Vista and Redwood Informal Homestead Subdivisions in Central Texas.

CONTENTS

EXECUTIVE SUMMARY
CHAPTER 1: HOUSING CONDITIONS, SUSTAINABILITY AND SELF- HELP IN COLONIA TYPE SUBDIVISIONS IN CENTRAL TEXAS
CHAPTER 2: HISTORICAL DEVELOPMENT AND SOCIO-ECONOMIC BACKGROUND OF RANCHO VISTA AND REDWOOD, 1980-200020
CHAPTER 3: SOCIO-ECONOMIC PROFILE AND HOUSING ACQUISITION AND STRUCTURE
CHAPTER 4: HOUSING SERVICES AND INFRASTRUCTURE PROBLEMS
CHAPTER 5: HOUSEHOLD ACTIVITIES AND HEALTH ISSUES
CHAPTER 6: NEXT STEPS, FUNDING, AND THE PRIORITIES FOR HOME IMPROVEMENT AND SELF HELP HOUSING IN RANCHO VISTA AND REDWOOD
REFERENCES

Executive Summary

This report results from a study undertaken by researchers at the LBJ School of Public Affairs and the Law School Community Development Clinic (CDC) at University of Texas at Austin. It arose in response to a request from the community leaders and residents of Rancho Vista and Redwood – two large low-income "informal homestead subdivisions" in Guadalupe County, central Texas. In order to help with the preparation of grant and other assistance proposals, the CDC proposed the creation of a detailed baseline profile of housing conditions in these two settlements. To that end, the LBJ School designed and implemented a (two-wave) mail and inperson household survey. Out of some 630 mails interviews that were sent out, a total of 93 households returned the self-addressed, pre-paid envelopes containing completed questionnaires, and a further 40 households participated in randomly selected face-to-face interviews. Two-thirds of the surveys were completed in English; 60% of survey respondents were female; 96% Hispanic.

As is usual in these IFHSs, most of the householders were owners, although twelve renter respondents fell into our sample. Since the mail-back survey was self-selecting, we tested for bias between the two types of survey and found small to modest differences between the two sample populations. Because they were self selecting, households who took the mail-back surveys appear to be slightly poorer within a uniformly low income population. It is also apparent that they were especially motivated to provide data about their housing conditions in the hope that they might benefit from downstream interventions. With one or two exceptions, minimal differences were observed between the two communities, and while data are presented for each settlement in almost all instances the data can be combined.

The data presented in the report were analyzed using SPSS and STATA software, and the actual databases (with all identifying information removed) are made publicly available in electronic format as part of the appendices to this report. These databases can be analyzed by anyone interested in having access to the original data, and are presented in EXCEL and SPSS formats.

Historical Development and Background (Chapter 2)

Redwood and Rancho Vista each have over 300 lots and are located on the edge of Guadalupe County, several miles south-east of San Marcos, surrounded by agricultural land. The study area lies within a patchwork of similar subdivisions to be found in Caldwell, Hays, Bastrop, and Travis counties. Although the size and growth of the two subdivisions varies, most initial development and sales began by developers through Contract for Deed during the mid-1980s, with the most notable housing infill and consolidation occurring primarily in the mid to late 1990s and early 2000s. Satellite images of this cluster within the past five years indicate a drop in new lot occupation, accompanied by visible housing-structure improvements and additions. Indeed, a visual count of housing-units and lots shows that the total number of housing-units exceeds the total number of lots. This is to be expected where some internal subdivision and/or sharing

between kin has occurred. The drop in recent new lot occupancy and the rise in housingstructures observed may indicate declining affordability and limited mobility.

Surveyed areas are divided into two units for the purpose of comparative analysis. Rancho Vista, the largest single development within the clustered subdivisions, is separated from remaining smaller subdivisions (promoted by a variety of developers), referred to collectively as Redwood. Census 2000 data for Redwood CDP (Census Defined Place) shows that the population comprised primarily of young to middle-aged adults with elementary school-aged children and is almost exclusively Hispanic. Most homes are owner-occupied manufactured (mobile) homes. The larger median family/household sizes and a lower median number of rooms per dwelling compared with 2000 data from Guadalupe County overall, indicate greater levels of overcrowding, and comparisons also indicate notably higher levels of poverty than in the county and Central Texas at large. Declining property valuations, decreasing education levels, and increasing low-wage employment during the period between the 1990 and 2000, further support the possibility of declining mobility. Census data for 2010 will be important to evaluate how these trends have changed over the past ten years.

Socio-economic Profile, Housing Acquisition, and Dwelling Structures (Chapter 3)

Corresponding quite closely to Census 2000 and satellite image information, the survey results indicate an average household size of 3.94 and a slightly higher average lot size of 4.29 persons. Roughly 14% of lots contain two housing units, and most of the persons in the second home are close-kin relations to the primary household dwelling (parents or adult siblings). The large majority (three-fourths) of households have one or two members in paid employment, and one-third reports a monthly household income of between \$2,000 and \$3,000, while 60% report their income at under \$2,000 underscoring the poor, and very poor, status of residents in these two communities. A general trend is that households with only one member, and those with six or more persons, are much likely to live in poverty than are smaller nuclear families. Between settlements there is little variation with regards to socio-economic profiles.

Few if no residents are found in higher paying professions such as in managerial, professional, engineering, technical, and upper-level office positions. Most **primary** household income earners work in *Construction & Extraction*, followed by persons that work in *Building & Grounds Cleaning & Maintenance, Production*, and *Sales* occupations. *Secondary* and *tertiary* household earners can also be found in *Office & Administrative Support, Food Preparation & Serving* and in *Healthcare Support* fields. A total of 105 of the 133 households surveyed listed at least one person with construction skills, which in later analysis were statistically found to be important in reducing the number of problems the home faces. The top five construction skills listed are in: 1) painting; 2) carpentry & framing; 3) brick & cement laying; 4) floor & tile laying; and 5) plumbing. Within the two communities there are also a handful of persons with electrical, air conditioning (AC) and roofing expertise.

Lot and housing acquisition and structure. Most households (61%) report living on their lot for 15 years or more, confirming our reading that by 1995 most communities were fairly well established. Nineteen per cent are relatively new arrivals during the past 10 years indicating a low to modest turnover of homeownership. Tax appraisal data show that lot sizes vary, with the

majority of lots in Redwood (62%) measuring between 0.34 and 0.505 acres while in Rancho Vista lot sizes are fairly uniform, with 84% measuring 0.574 acres. In Redwood, most lots (72%) are valued below \$17,000, lower than in Rancho Vista where 89% of lots values are \$17,000–\$18,000. The variations in lot size and value in Redwood result from the more diverse pattern of subdivisions, and variety of developers who were active in this neighborhood.

As to be expected in informal self-managed homestead subdivisions of this kind, mortgages play only a minor role in lot acquisition. Over 4/5 of respondents (82%) report purchasing land through payments to a seller (over several years). Over half of respondents (56%) report purchasing their lot from a company or land seller, while 31% report purchasing the lot from a former owner (probably a buy-out). Nearly all respondents (94%) hold deeds or are purchasing under contract for deed and, of the respondents still paying for their land, the majority (88%) possess a written contract. The prevalence of contract for deed in both communities, and the relatively small number of cases (10.5%) that have oral contracts, indicates the vulnerability and lack of protection. (Most of the oral contracts are renters.)

The average age of the primary dwelling unit (defined as the principal structure in which the household resides) is 22 years, emphasizing the likelihood of a high need for weatherization and home improvements in older units. The vast majority of survey respondents (91%) own or are purchasing their home, and taking into account only those that are still paying installments the data suggests that payments run to 30–45% of monthly household income. Two-fifths of respondents (42%) report purchasing their home from a manufactured home dealer, indicating the importance of such dealers in housing acquisition. One-quarter (26%) report purchasing their home from a former occupant, indicating that buy-outs of previous occupants or lot owners is also important.

Regarding the type of structure: 69% of dwelling units are manufactured trailer homes (although due to difficulties of definition some of these may be "modular" homes), and 14% are self-built. Between the two subdivisions Rancho Vista has a higher presence of self-built homes than Redwood, but otherwise there are little differences. Both communities appear to have a similar number of bedrooms (68% of units having 3-4 bedrooms). Two out of five respondents have extended or added to their primary housing unit, mainly for additional living (sleeping) space.

Housing Services and Infrastructure Problems (Chapter 4)

<u>Housing Services and Supply of Utilities</u>: Overall, there appears to be little difference between Rancho Vista and Redwood in terms of water supply, wastewater provision, and electricity. The only notable difference is in the method of garbage disposal.

Both communities get their supply of water primarily from a piped-in source: 92% do so. Roughly 18% report a problem with their water supply and, of these, hard water or deposits in the water (calcium or rust) are the most often mentioned. Almost all households (98%) rely on some sort of septic tank (mainly professionally installed). Overall, 44% report serious problems with their septic tanks, involving clogs, back-ups of sewage, capacity issues, and leaks. It appears likely that many of these problems are related to the fact that in 60% of cases the septic systems are more than 15 years old, and almost half (49%) are more than 20 years old. Problems also arise since these septic tanks are designed to be professionally (vacuum) pumped periodically, but many households fail to do so because of the cost.

Most residents (62%) make exclusive use of electrical power; others (1/3) have electric power that they supplement with propane tanks. Most people do not have problems with their electricity, but of those that do (19 persons), the most common complaint relates to cost. About 88% of households have electric water heaters, making this the primary source of hot water in both communities, and a further source of complaints about high electricity costs since electric water heaters consume more energy and are more expensive to run than gas heaters.

Multiple options are adopted to provide air-cooling in the homes. Almost half of households (49%) count on at least one partial air conditioner (AC) unit to cool their homes, and 9% more supplement their central (full) AC with a partial AC unit. Half of the homes with partial ACs have more than two partial units (usually window-based in bedrooms) and considering the small average size of many homes this high number is notable. Given the many complaints about high energy bills, and about it being insufferably hot during the summer, the real story is probably that many homes are not capturing cool airflow efficiently. Overall, one-third (34%) of those surveyed report a problem with their air-cooling source, mainly related to having a broken or no AC, or that an AC system requires repair. In addition, many homes have fan units.

Twenty-two percent of the respondents have a formal garbage collection service, while around one third have a semi-formal arrangement with an individual contractor. No less than 42% either drop off their garbage elsewhere, or burn it. There are statistically significant differences between communities for how they dispose of their garbage: residents of Redwood have more access to formal garbage service and are more likely to drop off their garbage themselves or burn it, while those in Rancho Vista are twice as likely to use the semi-formal contractors.

<u>Housing Problems.</u> Housing problem areas and the severity of these problems are to be the focus of possible grant proposals for weatherization and home improvements on behalf of the two communities, as well as for potential future funding for "green" technologies and housing upgrades and rehabilitation. These latter improvements can also be tied to self-building new homes, and to DIY self-help improvements.

The survey enquired about 24 dimensions of possible housing problems. Ratings of these 24 housing dimensions from all surveys (N=133) was based on an ordinal scale that indexed responses to the housing characteristics as a "severe" or "occasional" problem. Findings show that the top problem area for residents (72%) is that *doors do not close properly*, followed by that their dwelling unit is *too hot during the summer* (69%), *too cold during the winter* (64%) and *poorly insulated* (62%). It appears that multiple benefits can be achieved through a combination of potentially cost effective home improvements in these areas. Other key problems as rated by households include *pest infestation, septic tanks, bathroom venting, roof leaks, flooring, kitchen venting, foundation, windows closing properly,* and *electrical wiring*. Of the 24 dimensions, *front door steps* receive the fewest number of problem counts but, even here, 37% say that the steps to their front doors are an issue of concern. Subgroup comparisons show little variation between residents of Rancho Vista and Redwood in the problems reported. Households that answered the mail survey were more prone to report problems than those surveyed face-to-face, a

difference that was statistically significant. This not completely surprising since we would expect those most concerned about their housing conditions and in need of assistance, to be more likely to respond in the mail surveys (which were self-selecting).

Residents were also asked an open-ended question to list (up to) five most severe problems that they confronted. Our hypothesis is that householders will prioritize major structural or infrastructure problem areas since these are the ones that if fixed, will most improve their living situation. The results confirm this: the topmost severe condition listed is that of *septic tank problems*, followed by *roof leaks*, *poor insulation*, and *too hot in summer*. Put another way, residents rank septic tanks as the number one issue they would like to have corrected. Both Rancho Vista and Redwood residents list analogous severe problems.

To further measure home problems, households were grouped into four categories (quartiles) to differentiate their overall housing condition with the following distribution showing that 42% of homes have major housing problems in the two settlements.

Category 1: 18.3% of households with extensive and serious housing problems.

Category 2. 23.7% of households with substantial housing problems.

Category 3. 21.4% of households with largely modest housing problems.

Category 4. 36.6% of households with **relatively few housing problems**.

Finally, an ordered logit model was generated using the housing quartiles as an index and dependent variable to estimate the factors that help explain housing conditions. In general, the **number of housing problems is estimated to rise** as the house structure ages, when the household reports problems with their septic tank and source of air cooling, and where the household has a member with health issues or disabilities. On the other hand, the **number of housing problems is estimated to decline** as the value of the home increases and if the household has a member with construction experience. The three variables that appear to most influence the number of housing problems are: 1) where a household has no member with construction experience; 2) where the house reports septic system problems; and 3) where one or more members of the households have chronic health problems.

We posit, therefore, that a home that has someone with some type of construction experience is more likely to be able to fix the problem or make an improvement compared to those households that have no such skills. With regards to air cooling, many consequent problems are associated with poor air quality and, thus, a home with poor central air flow is more likely to experience additional housing problems. Similarly, if the home contains persons with severe health problems or disabilities, they are less likely to have the physical resources to deal with dilapidating dwelling conditions.

Planned Improvements, Recycling and Health Issues (Chapter 5)

Ninety-eight of the residents (75%) have plans for their house within the next two years: most indicate that they plan to make general improvements of some form or other; one in four (26%) respondents indicate that they have plans for building a house, alongside other improvements, extensions/additions, and/or even installing a mobile home. A further 19% plan on adding on or

extending to their current dwelling unit, with or without any other improvements but without building another house; while a few plan on doing no more than maybe fixing their yard (4.3%).

Many (40%) residents recycle: most commonly aluminum cans. Few residents compost (only 13%) despite the high percentage of our study population that report disposing of their garbage themselves (either by dropping it off, or burning). Most our survey participants (82%) have not heard about sustainability issues beyond that of recycling. The majority of residents own pets – dogs mostly.

<u>Health Problems and Disabilities and their Relation to the Dwelling Unit.</u> More than half of the surveyed population (57%) indicate that they have at least one member of their household with some sort of severe or chronic health problem or disability. The most frequently reported health problem among respondents is *diabetes* (29% of the households have at least one member with diabetes). There are several other health problems that affect at least one member in about 15% of the households: *poor physical mobility, asthma/respiratory problems,* and *migraines/headaches.*

Correlating with how health problems are affected by housing situations, the condition cited by residents as most often as contributing to illness and poor health is **poor indoor air quality**. This includes mold, noxious odors, humidity, dust, and poor air circulation. This response is especially notable given the growing body of research that links health outcomes such as asthma and lung cancer to the quality of indoor home environments. We find a strong relationship between negative health outcomes, and the condition of the physical house. For instance, cases that report having a member of their household affected by asthma are more likely to list mold, poor air quality, humidity and condensation, poor venting from the kitchen or bathroom or toilet, or drafts from doors as problems.

Conclusion and Policy Implications (Chapter 6)

In the final chapter of this report we offer an overview of the range of possible actions that might be undertaken in light of the survey and analysis of Rancho Vista and Redwood. We emphasize, however, that these are only way-makers to possible future actions, and we offer no prioritization of actions: rather this must be undertaken by the residents themselves.

The first section of the chapter provides an inventory of the types of funding available to subsidize sustainability and home improvement expenditures at the federal, state and private utility levels. These include: USDA Direct Housing Loans; Home Repair Loan and Grant Program; Mutual Self-Help Housing Program; Housing Preservation Grants; Multi-Family Housing Grants; Weatherization Assistance Program; Energy-Efficient Mortgages Program; Residential Energy Subsidies and Tax Credits; PACE Financing: Property Assessed Clean Energy (PACE); Sales Tax Incentives, and Local Utility Incentive Programs.

Principal Housing Priorities & Actions

- a) Property Titles and Lot and New Housing Acquisition and Sales.
 - Most households have acquired their homes through Contract for Deed. Residents in central Texas would benefit from conversion to Warranty Deeds that would give greater protection.
 - There is a major need for financing support lower cost loans and small scale credits – for lot purchase, housing improvements, and infrastructural investment. For many of the upgrades and improvements to take place, financial underpinning will be critical.
- b) Infrastructure
 - The most salient infrastructural problem that emerges from our analysis is that of the poor quality and operation of most septic tanks. Two actions appear to be warranted. First, funding is urgently required to systematically replace defective septic tanks; second, regular periodic vacuum pumping is required on all existing and newly installed septic tanks.
 - Garbage collection is privately managed, but we found interesting lower cost "informal" services operated by local entrepreneurs which many use, and which seem to work reasonably well. As part of a more generalized campaign to raise public awareness of housing and community sustainability, promotion of safe (covered container) composting systems could take advantage of biodegradable materials that are currently burned or dumped, and offer compost that can be used in the yard.
- c) Housing Problems. While considerable housing diversity exists across the two neighborhoods, the modal house type is that of manufactured homes – singlewide and doublewide trailers. Dwellings vary greatly in quality and adequacy and fall into one of four categories of housing problems (see above). The primary areas of concern are:
 - Septic tank problems (already mentioned above)
 - Roofs leaking
 - Unstable foundations and footings
 - Poor and dangerous electrics
 - Poor insulation and a gamut of associated problems (doors & windows don't close properly)
 - And poor ventilation and inadequate cooling (especially) and heating.

The widespread presence of construction skills is an important human resource in these two communities which offers considerable potential for self help and mutual aid assistance, and for local job creation.

There seems little doubt that many of the chronic health conditions that residents identified are related to, or aggravated by, the poor housing conditions. This is particularly likely in the case of the diseases and illness that are directly related to poor air quality.

- d) Priorities for Housing Improvement versus Housing Replacement. These data relating to levels of housing problem are likely to be important when considering the nature of housing improvement interventions that should be undertaken.
 - Category 1 & Category 2 households will benefit substantially from interventions to improve the dwelling unit. However, it seems probable that the costs of intervention will greatly outweigh the benefits (unless the interventions are low cost and ameliorative), and will be un-economic. In such cases where major structural improvements are required to the older and most dilapidated properties, it will probably be desirable to start over, bringing in new(er) housing units, or by promoting new self-help home construction. Certain interventions in these lots can be undertaken without prejudice to decisions about the house structure itself: for example septic tank replacement, yard improvements, etc
 - Category 3 (especially) and Category 4 housing units present the best prospects for actions to best opportunities for maximum and longer term benefits to accrue from home improvement and weatherization programs. However, the prioritization about the types of programs to be promoted, and the targeting of households to be affected, must be a decision for the residents themselves.

e) Housing Sustainability and Planned Improvements

- Knowledge about sustainability and sustainable housing practices was fairly limited. However, there are good preconditions in the two neighborhoods to suggest that an ongoing community education and information program about the opportunities for incorporating sustainability into future home improvement programs and home building is both warranted, and likely to gain traction. A number of action items are proposed, and are identified in a companion report -- Urban Sustainability and Renewable Energy Applications for *Colonia*-Type Housing in the Southern US."
- Large yards are often underutilized "dead spaces", and offer a major opportunity to engage in sustainable practices that will make the outdoors more attractive and more usable. Tree and shrub planning tied to spot watering, itself linked to rainwater harvesting or reuse of gray water, would do much to provide shade and sites for recreation.

Next Steps

The main purpose of this survey was to better understand housing conditions and housing processes in these two low income informal homestead subdivisions, with a view to identifying possible housing actions and opportunities for home improvement. Now the community will need to make some tough choices. Most notable here will be the choice between those

dwellings and households that will benefit from major investment and improvement, and those that won't. The latter are likely to be the oldest and most dilapidated residences, where apart from modest "band-aid" type improvements (resetting doors to exclude draughts, making electricity sockets safe, covering exposed windows with aluminum foil, etc.), any major investment in these dwellings is likely to be uneconomic. Better, in these cases to start over, looking towards newer and higher-standard manufactured housing to replace the old. Sponsored self-help and self build should also be on the agenda, whether as new stand alone homes or as extensions. Those cases where investment and improvements will achieve notable gains and benefits are likely to be more economic and viable.

But how can policy-making and grant-seeking meet the legitimate needs of both groups, ensuring that everyone has an opportunity to participate in some of the benefits and supports that the communities are able to secure? Here we return to the idea of yard-wide versus strictly dwelling structure centered improvements. This report has identified the urgent need for new septic tanks and for improved septic tank usage. In addition we have underscored the very real benefits that will accrue from better yard and garden management: clean-up, composing, rainwater harvesting and spot irrigation, tree planting, etc. Investment in the yard can prove highly economic. New septic tanks and the other actions complement the home and do not restrict or impede future home replacement. Nor do new septic systems or yard improvements result in any appreciable loss of the original investment when homes are replaced. Yard investments and improvements offer positive advantages to those residents whose housing structures are less viable in the medium to long term, and pave the way for home replacement in the future. It is also likely to add value to the property, even though the actual dwelling value is flat or in decline. While the benefits of these yard-centered actions will also apply to those residents whose homes are targeted for significant improvement and upgrading, the adoption of yard-centered upgrading will at least ensure that everyone, potentially, can benefit, and that noone needs to be left out.

* * * * *

Chapter 1

RESEARCHING HOUSING CONDITIONS, SUSTAINABILITY AND SELF-HELP IN COLONIA TYPE SUBDIVISIONS IN CENTRAL TEXAS

1.1 Study Goals and Organization

This report is undertaken on behalf of some 630 households in two low-income settlements in Guadalupe County, central Texas. The settlements – Rancho Vista and Redwood – are somewhat similar to border *colonias*, being almost exclusively Hispanic, poorly serviced, largely owner-occupied, and self-managed and self-built homesteads on lots that were acquired at relatively low cost legally through Contract for Deed, a transaction that leads to deeds being granted once the buyer has completed all payments.¹ They differ from colonias by location and size, being located way beyond the border, buried in rural areas in close proximity to major metro areas. They are also considerably larger than most border colonias, these being over 300 lots in each community. Generally speaking, the levels of poverty are not as extreme as in the border, nor are housing conditions quite as bad. Most of the dwelling units are manufactured (mobile) homes, but many units are old and suffer from severe dilapidation, wear and tear, insulation, roof leaks, poor air quality etc., making living conditions intolerable or extremely difficult for residents and their families, especially for the elderly and children. Many lots have significant infrastructural problems, especially wastewater and sewage disposal, solid waste removal, animal infestation, etc.

Since the 1990s there has been substantial research and major public policy interventions in border *colonias* (Ward, 1999), but there is less awareness about colonias in the rest of Texas, and in this case, in the backyard of Austin and San Marcos. Indeed there is very little research about *colonia*-type housing beyond the border in the United States and Texas (Ward and Peters, 2006; Mukhija and Monkonnen, 2006; Mukhija, 2007; Esparza and Donelson, 2008). In this study we will refer to them not as *colonias* (which many outside consider derogatory), but as "informal homestead subdivisions": informal because they develop through informal land development and home development (self-managed) practices; and homestead subdivisions since that is what they are – subdivisions in which people engage in homesteading.

