U.S. Department
of Transportation
Federal Highway Administration

Texas Division

300 E. 8th Street, Rm 826
Austin, TX 78701
(Tel) 512-536-5900
(Fax) 512-536-5990
www.fhwa.dot.gov/txdiv

May 4, 2015

In Reply Refer To:
HTA-TX

Mark McDaniel
Assistant City Manager
City of Dallas
1500 Marilla St., Room 4CN
Dallas, TX 75201

Dear Mr. McDaniel:

Enclosed for your use is the Vickery Meadow Pedestrian Road Safety Assessment conducted by the Federal Highway Administration with assistance from the North Central Texas Council of Governments and other partners. The report includes several recommendations for improving pedestrian safety in the Vickery Meadow neighborhood, primarily along Park Lane between the DART Park Lane station and the "Five Points" intersection. Thank you for leading the City's interest in pedestrian safety for the neighborhood, hosting the assessment, and providing the staff's time and support from multiple city departments.

Once the City of Dallas has completed its response to the recommendations, please provide me with a copy. If needed, my office is available to provide further technical assistance to help implement the recommendations. We look forward to continuing our work with the City to advance pedestrian safety.

Sincerely,

Stephen Ratke

Stephen Ratke
Safety Engineer

Enclosure

Cc: Merry Vickers, City of Dallas
Robert Parks, DART
Tushar Solanki, Dallas County
Alberta Blair, Dallas County

Antoinette Bacchus, Dallas County
Dr. Theresa Daniel, Dallas County
Jonathan Toffer, Dallas County
Stan Hall, TxDOT
Mo Bur, TxDOT
Noel Paramanantham, TxDOT
Kevin Kokes, NCTCOG
Jeremy Williams, NCTCOG
Sandy Wesch, NCTCOG
Karla Weaver, NCTCOG
Michael Morris, NCTCOG
Jared White, City of Dallas
Micah Baker, Dallas County
Craig Allred, FHWA
Peter Eun, FHWA

Vickery Meadow
Pedestrian Road Safety Assessment (PRSA)

Conducted:

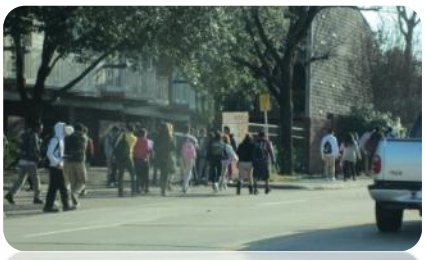
February 24-26, 2015

At the Request of:

City of Dallas

With Assistance from:

North Central Texas Council of Governments (NCTCOG)



Facilitated By:

Craig Allred - Transportation Specialist

&

Peter Eun - Transportation Safety Engineer

FHWA Resource Center

Safety and Design Technical Service Team

Table of Contents	

Acronyms
ACS - American Community Survey
ADA - Americans with Disabilities Act
CRF – Crash Reduction Factor (Explained in Appendix D)
DART - Dallas Area Rapid Transit
FHWA - Federal Highway Administration
Ft/sec – Feet per Second
LOS - Level of Service
LPI - Leading Pedestrian Interval
MUTCD - Manual of Uniform Traffic Control Devices
NCTCOG - North Central Texas Council of Governments
NTOR - No Turn On Red
PHB - Pedestrian Hybrid Beacon
PID - Public Improvement District
PRSA - Pedestrian Road Safety Assessment
RRFB - Rectangular Rapid Flashing Beacon
RSA – Road Safety Assessment
SOPAC - Southern Pacific
TAS - Texas Accessibility Standards
TDLR - Texas Department of Licensing and Regulation
TWLTL - Two-Way Left Turn Lane
VM – Vickery Meadow

Background

Planned improvements to the Vickery Meadow (VM) area include pedestrian and bicycle safety. Some of the existing plans are:

- Vickery Meadow Station Area Plan February 2013
- Vickery Meadow Tax Increment Financing District Project Plan & Reinvestment Zone Financing Plan Approved December 14, 2005 (Ordinance No. 26181) Amended September 10, 2014
- Planned Southern Pacific (SOPAC) Trail

The City of Dallas is one of Federal Highway Administration's (FHWA) 30 pedestrian safety focus cities across the country and is eligible for free technical assistance. The City of Dallas, with the assistance of the NCTCOG, requested a PRSA for the Vickery Meadow Neighborhood. The study area was primarily focused on the Park Lane corridor from the Park Lane Dallas Area Rapid Transit (DART) rail station and Greenville Avenue on the west to the "5-Points" intersection (Park Lane/ Ridgecrest Road/Fair Oaks Avenue) to the east.

The FHWA Safety Office established Road Safety Assessments (RSA) as a way to improve the overall safety performance of roadways. A Road Safety Assessment is a comprehensive formal safety performance evaluation on an existing or future road segment or intersection performed by an independent and multidisciplinary team. RSAs are a low-cost proactive approach to safety which considers all road users and identifies opportunities to enhance safety and reduce the number and severity of crashes. A Pedestrian Safety Assessment is a specialized type of RSA intended to focus on pedestrian safety issues. In addition to pedestrian safety, the RSAs documented here also consider bicyclist safety, as well as the safety and operational conditions for motor-vehicles.

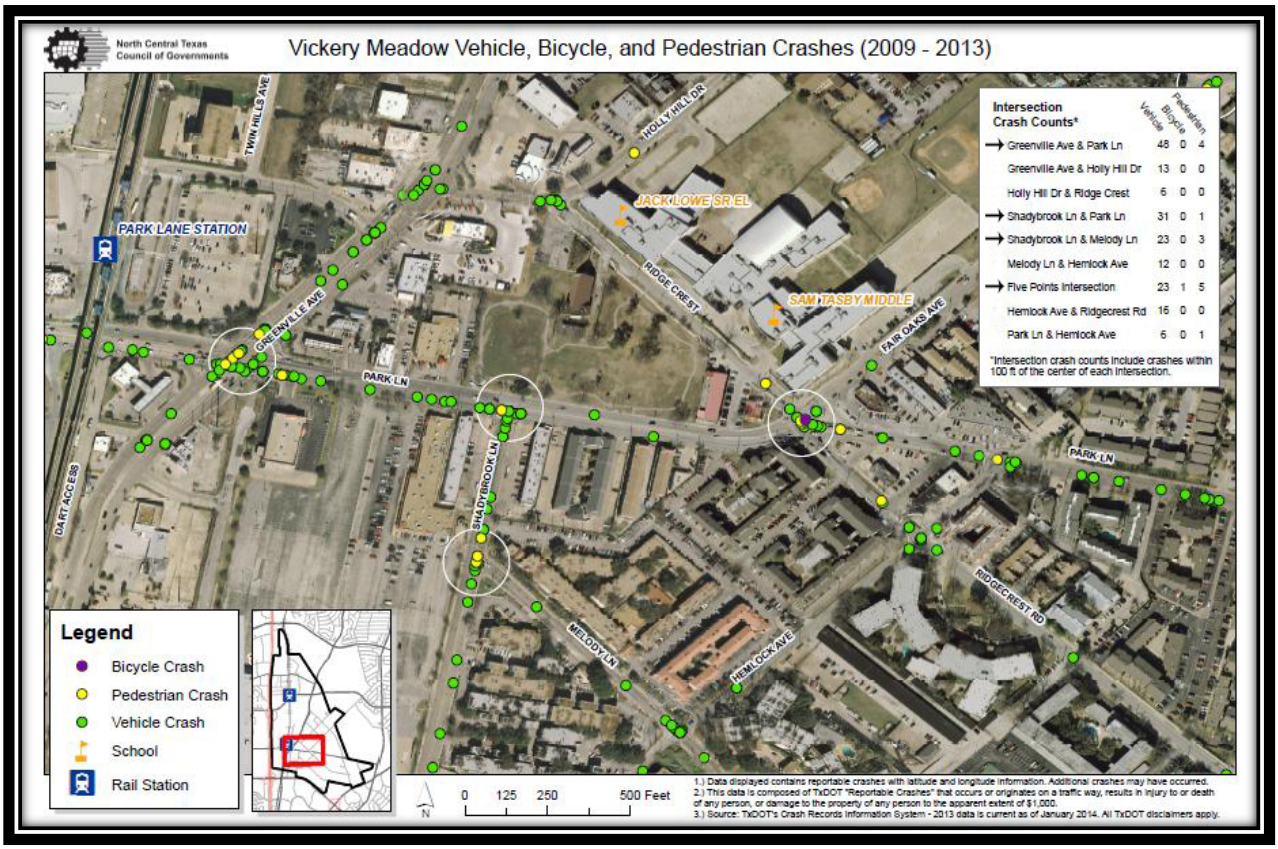
Pedestrian Road Safety Assessment (PRSA) Team:

