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Trinidad Walkability Study

1.1 Introduction

This report has been conducted in support of the upcoming General Plan update. The report focuses on the circulation element of the General Plan. Its main focus is on pedestrian access and the facilities that Trinidad provides for its local residents. The report means to identify what facilities Trinidad should look to develop during the next 20 years to provide walkability for its residence and visitors. The first chapter serves as an introduction and provided background information. The second chapter of the report addresses how Trinidad can plan for walkability and is based on information obtained from various guides for creating desirable neighborhoods. The third chapter of this report assesses the quality and usefulness of current trails and walkways in the City. This assessment of Trinidad's walkability was conducted over 3 days in March 2008 with an initial study being completed in October 2007. This assessment was conducted using techniques developed in both the UK and the US. Chapter 4 of the report uses the information obtained in Chapters 1, 2 and 3 to present possible solutions for improving Trinidad's walkable character.

1.2 Background

The City of Trinidad is located in Humboldt County Approximately 25 miles north of the City of Eureka. The City was founded in the 1850's as a supply center for the gold rush and is one of California's oldest cities. With only about one-half square mile of land area and a year-round population of 311 residents and 200 residences, the City is also one of California's smallest cities. Though small in area the City of Trinidad provides commercial services to surrounding rural areas stretching from McKinleyville six miles South, to Orick sixteen miles North (Trinidad Draft General Plan, 2001). Historically Trinidad has been accessed primarily by the sea and later via the railway. The railway has now gone and the sea port accommodates, mainly, small fishing vessels. Highway 101 is now the prime access route to and from Trinidad.

1.3 What constitutes a walkable city?

A walkable community is one that provides for all users and offers facilities that can be accessed on foot, via the use of a desirable walking environment. The following are a list of requirements based on Dan Burdens (2008) findings from 'What Constitutes a Walkable Community?'

1. **A functioning Town Center:** Included within this city center is a pleasant main street that provides easy access to shop fronts and is safe for pedestrians. A

variety of different stores are offered. The number of which will depend on the population that supports them. Basic center stores should include a post office, grocery store, a bank and varieties of secondary goods stores (clothing, hardware, and pharmacist). Lists of facilities per 100 populations are identified in Table 1. Stores should be open for a minimum of 8 hours a day. In incorporated towns, Town Hall should be located in the center and facilities should be within a ¼ mile or 5 minute walk.

2. **Mixed uses and mixed incomes:** A truly walkable community does not force people to drive to work; instead it encourages a high percentage of people living in the center to walk to work. By providing a range of affordable housing, a town center is able to accommodate a variety of income levels. This ensures that those who provide the services in the town are not forced to commute from outside of town and helps to increase the diversity of the town.
3. **Public space:** A requirement for any walkable community is that residents are given an area to meet and congregate. According to Dan Burden (from walkable communities) the best walkable communities have public space within 1/8th of a mile or 700ft of each residence.
4. **Streets designed for all:** Streets and walkways should be designed so as they provide adequate access for all users. Street furnishing should be located in appropriate places along popular routes so as to allow less able people the opportunity to rest along route. 'Appropriate ramps, medians, refuges, crossings of driveways, sidewalks on all streets' (Dan Burden, 2005) should be provided to ensure a pleasant, easy walking environment.
5. **Speed controlled streets:** A pleasant walking environment is created by reducing traffic speeds. Streets use affordable methods for reducing speed, such as tree lined roads, on street parking, sinuous street design and low speed limits. Shared space creates a more encouraging walking environment and slows traffic at the same time.
6. **Streets, trails are well linked:** The town provides good connections between popular walking destinations within the town. Areas are not simply connected by road but also provide off road walkways that allow users to commute via the most direct route. Distance for pedestrians should be shorter than that of vehicles in an effort to further encourage walking. These walkways should create a safe and pleasant environment for their users.
7. **Design is properly scaled** to ⅛, ¼ and ½ mile radius segments. From most homes it is possible to get to most services in ¼ mile (actual walked distance). Neighborhood elementary schools are within a ¼ mile walking radius of most homes, while high schools are accessible to most children (1 mile radius). Most important features (parks) are within 1/8th mile, and a good, well designed place to wait for a high frequency (10-20 minutes) bus is within ¼ to ½ mile. Note that most of these details can be seen on a good local planning map, and even many can be downloaded from the web (Dan Burden, 2005).
8. **Designed for people:** Walkable towns must think of the pedestrian first and the car second. If a town has many downtown parking spaces with main street access being provided for commercial vehicles, then the pedestrian is not being fully considered. Funding should be being directed towards improving plaza's, paths,

walkways and the street scene as a whole not on reducing congestion in out of town areas.

9. **Town is Thinking Small:** Instead of encouraging large scale developments, towns must ensure that small local businesses are given the opportunity to compete. In some towns caps have been put on the maximum size of buildings to ensure that competition is managed on a smaller scale. Towns have also put caps on the maximum number of parking spaces rather than on the minimum number. The majority of these spaces are on street. Creating a more enjoyable walking environment and reduces people's likelihood of using the car.
10. **11. The Town and Neighborhoods have a Vision.** Seattle, Washington, Portland, Oregon and Austin, Texas are just three examples where neighborhood master plans have been developed. Honolulu sets aside about $1M per year of funds to be spent by each neighborhood. Visionary, master plans provide direction, build ownership of citizens, engage diverse people, and create opportunities for implementation, to get past sticky issues, and deal with the most basic, fundamental, necessary decisions and commitments. When there are budgets set aside for neighborhoods, for sidewalks, trails, links, and parks; the community no longer talks about where they will get the money, but how they will change their priorities (Dan Burden, 2005).

1.4 What are the requirements?

It is not a state requirement that city's adopt an ordinance which encourages walkability. However, it is a mandate of the circulation element of the General Plan that cities provide for the 'pedestrian and cyclist' (Planning and Research, 2003). The guidelines go on to say that city General Plans should:

- Assess the adequacy of existing bicycle routes and facilities and the need for new ones.
- Examine trends in bicycle usage.
- Assess adequacy of pedestrian routes and the need for new ones.
- Assess historical data and trends with regard to bicycle and pedestrian accidents.

(Planning and Research, 2003)

This study aims to assess the adequacy of pedestrian routes in Trinidad and what improvements can be made to create a more walkable community. The question arises as to why Trinidad should develop a walkability plan when it is not a state requirement. The cost of such projects can be high and funding is not always available. The main issue to consider is what the community would like Trinidad to look like in 20 years. If policies are developed that encourage pedestrian activity there are a number of advantages that could be realized in Trinidad. Objectives that could be accomplished with this type of planning include:

1. Better health of residents, from exercise
2. Less noise created by traffic
3. Reduction in car use and thus a reduction in CO2 emissions

4. Improvements in the streetscape can improve commerce and encourage visitors to shop more
5. Increased community cohesion by creating public space
6. Improve the quality of the environment making Trinidad an even more desirable place to live

(Barton, 2003)

The study will also assess the facilities within Trinidad and whether they are adequate for the population. The main emphasis will be on identifying whether these facilities are within walking distance of residents.

1.5 Sources for Walkability Standards

The walking distance and time standards used in this study are based on information obtained from Hugh Barton's, Shaping Neighborhoods (2003) and the Mid Atlantic Regional Council (MARC) work on walkable communities.

Barton's book focuses on the physical fabric of neighborhoods. The book is designed as a guide on how to plan, design and manage the physical environment in a way that enhances quality of life, promotes social inclusion and conserves natural resources. Two main themes are looked at throughout this guide, they are:

1. The neighborhood as the local human habitat, providing a healthy, sustainable convivial environment.
2. The management of the habitat by voluntary co-operation between the various public, private and community stakeholders that affect it.

Creating walkable communities is another guide for use by local governments as they work to create these unique communities. It presents guidelines, suggestions, and techniques on how to make communities more walkable and pedestrian-friendly. It has been created by the Mid American Regional Council, which is made up of 100 local governments. For comparison purposes, Trinidad should be looked at on a neighborhood scale due to its small scale.

Chapter 2
Service Provision Appraisal

2.1 Service provision appraisal:

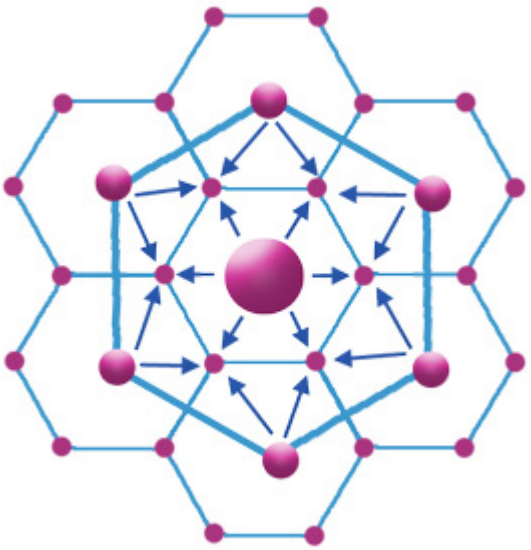
This appraisal was conducted in an effort to ascertain what services were within walking distance of residents in Trinidad. It also identified what facilities currently exist and what new facilities might be considered into the future to meet the Towns requirements.

The way that facilities and amenities are provided across an urban area is an integral feature of sustainability. They are closely linked to transportation, accessibility issues, and social issues. It is important when considering the needs of a community that these elements are not seen in isolation but part of the greater whole. The location of facilities such as schools, supermarkets, leisure centers, or community facilities will determine how people travel to use such facilities (EPA, 2006). Therefore, with good positioning of facilities and transportation links; people could be encouraged to walk and cycle more, which would reduce car use and encourage physical activity. People also require good access to services as a social function, to be able to access community facilities or jobs, and improve individual well being.

The positioning of facilities is a major factor in ensuring the viability of market and state services, and two main issues are vital in ensuring this feature. Firstly, services require a sufficient catchment to enable them to be economically viable, and secondly, they must have sufficient access routes to enable people within the catchment area to make use of the facilities (EPA, 2006).

Christaller's Central Place Theory and it's relevance to Trinidad

Christaller's, Central Place theory was developed to identify the shopping patterns of a population. Although this theory makes a number of assumptions it is a useful tool in determining how Trinadadians shop. The theory assumes that shoppers will form three different patterns when accessing facilities. Christaller assumed that in a city with an even distribution of population, all with equal money and transport opportunities, and the land is flat and featureless, then settlements will follow a distribution pattern according to size (Christaller, 1933/1966). The Hexagonals represent the catchment areas of each settlement which are depicted as the purple dots. **The distribution will follow one of three patterns:**

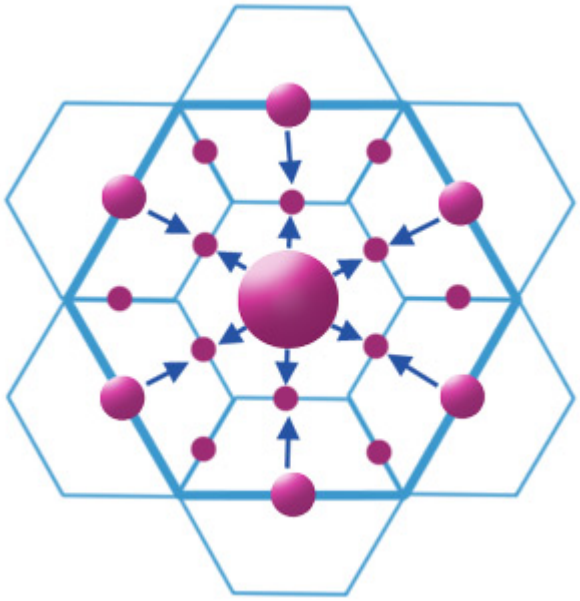


K = 3 Marketing principle

According to the marketing principle *K* = 3, the market area of a higher-order place includes a third of the market area of each of the following size neighboring lower-order places and each is located at the corner of a hexagon around the high-order settlement. Each high-order

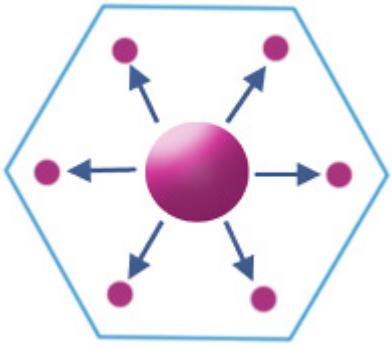
settlement gets 1/3 of each satellite settlement, thus $K = 1 + 6 \times 1/3 = 3$ (Christaller, 1933).

However, although in this $K = 3$ marketing network the distance traveled is minimized, the transport network is not the most efficient, because the important transport links between the larger places do not pass through intermediate places.



$K = 4$ Transport principle

According to $K = 4$ transport principle, the market area of a higher-order place includes a half of the market area of each of the six neighboring lower-order places, as they are located on the edges of hexagons around the high-order settlements. This generates a hierarchy of central places which results in the most efficient transport network. There are maximum central places possible located on the main transport routes connecting the higher order centers.



$K = 7$ Administrative principle

According to $K = 7$ administrative principle (or political-social principle), settlements are nested according to sevens. The market areas of the smaller settlements are completely enclosed within the market area of the larger settlement. Since tributary areas cannot be spilt administratively, they must be allocated exclusively to a single higher-order place. Efficient administration is the control principle in this hierarchy.