The study was undertaken by researchers at the University of Texas at Austin, led by professors in the LBJ School of Public Affairs and the Law School and their respective graduate students from those programs as well as from Sociology, Community and Regional Planning, and Latin American Studies. The request from the residents came via the Law School's Community Development Clinic and the director (Professor Heather Way). The School had already worked with a number of families in both communities, first on a program to resolve and provide "clean" titles to a number of owners whose papers were not in order (Law Clinic); and later to install some 26 new septic systems (Environmental Clinic). Thus, the UT Law School had already garnered local credibility and enjoyed a good rapport with the two neighborhoods through their

¹ In the border region Contract for Deed was also important in the past, but from 1995 the Texas legislature made provisions to convert such contracts to a more secure form of interim title called Warrant Deeds, but this change does not apply statewide (Ward, 1999).

local leaders. Familiar with Dr. Ward's extensive research into colonias and similar communities, Professor Way asked if he and his students would be willing to help design a survey on behalf of the two communities. The Community Development Clinic was especially interested in developing a detailed profile of housing conditions in these two settlements, in order to collaborate with the Texas Low Income Housing Organization and Guadalupe County in preparing a major 502 grant and assistance proposal for a weatherization and housing program on behalf of the two communities. These funds are being made available in part through the American Recovery and Reinvestment Act of 2009 ("stimulus package") that offers a major window of opportunity for these and similar areas over the coming two-three years.

In designing the survey we also minded to explore how broader issues of housing and residential sustainability might be built into the analysis and, later, into the grant proposal. Specifically, what potential is there for "green" technologies and awareness to be a part of housing, upgrading, rehab, and self-build/Do-It-Yourself (DIY)? What sort of weatherization improvements would most effectively improve energy efficiency, and how might these costs and benefits be assessed? What existing community development and social capital potential was present to participate in any community wide mutual aid and self-help programs, and what skills existed in the community that might be harnessed in those programs? What level of awareness is there among residents about: a) sustainability and sustainable housing practices and applications; and b) about the interplay between the physical elements of the dwelling environment, health and illness. Several of these questions were at the forefront of a graduate class that Dr. Ward was already leading in the spring semester, and came to directly inform both the study itself, and the shape of this final report.²

1.2 Methodology and Survey

After several visits and meetings with community leaders from both communities it was decided to conduct a mail survey, at least in the first instance. Mail surveys have the advantage of being much lower in cost to undertake, since once the instrument is designed and tested, it can be distributed to a large population – or as in this case to everyone. This makes sampling unnecessary. But the downside of mail surveys is also well known. A poor response rate is almost inevitable – a 5-7% response rate of questionnaires being returned even after reminders have been sent out is considered quite satisfactory, and the question of bias will always hang over the results: who were the people who did not respond and why? The ways in which this non-response can give a distorted picture are numerous and well known. In addition, with mail back surveys the instrument has to be simple and easy to self-administer, and the researcher has no control over the process: not just who responds, but also whether questions were understood, answered sensibly and seriously, handed off to an unsuspecting family member,

² The class was supported by a 2009-10 grant to Professor Ward from the Lyndon B. Johnson School of Public Affairs, Policy Research Institute, "Urban Sustainability and Renewable Energy Applications for *Colonia*-Type Housing in the Southern US." It was offered as part of the "Sustainable Cities" interdisciplinary doctoral program anchored in the School of Architecture (Community & Regional Planning).

and so on. Little surprise, therefore, that few researchers in the humanities and social sciences use mail-back interviews.³

So why did we? In our case it made a lot of sense, largely because the request for the survey had come from the communities and had the full support of the leaders who were willing to do what they could to ensure a good response. Moreover, we had limited resources and time, since the survey had to be completed before the end of the semester, which in effect meant that we only had six weeks.⁴ Nevertheless, while we were confident that we would get a better than usual response from a mail survey we were also eager to ensure that we generated enough responses to provide for a credible analysis that would convince external agencies and grant evaluators. Therefore, in addition to the mail survey we decided also to oversample the two settlements with a random personal survey applied by graduate student interviewers, most of whom spoke Spanish. This was also highly desirable from the perspective of the Community Development Clinic which was eager to foster face-to-face contact, rather than faceless communication by mail. Methodologically, too, this dual strategy was attractive since it would provide an alternative sub-sample with which to compare the responses received by mail. Providing that we had a reasonably robust sample from both sides, we would be in a better position gauge possible bias resulting from either method.

Preparation and Application of the Survey

Working with similar previous surveys, several iterations of the instrument were prepared and discussed before testing. Written in Spanish and English (odd and even pages), the questionnaire was relatively simple to follow and could be completed in 15-20 minutes. A copy is contained at Appendix 1.1. It was accompanied by a letter detailing the nature and purpose of the survey, requesting voluntary participation, and ensuring confidentiality (Appendix 1.2). In addition, a contact phone number at the LBJ School of Public Affairs was provided for anyone who wished to request additional information. Finally a prepaid envelope, which improves the return rate, was enclosed for the return of the completed questionnaire.⁵

While working on the design of the questionnaire, community resident volunteers offered to publicize and circulate a "flyer" (*volante/*notice) that explained the purpose of the survey and urged residents to respond in a timely fashion (see Figure 1.1). These were posted in the Church Hall and were circulated house-to-house by community leaders and volunteers several

³ Today online and web-based surveys are much more common and have largely come to replace mail-back surveys. But these also suffer from many of the same drawbacks as mail surveys. In our case, however, the relatively low number of households in the two settlements with high speed internet access made an online survey both inappropriate and unrealistic.

⁴ Previously too, Dr Ward had used a mail survey in colonias to good effect when it had been the only way to gather information from what he called "no-see'em" populations, these being absentee lot owners whose addresses he was able to get from the property register. People had often dispersed throughout the country so a mail survey, complemented by 'phone follow-ups where possible, was the only realistic way to gather the sample. Despite being low-income and largely Spanish speaking, the survey yielded a good return (over 10%, Ward and Carew 2002).

⁵ The research project and instruments were approved by the University Human Subjects Review Board: "Weatherization and Self-Help Support Survey of Case Study Informal Homestead Subdivisions, Central Texas," 2010-03-0089.

of whose names appeared on the flyer as contact persons for any local resident requiring further information. A week later the survey began.



Figure 1.1. Purpose of Survey Flyer/Volante

The plan was to work street-by-street dropping off mail surveys at every house and, in addition, to actually apply a face-to-face interview at every 6th lot starting at a randomly selected point. Graduate student interviewers (class members mostly) were trained in various key elements: applying the questionnaire, manner of presentation, compliance with Human Subjects Review protocols, etc. With the assistance of the community resident volunteers most of the mail interviews were distributed in the first weekend of interviewing, although a later follow-up distribution was necessary in two or three areas that we believed had not been fully covered the first time around. Some 630 mail questionnaires were distributed and 93 were returned – a satisfactory 14.8% response rate.⁶ A slightly higher proportion of mail returns were recorded for Redwood compared with Rancho Vista (Table 1.1).

⁶ As mentioned above anything higher than 5-7% may be considered a good rate of return. While the % return was not as high as we had hoped (we believed that 20% was a possibility), we are sure that our success was due in large part to the support and direct assistance that we received from the community leaders. We take this opportunity for thanking them for their hard work and unstinting support. We should also like to thank Ms. Ruby Roa – liaison officer between the community and the Law School -- for her insights and fulsome logistical assistance. The success of the survey is largely down to her and the community leaders support (see title page for acknowledgements)..

Dimension / Item	Rancho Vista		Redwood		Combined	
	%	N	%	N	%	N
Total Interviews	49.6%	66	50.4%	67	100%	133
Survey Type Analysis						
Mail survey	65.2%	43	74.6%	50	69.9%	93
Face-to-face interview	34.8%	23	25.4%	17	30.1%	40
Language of Survey						
Spanish	37.9%	25	25.4%	17	31.6%	42
English	62.1%	41	74.6%	50	68.4%	91
Appraisal Values						
Appraised lot size (acre)	0.62	64	0.93	56	0.76	120
Mean home improvement (\$)	\$32,685	61	\$31,653	58	\$32,182	119
Mean total appraised (\$)	\$49,508	63	\$50,664	57	\$50,057	120
Garbage Disposal						
Formal contract and service	17.7%	11	27.0%	17	22.4%	28
Semi-formal contractor	43.5%	27	20.6%	13	32.0%	40
None – drop off, dump or burn	35.5%	22	46.0%	29	40.8%	51
	Mail		Face-to-Face			
Dimension / Item	Mail		Face-to-	Face	Combi	ned
Dimension / Item	Mail %	N	Face-to-	Face N	Combin %	ned N
Dimension / Item Total Interviews	Mail % 70.0%	N 93	Face-to- % 30.0%	Face N 40	Combin % 100%	ned N 133
Dimension / Item Total Interviews Gender of Respondent	Mail % 70.0%	N 93	Face-to- % 30.0%	Face N 40	Combin % 100%	ned N 133
Dimension / Item Total Interviews Gender of Respondent Male	Mail % 70.0% 38.5%	N 93 35	Face-to- % 30.0% 37.5%	Face N 40 15	Combin % 100% 38.2%	ned N 133 50
Dimension / Item Total Interviews Gender of Respondent Male Female	Mail % 70.0% 38.5% 61.5%	N 93 35 56	Face-to- % 30.0% 37.5% 57.5%	Face N 40 15 23	Combin % 100% 38.2% 60.3%	ned N 133 50 79
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey	Mail % 70.0% 38.5% 61.5%	N 93 35 56	Face-to- % 30.0% 37.5% 57.5%	Face N 40 15 23	Combin % 100% 38.2% 60.3%	ned N 133 50 79
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey Spanish	Mail % 70.0% 38.5% 61.5% 29.0%	N 93 35 56 27	Face-to- % 30.0% 37.5% 57.5% 37.5%	Face N 40 15 23 15	Combin % 100% 38.2% 60.3% 31.6%	ned N 133 50 79 42
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey Spanish English	Mail % 70.0% 38.5% 61.5% 29.0% 71.0%	N 93 35 56 27 66	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5%	Face N 40 15 23 15 25	Combin % 100% 38.2% 60.3% 31.6% 68.4%	ned N 133 50 79 42 91
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey Spanish English Appraisal Values	Mail % 70.0% 38.5% 61.5% 29.0% 71.0%	N 93 35 56 27 66	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5%	Face N 40 15 23 15 25	Combin % 100% 38.2% 60.3% 31.6% 68.4%	ned N 133 50 79 42 91
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey Spanish English Appraisal Values Appraised lot size (acre)	Mail % 70.0% 38.5% 61.5% 29.0% 71.0% 0.78	N 93 35 56 27 66 84	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5% 0.72	Face N 40 15 23 15 25 36	Combin % 100% 38.2% 60.3% 31.6% 68.4% 0.76	ned N 133 50 79 42 91 120
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey Spanish English Appraisal Values Appraised lot size (acre) Mean home improvement (\$)	Mail % 70.0% 38.5% 61.5% 29.0% 71.0% 0.78 \$29,457	N 93 35 56 27 66 84 84	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5% 0.72 \$39,285	Face N 40 15 23 15 25 36 33	Combin % 100% 38.2% 60.3% 31.6% 68.4% 0.76 \$32,182	ned N 133 50 79 42 91 120 119
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey Spanish English Appraisal Values Appraised lot size (acre) Mean home improvement (\$) Mean total appraised (\$)	Mail % 70.0% 38.5% 61.5% 29.0% 71.0% 0.78 \$29,457 \$47,900	N 93 35 56 27 66 84 86 86	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5% 0.72 \$39,285 \$55,514	Face N 40 15 23 15 25 36 33 34	Combin % 100% 38.2% 60.3% 31.6% 68.4% 0.76 \$32,182 \$50,057	ned N 133 50 79 42 91 120 119 120
Dimension / ItemTotal InterviewsGender of RespondentMaleFemaleLanguage of SurveySpanishEnglishAppraisal ValuesAppraised lot size (acre)Mean home improvement (\$)Mean total appraised (\$)Garbage Disposal	Mail % 70.0% 38.5% 61.5% 29.0% 71.0% 0.78 \$29,457 \$47,900	N 93 35 56 27 66 84 86 86	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5% 0.72 \$39,285 \$55,514	Face N 40 15 23 15 25 36 33 34	Combin % 100% 38.2% 60.3% 31.6% 68.4% 0.76 \$32,182 \$50,057	ned N 133 50 79 42 91 120 119 120
Dimension / Item Total Interviews Gender of Respondent Male Female Language of Survey Spanish English Appraisal Values Appraised lot size (acre) Mean home improvement (\$) Mean total appraised (\$) Garbage Disposal Formal contract and service	Mail % 70.0% 38.5% 61.5% 29.0% 71.0% 0.78 \$29,457 \$47,900 22.1%	N 93 35 56 27 66 84 86 86 86	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5% 0.72 \$39,285 \$55,514 23.1%	Face N 40 15 23 15 25 36 33 34 9	Combin % 100% 38.2% 60.3% 31.6% 68.4% 0.76 \$32,182 \$50,057 22.4%	ned N 133 50 79 42 91 120 119 120 28
Dimension / ItemTotal InterviewsGender of RespondentMaleFemaleLanguage of SurveySpanishEnglishAppraisal ValuesAppraised lot size (acre)Mean home improvement (\$)Mean total appraised (\$)Garbage DisposalFormal contract and serviceSemi-formal contractor	Mail % 70.0% 38.5% 61.5% 29.0% 71.0% 0.78 \$29,457 \$47,900 22.1% 27.9%	N 93 35 56 27 66 84 86 86 19 24	Face-to- % 30.0% 37.5% 57.5% 37.5% 62.5% 0.72 \$39,285 \$55,514 23.1% 41.0%	Face N 40 15 23 15 25 36 33 34 9 16	Combin % 100% 38.2% 60.3% 31.6% 68.4% 0.76 \$32,182 \$50,057 22.4% 32.0%	ned N 133 50 79 42 91 120 119 120 28 40

TABLE 1.1. Survey Returns by Subdivision and by Type of Survey
(mail versus face-to face)

Source: Mail and Face to Face Surveys. Appraisal values are drawn from the County Appraisal Office – on-line records.

The interview survey took several weekends to complete since interviewers began working in pairs to ensure that the survey could be administered in either Spanish or English – whatever came easiest to the respondent. Even as we became accustomed to applying the survey instrument, it was rarely possible to complete more than 3-4 surveys per interviewer in a Saturday or Sunday 4-5 hour session. Just walking the streets, explaining the purpose of survey, and then engaging with respondents who often had questions of their own takes time – as any experienced survey interviewer will attest. Interviewers were given updated lists of the names and addresses that had already responded by mail so as to avoid disturbing them twice. If a household responded that they had already replied by mail, they were thanked and we moved to the next house. Mostly though, the tactic of partial follow up with a personal survey worked well: most people knew about the survey, and while they hadn't yet completed it, most were willing to proceed there and then.

In total we completed 40 face-to-face interviews, although a larger proportion were from Rancho Vista, probably because it was a formally laid out settlement and was somewhat easier to work systematically (Table 1.1). Looking across the two interview types, was there bias? We expected that those who were most concerned with housing conditions, most in need of assistance, or those who had benefited or heard about previous Law School interventions, would be more likely to respond. Those who feel they are doing fine are less likely to have seen the need to respond by mail, but they would be more likely to fall into our interviewer (face-to-face) survey.

Table 1.1 presents several dimensions where some differences were noticed. With these sample sizes, of course, it is not possible to be definitive – a few percentage points are inevitable and should not be construed as bias. Although almost all of the survey population is Hispanic (only 4% are not), and 25% of our respondents were actually born in Mexico; the majority responded in English (68%). We noticed a slightly higher rate of responses in Spanish in the case of the face-to-face surveys, suggesting that there was a slightly higher propensity for people to use the English pages of the survey in the mail interview. The Redwood Census Defined Place (CDP) data from the 2000 Census which comprises almost exclusively these two settlements (see next chapter) showed that some 13.6% of the population are Caucasian, and if this is representative of the ethnic distribution of the two colonias 10 years later then we should conclude that this group did not participate in the mail survey as much as expected (although they were also underrepresented in the interview survey as well – 5% compared to 2% in the mail-back). It is likely, though, that the percentage of Hispanics has grown somewhat since 2000, but we will not know for sure until the 2010 Census results are made public.

Strangely perhaps, the manner of garbage collection was one area where there were major differences between settlements which we will discuss further and seek to explain in Chapter 3, (Table 1.1). Redwood is more likely to make use of the formal service or dump its garbage; while Rancho Vista uses a local (semi-formal) service of local collectors, and also dumps or drops off its solid waste. The mail back survey suggests that the type of survey may have affected the response to this particular question in that more people that were interviewed face-

to-face revealed that they use a semi-formal arrangement for their garbage pickup. One area where there was an observable difference in responses between the two types of survey was in the extent to which housing problems were reported. Mail in surveys were self selecting in so far as they appear to have been more interested in reporting their dwelling problems than those who felt less need (see Table 4.8). On the other hand, mail-ins were less likely to systematically offer responses on a five point scale for some 24 dimensions on the questionnaire. Insread they appear to have alighted on those that were most pertinent to them, and ignore those dimensions deemed to be irrelevant. In the interview survey we were able to go line by line for all 24, no matter how tedious it felt at the time. This is one area where the type and nature of the survey shaped the responses. However we do not think that it led to significant underreporting in cases where there were severe or ongoing problems. This is why in our analysis we upon those problems that were most commonly and widely described. Similarly, the data suggest that generally the mail survey respondent households were more likely to be below the poverty line than those we interviewed in person; again suggesting self selection from among those most in need of intervention and assistance. Thus there may be some slight weighting in our survey data to the poorer sections of the community, although it is clear that this is an almost uniformly low-income community by any measures.

1.3 Analysis and Preparation of the Report

One of the team members with extensive experience in SPSS prepared a detailed coding guide (Appendix 2.1) that was used by team members to code and validate the data. Additional information about lot size and property values were obtained from the County Appraisal Office on-line records⁷ and added to the record for each household surveyed. Once checked and cleaned for errors and recodes, the data were stored in Excel and SPSS databases and are available in their open access format (minus names and other identifiers, addresses, and phone numbers) for public use (See Folder Appendix 2. Excel (2.2) and SPSS Databases (2.3); users will need to have SPSS licensed software to use the SPSS version). The original surveys and private database records are held by Dr. Ward at the LBJ School and are confidential and not available publicly. In the Folder to this report we have also included pdfs of the tabulated results (frequencies [2.4] and [2.5) for many of the questions, in order to provide fast access to the basic data without having to perform new data analysis.

The data were analyzed by leading members of the team in order to compile this report. In most cases tables give the results for each settlement as well as the combined data. In almost all cases were able to work with the combined data since both were almost equally represented in the survey. Moreover, as mentioned above, with few exceptions we find little variation between the settlements in responses and housing conditions underscoring the possibility (and desirability) of treating Rancho Vista and Redwood as a single entity. Only where there are statistically significant differences will we make a special comment about the individual settlement, and what this means for that element of the findings and recommendations.

⁷ See http://www.guadalupead.org

Outline of the Report

Using Google Earth and county records, the chapter following this one provides a detailed description and overview of the historical development and original platting of the two communities and the take-up of lots over time. Most of the households arrived before 2000, and there has been considerable stability of the population with most people moving into the settlements during the 1990s. We also provide baseline data drawn from the 2000 census when the large proportion of the population of these two communities was folded into a single Census Defined Place. Data for 1990 for a more or less similar spatial unit (one block in Census Tract -- #2105.01) is also presented in order to get some sense of change since 1990. These data provide help to assess the extent to which there are possible inconsistencies and bias in the data that we gathered as part of the survey, not least since responses to the mail survey were self-selected.

Two major chapters contain the survey findings. Chapter 3 presents information about the socio-economic profile of the population across the two settlements. Here we are particularly interested in characterizing accurately the demographics and household structures in which people live; their employment and income; their experience and skills in the construction sector. In the second section of this chapter we explore the housing structure itself: types of housing; years of residence in the same, methods of dwelling and lot acquisition and sources of financing. We also present detailed data about the primary housing unit and, where it exists, the secondary unit as well – the number and types of rooms, the services and infrastructure, etc.

Chapter 4 analyzes the housing problems as these are perceived and experienced by the people themselves. We asked questions about some 24 housing dimensions to ascertain which (if any) problems the household experienced with their dwelling unit, services and essential appliances. A **housing problem index** was constructed from these 24 housing dimensions, giving us an inventory of the range of problems that respondents identified, and the frequency that each dimension was considered a problem issue or not. In addition those households that identified severe or ongoing housing problems were asked to prioritize their most pressing concerns. We also constructed a measure for each household in order to identify those households that were particularly severely affected by housing problems. We used this measure to create a quartile analysis (similar to a box plot analysis) and used it as the dependent variable in an ordered logit regression model analysis in order to try to identify what factors were most associated with the especially distressed dwellings. The results and preliminary conclusions of that analysis are summarized at the end of Chapter 4.

Chapter 5 analyzes the improvements and changes that residents stated they were planning for their home. We are also interested in their awareness about sustainability issues, and the extent to which they are already engaged in some elements of "green" practices – both in the home and in the yard. Building upon our LBJ School graduate class which explicitly analyzed sustainable housing practices and applications for different low income housing scenarios, we are able to outline a number of actions and approaches that residents, local agencies, and NGOs might wish to consider when developing their grant proposals. Adopting a broader understanding about sustainability and housing development – whether in rehab, or new

housing, or in self-help and DIY – will greatly enhance the reach of home improvement, and lay the basis for ongoing home improvements as well as individual and community empowerment. Or at least, that is the hope. The second half of this chapter reports upon the extent to which we found severe health problems and disabilities among household members in the two settlements, and describes if there is any correlation or association between poor health and the housing conditions and problems that were identified.

Chapter 6 contains a summary of the principal findings as we see them. These are for the consideration of the community and grant writers and provide a preliminary checklist for their deliberation about the next steps. The chapter should not be read as a conclusion or as a set of recommendations.

Finally, the Appendices contain the databases themselves, copies of the instruments and coding guides, etc.

Chapter 2

Historical Development and Socio-Economic Background of Rancho Vista and Redwood, 1980-2000

In this chapter we provide a brief overview of the historical development of the study area, focusing largely upon the process of plat development (settlement planning) since the early 1980s using secondary source materials obtained from the County Records Office, aerial and satellite imagery in the public domain, and census information. Occasionally we also use semi-structured interviews with key informants to fill in some of the gaps in the historical record.

2.1 Redwood CDP

The survey area forms part of the census-defined place (CDP) known as Redwood. The Redwood CDP is 5.9 square miles of land located in south-central Texas, approximately nine miles outside of the city of San Marcos, SE of Highway 35. Unlike San Marcos, which is in Hays County, Redwood CDP falls just inside of Guadalupe County's border with Hays (Figure 2.1).