- FHWA:
    - Stephen Ratke (Texas Division Office)
    - Craig Allred (-Resource Center)
    - Peter Eun (Resource Center)
- NCTCOG:
    - Kevin Kokes
    - Jeremy Williams
    - Sandy Wesch
- City of Dallas:
    - Merry Vickers
    - Jared White
- Dallas County:
    - Micah Baker
- Dallas Police Department
- Vickery Meadow Public Improvement District (PID)

PRSA Project Location:

Prior to the PRSA the NCTCOG provided crash maps of the Vickery Meadow Neighborhood. Although the PRSA team would assess more than what's shown on Map 1, a decision was made to focus the PRSA to the following areas:

- DART Park Lane Transit Station
- Intersections
  - Greenville Avenue & Park Lane
  - Park Lane & Shady Brook Lane
  - Shady Brook Lane & Melody Lane
  - 5-Points (Ridgecrest Road, Park Lane, and Fair Oaks Avenue)
- Schools
  - Jack Lowe Sr. Elementary School
  - Sam Tasby Middle School
  - Emmett J. Conrad High School
- Corridors
  - Park Lane
  - Shady Brook Lane



Map 1: Vickery Meadow Neighborhood

Kick Off Meeting

The VM PRSA was planned to kick off on Tuesday February 24, 2015 at 9 am; however due to the unusual cold weather and ice on the roadways the kickoff was pushed back to 2 pm. The kickoff meeting was held at the City Central Apartments Clubhouse. There was a diverse group of agencies and organizations represented at the meeting. The list of attendees can be found in Appendix A. Councilwoman Jennifer Gates welcomed everyone and established the importance of the VM RSA. She noted VM is a very diverse group of cultures and there are an extraordinary number of people who walk in this area, and safety is a priority for this area. Karla Weaver, NCTCOG Sustainable Development Manager, provided an introduction presentation including pedestrian and bicycle crash data for the area. Craig Allred then presented the eight steps of a RSA (Appendix B) and some background information for the VM RSA. The VM RSA team was introduced and then the PRSA team began the review.

Figure 1: Kickoff Meeting

Site Visits

Temperatures were unusually cold the days of the PRSA, however the entire PRSA team ventured out on the following days and times:

- Tues Feb 24th 5-8 pm
- Wed Feb 25th 3-6 pm

Figure 2: PRSA team site visit

Craig and Peter made additional observations during the following days and times:

- Tues Feb 24th 9-11 am
- Wed Feb 25th 8:30-9:30 am

The Positives

The VM PRSA team observed many positive features in the area. High Visibility Crosswalk Markings at some of the intersections provided more awareness to drivers to watch for pedestrians (Figure 3). Sidewalks were present along most of the major roadways. A map showing existing sidewalks can be found in Appendix C. A map of existing gaps or missing pedestrian infrastructure should be developed. All of the signalized intersections had pedestrian push buttons and signal heads. Turning islands were utilized at the intersections of Greenville Avenue and Park Lane and also at the 5-Points intersection. Schools utilized crossing guards at the 5-Points Intersection. Street lighting was present along most of the roadways. Medians were present along Greenville Avenue and Park Lane

Figure 3: High Visibility crosswalk

near the Park Lane DART transit station. These roadway features and their safety benefits will be further discussed later in this report.

The Vickery Meadow Neighborhood has a very proactive group of organizations and multiple agencies supporting improvements. Great transit service is provided to the area by bus and rail. The VM area has a large transit dependent population and there is a significant amount of pedestrian activity both day and night. There has been a reduction in criminal activity. A majority of children and teenagers are walking to the area schools. The SOPAC trail is planned to run right beside the high school.

Primary Concerns

Although the high number of pedestrians is a positive attribute, it does create its own challenges. One challenge is balancing the needs of all road users. The traditional methodology for roadway design places a higher prioritization on moving vehicles along the roadways. However many agencies around the country are changing the roadway design hierarchy as shown in Figure 4. Roadways should be designed to move people and in the VM neighborhood it appears walking is the mode of choice. However this could be validated with both pedestrian and vehicle counts. In addition vehicle and pedestrian counts would help determine if some of the PRSA Team's recommendations would be feasible.

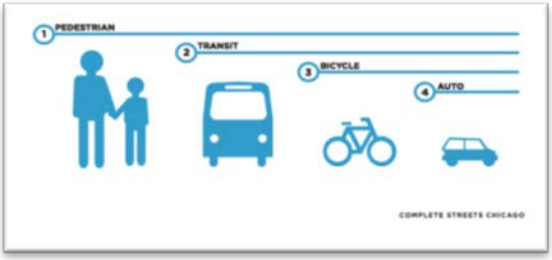


Figure 4: Chicago Roadway Design

We heard the diversity of the council district makes it difficult for those outside the VM area to really understand the challenges in the area. The number of people walking in Dallas compared to the VM neighborhood is vastly disproportionate. Table 1 is information from the 2013 American Community Survey (ACS) and is a 5 Year Estimate. It shows the diversity of the Vickery Meadow District compared to the rest of the City of Dallas. Cultural issues create challenges because there are so many nationalities living in the area and many of the cultures may not realize that walking in the roadway or crossing anywhere along the roadway can be an unsafe practice. The pedestrian's background may require re-educating them about pedestrian safety, but with 40+ languages in the area education is not a simple task. We learned some cultures may have a distrust of law enforcement due to negative experiences back in their native countries. This distrust coupled with the language barrier may be one of the leading reasons for perceived underreporting of pedestrian crashes or other incidences.

Table 1

2013 ACS 5 Year Estimates:	Vickery Meadow	Dallas
Households whose income is below the poverty level	39%	16%
No vehicle households	23%	10%
Workers who take public transportation or walk to work	13%	6%
Households do not have someone over 14 who speaks English only or English "very well"	24%	12%
Spanish Speaking Households	40%	36%
Other Indo-European languages	37%	19%
Asian and Pacific Island languages	38%	33%
Other languages	45%	20%
Housing Density (all housing units – 11,354)	6,624 per square mile	2,788 per square mile
Population Density (total population - 21954)	12,808 per square mile	3,470 per square mile

The location and site design of Sam Tasby Middle School and Jack Lowe Sr. Elementary School creates operational challenges at and near the 5 points intersection. The specific concerns and suggestions for improvement are discussed in more detail under specific location issues and suggestions.

General Safety Concerns

Intersections:

Figure 5: Pedestrian crossing outside of intersection

There were four intersections that the PRSA team focused on. Each of the intersections had either one or more concerns that could be improved. Some pedestrian signals and buttons were not operating properly. Equipment that does not work properly and is not repaired in a timely manner might lead to road users ignoring not only the broken equipment, but avoiding the intersections all together. The 2009 national Manual of Uniform Traffic Control Devices (MUTCD) lowered the walking speed rate for the clearance interval from 4 feet per second (ft/sec) to 3.5 ft/sec to provide pedestrians a little more minimum time to clear the intersection. However 3.5 ft/sec is a minimum walking rate and agencies should provide enough time for pedestrians to safely cross. The Americans with Disabilities Act (ADA) Title II are regulations set by the U.S. Department of Justice. All city governments were required to complete a self-evaluation of their facilities, programs, policies, and practices by January 26, 1993. The self-evaluation identifies and corrects those policies and practices that are inconsistent with Title II's requirements. Both the self-evaluation and transition plans must be available to the public per 28 C.F.R. §§ 35.105, 35.150(d). Capital improvement projects by Texas cities must also generally comply with the Texas Accessibility Standards (TAS) defined by the Texas Department of Licensing and Regulation (TDLR).