Population Threshold Analysis also referred to as demand threshold analysis, gives estimates of the average number of people found in a community for a particular type establishment. Christaller developed this to determine whether a settlement could support the facilities which it was providing. Population threshold analysis could be referred to as "population-establishment ratio". Population threshold levels are calculated by dividing the total population of a community by the number of establishments in a particular trade or service activity. Analysis of the results could indicate whether there is enough population to justify another retail store, for example (Christaller, 1933/1966). This method could be used in Trinidad to determine whether Trinidad could support any more facilities.

Facility supply and location in Trinidad

With consideration towards this model and issues created by facility location, a series of catchment area maps were produced to analyze the provision of services in Trinidad. Map 2 (Appendix 2) identifies the facilities provided within Trinidad, and shows the distance that people may be willing to walk to such facilities based on measurements from MARC (1998).

The Study revealed there to be a variety of different services that Trinidad provides. According to Barton (2003) a town with a population of 1,000 people or less should offer the following services.

- A post office
- 1 or 2 local stores, offering basic goods
- A church
- Bakery or equivalent food store
- 1 or 2 eateries
- A gas station
- A primary school
- Police Department
- Village Hall
- A hair dresser and other small service stores

The study into Trinidad identified that there were a variety of different facilities in and around Trinidad. These facilities were identified using a number of different means. A mixture of web base information, water data and field work were undertaken to conglomerate the following list of facilities. An area measuring 1500 ft outside the city limits was used to allow nearby facilities to be included in the findings. These facilities are also dependant on the Trinidad population and its surroundings for its service. Each facility has its threshold population that it requires in order to support it. Figures have been obtained from Barton (1998) and http://www.reddi.gov.on.ca/dr_markettresholdanalysis.htm.

- Katy's Smokehouse (709)
- Murphy's Market (1,275)
- Saunders Shopping Center
- Sea Around Us (2,572)
- Trinidad Art (3,253)
- Trinidad Bay Eatery & Gallery (709)
- Trinidad Clothing and Gifts (1,585)
- Trinidad Trading Company (5,227)
- Trinidad Library
- City Hall
- Trinidad Union School (13,438)
- Trinidad Police Department
- Trinidad Fire Department

- True Value Hardware (2,200 for an average sized hardware store).
- Salty's Sporting Goods (2,793)
- Various construction contractors
- Beachcomber Café (407)
- Kahish Catch Café (407)
- Post Office
- Kayaking Adventures
- Sandcastle Hair Gallery (2,572)
- Trinidad Wash and Go (3,731)
- Chevron Gas Station (2,266)
- Law Firm (2,427)
- Casino

It is evident that Trinidad has a wide variety of facilities; more than a town of 311 is likely to have according to Barton (2003). As the figures suggest, each facility requires a much higher population to support the facilities that can be found in and around Trinidad. According to 2000 census data 2,352 people lived within the 95570 Zip Code. This population is not enough to support many of the facilities within the city, meaning that the majority of people who use these facilities are from outside the city limits and beyond. This would indicate that Trinidad relies heavily on tourism which is largely facilitated by the automobile. It is important to ensure that car trips by these users are reduced down to a minimum by providing the necessary pedestrian and cycling infrastructure. There is also advantage to creating a walkable core to Trinidad, as this encourages visitors to stay longer as predicted according to Barton (2003). A walkable core allows visitors who travel by car to use alternate means of getting around the city once they have arrived.

Map 2 reveals that most of the services are within walking distance of those residents within Trinidad's City limits. There are also a number of residents to the North and South of the City that are within the walkable areas. True Value Hardware and the Casino, which are outside City limits are within walking distance of residents on the fringe of the City. Barton suggests that the best way to maximize pedestrian trips is by locating facilities in a central area, especially if these facilities are small in floor area. This makes pedestrian trips more likely as users can utilize all the facilities in one trip. This is a problem for Trinidad as not all the facilities are located in a central area. However there is an opportunity along Trinity Street to create a centralized area where pedestrians can congregate, this concept is discussed further in Chapter 3.

Although Trinidad has a wide variety of facilities that would appear to meet the needs of the community based on Barton's Standards, it is important to assess whether these are the right facilities for the community to have in 20 years time. In order to ascertain what facilities are required, a residential survey would have to be conducted in order to acquire the public's opinion. Chapter 1 of Trinidad's Draft General Plan (2001) offers a vision for Trinidad based on the views of residents at the time, it states that:

'The citizens of Trinidad envision the future Trinidad as a coastal community nestled in the redwood forests overlooking the rugged Pacific Ocean coast. It is a small town with active community members.

Trinidad intends to maintain the existing small town atmosphere. Scenic preservation is an essential complementary aspect to the natural environment. There are ample community services such as a community park, a recreation center for youth and elderly, improved bus service, and an effective system for sewage management'.

(City of Trinidad, 2001)

It can be ascertained from this statement that the future of Trinidad is one of little change that ensures the town retains its small town atmosphere. For this reason it would be beneficial for the community, if any new facilities that do emerge are of a small scale and do not impose on the landscape. Fishing is a major aspect of the town and support of these and other related facilities should be encouraged. It is important that these new facilities, along with existing ones, can be accessed primarily by pedestrians so as the traffic created by tourism does not negatively affect the small town atmosphere. Chapter 3 of this report seeks to identify how new facilities could be organized to create a more walkable environment and retain this small town atmosphere.

Map 2, can be slightly misleading as it would appear that Trinidad is a very walkable town. The facilities, although spread over a small portion of the City, are within walking distance of most residents. However the walking distance depicted by the circles on the map does not tell the whole story. These circles identify the walking distance that people are usually willing to walk, but these circles make the assumption that pedestrians are able to walk in a straight line from their place of residence to the facilities in question. This is not a possibility when considering all the obstacles along most routes, whether these are roads ending in dead ends, a lack of roads in rural areas, structures impeding pedestrian desire lines, sidewalks that end abruptly or no pedestrian access at all. These impediments, along with others, will slow and lengthen pedestrian walking times or may discourage pedestrian movements altogether.

Chapter 3 takes a look into the major pedestrian routes in town and whether or not they provide adequate access to these facilities.

Trinidad according to the Central Place Theory

The majority of facilities that can be found within Trinidad would be considered to be selling low order goods.

Examples for low order goods and services are: newspaper stalls, groceries, bakeries and post offices. They are supported by a relatively smaller threshold population and demand.

(Britannica Encyclopedia, 1995)

Although the facilities that are provided for are of low order, there is a large quantity of them, making Trinidad a relatively robust, low order settlement. According to Christaller's model, Trinidad would appear to resemble the marketing principle. Trinidad serves as a low order settlement that is supported firstly by Arcata and secondly by Eureka. Currently the transport links between these settlements are dominated by the motor car; in order for these settlements to be viable under the transportation principle, bus and cycle facilities would have to be improved. Trinidad in relation to no other settlement shows a sign of being under the administrative principle, seeing as it acts as the administrative center for the 2,352 in the 95570 Zip Code. This is considered to be the most in effective system for encouraging trips by public transport, seeing as such facilities are lacking in this model (SFA, 2002) we don't find this to be the case in Trinidad. At present Trinidad has the facilities to make it a dominant center for the area but lacks the infrastructure to support it; this is later discussed in chapter 3.

Chapter 3
Town Center's and their benefits

Background information on how a community core zone can be beneficial

In the US, most land use decisions have been effectively made by the development industry. New residential areas have been, and are being, defined not by any understanding of local accessibility or the pedestrian realm – let alone 'community' – but by market interests and land ownership as mediated by the planning system, creating a fragmented, car-dependant pattern. 'Community' is defined as 'a network of people with common interests and the expectation of mutual recognition, support and friendship' (Barton, 2006). With people now having a high mobility and individual lifestyle the community heart of a settlement is considered, by some, to be no longer necessary.

Evidence and ideas are beginning to resurface that contradict this way of thinking. The term eco village is beginning to be used more commonly to promote sustainability within communities. This word sustainability is some times misunderstood and met with apprehension from developers and residents alike. There is a belief that sustainability relates only to development that ensures the natural environment is protected. This is true, but the protection of the environment relates directly to providing opportunities for the population as well. The UK government defines sustainability as 'sustainable development is about ensuring a better quality of life for every-one, now and for generations to come' (DEFRA, 1998).

One way to ensure a better quality of life is through the concentration of services in a central location. By providing an area for work, play, shopping and a place to go to school, people will obviously travel less; thus ensuring that non-renewable and polluting energy sources are kept to a minimum. By creating a permeable street pattern that allows for easy access to these concentrated local services, the health of the community can also be improved via the encouragement of other forms of transport, namely pedestrians and bicycles.

The eco village concept is based on the villages of the past, which are prevalent across Europe. These small nuclei settlements are often concentrated around a village core that provides the essential services for the inhabitants. Their entire design is based around short distance travel due to no motor vehicles existing during their creation. This same concept has existed in the US since 1939 when the American sociologist Clarence Perry (1939), proposed the division of the city into distinct neighborhood units, each with its own communal facilities such as convenience shops, a primary school, a church and a local park. Further, these facilities were to be located at the center of the neighborhood so that they would be within walking distance and act as a social focus for the inhabitants of the neighborhood (Erik Assadourian, 2008).

Some successful village center regeneration

There are many different development patterns that could be used when designing the center of any settlement. In Letchworth, a garden city, directly North of London, the town council has put accessibility to the top of the agenda:

The changes to The Wynd will be focused on creating better quality small units for independent and specialist retailers. The service access will be re-designed to provide a more enclosed shopping environment. Pedestrian access to the Wynd will take a high priority. This will be achieved via the use of shared space'.

*(*Jonathan Dawson, 2006)

This concept of 'shared space' encourages vehicles and pedestrians to share development space with priority being given to pedestrians. The focus is on removing road markings and lowering curbs in an effort to encourage pedestrians to use the whole street. A scheme implemented in London's Kensington High Street, dubbed *naked streets* in the press—reflecting the fact that the road has been cleared of markings, signage and pedestrian barriers, has yielded significant and sustained reductions in injuries to pedestrians. It is reported that, based on two years of 'before and after' monitoring, casualties fell from 71 in the period before the street was remodeled to 40 afterwards - a drop of 43.7% (CABE, 2006). This is in stark contrast to the norm, in which curbs, cross walks and signage are used in an attempt to increase pedestrian safety. The 'shared space' concept relies on the crowds to act to slow traffic and create a safe pedestrian experience.

Although Trinidad traffic volume is relatively low, there still exists the possibility that a shared space, central development scheme could help encourage the use of facilities that would otherwise be accessed by car. The Letchworth example offers a design that provides access for both cars and pedestrians but encourages pedestrian use via three main walking arteries connected to a central triangular design.

There are many different ways in which communities are working towards the concept of 'shared space'. The village of Franklin in the County of New York UK may not have embraced the concept of 'shared space' but its policies recognize the importance of the village center and the need to encourage its access for pedestrians.

Strengthen and preserve the essential historic and rural character of the Village Center as the focus of the community.

Encourage visitors and residents alike to use non-motorized forms of transportation in the Village Center.

- Create clear connections (sidewalks, bike paths, alleys) among activity centers throughout the Village Center and to the Franklin Cider Mill.
- Install appropriately-designed way finding signage to orient visitors to primary destinations in the Village.

(Village of Franklin, 2006)

The central area for Franklin is stipulated as essential for providing for its community's needs. Like many European villages, it was constructed before the invention of the motor car and so has a layout that already encourages walking.

It is significant that the buildings are laid out in a relatively dense development pattern in the Village Center. The closeness of the buildings has much to do with the character and walkability of the district, and the fact that the pattern that was established prior to the advent of the automobile.

(Village of Franklin, 2006)

By creating a center of higher density in Trinidad, a vibrant, active area could be created which, like in Franklin, could improve the local character and add to the sense of place in the community. There are also economic advantages brought about by a densely packed village center. The village budget for Franklin identifies that the improvements made to the streets around the village center provided revenue of $308,000 in 2007 (village of Franklin, 2006). The street improvements encouraged new shops to be built adding to the diverse range of existing retail.

The Value of Streets

When creating a community center, the importance the streetscape has in encouraging its use should be recognized. The Commission for Architecture and the Built Environment (CABE) produced 'Streets Paved with Gold' (2007) earlier this year, which is the first ever study conducted into the correlation between good street design and property prices. The study took a selection of high streets across London and tested their quality of design using the 'pedestrian design review system', identified below. This system breaks down the importance of each element of the street allowing the collector to ascertain what score a street should be given. The results identified that for each increase in point on the Pedestrian Environmental Review System (PERS) scale an increase of 5% in residential property values was be seen. In relation to retail, a 4.9% increase was noted in shop rents.