Figure 2.1. Map of Redwood CDP Boundaries Source: US Census Factfinder (2000)

The majority of land within the Redwood CDP is undeveloped or dedicated to agricultural uses. Non-agricultral development is mostly residential and as Figure 2.2 shows it is concentrated in the northern section of the CDP.



Figure 2.2. 2010 Satellite Image of Redwood CDP Boundaries

Source: Google Earth (Redwood CDP boundaries added to image by authors)

Development comprises a patchwork of subdivisions. Analysis of plat map data, presented in Table 2.1, illustrates that the numerous subdivisions vary significantly in size (acreage and number of lots). With the exception of Rancho Vista, most are relatively small, and are similar to most *colonias* and informal subdivisions throughout Texas (Ward and Carew, 2002). Examination of plat map data also reveals that while the same developer(s) was/were responsible for several of the subdivisions, the actual development and consolidation of settlement occurred in the Redwood CDP during different periods.

Indeed, as the Table 2.1 indicates, new site development in Redwood began in mid-1982 and continued into late-1998, with the bulk of development submissions occurring in the mid-1980s. Figure 2.3 illustrates the CDP's development chronologically. Subdivisions are identified and color-coded according to the period in which the plat maps were submitted and approved.

In the interest of ease of analysis and discussion, this report examines the smaller subdivisions as a group, referring to them collectively as Redwood, and isolates the largest subdivision, Rancho Vista.

Subdivision	Plat Submission Date (yr / mo)	Developer	Subdivision Size (Acres)	Total Lots
Meadow Brook	1982 / 09	Ralph Giesecke	105.5	35
Four Oaks	1983 / 03	Bob Boyd & Sheryl McPherson (Boyd-McPherson Enterprises	9.955	20
Redwood Estates	1984 / 02	Ralph Iltis	Not available	28
David Major	1984 / 03	David & Jana Major	10	14
Lakecrest	1984 / 04	Bob & Sheryl Boyd	7.949	14
Emerald Acres	1984 / 08	Bob Boyd	13.5	22
Rancho Vista	1984 / 12	Ralph Giesecke	236.845	339
Tallowood	1985 / 09	Richard & Milton H. (Jr) Salmon	4.033	7
Hidden Forest	1985 / 09	Michael Lee Tessaro & Kenneth Dean Masters	12	28
Brookhollow Estates – Phase I	1986 / 04	Royal Resorts, Inc. (Frank Gordon – President)	31.15	42
Brookhollow Estates – Phase II	1986 / 04	Royal Resorts, Inc. (Frank Gordon – President)	40.14	44
Brookhollow Estates – Phase III	1986 / 04	Royal Resorts, Inc. (Frank Gordon – President)	38.94	49
Casa Verde	1994 / 05	Robert Boyd	9.91	18
Rose Trail	1995 / 08	Robert L. Boyd	2	4
Lost Prairie	1995 / 12	Robert L. Boyd	8.03	16
Crestview Estates	1997 / 09	Robert L. Boyd	23.93	29
Mesquite Estates	1998 / 12	Robert L. Boyd	11.96	11
Bumblebee Acres	1999 / 12	Peace and Thomas Construction (Johnny Peace – President)	10.626	18

Table 2.1. Development Information from Plat Maps

Source: Plat maps retrieved from the Guadalupe County Records Office, Seguin, TX



Figure 2.3. Chronological Development of Subdivisions in the Redwood CDP

Source: Google Earth (subdivision boundaries added to image by author)

Legend: Blue = pre-1985 plats; Red = 1985-90; Purple = post-1990

Abbreviations: BA = Bumblebee Acres, CV = Casa Verde; DM = David Major; EA = Emerald Acres; HF = Hidden Forest; ME = Mesquite Estates; RT = Rose Trail; TW = Tallowood

Redwood Neighborhoods

In addition to plat map analysis, comparison of past satellite images, such as the image used in Figure 2.4, is a useful tool in the reconstruction of Redwood's development. Unfortunately, Google Earth satellite images of Redwood only go as far back as 1995, so visual analysis of the initial physical development and occupation of subdivisions before 1995 is not included. Analysis of more recent images provides information about the growth of this area. Figure 2.4 shows the development and site occupation of most of the subdivisions created in the 1980s and in 1994. In 1995 we estimate that a housing unit or structure occupied approximately only one-quarter to one-half of the lots in most of the subdivisions. However, with the exception of Rancho Vista, it is important to note that most of these subdivisions are quite small, such that occupation of half of the lots may mean as few as four or seven lots (see Table 2.1).



Figure 2.4. 1995 Satellite Image of Redwood Source: Google Earth



Figure 2.5. 2002 Satellite Image of Redwood (with development markings) Source: Google Earth (red lines added by authors)

Comparison of satellite images from 1995 and 2002, clearly illustrates further development, namely the addition of Mesquite Estates (ME on Figure 2.3) and the occupation of Brookhollow and Crestview (CV). Satellite images also demonstrate further densification and infilling in the existing smaller subdivisions, such as Hidden Forest (HF). Figure 2.5 shows the growth and change that occurred in Redwood between 1995 and 2002 (in red), and comprises areas of additional development and consolidation. Single red lines indicate easily visible densification and squared sections indicate new areas of development and/or occupation of essentially unoccupied areas within an existing subdivision. The absence of red lines in subdivisions such as Casa Verde or Redwood Estates does not imply that consolidation did not occur in these areas. Quite the opposite, it is clear that by 2002 the majority of lots in these subdivisions were occupied by a housing structure. However, most of the consolidation in these subdivisions occurred through the addition of scattered housing units. For ease of analysis, Figure 2.5 only identifies new sites and the occupation of sparse or unoccupied areas in existing developments. Thus, through the addition and densification of relatively small subdivisions, Redwood's growth process was characterized by gradual accretion and consolidation.



Figure 2.6. 2010 Satellite Image of Redwood Source: Google Earth

Later satellite images (2005, 2006, 2008, and 2010) show further consolidation in most of the subdivisions in Redwood, with the most apparent quickening of a modest number of new units (approximately 10) occurring in larger subdivisions, such as Meadow Brook and Brookhollow. While most of the population and lot development occurred before 2000, it is apparent that both large and smaller subdivisions experienced some additional growth in the period between 2005 and 2008, primarily in 2006. Of note is the fact that there were little-to-no new additions visibly

evident in Redwood during the period between 2008 and 2010. Examination of re-plats for subdivisions in Redwood supports the previous observations: formal subdivision of existing lots occurred in both Brookhollow and Meadow Brook. Additional lots were added to Meadow Brook in the period between 1984 and 1991, and new formal lot creation in Brookhollow occurred during 1995 and 1996.

Visual analysis also demonstrates that while some significant structural changes in dwelling units occurred (e.g. mobile home being substituted by constructed or modular type housing), in the smaller established subdivisions, such as Mesquite Estates, the addition of units (e.g., the addition of another trailer or the extension of an existing trailer) appears to have been quite common. For example, house structure changes are evident along Joleen Street in the Mesquite Estates subdivision (see Figure 2.7 Red Arrow). The lack of formal re-platting that accompanied these visual changes suggests the possibility of informal lot sub-division, increasing the number of residents per lot, and/or housing changes (in terms of structure). However, again, these improvements appear to take place primarily in 2006 and diminish significantly in the period between 2008 and 2010. Thus, while recent images of Redwood indicate further consolidation (see Figure 2.6), the drop-off in new lot occupation and visible housing-structure improvements and additions may be indicative of declining affordability and mobility into Redwood today.



Figure 2.7. Street Map of Redwood Area Source: Google Earth, 2010

Rancho Vista Neighborhood

In December of 1984, Richard Giesecke submitted a plat map for the development of Rancho Vista. With 339 lots the subdivision was significantly larger than any other proposed developments in the same area. As before, due to the lack of readily available images from this period, the initial development of Rancho Vista is difficult to trace. However, examination of the growth through later satellite images indicates that while Redwood grew gradually through the development and densification of small subdivisions into the late 1990s, Rancho Vista was already significantly consolidated by 1995. Indeed, as Figure 2.8 demonstrates, by 1995 more than half of the lots in Rancho Vista were occupied by some housing structure. Although other subdivisions in Redwood were also relatively consolidated by this period, the large relative size of Rancho Vista makes this densification and take-up of lots especially significant.

Interviews with Ruby Roa, a community organizer who has worked in Rancho Vista since 2003, revealed that the majority of early residents in the subdivision are Mexican-American blue-collar workers working in nearby cities such as San Marcos, Austin and Seguin. Roughly equivalent to the cost of renting an apartment or rooms in inner-city San Marcos or Kyle, Rancho Vista provided a feasible alternative to renting or public housing, as well as the opportunity to own land and a home. According to Ms. Roa, information about Rancho Vista is thought to have spread by word of mouth, not least since inter-familial ties in the community are common.

Visual comparison of satellite images from 1995 with images from 2002 demonstrates that although it was already quite consolidated by 1995, Rancho Vista experienced notable densification after 1995. Figure 2.9 illustrates these changes. The red slashes in this figure signify previously unoccupied lots that, by 2002, possessed a housing structure. As the image demonstrates, the most significant growth occurred in the southern portion of Rancho Vista along Poplar, Pine, and Spruce Streets (see Figure 2.11). However, the consolidation of previously occupied areas, such as Cypress Street, is notable as well. Also worthy of commentary, comparison of these images shows structural additions and improvements being made, such as the addition of a mobile home or the replacement of a mobile home with a constructed or modular home.

Later satellite images of Rancho Vista (2005, 2006, 2008, and 2010) show further growth in the subdivision. Indeed, today some form of housing structure occupies nearly all of the lots in Rancho Vista (see Figure 2.10). However, this growth appears almost exclusively due to changes in already established lots and we see little or no visible occupation of previously empty lots. For example, while image comparison of Fir Street shows several structural changes between 2002 and 2008, the same vacant lot area space along Spruce Street (at the bottom) in 2002 images (see Figures 2.9 and 2.11) remains in recent images from 2010 (see Figure 2.10 and 2.11). Further, rather than significant structural change (mobile home to constructed/ modular home), most housing unit changes involve additions to the existing unit or the introduction of additional trailer. As in Redwood, visible housing additions/improvements appear in the period between 2006-2008, and appear to have stopped almost entirely in the period since the last set of photos for the period 2008 to 2010. This may relate to the economic downtown and the housing crisis. Certainly our fieldwork observations corroborated that there

was relatively little active building activity going on, although many have plans to improve their homes in the short and medium term (see Chapter 5).



Figure 2.8. 1995 Satellite Image of Rancho Vista Source: Google Earth



Figure 2.9. 2002 Earth Google Image Showing Changes (in red) from 1995 Source: Google Earth



Figure 2.10. 2010 Satellite Image of Rancho Vista Source: Google Earth



Figure 2.11. Street Map of Rancho Vista Source: Google maps

Although only a very small number (approximately 5 lots) the apparent exits from Rancho Vista during the same period as additions (2006-2008) are noteworthy (and easier to discern given its

regular layout). The land and housing market in these settlements does not make it easy to sell, so it is likely that these exits mark repossession of the dwelling unit or the inability to pay the contracted costs of the land. It could also indicate movement to another settlement and the transfer to another home-site, but this is relatively rare in our experience.

Finally, as Table 2.2 illustrates, although we have provided an overview of the platted development and estimates of the take-up of lots over time, in some subdivisions (Rancho Vista & Meadowbrook, for example), the total number of housing units relative to the original number of lots appears to be somewhat higher. This is to be expected if there is some splitting of lots or internal subdivision and/or sharing between kin. Later in Chapter 3 we will present survey data which shows some evidence for lot sharing. However, some of the subdivisions that have the same number of lots as were originally platted may still have vacant lots within them. These data are for 2010 and are based upon an examination of satellite images provided by Google Earth and maps provided by the Guadalupe County Appraisal website. Housing unit counts were conducted through visual analysis of the previously mentioned satellite images. The number of units should be considered an approximation as the quality and angle of satellite images complicates analysis, e.g. sheds and campers, or trailers and roof extensions, may appear similar. Indeed, this total number of housing units is likely to be conservative as only distinct housing units are included in the count. Moreover, we cannot be conclusive that two buildings/units indicate two separate households.

Subdivision	Total Lots in Plat Map	Total Lots in 2010	Apparent # of Housing Units in 2010
Meadow Brook	35	67	100
Four Oaks	20	20	23
Redwood Estates	28	27	30
David Major	14	14	14
Lakecrest	14	14	16
Emerald Acres	22	22	23
Rancho Vista	339	344	391
Tallowood	7	8	11
Hidden Forest	28	28	27
Brookhollow Estates	135	193	131
Casa Verde	18	18	17
Rose Trail	4	8	9
Lost Prairie	16	17	20
Crestview Estates	29	29	30
Mesquite Estates	11	11	18
Bumblebee Acres	18	18	16

2.2 Demographic Information

Figure 2.12 illustrates that although the historical analysis of Redwood included each of the subdivisions noted in Table 2.1, our survey area did not formally include every community within the clustered residential area. This was because in our early discussions with community leaders and residents of Redwood and Rancho Vista they did not consider some subdivisions to be a part of their community (e.g., Wheatfield Lane and Shelley Lane off FM 621). Especially interesting is the case of Brookhollow Club Estates developments (located in the lower right corner of Figure 2.12 or see Figure 2.3), and which is entered from FM 621 (Mallard Loop and Pintail loop). When we asked whether these streets were a part of Redwood the residents purported not to know about the subdivision, and insisted that it was not part of Redwood. In retrospect we should have included it, but given that the survey relied heavily upon the participation and goodwill of the residents in the two communities, we did not press the case.

There seems little doubt that the residents of these two streets come and go from a different highway and have little to do with, or feel any affinity towards their neighbors in Redwood and Rancho Vista. However, they are included as part of Redwood in the Census and, as we observed in Table 2.1, the three phases of this development comprise over 130 lots, making it the largest single subdivision after Rancho Vista. "Windshield" (drive through) visual surveys suggest that these dwellings are newer mobile homes than many that one sees in Redwood. But despite the absence of formal study in areas such as the Brookhollow subdivisions, the relative size of the rest of the survey areas included within Redwood and Rancho Vista suggest that the demographic information discussed below relating to the Redwood CDP accurately portrays the two surveyed areas for which we present detailed data later in this report.



Figure 2.12. Study Survey Area Source: Google Earth

	2000 Redwood CDP		2000 Guadalupe County		1990 Blk 1, Tract 2105.01		
	%	N	%	Ν	%	N	
Population							
Total population	100%	3,586	100%	89,023	100%	3,511	
Median age (years)		24.8		34.9		(x)	
0 - 4 years	10.8%	386	7.3%	6,481	9.4%	329	
5 - 11 years	15.2%	546	11.2%	9,959	14.6%	511	
12 - 14 years	6.9%	248	5.0%	4,475	5.0%	174	
15 - 17 years	6.2%	221	5.0%	4,415	4.8%	167	
18 - 24 years	11.2%	402	9.0%	7,981	10.1%	354	
25 - 34 years	16.2%	582	12.7%	11,306	18.9%	662	
35 - 44 years	16.3%	585	16.4%	14,613	16.4%	575	
45 - 54 years	9.3%	334	13.4%	11,955	9.8%	343	
55 - 64 years	4.9%	177	8.7%	7,773	5.2%	181	
65 years and over	2.9%	105	11.3%	10,065	6.1%	215	
	Miscell	aneous	2				
Hispanic or Latino	84.2%	3,108	33.2%	29,561	57.9%	2,035	
Disability status (5 yrs +)	22.1%	720	19.0%	15,464	(x)	(x)	
Educa	ational Atta	inment (2	25 yrs +)				
Total	100%	1,738	100%	55,679	100%	2,031	
Less than 9th grade	21.7%	378	9.6%	5,349	23.7%	481	
9th to 12th grade, no diploma	24.3%	423	12.3%	6,839	14.8%	301	
High school graduate (or equivalent)	39.0%	678	30.1%	16,756	27.8%	564	
Some college, no degree	13.1%	228	22.9%	12,765	15.5%	314	
Associate's degree	0.0%	0	6.0%	3,333	4.1%	83	
Bachelor's degree	1.8%	31	13.1%	7,288	9.3%	189	
Graduate or professional degree	0.0%	0	6.0%	3,349	4.9%	99	
% high school graduate or higher	53.9%	937	78.1%	43,491	61.5%	1,249	
	Emplo	oyment					
In Civilian Labor Force (16+ years)	66.2%	1,556	64.9%	43,189	72.5%	1,782	
Employed	62.2%	1,462	61.4%	40,845	68.0%	1,670	
Unemployed	4.0%	94	3.5%	2,344	4.5%	112	
Occupation (16+ years)							
Management, professional & related	13.2%	193	28.8%	11,749	16.5%	275	
Service	17.8%	260	14.4%	5,872	19.1%	319	
Sales & office	29.2%	427	26.9%	10,972	21.8%	364	
Farming, fishing & forestry	0.0%	0	0.6%	230	6.4%	107	
Construction, extraction & maintenance	25.2%	368	13.0%	5,291	15.6%	260	
Production, transport & material moving	14.6%	214	16.5%	6,731	20.7%	345	

Table 2.3. Redwood CDP and Guadalupe County 1990 and 2000 Census Data

Table 2.3.	Continue	d
------------	----------	---

	2000 Redwood CDP		2000 Guadalupe County		1990 Blk 1, Tract 2105.01	
	%	N	%	N	%	N
Housing						
General						
Total units		987		33,585		1,246
Occupied units	95.2%	901	92.0%	30,900	85.3%	1,063
Owner-occupied units	83.7%	754	77.0%	23,808	70.2%	875
Units in Structure (All units)						
Mobile homes	80.3%	793	21.6%	7,254	45.4%	566
1-unit, detached	18.7%	185	68.3%	22,955	52.7%	657
1-unit, attached	0.9%	9	1.3%	426	0.9%	11
2 or more units	0.0%	0	8.8%	2,950	1.0%	12
Median number of rooms		4.5		5.3		(x)
Financial (owner-occupied)						
Median value of units (dollars)	\$4	44,500		\$91,400	\$	47,900
Owner-occupied units with mortgage	46.0%	69	65.1%	10,691	47.3%	141
Median mortgage (dollars)		\$576		\$971		\$475
	House	ehold				
Total households		901		30,900		1,063
Size				÷		
Avg. family size		4.16		3.23		3.65
Avg. household size		3.98		2.83		3.26
Avg. owner-occupied household size		4.03		2.86		3.29
Туре						
Family households	87.2%	786	77.1%	23,831	82.8%	880
Married-couple family	63.9%	576	61.6%	19,043	70.8%	753
Female householder, no husband	13.4%	121	11.2%	3,452	8.0%	85
Nonfamily households	12.8%	115	22.9%	7,069	17.2%	183
Householder living alone	7.9%	71	18.9%	5,844	15.0%	159
Financial						
Median family income (\$1999)	\$:	31,559		\$49,645	\$	24,719
Median household income (\$1999)	\$3	31,132		\$43,949	\$	22,339
Families below the poverty line	16.6%	133	7.3%	1,746	15.6%	145
Individuals below the poverty line	18.5%	671	9.8%	8,568	22.9%	805

Source: 2000 and 1990 U.S. Census Data

Until the 2010 US Census results are published we have to rely upon the 2000 census for the most recent demographic information available on the Redwood CDP.⁸ Prior to 1990 Redwood was not defined as a Census Defined Place (CDP). Examination of 1990 census tract and block

⁸ Unfortunately, single and multiple year estimates, and the accompanying data on which they are based, are only available for geographic areas with populations of 65,000 and 20,000 or more, respectively. Five-year estimates, based on data from 2005-2009 and covering areas with populations less than 20,000 are, however, expected to be released in late 2010.

group boundaries suggests that block one of census tract (#2105.01 Seguin North) includes the contemporary Redwood CDP area and that relatively little additional development appears within this census block – apart from the previously described subdivisions of Brookhollow Club Estates. Block one of census tract 2105.01, and the accompanying census information, is thus roughly equivalent to the Redwood CDP and our survey area. Table 2.3 provides general population, housing, and household data regarding the Redwood CDP for 2000 and for the tract 2105.01 census data for 1990. Equivalent demographic information regarding Guadalupe County is also included as a reference for 2000 data.

Population

As Figure 2.13 illustrates, the Redwood CDP population is primarily young-adult to middle-aged and elementary school age children. With the exception of notable decreases in elderly (65 years and over) and young adult (25-34) groups, and a notable increase in adolescent and teenage groups (12-17,) Redwood's age structure remained relatively constant in the period between 1999 and 2000. In addition, there were no notable differences between sexes in the Redwood CDP (see Figure 2.13). Age structure changes in Guadalupe County were, with the exception of ages 35-54, similarly minimal. One key factor that differentiates the Redwood CDP is a high Hispanic and Latino population. Indeed, while 84% of the population in the Redwood CDP self-identified as Hispanic or Latino, only 33% did so in Guadalupe County. As Table 2.3 illustrates, the Redwood CDP Hispanic and Latino population has been historically larger than in Guadalupe County, and, while Hispanic/Latino populations grew in both areas between 1990 and 2000, Hispanic/Latino population growth in Redwood was larger. This significant increase in Hispanic population in Central Texas has been especially marked since 1990, and continued post-2000 (Rogers and Ward, 2008).



Figure 2.13. 2000 Age and Sex Cohorts for Redwood CDP Source: 2000 U.S. Census Data

When compared with Guadalupe County, 2000 census data indicates that the percentage of Redwood CDP residents five years and over with disability status was slightly higher (22% in Redwood and 19% in Guadalupe County) and education levels in the Redwood CDP were notably lower than in Guadalupe County. High school graduates (or higher) represented only 54% of the population in the Redwood CDP versus 78% in Guadalupe County. Nonetheless,

employment rates in the Redwood CDP and Guadalupe were similar, 62% and 61% respectively.

Between 1990 and 2000 median family and household incomes increased (see Table 2.3). However, during the same period, the percentage of families in Redwood living below the poverty line increased marginally (15.6% to 16.6%) but was much higher than in the County as a whole (7.3%). Changes in education levels and occupation types may help explain this difference along with the higher level of Hispanic population. Education levels in the Redwood CDP area decreased (7.6% drop in population with high school diploma or higher in Table 2.3), and increases in typically lower paying occupations (e.g., maintenance) were accompanied by decreases in higher paying ones (e.g., managerial and professional positions).

<u>Housing</u>

Of the 987 units in the Redwood CDP in 2000, the majority are mobile homes (80%) and the median number of rooms within these units is 4.5. As expected, most housing units are owner-occupied (84%) rather than renter-occupied. The median owner-occupied unit value was \$44,500 and the median monthly mortgage payment in the Redwood CDP was \$576. Compared with Guadalupe County it is clear that housing units in the Redwood CDP are smaller, more modest and have a lower value. Comparisons between 1990 and 2000 Census data also show that while the median value of homes in Guadalupe more than doubled (from \$60,100 to \$91,400), the median value of homes in the Redwood CDP actually decreased (\$47,900 to \$44,500). This is a dramatic initial finding and it points towards other research that has also shown a much lower rate of valorization of property in colonias and informal homestead subdivisions (Ward et al, 2006), as well as the fact that mobile home structures are more likely to depreciate in value.