- Suggestion: Check all pedestrian signals and push buttons to ensure they are working properly
- Suggestion: All signal timings should be checked to ensure adequate crossing times.
- Suggestion: Each intersection should be evaluated for proper ADA/TAS curb ramps and pedestrian signals. Non ADA/TAS compliant features should be documented in the City of Dallas' ADA transition plan.

Sidewalks

Figure 6: Students walking on sidewalk and in the roadway

Although it was great to observe sidewalks in many parts of the VM Neighborhood, there were places where the condition of the sidewalks was in need of repair. In addition wider sidewalks could benefit the very high volume of people walking. In some locations people were walking in the street because the sidewalks could not handle the pedestrian demand (Figure 6), especially along Fair Oaks Avenue near Emmett J. Conrad High School. Sidewalk connectivity and obstructions are two other considerations when developing plans for improvement.

- Suggestion: Upgrade and repair sidewalks
- Suggestion: Widen sidewalks
- Suggestion: Fill in sidewalk gaps for continuity and to create a sidewalk network

Minimal Use of Pedestrian Accommodations

It was noted there were pedestrian accommodations throughout the VM Neighborhood such as sidewalks and pedestrian signals. However it was observed on multiple site visits many pedestrians were not using the accommodations provided. Even where a pedestrian signal was less than 100 feet from where they wanted to cross many pedestrians crossed mid-block (Figure 7). Culture and convenience could be reasons for the behavior; however three other reasons may be that pedestrian signals not working properly, not providing enough walk and clearance time, or wait times are too long.

Figure 7: Elementary students running across roadway midblock

- Suggestion: Ensure pedestrian signals are working and timed properly
- Suggestion: Evaluate locations for midblock crosswalks with raised crossing islands
- Suggestion: Traffic Safety Education campaign

Risky Pedestrian Actions

Many pedestrians were walking the most direct paths and that often includes crossing at mid-block locations where there was not any controlled crossing. The team observed adults as well as children, possibly as young as 8 or 9 years old, running across at uncontrolled mid-block locations. Other risky behaviors observed were pedestrians crossing against the pedestrian signal and walking in the street. Some of the behavior may be attributed to the various cultures, convenience, pedestrian signals not working properly, or sidewalks not being wide enough. The potential for a multiple threat crash (Figure 8) occurs on multilane roadways where one vehicle will stop for a pedestrian to cross but the second vehicle and pedestrian do not see each other due to the first vehicle blocking their sight lines and the second vehicle does not stop and hits the pedestrian. This will typically occur at non signalized intersections or mid-block crossings either controlled or uncontrolled.

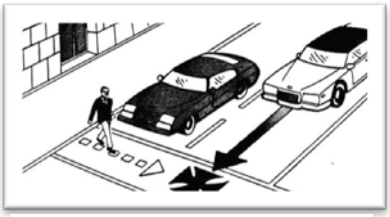


Figure 8: Multiple Threat Scenarios

- Suggestion: Design roadways using Complete Streets principles
  - Consider Road Diets and installing raised medians
  - The Classic Road Diet is converting a 4 lane roadway to 3 lanes (Figure 9). CRF between 29% - 53%
  - Raised Medians: CRF between 39% - 46%
- Suggestion: Determine desired walking routes/paths and accommodate to the greatest extent possible
- Suggestion: Education and progressive enforcement for children and adults
  - Progressive enforcement is educating, then warning, and then enforcing

Figure 9: Classic Road Diet 4 to 3 lanes

Need for Education, Positive Examples, Encouragement and Enforcement

The most effective safety programs incorporate multiple countermeasures in the disciplines of education, enforcement, and engineering. Positives examples and encouragement are also needed. In the Vickery Meadow Neighborhood it is a challenge to educate the community in traffic safety because there are so many nationalities and languages. The diversity in cultures and background with law enforcement creates challenges in communication and trust since it was stated some cultures have had negatives experiences with law enforcement back in their home countries.

- Suggestion: Develop traffic safety education programs where the children are learning and educating their parents. Use high school volunteers to educate the middle and elementary school students.

Roadway Width

The wider the roadway is the longer the crossing time, thus longer exposure of pedestrians to on coming vehicles. The width of a roadway can also influence drivers speed. Opportunities may exist to narrow the roadway profile by either eliminating travel or turning lanes, narrowing travel lanes, adding bike lanes, installing edge line pavement markings, installing curb extensions where parking exists (Figure 10). Traffic counts would be needed to evaluate eliminating travel or turning lanes.

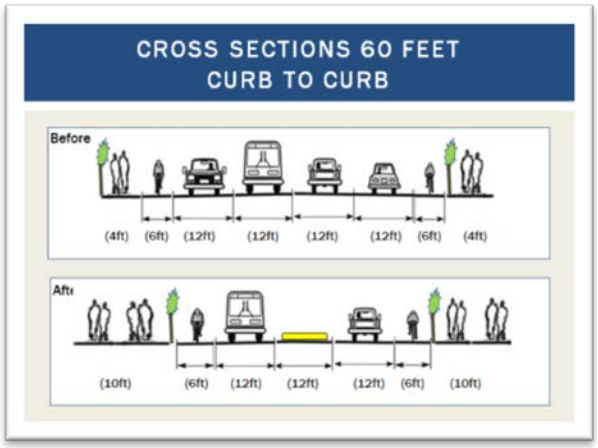


Figure 10: Road Diet example of 60 feet. Raised Median in turn bay optional

- Suggestion: Evaluate roadways for Complete Streets Designs including the potential for a "Road Diet"

Turning Movements

Left and right turning movements are conflict points for vehicles and pedestrians and bicyclists at both signalized and non-signalized intersections. At signalized intersections a protected left turn signal phase provides better safety to pedestrian than a permissive left turn signal phase.

- Suggestion: Evaluate installing "Turning Vehicles Yield to Pedestrians" sign (Figure 11)
- Suggestion: Evaluate replacing/installing a flashing yellow signal where the signal can function in a protected left turn signal phase when a pedestrian activates the pedestrian push button but in a permissive left turn phase when not activated (Figure 12).

Figure 11: Turning Vehicles Yield to Pedestrians sign

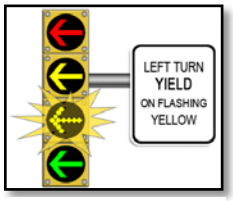


Figure 12: Flashing Yellow Arrow

Pedestrian Lighting

Street lighting is provided along the major roadways and intersections. However, lighting levels could be improved in many locations. There is a lack of pedestrian lighting throughout the study area. Lighting can reduce pedestrian fatalities by 42% at midblock locations and 54% at intersections.

- Suggestion: Evaluate street lighting levels and the addition of pedestrian lighting in areas with high pedestrian activity.

Figure 13: Lighting for Pedestrians

Intersection Geometry

How an intersection is designed can influence both driver and pedestrian behavior, but can also impact signal operations. A large corner radius of an intersection tends to encourage higher speeding turns (Figure 14).

- Suggestion: Evaluate the geometry at intersections and consider designs that accommodate trucks but also discourage high speed turns.

Figure 14: Large corner radius

Truck Traffic (Transfer Station)

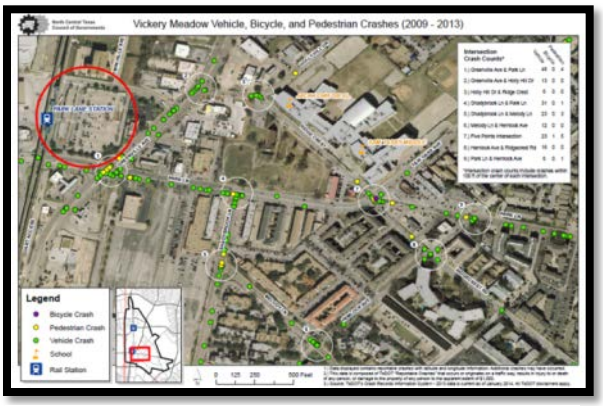
It was discovered that there is a refuse transfer station across from the high school near Fair Oaks Ave and Walnut Hill Ln. The route currently used by the refuse semi-trucks travels through the 5-Points intersection and along Fair Oaks Avenue and Park Lane (Figure 15). The trucks were observed traveling through during school dismissal hours. This truck traffic is not compatible in a neighborhood environment with schools and high pedestrian activity.