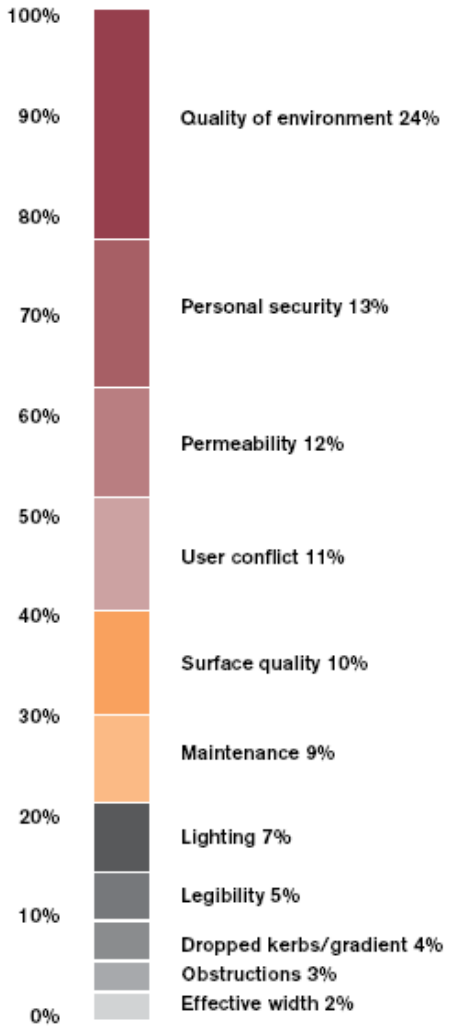


Fig 2: Individual importance of PERS categories

What makes a high-quality street?

- dropped kerbs
- tactile paving and colour contrast
- smooth, clean, well-drained surfaces
- high-quality materials
- high standards of maintenance
- pavements wide enough to accommodate all users
- no pinch points
- potential obstructions placed out of the way
- enough crossing points, in the right places
- traffic levels not excessive
- good lighting
- sense of security
- no graffiti or litter
- no signs of anti-social behaviour
- signage, landmarks and good sightlines
- public spaces along the street
- a street that is a pleasant place to be.

Chapter 4
Pedestrian Quality Street Assessment

4.1 Methodology and Reasoning

Trinidad's low population of 311 inhabitants may suggest that there is relatively little need to provide for a walkable community; however there are a high number of visitors to Trinidad each year, and over 2,335 people rely on Trinidad for their basic needs. The Humboldt County Needs Assessment (2003) revealed there to be 4 main trip generators in the City, these are listed below.

- Trinidad Market, Post Office, and other services – corner of main and scenic drive
- Trinidad Elementary - Trinity Street
- Public Beaches, Trinidad Head and coast trail system – West and South of town
- RV Park – East of US 101

In an effort to ascertain what standard of walkability these routes provide, an assessment was carried out. These four locations were selected alongside one other location of different but representational character. This one additional location was chosen to represent more fully the wide range of different walkways Trinidad provides. The walkability of these five locations was assessed using methods from the UK and basing findings on standards set by Dan Burden (Walkable Communities, Chapter 1). The two street quality measuring tools used were from the CABE PERS criteria (as mentioned in chapter 3) and Dan Burden's 'Walking Levels of Quality' analysis sheet.

This visual assessment was used at the five varying locations to ascertain the walkability of the streets in Trinidad. Each designated location was given an assessment area boundary based on the individual viewsheds (marked on Map 2) and the walked route. The route walked was measured between 200 ft and 500 ft dependent on the area's street features, previously determined through aerial photos. This distance was measured using a 'Rolla Tape Measuring Wheel' prior to walking the route. The width of the walkway at each location was measured using the same device. The width measurement was intended to be cross referenced with design standards for 'Accessible Streets'. The 200-500 ft distance was walked by the surveyor who determined the score the street should receive along route, based on the 12 categories below.

The PERS visual assessment was conducted at these five locations (described above in chapter 3). This involved a visual assessment of the route taking into account 12 different categories, all of which had varying levels of importance on the overall score. The 12 different categories are as follows:

- Quality of Environment: 24%
  Visual assessment based on noise level at the location, whether or not vegetation has been planted, amount of litter or graffiti present. How the area feels as a whole: Is it a pleasant and enjoyable place to be or is it dark, closed off and unsettling?

- Personal Security: 13%
  Are there any signs of antisocial behavior? Are the areas safe for children to play and walk? Has consideration been given to times of increased pedestrian flows, are users safe from traffic and is traffic calmed to a safe level? Are the routes overlooked by active frontages or are they enclosed in dark unsafe corridors?

- Connectivity: 12%
  Assess whether users are able to reach their destination without having to deviate from their desire line? Do users have to navigate around objects in order to use access points? Do streets lead to dead ends with no easily accessible footpaths? Does private property inhibit movement?

- User Conflict: 11%
  Can people with disabilities safely navigate the streets without having to avoid obstacles?

- Surface Quality: 10%
  What is the material of the walkways made from? Is the material appropriate for the area, i.e. does it reflect the area's rustic quality? Have the paths been laid in away that accommodate all users, in other words are the footpaths level?

- Maintenance: 9%
  Are there visible gaps along the walkways where paving slabs have become overused and not replaced? Has the route been designed in such away that minimizes the need for maintenance? Is paint or wood chippings or other material used lacking?

- Lighting: 7%
  Is their adequate lighting considering the type of trips taken at that location? Is lighting bright enough to create a feeling of safety at night but not so bright that it creates an unpleasant environment?

- Legibility: 5%
  Are paths and route clearly marked with signs and those that are, are they located in an area that does not impose on the streetscape? Are adequate maps and destination pointers provided that encourage walking to desired points?

- Dropped Pavements/gradient: 4%
  Are pavements dropped at locations appropriate to allow for wheelchair access, bicycle entry and vehicle entry?

- Effective Width: 2%
  Are paths and route ways an appropriate width for their location? Do they accommodate for the volume of pedestrians and the type of people who will be using it?

All of these categories were given a score out of 10 at each location, with 1 being the worst level of street design to 10 being the best. The results were then calculated according to the percentage bearing that they had. An example is shown below:

$$x * y = b$$
$$b*100 = \text{Percentage Scored}$$

Where x = Score
y = Percentage
b = Result

4.2 Walkability Results

4.2.1 Location 1: Corner of Main Street and Scenic Drive

This was one of the busiest locations selected for study containing high volumes of pedestrians and higher volumes of traffic (compared to the other study locations). This is the gateway to Trinidad, making walkability a priority. Zoning around the area is predominantly commercial.

- Quality of Environment: 24%

PERS: Score 4

This location was reached at 10:30 am on March 22. At this time the noise levels caused by traffic were relatively low. However a further stop was made at 5 pm, March 22 and noise levels were recorded as being higher than was desirable. Noise was never at a level that created an environment which would entirely discourage walking but it was enough to create unease for the pedestrian. Small amounts of graffiti were present on the bike lockers but were hardly visible. Litter could be identified collecting along the sidewalks but although higher than the other locations it did not reach a level that was unsightly. There was limited vegetation within a 100 ft radius. Vegetation that was present at the corner of Main and Scenic was limited to unmanaged trees along the freeway overpass and a small collection of bushes on the corner of the Chevron garage. Neither of which added to the quality of the walking experience. The lack of vegetation reduced the desirability of the walk and did little to calm traffic or reduce noise. The environment as a whole did little to encourage walking.

- Personal Security: 13%

PERS: Score 2

Crime and antisocial behavior is not an issue in this area, or in most of Trinidad for that matter. The area is wide open and there is much activity here. Murphy's Market is set back from the street creating a sizeable distance from an active frontage but this does not create a feeling of an unsafe environment. However the majority of activity in the area is vehicular traffic which creates other problems for safety. Considering that at this location there is an on and off ramp to Highway 101 the junction should be designed to accommodate large volumes of traffic; but this is not the case. With a six junction right of ways, traffic should be managed effectively to create a safe environment for both the pedestrian and the motorist. The multiple junctions create confusion and uncertainty for the motorist while discouraging the pedestrian from crossing the road. The route walked identified a major problem with reaching the Park and Ride and the other side of the freeway (which is discussed in Location 2). At present the design of the crossing does little to accommodate the disabled user and does not create a pleasant safe environment in which to walk. Child safety has not

been considered as there are no traffic lights present and nothing to help direct children to the other side of the freeway and the RV Park.

- Permeability: 12%

PERS: Score 9

Permeability is not much of an issue at this location. There are no homes within 500 ft of the area to create bottle necks. The space around the location is open and no fences or obstructions can be found on the North side of Main Street. However the bus stop located on the South side of Main Street does limit space for maneuverability. Only a foot of space has been provided which is not adequate to accommodate wheel chairs. A typical pavement layout should provide room for users to pass each other without having to deviate onto the road. According to walkable community standards, effective walkways should measure between 5 and 6 ft, this is also the standard size set by the 1990 American's with Disability Act (ADA). The ADA ensures that equal access is granted to all citizens of this country as a right.

- User Conflict: 11%

PERS: Score 4

The intersection creates conflicts between the pedestrian and car users. This conflict is not dealt with adequately by the design of the intersection. The Humboldt Transportation Plan stipulates that 'Sidewalks need to be safe for wheelchairs, strollers, elderly, and all users. More curb cuts are needed at intersections. Driveway dips are often hazardous – wider sidewalks or other designs are needed. New sidewalks need to be well-designed, and many existing ones need to be improved' (Alta Planning, 2003). There is evidence that there has been an attempt to improve the sidewalks in this area. Curbs have been lowered and tactile paving has been introduced to accommodate for disabled users. However a lot more work is required before the area could be considered user friendly and meet ADA requirements. The sidewalk abruptly ends once pedestrians reach the overpass. As the Transport Plan stipulates sidewalks need to be completed to accommodate for all users. No safety measures have been offered for users at the busiest intersection in Trinidad.

- Surface Quality: 10%

PERS: Score 5

The materials used for the walkways are tarmac which is of a good standard. The sidewalk itself is of a high standard in parts but disappears once you reach the overpass. From here on the sidewalk is made up of a gravel dirt path which is little more than a worn area of grass created by pedestrians. The materials used are

standard in most intersection designs however there has been little concern for what is located in this area or the image that Trinidad is attempting to create.

- Maintenance: 9%

  PERS: Score 8

Asphalt is a low maintenance material that is commonly used in sidewalk construction (Barth, Edwin, J, 1968), although it has a life span of around 7 years. There are no visible signs that the sidewalk needs repair, it is still providing an adequate walkway for users to access required facilities. The advantage of this material is that it will only require minor adjustments in order to ensure it retains its form.

- Lighting: 7%

  PERS: Score 1

  No public lighting is created along the route taken. There is lighting from near by facilities such as the Chevron garage and Murphy's market. This is not adequate however to create a feeling of safety during night time hours. The crosswalk that leads over the freeway is not visible from the off ramps for the freeway creating an unsafe environment for cars and pedestrians alike.

- Legibility: 5%

  PERS: Score 6

  The crosswalks along the study route are clearly identifiable but do not connect under the freeway making legibility of this area poor. The chamber of commerce is located near by to the study area which provides adequate information for the trails located in Trinidad. However the chamber of commerce is not easily identifiable from the street. There is also very few signs within the city that direct pedestrians to desired locations making walking along the study area confusing.

- Dropped Pavements/gradient: 4%

  PERS: Score 8

  The recent addition of lowered curbs and tactile paving along the route have helped access for all although improvements can still be made along the South side of the road.

- Effective Width: 2%

  PERS: Score 7

As mentioned earlier the walkways are of an adequate width according to state standards apart from where the bus stop is located.

Workings:

Total Score out of 100 = 55

Score According to % rating:

Quality of environment: 0.4*0.24 = 0.096*100 = 10%

Personal Security: 0.2*0.13 = 0.026*100 = 3%

Permeability: 0.9*0.12 = 0.108*100 = 10%

User Conflict: 0.4*0.11 = 0.044*100 = 4%

Surface Quality: 0.5*0.10 = 0.05*100 = 5%

Maintance: 0.8*0.09 = 0.072*100 = 7%

Lighting: 0.1*0.07 = 0.007*100 = 1%

Legibility: 0.6*0.05 = 0.03*100 = 3%

Dropped Pavements: 0.8*0.04 = 0.032*100 = 3%

Effective Width: 0.3*0.02 = 0.006*100 = 1%

Location 1 Total = 47%

4.2.2 Location 2: Corner of Main Street and Scenic Drive

Located on the other side of the freeway this is where the Park and Ride is located and where traffic exiting the freeway from the North enters Trinidad. Vehicle traffic here is higher than pedestrian flows. However the RV park and Park and Ride create a number of pedestrian trips to Murphy's and the rest of Trinidad.

- Quality of Environment: 24%

PERS: Score 2

This location was reached at 11.14 am on March 22. At this time the noise levels caused by traffic were relatively low. However a further stop was made at 5.27 pm, March 22 and noise levels were recorded as being higher than was desirable. The environment is unfavorable for the user as approaching traffic is difficult to see and crossing areas are the only clearly defined in certain areas. The overpass creates an enclosed unsightly area that has been designed primarily for vehicle traffic giving almost no consideration for pedestrians. No art work or lighting has been provided to improve upon the area, plus the walkways are little more than worn grass which does little to encourage pedestrian users.

- Personal Security: 13%

PERS: Score 2

Crime does not appear to be much of an issue in this area however the overhead freeway creates a feeling of unease especially after nightfall. The lack of clearly marked routes to the West side of the freeway makes for an undesirable walking route. By locating the crossings so close to the freeway exits there is a safety issue with vehicles and pedestrian crossings. The off ramp is on a steep incline and if speeds are not judge properly pedestrians can be put at risk. By not creating a designated walkway under the freeway, surfaces are uneven and pose a safety issue for elderly users or people with disabilities.