Household Information

The average household size among the 901 households in the Redwood CDP is 3.98 persons. Taking just "family households" the average family size is higher – 4.16 persons. Compared with Guadalupe County, the Redwood CDP has both a higher family and household size and a higher percentage of family households. The larger household size (3.98 in Redwood versus 2.83 in Guadalupe County) is also significant in light of the lower median number of rooms in the Redwood CDP (4.5 in Redwood versus 5.3 in Guadalupe County), suggesting higher overcrowding indices. Also significant is the lower median household income in the Redwood CDP which is almost \$13,000 lower than that of Guadalupe County (\$31,132 vs. \$43,949 in 1999 dollars, Table 2.3). Poverty levels in Redwood are double those of Guadalupe County: some 17% of families fall below the poverty line.

In short, the Census data tell us that Redwood is an almost exclusively Hispanic neighborhood with much higher levels of poverty and lower education compared with the County population in which it forms part. Most are employed, but work in lower wage sectors of the economy, especially services. While most comprise modest to large family households, dwellings are mostly manufactured (mobile) homes and leads to some overcrowding, and to only modest (or even negative) investment returns deriving from entering the American Dream of becoming a
homeowner. These data, stark in their own right, will provide a useful baseline from which to evaluate the survey information collected and which we present in the following chapters.

This chapter yields significant insights into classic nature and expansion of informal homestead subdivisions in central Texas, a process that appears to have occurred as if by stealth since the late 1980s. While *colonias* in the border have been the almost exclusive focus of attention and public policy initiatives, these platted developments and poorly serviced settlements that were being laid out on agricultural land in the peri-urban areas of cities like Austin, San Marcos, Dallas, Houston, San Antonio, and even further afield in cities such as Lubbock. At that time urbanization concerns throughout the USA focuses largely on issues of suburbanization, and "sprawl" especially that into ex-urbia. All the more strange that so many low-income settlements akin to *colonias* were allowed to develop under the radar in Central Texas and elsewhere. How that happened is largely moot. What it means, however, is that semi-urban tracts of low-income self-built and self-managed housing such as those in Redwood are widespread in the peri-urban areas of many US cities.⁹

One of the principal aims of this study is to examine the opportunities for building more sustainable communities and yet the cases of Rancho Vista and Redwood present us with a paradox. This is that informal homestead subdivisions are fundamentally **unsustainable** given the need for lengthy commutes, dependence upon private transport (vehicles), low densities, distance from the energy and servicing grids, and low fiscal capacities of the jurisdiction in which they belong. But that is water under bridge, and what policy makers must now do is figure out ways of making the unsustainable sustainable. The following chapters may provide some pointers.

⁹ It is rather ironic that subsequently developers found that formal development of ex-urban neighborhoods were a much more profitable investment. Fuelled by housing demand, low interest rates and subprime mortgage supports in the late 1990s and in the early 2000s, this housing in the lower to upper 100s (thousands) sprang up in the corridor between Georgetown and Austin to San Antonio corridor. It is a double irony, therefore, that the crisis when it came probably adversely affected many of those who had bought into the American Dream through sub-prime lending routes. Residents in the informal sector were less likely to be affected, of course. To date, we know little about the spatial trajectories of those who are losing their homes. Downsizing into lower cost housing in informal homestead subdivisions may be one option.

Chapter 3

SOCIO-ECONOMIC PROFILE AND HOUSING ACQUISITION AND STRUCTURE

In the first part of this chapter we explore the demographics and socio-economic profiles of the population in the two communities and this should be read against the baseline data that were presented for Guadalupe County. Understanding these characteristics is important when it comes to elaborating grant proposals for home improvements and for conceiving policy options that will assist in upgrading, weatherization and self-help. The second half of the chapter examines how households have acquired their lots and housing, the financing mechanisms used, and describes both the different types and characteristics of the housing that exist in the two settlements. All data are from the household surveys and are only broken out by settlement where there are notable differences.

3.1 Household, Income and Labor Characteristics

Socio-economic Summary

Households for the survey area (Rancho Vista and Redwood combined) vary but are typically between two and five household members with relatively few outliers (Figure 3.1). The average size is 3.94, almost matching exactly the 2000 Census average household size of 3.98 (see Table 2.3). The number of people living on the respective lots follows a similar distribution, with a slightly higher mean, not surprisingly, of 4.29 since some lots contain multiple homes. More specifically, roughly 14% of lots contain two units and most of the persons in the second home are related to the primary household dwelling.



Figure 3.1. Member Size of Households (N=125)



Figure 3.2. Household Members in Paid Employment (N=127)

A key benefit of the questionnaire is that it allows us to obtain current and detailed economic information about the residents as compared to decennial census data. Survey results show that 46% of households have one member in paid employment, while another 30% have two members working (Figure 3.2); 16% indicate that no one in their household is employed. One-third reports a monthly household income of between \$2,000 and \$3,000, while almost another third report it at between \$1,000 and \$2,000 (Figure 3.3); 28% place their monthly household income at under \$1,000. Compared to 2000 Census median household income of \$31,000 (see Table 2.3), the survey findings for household income appear much lower, which may indicate some underreporting of all income sources, including non-work earnings, from all household members, not just family members. Analysis by settlement shows little variation between Rancho Vista and Redwood with regards to household and lot size, the number of members in paid employment as well as with income.



81.8% 66.7% 53.0% 47.1% 44.4% 44.4% 40.9% 1 2 3 4 5 6 thru 12 All Households (N=9) (N=22) (N=18) (N=27) (N=17) (N=22) (N=115)

Figure 3.3. Monthly Household Income including Benefits (N=123)



Taking into account the number of household members (Figure 3.1) and household income (Figure 3.3), and utilizing the poverty threshold by size of family provided by the U.S. Census Bureau,¹⁰ we created a proxy for household poverty measure for Rancho Vista and Redwood (Figure 3.4). The outcome is that roughly one-half of all homes live below the poverty line, with greater poverty shares for households with only one member and with households with six or more persons. However, if persons underreported household income then poverty levels are consequently overstated. Census data for 2000 show that 17% of families live below the

¹⁰ See http://www.census.gov/hhes/www/poverty/data/threshld/thresh09.html. The poverty proxy is not included in the public SPSS file since it is our calculation rather than part of the data collected.

poverty line, which is only one third of the level that we show in Figure 3.4. Additionally, trends observed between the 1990 and 2000 Census suggest that: 1) a greater percentage of persons 25 years and older had less than a 12th grade education, 2) the number of high school graduates increased, and 3) the number with college education or post-high school training declined. Overall, this development negatively affects the occupational mobility and earnings potential of workers (even an increase in high school graduates with no college education or technical training means that they remain competing for lower-wage employment). If these tendencies have continued throughout the current decade (2000-10), alongside the multiple economic downturns and financial crises, then it will not be surprising to see an increase of households living in poverty in the 2010 Census (relative to the 2000 Census). Interestingly, 56% and 47% respectively of those that filled out the mail survey and those that were interviewed fall into the poverty category, which is indicative of some slight bias in self-selection coming from poorer and more needy households (see our discussion earlier on page 6 of this report).

Overall, 96% of survey participants indicate that they are Hispanic: 25% are Mexican born, 60% are Mexican American, and the remaining 11% are Other Hispanics (which includes a combination of Mexican or Mexican American with another stated ethnicity). The 2000 Census count classified 84% of the area's residents as Hispanic or Latino, so our survey results also appear to over-represent Hispanics. In Rancho Vista one Caucasian and one African American volunteered for the survey, while in Redwood three Caucasians participated. Nonetheless, test results show no statistically significant relationship between ethnicity and household income, so the Hispanic over representation does not appear to affect results in other socio-economic areas – at least not in this survey.

Occupations

A key interest of the survey was to understand some of the labor market characteristics of Rancho Vista and Redwood residents. Two separate questions were asked: 1) the occupations of income earners within the household and 2) if they had any construction experience. A third question asked the type of work for those in paid employment, which led to the construction experience question. However, results of the type of work question are omitted from this summary table. Since the occupations question was open-ended. Instead we recoded responses into a standard format used by many researchers, academics and government agencies – the Standard Occupation Classification (SOC) system (U.S. Bureau of Labor Statistics).¹¹ This provides comparability across studies.

Respondents were asked to provide information on up to five household members that receive some sort of income. Overall, four out of five persons in paid employment work on a full-time basis and these results do not differ by subdivision (Rancho Vista or Redwood), or by the type

¹¹ The 2010 SOC system is used by Federal statistical agencies to classify all workers into one of 840 detailed occupations. To facilitate classification, detailed occupations are combined to form 461 broad occupations, 97 minor groups, and 23 major groups. Detailed occupations in the SOC with similar job duties, and in some cases skills, education, and/or training, are grouped together.

of survey filled out (mail or face to face). Analyzed separately in Table 3.1, the *primary* income earner (Person 1) for was in "Construction & Extraction": 24 of the 73 (one-third) of workers classified themselves into this broad occupational category. Most other *primary* income earners fall into the following groupings:

- Building & Grounds Cleaning & Maintenance includes janitors, maids, housekeeping, grounds-keeping, landscaping, lawn service, and supervisors of these.
- Transportation & Material Moving includes truck and bus drivers, warehousing, and car washing and supervisors of these.
- Production includes manufacturing, assembly, fabricators, and supervisors of these.
- Sales & Related includes retail, cashiers, real estate agents, and supervisors of these.

SOC	SOC Description	Person 1	Person 2	Person 3	Tot	tal
Code	Soc Description	Count	Count	Count	Count	%
47	Construction & Extraction	24	2		26	22.2
37	Building & Grounds Cleaning & Maintenance	10	5		15	12.8
53	Transportation & Material Moving	8	2		10	8.5
51	Production	6	5	2	13	11.1
41	Sales & Related	5	6	2	13	11.1
31	Healthcare Support	3	2	3	8	6.8
35	Food Preparation & Serving Related	3	4	3	10	8.5
43	Office & Administrative Support	3	5		8	6.8
11	Management	2			2	1.7
13	Business & Financial Operations	2			2	1.7
33	Protective Service	2			2	1.7
49	Installation, Maintenance, & Repair	2	1		3	2.6
29	Healthcare Practitioners & Technical	1		1	2	1.7
39	Personal Care & Service	1	1		2	1.7
55	Military Specific	1			1	0.9
	Total Occupations	73	33	11	117	100.0

Table 3.1. Occupations of Household Income Earners

Note: One household included a 4th income earner in Sales & Related.

Secondary and tertiary household earners (Persons 2 and 3) fall into the following fields:

- Sales & Related
- Building & Grounds Cleaning & Maintenance
- Production
- Office & Administrative Support includes customer service, receptionists, clerks, administrative assistants, and supervisors related to these.
- Food Preparation & Serving Related includes servers, cooks, and supervisors related to these in fast food and non-fast food eating and drinking establishments.

• Healthcare Support – includes home health aides, nursing assistants, medical assistants, nutritionists, and supervisors of these.

The percentage of persons in construction and maintenance occupations mirrors the share in these fields provided in the 2000 Census (see Table 2.3). A divergence from the 2000 Census is clear for other key categories: survey findings show lower occupational shares in: 1) managerial & professional, and in 2) sales and office; and a higher percentage in 3) service and in 4) production & transportation related occupations. These results are interesting in that they also coincide with a key trend noted above between the 1990 and 2000 Census. Between these decennial counts the area witnessed an increase in the share of high school graduates and a decline in persons with college degrees. The corollary is that employment in managerial, professional, technical, and some office occupations, is typically tied to greater post high school education, which itself is linked to greater income levels and improved economic opportunity.

Income Earner Profile

Follow-up questions to members of the household that had earned income included their age, whether they faced some sort of disability, and their work income. The median age for the primary, secondary and tertiary income earners, respectively, is 48, 45 and 33 (the means are 48, 42 and 36); these results coincide with one of the largest age cohorts for the area – the 35 to 44 year olds – in the 2000 Census. The mean age (46 for Rancho Vista and 50 for Redwood) for the primary income earner is similar between the two settlements, and chi-square testing also indicates no statistical difference between age groups of the two subdivisions. Similar findings are present for the secondary and tertiary listed workers. With regards to disability, just over one in four (28.7%) are reported as having a disability, and again, there is no significant difference between settlements or by the type of survey conducted. Not surprisingly, the average income earned drops between the primary, secondary and tertiary worker, from \$1,408 to \$1,054 to \$850 respectively. Additionally, primary income earners from Rancho Vista appear to earn roughly \$280 more on average than their Redwood counterparts. However, a cautionary note is that we found several low value outliers in the income data, indicating that some respondents may have confused weekly with monthly earnings.

Construction Industry Experience

Besides the type of work the survey sought to capture specific construction experience of household members. The rationale is that residents themselves may have widespread construction skills that might be incorporated into home improvement programs, thereby reducing the economic costs of future funded improvements. Participants were first asked whether any of their household members had any construction experience, and if they answered yes, they were asked to list the skills of up to three members. A total of 105 of those surveyed listed at least one person in their household with construction skills, and six respondents listed a second person in the construction trade.

Responses on the construction experience question were also open ended, and it was necessary to recode them into the standard SOC codes. Since specific construction skills were provided, it was possible to recode them into detailed groups. Table 3.2 illustrates the skills sets

in construction for both settlements. The top five construction skills are in: 1) painting; 2) carpentry (this includes framing); 3) brick and cement laying and related; 4) floor and tile laying and related; and 5) plumbing. There are also a handful of persons with electrical, air conditioning (AC) and roofing expertise. This is important since some of the most severe problems of the homes, discussed in Chapter 4, are related to roofing leaks and inadequate AC and heating that makes it unbearably cold or hot during the winter and summer.

SOC	SOC Description	Person 1	Person 2	To	tal
Code	SOC Description	Count	Count	Count	%
47-2141	Painters	20		20	18.0
47-2031	Carpenters (includes Framing)	18		18	16.2
47-2020 / 51	Brick, Block, Stone, & Cement Masons & Concrete Finishers	15	1	16	14.4
47-2042 / 43 / 44	Floor Layers, Sanders, & Finishers & Tile Setters	13	1	14	12.6
47-2152	Plumbers, Pipefitters, & Steamfitters	12		12	10.8
47-2111 & 49-9021	Electricians & Air Conditioning & Refrigeration Mechanics & Installers	6		6	5.4
47-2181	Roofers	5		5	4.5
47-2000	Multiple Construction Trades	4	1	5	4.5
47-2080	Drywall Installers, Ceiling Tile Installers, & Tapers	3	1	4	3.6
47-4099	Construction Basics or Unclassified	3		3	2.7
51-4041 / 121	Machinist or Welder	2	1	3	2.7
47-2041	Carpet Installers	1	1	2	1.8
47-2121	Glaziers (Windows)	1		1	0.9
47-2221	Structural Iron & Steel Workers	1		1	0.9
47-4051	Highway Maintenance (Road Repair)	1		1	0.9
	Total Construction Skills	105	6	111	100.0

Table 3.2. Construction Occupational Skills of Household Members

Note: One household included a 3rd member with basic construction experience (SOC 47-4099).

3.2 Lot and Housing Acquisition

Neighborhoods such as Rancho Vista and Redwood are quite common in the peri-urban areas of major metropolitan areas of Texas. Less poor than their better known *colonia* counterparts in the border region, they are quite similar in the nature of their informality, acquiring land legally through seller financing, contracting for services, installing septic systems, and developing their own housing arrangements for themselves (Ward, 1999, 2004). As we observed in Chapter 2, lots are purchased, usually with only minimal (or no) servicing (Plate 1), and in central Texas would cost between \$20-30,000 depending upon size. Housing is self managed: some families build their own homes through self-help; others turn to different forms of manufactured homes which they buy and move to the site – as in the picture (Plate 2). For low income households wishing to share in the American Dream and become home owners, self-managed housing

such as this is the only way in which households earning \$20-30,000 a year can break into the housing market. At considerable social cost, they sacrifice poor (distant) locations and poor quality housing often with minimal services in order to become owners and raise their families. Rather than call these communities "*colonias*" we refer to them as **informal homestead subdivisions** (IFHSs) because that is exactly what they: subdivisions of tracts that are sold informally by developers in which homesteaders self-manage their housing and infrastructure development, much of which is also done informally and outside of regulatory standards that prevail in city jurisdictions (Ward and Peters, 2008).



Plate 1. Lots for Sale -- Low Income Subdivision in Hays County 2009 (Note cash price \$30,000; and \$27K with no lot improvements)



Plate 2. Moving a used trailer home onto a vacant lot, Bastrop County (Delivery truck is hitched to the front)

Year of Acquisition and Appraisal

Survey responses regarding length of residence reinforce the previous visual methods and analysis of settlement consolidation (see Chapter 2.1). Indeed, over half of the respondents (61%) report living on their lot for 15 or more years, suggesting that by 1995 most communities

were fairly well established (Figure 3.5). Responses indicate that lot occupation boomed in the early 1990s; the highest percentage of respondents (31%) report living on their lot between 15 and 19 years ago (modal group). Responses also indicate that 19% of new arrivals have come in the past 10 years and, as mentioned in Chapter 2.1, this suggests that there has been some modest turnover: from our sample of 133 households, on average between two and three new families have arrived since 2000 on an annual basis. But the overall picture is one of population stability with relatively little "churn" and outward physical mobility.

Tax appraisal data indicate that, while in Redwood lot size varies notably (ranging from 0.29 to 3 acres), lot size in Rancho Vista is fairly uniform; just over five out of six of the lots in Rancho Vista (84%) measure 0.574 acres. However, despite a varying range of lot sizes, the majority of lots in Redwood (62%) measure between 0.34 and 0.505 acres. Not surprisingly, lot values vary in accordance with lot size. Thus, although lot values vary notably in Redwood (less than \$10,000 to just above \$52,000) the majority of lots in Redwood (72%) are valued below \$17,000, lower than in Rancho Vista where 89% of lots values are between \$17,000 and \$18,000. The variance in lot size and value in Redwood is likely due the numerous and diverse subdivisions in this area – the different subdivisions sizes, the different developers, etc. (see Table 2.1).



Figure 3.5. Number of Years Living on Lot

Land Acquisition

As we anticipated, the data confirm that mortgages play a minor role in lot acquisition. The large majority of respondents (82%) report purchasing land through payments to a seller over several years. Over half (56%) report purchasing their lot from a company or land seller while almost 1/3rd of respondents (31%) purchasing the lot from a former owner. Furthermore, of those respondents who bought out a previous owner, 70% bought the lot 10 or more years ago, supporting the idea mentioned previously that there has been a decline in new arrivals.

Nearly all respondents (94%) hold deeds, or are purchasing under a contract for deed¹² and of the respondents who do not yet have final deeds and are still paying for their land, the majority

¹² As mentioned in the Introduction (Chapter 1), Contract for Deed is a form of seller financing whereby the purchaser does not receive the deed until all payments have been completed. Until then the vendor may repossess the lot for non-payment of monthly installments. Leaving the purchaser vulnerable, State Legislation in 1995 promoted the use of Warranty Deeds which give the buyer greater security, and mandated its use in the border region. Elsewhere however, it continues to be widespread practice. The fact that most have either a deed or a contract for deed suggests that in these two communities it has been the dominant mode of land sale contract.

(88%) possess a written contract (Table 3.3). Only a small number of those surveyed indicate "other" types of land title (7%) and only three report no contract whatsoever, while the remaining responses indicate alternative or pending contracts.

Nonetheless, the fairly even split in both communities between deed and contract for deed holders demonstrates that contract for deed as a process has been, and remains, alive and well in Central Texas. The prevalence of contract for deed and, although relatively small (10.5%,) the employment of oral contracts indicates the vulnerability and lack of protection – certainly relative to the border region post-1995. Survey analysis indicates more contract for deeds in Rancho Vista than in Redwood (53% vs. 36% respectively). However, this difference is not significant.¹³ The higher percentage of contract for deeds likely results from Rancho Vista's development process. As mentioned in Chapter 2, Rancho Vista was developed by a single developer over a relatively short period of time. The developer likely established contracts uniformly, i.e., he established contracts for deeds for most of the residents who arrived, in general, around the same period.

Dimension / Item	Rancho	Vista	Redwo	bod	Combi	ned
Dimension / Rem	%	N	%	N	%	N
Title Type		53		47		100
Deed	41.5%	22	55.3%	26	48%	48
Contract for deed	52.8%	28	36.2%	17	45%	45
Other	5.7%	3	8.5%	4	7%	7
Agreement Form		28		29		57
Written	96.4%	27	79.3%	23	87.7%	50
Oral	3.6%	1	17.2%	5	10.5%	6
Other	0.0%	0	3.4%	1	1.8%	1

Table 3.3. Lot Title Type and Form of Agreement

Housing Acquisition

The vast majority of survey respondents (91%) own or are purchasing their home. Approximately 1/3 of owners (32%) report no payments on their home, a further third pay less than \$500 (36%), and the remaining (32%) pay between \$500–\$1,000 per month. Taking into account only for those that are still paying for their home we see a median monthly payment of \$450, considerably 22% lower than the 2000 Census median level of \$576 for Redwood CDP and almost half that of the County some ten years earlier (see Table 2.3). This may suggest a decrease in mortgage costs over time, but is more likely due to the absence of larger settlements, such as Brookhollow, from our survey area. Nonetheless, based on calculations in the previous section, mortgage payments could account for approximately 30–45% of monthly household income (based on median monthly income of \$1,000–\$1,500, see Figure 3.3). (The maximum mortgage to total household income ratio recommended by HUD is 30%.)

¹³ The p-value =0.133 testing for only deeds and contract for deeds differences. The p-value is higher if the "other" category is included

Two out of five (42%) of the primary units in which respondents currently live in were purchased within the past 10 years. However, 61% report living on their lot for 15 or more years. This suggests that there is a phasing between lot acquisitions, lot occupation, and turnover of the actual primary housing unit in which residents currently live. Namely, that a portion of those people who have been living on the lot a substantial number of years have a primary unit that has been erected or moved to the lot more recently. While this may not be the norm, it does provide some evidence for upgrading of primary housing unit structures or sequencing, such as replacing a camper with a trailer or a dilapidated trailer with a newer model.

Figures 3.6 and 3.7 illustrate how and from whom occupants purchased their current primary housing-unit. Although mortgages figure more into the purchase of homes than lots, only 23% report separate home purchases through a mortgage payment. Rather, over half of the respondents (56%) report purchasing their home through savings/cash and/or payments to the seller over several years. Two-fifths of respondents (42%) report purchasing their home, including mobile homes, from a manufactured home dealer, indicating the considerable importance of dealers in housing acquisition. However, 1/4 of respondents (26%) report purchasing their occupant, suggesting that buy-out from former



Figure 3.6. How the Primary Housing Unit was Acquired



Figure 3.7. From Whom the Primary Housing Unit was Purchased

occupants is another important method of housing acquisitions. Indeed, 54% of arrivals in the past 10 years report purchasing their home from a former occupant and several of the "other" responses indicate taking over payments from the former occupant. This could suggest spatial Mobility or "churn", i.e., moving out of the area or purchasing a new housing unit.