Figure 15: Large trucks heading to transfer station

- Suggestion: Look into other travel routes for trucks that do not travel along Park Lane, 5-Points Intersection, and Fair Oaks.
- Suggestion: If rerouting is not possible, do not allow trucks during peak school dismissal periods.

Specific Location Issues and Suggestions

Location: DART Park Lane Station



Map 2: DART Park Lane Station

Map 3: Close up of Dart Park Lane Station

Issues and Suggestions:

1. A high percentage of pedestrians coming and going from the south side of the DART station towards the 7-11 convenient store at the southwest corner of Park Lane and Greenville Avenue were crossing midblock where there is not a marked crosswalk (Figure 16). The distance to cross the roadway from the stations walkway via signalized intersection is approximately 435 feet compared to 80 feet crossing midblock generally near the elevated DART rail line. This does not include the distance to walk to the entrance of the 7-11. The extra walking distance explains why so many are willing to risk crossing midblock. In addition there is a 5 foot wide raised median on Park

Figure 16: DART Station Exit

Lane where pedestrians wait to finish the crossing.

- Suggestion 1: Extend the pedestrian bridge across Park Lane from the elevated train platform. This would be the most direct path, therefore a higher probability it will be used. A similar design was constructed at the Downtown Carollton DART Station (Figure 17).
- Suggestion 2: Evaluate installing a marked crosswalk with a Rectangular Rapid Flashing Beacon (RRFB) or Pedestrian Hybrid Beacon (PHB) enhancement where pedestrians are currently crossing.

Figure 17: Downtown Carrollton DART Station platform extending over Belt Line Road with a stair and elevator tower on the opposite side of the roadway from the DART station

- RRFB – Uses a rectangular-shaped high-intensity LED-based indication, flashes rapidly in a wig-wag "flickering" flash pattern, and is mounted immediately between the crossing sign and the sign's supplemental arrow plaque (Figure 18).
  - Interim Approval Memo
- PHB - A pedestrian-activated warning device located on the roadside or on mast arms over midblock pedestrian crossings (Figure 19).
  - Video Link - https://www.youtube.com/watch?v=7tyniC5DixE

Figure 18: RRFB

Figure 19: PHB

- Timeframe: Intermediate to Long
- Cost: Intermediate to High

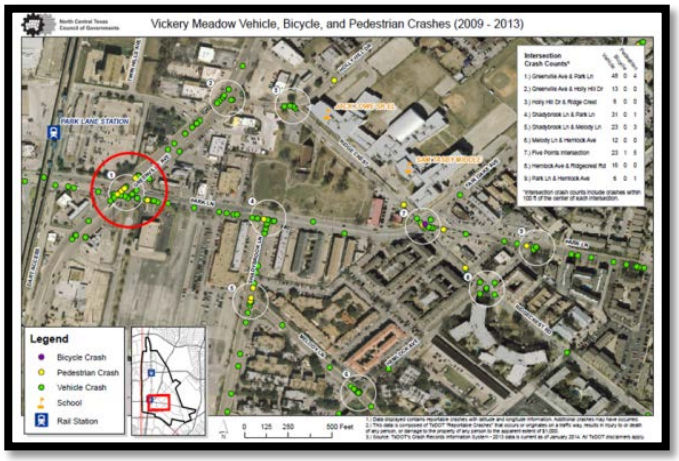
2. There are multiple locations on the east side of the DART station parking lot where pedestrians are exiting (Figure 20 & 21 red arrows) and crossing midblock instead of walking 110 to 130 feet to the signalized intersection (Figure 20 yellow arrows). At one location stepping stones were constructed to assist people making their way up the slope of the parking lot but did not direct pedestrians to an appropriate street crossing location.

Figure 20: DART Parking Lot at the northeast corner of Park Lane and Greenville Avenue

- Suggestion: Remove the stone steps (Figure 21), add fencing along the edge of the parking lot along Greenville Avenue, and add pedestrian wayward signing and markings through the parking lot so pedestrians will be guided and encouraged to cross adjacent streets at the proper crossing points. Consider re-orienting the parking lot stalls and aisles to direct pedestrians more directly to the corner of Greenville Ave and Park Ln.
- Timeframe: Short to Intermediate
- Cost: Low to Medium

Figure 21: Stepping stones

Location: Intersection of Greenville Avenue and Park Lane



Map 4: Intersection of Greenville Ave and Park Lane

Map 5: Close up of Greenville and Park

Issues and Suggestions:

1. Some pedestrians did not finish crossing Greenville Avenue before the countdown signals went to zero.

    - Suggestion: Check signal timings for all legs of the intersection. Use at a minimum the 3.5 ft/sec per the national MUTCD. For the higher volume crossings across Greenville Avenue enough time should be provided per the characteristics of the pedestrians using the crossings. For example older and disabled population will need more crossing time than the 3.5 ft/sec.
    - Timeframe: Short
    - Cost: Low

Figure 22: Countdown signal

2. Some of the pedestrian signals and push buttons were not working or not working properly. This might influence pedestrians to not use any of the pedestrian push buttons nor the crosswalks. Accessibility for someone in a wheelchair to use the push buttons would be challenging on some of the corners (Figure 23).

    - Suggestions: Check and repair all the push buttons and pedestrian signals heads that are not working properly. Place a sticker on poles to who can be contacted if buttons and signals do not seem to be working
    - Evaluate accessibility design standards for push buttons and curb ramps. If locations cannot be fixed right away be sure to add the locations in the city's ADA transition plan.
    - Timeframe: Short to Long
    - Cost: Medium to High

Figure 23: Pedestrian Push Buttons and curb ramp

3. There may be more lanes, both travel and turning lanes, than necessary. The team learned historically Greenville Avenue may have carried and/or was projected to have higher traffic volumes than are using the roadway today. The intersection is also at a skew therefore some of the corners of the intersection have a large turning radius, which encourages faster turns.

Figure 24: Right Turn Lane

    - Suggestion: Evaluate the intersection to determine if any through or turning lanes can be eliminated. If lanes can be eliminated consider widening the narrow medians that are currently there and consider adding medians where they do not currently exist. Evaluate the corners to determine if the radius can be designed to discourage fast turning movements.
    - Timeframe: Short to Intermediate
    - Cost: Low to Intermediate

4. Three street lights were within 25 feet of the intersection. The nighttime review revealed lighting could be improved at and near the intersection. On the northwest corner of the intersection there were tree branches which made the corner even darker at night. The tree branches also housed many birds which also took care of "business" directly over where people would be waiting for the pedestrian signal.

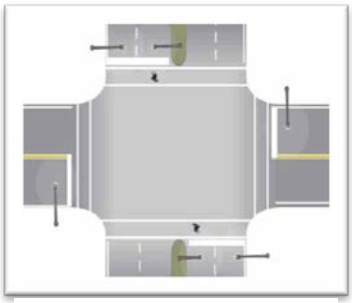
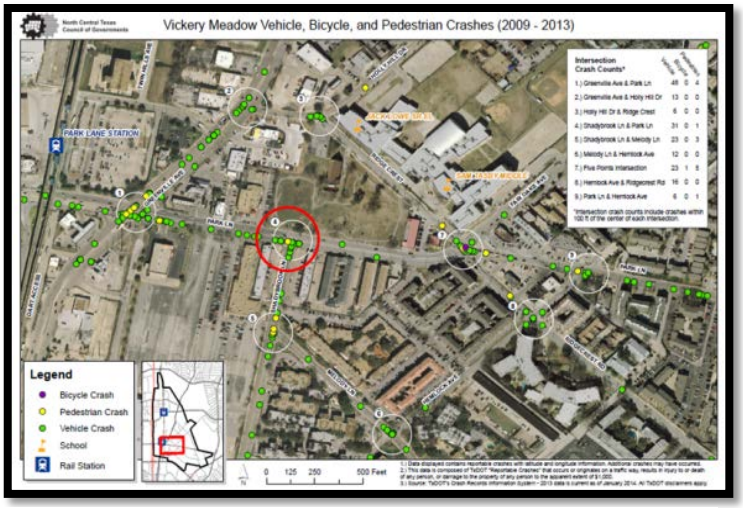


Figure 25: Recommended Street Lighting layout

    - Suggestion: Add street lighting per the recommendation of FHWA-HRT-08-053 April 2008 Informational Report on Lighting Design for Midblock Crosswalks (Figure 25)
    - Suggestion: Trim tree branches to improve lighting and not housing birds directly over the sidewalk area (Figure 26).
    - Timeframe: Short to Intermediate
    - Cost: Lighting–Intermediate to High; Tree trimming-Low

Figure 26: Birds in trees and bird droppings on waiting area of pedestrians

Location: Intersection of Park Lane and Shady Brook Lane



Map 7: Park Lane and Shady Brook Lane Intersection

Map 8: Close up Park Lane and Shady Brook

Issues and Suggestions:

1. During certain hours of the day the pedestrian signal was not operating properly. The pedestrian signal would show a walk symbol then go into the clearance phase with the countdown but then before finishing the countdown a walk symbol would come up for a few seconds, then then go back to a countdown. This may be confusing pedestrians and discouraging them from using it at all.