- Permeability: 12%

PERS: Score 4

Permeability is not much of an issue at this location. There are no homes within 500 ft of the area to create bottle necks. The freeway itself however does create a barrier. At present the lack of an off road trail or proper paving limits the access for residents and visitors to the RV Park on the North side of the freeway. Permeability could be increased by simply creating a well paved walkable route under the freeway.

- User Conflict: 11%

PERS: Score 2

The intersection creates conflicts between the pedestrian and car users. This conflict is not dealt with adequately by the design of the intersection. The Humboldt Transportation Plan stipulates that 'Sidewalks need to be safe for wheelchairs, strollers, elderly, and all users. More curb cuts are needed at intersections. Driveway dips are often hazardous – wider sidewalks or other designs are needed. New sidewalks need to be well-designed, and many existing ones need to be improved' (Humboldt County association of Governments, 2006). There is no direct access from the Park and Ride or the RV Park to the West side of the freeway, making conflicts between pedestrians and vehicles high. There is no crosswalk over Westhaven drive making crossing the road from the RV Park to the Park and Ride more dangerous.

- Surface Quality: 10%

PERS: Score 1

The road is of a good quality but the walkable areas have been neglected or are not complete. The undesignated trail that leads under the freeway is of a very poor quality being little more than tracks in the earth. The surfaces are uneven and the ground has not been leveled to accommodate for wheel chair users.

- Maintenance: 9%

PERS: Score 2

Caltrans is responsible for the maintenance and management of Highway 101 and it's on and off ramps. The on and off ramps that adjoin Westhaven Drive are of a good standard, although the incline on the off ramp gives drivers only limited space in which to slow down.

- Lighting: 7%

PERS: Score 1

There is no public lighting in the area. The Park and Ride areas that run along the side of the freeway are not lit creating an unsafe environment during winter months when days are short. The lack of lighting under the freeway is also likely to discourage the use of these areas

- Legibility: 5%

PERS: Score 3

There is no indication as to what pedestrians are able to access in the area. Information is provided directing vehicle traffic to Trinidad State Park and the beach

but there are no signs designed to allow for pedestrians to direct themselves. Due to the lack of paving and signage there is little incentive to utilize the Park and Ride facilities or even walk 500ft from the RV park to Murphy's market.

- Dropped Pavements/gradient: 4%

PERS: Score 1

There are no pavements in the area making the need for dropped pavements irrelevant. The gradient leading from the RV Park to Murphy's is on a slight incline which could be managed with appropriate paving to make it more user friendly for the less able users.

- Effective Width: 2%

PERS: Score 1

The crosswalks are of a standard width for pedestrians, measuring around 4'. This is adequate to allow for most users but could be improved. The undesignated trail under the freeway measures a mere 2' at most. This route has a viable amount of space to create an adequate walkway accessible to all.

Total Score out of 100 = 19

Score According to % rating:

Quality of environment: 0.2*0.24 = 0.048*100 = 5%

Personal Security: 0.2*0.13 = 0.026*100 = 3%

Permeability: 0.4*0.12 = 0.048*100 = 5%

User Conflict: 0.2*0.11 = 0.022*100 = 2%

Surface Quality: 1.0*0.10 = 0.01*100 = 1%

Maintenance: 0.2*0.09 = 0.018*100 = 2%

Lighting: 0.1*0.07 = 0.007*100 = 1%

Legibility: 0.3*0.05 = 0.015*100 = 2%

Dropped Pavements: 0.1*0.04 = 0.004*100 = 4%

Effective Width: 0.1*0.02 = 0.002*100 = 0%

Location 2 Total = 25%

4.2.3 Location 3: Trinidad Elementary School – Trinity Street

This is the most central location that can be found in the city. Within the boundaries of the study area can be found the Town Hall, Trinidad School, tennis courts and a local café. This area sees high levels of pedestrian and motorized traffic during 9.00 – 10.00am and from 3.00 – 4.00pm. This area is zoned Planned Development and Public + Religious.

- Quality of Environment: 24%

  PERS: Score 8

  This location was reached at 11:37 am when traffic levels were relatively low and pedestrian movement was limited. A revisit to this location at 3:30 pm revealed a number of issues that need to be addressed. The walking environment created at this location was of high standard. Speed limits had been reduced to 15 miles an hour via the use of speed limit signs and red cones positioned in the center of the road. These cones detract from the environment slightly due to their color and appearance. They are also only a temporary measure used to slow traffic during school operating hours. Due to the slow speed limit which has been put in place, the noise created by the vehicles in the area is minimal compared to the volume of traffic that the area receives. Trees do not line the entire walkway; however a pleasant environment has been created by individual landowners who have grown a variety of vegetation along the roadway. There is no evidence of graffiti in the area, Trinity Street is open and exposed with no enclosed spaces. The area has a feeling of security and does not encourage antisocial behavior.

- Personal Security: 13%

  PERS: Score 8

  The area is a safe and relatively enjoyable area to walk. There are no signs of antisocial behavior and traffic calming measures are relatively successful. The area is lacking a safe accessible designated bus stop. Currently the school bus that serves the area must stop on the side of the road to pick up passengers creating an issue for child safety. Policy A-4 of the Humboldt County Transportation Plan encourages the; '*Securing of funds for efforts to reduce traffic congestion, promote non-motorized access with bridge and shoulder widening, and improve overall safety for motorists, bicyclists, and pedestrians on all county, city, and state highways and streets.* The addition of a school bus stop at this location could help promote and improve child safety. The crosswalk that adjoins the school with the Town Hall is clearly identifiable and can be easily accessed by all types of users. The low speeds, easy crossing and traffic calming measures provides a high level of safety for pedestrians.

- Permeability: 12%

PERS: Score 6

The permeability of the area is low. Access to the school and Town Hall is limited largely due to Trinity Street. The school field that adjoins the back of the school can only be accessed via the main school entrance or via a small, unmarked gap in the fence along Underwood Drive. Access can be obtained to the Town Hall via the lane at the rear. However this is not clearly marked and no direct access can be obtained to the facilities along Main Street.

- User Conflict: 11%

PERS: Score 6

Street furnishings are very limited, meaning that there is no street clutter that causes an obstruction to users of the street. However the lack of furnishings means that users that are not able to rest during walking trips. The sidewalks and roadways are clearly distinguishable creating little confusion between pedestrian and vehicular movements.

- Surface Quality: 10%

PERS: Score 4

The Sidewalk is again made from asphalt which is easily manageable, showing little sign of degrading. No effort has been made to match the materials used with the surrounding development. Materials have been chosen based on the most cost effective materials that require the lEast amount of maintained.

- Maintenance: 9%

PERS: Score 9

The sidewalks along Trinity street are made of asphalt which is a material used within city limits. As mentioned earlier it is a low maintenance material. In this location the paving is of a high standard and is in no need of repair. There are no visible areas of the sidewalk that need improving or attention. The variety of materials is limited to asphalt and tarmac in this location.

- Lighting: 7%

PERS: Score 3

There is no on street lighting in the area but there is lighting constructed on the West and South side of Town Hall. Although lighting is limited the area has a feeling of security created by the existing lighting that is incorporated into the public buildings. Murphy's is the only facility open past nightfall meaning that

pedestrian trips are likely to be low during the night time. Even so, with improved lighting along Trinity Street a safer more enjoyable environment could be created to encourage pedestrian night trips to the market.

- Legibility: 5%

  PERS: Score 3

  Crossings and sidewalks at this location were clearly visible and easy to access. Landmarks buildings, such as the school and town hall are easily visible however there is no signage to direct users to desired locations, such as the harbor area and the commercial district near the freeway.

- Dropped Pavements/gradient: 4%

  PERS: Score 7

  The main crossing from the school to the Town Hall along Trinity Street has dropped curbs and tactile paving, being clearly identifiable for all types of users. Dropped curbs are present at every junction along Trinity Street and are of a high standard. There is still room for improvement through the introduction of tactile paving.

- Effective Width: 2%

  PERS: Score 7

  Considering the Standards of 5'-6'ft for a walkable route way there is room for improvement along Trinity Street. At presence there is adequate space for pedestrians however in order to introduce a permanent speed reduction measure sidewalks could be widened and the road width narrowed. This would also provide room for street furnishings

Total Score out of 100 = 61

Score According to % rating:

Quality of environment: 0.8*0.24 = 0.192*100 = 19%

Personal Security: 0.8*0.13 = 0.104*100 = 10%

Permeability: 0.6*0.12 = 0.072*100 = 7%

User Conflict: 0.6*0.11 = 0.066*100 = 7%

Surface Quality: 0.4*0.10 = 0.04*100 = 4%

Maintenance: 0.9*0.09 = 0.081*100 = 8%

Lighting: 0.3*0.07 = 0.021*100 = 2%

Legibility: 0.3*0.05 = 0.015*100 = 2%

Dropped Pavements: 0.7*0.04 = 0.028*100 = 3%

Effective Width: 0.7*0.02 = 0.014*100 = 1%

Location 3 Total = 63%

4.2.4 Location 4: Indian Beach Access

This access route connects Indian Beach to Trinity Street. It is the main coastal access for pedestrians. Pedestrian traffic consists largely of visitors to the area. Pedestrian traffic is higher during the summer months when visitors to Trinidad are higher. This area is zoned open space.

- Quality of Environment: 24%

  PERS: Score 9

  This study location offers one of the most desirable walks in Trinidad. The trail that leads down from the lighthouse is one of the most scenic walks in Trinidad. The walking environment has been considered to a high standard and sensitivity has been given to the construction of the walkway. The path has been molded into the hillside so as it does not damage the quality of the environment. Vegetation has not been compromised to create the route instead it has been used to create a feeling of enclosure and security along the walkway. The natural view out over Indian beach adds to the value of the walk. The natural materials used in the construction of the walkway make for a more natural environment in which to walk.

- Personal Security: 13%

  PERS: Score 7

  The area is free of antisocial behavior and there are no signs of graffiti or crime in the area. Being a designated trail, this walkway is separated from the roadway making conflict with traffic minimal. The only area where traffic may pose a danger is along Edwards Street where the lighthouse is accessed from. Here there is no visible cross walk that connects the start of the walkway. Emphasis here has been on parking ones car then walking down the beech. The walkway has not been designed to link with other areas of town. During fishing season Edwards Street sees an increased level of traffic in the form of boat trailers making crossing at this location less desirable due to the risks posed by traffic. Without a clearly identifiable crosswalk people are likely to be discouraged from walking.

- Permeability: 12%

  PERS: Score 4

  There is no development in the area where the study was conducted making permeability less of an issue. Due to the steepness of the hillside and the amount of vegetation that covers it, permeability is limited to the single walkway. However there is no need for further permeability as the walkway links directly to the Indian Beach along the pedestrian's desire line.

- User Conflict: 11%

  PERS: Score 7

  Due to the route being designed only for pedestrians there is no user conflict between vehicles and pedestrians. However the path has not been designed for wheelchair access. Seeing as it is a trail and does not provide access to a public or private facility there is no requirement under the Americans with Disabilities Act that it must provide access for less able users. Being built on a steep incline it would be very difficult to make this trail accessible to all. Attempts have been made to include furnishings that are strategically placed to provide rest stops for users. The trail is also well managed and includes steps to increase the ease of access. There is a less challenging route that leads back up towards Trinidad at the other end of Indian beach but this path is not clearly identifiable.

- Surface Quality: 10%

  PERS: Score 8

  This trail has been designed in such away that takes in to consideration the environment in which it was constructed. The materials used are comprised of wood for the walkway's and gravel for other parts. The materials match the environment and blend with the natural landscape. In places gravel has began to slide away from the main path and small repairs made be required but the trail entirety is well constructed and serves its purpose to the best of its ability.

- Maintenance: 9%

  PERS: Score 7

  There are areas of the walkway that may need a little work but at present there is nothing along route that would pose a hazard. For a recreational trail, this route is of a high standard. Considering the materials used in construction and problems that could occur from weathering this trail is in good condition. This trail receives the highest volume of pedestrian traffic in comparison to the other recreational trails and has not been damaged by this high level of use.

- Lighting: 7%

  PERS: Score n/a

  No lighting exists on this trail. However it is not used by pedestrians after nightfall. There is no requirement for lighting to be present as it would likely damage the natural environment.

- Legibility: 5%

PERS: Score 6

The trail is clearly marked on the trails map obtainable from the chamber of commerce and is clearly identifiable from the road. However there is no information at the trail head explaining what the trail links to or where it might go.

- Dropped Pavements/gradient: 4%

PERS: Score 5

The pavement at the entrance of the trail has not been dropped to accommodate for wheelchair access which would allow access for users to the lighthouse monument.

- Effective Width: 2%

PERS: Score 6

The path measures from 2' to 4' in places and offers passing areas along the way so users are able to navigate the trail safe and comfortable. Although this width is lower than that of the pavements around town it is not an issue due the inability for this trail to be able to accommodate disable users.