3.3 Primary and Additional Unit(s) Structure

Types of Structure

Below we identify several generic types of dwelling unit that may be found in *colonias* and in informal homestead subdivisions. Briefly these are:

Self- built homes in which the household constructs its home, usually on a slab taking primary responsibility for the house construction themselves, sometimes making use of sections of kits and building the house gradually over a period of time, when they have the resources. In the meantime they either live off site, or in a trailer/camper on site, or in a part of the incomplete dwelling. Self-build leads to a variety of housing shapes and sizes since the dwelling grows gradually in response to the household's needs and wishes (Plate 3). Materials and standards of construction vary as does the level of compliance with local regulations.



Plate 3. Self build house and camper extension. Stony Point, Bastrop County

Manufactured homes are those that are built off site and moved onto the lot. They are usually trailers and may be single or double-wide. They all share the feature of being on a wheel-base chassis although the wheels may be removed when placed on site. Generally they are supported on brick piers, and often have a "skirt" around the base to disguise the wheel base and to keep out animals (Plate 4). Older trailers/manufactured homes are easily distinguished by their snout nosed shape at one end (Plate 5). These and older trailer homes often predate the 1986 HUD codes for manufactured home production. Some of the doublewides (especially) are spacious and come in sections with a porch or front extension. More recent manufactured homes are built to higher code specifications and higher energy efficiency.



Plate 4. Typical manufactured home (trailer) with "skirt". Rancho Vista.



Plate. 5. Older –style manufactured (trailer) with self built extensions, porch and false roof for shade, Rancho Vista.



Plate 6. Two homes on site (maybe two related households). Front is manufactured home; rear is custom home. Rancho Vista *"Modular" homes* are also manufactured off site but are not set on a chassis or wheelbase. They also come in various shapes and sizes and are erected on site, either on a slab, or more usually on piers. A variant is called a "stick-frame" house which is framed and built on site with less manufactured parts or sections being incorporated into the design (Plates 7-9).



Plate 7 . Typical "Modular" Home in Redwood



Plate 8. "Modular" home in Rancho Vista(Note "camper" alongside, and extensions at rear)



Plate 9. Dilapidated "stick-built" home, Redwood. (This may be modular or self-built or both)

Recreational vehicles and campers are self-explanatory. To the extent that they exist they are most likely to provide temporary accommodation for households in the first months after they move onto the lot (examples may be observed Plates 3 & 8). Commonly observed in *colonias* and subdivisions they often function as overflow sleeping space for family members. The same is often true for older dilapidated trailer homes which no longer comprise the primary dwelling unit, but still serve a purpose as sleeping accommodation.

Custom built homes are those that are built formally by a construction firm either to the specifications of the homeowner, or to a standard design plan. Built on slab, these are framed housing built to a high level of specification usually with cladding brickwork. Affordable by only a small proportion of households, these families take advantage of the lower land costs, large lot and yard size and generally are able to build a larger home than they would be able to afford in a formal subdivisions.



Plate 10. "Custom"-built home. Redwood.



Plate 11. Manufactured home (trailer in front) with Custom home under construction at the rear. Redwood.

These generic types were used to identify the type of dwelling structure. It is quite common to find more than one type of structure on a single lot (see Plates 6, 8, and 11), either belonging to different households (usually kin related), or as people upgrade their homes. Sometimes, too, there is a mixture of house structures: such as where a camper or manufactured home unit is extended through self-build (Plates 2 and 5). Such mixed (hybrid) arrangements are especially common in border *colonias*.

Dimension / Item	Rancho	Vista	Redwo	Redwood Combin		
Dimension / Rem	%	N	%	N	%	N
Housing Structure Type		65		66		131
Manufactured home (trailer)	69.2%	45	68.2%	45	68.7%	90
Single-wide	53.8%	35	45.5%	30	49.6%	65
Double-wide	15.4%	10	22.7%	15	19.1%	25
Constructed home	21.5%	14	15.2%	10	18.3%	24
Contractor built on-site	1.5%	1	7.6%	5	4.6%	6
Self-built on-site	20.0%	13	7.6%	5	13.7%	18
Modular manufactured home (not on wheel base) assembled on site	4.5%	3	1.5%	1	3.1%	4
Camper (recreational vehicle)	0.0%	0	1.5%	1	0.8%	1
Other	4.6%	3	13.6%	9	9.2%	12

Table 3.4. Housing Structure Types

Table 3.4 demonstrates that roughly 2/3 of reported primary dwelling units are trailer homes (69%), the large majority of which are single-wide (49.6% of the total homes). Very few residents report living in a modular home, even though they are relatively common. However, this may partially reflect a lack of clear understanding of what constitutes a modular home, particularly in the mail surveys. "Other" answers appear entered as such because the unit is combined with another unit, was built elsewhere and moved onto the lot, or because the

respondent was unsure of how the home was built. The percentage of self-built homes, although small (13.7%,) is notable since self-built homes represent 3/4 of constructed homes (Table 3.4). Responses also indicate that Rancho Vista has a higher presence of self-built homes than Redwood, but otherwise there is little difference between the settlements in the type of housing structure.

Dimension / Item	Rancho	Vista	Redw	ood	Comb	Combined % N 33.3% 38 40.4% 46		
	%	N	%	N	%	Ν		
Age								
< 15 years	32.1%	18	34.5%	10	33.3%	38		
15 - 29 years	50.0%	28	31.0%	18	40.4%	46		
30+ years	17.9%	10	34.5%	20	26.3%	30		
Mean / median age		20.6 / 18		24 / 19.5		22.4 / 18		
Roof								
Peaked (sloping)	69.8%	44	72.3%	47	71.1%	91		
Flat	30.2%	19	26.1%	17	28.1%	36		
Foundation			5		5			
Slab	15.3%	9	12.5%	8	13.8%	17		
Piers / cinder blocks	81.4%	48	81.3%	52	81.3%	100		
Bedrooms								
1 - 2	31.3%	20	25.8%	16	28.6%	36		
3 - 4	65.6%	42	71.0%	44	68.2%	86		
5+	3.2%	2	3.2%	2	3.2%	4		
Living Rooms								
1	88.5%	54	91.5%	54	90.0%	108		
2	11.5%	7	8.5%	5	10.0%	12		
Dining Rooms								
1	100%	26	100%	30	100%	56		
Kitchens					1.	6		
1	98.3%	59	98.4%	62	98.4%	121		
2	1.5%	1	1.7%	1	1.6%	2		
Full Bathrooms								
1	54.2%	32	44.3%	27	49.2%	59		
2	40.7%	24	49.2%	30	45.0%	54		
3	5.1%	3	6.6%	4	5.8%	7		
Half Bathrooms								
1 - 2	100%	11	100%	10	100%	21		
Extension / Addition to	Primary Un	nit						
Yes	46.9%	30	0.323	21	39.5%	51		
Additional Units on Lot	used by ho	oushold m	embers					
Yes	28.1%	16	23.3	14	25.6%	30		

Table 3.5. Characteristics of Primary Housing Unit Structure

Note to Table 3.5. For the number of rooms only non-zero entries are used in the calculations. The reason for this is that some respondents entered "0" for a specific type of room (e.g., "0" dining rooms) while others left the question blank even though they made room entries everywhere else. So "missing" values cannot be distinguished from as "0" entries. Hence, room questions translate to "of those who answered" (e.g., of the 56 who answered how many dining rooms they have 100% (all 56) said they have "1" dining room).

Age of the Primary Unit

The average (approximate) age of the primary dwelling units was 22 years, indicating that many houses are relatively old and in need of repair or weatherization. Only 1/3 of the homes are less than 15 years old. Further, 21% of homes are 30 years or older. A similar percentage for the trailers (21%) is especially notable as the U.S. Department of Housing and Urban Development (HUD) is extremely reluctant about making improvements on older units which are most likely to be dilapidated. HUD's standards cannot be met by any home built prior to June 15, 1976, and so the department refuses to examine any units built prior to the aforementioned date.¹⁴

Number of Rooms and Functions

Although the homes in Redwood are generally older than the homes in Rancho Vista (see Table 3.4), the general structure of housing units in both communities is similar (Table 3.5). Roofs are primarily sloping (71%) and homes are set on piers or cinder blocks (81%), not surprising in light of the higher number of mobile homes and the additional costs associated with laying a concrete slab. Both communities also appear to have a similar average number of bedrooms with most units (68%) having 3-4 bedrooms, which coincides with the average household member size of 3.94 (see section 3.1). Of those respondents who answered the questions, they generally report one living room, one kitchen, and one dining room, although the survey asks about function, not separate living spaces, and some respondents may have recorded rooms two rooms whereas in actual fact it is a single room with a dual function -- a dining room/kitchen for example.

Additional Units on Lot

One quarter of respondents (25.6%) report the presence of additional units on lot used either by themselves or by members of their household (Table 3.5). In addition, 39.5% have extended or added to their primary housing unit, 2/5 of which are trailers. Self-built extensions are common, accounting for 1/4 of construction and, again, more residents in Rancho Vista report self-built additions than in Redwood. Where they exist, most of the additional units have 1-2 usable rooms (77%). The age of the extensions and additional units varies: just over 1/4 of the units are under five years old (29%); while 1/3 are over 30 years old (33%). Extension and addition types and purposes vary, and include uses such as storage, porches, garages, and outhouses. However, the majority of reported additions are for the purpose of living space: bedrooms, family rooms, etc. Indeed, 3/4 of the respondents (78%) indicate that their addition or extension is for the purpose of sleeping or the primary residence of another household.

¹⁴ See http://fhadirect.hud.gov/offices/hsg/ramh/mhs/faq.cfm

3.4 Renters

As stated earlier, our renting sample is very small, only 12 of the 133 cases. But for comparison purposes, relative to the overall population renters have the following characteristics. Median reported rent is \$500, higher than overall median mortgage payments (\$450), and accounts for 17–25% of the reported household monthly income (based on the modal income of \$2,000–\$3,000 per month for renters). House structure types are similar to those for the overall population, and 17% of the units are estimated to be less than 15 years old, somewhat less than in the overall population data (33%). In addition, most renters report three bedrooms as does the general population of owners. Finally, 45% of renters report additions or extensions to the primary unit they rent. In short relatively few people rent homes in either of the communities, and those that do have housing that is quite similar to the broader profile of housing structures that exist.

Of the 12 renters we found that eight live in Rancho Vista and four live in Redwood, suggesting that Rancho Vista may be more amenable to renters. However, analysis of renter responses in both settlements indicates few differences. Most notable, median rent in Redwood is nearly 63% greater than Rancho Vista's, \$650 vs. \$400. The reported type of primary housing structure in each settlement is basically the same, except for the absence of renters living in self-built homes in Redwood. Lastly, the estimated age of the primary housing unit varies in Rancho Vista, while in Redwood reported age is, generally speaking, older. The latter is similar to trends in the overall population data. However, this is a small sample size and care should be exercised in extrapolating too much from the twelve cases.

3.5 Concluding Remarks

These data are broadly consistent with the socioeconomic profiles of populations in informal homestead subdivisions in central Texas: low income, largely Hispanic and Spanish speaking, employed in low waged service and construction sector activities; moderate to large household sizes comprising nuclear families with adults aged 35-50 with younger children. Homes are seller financed and bought under Contract for Deed. Housing structures vary considerably in type and age, but most have 3-4 bedrooms to provide for separate sleeping space to accommodate the relatively large family and household size. This is often provided through separate (secondary) dwelling structures rather than in an integrated single unit. Although the housing process is self-managed, actual self-build of the main home is less common, although many do use self-help to build extensions of additional units.

Without direct data comparisons any assessment of how the two neighborhoods differ from others in and around Austin must necessarily be considered subjective. But from the outset the lead author (Ward) was struck that these two settlements appeared to be poorer than others in which he has worked in the Austin metro area in recent years. Compared with other settlements where a greater mixture of home types and arrangements is observed, houses in both Rancho Vista and Redwood appeared to be somewhat more uniform (largely manufactured homes), and were often quite dilapidated. In thinking ahead about the prospects and opportunities for widespread weatherization and home improvements, our initial site visits were not encouraging:

we thought that in many cases new home construction would be a better option than rehab and home improvements. To the extent that many of the housing units are relatively old and sometimes heavily dilapidated this chapter has confirmed several of the a priori assumptions that we made upon first visiting the neighborhoods. However, it is also obvious that residents are making the best that they can of their housing conditions, often extending the home in order to accommodate their needs. They are often proud of their efforts and homes, and are eager to figure out ways to improve the quality of their dwelling units. Many have construction skills that could be put to good use if the resources were made available to them. Where, when and what is the dividing line between embarking upon cost effective home improvements or starting over with a new home is not an easy call to make, and we will return to this question at the end of this report.

Chapter 4 HOUSING SERVICES AND INFRASTRUCTURE PROBLEMS

This chapter analyzes housing infrastructure and services as well as the self-reported housing problems of residents of Redwood and Rancho Vista. The chapter is divided into two sections. First, we review data collected from residents of the two communities regarding their primary supply of utilities and descriptions of any problems with these services. Second, we analyze the various problems with the physical dwelling units as they are perceived and experienced by the residents themselves.

4.1 Housing Services and Supply of Utilities

Method

This section presents the responses of residents who were asked to list the sources of their household utilities including water and wastewater, electricity, air conditioning and solid waste disposal. Residents were given a range of response options that listed both formal and informal methods of accessing the above utilities. They were also given the option to list "other" and describe the alternative means of procuring their utilities. In many cases they were also asked to describe the specifics of their utilities, such as the age of their septic tank or the number of air conditioning units in their home. Respondents were further asked in an open-ended question to report any problems they experience with their utilities. We recoded the range of responses to these open-ended questions to capture similar categories of reported problems in each area.

Overall, there does not appear to be significant differences between Rancho Vista and Redwood for residents' sources of water, wastewater, and electricity. Though, as we explain below, there are some differences between Rancho Vista and Redwood in the problems residents report with their utilities.

Water and Wastewater and Drainage Sources

Residents of both communities get their supply of water primarily from a piped-in source (92% --Table 4.1). This includes a company named Crystal Clear Water Supply Corporation, which is a member owned, not-for-profit water supply that has served Comal, Guadalupe and Hays Counties since 1964. Crystal Clear provides piped-in, metered water. Only 18% of residents report any problem with their water supply. Of these, hard water or deposits in the water (calcium or rust) are the most often mentioned. Still, residential water source is not an area with many reported problems. Even the largest category of complaints, deposit-related problems, only affects 7% of all residents.

As Table 4.1 demonstrates, the majority (98%) of households rely on some sort of septic, whether it is fully professionally installed (85%) or self-built (9%). When examining only those cases that have self-built septic systems, 61% or three out of five respondents report problems (mostly clogging and "backing up") with their tanks. By comparison, 41%, or two out of five people with professionally installed septic systems also report problems. Thus, while there appears to be a difference in the reporting of septic tank problems between those that are self-

built and those that are professionally installed, the underlying fact remains that just under half of the households reported problems with their septic systems (Table 4.1).

Dimension / Item	Rancho	Vista	Redwo	Redwood Combined		ined
Dimension / Rem	%	N	%	N	%	N
Total Interviews		66		67		133
Water Source		64		65		129
Piped supply from street	84.4%	54	83.1%	54	83.7%	108
Crystal Clear Water Supply	6.3%	4	10.8%	7	8.5%	11
Well	6.3%	4	4.6%	3	5.4%	7
Well & piped supply	1.6%	1	0.0%	0	0.8%	1
Other	1.6%	1	1.5%	1	1.6%	2
Wastewater & Drainage Source		65		65		130
Professionally installed septic tank	89.2%	58	80.0%	52	84.6%	110
Self-built septic tank	4.6%	3	13.8%	9	9.2%	12
Not sure if professionally installed	3.1%	2	1.5%	1	2.3%	3
Professionally or self-built installed septic tank with chemical toilet	3.0%	2	0.0%	0	1.6%	2
Other	0.0%	0	4.6%	3	2.3%	3
Septic Tank Problems Reported	50.8%	33	36.9%	24	43.8%	57
Clogs/overflows/backsup	24.6%	16	16.9%	11	20.8%	27
Leaks	3.1%	2	7.7%	5	5.4%	7
Offensive smell	1.5%	1	3.1%	2	2.3%	3
Capacity / too small	10.8%	7	3.1%	2	6.9%	9
Drainage issue	1.5%	1	3.1%	2	2.3%	3
Other problem	9.2%	6	3.1%	2	6.2%	8

 Table 4.1. Sources of Water and Wastewater and Drainage

This high reporting may be in part due to the work of the UT Law Community Development Clinic, which has already raised awareness of septic problems in the communities. It is interesting to note that residents of Rancho Vista – where the clinic's work was focused – were more likely to report a problem with their septic system than residents of Redwood (51% compared to 37% respectively). But even so, the extent of the problem that still exists is a cause for concern.

The difference between communities may also be related to the way many of the septic systems in Rancho Vista were installed. Most of Rancho Vista was developed by a single developer, Richard Giesecke (see Chapter 2.1). Community organizer Ruby Roa claims that Giesecke was responsible for installing all the septic in the community. To the extent that he installed less expensive, smaller sized tanks, it may help explain why residents of Rancho Vista are more likely to report clogs (25% compared to 17% in Redwood); or why twice as many Rancho Vista residents report issues related to capacity (11% Rancho Vista compared to 3% Redwood).

Table 4.1 summarizes these primary septic problems within each of the two communities. Since the problems are obtained from an open-end question, similar responses are recoded and merged into the Table 4.1 groupings. Most responses related to clogs, back-ups and overflows. "Other problems" included "needs replacement," "issues with permitting," "cost," etc.

In the end, it is likely that the issues reported are related to the fact that 60% of our respondents' septic systems are more than 15 years old and 49% are more than 20 years old. Most of these septic systems date to the year of occupation of the lot and this fact may be the largest factor contributing to the 43% of residents that reported septic problems. Moreover, these septic systems are without drainage/leach fields and require periodic pumping and sludge removal (every 1-2 years) at a cost of around \$130. We did not ask how often families pay to have their tanks cleared, but we suspect that few do so regularly, largely because of cost.

Power and Water Heating Sources

Most residents (62%) have exclusively electric power (Table 4.2). Many others have electric power that they supplement with propane: a third of all residents use a mix of electric power and either a large or small propane tank. A much smaller percent (3%) uses propane only. Most people do not have problems with their electricity, but of those that do (19 persons), the most common complaint about their power source is that their bills are too high (this includes those who report trouble paying to fill propane tanks or those who complaint their contract stipulates minimum purchases that are too large). A second complaint includes issues with circuit breakers (mainly constant short circuiting, inability to run appliances at same time, etc.).

About 88% of households have electric water heaters, making them the primary source of hot water for the majority of residents in both communities (Table 4.2). Only a very small percentage (8%) utilizes gas heaters. There may be a link between the predominant use of electric water heaters and the fact that the primary complaint for power is high electricity bills, since electric water heaters consume more energy and are more expensive to run than gas heaters. The annual operating cost of heating water with natural gas is usually 50% lower than electric water heating.¹⁵

To investigate this further we examined frequencies of reported problems by power source for residents within two categories: those with electric water heathers and those with gas. Of respondents with electric water heaters who reported any issue with their power source, over a third reported problems related to cost. Of respondents with gas water heaters who reported any issue with their power source, none reported a problem with cost, thus supporting our hypothesis. The majority of residents, about 89% have hot water in all their faucets, though it is notable that 11% do not. Relatively few homes reported a problem with their water heating source, but of those who did (24 persons) half of them indicate insufficient hot water as the primary problem (see Table 4.2). With regards to any differences between Rancho Vista and

¹⁵ The Austin Energy Sustainable Building Sourcebook:

http://www.austinenergy.com/Energy%20Efficiency/Programs/Green%20Building/Sourcebook/index.htm

Redwood in their sources of and problems with power and water heating, the data shows little differences between the two communities.

Dimension / Item	Rancho	Vista	Redwo	bod	Combi	ned
	%	Ν	%	N	%	N
Total Interviews		66		67		133
Power Source		64		67		131
Electricity (metered supply)	54.7%	35	68.7%	46	61.9%	81
Mains gas (metered supply)	0.0%	0	1.5%	1	0.8%	1
Propane (large or small tank)	3.1%	2	3.0%	2	3.1%	4
Electricity & propane (large or small tank)	39.1%	25	25.3%	17	32.0%	42
Electricity, propane & mains gas	1.6%	1	1.5%	1	1.5%	2
Other	1.6%	1	0.0%	0	0.8%	1
Water Heating Source		63		66		129
Electric water heater	84.1%	53	89.4%	59	86.8%	112
Gas water heater	11.1%	7	4.5%	3	7.8%	10
Electric & gas water heaters	1.6%	1	1.5%	1	1.6%	2
None, cold water only	1.6%	1	4.5%	3	3.1%	4
Heat water on stove	1.6%	1	0.0%	0	0.8%	1
Water Heater Problems Reported	22.2%	14	15.2%	10	18.6%	24
Capacity / insufficient hot water	11.1%	7	7.6%	5	9.3%	12
Mineral deposits	1.6%	1	4.5%	3	3.1%	4
Needs replacement (whole or parts)	4.8%	3	1.5%	1	3.1%	4
Water turned off / unpaid bills	3.2%	2	1.5%	1	2.3%	3
Other	1.6%	1	0.0%	0	0.8%	1
Hot Water Supply in all Faucets						
Yes	88.1%	52	88.9%	48	88.5%	100

Table 4.2. Sources of Power and Water Heating

Air Conditioning Source

Multiple options are available for the type of air-cooling used by homes. These include full air conditioner (AC), partial AC, ceiling fans, stand alone (floor) fans, and even a natural breezeway. As such, residents report many different arrangements for how they cool their homes (full AC, full and partial AC, partial AC, full AC with fans, full and partial ACs with fans, partial AC with fans, and so forth). Given the many permutations of cooling devices, answers were regrouped in Table 4.4 into the following: 1) a category for full AC and full AC with any type of fan or breezeway; 2) a category for partial AC and partial AC with any type of fan or breezeway; 3) a category that captures the situation in which a full AC is being supplemented by a partial AC unit alongside any other source (fans, breezes, etc.); and 4) a final category that only includes the use of fans (ceiling or floor) or breezeways to cool the home. Table 4.3 provides this distribution for both communities: there is little difference in modes of air conditioning between Redwood and Rancho Vista.

Dimension / Item	Rancho	Vista	Redwo	Redwood Combin		ned
Dimension / Rem	%	N	%	N	%	N
Total Interviews		66		67		133
Air Conditioning Source		65		67		132
Full AC	30.8%	20	31.3%	21	31.0%	41
Partial AC	52.3%	34	46.3%	31	49.0%	65
Full & partial AC	7.7%	5	10.4%	7	9.2%	12
Ceiling fans, floor fans &/or breezeways	6.2%	4	7.5%	5	7.0%	9
None	3.1%	2	4.5%	3	3.8%	5
Air Conditioning Problems Reported	33.8%	22	34.3%	23	34.1%	45
Fully broken or no AC	7.7%	5	7.5%	5	7.6%	10
Partially broken or insufficient cooling	9.2%	6	11.9%	8	10.6%	14
AC old or system needs parts or fixing	4.6%	3	7.5%	5	6.1%	8
High bills or wastes electricity	10.8%	7	7.5%	5	9.1%	12
Old trailer does not keep cool	1.5%	1	0.0%	0	0.8%	1

Table 4.3. Modes of Air Conditioning in Rancho Vista and Redwood

Full AC - includes full AC with and without any combination of fan or breezeway.