Figure 27: Countdown Signal

   - Suggestion: Check the traffic controller and pedestrian signal to ensure it is working properly and is following MUTCD standards.
   - Timeframe: Short
   - Cost: Low to High

2. There were crosswalks at the T-Intersection; however there were no curb ramps on the north side of Park Lane at the ends of two of the three crosswalks. (Figure 28) This makes it very difficult for people with disabilities to cross at these signalized locations. The curb ramp on the southwest corner had a large hole (Figure 29), therefore making it unusable for a person in a wheelchair, but also tripping hazards for both sight able and disabled pedestrians. The pedestrian push buttons were also placed at locations and heights that made it difficult or impossible for a person in a wheelchair to access. Truncated domes or detectable warnings are required to indicate to the blind where the edge of the sidewalk is located and that a curb ramp exists.

Figure 28: T-Intersection of Park Lane & Shady Brook

- Suggestion: Install curb ramps and truncated domes, fix the hole, make pedestrian push buttons accessible for people in wheelchairs. Check the City's ADA transition plan for where these items are on the priority list.
- Time Frame: Short to Intermediate
- Cost: Low to Medium

Figure 29: Hole at SW Corner of Park Lane and Shady Brook

3. The intersection did not have any street lighting. The closest street light was about 100 feet way.

    - Suggestion: Add street lighting at the intersection per the recommendation of FHWA-HRT-08-053 April 2008 Informational Report on Lighting Design for Midblock Crosswalks
    - Timeframe: Intermediate to Long
    - Cost: Medium to High

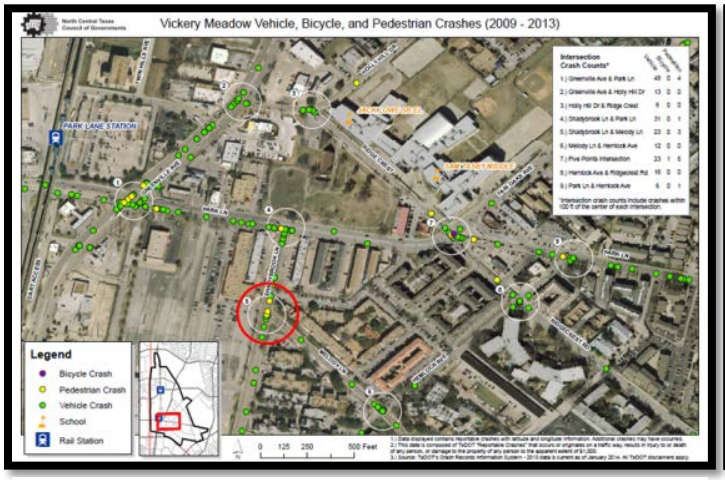
4. The review team observed a high number of turning movements at this intersection.

    - Suggestion: Consider implementing a Leading Pedestrian Interval (LPI) (Figure 30). An LPI is when the pedestrian gets a head start before the vehicles. This is implemented by giving the pedestrian signal a walk 3-4 seconds typically before the vehicles get the green. This allows pedestrians to establish themselves in the crosswalk before vehicles start moving. Yield or Stop for pedestrian in-street signs could be installed on lower speed roadways in conjunction with this implementation.
    - Timeframe: Short
    - Cost: Low

Figure 30: Example of Leading Pedestrian Interval

5. Under the Complete Streets section of this report Shady Brook Lane is recommended to follow the Complete Streets Design Standards. As part of that recommendation either a modern or mini roundabout is suggested for evaluation.

Location: Intersection of Shady Brook Lane and Melody Lane



Map 9: Intersection of Shady Brook Lane and Melody Lane

Map 10: Close Up of Shady Brook & Melody Lane

Issues and Suggestions:

1. A couple of the pedestrian push button and signals were located a fair distance away from the curb ramp and do not conform to ADA standards (Figure 31). This causes two issues, one is the signal timing and the other is visibility of the pedestrian signal. The signal timing should include the time a person in a wheelchair would push the button, get to the curb ramp and cross the roadway. The visibility of the signal head was difficult to see due to the angle and expected location of the pedestrian signal head (Figure 32 yellow circle).

Figure 31: Pedestrian Signal far distance from Crosswalk

Figure 32: Signal Head hard to see due to location

   - Suggestion in three parts:
     i. Check the pedestrian walk and clearance times for all the crossings.
     ii. Align the pedestrian signal heads so it is visible from the location a pedestrian would be standing on the corner waiting to cross.
     iii. Install / move the pedestrian signals and push buttons closer to the corner/curb ramps. Reference the MUTCD standards and guidance.
   - Timeframe: i. Short ii. Short iii. Intermediate to Long
   - Cost: Low to High

2. Some street lighting was observed but could be improved for pedestrians.

    - Suggestion: Evaluate the street lighting for the intersection but also consider installing pedestrian lighting for the intersection and corridor.

        i. Lighting CRF:
            1. by 42% at midblock locations
            2. by 54% at intersections

    - Timeframe: Short to Long
    - Cost: Intermediate to High

Figure 33: Lighting

3. Although curb ramps exist, they do not meet current ADA standards. Curb ramps need a level 4'x4' level landing at the top of the ramp so a person in a wheelchair can wait on a level surface and also maneuver a turn (Figure 34). Although single curb ramps are discouraged, if they are installed a 4'x4' level landing is required at the bottom of the ramp as well to maneuver a turn into the correct direction (Figure 35). Truncated domes are also required to indicate to the blind where the edge of the sidewalk is located and that a curb ramp exists.

    - Suggestion: Check the City's ADA Transition Plan for when these locations will be brought up to current ADA standards.
    - Timeframe: Intermediate to Long
    - Cost: Low to High

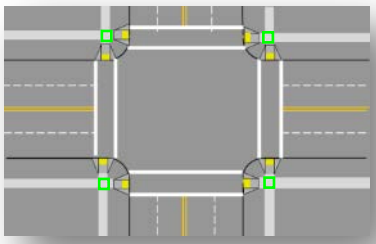


Figure 34: Example of preferred dual curb ramps and 4'x4' level landing

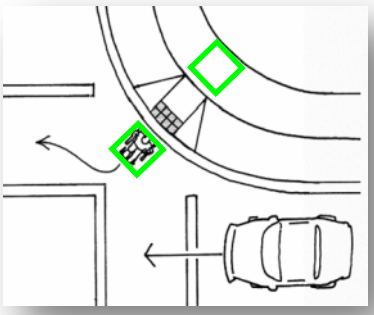
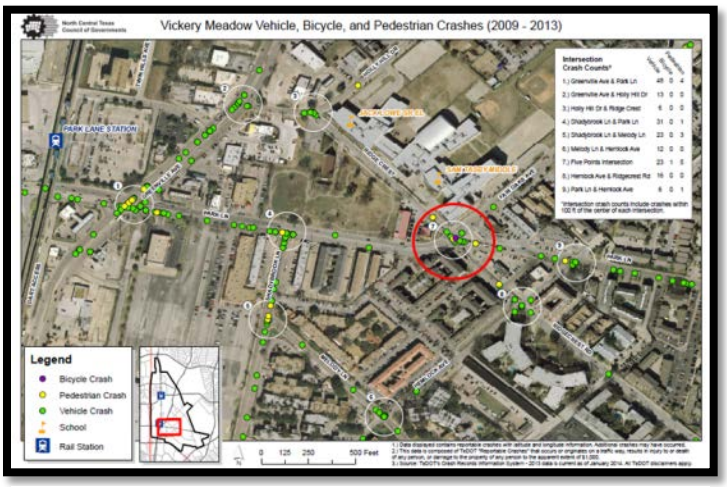


Figure 35: Single Ramp needing top and bottom 4'x4' level landing

Location: Intersection of 5-Points (Park Lane, Fair Oaks Avenue, and Ridgecrest Road)



Map 11: 5-Points Intersection

Map 12: Close Up 5-Points

Issues and Suggestions:

1. The 5-Point's intersection is challenging because it was designed with 5 different approaches, the elementary and middle schools location of buildings and entrance/exits doors are very close to the street and intersection, and the majority of students walk to and from school. The configuration of the intersection is also confusing for drivers. Due to the nature of where people are coming and going, two legs of the intersection need to be crossed, which makes for longer crossings and additional delay to the pedestrians while waiting for two walk signal indications. This may be part of the reason so many pedestrians were observed crossing away from the intersection at uncontrolled midblock locations.