Total Score out of 90 = 59

Score According to % rating:

Quality of environment: 0.9*0.24 = 0.22*100 = 22%

Personal Security: 0.7*0.13 = 0.091*100 = 9%

Permeability: 0.4*0.12 = 0.048*100 = 5%

User Conflict: 0.7*0.11 = 0.077*100 = 8%

Surface Quality: 0.8*0.10 = 0.08*100 = 8%

Maintenance: 0.7*0.09 = 0.063*100 = 6%

Lighting: 1.0*0.07 = 0.07*100 = 7%

Legibility: 0.6*0.05 = 0.03*100 = 3%

Dropped Pavements: 0.5*0.04 = 0.02*100 = 2%

Effective Width: 0.6*0.02 = 0.012*100 = 1%

Location 4 Total = 71%

4.2.5 Location 5: North end of Underwood Drive

This is primarily a residential area that sees very little pedestrian traffic. It is located just South of Trinidad State Park. There are no paved walkways and the area is designed primarily for access to people residents. This area is zoned Urban Residential.

- Quality of Environment: 24%

  PERS: Score 6

  This residential street handles low volumes of traffic and is a pleasant area to be during the day. The undeveloped properties on the West and East side of the street create an area of wide open space. However this is private land and is likely to be developed in the future. The environment is effected by the chain metal fence that runs along the North end of Underwood. Not only does this obstruct pedestrian movement but it presents an unsightly barrier which serves little purpose. The trail that leads from Underwood down to the beech trail creates a feeling of enclosure which in this case provides a feeling of security for the user. Noise levels are low here as traffic is predominantly accessing residents, there is no through road. There is no sign of dumped garbage or graffiti of any kind. The quality of the homes also adds to an environment that is enjoyable to walk in.

- Personal Security: 13%

  PERS: Score 7

  Although there are no pavements in the area the limit number of vehicles that utilize the road make for a safe environment. The road on this route is free of road markings and according to Buchanan Associates a lack of road markings can actually create a safer environment as vehicle users are more likely to concentrate on driving. The only area that is enclosed is the trail that leads down to the beach, which has been framed in vegetation. This creates a feeling of safety rather than a feeling of unease. The road itself is open and setbacks have created a pleasant environment in which to walk.

- Permeability: 12%

  PERS: Score 4

  Desire lines for pedestrians in this area are lacking. There is no direct pedestrian route linking the area to Trinity Street although there is the trail that connects the street to college cove. There exists the possibility to remove the metal fence to the North of Underwood Drive to allow for pedestrian access to the State Park and further connect this with Trinity Street. There is currently a hole in the fence by the school athletic fields. This is not a designated right of way, but there is

evidence in the form of a well walked grass area, that pedestrians have been using it to gain access. Currently the property on which this undesignated path originates is vacant. If the property was to be developed in the future it may prove beneficial to create an easement so as the path could be properly managed in the future. This would improve the permeability of the area, creating pedestrian access in four different directions. No pavement exists, meaning that navigating the existing route is not a major problem.

- User Conflict: 11%

  PERS: Score 6

  It could be considered that there is user conflict between vehicles and pedestrians due to there being no sidewalks at this location, meaning pedestrians must walk on the road. However, so long as it is indicated that pedestrians have right of way there is no reason why vehicles would conflict with pedestrians. Safety for disabled users may be an issue but due to the fact that low pedestrian volumes make wheelchair access low on the list of priorities.

- Surface Quality: 10%

  PERS: Score 5

  The road is constructed of asphalt and is of high standard, only small blemishes and cracks are visible which do not cause a problem for users. The asphalt does not match the character of Trinidad or the area, and could benefit from more sensitive material selection. The trail that leads from Underwood Drive to the coast is a loose gravel trail that is not of a high enough standard to allow for wheelchair access; however it is of a standard that would accommodate for elderly users. Seeing as this route does not lead to any major facilities, it is not required or feasible to improve this trail route. At present it is of a standard that would encourage most visitors to access the coast, or provide residents with an opportunity to access the beach.

- Maintenance: 9%

  PERS: Score 8

  The material used for construction of the road is asphalt, like the pavements along Trinity Street, and therefore has a lower maintenance quality. The trail that leads to the coast does require a limited amount of maintenance to clear overgrown vegetation; however it is of a design that does not require significant maintenance due to its low pedestrian use.

- Lighting: 7%

PERS: Score n/a

No on street lighting exists at this location but due to the low pedestrian count there is little need for improved lighting. On street lighting would detract from the rustic small town environment. If a permanent trail was to be introduced between Underwood Drive and Trinity Street via the school, limited lighting should be provided to encourage trips to Murphy's during the evening time.

- Legibility: 5%

PERS: Score 7

The trail down to the beach is not easily identifiable from Underwood Drive but there is signage to indicate where the trail leads. Because of the current area being a residential zone there is not a high desire for signage, as residents are already aware of the current route. If a pedestrian link was to be made to the State Park to the North it would be beneficial to introduce some limited signage so visitors would be aware of what path they accessed.

- Dropped Pavements/gradient: 4%

PERS: Score n/a

There is no pavements, so no dropped pavement areas are present here. The trail leading down towards the beach is of a gradient that would be manageable by most users. The roadway measures around 20 ft in most locations making vehicle, bicycle and pedestrian use all viable.

- Effective Width: 2%

PERS: Score 9

The 20 ft roadway is an effective width to accommodate for most users. It is suggested by Peter Swift associates that an effective width for a residential street is 22'-26'. This was indicated by a study in the town of Longmont Colorado, which took 20,000 police reports on road accents. The result showed that narrow roads were safer and could still accommodate most users, depending on traffic flow. The low traffic flow in the area makes a 20' roadway adequate to provide for cyclists pedestrians and vehicles.

Total Score out of 80 = 57

Score According to % rating:

Quality of environment: 0.6*0.24 = 0.144*100 = 14%

Personal Security: 0.7*0.13 = 0.091*100 = 9%

Permeability: 0.6*0.12 = 0.072*100 = 7%

User Conflict: 0.8*0.11 = 0.088*100 = 9%

Surface Quality: 0.5*0.10 = 0.05*100 = 5%

Maintenance: 0.8*0.09 = 0.072*100 = 7%

Lighting: 1.0*0.07 = 0.07*100 = 7%

Legibility: 0.7*0.05 = 0.04*100 = 4%

Dropped Pavements: 1.0*0.04 = 0.04*100 = 4%

Effective Width: 0.9*0.02 = 0.018*100 = 2%

Location 5 Total = 71%

Results:

According to CABE, the creators of the PERS study, if an area provides a desirable walking environment it should have a score of 70% or above. A score of 80% or higher means that pedestrian trips take priority over vehicles and encourage walking to the highest level.

This pedestrian facility assessment revealed that areas of Trinidad show signs of promise in terms of their walkability. It seems that Trinidad already has the basis for a walkable community as described by Dan Burden. However there are certainly areas that require improvement and there are areas where new trails and pedestrian routes could be created that would allow for easier pedestrian movement. Location one and two would appear to be the areas that are most in need of improvement. The cost of improving this area could be minimal, a step program could be implemented which concentrates on improvements over a prolonged period of time as funds become available. The priority for this area would be to create a continuous walkway under the freeway, connecting the RV Park and Park and Rides to the West side of the freeway. In an effort to manage the multi change intersection roundabouts could prove to be beneficial. It is important to create an overall plan for this area before any work commences or work will have to be redone in the future to meet further changes.

What is also evident from this study is not all the areas of Trinidad have continuous walkable connections. The main access to the beech is designed to encourage users to park and walk down the trail rather than providing a continuous connection from the start of Main Street to Indian Beach.

Location 5, (North end of Underwood Drive) was studied with the intention of understanding what issues need to be addressed in the neighborhood areas of Trinidad. At this location permeability would appear to be the major problem. Although the area received a high score of 71%, it does not allow for the free movement of pedestrians reducing the likelihood of pedestrian trips. Permeability needs to be addressed at this location.

Location three does offer a healthy walking environment and possibly provides for the best pedestrian facilities in the town. However considering that this is the main street in Trinidad and the school is located along this street there is still room for improvement. This improvements, funds pending, should concentrate on widening pavements at locations and encouraging more local business in an effort to create a more sociable environment. Small scale on street lighting could help increase pedestrian movement to the Market at the end of Main Street.

Walkable city successful examples

A number of cities have realized the benefits of walkable streetscape design standards. There are a number of different ways to create and implement design guidelines that encourage walkability in a town. However there are a number of key approaches that should be taken when attempting to improve the walkability and desirability of a street, these are:

- New buildings or additions on any given street should be consistent with the predominant setback pattern for that street.
- Especially in downtown and commercial areas, setback requirements should reinforce an urban and pedestrian streetscape by being closer to the sidewalk.
- Street-level store fronts and building entrances should be open and inviting to pedestrians, and service entrances, driveways and garages should be located on side streets or in service alleys.
- The scale and massing of buildings on any given street should be harmonious. This does not mean uniform however. Variations in scale and design are an essential factor in creating a distinctive built environment.
- Street width should be appropriate to the type and character of land uses found along the street.
- Where streets have more pavement than necessary, excess pavement should be replaced by green areas, sidewalks, or other appropriate public amenities.

There are six main considerations that Trinidad should take into account when creating a plan 20 years in the future and these are.

1. Are setbacks for buildings being managed appropriately to create a uniformed street scene that is enjoyable for the user?

2. Are streets being treated as public spaces? Do they encourage interaction and communication between neighborhoods and business?
3. Are street utilities located in an area that does not impose negatively on the streetscape?
4. In areas where the streetscape will allow it, has vegetation been encouraged?
5. Has lighting been used in the correct places to a standard that creates a feeling of safety but does not intrude on peoples privacy.
6. Are appropriate trails and paths accessible to all users?

Below are a number of links for examples of street design guidelines adopted by other cities across the US.

http://www.franklin.mi.us/govern/Master%20Plan%20Update%20Draft/Chapter%201%20-%20Planning%20Goals%20for%20Franklin.pdf
http://environment.transportation.org/documents/Design_Guidelin.pdf
http://www.co.lancaster.pa.us/lancastercity/cwp/view.asp?A=671&Q=545667
http://www.co.larimer.co.us/engineering/gmardstds/old/appc-1.pdf

Solutions for designing walkable streets.

As mentioned earlier in section one there is a real need for walkable streets to accommodate for social space where people are able to interact with one another. According to Urban Design Collaborative (2001) social space should provide for the following.

- Place to rest and/or interact with community members along pedestrian travel-way.

Ways to accomplish:

- Pedestrian plaza or pocket park
- Seating (benches, movable chairs, low walls)
- Café, with outdoor dining.

Barton (2004) claims that in order for a town to be fully walkable there needs to be a central area that can be accessed via pedestrians through an enjoyable walkable environment. This area could be comprised of a central shopping area or communal area such as a park. The idea is to provide a centralized point where people can meet and commune.

In Trinidad the center of the town can be identified as the area around town hall along Trinity Street. One possible solution to providing such a centralized communal area would be to transform the parking lot within the school grounds. Currently the school parking lot provides for 25 cars. At peak hours this car park can be filled to capacity making the removal of spaces problematic. However by creating designated on street parking via the narrowing of the road there is the possibility to utilize the car park as a park. Derived from ideas created by Barton (2001) a possible solution has been developed, a full project description is visible on map 3

In order to create walkable streetscapes it is suggested by Urban Design Collaborative that proportions on the street must be balanced. Focus is on reducing road width where possible and never letting the combined sidewalk width drop below that of the roadway. The following are suggestions made by Urban Design Collaborative;

BALANCE PROPORTION

Objectives:

- The roadway travel width should not dominate the streetscape.
- The combined width of the pedestrian areas should be approximately equal to the roadway.

Ways to accomplish:

- Wide sidewalks, planted areas, curb extensions, on-street parking.
- Refine street design criteria and standards; reduce lane width/remove lanes if appropriate.

Barton (2001) is of the opinion that in an effort to encourage pedestrian trips, paths and walkways should be separated from the road by some form of physical separation like vegetation or a hardscape element. This is also considered to be a method for slowing traffic flow. Peter Swift conducted a study into how narrow streets affect vehicle speed. The study looked at 20,000 vehicle related accidents in the city of Longmont, Colorado. The study revealed that as street width decreased and the curvature of the street increased the number of accidents was reduced.

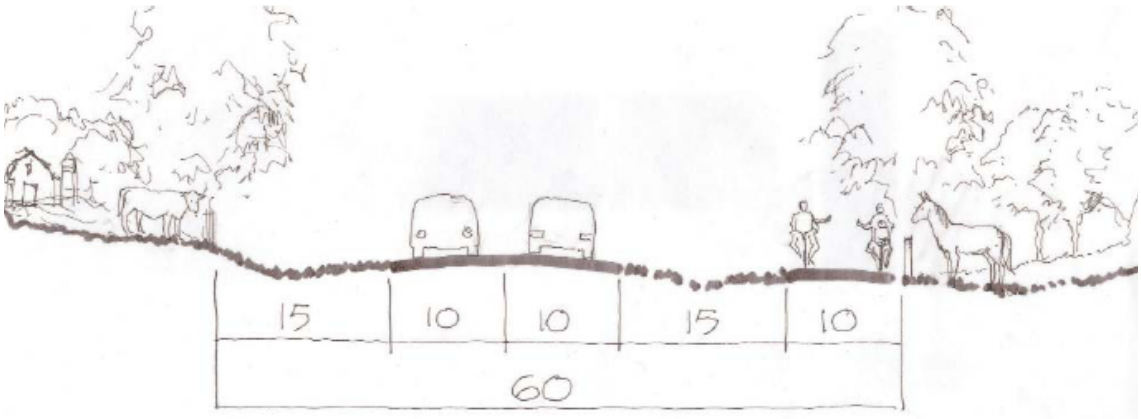
Using this regression, a typical 36 foot wide residential street has 1.21 a/m/y (Ed: accidents/mile-year) as opposed to 0.32 for a 24 foot wide street, the street with the least a/m/y. This is about a 400 percent increase in accident rates. The a/m/y for a 30 foot wide street is 0.36. It appears that the group of streets with the safest results occur between 22 and 30 feet in curb face width.