Partial AC – includes partial AC with and without any combination of fan or breezeway.

Full & partial AC – includes full and partial AC with or without any combination of fan or breezeway.

Note: Only 40 persons reported problems, but five of these respondents gave multiple answers that included "high bills" and are included separately making the sample size 45 for problems reported.



Figure 4.1. Number of Partial Air Conditioning Units

Breaking out the data this way it becomes clear that most households (49%) count on at least one partial AC to cool their homes and 9% more supplement their central AC with a partial AC unit. For these residents, Figure 4.1 illustrates the distribution of the number of partial AC window units they use. Approximately 30% have one partial AC unit, 20% have two units, 25% have three units, and 25% have four or more. Considering that 67% of our respondents live in either a single- or double-wide mobile home, the majority of homes in this area will be either about 1,100 square feet or 1,700 square feet (the average sizes of single- and double-wide mobile homes respectively). The small average size of these homes makes the high number of AC units notable. Since one of the principal problems reported among our study population is high energy bills (Table 4.3) and that it is too hot during the summer (see section 4.2 below), the real story here might be that 25% of people are using four or more window units to cool their homes, as well as that the homes are not capturing the air flow efficiently and/or have poor insulation. Overall, one-third (34%) of the population surveyed reported a problem with their air-cooling source, and we see that 32 residents (24% of the total respondents) report an AC problem related to having a broken or no AC or an AC system that requires some form of repair.

Garbage and Solid Waste Disposal

As Table 4.4 shows, 22% of the respondents have formal garbage collection, 32% have a semiformal arrangement with an individual contractor, and 42% either drop off their garbage or burn it. There are some differences between the communities for how they dispose of their garbage. Residents of Redwood have more access to formal garbage service while those in Rancho Vista are twice as likely to dispose of their garbage through semi-formal collection, meaning that more residents in that community use an individual contractor to dispose of their solid waste. Alternatively, residents of Redwood are more likely to drop of their garbage themselves or burn it. A test for significance shows that in fact there is a statistically significant difference between settlement and the type of garbage and solid waste service they use (p=0.017).

Dimension / Item	Rancho	Vista	Redwo	Redwood Combin		ned
Dimension / Rem	%	N	%	N	%	N
Total Interviews		66		67		133
Garbage / Solid Waste Disposal		62		63		125
Formal service	17.7%	11	27.0%	17	22.4%	28
Semi-formal service	43.5%	27	20.6%	13	32.0%	40
Drop off, dump &/or burn	35.5%	22	47.6%	30	41.6%	52
Other	3.2%	2	4.8%	3	4.0%	5

Table 4.4. Garbage & Solid Waste Disposal

For those with formal or semi-formal service, most have their garbage picked up at least once a week (40% once per week and 10% twice per week). When we split the cases between types of garbage disposal service (formal, semi-formal, drop off and/or burn), there is very little difference in the frequency of pick-ups between those with formal and semi-formal service. It seems that regardless of formal or semi-formal solid waste disposal, the majority in both categories are getting pick-up service at least once a week. The modal cost of garbage collection for both communities is about \$30 per month, though there is quite a bit of variation. Still, 64% report a cost for their garbage collection of between \$20 and \$40.

Twelve percent of the respondents (15 out of 125) report a problem with their garbage/solid waste disposal. Only one of these has formal service, so the remaining 14 have semi-formal collection or drop off and/or burn their garbage. Those that have semi-formal garbage disposal mainly report problems related to missed or incomplete pick-ups. Besides the type of problem they report, there is very little variation in respondents' likelihood to report problems between the

categories of semi-formal pick-up and drop-off and burn: 15% of those with semi-formal service report a problem and 12% of those who drop off and/or burn report a problem.

The underlying story seems to be that while most residents do not have formal garbage collection, and while the largest percent either drops off or burns the garbage themselves, only a few homes report dissatisfaction with their means of disposal. Those that have the most informal means of disposal (i.e., they do it themselves) are even less likely to report problems than those that have a semi-formal arrangement. A note of caution is warranted. The survey instrument asked respondents to describe any problems with their disposal service. It is possible that some persons without formal or semi-formal service may have interpreted this question as not applicable to their situation since they have no service and, hence, left it blank.

A chi-square test for significance between type of garbage collection and reported pest infestation found no statistical difference between the variables. That is, there is no difference in reporting a problem with pest infestation between those with formal service, semi-formal service and those that drop off or burn their garbage themselves. This is interesting considering that pest infestation was ranked 5th in our index of constant or occasional problems (see Table 4.5 in section 4.2). With so many respondents dropping off and/or burning their garbage, one could hypothesize that those whose trash sits on the lot longer than if they had formal or semi-formal pick-up would probably have greater complaints about pest infestation, but this is not the case.

Additionally, frequencies were analyzed within each category of garbage service (formal, semiformal, drop off and/burn) for all the health variables reported in Chapter 5 (e.g., the frequency of reporting asthma for those with formal service or the frequency of reporting diabetes for those with semi-formal service only). This was done to see if there was variation in rates of reporting health problems across the categories of form of garbage disposal. We were especially interested in the intersection of the drop off and/or burn category and rates of reporting problems with asthma or respiratory symptoms, headaches or migraines, and eye or nose irritation. The result was that there was very little variation between groups. Those with semiformal or drop off and/or burn arrangements were not significantly more likely to report that a member of their household is affected by asthma or respiratory symptoms, migraines or headaches, eyes or nose irritations, or any other health problem we listed.

4.2 Problem Ratings of Housing Characteristics

Method

This section analyzes housing problems as they are perceived and experienced by the residents themselves. Survey participants were asked to rate 24 housing dimensions on the following ordinal scale – 1) constant or severe problem; 2) occasional problem; 3) satisfactory or okay; and 4) good, not a problem. They were also allowed to answer 5) not relevant or no opinion. Additionally, respondents were asked to list in an open-ended question the five most severe problems in their homes. These ratings provided us with an inventory of the range of problems that residents face, as well as the severity of each problem. It is the problem areas that are our focus for a major 502 grant proposal for a weatherization and housing program on behalf of the two communities, as well as for potential future funding for "green" technologies

and major housing upgrades and rehabilitation. These latter improvements can also be tied to do-it-yourself (DIY) self-building and work and is the reason construction experience was included in the survey (see Chapter 3). To gauge and prioritize the most pressing concerns for the households of Rancho Vista and Redwood, we constructed three measures:

- 1) A general (aggregate) percentage index that accounts for how the 133 respondents *rated* the 24 housing dimensions;
- 2) Frequencies that measures the top five severe problems *written in* by respondents; and
- 3) A rating that separates respondents into quartiles based on the number of times they ranked the 24 dimensions as being problems. This third measure separates homes with critical needs from those with relatively few problems and is used as the dependent variable for an ordered logit modeling analysis which we undertake in order to better understand the factors that lead to dwelling problems.

Each analysis I are discussed in detail in the following subsections and include comparisons of problems between settlements, survey type, and whether they rent or own.

Problem Index of 24 Housing Dimensions Rated

This index is provided in Table 4.5 and uses the frequency valid percentages from the rankings of the 24 housing dimensions by all surveys (N=133). It combines the frequencies of persons that answer "constant or severe problem" with those of persons that answered "occasional problem" for the respective housing aspect. Similarly, frequencies are combined for answers of "satisfactory" and "good, not a problem." The final column % problem indicates the difference between the two sets of scores.

The top problem area for residents as listed in Table 4.5, in percentage terms, is that doors do not close properly, thus creating drafts and security concerns. Seventy-two percent of respondents report this to be a constant or occasional problem, versus 24% said their doors were satisfactory or not a problem home aspect. The second, third and fourth top problems are somewhat related to one another and to the fact that their doors do not shut properly. Sixty-nine percent of homes say that their dwelling unit is too hot during the summer, 64% say it is too cold during the winter, and 62% say it is poorly insulated (Table 4.5). Fixing the doors and insulation of homes can help improve the capturing of coolness during the summer and heat during the winter. However, the unbearable heat and cold, as indicated by respondents in the following subsection, is more a result of poor or non-working central AC and heating units. More so, some homes note that their electricity costs are high; a likely result of AC or heating units kept running continuously or the large number of partial ACs used to keep the home cool (see section 4.1). Clearly, multiple benefits can be achieved through a combination of similar and potentially cost effective home improvements.

Between 50% and 56% of the households rated the following housing dimensions as a constant or occasional problem of the dwelling units: pest infestation, septic tanks, bathroom venting, roof leaks, flooring, kitchen venting, foundation, windows closing properly, and electrical wiring (Table 4.5). Some of the housing conditions that received the fewest problem ratings include

front door steps, insufficient hot/warm water, missing shingles, and inadequate number of electrical outlets. However, a cautionary note in interpretation is warranted. While these four dimensions received the fewest number of problem ratings relative the other 20 dimensions, this does not mean that they are not problem areas. For example, while 56% of respondents say that the front door steps are satisfactory or not a problem, the fact remains that more than one in three homes (37%) say that the steps to their front doors are an issue of concern.

		% Constant or Occasional Problem	% Satisfactory or Good, Not a Problem	% Problem Index
1	Doors do not shut properly	71.9	24.2	47.7
2	Unit is too hot in summer	68.5	29.0	39.5
3	Unit is too cold in winter	63.9	33.6	30.3
4	Poor insulation	61.9	33.0	28.9
5	Pest infestation	55.7	36.5	19.2
6	Problems with septic tank	55.0	40.8	14.2
7	Poor venting from bathroom	53.8	42.0	11.8
8	Roof leaks	53.3	45.0	8.3
9	Poor flooring	52.6	42.9	9.7
10	Poor venting from kitchen	52.6	42.4	10.2
11	Unstable foundation	52.1	42.7	9.4
12	Windows do not close properly	51.7	45.9	5.8
13	Electrical wiring and/or outlets	50.8	45.7	5.1
14	Plumbing leaks	48.6	46.8	1.8
15	Mold	47.0	46.1	0.9
16	Poor venting from toilets	46.5	50.0	-3.5
17	Humidity/condensation problems	46.1	50.4	-4.3
18	Lack of privacy (poor sound proofing)	45.2	49.6	-4.4
19	Poor air quality	44.0	47.4	-3.4
20	House shakes when windo blows	43.2	51.6	-8.4
21	Steps to the front door	36.6	56.2	-19.6
22	Insufficient hot/warm water	30.9	62.7	-31.8
23	Missing shingles	27.8	40.8	-13.0
24	Inadequate number of electrical outlets	27.2	66.7	-39.5

Table 4.5. Comparison of the Percent of Respondents that Answered "Constant orOccasional Problem" vs. "Satisfactory or Good, Not a Problem."

Note: Problem areas are ranked by "% Constant or Occasional Problem." The "Problem Index" is the difference between the "% Constant or Occasional Problem" and "% Satisfactory or Not a Problem." As a difference, the problem index is another means of ranking the most problematic housing conditions.

Subgroup comparisons are helpful to understanding different needs, if any, resulting from different sub-populations and also to assess any bias from the method used to collect the data. Table 4.6 provides a snapshot of dwelling unit problems between settlements and survey type.

The top 10 problems listed in Table 4.5 are compared to moderate the discussion. Overall, a greater percentage of Rancho Vista residents report more problems than their Redwood counterparts, particularly in the areas of "unit is too cold in winter," "pest infestation,' "poor venting from kitchen," "problem with septic tank," and "roof leaks" (see Table 4.6).

		% Rancho Vista	% Redwood	% Mail	% Face-to- face
1	Doors do not shut properly	76.6	67.2	76.1	62.5
2	Unit is too hot in summer	71.7	65.6	73.8	57.5
3	Unit is too cold in winter	71.7	56.6	69.5	52.5
4	Poor insulation	63.8	60.0	65.4	55.0
5	Pest infestation	63.0	49.2	56.0	55.0
6	Problems with septic tank	60.7	50.0	60.5	43.6
7	Poor venting from bathroom	55.9	51.7	68.8	23.1
8	Roof leaks	58.6	48.4	62.5	35.0
9	Poor flooring	57.4	48.3	64.0	30.8
10	Poor venting from kitchen	58.3	46.6	62.8	32.5

Table 4.6. Percent of Households that Answered "Constant" or "Occasional" Problem tothe 24 Housing Dimensions by Settlement and Survey Type

When comparing between residents that answered through the mail or through interviews, the differences are more obvious. A greater percentage of persons that answered via the mail overwhelmingly indicate more problems with their housing structures. This is not completely surprising since we expected that those who were most concerned with housing conditions, most in need of assistance, or those who had benefited or heard about previous Law School interventions would be more likely to respond. Those who feel they are doing fine are less likely to have responded via the mail surveys (interviews through interval sampling provided a more random representation, thus captured those with great need as well as those with less need).

As noted in the opening chapter, a total of 12 renters participated in the survey. The following bullets summarize how many renters out of the 12 total experience problems (constant or occasional) with their rental units and the specific housing dimensions they deem problematic:

- 6 out of 12 renters indicate the following problem areas Lack of privacy (poor sound proofing), unstable foundation, electrical wiring/outlets, plumbing leaks, and septic tank.
- 7 out of 12 renters indicate Poor insulation, doors do not shut properly, roof leaks, unit is too hot in summer, and unit is too cold in winter.
- 8 out of 12 renters indicate Pest infestation.
- 9 out of 12 renters indicate Windows do not shut properly.

In summary, subgroup comparisons show little variation between residents of Rancho Vista versus Redwood and between renters versus homeowners in the problems they report with the dwelling units they live in. On the other hand, there is a statistically significant difference between households that answered through a mail versus a face-to-face survey.

		Top Severe Problem	2nd Severe Problem	3rd Severe Problem	4th Severe Problem	5th Severe Problem	Top 5 Severe Problems
1	Septic tank problems	25	6	1	5	3	40
2	Roof leaks	16	10	4	3	1	34
3	Foundation unstable	5	15	4	5	4	33
4	Electrical wiring/outlets problems	3	8	6	3	7	27
5	Flooring poor	5	8	5	5	2	25
6	Poor insulation	7	7	5	3	2	24
7	Doors do not close properly	3	7	6	4	2	22
8	Too hot in summer	7	6	3	4		20
9	Too hot & too cold	6	5	4	4	1	20
10	Windows do not close properly	2	2	5	5	5	19
11	Home old, has holes, needs remodeling, or too small	6	4	3	2	2	17
12	Plumbing leaks	2	4	6	4	1	17
13	Too cold in winter	2	1	6	5	1	15
14	Pest infestation	6		1	1	2	10
15	Bathroom problems	3	2	1	1	3	10
16	Kitchen poor venting	1		2	1	4	8
17	Mold		1	3	2	2	8
18	Insufficient hot/warm water	2	1	1	1	1	6
19	Missing shingles	1	1	2	2		6
20	Wall holes/cracks	1	2	1	2		6
21	Toilets poor venting	2	1	1			4
22	Roof leaks cause mold	1	1	2			4
23	Roads unsafe	1				2	3
24	Electrical outlets inadequate number			1		2	3
25	Poor air quality	1				1	2
26	Humidity/condensation problems	1			1		2
27	Front door steps poor	1		1			2
28	Doors & windows do not close properly			1		1	2
29	Lack of privacy (poor sound proofing)			1	1		2
30	House shakes with wind					1	1

 Table 4.7.
 Frequencies of the Top 5 Severe Problems

Top Five Severe Problems Listed

Table 4.5 earlier describes dwelling unit problems from an aggregate perspective, combining all respondents via a rating and ranking scale. In Table 4.7 households were asked in an openended question to list their top five most severe problems. It was generated by first compiling the "top" severe problem listed by participants, then manually recoding the open-ended responses into groupings. The same was done for the "2nd" severe problem listed, and so forth. Table 4.7 lists the frequencies of each of the five severe housing concerns for residents, as well as a "total" column that combines the five frequency counts.

Our hypothesis is that homes will first and foremost list major structural or infrastructure problem areas since these are the ones that if fixed, will most improve their living situation. For example, given the resources, residents are likely to first consider fixing a roof versus fixing a door since a substandard roof affects the household more negatively. Results seem to affirm this. The top severe condition listed is "septic tank problems" (frequency of 25), followed by "roof leaks," "poor insulation," and "too hot in summer" (frequency counts are bolded and highlighted in Table 4.7). Noteworthy is that an additional six persons mention as a top severe problem "too hot & too cold." While we could combine "too hot in summer," "too cold in winter" and "too hot & too cold" into one category, we left these separate categories to provide the reader with greater detail. The 2nd through 4th most severe problem can be read accordingly in Table 4.7. If the top five severe problems are combined, they tend to fall in line with the hypothesis that households are more concerned with big structural issues: in this case problems related to the septic tank, roof, foundation, electrical, and floor.

Comparing tables also affirms the hypothesis. For example, Table 4.5 shows that 72% of households (frequency count of 92) have a problem with their doors not closing properly. But when these 92 homes are further analyzed, only three of them mention doors not closing properly as their top severe problem. That is because they have more serious problems besides the doors that they consider priority – 17 of them list as their most severe problem the septic tank, 14 list roof leaks, and 12 list problems with the house being too cold and/or too hot. Put another way, residents understand the consequence that overflowing/leaking/standing sewage water can have on public health, and it is probably the reason for ranking septic tanks as the number one issue they would like to correct.

A comparison between settlements in Table 4.8 shows that residents of both Rancho Vista and Redwood are very similar in their listing of severe problems. In comparing survey types, one should note that there is more than double the number of mail surveys than there are face-to-face surveys, so more mail frequency counts are expected. In spite of this, there does appear a divergence in responses in the number of persons that indicate problems with their septic tank and with their flooring; that is, persons that answered via the mail are much more likely to report septic or flooring problems. Analysis of renters shows that they list "roof leaks" and "septic tanks" as their top two issues that need repair. Overall, there is little variation between renters and homeowners in the problems they report with the dwelling units they live in.

		Rancho Vista Frequency	Redwood Frequency	Mail Frequency	Face-to-face Frequency
1	Septic tank problems	20	20	31	9
2	Roof leaks	22	12	22	12
3	Foundation unstable	18	15	21	12
4	Electrical wiring/outlets problems	17	10	17	10
5	Flooring poor	10	15	24	1
6	Poor insulation	12	12	16	8
7	Doors do not close properly	11	11	13	9
8	Too hot & too cold	9	11	16	4
9	Too hot in summer	10	10	14	6
10	Windows do not close properly	10	9	12	7

Table 4.8. Frequencies of Top Severe Problems by Settlement and Survey Type

Household Quartiles Based on Severity of Problems

Table 4.9 is compiled in a three-step process. First, each household was individually measured by the number of times it answered that a particular housing dimension was either a "constant" or "occasional" problem. For example, if a particular home ranked 17 of the 24 dimensions as a "constant" or "occasional" problem, then that home was given a count of 17. Second, all the households were ranked by the number of times they answered "constant" or "occasional" problem. So the minimum number problems was 1 and the maximum was 24. The third step was to simply place the number of problem counts into quartiles between 1 and 24. That is, if they answered a total of between 19 and 24 problem housing conditions, then they fell into the 1st quartile; between 13 and 18 problems were placed in the 2nd quartile; between 7 and 12 problems into the 3rd quartile; and finally, between 1 and 6 problems into the 4th quartile. Interpretation of each of the quartiles is as follows:

- Category 1: 18.3% of households with extensive and serious housing problems.
- Category 2. 23.7% of households with substantial housing problems.
- Category 3. 21.4% of households with largely modest housing problems.
- Category 4. 36.6% of households with relatively few housing problems.

	Number of respondents	%	Cumulative %
1st Quartile - Serious House Problems	24	18.3	18.3
2nd Quartile - Substantial House Problems	31	23.7	42.0
3rd Quartile - Modest House Problems	28	21.4	63.4
4th Quartile - Few House Problems	48	36.6	100.0
Total respondents	131	100.0	

Table 4.9. Quartiles of Households that Answered "Constant" or "Occasional" Problemto the 24 Housing Dimensions

Describing Table 4.9, a total of 18% of households fall into the 1st quartile, meaning that almost one in five homes have extensive and serious housing problems since they ranked between 19 and 24 of the housing dimensions as a constant or occasional problem. Another 24% (almost one in four) households fall into the 2nd quartile with substantial housing problems. Combined, this translates to two out of five homes (42%) have substantial to extensive housing troubles. Those with serious housing problems should probably be targeted for new homes since there are limits to the benefits that may accrue from home improvement inputs. The same may also apply to some of the second quartile homes. Other homes in the 2nd and 3rd quartiles would almost certainly benefit from grant assistance for home improvements and weatherization. Thirty seven percent of homes have relatively few housing problems, but even here some level of home improvement and weatherization assistance could prove highly beneficial.



Figure 4.2. Quartiles of Households that Answered "Constant" or "Occasional" Problem to the 24 Housing Dimensions – Rancho Vista vs. Redwood

Comparing settlements, a slightly higher percentage of Rancho Vista homes fall into the first two quartiles of substantial or serious dwelling problems (45% vs. 39% in Redwood, see Figure 4.2).

Ordered Logit Regression Modeling on Factors that Explain Housing Problems

In order to assist our understanding about the factors that help to explain housing conditions we conducted further statistical analysis using an ordered logit model (also known as an ordered logistic regression or proportional odds model). In this analysis the housing quartiles 1-4 were the dependent variable. The ordered logit model is simply an extension of the logistic regression for dichotomous dependent variables, allowing for more than two ordinal response categories. That is, the analysis accounts for the ordinal nature of the dependent variable "housing problems" which takes on four categorical values – from few housing problems to serious housing problems. A total of eight independent or explanatory variables were selected for analysis in order gauge which influenced the variation in the degree of housing problems observed.