Figure 36: 5-Points during school dismissal

    - Suggestion: Evaluate different intersection designs that would improve pedestrian flow, such as a modern roundabout. Roundabouts have fewer conflict points, and also can be more efficient than a signalized intersection in many situations.
    - Timeframe: Intermediate to Long
    - Cost: Intermediate

Figure 37: Road Diet and Roundabout Example Before & After, Asheville NC

Different stakeholders had design concepts developed for the 5-Points intersection and surrounding area (Figure 38).

Figure 38: 5-Points Intersection concept plans

2. The pedestrian signal head and push buttons controlling the crossing of Ridgecrest Road were not operating properly. When crossing certain legs of the intersection the countdown went to zero as we stepped onto the sidewalk.

    - Suggestion: Check and ensure all pedestrian signal heads and push buttons are working properly. Check to ensure the pedestrian walk and signals times meet at least the minimum time required outside of peak pedestrian volume hours. Provide enough time for pedestrians to cross during school dismissal times.
    - Timeframe: Short
    - Cost: Low

3. When approaching the 5-Points intersection from the west there are two regulatory signs which provides lane designations for turning and thru movements (Figure 39). Even with redundant signing the out of town reviewers could not figure out what message the sign was trying to convey until the third drive by. In addition the text for the street names is small and hard to read. A second regulatory sign "Yield Here to

Figure 39: Directional Sign prior to 5-Points

Pedestrians" is located at the corner behind the directional sign. The arrow on the sign however is pointing to a stop bar which is set at a skew. Several NO TURN ON RED (NTOR) signs with the supplemental signing stating the hours that apply were difficult to read.

- Suggestion: Simplify and clarify the signing. Consider a diagram of the intersection with arrows showing the through and turning movements, no text. The sign should be larger. Evaluate to see if the Yield Here to Pedestrian sign is needed? It appears vehicles are stopping at the stop bar consistently. The NO TURN ON RED signs should be made legible or install pedestrian actuated NTOR signs. (Figure 40)

Figure 40: Example of NTOR actuated sign

- Timeframe: Short to Intermediate
- Cost: Low to Intermediate

4. Prior to the 5-Points intersection along Park Lane there is a school advance sign; however students and adults taking their children to school were crossing midblock on Park Lane in advance of the school zone signs. (Figure 41)


Figure 41: Children crossing at uncontrolled midblock location prior to 5-Points

   - Suggestion: Evaluate expanding the School Zone to capture the zone the children are crossing.
   - Suggestion: Work with school officials to educate students and parents about proper pedestrian crossing locations and safety, and to discourage these dangerous midblock crossings.
   - Timeframe: Short
   - Cost: Low

5. The signalized intersection appeared to be operating fine outside the hours where students were starting and ending school. School guards were being utilized during the start and end of school. The operation of the intersection was more stressed during the end of the school day compared to the start.
   - Suggestion: Allow for longer pedestrian walk and clearance phases for those times of day where students are entering and exiting the school in large volumes.
   - Timeframe: Short to Intermediate
   - Cost: Low

6. The intersection operations could be improved for all times of day. During non-peak hours protected left turn phases frequently served no movements and the time could be reassigned to other phases.

    - Suggestion: Install an actuated signal control. Evaluate making Ridgecrest a one-way roadway near the school
    - Timeframe: Intermediate to Long
    - Cost: Intermediate to High

Location: Schools

Issue and Suggestions:

1. The site design for the elementary and middle school is causing several challenges during school dismissal. One challenge is getting students to wait for the pedestrian walk phases at the 5-Points intersection because there are so many students exiting at the same time and all the students cannot cross during one pedestrian cycle. This creates the second challenge where students do not have adequate space to wait between the middle schools main entrance doors and the 5-Points intersection corner. An additional challenge is keeping students from crossing Fair Oaks midblock directly outside of the main doors of the middle school where there is no traffic control.

Figure 42: 5-Points Intersection school dismissal

    - Suggestions:

        i. Limit the left-turns from Ridgecrest to Fair Oaks eastbound during school dismissal. This will keep traffic from backing up on Ridgecrest adjacent to the school, but also reduce the conflict between vehicles and pedestrians.

        ii. Evaluate closing Ridgecrest Road on the west side of the 5-Points Intersection and making Ridgecrest a one-way street eastbound on the east side of the 5-Points Intersection. This could improve the signal operations for vehicles throughout the day but also provide more flexibility for pedestrian signal timing during school dismissal.

        iii. Because students exiting the main doors that lead directly to Fair Oaks will be tempted to directly cross there in an unmarked midblock location, encourage using the doors closer to the corner of the 5-Points intersection.

        iv. Staggering dismissal times could improve the flow of students crossing at the 5-Points intersection but could also reduce or eliminate the number of students crossing midblock along Fair Oaks directly in front of the main doors.

v. Widen the crosswalk area to accommodate more pedestrians during crossings

vi. Another signal operations countermeasure to evaluate would be a variation of the Pedestrian Scramble also known as a Barnes Dance, or All Pedestrian Phase. This countermeasure provides a pedestrian phase where vehicles are stopped in all directions and pedestrians are allowed to cross in any direction. The Pedestrian Scramble works well where there are high volumes of pedestrians but not as efficient where the pedestrian volumes are lower. One of the most famous Pedestrian Scrambles is in Tokyo Japan. This YouTube video shows how it works https://www.youtube.com/watch?v=fl-DoYt3ffw. A variation may involve pedestrians walking in all legs of the intersection without vehicular conflicts but not diagonally. This would allow for longer pedestrian cycles during dismissal but normal operations at other times.

- Timeframe: Short to Intermediate
- Cost: Low to Intermediate

2. The width of the sidewalks is not adequate for the number of school students walking along the road after school dismissal. (Figure 43) This applies to all the schools from elementary to high school.

Figure 43: School Students at dismissal

- Suggestion: Develop Safe Routes to School Plans specific to each school and widen sidewalks
- Timeframe: Intermediate to Long
- Cost:
    i. Low to Medium: Developing Safe Routes to School Plans
    ii. High: Widening sidewalks

3. The Vickery Meadow Neighborhood is very diverse with over 40 plus nationalities. Traffic laws and acceptable pedestrian behaviors may differ from the United States, therefore causing confusion and increasing risks between multimodal interactions.

- Suggestion: Traffic Safety Education for Students and Parents
- Timeframe: Short to Intermediate
- Cost: Low to Medium

Complete Streets

Complete Streets is using street design standards that include all modes of transportation, vehicles, transit, walking and biking (Figure 44). The City of Dallas has a Complete Streets initiative and the Vickery Meadow Station Area Plan recommends a Complete Street retrofit for Park Lane. In addition, the Dallas Bike Plan recommends bike facilities along Park Lane from the DART station east to the future SOPAC trail being constructed east of Pineland Drive. A recommendation of the PRSA team would be to implement Complete Streets design concepts for Shady Brook Lane, Fair Oaks Avenue and Greenville Avenue. This would improve safety for all users in the neighborhood and accommodate multi-modes of travel.