There was another interesting observation made concerning this study. Figure 2 is a graph of street width vs. ADT (Ed: average daily traffic). It shows a clustering of accidents below 1,000 ADT and between street widths of 36 to 44 feet. The most intense portion of accident frequency lies below an ADT of 500. This indicates that more accidents occur on wide streets that have low daily volumes.

Based on these ideas Trinidad could benefit from wider sidewalks and an increase in vegetation along the streetscape.

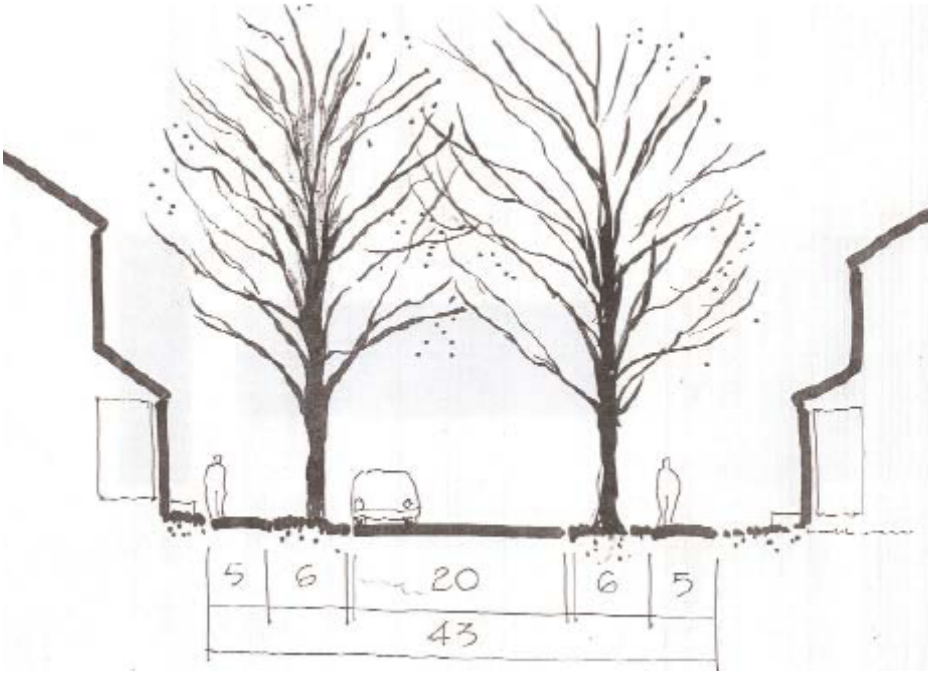
Solutions to the Current issues in Trinidad

Example of a rural road with separate pedestrian and bike path, measuring 10'.



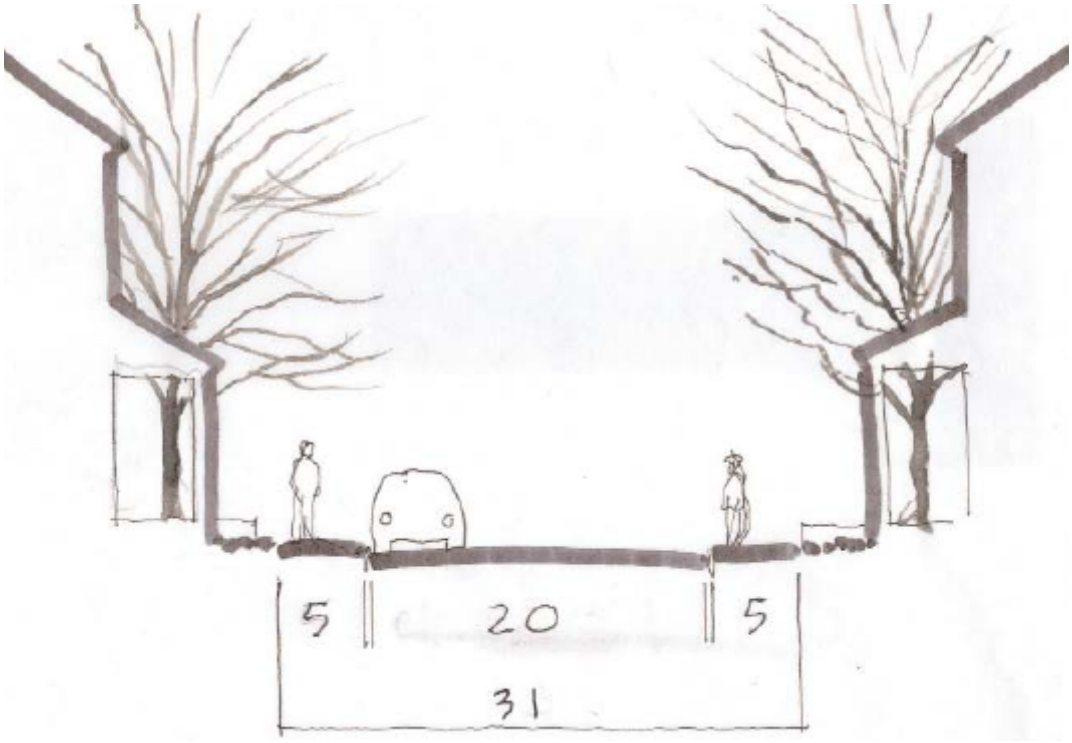
This design could provide a low cost measure for encouraging man powered recreational and business trips to Trinidad's center. By diverting the Pacific Bike route, which follows the 101 freeway, onto Patrick's Point Drive more users to the North of Trinidad would be likely to use sustainable forms of transport.

Example of residential street improvements in Trinidad City limits.

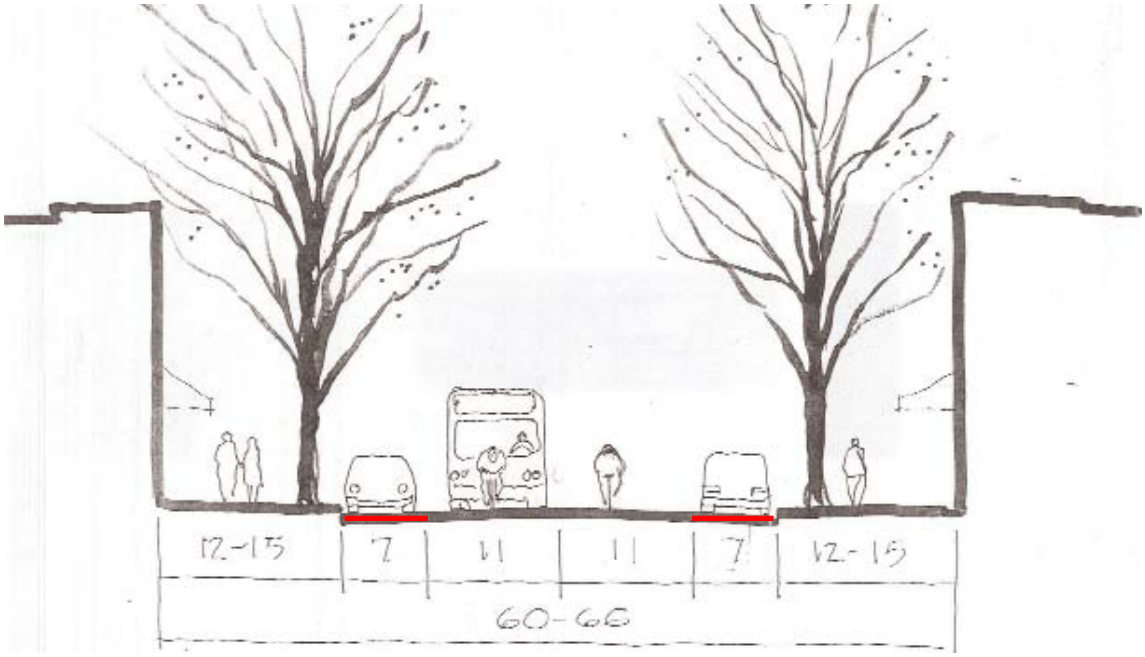


Although sidewalks are not considered necessary in the residential areas of Trinidad, there still exists the possibility to create graveled or wood chip paths separated from the road by vegetation. The average residential street width in Trinidad is 20'. The addition of a set back path could prove difficult in areas due to the limited space provided in front of residences and the set back requirements that currently exist. However this may be a possibility in areas where property has not yet been developed, such as along the wood storage area behind Murphy's Market. In other cases the road width could be reduced in residential areas to 10', providing passing lanes for 2 way traffic.

An alternative design for residential streets in Trinidad.



Example of how Trinity Street and Main Street could be transformed in the future.



The central zone of Trinidad could be transformed into a more walkable environment by widening the street fronts in places and planting vegetation to create a more attractive walking environment. The area marked in red on the cross section above identifies where on street parking could be replaced with an extended sidewalk to slow traffic and provide available space to increase the walkable area. This example could be introduced in study area 1.

Conclusion and Summary

These are only some of the solutions that could be implemented in Trinidad; there are a whole host of options that could be taken, as is evident by the other examples from towns and cities across the US. What is important is that three simple questions are asked when considering any new projects in Trinidad, based on making Trinidad a walkable community.

1. Does the project improve the existing pedestrian network, so that Trinidad's existing facilities are better interconnected by a desirable walking environment?
2. Does the project ensure minimal user conflict, by providing primarily for the pedestrian and secondly for the car user?
3. Is the project in a location that will fit closely with other existing development so that walking times are minimized between facilities? (Does it encourage a community core zone?)

The facility provision study reveals that Trinidad offers a wide range of different, low order, facilities. The majority of which are located within Trinidad's city limits. These facilities serve a larger population that exists within the 95570 ZIP code meaning that many of Trinidad's facilities are also dependant on tourist traffic. The study indicated that a variety of these facilities are within walking distance of most residences in Trinidad, according to the walkable communities standards (MARC, 1998). However this is based on an assumption that all facilities can be accessed via a straight line and does not consider any obstructions along the way.

The PERS study brought these findings into question by revealing that a number of areas within Trinidad are either not desirable areas to walk or create an environment that does not link key locations, increasing walking times and encouraging the use of a motor vehicle. The Study identified 3 main locations where improvements should be made over the next 20 years.

Initially it would appear that Trinidad meets the majority of standards that make a walkable community. It offers an environment that is 'thinking small', has 'speed controlled streets' and buildings that are 'scaled' to the streets environment (in some cases). However it does lack four key elements that are described by Dan Burden as 'essential' in creating a walkable community, these are a functioning town center, streets for all users, pedestrian links between key locations and a vision that incorporates walkability into the future of the city. These are all things that should be considered in creating the 20 year plan for Trinidad. Changes are not likely to happen over night but by creating policy that encourages walkability Trinidad could prove itself as being a city that is at the forefront of community design.