Below is a non-technical description of the model and model parameters:

houseproblems = f { (-)cmean_income ; (+)cmean_age ; (-)cmean_value ; (-)construction ; (+)septicprob ; (+)aircoolprob ; (-)garbageserv ; (+)healthprob }

Dependent variable:

houseproblems: quartiles of reported problems with the primary dwelling unit where 1 = few problems, 2 = modest problems, 3 = substantial problems, and 4 = serious problems

Independent variables:

- 1. *cmean_income*: centered mean of household income where 0 = <\$1000, 1 = \$1000-\$2000 and 2 = >\$2000 (expected to reduce house problems negative coefficient)
- 2. *cmean_age*: centered mean of the age of the primary dwelling unit (expected to increase house problems positive coefficient)
- 3. *cmean_value*: centered mean of the appraised home improvement value of the primary dwelling unit (expected to reduce house problems)
- 4. *construction*: construction experience of any house members where 0 = no and 1 = yes (expected to reduce house problems)
- 5. **septicprob**: reported problems with wastewater infrastructure where 0 = no and 1 = yes (expected to increase house problems)
- 6. *aircoolprob*: reported problems with air cooling in the home where 0 = no and 1 = yes (expected to increase house problems)
- 7. **garbageserv**: denotes formal or semi-formal garbage service where 0 = no and 1 = yes (expected to reduce house problems)
- 8. *healthprob*: (see following chapter) severe health problems or disabilities by any house members where 0 = no and 1 = yes (expected to increase house problems)

Ordered logistic re	Number of obs =		81 37 61		
				Prob > chi2 =	0.0000
Log likelihood =	-90.729776	(iteration 4)		Pseudo R2 =	0.1717
	houseproblems	Coef. (b)	Std. Err.	e^b	P>z
	cmean_income	0.27584	0.300	1.318	0.359
	cmean_age	0.03539	0.015	1.036	0.018
	cmean_value	-0.00002	0.000	0.99998	0.040
	construction	-1.20995	0.456	0.298	0.008
	septicprob	0.98204	0.463	2.670	0.034
	aircoolprob	1.67557	0.493	5.342	0.001
	garbageserv	-0.39956	0.478	0.671	0.403
	healthprob	0.93858	0.454	2.556	0.039

Table 4.10. Ordered Logistic Regression for Housing Problems

Table 4.10 shows the results of the modeling exercise using a STATA statistical package. A total of 81 observations were used since 32 of the surveys had at least one missing value in the variables used. The model is highly significant and all but one of the model parameters (income is the sole exception), and have the predicted signs (i.e. the expected association with house problems – positive and negative coefficients), indicating that the chosen explanatory variables do a good job explaining the condition of the home. Six of the eight independents are significant at or above the 5% level, while only two (income and garbage service) are not. Additionally, our tests show that the proportional odds (parallel regression) assumption is not violated so the ordered logit technique provides a robust analysis.

A general way of interpreting the statistical results in Table 4.10 is as follows: the number and extent of **housing problems is estimated to rise** as the house becomes older, if the household reports problems with the septic tank and source of air cooling, and if the household has a member with health issues or disabilities. (These coefficients are positive in Table 4.10. meaning that as they increase they intensify the likelihood that problems will exist.) On the other hand, the number of **housing problems is estimated to decline** (negative coefficients) as the value of the home increases, and especially if the household has someone with construction experience. There is no statistically significant effect of income and type of garbage service on the condition of the home. Ordered logit models were also run without these two non-significant regressor variables, and the remaining model parameters remained statistically significant. However, they were left in the model since theoretically we estimated that they might have an influence on the number of problems a home reported.

Interestingly, lower incomes are not significant as an explanation for level of housing problems experienced. This is probably because most of the households are low income and there is relatively little differentiation among residents (see Chapter 3), but it may be posited that higher income households are more likely to be able to maintain their homes then the poorest and very poor. Indeed, lower house values shows are significantly linked to poor housing conditions (and
vice versa one assumes). Household practices in solid waste (garbage) disposal removal appear to be unrelated to housing problems.

Outside of income and garbage collection, all of variables tested significant in the models and shape the level of housing problems experienced. It is quite clear that the older the property the higher the likelihood of problems occurring, and those with septic problems tend to have a number of knock on effects that intensify a range of problems. In particular we wish to highlight three variables: construction, aircoolprob and health. The first two have the highest significance values. This strongly suggests that households with members who have some type of construction experience are much more likely to be able to overcome dwelling problems than do households with no such skills. This is not surprising, of course, but it is an important finding given the quite extensive construction skills that we identified in the survey and which were reported earlier. This is an important local resource that should be built into community improvement programs. The linkage between poorer air cooling and many other consequent problems is less easy to discern. But it seems likely to relate to inadequate insulation and the costs of effective ac which are both a surrogate for poor quality homes and fittings, as well as aggravating problems associated with high temperatures and poor air quality. A home with poor central air flow and cooling efficiencies is more likely to experience additional housing problems. Also, ensuring effective cooling can be both difficult and expensive and is likely to have several downstream or knock-on effects. Similarly, if the home contains persons with severe health problems or disabilities, then are less likely to have the physical resources to deal with dilapidating dwelling conditions, and are more likely to be adversely affected by those conditions.

Therefore in terms of home improvement and future housing policies, this chapter has highlighted a wide range of problems in the dwelling environment, but has highlighted the principal problem areas that would appear to require priority attention (Table 4.8). Some of most significant problems are higher cost and not easy to fix through DIY: septic, roofs, unstable foundations, and AC. Others frequent problems are less costly but also require some expertise (electrical fittings and outlets), while several of the other lesser (but frequently mentioned) problems could be addressed relatively easily – closer fitting doors and windows for example. Such improvements can be undertaken by DIY, or by employing local labor to assist.

Overall the logit model analysis suggests that the central factors shaping poor dwelling environments are: age of the dwelling; poor AC and ability to reduce ambient temperatures and improve air quality; problems with septic tanks; and the presence of disabled householders who have physical difficulty in making (or being able to afford) the necessary improvements. On the other hand, higher value homes are less likely to show dwelling problems, and households with construction skills and experience are especially likely to have been able to improve their homes, reducing housing problems.

Chapter 5 HOUSEHOLD ACTIVITIES AND HEALTH ISSUES

In this chapter we first describe the plans that residents of Rancho Vista and Redwood have for their homes, followed by a description of some behaviors within their home especially in regard to sustainable home practices and knowledge about sustainable home improvement opportunities and technologies. A brief discussion on household pets is also included here. Lastly, we examine data collected about the health and illness of members of these two communities in the hope of tying their health outcomes to the data we collected about their home environments. (This variable already appears in the logic model in the previous chapter.)

5.1 Housing Plans and Household Practices

Future Home Plans

Ninety-eight of the residents (75%) have plans for their house within the next two years (Figure 5.1 below). Of these, 94 listed their future housing plans and gave a range of responses, provided in Table 5.1. Since the range of responses was many and overlapped, for ease of analysis the answers were recoded into five categories. Most residents (45%) indicate that they plan to make general improvements of some form or other; while a few plan on doing no more than maybe fixing their yard (4.3%). One in four (26%) respondents indicate that they have plans for building a house, alongside other improvements, extensions/additions and/or even installing a mobile home. Another 19% plan on adding on or extending to their current dwelling unit, with or without any other improvements but without building another house. Interestingly, six respondents plan on moving even after making improvements to the home, perhaps to increase the sale value. Comparing between communities, at first glance it appears the twice as many Rancho Vista residents intend on extending to their current dwelling units, while more residents in Redwood are planning on just making general improvements or repairs. However, with so much overlap in the responses as to what the households plan on doing, would like to do, or wish they could do given the resources, it is difficult to say that there is any true difference between the two areas.

Dimension / Item	Rancho Vista		Redwood		Combined	
Dimension / Rem	%	N	%	N	%	N
Total Interviews		66		67		133
Future Home Plans		46		48		94
General improvements or repairs	39.1%	18	50.0%	24	44.7%	42
Add extension plus improvements &/or install mobile home	26.1%	12	12.5%	6	19.1%	18
Build house plus improvements, extension &/or install mobile home	23.9%	11	27.1%	13	25.5%	24
Fix garden & yard only	6.5%	3	2.1%	1	4.3%	4
Move even after improvements	4.3%	2	8.3%	4	6.4%	6

Table 5.1. Future Home Plans for Residents



Figure 5.1. Households with Housing Plans in the Next Two Years



Figure 5.3. Households with Compost Heap



Figure 5.5. Households with Pets



Many residents recycle. There is a 40/60 split between those that do and those that do not (Figure 5.2). The most common item recycled is aluminum cans; 50% of those that listed what they recycle report recycling only cans while another 42% recycle cans with a combination of other materials, such as paper, glass and plastic. Few residents compost however (only 13% in Figure 5.3), despite the lack of formal garbage service in the area (see Chapter 4.1).



Figure 5.2. Households that Recycle



Figure 5.4. Households that know about Sustainability, Apart from Recycling



Figure 5.6. Households with Members with Health Problems or Disabilities

Interestingly though, the high percentage of our study population that disposes of their garbage themselves (by either dropping off or burning) may be partially responsible for the large percent of recyclers in both communities. Those that listed 'drop off and/or burn' as their mode of garbage disposal were more likely to recycle than those with formal and semi-formal service. Of those with formal service, 41% recycle; of those with semi-formal service, 53% recycle; and of those who drop off and/or burn, 66% recycle. Among the two communities, there is little variation in their recycling patterns, with 59% and 63% of Rancho Vista and Redwood residents, respectively, indicating that they do recycle.

Unlike the case of recycling, there is no observable difference in composting between categories for garbage disposal (formal, semi-formal, drop off and/or burn). For instance, those that dispose of their garbage themselves are no more likely to compost. However, the majority (87%) does not compost. It is worth noting, however, that there are current composters in both communities, though it is a modest group, about 13% of the households surveyed. Effective composting in closed receptacles (to avoid pests) could be a useful addition, especially in those homes that currently drop off or burn their garbage.

Most of our survey participants (82% in Figure 5.4) have not heard about sustainability issues beyond that of recycling. Moreover, while the questionnaire asked respondents to list any three aspects of sustainability (if they had heard of it), only 16% of those who heard of sustainability were able to list one aspect; 7% were able to list two; and a just 4% were able to list three. One out of six respondents listed energy efficiency and efficient appliances most often as the sustainable issue they have heard of, followed by solar energy applications.

The majority of residents own pets (77.5% in Figure 5.5). Most often these pets are dogs (66%), though (17%) and chickens (12%) also figure. Most residents with pets have one or two dogs but no farm animals such as pigs, although two homes surveyed kept goats.

5.2. Health Problems and Disabilities and their Relation to the Dwelling Unit

Households with Serious Health Problems or Disabilities

More than half of the surveyed population (57% in Figure 5.6) indicates that they have at least one member of their household with some sort of severe health problem or disability. The most frequently reported health problem among respondents is diabetes; 29% of the population reporting that a member of their household was afflicted by diabetes (Figure 5.7). This statistic, striking in itself, is actually an underrepresentation of the incidence of diabetes within these communities. Because residents were only asked if they or a member of their household with diabetes. Oftentimes respondents answered "yes" (that someone in their household is affected) and then listed that both they and their spouse or a parent suffered, or that diabetes was an issue for several members. It is clear that diabetes is a significant health problem in these communities. This may be because of the very-low reported incomes and high poverty levels of our population (see Chapter 3.1), a factor that has been shown to contribute to diabetes.

The next most reported category for health and illness was the "other" category (25%). The majority of these problems related to cardiovascular disease or orthopedic problems (e.g., issues with back or joints). There were several other health problems that affect at least one member in about 15% of the households: poor mobility (15%), asthma or respiratory problems (16.5%), and migraines or headaches (14%).



Figure 5.7. Percentage of Households Reporting a Member with a Serious Health Problem or Disability

Because almost 70% of our respondents live in manufactured housing, we were also interested to see if this group of residents reported different rates of health problems. We restricted the groups by those that live in manufactured housing vs. those that do not. Results showed no difference in the rate of reporting health problems: 58% of manufactured home residents report some health problem vs. 57% of non-manufactured home residents. Comparing the same groups (manufactured vs. non-manufactured homes) within each category of poor mobility, Alzheimer's, diabetes, asthma, migraines, sight problems, eyes/nose irritation, and other problems we found no significant difference in the rate of reporting any of these health issues. Based on the data, living in a manufactured home does not of itself contribute to negative health outcomes in the above areas.

Relationship between Health Problems and Housing Problems

When we asked the residents themselves how the above problems are affected by their housing situations, many listed poor access for those with limited mobility and generalized stress produced by their housing condition. However, the housing condition they cite most often as contributing to illness and poor health is **poor indoor air quality**. This includes mold, noxious odors, humidity, dust, and poor air circulation. This response is worthy of note given a growing body of research that links health outcomes such as asthma and lung cancer to the quality of indoor home environments. Americans tend to spend 90% of their time indoors, and children and the elderly especially spend a disproportionate amount of time indoors. Unfortunately, as the Environmental Protection Agency advises, indoor air is often more polluted than outdoor air for a variety of reasons.

The relationship between negative health outcomes and the condition of the physical house becomes clearer when we analyze reported *housing* problems within the groups that also report *health* problems. For instance, when we select only those cases that report having a member of

their household affected by asthma and then examine the housing problems that they list as being a constant or occasional problem, we find that this group is more likely across the board to list mold, poor air quality, humidity and condensation, poor venting from the kitchen or bathroom or toilet, or drafts from doors as problems. The same is true for those that report problems with migraines or headaches and eyes or nose irritations.

Table 5.2 below summarizes these findings by comparing the total population (N=133) against the subgroup affected by severe health problems on the rate of reporting problems with certain housing dimensions. Although the sample size (N) is not large for these illnesses, it is probably sufficient to allow us to draw some preliminary conclusions. The table shows that those reporting asthma or respiratory problems, migraines or headaches, and eye or nose irritation are more likely than the total population to rate these housing issues as problematic. Across the board, residents affected by illness are more likely to report housing issues related to indoor air quality. For instance, residents affected by asthma are almost twice as likely to report poor indoor air quality as a problem than the general population.

	Asthma & Respiratory Problems		Migraines & Headaches		Eyes & Nose Irritation	
	% Asthma Population (N = 15)	% Total Population (N = 133)	% Migraine Population (N = 19)	% Total Population (N = 133)	% Eye/Nose Population (N = 13)	% Total Population (N = 133)
Poor air quality	81.0%	44.0%	56.3%	44.0%	76.9%	44.0%
Humidity & condensation	68.0%	52.5%	64.7%	52.5%	76.9%	52.5%
Mold	81.8%	47.0%	76.5%	47.0%	92.3%	47.0%
Poor venting from kitchen	81.0%	52.5%	82.4%	52.5%	69.2%	52.5%
Poor venting from bathrooms	85.7%	53.8%	61.1%	53.8%	83.3%	53.8%
Poor venting from toilets	86.4%	46.5%	58.8%	46.5%	76.9%	46.5%
Poor insulation	90.5%	61.9%	76.5%	61.9%	76.9%	61.9%
Doors do not shut properly causing drafts	86.4%	71.9%	89.5%	71.9%	100.0%	71.9%

Table 5.2. Percentage of Households that Answered "Constant" or "Occasional" Problemto Selected Housing Dimensions by Population Sub-groups Reporting Illness

5.3 Concluding Remarks

It would be a relatively easy next step to examine some of the major data sets relating to health among Hispanics in Texas (Angel 2007) and to generate an accurate profile of the health problems that confront aging and Mexican origin populations. What our study strongly suggests, however, is that there is an important intersection with poor housing conditions found in these informal homestead subdivisions in Central Texas, especially in relation to poor air quality and ineffective ventilation. This should be an important component in thinking about grant priorities relating to home improvement and weatherization. Those (a minority) with physical mobility problems could be similarly assisted by modest modifications to the dwelling, although many have already undertaken such measures (ramps, etc.). Encouraging is the fact that so many households have plans and are well disposed to making home improvements. While it is true that the mail-in survey respondents were probably self selecting, hoping that a response would enhance the community's and their own chances of receiving assistance in the future, our broader research suggests that most self-helpers living in these communities have considerable willingness to make sacrifices and to undertaken "bootstraps" home improvements. This is why they move to IFHSs in the first place. These are working class families for the most part: their biggest challenge is in earning a viable living wage that will cover their living and transport costs (a priority since there is no public transport); ensure that their kids get an education and stay health, and to undertake home improvements with anything that is left over. The current economic climate is especially challenging, and our reading of the low turnover (sales and exits) of homes; the seemingly "stalled" level of home improvements; and the inability to attend to major problems such as those of backed–up septic systems, all indicate that improvements, while urgently needed, are unlikely to happen without external intervention and incentives.

One of the major advantages that homesteaders have in low income subdivisions such as Rancho Vista and Redwood is that of space. Most lots are half an acre or thereabouts, but in our conversations with residents and our observations it was apparent that yards could be put to more effective use. We recognize that summers in Texas are extremely hot, and that climate restricts the potential use of the yard for half the year. But after clearing up the yard and, where it is a problem, attending to septic seepage, modest activities such as tree planting, improved shading, rainwater harvesting tied to specific beds or plantings, composting, raising animals (chickens for example), could all enhance the use of outdoors. Indeed, in some homes that we visited with little or no AC, the interior of the house was much hotter than shaded areas of the yard. To the extent that we have argued that a substantial proportion of the housing problems identified, and the aggravation of illnesses lies in poor indoor air quality, just spending more time outside would be a step forward and an improvement. These is not to belie the need to seek major grants for priority areas home improvement, but the idea of thinking creatively and systematically about the exterior yard space has much to merit it. In those cases where the housing unit is so dilapidated that there is little likelihood of a grant being offered, or little positive outcome to be gained from home improvements, improving the quality of the yard environment would have immediately benefits, and would not be lost even though the house ultimately would need to be replaced.

Chapter 6

NEXT STEPS, FUNDING, AND THE PRIORITIES FOR HOME IMPROVEMENT AND SELF HELP HOUSING IN RANCHO VISTA AND REDWOOD

6.1 Funding Opportunities

In the final chapter of the companion report "Sustainable Housing Design and Technology Adoption in *Colonias*, Informal Homestead Subdivisions, and the 'Innerburbs'" we outline what a more holistic sustainable housing development policy would entail, looking not only at physical home improvements and applications, but also at judicial and regulatory sustainability, as well as social and community sustainability. In that report and associated Appendices, we also describe the various sources of funding that are available to communities in Texas for infrastructure and home improvements.

That inventory of the types of funding available to subsidize sustainability expenditures is reproduced below.¹⁶ We include funding opportunities at the federal, state and private utility levels.

Federal Funding Sources

The structure of federal income incentives can be broken down by income level, region typology (urban or rural), and scale of the housing (single- or multi-family). Here we outline six federal programs that provide funds for sustainable rehabilitation or development.

<u>USDA Direct Housing Loans</u>: The USDA funds several grant and loan programs that focus on rural housing and community development. Though they do not specifically deal with sustainability, there is room to include technologies and interventions through education and additional funding through other means. USDA funding is primarily broken down by single-family and multi-family housing opportunities. There are direct loan and loan guarantee programs that provide low, affordable interest rates to families that may not otherwise qualify and pay for loans when a family is in danger of defaulting. Families typically qualify if they are 80% of area median income (AMI) and can use the loans for home purchase (existing or new construction). Under the loan guarantee program, future homeowners can also borrow up to 100% of the value of a home, so that the barrier of having a down payment is eliminated.¹⁷,¹⁸

Home Repair Loan and Grant Program: Other USDA programs exist to maintain and upgrade the existing housing stock in low-income communities, including *colonias* and informal

¹⁶ These funding sources were drawn up by graduate students of the class and were integrated into their current form by Esther Sullivan.

¹⁷ http://www.rurdev.usda.gov/RHS/sfh/indiv_sfh.htm#Mutual%20Self-Help%20Housing%20Program%20(Section

¹⁸ Appendix E1, "Eligibility for USDA Direct Housing Loans. See the companion report "Sustainable Housing Design and Technology Adoption in *Colonias*, Informal Homestead Subdivisions, and in the Innerburbs."

homestead subdivisions. The Home Repair Loan and Grant Program offers loans and grants for renovation for very low income owners of homes in need of repairs or interventions to make a home accessible to someone with disabilities. For example, funds can be used to repair a leaking roof, replace a wood stove or unvented heater with central heating, construct a front-door wheelchair ramp, or to replace an outhouse and pump with running water, a bathroom, and a waste disposal system. Direct home improvement grants are only available to homeowners 62 years and older. Low-interest loans (1%) are available to low-income families and individuals through the HCFP.¹⁹ The loans are repaid over twenty years and to qualify, the household must make less than 50% of AMI. Additionally, the loans are a maximum of \$20,000, while grants are capped at \$7,500.²⁰ This program seems most appropriate for declining, but not dilapidated homes. As an example, this would be ideal for a post-1978 mobile home that is in overall decent shape, but needs one or two significant repairs.

<u>Mutual Self-Help Housing Program</u>: This program is targeted at low- and very low-income households, who cannot afford to purchase or construct clean, safe, livable housing. The premise is that communities, broken down into smaller groups, will contribute labor or "sweat equity" to the home construction process in order to make overall home costs attainable. Sweat equity would comprise 65 percent of the construction labor costs on everyone in the group's homes. Like most of the USDA programs, the homeowners must be in the 50-80% AMI range, but must be able to make payments of around 22-26% of household income. There is a subsidy that covers whatever the homeowner cannot pay in excess of the 26% of income cap and there is a consideration for total family debt. Homes are to be modest in size, cost, and design. This modesty certainly would not exclude conservation fixtures, such as low-flow faucets and toilets and energy-efficient appliances and many other sustainable technologies. The Mutual Self-Help Housing Program gives guidelines about how a community with little financial capital can greatly improve their home stakes, communities, and property values by providing most or all labor through sweat equity.²¹

<u>Housing Preservation Grant</u>: Funds from this program must be used in an area where there is a documented need for very-low and low-income housing. Funds must be used in a 2-year period and can be used on either single-family and multi-family housing, as long as it is targeted toward very-low and low-income residents and in a town/city with 20,000 residents or less.²²

<u>Multi-Family Housing</u>: While most of the USDA's grants are for single-families and home owners, there are also several programs available for multi-family housing, which is directed mostly at developers. Anyone, from individuals to non-profits to public agencies, is eligible to apply for financing and must have tenants in the very low- to low-income bracket. Individuals with disabilities are also targeted. In order to be competitive, the housing suggested must be in certain communities that are published yearly in the *Federal Register*. Loans can be approved on the state level up to \$1.5 million; in excess of that amount is approved at the HCFP national

¹⁹ Ibid.

²⁰ http://www.rurdev.usda.gov/RHS/sfh/brief_repairloan.htm

²¹ http://www.rurdev.usda.gov/RHS/sfh/indiv_sfh.htm#Mutual%20Self-Help%20Housing%20Program%20(Section).

²² http://www.rurdev.usda.gov/RHS/mfh/brief_mfh_hpg.htm

office.²³ There is also a loan guarantee program available to developers that make providing loans more beneficial to lenders. The USDA is interested in increasing very low to moderate priced housing in rural areas. New construction and intense rehabilitations are covered and the housing must have a minimum of five dwelling units. The government guarantees the loans up to 90%, gives credit towards the Community Reinvestment Act, and the loans are exempted from the lender's lending limits.

<u>Weatherization Assistance Program</u>: At the behest of the Obama administration, energy efficiency incentives have become a cornerstone of the economic recovery and the green jobs drive. At the center of this agenda, the Weatherization Assistance Program is a federally-funded and state-administrated program designed to reduce green house gas emissions, provide economic relief to low-income households faced with rising electricity and fuel costs, and stimulate local economic growth. To meet these objectives the program provides free weatherization services to low-income homes. Most often, local contractors are hired to tighten the building envelope of a home so that it is more energy efficient. The U.S. Department of Energy funds and manages the WAP federally.²⁴

In Texas, the Texas Department of Housing and Community Affairs' (TDHCA's) Weatherization Assistance Program has typically received roughly \$13 million per year through DOE, the Low Income Home Energy Assistance Program (LIHEAP), and IOUs. In 2009, the TDHCA received \$43 million (\$12.2M regular DOE, \$6.9 M Supplemental DOE, and \$23.9M). The American Recovery and Reinvestment Act authorized a dramatic surge in federal funding for local energy efficiency projects and Texas is receiving \$326.9 million on top of existing funding. Despite this rapid increase in funding, the level of investment still only reaches a fraction of the total need for such assistance. In Austin, over 4,000 households would be income eligible for WAP but even with the Stimulus money, there is only capacity to reach 1,000. The need is as broad as it is deep. In Texas, WAP income-eligible households pay roughly 12.2% of their annual income on home energy costs. ^{25 26}

Other Federal Programs

There are several federal programs that fund low-income and/or sustainable housing outside of the rural context.