Figure 44: Example of before and after complete streets design which balance the needs of pedestrians, bicyclists, transit, and motor vehicles

Issues and Suggestion:

1. Park Lane functions as a short cut route for many commuters who do not live or work in the neighborhood. It would be beneficial to have recent Average Daily Traffic volume counts, referred to as ADT. ADT will help determine what type of Complete Streets design will be achievable along all the roadways in the Vickery Meadow neighborhood. Whether the roadway was originally overbuilt, or traffic patterns have changed overtime, certain corridors seemed to have more travel lanes than needed. Lowering the Level of Service (LOS) for motor vehicles and increasing accommodations for pedestrians, bicyclists, and transit may discourage motorists from outside the area from using area streets as a short cut.

    - Suggestion: Conduct a multi-modal LOS analysis to balance the needs of all modes of transportation.

    - Suggestion: Evaluate reducing the number of lanes in each direction on Park Lane from Shady Brook to Abrams Road and Shady Brook from Park Lane to Northwest Highway and Fair Oaks Avenue from Park Lane to Walnut Hill Lane. The roadway cross-section would be one lane in each direction with a two-way left turn lane (TWLTL) in the center (Figure 45) and/or a continuous raised median or multiple crossing islands.

Figure 45: Example of 2 through lanes with a center 2 way left turn lane

- Suggestion: Consider widening sidewalks using the Zone System (Figure 46)

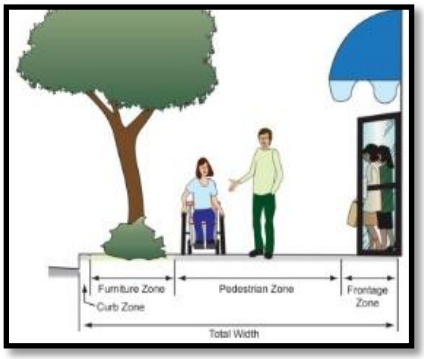


Figure 46: Zone System

- Suggestion: Evaluate either the modern or mini roundabout at three intersections: (1) Park Lane and Shady Brook Lane, (2) 5-Points, (3) Shady Brook Lane and Melody Lane. Consider designing some of the roundabouts as gateways into the Vickery Meadows Neighborhood. Installing multinational flags in the roundabout to display the 40+ nationalities in the area was suggested by members of the public during the planning process.

    i. The Modern Roundabouts (Figure 47) has a CRF of 27% for pedestrians
    ii. Conversion from signal control:
        1. All crashes: CMF = 0.52 (CRF = 48%)
        2. Injury crashes: CMF = 0.22 (CRF = 78%)


Figure 47: Example of Modern Roundabout

- Suggestion: Evaluate a direct connection from Northwest Highway to Greenville Avenue to alleviate a lot of the non-local traffic along Park Lane and at Five Points. This may improve the possibility of implementing a Road Diet and single lane modern roundabouts throughout the entire corridor.

- Suggestion: Examine options to implement the Dallas Bike Plan recommendations for bikeways on Park Lane, including connection to the DART stations. The addition of bike lanes could benefit pedestrians by slowing the speeds of vehicles on the street as well as creating a larger buffer between pedestrians on sidewalks and vehicles in the travel lanes.

- Timeframe: Intermediate to Long

- Cost: Low to High

Appendix A

Sign in list of attendees for Kick Off Meeting February 24, 2015

Vickery Meadow Pedestrian Road Safety Audit Kickoff Meeting
City Central Club House, Dallas, TX
February 24, 2015 2:00 pm - 5:00 pm

LAST	FIRST	E-MAIL	AGENCY	SIGNATURE
ALLRED	CRAIG	craig.allred@dot.gov	Federal Highway Administration	
BAKER	MICAH	micah.baker@dallascounty.org	Dallas County	
BARNARD	DALE	dale.barnard@dallascityhall.com	City of Dallas	
COLLINS	BEN	ben.collins@dallascityhall.com	City of Dallas	
DUNKLIN	NIKKI	nikki.dunklin@dallascityhall.com	City of Dallas	
EUN	PETER	peter.eun@dot.gov	Federal Highway Administration	
EVANS	TELEMACHUS	telemachus.evans@dallascityhall.com	City of Dallas	
GATES	JENNIFER	Dana.Burghdoff@fortworthtexas.gov	City of Dallas	
GLASS	TIMOTHY	timothy.glass@dallascityhall.com	City of Dallas	
GOODE	PHYLLIS	phyllis.sparksgoode@dallascityhall.com	City of Dallas	

LAST	FIRST	E-MAIL	AGENCY	SIGNATURE
KOKES	KEVIN	kkokes@nctcog.org	North Central Texas Council of Governments	
LOTT	JEREMY	jlott@dart.org	Dallas Area Rapid Transit	
MANOY	KEITH	keith.manoy@dallascityhall.com	City of Dallas	
O'DONNELL	THERESA	theresa.odonnell@dallascityhall.com	City of Dallas	
ORTIZ	JUANITA	juanita.ortiz@dallascityhall.com	City of Dallas	Clinton Lawrence for Juanita Ortiz
PARKS	ROBERT	robparks@dart.org	Dallas Area Rapid Transit	
TAMAYO	LUIS	luis.tamayo@dallascityhall.com	City of Dallas	
TOFFER	JONATHAN	jonathan.toffer@dallascounty.org	Dallas County	
VICKERS	MERRY	merry.vickers@dallascityhall.com	City of Dallas	2)601-1814c
WEAVER	KARLA	kweaver@nctcog.org	North Central Texas Council of Governments	
WESCH	SANDY	swesch@nctcog.org	North Central Texas Council of Governments	

LAST	FIRST	E-MAIL	AGENCY	SIGNATURE
WHITE	JARED	jared.white@dallascityhall.com	City of Dallas	
WILLIAMS	JEREMY	jwilliams@nctcog.org	North Central Texas Council of Governments	
WILLIAMS	SANDRA	sandra.williams2@txdot.gov	Texas Department of Transportation	
Range	Rebecca	rebecca@vickerymeadow.org	VMPID	
SCHULTZ	TEENA		DALLAS P.D	
Ratliff	Stephen		FHWA	
ROBERTS	JAMES	JROBERTS@Heartland-Security.com	HEARTLAND PATROL & INVESTIGATIONS	
Dunklin	Nikki		city of Dallas	
Reading	Barbara	barbara.reading@dallascityhall.com	City of Dal Public Works	
GARCIA	HORACIO	horacio.garcia@dcityhall	DALLAS FIRE EMS DIVISION	
Hobbs	Barbara	barbara.hobbs@dpd.ci.dallas.tx.us	POLICE DEPT	
Smith	Bervin	Bervin.Smith@dpd.ci.dallas.tx.us	DPD	