Appendix 1: Facility Threshold populations

A	B	C	D	E	F	G
Population of Market Area:						
NAIC	**Type of Retail / Service Activity**	**Number of Establishments in Ontario**	**Demand Threshold (Population Required to Support Average Establishment)**	**Theoretical Number of Establishments that could be Supported in Market Area**	**Actual Number of Establishments that are Supported in Market Area**	**Surplus Demand Potential (Additional Establishments that Might be Supported in Market Area)**
4111	Farm Product Wholesaler-Distributors	752	15,173	=TRUNC($C$2/D4)		=E4-F4
4121	Petroleum Product Wholesaler-Distributors	525	21,733	=TRUNC($C$2/D5)		=E5-F5
4131	Food Wholesaler-Distributors	3,529	3,233	=TRUNC($C$2/D6)		=E6-F6
4132	Beverage Wholesaler-Distributors	300	38,033	=TRUNC($C$2/D7)		=E7-F7
4133	Cigarette and Tobacco Product Wholesaler-Distributors	94	121,383	=TRUNC($C$2/D8)		=E8-F8
4141	Textile, Clothing and Footwear Wholesaler-Distributors	2,029	5,623	...AND SO ON		...AND SO ON
4142	Home Entertainment Equipment and Household Appliance Wholesaler-Distributors	524	21,775			
4143	Home Furnishings Wholesaler-Distributors	1,110	10,279			
4144	Personal Goods Wholesaler-Distributors	2,302	4,957			
4145	Pharmaceuticals, Toiletries, Cosmetics and Sundries Wholesaler-Distributors	1,061	10,754			
4151	Motor Vehicle Wholesaler-Distributors	1,072	10,644			
4152	New Motor Vehicle Parts and Accessories Wholesaler-Distributors	1,859	6,138			
4153	Used Motor Vehicle Parts and Accessories Wholesaler-Distributors	282	40,461			
4161	Electrical, Plumbing, Heating and Air-Conditioning Equipment and Supplies Wholesaler-Distributors	1,786	6,389			
4162	Metal Service Centers	627	18,198			

4163	Lumber, Millwork, Hardware and Other Building Supplies Wholesaler-Distributors	3,111	3,668			
4171	Farm, Lawn and Garden Machinery and Equipment Wholesaler-Distributors	1,009	11,308			
4172	Construction, Forestry, Mining, and Industrial Machinery, Equipment and Supplies Wholesaler-Distributors	2,987	3,820			
4173	Computer and Communications Equipment and Supplies Wholesaler-Distributors	3,199	3,567			
4179	Other Machinery, Equipment and Supplies Wholesaler-Distributors	4,070	2,803			
4181	Recyclable Material Wholesaler-Distributors	920	12,402			
4182	Paper, Paper Product and Disposable Plastic Product Wholesaler-Distributors	833	13,698			
4183	Agricultural Supplies Wholesaler-Distributors	664	17,184			
4184	Chemical (except Agricultural) and Allied Product Wholesaler-Distributors	919	12,416			
4189	Other Miscellaneous Wholesaler-Distributors	6,123	1,863			
4191	Wholesale Agents and Brokers	4,811	2,372			
4411	Automobile Dealers	4,508	2,531			
4412	Other Motor Vehicle Dealers	1,154	9,887			
4413	Automotive Parts, Accessories and Tire Stores	1,669	6,836			
4421	Furniture Stores	1,799	6,342			
4422	Home Furnishings Stores	2,964	3,850			
4431	Electronics and Appliance Stores	5,462	2,089			
4441	Building Material and Supplies Dealers	2,974	3,837			
4442	Lawn and Garden Equipment and Supplies Stores	627	18,198			
4451	Grocery Stores	8,948	1,275			

4452	Specialty Food Stores	3,137	3,637			
4453	Beer, Wine and Liquor Stores	793	14,388			
4461	Health and Personal Care Stores	5,534	2,062			
4471	Gasoline Stations	5,036	2,266			
4481	Clothing Stores	7,198	1,585			
4482	Shoe Stores	1,030	11,078			
4483	Jewelers, Luggage and Leather Goods Stores	2,183	5,227			
4511	Sporting Goods, Hobby and Musical Instrument Stores	4,085	2,793			
4512	Book, Periodical and Music Stores	1,411	8,086			
4521	Department Stores	296	38,547			
4529	Other General Merchandise Stores	4,629	2,465			
4531	Florists	1,738	6,565			
4532	Office Supplies, Stationery and Gift Stores	3,608	3,162			
4533	Used Merchandise Stores	1,930	5,912			
4539	Other Miscellaneous Store Retailers	4,439	2,570			
4541	Electronic Shopping and Mail-Order Houses	910	12,539			
4542	Vending Machine Operators	704	16,207			
4543	Direct Selling Establishments	1,397	8,168			
4811	Scheduled Air Transportation	103	110,777			
4812	Non-Scheduled Air Transportation	432	26,412			
4821	Rail Transportation	25	456,402			
4831	Deep Sea, Coastal and Great Lakes Water Transportation	93	122,689			
4832	Inland Water Transportation	25	456,402			
4841	General Freight Trucking	13,494	846			
4842	Specialized Freight Trucking	5,154	2,214			
4851	Urban Transit Systems	65	175,539			
4852	Interurban and Rural Bus Transportation	40	285,251			
4853	Taxi and Limousine Service	4,143	2,754			
4854	School and Employee Bus Transportation	616	18,523			

4855	Charter Bus Industry	67	170,299			
4859	Other Transit and Ground Passenger Transportation	252	45,278			
4861	Pipeline Transportation of Crude Oil	7	1,630,007			
4862	Pipeline Transportation of Natural Gas	42	271,668			
4869	Other Pipeline Transportation	12	950,837			
4871	Scenic and Sightseeing Transportation, Land	33	345,759			
4872	Scenic and Sightseeing Transportation, Water	87	131,150			
4879	Scenic and Sightseeing Transportation, Other	14	815,003			
4881	Support Activities for Air Transportation	436	26,170			
4882	Support Activities for Rail Transportation	76	150,132			
4883	Support Activities for Water Transportation	144	79,236			
4884	Support Activities for Road Transportation	1,132	10,080			
4885	Freight Transportation Arrangement	1,471	7,757			
4889	Other Support Activities for Transportation	933	12,229			
4911	Postal Service	429	26,597			
4921	Couriers	831	13,731			
4922	Local Messengers and Local Delivery	1,188	9,604			
4931	Warehousing and Storage	1,091	10,458			
5111	Newspaper, Periodical, Book and Database Publishers	2,418	4,719			
5112	Software Publishers	690	16,536			
5121	Motion Picture and Video Industries	4,982	2,290			
5122	Sound Recording Industries	634	17,997			
5131	Radio and Television Broadcasting	400	28,525			
5132	Pay TV, Specialty TV and Program Distribution	235	48,553			
5133	Telecommunications	762	14,974			
5141	Information Services	971	11,751			
5142	Data Processing Services	493	23,144			
5211	Monetary Authorities -	3	3,803,349			

	Central Bank					
5221	Depository Credit Intermediation	2,034	5,610			
5222	Non-Depository Credit Intermediation	5,210	2,190			
5223	Activities Related to Credit Intermediation	616	18,523			
5231	Securities and Commodity Contracts Intermediation and Brokerage	1,493	7,642			
5232	Securities and Commodity Exchanges	99	115,253			
5239	Other Financial Investment Activities	26,324	433			
5241	Insurance Carriers	905	12,608			
5242	Agencies, Brokerages and Other Insurance Related Activities	4,702	2,427			
5261	Pension Funds	22	518,638			
5269	Other Funds and Financial Vehicles	1,112	10,261			
5311	Lessors of Real Estate	29,582	386			
5312	Offices of Real Estate Agents and Brokers	17,587	649			
5313	Activities Related to Real Estate	6,609	1,726			
5321	Automotive Equipment Rental and Leasing	1,923	5,933			
5322	Consumer Goods Rental	2,106	5,418			
5323	General Rental Centers	533	21,407			
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	2,117	5,390			
5331	Lessors of Non-Financial Intangible Assets (Except Copyrighted Works)	421	27,102			
5411	Legal Services	9,396	1,214			
5412	Accounting, Tax Preparation, Bookkeeping and Payroll Services	9,872	1,156			
5413	Architectural, Engineering and Related Services	13,278	859			
5414	Specialized Design Services	5,149	2,216			
5415	Computer Systems Design and Related Services	26,519	430			
5416	Management, Scientific and Technical Consulting Services	36,431	313			

5417	Scientific Research and Development Services	1,287	8,866			
5418	Advertising and Related Services	6,680	1,708			
5419	Other Professional, Scientific and Technical Services	5,349	2,133			
5511	Management of Companies and Enterprises	27,946	408			
5611	Office Administrative Services	3,663	3,115			
5612	Facilities Support Services	-	#DIV/0!			
5613	Employment Services	2,177	5,241			
5614	Business Support Services	2,410	4,734			
5615	Travel Arrangement and Reservation Services	3,021	3,777			
5616	Investigation and Security Services	1,698	6,720			
5617	Services to Buildings and Dwellings	13,292	858			
5619	Other Support Services	9,531	1,197			
5621	Waste Collection	370	30,838			
5622	Waste Treatment and Disposal	341	33,461			
5629	Remediation and Other Waste Management Services	320	35,656			
6111	Elementary and Secondary Schools	851	13,408			
6112	Community Colleges and C.E.G.E.P.s	555	20,559			
6113	Universities	127	89,843			
6114	Business Schools and Computer and Management Training	1,002	11,387			
6115	Technical and Trade Schools	638	17,884			
6116	Other Schools and Instruction	3,387	3,369			
6117	Educational Support Services	452	25,243			
6211	Offices of Physicians	11,125	1,026			
6212	Offices of Dentists	5,038	2,265			
6213	Offices of Other Health Practitioners	4,802	2,376			
6214	Out-Patient Care Centers	1,074	10,624			
6215	Medical and Diagnostic Laboratories	802	14,227			
6216	Home Health Care Services	640	17,828			

6219	Other Ambulatory Health Care Services	202	56,485			
6221	General Medical and Surgical Hospitals	230	49,609			
6222	Psychiatric and Substance Abuse Hospitals	31	368,066			
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	117	97,522			
6231	Nursing Care Facilities	685	16,657			
6232	Residential Developmental Handicap, Mental Health and Substance Abuse Facilities	311	36,688			
6233	Community Care Facilities for the Elderly	499	22,866			
6239	Other Residential Care Facilities	411	27,762			
6241	Individual and Family Services	2,129	5,359			
6242	Community Food and Housing, and Emergency and Other Relief Services	186	61,344			
6243	Vocational Rehabilitation Services	604	18,891			
6244	Child Day-Care Services	2,138	5,337			
7111	Performing Arts Companies	1,825	6,252			
7112	Spectator Sports	1,301	8,770			
7113	Promoters (Presenters) of Performing Arts, Sports and Similar Events	503	22,684			
7114	Agents and Managers for Artists, Athletes, Entertainers and Other Public Figures	410	27,829			
7115	Independent Artists, Writers and Performers	3,239	3,523			
7121	Heritage Institutions	390	29,257			
7131	Amusement Parks and Arcades	320	35,656			
7132	Gambling Industries	698	16,347			
7139	Other Amusement and Recreation Industries	5,148	2,216			
7211	Traveller Accommodation	3,500	3,260			
7212	RV (Recreational Vehicle) Parks and Recreational Camps	1,618	7,052			
7213	Rooming and	109	104,679			

	Boarding Houses					
7221	Full-Service Restaurants	14,384	793			
7222	Limited-Service Eating Places	16,096	709			
7223	Special Food Services	2,917	3,912			
7224	Drinking Places (Alcoholic Beverages)	1,806	6,318			
8111	Automotive Repair and Maintenance	14,456	789			
8112	Electronic and Precision Equipment Repair and Maintenance	1,349	8,458			
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	3,301	3,457			
8114	Personal and Household Goods Repair and Maintenance	4,237	2,693			
8121	Personal Care Services	10,120	1,127			
8122	Funeral Services	681	16,755			
8123	Dry Cleaning and Laundry Services	3,058	3,731			
8129	Other Personal Services	1,689	6,756			
8131	Religious Organizations	5,633	2,026			
8132	Grant-Making and Giving Services	679	16,804			
8133	Social Advocacy Organizations	625	18,256			
8134	Civic and Social Organizations	3,331	3,425			
8139	Business, Professional, Labour and Other Membership Organizations	6,913	1,651			
8141	Private Households	2	5,705,023			
9111	Defence Services	4	2,852,512			
9112	Federal Protective Services	14	815,003			
9113	Federal Labour, Employment and Immigration Services	7	1,630,007			
9114	Foreign Affairs and International Assistance	7	1,630,007			
9119	Other Federal Government Public Administration	76	150,132			
9121	Provincial Protective Services	8	1,426,256			

9122	Provincial Labour and Employment Services	3	3,803,349			
9129	Other Provincial and Territorial Public Administration	40	285,251			
9131	Municipal Protective Services	38	300,264			
9139	Other Local, Municipal and Regional Public Administration	728	15,673			
9141	Aboriginal Public Administration	134	85,150			
9191	International and Other Extra-Territorial Public Administration	50	228,201			

References

Alta Planning + Design Redwood Community Action Agency, 2003: Humboldt County Regional Pedestrian Needs Assessment Study Update

Barton Hugh. Shaping Neighborhoods: A Guide for Health, Sustainability and Vitality. Published by Taylor & Francis, 2003

Burden Dan, April 2008: Walkable Communities http://www.walkable.org/

Christaller, Walter, 1933. *Die zentralen Orte in Suddeutschland*. Jena: Gustav Fischer. The Central Place Theory. www.treasury.gov.za/divisions/bo/ndp/TTRI/Day%202%20-%2030%20Oct%202007/2c%20Reading%20Central%20Place%20Theory%20Christaller.pdf

City of Trinidad, 2001: Trinidad Draft General Plan

Commission for Architecture and the Built Environment (CABE) 2007 Report: Streets Paved With Gold. www.cabe.org.uk/AssetLibrary/9896.pdf

Dawson, Jonathan. 2006: How ecovillages can grow sustainable local economies. www.gen.ecovillage.org/iservices/publications/articles/emag133_dawson_economies.pdf

DEFRA, 1999: Sustainability and the future http://www.defra.gov.uk/

Erik Assadourian, 2008: Worldwatch Institute - Engaging Communities for a Sustainable World"

Encyclopedia Britannica, 1995: Central Place Theory

Governor's Office of Planning and Research, 2003: General Plan Guidelines State of California.
http://www.opr.ca.gov/planning/publications/General_Plan_Guidelines_2003.pdf

ICMA and EPA, Report 2006: Smart Growth.
www.smartgrowthonlineaudio.org/pdf/TSIG_2006_8-5x14.pdf