²³ Ibid.

²⁴ Funds from this program are typically coupled with funds from the Low Income Home Energy Assistance Program (LIHEAP) and support from Investor Owned Utility program (IOU) funds to expand the toolkit of energy efficiency interventions available to each household. While WAP funding tends to focus more on building related interventions, LIHEAP provides funding directly for appliance replacement.

²⁵ http://168.39.88.72/ea/wap.htm

²⁶ See the companion report "Sustainable Housing Design and Technology Adoption in *Colonias*, Informal Homestead Subdivisions, and the 'Innerburbs'" Appendix E2, "Guidelines for Weatherization Assistance Program Funds" for a complete list of the weatherization services provided once TDHCA allocates WAP funds and for household eligibility requirements.

<u>Energy-Efficient Mortgages Program</u>: The Energy-Efficient Mortgages Program, targeted at moderate and lower-income households, finances energy efficiency measures, particularly renewable energy, in a new or existing home. These mortgages are insured through the Federal Housing Authority or the Veterans Affairs Programs. Loan amounts are capped at 5% of the value of the property; 115% of the median area price of a single-family home or; 150% of the Freddie Mac conforming loan program. Perhaps most important in determining a loan amount is that they cannot exceed the projected savings of the improvements. This makes projecting future savings and determining which technologies deliver the greatest savings at the lowest costs a necessary and desirable part of the process of applying for these monies.²⁷

<u>Residential Energy Subsidies and Tax Credits</u>: A program that can be used in tandem with the mortgages program is the Residential Energy Conservation Subsidy Exclusion, which states that gross income should not include the value of any subsidy provided by a public utility for customer purchase or installation of an energy conservation measure, which might include solar water heat, solar space heat, or photovoltaics.²⁸ In relation to the above incentives, a home owner can also apply for the Residential Energy Efficiency and Residential Renewable Energy Tax credits, which allow for a \$1500 dollar two-year and a 30% of expenditure tax breaks, respectively. This creates considerable up-front and first year savings for a household considering such improvements.

State and Local Funding Sources: Texas Case Study

There are several incentive programs occurring on a state and local level in all 50 states. Public utilities are at the center of these incentives in Texas. On a residential level, as mentioned previously, the utilities often offer rebates for specific renewable or efficient energy technologies to be purchased and/or installed. Additionally, localities have begun piggybacking on the local utilities and increasing the overall cost benefits available to homeowners or landlords.

<u>PACE Financing</u>: Property Assessed Clean Energy (PACE) financing is an innovative funding structure administered by the State Energy Conservation Office. It allows businesses, landlords, and homeowners to borrow money for energy-efficient improvements and pay them back via a special assessment on the property over a series of years. While the state provides the funding, local municipalities determine the terms and what technologies are eligible. Since May 2009, the state requires the following information from local municipalities to determine how it handles PACE:

- Eligible renewable-energy systems and energy-efficient technologies;
- A method for ranking requests from property owners for financing through contractual assessments if requests exceed the authorization amount;
- Specification of whether the property owner may purchase the equipment directly or contract for the installation;
- The maximum aggregate dollar amount of contractual assessments;

 ²⁷ http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US03F&re=1&ee=1
²⁸ Ibid.

- A map of the boundaries within which contractual assessments will be offered;
- A draft contract specifying the terms to be agreed upon by the municipality and a property owner;
- A method for ensuring that property owners who request financing have the ability to fulfill financial obligations; and
- A plan for raising the capital required to pay for work performed. The law allows municipalities to fund these directly or use proceeds from bonds. Furthermore, the plan must include information on how the interest rate and repayment schedule is determined, and whether or not a reserve fund will be created (and how).

Homeowners at this point can option into the program and a lien is placed on their property until the assessment is paid.²⁹

<u>Property Tax Incentives</u>: Property tax incentives exist in Texas to remove the property value increase from property appraisals, further encouraging homeowners to adopt solar or wind-powered energy alternatives without concern of an increased tax bill. This also includes devices used to store energy generated from any eligible wind- or solar-powered equipment. Technology categories for this tax exemption include:

- Passive Solar Space Heat
- Solar Water Heat
- Solar Space Heat
- Solar Thermal Electric
- Solar Thermal Process Heat
- Photovoltaics
- Wind
- Biomass
- Storage Technologies
- Solar Pool Heating
- Anaerobic Digestion

<u>Sales Tax Incentives</u>: Over Memorial Day Weekend, the state of Texas offers a sales tax weekend for energy efficient appliances. This covers both the state and local portions of the tax, up to 2% over the state tax of 6.25%. While specific items have price caps, the overall costs and number of appliances purchased is unlimited. This means that a complete home gut or a new build could purchase their appliances on this weekend and save a couple to a few hundred dollars, depending on the size of the house and the scope of the project. It is essentially effortless, free money that never leaves the pocket of a homeowner that can be redirected to other parts of the home. The only conditions are that the appliances are Energy Star compliant and that they fall into the falling categories of appliances:

- Air conditioners with a sales price of less than \$6,000
- Refrigerators with a sales price of less than \$2,000

²⁹ Ibid.

- Clothes washers
- Dishwashers
- Dehumidifiers
- Ceiling fans
- Incandescent or fluorescent light bulbs

<u>Local Utility Incentive Programs</u>: The largest and most varied forms of state and local funding are the local utility incentive programs. These are often structured either as rebate or loan programs, which essentially give grants or financing to differing customer types (residential, commercial, etc.) for energy-efficient or renewable energy technologies. The eligibility requirements almost always include specifications about the type and performance of the equipment, which often affects the amount of the rebate or loan amount.³⁰

6.2 Housing Priorities Identified by the Report

Here we offer tentative lines of actions that we believe merit detailed consideration by the community residents in association with those groups and organizations that will advise them in making the next steps. What follows is not a priority list of suggestions since such priorities must also derive from the community itself.

<u>Overview</u>

Our study has created a database about the historical development, detailed housing conditions, socio-economic and household characteristics, labor market conditions and skills that are embedded in the two communities. These data are not repeated here. Generally speaking the differences in the two communities is minimal, and along most dimensions of analysis it is not necessary to consider them as different entities nor propose recommendations or actions that would differentiate between them. We hope that the data and information will help to strengthen any grant proposals that are made. And even when the 2010 Census data are published, there is much in the survey that is not addressed in the Census.

Both neighborhoods were developed in the mid 1980s (see Chapter 2). Rancho Vista is a large settlement comprising over 300 lots that was developed by a single developer, while Redwood is similar in size but is made up of a number of smaller platted subdivisions also dating to this time. However, while households began to arrive from the late 1980s onwards, the settlements grew gradually by infill. Brookhollow Estates is a settlement (150 lots) at one edge of Redwood with a separate entrance from FM 621 with no direct connection into the other settlements. It was not included in the survey since the community leaders with whom we initially spoke did not

³⁰ See the companion report "Sustainable Housing Design and Technology Adoption in *Colonias*, Informal Homestead Subdivisions, and the 'Innerburbs'" Appendix D3, "Local Utility Incentive Programs." The chart shows all of the currently registered local utility incentive programs in the state of Texas and each link has a description of who is eligible, what requirements must be met, and how much money is at stake.

consider it a part of the neighborhood. In retrospect it should have been included since it is included in data relating to Redwood CDP (census defined place), and as well as being a large subdivision it also appears to have been populated more recently and prima facie housing conditions appear to be somewhat better than in either Rancho Vista. If any further surveying is done in Redwood it should include an oversample of Brookhollow Estates, and a couple of other streets off of FM621.

Property Titles and Lot and New Housing Acquisition and Sales

Most households have acquired their homes through Contract for Deed. While we did not detect major abuses in the application of Contract for Deed by developers and vendors, residents in central Texas would benefit from conversion to Warranty Deeds that would give greater protection.

There is a major need for financing support – lower cost loans and small scale credits – for lot purchase, housing improvements, and infrastructural investment. Part of the thinking about financing should target facilitating buy-outs and turnover for those families that are looking to sell. These low income housing subdivision markets are sluggish (even at the best of times). There is a high demand for low cost housing (\$20-60K), but the effective demand is extremely limited, in large part because there is no financing to facilitate market turnover. Private banks have not been interested in the past, and are even more skittish today after the sub-prime mortgage market collapse. Thus, State or Housing Association sponsorship is probably the way to go. To the extent that some homes and dwelling structures that we encountered are so heavily deteriorated as to make them non viable for home improvement, new homes will be required either, new manufactured or modular homes or self-built homes. Financial underpinning will be critical.

Infrastructure

Perhaps the most salient infrastructural problem that emerges from our analysis is that of the poor quality and operation of most septic tanks. These are mostly without drainage fields and require periodic pumping. Seepage and backups are common, and where the seepage is downhill onto a neighbor's property it causes conflict among neighbors. Many septic tanks are old (20-30 years), broken, affected by subsidence due to hot summers, and are inadequately maintained by homeowners. Two actions appear to be most warranted. First, funding is urgently required to systematically replace defective septic tanks, ideally tied to some sort of underground leach field, although that may not be practical. If permitted under State law, shared (communal) septic tanks and leach fields along common rear property lines might be worth exploring, tied to regular maintenance and pumping from an authorized body. Very few lots have buildings or active uses deep at the rear of their properties. In addition, there are several cow ponds throughout the two neighborhoods (Figures 2:5-2:7) which might offer potential for some local wetland management which use a natural process of settling, filtering and bacterial decomposition to treat wastewater. A study of the possible applications to the large fenced pond at the end of Fir Street in Rancho Vista would be worthwhile pursuing as an experimental design for Central Texas. Very few lots have buildings or active uses deep at the rear of their properties.

A second action tied to new septic system installation (and the use of those that do not need replacement), is the need for regular periodic vacuum pumping on all existing and newly installed septic tanks. Currently the costs often prove prohibitive (\$130 each time) and even though it is only required every 15-24 months, many households do not undertake periodic pumping. This may be an area where property taxes might be earmarked to providing a publicly financed (to private concessions) or county trucks directly providing a regular pumping service, that is carefully monitored.

Garbage collection is privately managed, but we found interesting lower cost "informal" services operated by local entrepreneurs which many use, and which seem to work reasonably well. But a substantial proportion of households (almost half) dump or burn their garbage. As part of a more generalized campaign to raise public awareness of housing and community sustainability, promotion of safe (covered container) composting systems could take advantage of biodegradable materials that are currently burned or dumped, and offer compost that can be used in the yard. These systems are inexpensive, easy to use, non-smelling and keep out pests.

Housing Problems

While considerable housing diversity exists across the two neighborhoods, the modal house type is that of manufactured homes – singlewide and doublewide trailers. Dwellings vary greatly in quality and adequacy. Using an inventory of some 24 dimensions of housing measures we were able to create an index of housing problems.

Category 1: 18.3% of households with extensive and serious housing problems.

Category 2. 23.7% of households with substantial housing problems.

Category 3. 21.4% of households with largely modest housing problems.

Category 4. 36.6% of households with relatively few housing problems.

Viewed subjectively, while the two settlements are fairly typical of other informal homestead subdivisions in central Texas, we would place them at the poorer end of the spectrum compared to those closer to Austin where we have also worked. The fact that 60% of the households earned \$2000 a month or less, and the substantial number calculated to be below the poverty line (Figures 3.3 & 3.4) tend to confirm this. Below we will return to what this categorization may mean for the viability of housing improvements and housing actions.

Respondents were asked to rate 24 dimensions of housing problem on a "problematic – non problematic" scale. In addition, each household was also invited to highlight (up to five) principal housing problems that most affect them. The range and frequencies of problems found are outlined in Table 4.5 and 4.6, but in summary the primary areas of concern are:

- Septic tank problems (already mentioned above)
- Roofs leaking
- Unstable foundations and footings
- Poor and dangerous electrics
- Poor insulation and a gamut of associated problems (doors & windows don't close properly)

• And poor ventilation and inadequate cooling (especially) and heating.

Our findings suggest that residents themselves identify both high-cost major problems (such as several of those mentioned above), as well as a wide range of lower-cost problems, but that in formulating their own priority list of relative severity of problems they tend to emphasize the high cost and more intractable problems. This is not surprising, but it does suggest that we need to organize improvement activities in a similar fashion: prioritizing those that the community views as grave but expensive, and which require external support and action; and those lower cost improvements and applications that can be addressed through self help, although here too some level of external incentives and support are probably required.

We used a multivariate analysis in order to analyze those variables that appear to be most closely associated with poor and problematic housing conditions. Variables that emerge as being especially significant are: i) the age of the dwelling; ii) existence of septic tank problems; iii) poor air quality; and iv) people whose health was impaired or who were disabled. With the exception of the age of the dwelling where deterioration and older technologies are almost certainly directly lead to poor housing conditions, the other variables are **associative** (i.e. not causative). But they do highlight areas of attention that, if fixed, or taken into account, could provide a lead into creating some momentum for home improvement.

Variables that emerged as positive indicators of home improvement and low levels of housing problems were: i) households with members who had construction skills; and ii) the assessed value of the house. The latter is correlative, of course, but the widespread presence of construction skills indicates that there is an important human resource in these two communities which offers considerable potential for self help and mutual aid assistance, and for local job creation.

More than half of the families surveyed reported chronic illnesses among family members. Diabetes was the first-order problem, while "other" problems was second-order, and include including a number of individual diseases and health conditions, such as angina, heart problems, etc. Beyond these first and second order categories (diabetes and "other"), major chronic conditions exist that are tied to the residential fabric: respiratory illnesses (asthma, bronchial, nasal and other disorders); migraines and stress related illnesses are also regularly reported, as is impaired mobility (Figure 5.7). Although our research did not delve into the direct relationship between epidemiology and dwelling attributes, there seems little doubt that many of the chronic health conditions that residents identified are related to, or aggravated by, the poor housing conditions. This is particularly likely in the case of the diseases and illness that are directly related to poor air quality. These findings about the intersection between chronic health and poor living conditions should be highlighted in requests for external funding support.

Most lots are around half-an-acre in size, and unless there is more than one home on the lot, the actual footprint of the dwelling relative to the lot is relatively small. Viewed another way, compared with many formal middle income subdivisions, yards and gardens in IFHSs are large. However, often the yard area is underutilized functionally, and many yards are poorly maintained. Yard improvement and use, tied to greater awareness about sustainability and

sustainable housing practices (see below), could be a relatively low cost and high benefit arena of housing improvement that would potentially raise home values, and provide greater incentives for household members to enjoy and benefit from the outdoors, especially those with some of the chronic illnesses that we have described.

Priorities for Housing Improvement versus Housing Replacement

These data relating to levels of housing problem are likely to be important when considering the nature of housing improvement interventions that should be undertaken. While Category 1 & Category 2 households would benefit substantially from interventions to improve the dwelling unit, it seems probable that the costs of intervention will greatly outweigh the benefits (unless the interventions are low cost and ameliorative), and will be un-economic. Where major structural improvements are required to the older and most dilapidated properties, it is probably best to start over by bringing in new(er) housing units, or by promoting new self-help home construction. Certain interventions in these lots can be undertaken without prejudice to decisions about the house structure itself: for example septic tank replacement, yard improvements, etc., (see below).

Category 3 (especially) and Category 4 housing units will probably provide the best opportunities for maximum and longer term benefits to accrue from home improvement and weatherization programs. However, the prioritization about the types of programs to be promoted, and the targeting of households to be affected, must be a decision for the residents themselves.

Housing Sustainability and Planned Improvements

Three-quarters of all households plan to make home improvements. While this may be a somewhat inflated figure given that people were aware that the survey was designed to assess housing conditions with a view to future intervention, it is encouraging that so many are interested in improving their dwelling environment.

Knowledge about sustainability and sustainable housing practices was fairly limited -- to issues of recycling, and occasionally to energy capture through solar panels of one form or another. But in our view there are several good preconditions in the two neighborhoods to suggest that an community education and information program about the opportunities for incorporating sustainability into future home improvement programs and home building. What are these preconditions? First, the fact that a significant proportion of the population already recycles and/or carry and drop-off their garbage suggests that many already have some level of experience in thinking about waste management – albeit not necessarily "green". Second, many homeowners employ efforts to improve shading and air circulation around the home (false roofs over the trailer, tree planting for shade), while others cover windows with aluminum foil in order to reduce incoming solar radiation. The alignment of homes north-south also reduces exposure of the home to incoming solar energy in summer when it is hot, and increases it in the winter when it is cool. South and west facing windows are often fitted with overhangs or shades, and many homes have shaded porches to the front entrance and windows.

A third indicator of the potentiality of sustainable housing applications to low income housing is the tradition of self-help/self-management and a bootstraps ("can do") approach. Given this experience and commitment, and the considerable local construction skills that exist, there is every reason to think that home improvers would respond well to be "steered" towards more sustainable applications, especially where these would reduce their ongoing housing costs. Many are relatively low cost: energy efficient doors and windows, resetting doors that don't close properly; composting, gutters and rainwater harvesting, new forms of septic or gray water sewer and drainage, practices to reduce water consumption, and many other innovative and often inexpensive technologies that we outline in the companion report -- "Sustainable Housing Design and Technology Adoption in *Colonias*, Informal Homestead Subdivisions, and the 'Innerburbs'". Fourth, as mentioned above, the large yards are often underutilized "dead spaces", and offer a major opportunity to engage in sustainable practices that will make the outdoors more attractive and more usable. Tree and shrub planning tied to "spot" watering, itself linked to rainwater harvesting or the reuse of gray water would do much to provide shade and sites for recreation.

Next Steps

The main purpose of this survey was to better understand housing conditions and housing processes in these two poor self-help/self-managed neighborhoods with a view to identifying possible housing actions and opportunities for home improvement. The goal was to provide the necessary information that will help the communities to formulate grant proposals that will maximize the effectiveness of their future endeavors, leading to a palpable improvement in their living conditions and quality of life. Heaven knows, there is a very real need. Much of the evidence presented here also attests to the capacity of the communities to respond positively and responsibly to any support and policy initiatives that target them. But the community will also need to make some tough choices.

Most notable here will be the choice between those dwellings will benefit from major investment and improvement, and those that won't. The latter are likely to be the oldest and most dilapidated residences where apart from modest "band-aid" type improvements (resetting doors to exclude draughts, making electricity sockets safe, covering exposed windows with aluminum foil, etc.). Any major investment in these dwellings is likely to be uneconomic. Better, in these cases to start over, looking towards newer, better-condition and higher-standard manufactured housing to replace the old. Sponsored self-help and self build should also be on the agenda, whether as new stand alone homes or as extensions.

For those homes that would clearly benefit from significant investment in home improvement, the primary questions will be: a) the costs and benefits of particular home improvements (new AC, solar water heaters, weatherization, window and door replacement etc.), and b), affordability and capacity of the household to make and sustain those improvements once in place. This will largely be a decision of the individual family.

But given that these are two communities with a high sense of self regard, and with a strong interest and commitment to home and neighborhood improvement, how can policy-making and grant-seeking meet the legitimate needs of both groups, ensuring that everyone has an

opportunity to participate in some of the benefits and supports that the communities are able to secure? Here we return to the idea of yard-wide versus strictly home-centered improvements. This report has identified the urgent need for new septic tanks and for improved septic tank usage. In addition we have underscored the very real benefits that will accrue from better yard and garden management: clean-up, composing, rainwater harvesting and spot irrigation, tree planting, etc. Investment in the yard can prove **highly economic**. New septic tanks and the other actions complement the home and do not restrict or impede future home replacement. Nor does it result in any appreciable loss of the original investment when homes are replaced. Yard investments and improvements offer flexibility to those residents whose housing structures are less viable in the medium to long term, and it paves the way for home replacement in the future. It is also likely to add value to the property, even though the actual dwelling value is flat or in decline. While the benefits of these yard-centered actions will also apply to those residents whose homes are targeted for significant improvement and upgrading, the adoption of yard-centered upgrading will at least ensure that everyone, potentially, can benefit, and that no-one needs to be left out.

* * * *

References Cited in the Report

- Angel, Jacqueline L. 2008. Inheritance in Contemporary America: The Social Dimensions of Giving Across Generations. Johns Hopkins Press: Baltimore
- Burnham, R. 1998. *Housing Ourselves: Creating Affordable, Sustainable Shelter*. New York: McGraw Hill.
- Harris, Richard. 1998. "The Silence of the Experts: 'Aided Self-help Housing', 1939-54. *Habitat International*, 22, 2, 165-189.

_____. 2001. "Irregular Settlement and Government Policy in North America and the Twentieth Century". *Memoria of a Research Workshop "Irregular Settlement and Self-Help Housing in the United States*", pp. 13-16, September 21-22, 2001. Cambridge, Mass. Lincoln Institute of Land Policy.

Larson, Jane. 1995 Free Markets in the Heart of Texas, *Georgetown Law Journal*. 84 (December), 179-260.

_____. (2002) Informality, Illegality, and Inequality, Yale Law and Policy Review, Vol 20, 137-182.

- LBJ School of Public Affairs. 2010. 2010. "Urban Sustainability and Renewable Energy Applications for *Colonia*-Type Housing in the Southern US" Final Report prepared by Peter M. Ward, Esrther Sullivan and graduate students.
- Mukhija, V. and Monkonnen, P, 2006. "Federal colonias policy in California: Too broad and too narrow." *Housing Policy Debate*, 17. 4. 755-80.
- OAG. Office of the Attorney general of Texas. 1996. *Forgotten Americans: Life in the Texas Colonias.* Austin, Texas. OAG.
- Turner, John F.C. 1976. *Housing by People: Towards Autonomy in Building Environments*. London: Marion Boyars.
- Ward, Peter M. 1999. Colonias and Public Policy in Texas and Mexico: Urbanization by Stealth. Austin: University of Texas Press. 298pp.

_____. 2004 "Informality of housing production at the urban-rural interface: the not-so-strange case of colonias in the US: Texas, the border and beyond" In *Urban Informality* Editors, Annanya Roy and Nezar AlSayyad, Lexington/Center for Middle Eastern Studies, UC Berkeley. (pp. 243-70)

_____.2007. "Colonias, Informal Homestead Subdivisions and Self-Help Care for the Elderly among Mexican Populations in the USA", In *The Health of Aging Hispanics: The Mexicanorigin Population* (Jacqueline L. Angel and Keith E. Whitfield, Eds.). Springer Publishing Co., New York.

Ward, Peter, C. Guisti and F. de Souza. 2004. "Colonia Land and Housing Market Performance and the Impact of Lot Title Regularization in Texas", *Urban Studies* 41, 13. 2621-2646.

- Ward, Peter and Peters, Paul. 2007. "Self-help housing and Informal Homesteading in Peri-Urban America: Settlement Identification Using Digital Imagery and GIS", *Habitat International*, pp. 141-64.
- Way, Heather. 2010. "Informal Homeownership in the United States and the Law". Saint Louis University Public Law Review, XXIX, 1, 116-92.