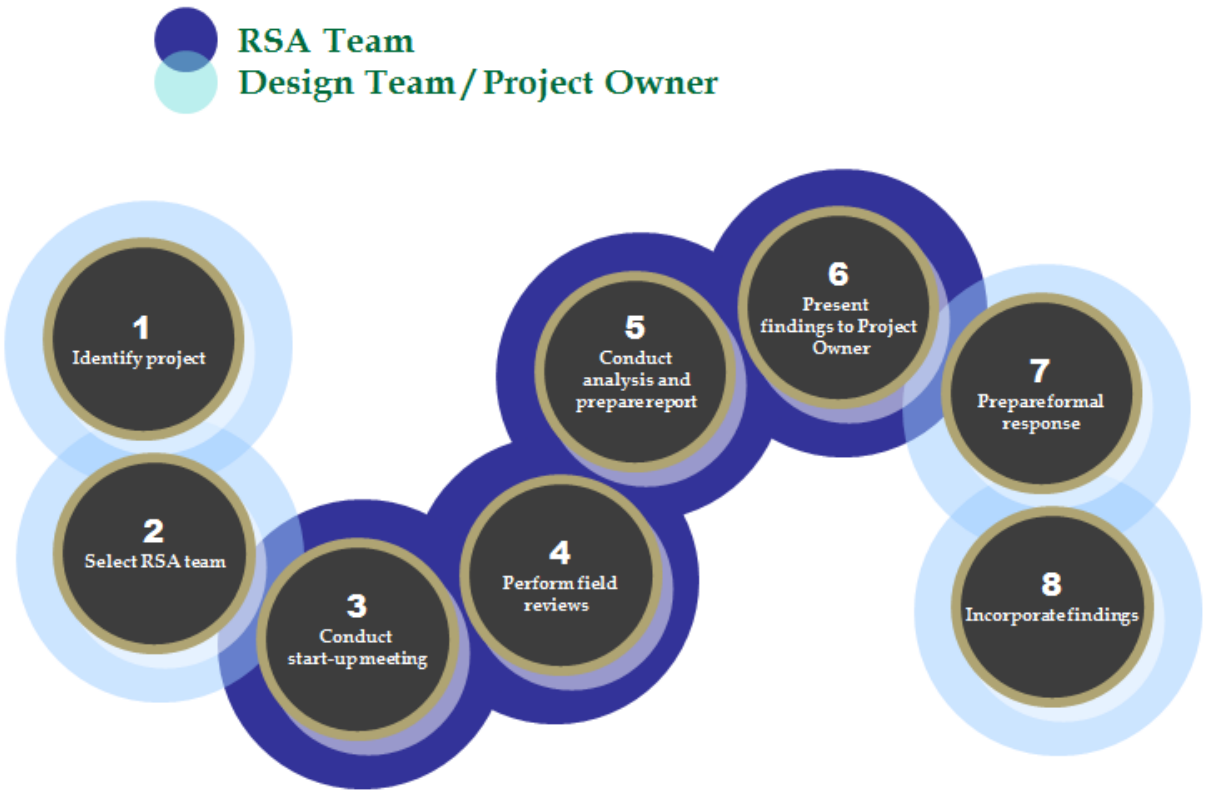
LAST	FIRST	EMAIL	AGENCY	SIGNATURE
McCue	Melissa	Melissa.mccue@dallascityhall.com	DPD	
VILLARREAL	CYNTHIA	c.villarreal@dpd.ci.dallas.tx.us	DPD	
Armon	Steven	steven.armon@dpd.ci.dallas.tx.us		
BANKS	SABRINA	SABRINA@GREATNEWPLACE.COM		
Schaefer	Edward	e@chapkinscommercial.com		
Johnson	Brent	brent.johnson@dallascityhall.com	code	
MAJUMDAR	Auro	aurobindo.majumdar@dallascityhall.com		
Lawrence	Clinton	Clinton.lawrence@dallascityhall.com	LIB	
Bahramnejad	Bahman	bahman.bahramnejad@dallascityhall.com	COD	
ROTH	STACEY	STACEY@VICKERYMEADOW.ORG		
WERTHEIMER	SADIE	sadie@arcadyrealestate.com		
"	JACK	jack@arcadyrealestate.com		
PATRINICK	STEVE	spatrinick@dart.org	214 749 2802	

DUANE NICHOLS
DAVID BORROWS - Watch Commander for NE Division
KEVIN NICHOLS - TRAFFIC

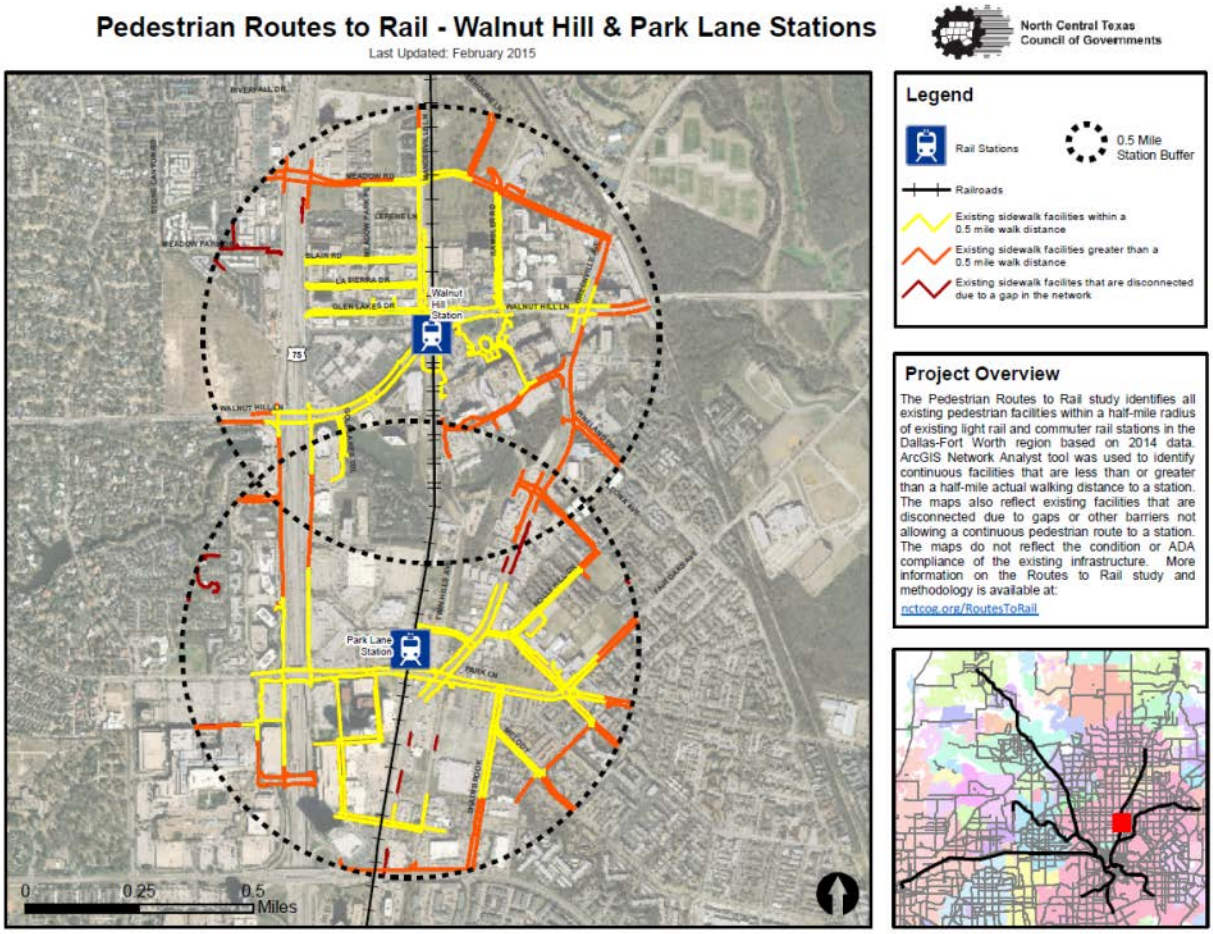
Appendix B

Eight Steps of a Road Safety Assessment

For more information about RSA's visit http://safety.fhwa.dot.gov/rsa/



Appendix C


Pedestrian Routes to Rail - Walnut Hill & Park Lane Stations
Last Updated: February 2015
North Central Texas Council of Governments
Legend
Rail Stations
0.5 Mile Station Buffer
Railroads
Existing sidewalk facilities within a 0.5 mile walk distance
Existing sidewalk facilities greater than a 0.5 mile walk distance
Existing sidewalk facilites that are disconnected due to a gap in the network
Project Overview
The Pedestrian Routes to Rail study identifies all existing pedestrian facilities within a half-mile radius of existing light rail and commuter rail stations in the Dallas-Fort Worth region based on 2014 data. ArcGIS Network Analyst tool was used to identify continuous facilities that are less than or greater than a half-mile actual walking distance to a station. The maps also reflect existing facilities that are disconnected due to gaps or other barriers not allowing a continuous pedestrian route to a station. The maps do not reflect the condition or ADA compliance of the existing infrastructure. More information on the Routes to Rail study and methodology is available at:
nctcog.org/RoutesToRail
Walnut Hill Station
Park Lane Station
0
0.25
0.5
Miles

- Crash Modification Factor (CMF): factor used to compute the expected number of crashes after implementing a given countermeasure.
- Crash Reduction Factor (CRF): % fewer crashes experienced on a road with a given countermeasure than on similar road without the countermeasure
- Relationship between CMF and CRF:
    - CMF = 1 - (CRF/100)
    - CRF = 100*(1 – CMF)

- May apply to all crashes, or crash specific subsets (e.g., run-off-road, night, wet weather, multi-vehicle, etc.)
- Same treatment in different contexts or highway types may have different effects and different CMF values

- CMF/CFR Clearinghouse: www.cmfclearinghouse.org