Humboldt County association of Governments, 2006: Humboldt County Regional Transportation Plan Update

Mid Atlantic Regional Council. Walkable Communities Repot.
http://www.marc.org/bikeped/walkable.htm

Perdue University Construction Management Department, Asphalt Information:
https://engineering.purdue.edu/CEM/People/Personal/Halpin/Sim/Examples/pave.htm

Rural Economic Development Data and Intelligence. Market Threshold Analysis http://www.reddi.gov.on.ca/dr_markettresholdanalysis.htm

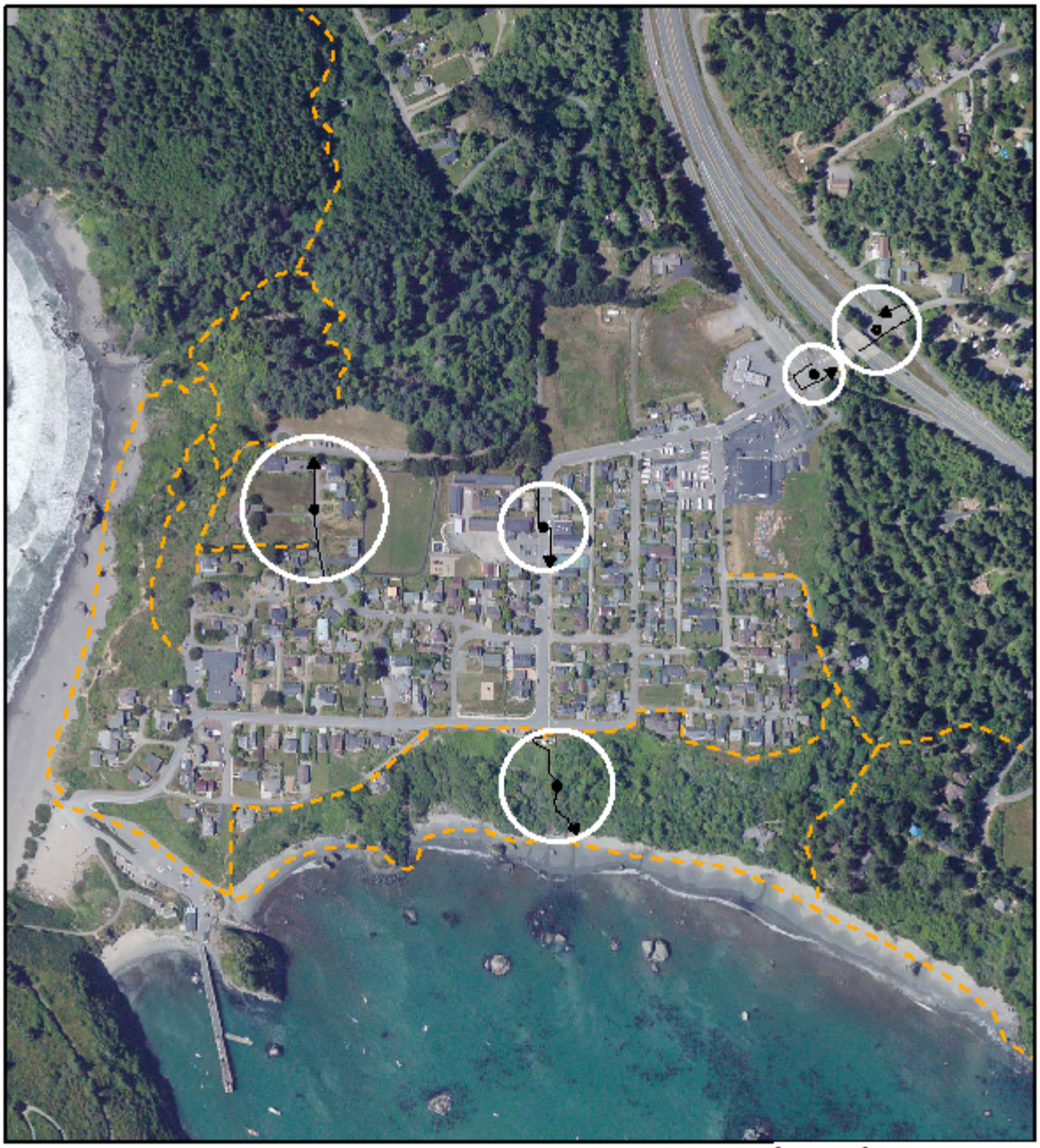
South African Government, 2002: Barth, Edwin, J, 1968:

Sevier, Laura. 2008: Eco Village a model for Life www.gen.ecovillage.org/iservices/publications/articles/ec_08_may_ecovillages.pdf

Urban Design Collaborative, 2001: Context Sensitive Street Design Atlanta Regional Commission.

Village of Franklin, 2006: Village Master Plan, (Traffic) http://www.franklin.mi.us/govern/Master%20Plan%20Update%20Draft/Chapter%209%20-%20Traffic%20and%20Circulation.pdf

Map 1: The 5 Pedestrian Study locations

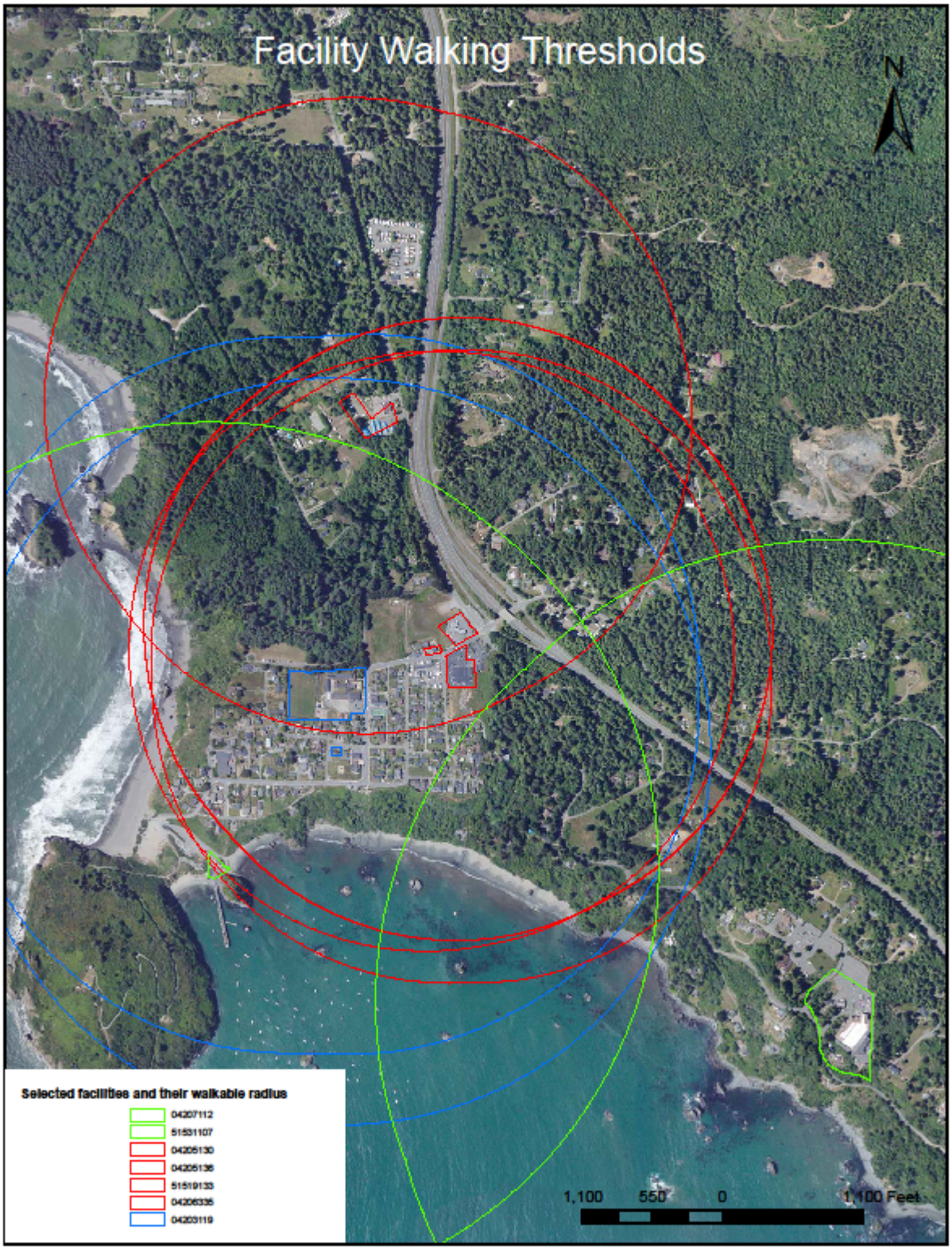


The five study locations are represented by the white circles. Each one of these locations apart from Location 5 (selected for its resedential street qualities were identified as areas of high pedestrian flows, according to the Humboldt County Transport Plan, 2006

Legend

- Trails
- Street Assesment route
- Street Quality, points

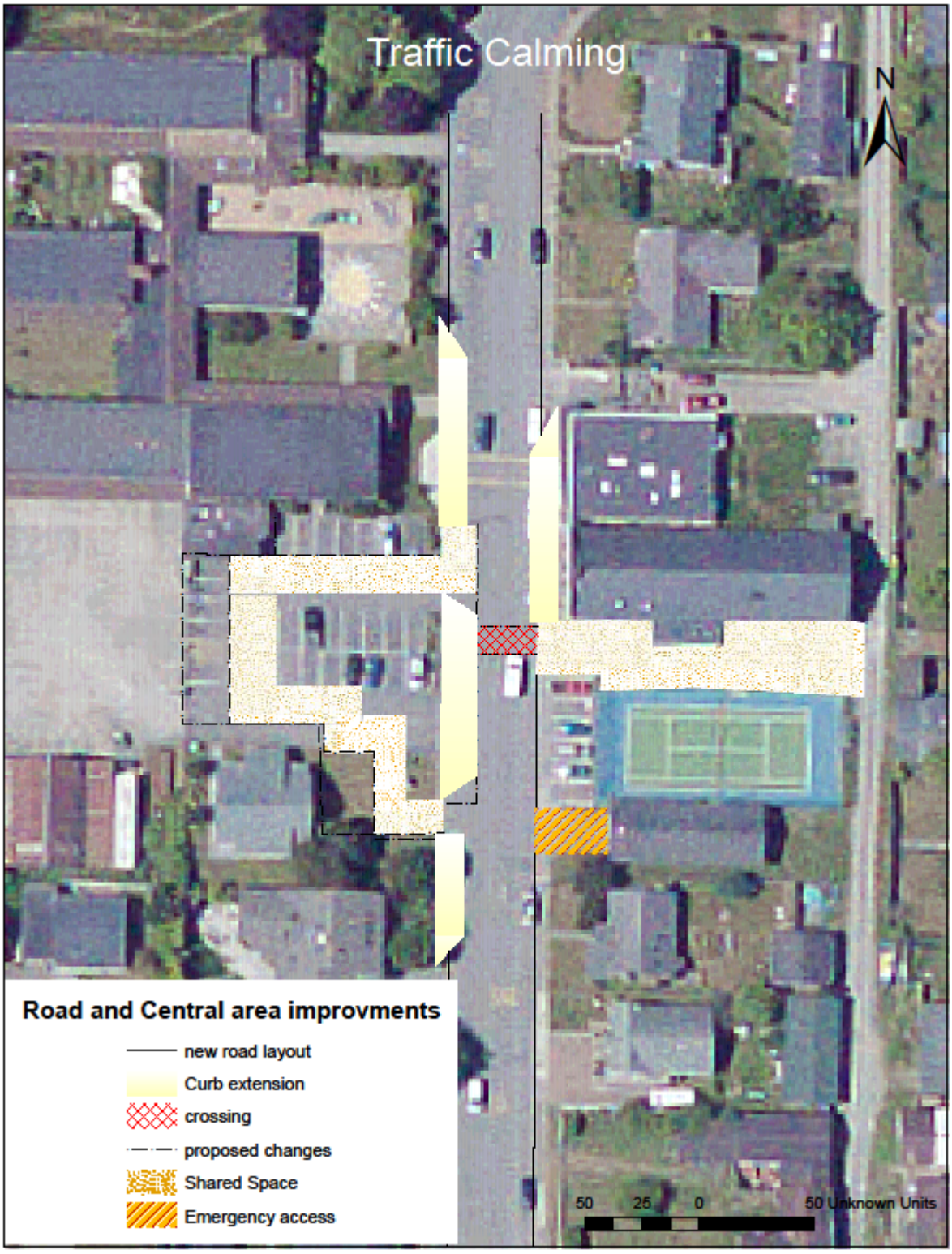
Map #2


Facility Walking Thresholds
N
Selected facilities and their walkable radius
04207112
51531107
04205130
04205136
51519133
04206336
04203119
1,100 550 0 1,100 Feet

Map #3


Possible Trinidad Central Area Proposal
N
Legend
Proposed trails
crossing
proposed Parking
Shared Space
proposed changes
Trails
120
60
0
120 Feet

Map #4


Traffic Calming
N
Road and Central area improvments
new road layout
Curb extension
crossing
proposed changes
Shared Space
Emergency access
50 25 0 50 Unknown Units